

UNECE

Conference of European Statisticians

Recommendations for the 2030 Round of Population and Housing Censuses



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UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

Conference of European Statisticians Recommendations for the 2030 Round of Population and Housing Censuses



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Preface

The population and housing census is an important pillar of a national statistical system, providing data on the population and its social, demographic and economic characteristics. Internationally, this is recognised in the decennial global census programmes of the United Nations. In July 2025, the United Nations Economic and Social Council adopted a resolution urging Member States to conduct at least one population and housing census under the 2030 World Population and Housing Census Programme, from 2025 to 2034.

To provide guidance and assistance to countries in the planning and execution of their population and housing censuses, the Conference of European Statisticians is issuing a set of recommendations in each decennial census round. While aligned with global guidance, the recommendations reflect the reality and specific needs of countries of Europe, North America, Central Asia and other countries participating in the Conference of European Statisticians. They facilitate and improve the comparability of census data through the identification of a core set of census topics and the harmonization of concepts, definitions and classifications.

The Statistical Division of the United Nations Economic Commission for Europe organized the preparation of the present Recommendations for the 2030 Round of Population and Housing Censuses in close collaboration with Eurostat and the United Nations Statistics Division in New York. Thirteen thematic task forces under the coordination of the Steering Group on Population and Housing Censuses carried out the work from 2022 to 2025. The Recommendations were endorsed at the 73rd plenary session of the Conference of European Statisticians in Geneva in June 2025.

Acknowledgements

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Altogether, 208 census experts from 37 countries and 12 international organizations participated in the preparation of the Recommendations (see Annex III for the full list of contributors).

UNECE is grateful to all of these experts for their contributions, as well as to the United Nations Population Fund (UNFPA) Eastern Europe and Central Asia office and to the Interstate Statistical Committee for the Commonwealth of Independent States (CIS-Stat) for supporting the related expert meetings.

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Acronyms and abbreviations

ABDR	Address, buildings and dwellings register
AI	Artificial intelligence
API	Application programming interface
CES	Conference of European Statisticians
CIS-Stat	Interstate Statistical Committee for the Commonwealth of Independent States
EC	European Commission
ECOSOC	Economic and Social Council
Eurostat	Statistical Office of the European Union
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FPOS	Fundamental Principles of Official Statistics
GA	General Assembly
GIS	Geographic information system
GISCO	Geographic information system of the European Commission
GSBPM	Generic Statistical Business Process Model
GSGF	Global statistical geospatial framework
ICF	International Classification of Functioning, Disability and Health
ICLS	International Conference of Labour Statisticians
ICT	Information and communications technology
ILO	International Labour Organization
INSPIRE	Infrastructure for Spatial Information in the European Community
ISIC	International Standard Industrial Classification of all Economic Activities
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISO	International Organization for Standardization
IT	Information technology
ITF	International Transport Forum
ITRS	International Territorial Reference System
KPI	Key performance indicator
NSO	National Statistical Office
PIN	Personal identification number
SDC	Statistical disclosure control
SDMX	Statistical Data and Metadata eXchange
SMART	Specific, measurable, achievable, relevant, and time-bound
SNA	System of National Accounts
TV	Television
UIS	UNESCO Institute for Statistics
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Population Fund
UN-GGIM	United Nations Global Geospatial Information Management
UN-IGIF	United Nations Integrated Geospatial Information Framework
UNSD	United Nations Statistics Division
WHO	World Health Organization
WPA	World Programme of Action Concerning Disabled Persons
WG-SS	Washington Group Short Set on Functioning

Chapter 1 Introduction

1.1 Background and purpose

1. The Conference of European Statisticians Recommendations for the 2030 Censuses of Population and Housing are designed to guide countries in preparing and carrying out their population and housing censuses, and to facilitate the comparability of census data by identifying a set of census core topics and by proposing harmonized concepts, definitions and classifications.
2. The Recommendations are also expected to be used as the general framework for the European Union (EU) programme for the 2031 round of population and housing censuses, for which data are to be provided by EU Member States to the Statistical Office of the European Union (Eurostat) under the provisions of Regulation (EC) 763/2008 on population and housing censuses.
3. The present Recommendations were prepared throughout 2022–2024 as part of the work programme of the Conference of European Statisticians (CES) and were endorsed at the 73rd plenary session of the Conference in June 2025. The Statistical Division of the United Nations Economic Commission for Europe (UNECE) organized this work in close collaboration with Eurostat and in conjunction with the preparation of the global Principles and Recommendations for Population and Housing Censuses – Revision 4¹, by the United Nations Statistics Division (UNSD) in New York.
4. The development of these Recommendations aimed to take into account new developments over the past decade in all statistical areas, including relevant statistical domains such as migration, labour and gender; methodological and technological developments impacting census-taking and the dissemination of census data; and societal changes affecting the demand for data on certain topics, the desire for more timely release of census results, the increased expectation of quality metrics and other metadata, and the need for more diverse and targeted communications activities.
5. The CES Steering Group on Population and Housing Censuses coordinated the work of the 13 thematic task forces that were established to prepare drafts of the various chapters covering many parts of the Recommendations. Some parts of the Recommendations, which did not fall within the scope of the task force themes, were revised by the Secretariat under the guidance of the Steering Group.
6. The task forces comprised experts from national statistical offices (NSOs) and international organizations across the UNECE region, as well as some independent experts. To ensure that each country had the opportunity to participate in the discussions on the structure and content of the draft Recommendations, expert meetings were held in 2023 and 2024 in Geneva, Switzerland, to which all countries participating in the work of CES were invited.

¹ United Nations (2025). [Principles and Recommendations for Population and Housing Censuses - Revision 4](#) (version 31 March 2025)

1.2 Structure of the Recommendations

7. The first part of this publication, **Planning and Conducting the Census** gives recommendations relating to the preparation and implementation of all stages of the census cycle. This includes everything from deciding on the high-level census design to be adopted and the specific methodology to be employed; through considerations relating to legislation, technology, data protection, archiving and outsourcing; to guidance on metadata, quality assurance and census costs.

8. New to the Recommendations for the 2030 round, chapters on geospatial information and on emergency management and contingency planning as well as significantly expanded content on dissemination and on communication reflect the changing realities and priorities of censuses in the UNECE region.

9. The second part of the publication, **Census Topics**, gives recommendations on the content to be collected or compiled as part of the census exercise.

10. The Recommendations include descriptions and definitions of the recommended topics, as well as guidance on matters that may need to be considered, such as specific methodological concerns, and explanations of the relevance of topics and their inter-relationships.

11. Where relevant, recommended classifications are specified. This publication also refers to several national examples illustrating individual countries and their practices or experiences.

1.3 Core and non-core topics

12. Topics are designated in these Recommendations as **core** or **non-core** on the basis of their relative importance for inclusion in most censuses. Core topics are those generally regarded as essential for providing key information for which there is a high demand in most countries and for which the census is usually the most suitable source. Non-core topics are those whose inclusion may, in general, be considered less vital for collection or compilation in a census, although they may still be essential topics for production as part of a system of national official statistics.

13. The specific national circumstances, in terms of both user demand and production capabilities, mean that this distinction between core and non-core should be regarded as flexible and must be adapted to each country's situation. The designation of a topic as core implies a strong suggestion on the part of the international expert community that it should be included in most censuses.

14. Depending on their own national circumstances and data requirements, countries may also decide to include in their censuses other topics that are not covered in these Recommendations. Countries should consult the United Nations **Principles and Recommendations for Population and Housing Censuses** (see paragraph 15 below) for guidance on additional topics not covered in this publication. When opting to include other topics in the census, due consideration must be given to matters such as response burden

and possible impacts on overall census data quality (e.g. if sensitive topics are included, or topics requiring proxy response).

1.4 Relationship to the 2030 World Population and Housing Census Programme

15. The planning, research and development that have led to these CES Recommendations took place simultaneously and in close cooperation with the revision of the global **Principles and Recommendations for Population and Housing Censuses** coordinated by the United Nations Statistics Division (UNSD), which has been prepared to coincide with the start of the 2030 World Population and Housing Census Programme.

16. While aligned with the Principles and Recommendations to the greatest extent possible, they are intended to reflect the reality and specific needs of countries in the UNECE region. These countries are characterized by a somewhat lower degree of diversity in their population and housing characteristics than can be seen globally; they enjoy a generally high level of economic development, meaning that some topics seen as essential for inclusion in censuses in other world regions are not applicable in this region; and they have, for the most part, relatively advanced statistics systems in which certain topics are sufficiently covered by other statistical activities and do not therefore need to be collected in the census.

17. The two sets of Recommendations are consistent and complementary. The global Recommendations are broader in terms of issues and coverage, while the CES Recommendations are more specific on some definitions and classifications. Where differences are seen, such as in the designation of core or non-core topics or differences in definitions, countries should decide which to follow based on a consideration of which best reflects their own circumstances and needs.

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Part A Planning and Conducting the Census

Chapter 2 Legal basis

18. Whatever type of census an NSO conducts, it should take place within an established legal framework². This can be permanent and/or it can require issuance of new legislation for each census. In the latter case, a Statistics Act or Census Act must be approved before each census, to authorize the topic content, prescribe access to administrative data, and deal with many other issues outlined below.

19. When a General Statistics Act includes all the necessary provisions required for the conduct of a population and housing census and/or the production and dissemination of statistical data, specific census legislation may not be necessary.

20. In general, countries employing a fully register-based census design are more likely to find that the census is covered sufficiently by general statistical legislation, while those using a combined or fully enumeration-based design are more likely to require a dedicated census law.

21. Whether general or specific, permanent or recurring, legislation plays a crucial role in safeguarding the conduct and quality of a census. Such legislation:

- (a) gives the NSO the power to oblige universal response (in the case of enumeration-based censuses) and/or the power to obtain the necessary administrative records (for register-based or combined censuses);
- (b) helps protect the census office from outside influence such as politically driven demands to include certain questions/variables, follow certain procedures or include certain groups that ought not to be included among usual residents;
- (c) fosters trust and better cooperation of the public, no matter what the census design, by reassuring them that data are kept confidential and used only for statistical purposes.

22. These essential roles of legislation must be balanced against the challenges that it can pose if not appropriately designed. Too-detailed legislation can limit the flexibility of the NSO (see below); delays in adoption of legislation can hinder efficient planning and conduct of the census; and a requirement for a new census law for each iteration of the census can expose the NSO to the exigencies of political matters, such as changes in government, which may lead to delays.

2.1 Establishing the required legislation for a census

23. In countries in which the NSO lacks permanent or primary legal authority for the taking of periodic censuses, or in countries where specific legislation is required to enable a

² While this section gives the key recommendations for census legislation, more detail can be found in the relevant sections of the [CES Guidance on Modernizing Statistical Legislation](#) (2019) and the [Generic Law on Official Statistics](#) (2016).

particular round of the census to take place, it is important to act early to establish the necessary legal authority.

24. The legislative process and the timeframe necessary to complete it will vary from country to country, but sufficient time should be allowed for the completion of such a process well before the scheduled starting time of any census activity that is dependent on the legislation, such as a request for allocation of funds or the appointment of field staff.

25. In planning such a timetable, countries should always build in a contingency to allow for unscheduled delays in the legislative process. As described in [Chapter 11](#), the risk of delays in the legislative process should be a part of the risk register, which should spur discussions on mitigations that might prevent a problem with the legislative process.

2.2 Scope of census legislation

26. Irrespective of the census design, the legal basis for the preparation and conduct of a census should usually cover at least the following:

- (a) the allocation of funds for the census operations, including amounts and timing of disbursement;
- (b) general aspects of the scope, methodology, content and timing of the census (see section [2.3](#) below);
- (c) provisions and standards for protecting confidentiality, privacy and security in the collection, transmission, storage and dissemination of data, including specific provisions prescribing access to, and protection of, any administrative data used for the census;
- (d) provisions for obtaining (in a timely manner and with the required format, content and quality) and permissible uses of registers and other administrative sources to produce census data or to support field operations, including provisions for linkage among sources and for high-granularity dissemination products;
- (e) the relationships between the agency responsible for the census and other public administrations involved in the census operations, including the holders of administrative data;
- (f) the procedures and necessary delegations of authority for procuring equipment and supplies and recruiting personnel;
- (g) in the case of censuses involving direct enumeration: the obligation of citizens to provide complete, accurate and timely census information and the obligation of the enumerators to record the responses faithfully, and the sanctions and penalties to be imposed for failure to comply with either of these obligations.

27. Where registers or other administrative sources are used that are produced and owned by entities other than the NSO, the census legislation must be carefully aligned with other national legislation pertaining to these sources, such as privacy and data protection laws, to ensure coherence and avoid ambiguity. In some cases, such general data protection laws may already include all the provisions necessary to cover the specific needs of censuses, including the use of register data for censuses, or measures to be applied to census enumerators. In

other cases, provisions on data confidentiality must be included in the census-specific legislation.

28. Whether part of general statistical legislation or census-specific legislation, the following provisions should also be ensured by enshrining them in law:

- (a) The Chief Statistician should be free to decide on the allocation of overall resources for official statistics between subject areas, with only the total budget decided at the political level as part of the budgetary process;
- (b) The Chief Statistician should be free to determine the census reference date, and the dates of field operations based on scientific principles and logistical considerations, without political influence;
- (c) NSOs must not be subject to any official or unofficial clearance process involving government bodies outside the statistical system for the release of census results;
- (d) Census results must be publicly accessible and disseminated simultaneously for all users, including government users, at dates determined by the statistical system;
- (e) The NSO has the right to communicate directly with the media regarding the results of the census.

29. Census legislation is equally important for protecting the rights of the NSO and for formalizing their duties. Where the duties and responsibilities are clearly specified in legislation, this can help to bolster public trust and support for the census.

2.3 Flexible census legislation

30. Census legislation should be as flexible as possible: that is, it should be designed without provisions that are rigid or prescriptive regarding the census design, content or operation. Legislation that defines the specific methods, questions or content and/or outputs of the census can limit the freedom of the census agency to respond adequately to changing circumstances, including evolving user needs, technological changes, poor quality administrative sources, or crisis situations calling for significant changes in methodology or timing.

31. Instead of being contained in legislation, the necessary detail should be included in the census regulations or other more detailed implementation plans produced by the census authorities.

2.4 Public communication on census legislation

32. As described in Chapter 6, public communications materials should be developed to ensure that members of the public understand the reasons for conducting a census, how it will take place, and their role in the process. This should include information that helps the public understand the data protection mechanisms enshrined in the law; and information explaining the legal obligations of citizens and potential penalties for non-cooperation.

33. While many countries' census laws designate the census as mandatory and include specific provisions for imposing sanctions for non-compliance, the communications implications of enacting these sanctions may be negative. Imposing penalties, or even using the threat of penalties as a means of soliciting responses, may result in adverse publicity which may reduce the degree of cooperation.

34. If there is to be a significant change in census design - such as a move from a census based primarily or exclusively on data collected from direct enumeration to one that employs registers or other administrative sources - new legislation must be drafted. It is important to allow time not only for the development of the legislation itself, but for public participation and consultation in this process, to ensure that the new census design and the associated legislation enjoy public support.

Chapter 3 Census design and enumeration methods

3.1 Aims and objectives of a census

3.1.1 Role in national statistical systems

35. The objectives of a census are specific to individual countries and differ according to the local circumstances. Its unique role depends on the demand for statistics existing in a country and by the content and structure of its existing statistical system.

36. The population and housing census represents one of the pillars for data collection on the number and characteristics of the population of a country and should form a central part of an integrated national statistical system, which may include other censuses (for example an agricultural census), surveys, registers and administrative files. It provides, at regular intervals the benchmark for the country's population estimates programme. For small geographical areas or sub-populations, it may represent the only source of information for certain social, demographic and economic characteristics. For many countries, the census also provides a unique source for a robust framework to develop sampling frames.

37. In 2025 the United Nations Economic and Social Council (ECOSOC) adopted a resolution³ urging "Member States to conduct at least one population and housing census under the 2030 World Population and Housing Census Programme, taking into account, as appropriate, the fourth revision of the Principles and Recommendations and other related international and regional recommendations, giving particular attention to advance planning, cost efficiency, coverage and the timely dissemination of, and easy access to, census results for all, in order to inform decisions and facilitate the effective implementation of development plans and programmes".

38. An increasing number of countries now rely on data derived from administrative registers or sources to produce some or all of their population and housing statistics. In these countries there is an opportunity to provide an integrated view of the country where social, demographic and economic characteristics are linked together. Moreover, census data is increasingly used for linkages with other data sources.

3.1.2 Non-statistical functions of a census

39. One of the Fundamental Principles of Official Statistics states that "individual data collected by statistical agencies for statistical compilation... are to be used exclusively for statistical purposes"⁴ (see also Annex II). While the use of census data for administrative purposes would violate this Fundamental Principle some countries use the census operational

³ ECOSOC Resolution 2025/13 on the 2030 World Population and Housing Census Programme, adopted on 10 June 2025.

⁴ General Assembly Resolution A/RES/68/261 adopted on 29 January 2014, Fundamental Principles of Official Statistics.

infrastructure not only to collect statistical information for the census but also to collect information on individuals or households for the creation or updating of population registers. Countries who use the census operations in this way should consider:

- (a) Using two separate questionnaires for the two purposes;
- (b) Explaining clearly to respondents the dual purpose of the census operations and that the information collected for the census will remain confidential and used only for statistical purposes;
- (c) Ensuring there is a separate legislative framework for each of the operations; and
- (d) Assigning responsibility for updating information required for administrative purposes to a different agency (one that is not the NSO).

40. In some countries, in recognition of their sociological and historical value, census records are made available to the public after a number of years. Section 7.4 addresses the related issues.

3.2 Definitions, essential features and phases of a census

3.2.1 Background

41. Traditionally, the definition of a census has been based on the basic principles of individual enumeration, simultaneity, universality and defined periodicity. In the last thirty years however, different methods have emerged in the UNECE region whereby the census has assumed a wider concept. In some countries the traditional method based on the field enumeration of all individuals has moved to the use of data recorded in administrative registers. Furthermore, the priority of universal enumeration of individuals and their characteristics has shifted towards the need for more frequent and relevant data for the total population and the smallest local areas. Consequently, a common definition of a population and housing census for the UNECE region is now based more on the output produced rather than on the methodology used to collect the data.

3.2.2 Definitions

42. The **population census** is defined as the operation that produces at regular intervals the official counting (or benchmark) of the population in the territory of a country and in its smallest geographical sub-territories together with information on a selected number of demographic and social characteristics of the total population. This operation includes the process of collecting (through a field enumeration or the use of registered-based information), processing and aggregating individual information, and the evaluation, dissemination, measuring the precision, and analysis of demographic, economic and social data. In order to plan for, and implement, economic and social development policies, administrative activity or scientific research, it is necessary to have reliable and detailed data on the size, distribution and composition of the population. The population census is a primary source of these basic benchmark statistics, covering not only the settled population but homeless persons and nomadic groups as well. Data from population censuses may at

times be presented and analysed in terms of statistics for a wide variety of geographical units ranging from the country as a whole to individual small localities or city blocks.

43. The **housing census** is similarly defined as the operation that produces at regular intervals the official counting (or benchmark) of all housing stock in the territory of a country and in its smallest geographical sub-territories together with information on a selected number of characteristics of housing. This operation includes the similar processes of data collection, processing and the aggregation of information related to housing, and the evaluation, dissemination and analysis of data related to the living quarters. The census should provide information on the stock of housing units together with information on the structural characteristics and facilities that have a bearing upon the development of normal family living conditions.

44. A **population and housing census** is thus the process that produces, at the same time, inter-related information on the population and housing stock as described above. This operation has the advantage of obtaining information on two universes (population and housing). The outputs of a census process related to the total population and housing stock are indispensable for providing statistics on the population, family, household and housing situation on a uniform basis for small areas or population sub-groups. The characteristics of the population include geographic, demographic, social, economic, and household and family characteristics. For many countries, the outputs obtained through a census process are vital for providing such information since the census is the only source available and there are no other viable alternatives.

45. Since an increasing number of countries rely on data derived from registers and administrative data sources for their censuses, it is worthwhile defining the terms register and administrative data. In some countries the term administrative data is used as a synonym for register-based data. In other countries a distinction is made between the two, and administrative data is taken also to include administrative sources other than registers.

46. For the purposes of this publication, a **register** is defined as a systematic collection of unit level data organized in such a way that updating is possible, whereas **administrative sources** are data holdings contain information collected primarily for administrative (not research or statistical) purposes. This administrative type of data is collected by government departments and other organizations for the purposes of registration, transaction and record keeping, usually during the delivery of a service. Thus, they serve an administrative purpose (e.g. if a person moves from one municipality to another, she/he is likely to need to update the taxation department). They include administrative registers (with a unique identifier) and other administrative data without a unique identifier.

47. The term **population register** is defined by the United Nations⁵ as a system that "records all residents in the country, together with their basic demographic information, and updates for births, deaths, changes of marital status, international migration (both into and out of the country), and internal migration (by recording changes of address within the country)". An **address register** is an up-to-date comprehensive list of all known physical addresses within a country. It is often a key piece of statistical infrastructure for a census, either register-based or field-based.

⁵ United Nations (2022). [Handbook on Registers-based Population and Housing Censuses](#) (para. 3-7)

48. Countries conducting a register-based census normally use a population register as the backbone for their census. Where population registers do not exist, countries are increasingly using linked administrative data and a series of rules to de-duplicate and determine which records and units should be considered as part of the usual resident population. The administrative “signs of life” method is also used by countries that do have a population register but wish to assess and correct coverage errors of the population register using other administrative sources.

3.2.3 Essential features of a population and housing census

49. The set of essential features that makes a population and housing census unique is the following:

3.2.3.1 Individual enumeration

50. Information on each enumerated person (and each set of living quarters) is obtained so that their characteristics can be separately recorded. This allows cross classifying the various characteristics and obtaining data by more than one characteristic.

3.2.3.2 Simultaneity

51. Information obtained on individuals and housing in a census should refer to a well-defined and unique reference period (or specific moment in time). Ideally data on all individuals and living quarters should be collected simultaneously. However, if data are not collected simultaneously, adjustments should be made so that the reported data have the same reference period.

3.2.3.3 Universality

52. The population and housing census should provide data on the total number of persons, households and housing within a precisely defined territory of a country. The counting (or benchmarking) of the population should include every person residing and/or present in the defined territory of a country at a defined singular point in time (commonly referred to as the census day – see paragraph 762). The data on the basic level of enumeration provided by the census should be validated with an independent coverage check such as a post-enumeration survey.

3.2.3.4 Small area data

53. The census should produce data on the number and characteristics of the population and housing related to the smallest geographic areas of the country, and to small population sub-groups, consistent with the overriding requirement to protect individual confidentiality.

3.2.3.5 Defined periodicity

54. The census should be taken at regular intervals so that comparable information is made available in a fixed sequence. It is recommended that census data be produced at least every ten years.

3.2.4 Census phases

55. Censuses conducted by means of a field enumeration do not necessarily follow a uniform pattern among different countries, but they have certain major common elements. They can be organized with the help of the Generic Statistical Business Process Model (GSBPM) which describes and defines the business processes needed to produce official statistics.⁶ Thus, in general, census operations can be divided into several phases which are not entirely separate chronologically or mutually exclusive. These are:

- (a) Involvement of stakeholders (including government agencies, statistical offices, local authorities, international organizations, general public);
- (b) Preparatory work (including legislation, testing and rehearsal, outsourcing, contingency planning);
- (c) Enumeration;
- (d) Data processing;
- (e) Quality assurance at each stage;
- (f) Dissemination of the results;
- (g) Evaluation of the coverage and data quality; and
- (h) Analysis of the results.

56. It is important that appropriate quality assurance strategies (Chapter 9) be applied in all these phases to make sure that all aspects of data quality (relevance, accuracy, timeliness, accessibility, interpretability, coherence) are taken into consideration, and that each choice made in all census phases is the best trade-off that achieves "fit-purpose".

3.3 Strategic objectives and criteria for the selection of census topics

57. Given the costs required and the massive involvement of the population, the content and the methods used in a census should be scrutinized carefully to make sure that all the aspects of collection operations and the dissemination of results comply with the highest standards of relevance, quality, confidentiality, privacy and ethics. Data should be collected using the most viable and/or cost-effective means. The content of a census should be decided after looking into:

- (a) The demand for data at national and local levels;
- (b) The availability of data from other statistical sources; and
- (c) The constraints of a census for data collection where (for enumeration-based censuses at least) only a limited number of questions can be asked on single topics and where sensitive or more complex topics that require extended modules and specialized training of interviewers can be covered only to a limited extent.

⁶ <https://statswiki.unece.org/display/GSBPM/Generic+Statistical+Business+Process+Model>.

58. In addition to these three factors, the countries following the census and population statistics programme of the European Union will have to take into account possible requirements of that programme in terms of census content, aimed at ensuring international comparability of census results specifically among countries of the European Union.

59. Each census topic should meet a number of key user requirement criteria:

- (a) The topic carries a strong and clearly defined user need, and is of major national importance and relevant at the local level;
- (b) Data on the topic are required for small population groups and/or at detailed geographical levels, and are expected to be used in multivariate analyses with other census topics respecting data confidentiality principles;
- (c) The data to be collected has been shown to be reliable and accurate;
- (d) The content does not differ drastically from previous censuses and where appropriate any new or modified topic can still provide comparison with previous censuses.

60. The user requirement for data should be balanced against a number of other factors when evaluating what information can be collected from the census. A topic should NOT be included in a census if:

- (a) It is sensitive or potentially intrusive, or requires lengthy explanations or instructions to collect;
- (b) It imposes an excessive burden on the population, or seeks information not readily known;
- (c) There is no longer a significant user demand;
- (d) Its inclusion is likely to have a detrimental impact on coverage or the quality of the information collected;
- (e) It enquires about opinions or attitudes; or
- (f) It is likely to present major coding problems or extensive processing or significantly add to the overall cost of the census.

61. In addition to these factors, the census should be considered as an exercise carried out purely for statistical purposes, and should not, therefore, be used to collect data that will deliberately promote political or sectarian groups, or sponsor particular causes.

62. In those censuses where a paper census questionnaire is used, the limited space available on the questionnaire should be optimized; the design and size of a question will also be an important factor in a census questionnaire in deciding whether certain data can be collected.

63. The inclusion of any new topic should always be tested to ensure successful collection and production of reliable results. In general, a population and housing census should be seen as part of an integrated programme of data collection and compilation aimed at providing a comprehensive source of statistical information for economic and social development planning, for administrative purposes, for assessing conditions in human settlements, for research and for commercial and other uses. The value of the census is increased if the results can be analysed together with the results of other investigations.

64. The full list of recommended topics can be found in Annex I. The list distinguishes between core and non-core topics and reflects the recommendations contained in part B. **Core topics** are those considered to be of basic interest and value to CES member countries, and it is recommended that these countries cover these topics in their 2030 round of population and housing censuses. **Non-core topics** are those topics that countries could select based on their national priorities (see also paragraphs [12](#) and [13](#)). Some topics are referred to as **derived topics**. These topics are those for which information is obtained indirectly (that is, from the data collected on other topics), and therefore are not required to be collected separately. The derived topics are presented in general after the topics from which they are derived.

3.4 The relationship between enumeration-based censuses and sample surveys

65. While population censuses go back at least 6,000 years, as suggested by clay tablets found in ancient Babylon, the history of “modern” censuses can be traced to the mid-seventeenth century. Sampling, in turn, is a more recent technique.

66. Traditionally, censuses started out as a simple enumeration of people. Over the years they grew in size and scope as users’ demands for information on other areas of social and economic life in addition to basic demographic characteristics increased. Consequently, as new issues emerged, there were pressures to ask more census questions. Allowing for too many extra questions may result in exceedingly large census forms. This can cause concern for the quality of all of the information collected. Indeed, the advantages of simultaneous investigation of several topics can be offset to some extent by the additional burden on the respondent and the enumerator resulting from the increased amount of information that has to be collected at one time.

3.4.1 Use of long and short forms

67. In order, therefore, to reduce the burden on the respondent when information is collected on many topics in a traditional census environment, the data collection could involve both a short form (with selected questions) and a long form (with more questions for specific topics). The long form is then completed only for a sample of dwellings, households or people.

68. The use of long and short forms has made it possible to collect more information while keeping planning, training and field operations relatively simple, and costs in check. However, in view of the increasing demand for information, this strategy may lead to new compromises since the number of questions contained on any long form cannot keep growing for reasons already explained. Should “simultaneity” become an overriding principle, countries may wish to consider data collection involving a short form together with two or more longer forms (covering questions on different topics) and with each long form being completed for a separate sample of households or people. However, having more than one form introduces complexities in terms of designing the necessary “interlocking” samples, keeping track of

forms in the field, and weighting results to the total population. It also introduces restrictions for multivariate analysis.

3.4.2 The census as benchmark and sampling frame

69. The value of either a population or a housing census is increased if the results can be used in connection with the results of other data collections. These could take the form of use of the census data as a basis or benchmark for statistics in the same field, or to furnish the information needed for conducting other subsequent statistical investigations. It can, for example, provide a statistical frame for other sample surveys or an agricultural census (see section 20.2). If census data is used as a future sampling frame, it is important to inform census respondents that their data will be used in this way. As an example, it has been noted that in each of Canada's recent censuses, post-census follow-up surveys on disability or on aboriginal populations have been conducted using the census as the frame. The census is also important in developing the population estimates needed to calculate vital rates from civil registration data. In addition, these censuses are a major source of data used in official compilations of social indicators, particularly on topics that usually only change slowly over time.

70. The purposes of a continuing coordinated programme of data collection and compilation can best be served, therefore, if the relationship between the population census, the housing census and other statistical investigations is considered when census planning is under way and if provision is made for facilitating the joint use of the census and its results in connection with such investigations.

71. An essential ingredient of sample design is the existence of a complete, accurate and up-to-date sampling frame. A sampling frame is defined essentially as comprising the materials from which a sample is selected. It may be a list of structures, addresses, households, or persons. The census can be used to construct any of these lists. Indeed, most countries use their census for such a frame. The census frame is almost always the departure point for the design of a household sample survey.

72. It is important to recognize, however, that any census – even one that is only one or two years old – will be out of date and may not be suitable as a frame. In such cases, it is essential to update the census frame with current fieldwork or with data from administrative records before using it as a frame for any household sample survey.

73. Population and household counts for the enumeration areas, taken from the census, are a highly useful ingredient to establish measures of size for the selection of first- or second-stage sampling units, or to help in various stratification schemes. Whenever the census captures socio-economic information, this can be used to complement such stratification schemes. Population and household counts of a census can also be used to calibrate weights calculated in sample surveys.

3.4.3 Inter-census surveys

74. Regardless of whether or not information, historically, on a wide number of topics was collected simultaneously, the rapidity of current changes in the size and other characteristics

of populations and the demand for additional detailed data on social, economic and housing characteristics that are not appropriate for collection in a full-scale census has maintained the need for continuing programmes of inter-census household sample surveys.

75. The population and housing census can provide the frame for scientific sample design in connection with such surveys; at the same time, it provides benchmark data for evaluating the validity of the overall survey results as well as a base against which changes in the characteristics investigated in both inquiries can be measured. To permit comparison of census and survey results, the definitions and classifications employed should be as similar as possible, while remaining consistent with the aims of each investigation.

3.5 The relationship between population and housing census and the agricultural census

76. While the population and housing censuses have a close relationship, their relationship with the agricultural census is often limited to the coordination of data collection in households involved in agricultural production. As the result of increasing integration within programmes of data collection, the relationship between the population and housing census and the agricultural census is now far closer than in the past and countries are increasingly looking at new ways to strengthen this relationship. This relationship is particularly relevant in countries where most agricultural production activities are in the household sector, which is the case in many developing countries.

77. One conceptual issue in relating the two censuses is that they use different units of enumeration. The unit of enumeration in the agricultural census is the agricultural holding, which is the economic unit of agricultural production, while the units of enumeration in the population census are the household and the individuals within the household. The unit common to the two censuses is therefore the household engaged in own-account agricultural activities. In many developing countries, there is usually a one-to-one relationship between households and agricultural holdings. In these cases the same unit is enumerated in both types of censuses.

78. Another conceptual issue is the reference periods used by the two censuses. The population census normally collects information about a person's main job or work activity during a short reference period (usually one week), while the census of agriculture collects information on work on agriculture during the year preceding the census because of the seasonality of many agricultural activities. In consequence, users may find some agricultural activity data from the agricultural census more comprehensive than from the population census because the latter may not identify persons connected with agricultural activity on a seasonal basis or as a secondary activity. On the other hand, the population census provides data on all persons working in agriculture, including as paid employees. Such information is not available from the agricultural census. Both censuses cover households with own-account agricultural production. To get a complete picture, agricultural data users will need both agricultural census data and population census data.

79. The relation between population and housing census and agricultural census is discussed in Chapter 20, in which two non-core topics are presented for consideration by

countries that may want to collect in the population census some information on agricultural activity.

3.6 Census designs in the UNECE region

80. There are three basic approaches to conducting a census, or “census designs” based on the method of data collection:

- (a) The traditional method of full enumeration (whether or not supported by registers as frame or control only) based (generally) on a field operation at a given moment, with an exhaustive collection of either all characteristics, or of some basic characteristics with a collection of other characteristics on a sample basis (long form/short form).⁷ The term “field operation” here is used generally and would include a census where the data is collected primarily online with little or no enumeration activity carried out physically in the field. This approach (referred to as a “full enumeration-based census”) also includes alternative enumeration methods applied in two large countries:
 - i. Enumeration (short form) with annual updates of characteristics (long form) on a sample basis (e.g. United States);
 - ii. A rolling census where information is collected by a continuous cumulative survey covering the whole country over an extended period of time (years) rather than on a particular day or short period of enumeration (France);
- (b) A combined approach with integration of data taken from registers and/or administrative data sources and field enumeration (whether complete/full field enumeration or ad hoc sample surveys) for selected variables and/or for completing/assessing the quality of the population count; and
- (c) The method of using registers and other administrative data sources (either exclusively or supported by data from existing sample surveys for selected variables).

81. These approaches are described below. Necessary conditions, advantages and disadvantages, implications for the phases of census taking, and implications for content are addressed for each approach.

82. Whichever method of data collection or data provision is to be used, countries should take into account a wide range of issues such as:

- (a) Users’ needs;
- (b) Quality of the data;
- (c) Completeness of the count;
- (d) Data protection and security;
- (e) Comparability of the results between countries and over time;

⁷ This method used to be referred to as a ‘traditional census’.

- (f) Burden on the respondents;
- (g) Timeliness of outputs;
- (h) Costs;
- (i) Political and legislative implications; and
- (j) Public understanding and acceptance.

83. The results of the UNECE Online Survey on National Practices in the 2020 Census Round, carried out in 2023,⁸ show that the full field enumeration census approach was adopted in only less than half of the countries in the UNECE region. Registers and administrative data sources thus now play a more prominent role in census taking than in previous census rounds, and it is likely that this trend will continue in the future. Indeed, since the previous census round, 5 more countries have joined the “register-based census” group (from 9 in the 2010 round), while the number of countries conducting a census entirely based on full field enumeration, almost halved from the previous round (19, from 35). This trend was accentuated by the COVID-19 pandemic which forced many countries to adapt or complement their census methodology on very short term.

84. Even among those countries planning to continue with a fully enumeration-based approach, several reported in the UNECE survey that they would introduce significant methodological changes that will utilize additional sources of administrative data to develop information to support a conventional enumeration. The administrative sources would then be used as frame or control only.

85. Whatever the methodology to be applied, most countries in the UNECE region will continue to collect information on both each individual person and on housing through the same operation.

3.7 Field enumeration censuses

3.7.1 Description

86. The field enumeration census is the total process of collecting (by means of a full field enumeration), processing, evaluating, disseminating and analysing demographic, economic and social data pertaining, at a specific time, to all persons and the housing stock in a country or in a well-delimited part of a country. It is taken in a given limited period immediately near to a given reference date (census day). Data are generally recorded on census questionnaires, being either in paper or, increasingly, electronic format, or via a secure online service provision. There are two major methods of enumeration:

- (a) Where the information is recorded directly by an enumerator (or interviewer); or
- (b) Where the household members complete the questionnaire on their own (self-completion).

⁸ The results of the survey have been presented in a number of [papers discussed at the UNECE Group of Experts on Population and Housing Censuses](#), Geneva 20-22 September 2023.

87. In the field enumeration method, information for each individual (in a population census) and for each set of living quarters (in a housing census) is collected and entered on the questionnaire by a census official designated to perform this operation in a specified area during a specified and (usually) short period of time to meet the requirements of universality and simultaneity. In the self-completion method, the major responsibility for entering the information is given to a responsible person in the unit being enumerated (usually the head of the household or some other "reference" person), although the questionnaire may often be distributed, collected and checked by a census official.

88. Questionnaires can be distributed either by post or by enumerators. In field enumeration censuses, addresses are listed by enumerators who also conduct the enumeration or drop off questionnaires, but many field enumeration censuses now use either pre-existing national address lists, or an address register that is purpose-built for the census, in all or part of their enumeration.

89. A postal service should be used to distribute the census forms only when a comprehensive up-to-date and nationally agreed list of addresses is available or can be prepared. In enumeration-based censuses, a big problem used to be how to cover uniquely all addresses in the country as there might exist many types of address lists in a country made for different purposes. For this reason, it may be necessary to undertake a field verification of address lists before the census. However, this is costly, and a cost/benefit analysis of carrying out such an operation is important. In other cases, instead of address checking, using enumerators for capturing new addresses during the enumeration might be a better approach than using the post for delivering questionnaires.

90. If an address list is not judged adequate for delivery of questionnaires by mail, then enumerators should deliver them. In this situation, when an address list is available a decision must be made regarding how exactly to use that list. Alternatives include: ignore it; undertake a pre-enumeration address checking operation; or provide it to enumerators and ask them to update it as they drop off questionnaires.

91. Another consideration might be to outsource the delivery to an official postal service provider. Questionnaires can be collected by enumerators, or can be sent back by post or can be delivered by the respondents to an agency (either the NSO itself or to a local government collection point) or online in case of Internet data collection. Field enumeration methods can use these delivery and collection methods depending on the circumstances.

92. In some countries, postal distribution of the questionnaire, with or without postal return, is used in conjunction with the self-completion method. This mail-out and mail-back procedure can be used exclusively or combined with on-site checking by a census official.

93. Both short and long forms may be used within the context of field enumeration-based censuses, or there may be an exhaustive collection of all characteristics data. If the former approach is used, the short form should contain only those questions intended for universal coverage, while the long form may be used to collect a wider range of information only from a sample of households and population. This form usually contains detailed questions on particular topics in addition to covering complex enquires such as fertility or disability. Both are utilized during the same time frame of the census, with no content data collected outside of that time frame.

94. The field enumeration-based census approach to census-taking is the one that in the 2020 round was adopted by less than half of the countries in the UNECE region. However, it has a long-standing tradition of use, and is more fully described in the United Nations' Principles and Recommendations for Population and Housing Censuses – Revision 4.

3.7.2 Advantages and disadvantages

95. The main advantages of the enumeration-based approach are in providing a snapshot of the entire population at a specified period and the potential availability of multivariate data for relatively small areas and population sub-groups. Moreover, with a field enumeration it is possible to collect data that are not present in any register or administrative data source (e.g. variables such as gender, religion or ethnicity).

96. Enumeration-based censuses have been singled out as the most elaborate, complex and costly data collection activity that national statistical offices undertake. In addition to the cost, this complex task requires full awareness and cooperation of the public to participate in it. Because of their complexity and expense, such censuses are usually carried out only once every five or ten years, so that even the most recent census data available are often several years out of date.

97. Each enumeration approach (interview or self-completion) also has its own advantages and limitations. The interview method is the most common practice for collecting data and may result in good quality data if the enumerators are well trained. This is the only approach that can be used in widely illiterate populations or in other population groups that may be unwilling to complete the census forms themselves, or find it difficult to do so. However, this usually requires a large number of field staff and public acceptance in letting the enumerators enter their home.

98. On the other hand, in countries where literacy is virtually universal and educational attainment relatively high, the self-completion method may often yield reliable results too, at substantially lower field costs, particularly if a mail-out/mail-back procedure can be used. This method is often preferred by respondents, who find that completing the questionnaire by themselves is more convenient than waiting for the enumerator, and offers a greater degree of confidentiality. However, notwithstanding the potential to reduce general costs, the census agency must design the questionnaire, instructions and related materials so as to be user friendly, encourage response, and minimize respondent error and item non-response. To achieve these results, a thorough questionnaire testing programme is necessary.

99. It may sometimes be desirable to rely on one method for enumerating most of the population and to use another method in certain areas or for special groups of the population.⁹ However, overly complex designs should be avoided.

3.7.3 Implications for the various phases of census-taking

100. The decision regarding the method of enumeration to be employed should be taken at a very early stage in planning on the basis of thorough testing of the various alternatives

⁹ Principles and Recommendations for Population and Housing Censuses: the 2030 Round - Revision 4; United Nations, New York 2025.

in terms of their costs, the quality of the data produced and their operational feasibility. Even where a method has been followed traditionally, it is well to periodically reassess its relative advantages in light of current census needs and changing techniques. An early decision is required because the method of enumeration used affects the budget, the organizational structure, the publicity plan, the training programme, the design of the questionnaire and, to some extent, the kind of data that can be collected. Especially when using several types of data collection, testing the public acceptance of the methods used is important as it affects the number of enumerators employed and thus the costs.

101. Timing and length of the enumeration period is of great importance. The main consideration should be to select a period in which the census is likely to be most successful in terms of coverage and quality of the data collected. This may depend on a number of factors. Firstly, it is necessary to avoid those seasons in which it will be difficult to reach inhabited areas, or in which the work will be particularly arduous, because of severe or extreme weather conditions.

102. Secondly, a time should be chosen when most people are staying at their place of usual residence; such a choice will simplify the census operations both in a *de jure* census (where people are enumerated at their place of usual residence whether or not they are present there at the census reference time) and in a *de facto* census (where people are counted where they happen to be present at the census reference time). The season of peak agricultural activity should be avoided because of the difficulty of contacting persons who, at such times, work late every day and who may even stay on their land at night if the land is far from home. Periods of traditional holidays, festivals, pilgrimages and fasting are also unsuitable times for the census enumeration. Exceptions could be made for specific traditional holidays for nomadic populations (for example, the "day of reindeer herder" in Russia), when the population groups are assembled in certain places for a short period of time. Where a *de facto* census is carried out it will be necessary to request each person enumerated away from home to state their usual residence address and code this address to a detailed level of geography to ensure that usually resident population counts can be calculated at a detailed level of geography. Usually, resident persons who are abroad on census night for a period of less than 12 months should also be counted. This can be achieved for example by requesting details of the person absent on census night from the household.

103. It is particularly important that the timing of the census should not overlap with major political events such as state or local election campaigns since the population may confuse the two events and be less responsive to the enumerator at home. Unfortunately, NSOs may have sometimes little or no control over this. It is also especially important that the census should be taken within a stable political and socially secure environment in the country. In times of political or military instability the public are less likely to be compliant and the security of enumerators may not be guaranteed. The level of security should allow enumerators to reach all parts of the country safely.

104. Once a particular census has been taken successfully and the census date is found to have been overall satisfactory, the next census should be taken at a similar time of the year, unless there are strong reasons for changing this date. A regular census date enhances the comparability of the data and facilitates analysis and provides administrative discipline, motivating all those involved in the census to make necessary preparations in a timely manner.

105. It is desirable to keep the enumeration period short to minimize double counting and omissions, which can occur despite a precise reference date. On the other hand, the shorter the enumeration period, the greater the size of the field staff that must be employed. This increases the cost and may lower the quality of the data. How these different considerations should be reconciled depends on the size and nature of the country and on the resources at its disposal.

106. In recent censuses, most developing countries have allowed about up to ten days for the training of enumerators, while the enumeration period itself has varied from a few days to two or three weeks. Short periods are sometimes feasible in small countries while longer periods may often be necessary in countries where the population is much more widely dispersed.

3.7.4 Implications for content

107. The enumeration-based approach to census-taking creates fewer content limitations than those that might be found with a register-based approach. However, overall content in this approach must result from a careful balance between the statistical requirements of users and the desire to minimize respondent burden.

3.8 Full field enumeration with yearly updates of characteristics

3.8.1 Description

108. This design – as adopted in the United States – is a variation on the full enumeration census design described above and focuses on counting the population and collecting only the basic demographic data in the census year. A large household survey then collects and tabulates detailed demographic, social, economic and housing data every year throughout the decade, replacing the need for a census long form to collect this detailed data from a sample of the population.

109. Depending on the needs of the country, the survey may sample addresses yearly or at some other interval to yield detailed characteristic data in years between censuses. The approach in the United States was to approximate a long form sampling rate based on cumulating data collected annually spread equally over a five-year period. Other approaches may utilize a lower sampling rate during non-census years and spike during census years or other designs. In the latter design, data may only be released for higher levels of geography for some years between censuses and then for lower levels of geography in other years. For example, they may only release lower levels of geography in the year of the census. Other examples have considered rolling samples by geography where complete data are published by region of the country.

110. The survey data must be weighted to produce reliable and usable estimates. Survey data are weighted to reflect the sample design, to adjust for the effects of non-response and to correct for survey under or over-coverage. This final weighting adjustment helps to ensure

that estimates of the characteristics are comparable to official population estimates. Once the final weights are applied, the statistics are then generated, including population estimates, proportions, means, medians and ratios.

3.8.2 Necessary conditions

111. Among a number of necessary conditions, this approach requires the agreement of census stakeholders and government policy makers to introduce such a major variation in design. Users of full enumeration census data products should understand the consequences of, and be willing to accept the transition from, once-a-decade products to such a new set of annually updated multi-year products. The users' desire for more timely data leads to a cost of more complexity (in terms, for example, of one-, three- and five-year estimates). This approach requires annual funding, rather than funding clustered in a one to three-year period each decade. The funding level is thus smoother over the years than it was previously.

112. In order to adopt this method a country also needs to have high quality population estimates at lower levels of geography that will be used to control the results of the survey. These population estimates also need to be kept up-to-date from year-to-year. Operationally, this approach requires an address frame for sample selection. It is critical that this frame not only be maintained but kept up-to-date from year-to-year, especially in rural areas.

113. Conducting a full enumeration with yearly updates of characteristics requires an on-going high level of professional staff throughout the decade to support the implementation of the survey. In addition, it requires staff to oversee a programme of early and comprehensive planning, development and testing designed to continually seek efficiencies in the management and performance of the short form component of the census.

3.8.3 Advantages and disadvantages

114. The primary impetus for this approach is twofold: to provide more frequent and relevant data on the population than is available from a census that is conducted only once a decade, and to reduce the operational risks associated with the census. Such an approach requires a multi-year programme of comprehensive planning, development and testing. In the United States with its long-standing statutory requirement for complete counts of the population at prescribed intervals, the complete count component of the census design is crucial.

115. In a full enumeration census design, even when detailed census data are released as soon as possible after the census year, data users are required to work with results that are, on the average throughout the decade, seven years old. The production of more timely data to support decision-making at all levels of government is a major motivation for this approach. These timely and, therefore, more relevant data can greatly enhance the value of the information to government officials, policymakers and businesses that are currently obtained from a once-in-a-decade long form.

3.8.4 Implications for the various phases of census-taking

116. This design transfers to the on-going survey the responsibility to provide estimates of detailed demographic, socio-economic and housing data throughout the decade. This transfer eliminates the data collection, data processing and tabulation responsibilities for these data from the decennial census enumeration. Removing the responsibility for the collection of detailed data from a sample of the population as part of the census will allow the short-form-only census to focus more directly on meeting the most basic census objectives. Innovations, including the use of some new technologies, may become possible when the census task is limited to short-form data collection. Eliminating the need for the census to capture, process and tabulate detailed data from the whole population will reduce the processing workload and allow the census to develop processing methods specific to the short-form requirements. The time required for the tabulation and release of census data should also be dramatically reduced. The focus of the census office thus switches to an on-going smaller (although still substantial) activity instead of a very large spike of activity every 10 years.

117. Many components of the previous (enumeration-based) census, however, should still be coordinated across the operational period surrounding the short-form census and the survey (throughout the decade). This includes consultation, outreach, promotion and publicity, and partnership programmes designed to increase stakeholder and public cooperation and awareness. It also includes maintaining a master file of addresses that must be updated regularly.

118. The fact that the survey is on-going throughout the decade provides an opportunity to develop a strong foundation to support data collection during the year of the census. Information obtained from the survey itself (for example, language spoken) can be of great use in planning for data collection in the census year. The survey-taking experience can be used to better allocate resources during the census.

3.8.5 Implications for content

119. As with the census long form, the ongoing survey can provide data on a wide variety of socio-demographic topics including household and family composition, income and poverty, educational attainment, work and unemployment, disability, migration and housing. In the most obvious approach, the content of the survey, designed to meet national needs, will be that of the census long form it replaces. Requirements for adding to, or revising, the topic content must be clearly defined and determined well in advance of its implementation since a survey that relies on aggregating sample data for multiple years to support the production of estimates cannot easily accommodate short-term content changes.

3.9 The rolling census

3.9.1 Description

120. A rolling census – as adopted in France – represents a further alternative approach to the full enumeration model of census taking by means of a cumulative continuous sample survey, covering the whole country over an extended period of time rather than an enumeration carried out simultaneously in all areas relating to a specific reference date. There are two main parameters in a rolling census:

- (a) The length of the period of time, which is linked to the frequency of update required; and
- (b) The sample rate, which depends on the budget and the geographical levels required for dissemination (country, regions, towns, local areas, etc.).

121. For example, it is possible to build a sample framework in order to produce national results with a single annual survey; regional results by cumulating a few consecutive annual surveys; and small area results by cumulating a more substantial number of years' data. An annual survey may be conducted over the course of a year, or in a particular month or shorter time frame.

3.9.2 Necessary conditions

122. The conditions necessary for the successful implementation of a rolling census methodology depend on the complexity of the sample framework. If the sampling units are addresses, a master address file is a prerequisite. But if the sampling unit is larger, for example at the municipality level, it is only necessary to have enough information to spread the municipalities over the different years as each will be representative. However, it will be necessary to explain to the users of census data what the consequences will be and how they should use these data, because it is likely that they will be more used to snapshot data rather than periodic cumulative counts. It is important that users understand the methodology (as is the case, of course, with any census design) so that they will continue to have confidence in the data.

3.9.3 Advantages and disadvantages

123. The main advantage of the rolling census approach is the greater frequency of updating data: a full enumeration census provides decennial, or sometimes quinquennial, benchmarks, whereas the rolling census can provide annual updates. Furthermore, it offers the possibility of improving the census process year by year; introducing new topics as and when they become relevant; and adopting new technologies as they emerge. The rolling census also allows for the deployment of permanent teams that can focus on the continuous evaluation of data quality and the training of field staff.

124. A major disadvantage, however, is that the essential feature of simultaneity is lost in that it no longer provides a snapshot of the entire population, at any one time, thus

complicating comparisons between areas due to different enumeration periods. However, a range of mathematical techniques (for example, averaging and/or projections and/or interpolation) may be employed so that the data are a statistical depiction of the average situation at any one specific period. Also, as the rolling census covers the whole country over a long period of time, any respondents that move may be surveyed several times, while some other people will not be captured by the census at all, resulting in the potential loss of another of the essential features of the census, universality, unless careful methodological adjustments are made. For these reasons, the rolling census demands a sophisticated methodological design yet is one that can be readily acceptable to users.

3.9.4 Implications for the various phases of census-taking

125. It is better to introduce a rolling census just after a full enumeration-based census, to reap the benefit of up-to-date information from which to build the sample framework. As the operational process is annual (or continuous), it must be very carefully prepared since any delay can be problematic for the following stages.

3.9.5 Implications for content

126. A rolling census can include all usual census topics and (as noted above) there is the possibility of changing the questions more regularly than in a decennial cycle. This enables the census to be more reactive to changes in social conditions and the needs of users, even if comparability over time must be preserved. However, for regional information, data for several consecutive years must be aggregated and that implies the need for some stability in the content of the questionnaire. Depending on the organization of the census, it may be possible to add some thematic surveys.

3.10 The combined census approach

127. The “combined” category includes many census approaches quite different one from the other, e.g. there are countries producing a fully register-based count and combining registers and survey data for producing census variables, and countries conducting a complete field data collection using the registers/administrative sources to complete the count/impute the population missed by the field enumeration. Sometimes different approaches are used for the population count and for the census variables, even though in the 2020 round most countries used both sources for both the population count and census variables, even though the balance of data collected from each source varies from country to country.

128. The majority of the countries that adopted a combined census approach used a combination of registers and full-field enumeration. While many countries utilizing the full enumeration approach employ administrative lists, such as address lists, to support the enumeration (but do not use administrative data to derive directly the census data), the essence of this type of “combined” census approach is to make use of population and other registers relevant to the census in order to directly produce census results (with the aim of

reducing costs and to lessen the response burden). This is complemented with exhaustive field data collection, with the aims of improving the accuracy of population counts and obtaining data on those census variables not available from the combination of registers.

3.11 The combined census approach: registers and a full field enumeration

3.11.1 Description

129. The approach of combining registers and a full field enumeration is likely to be one of the most complex and expensive approaches. In effect the approach though does combine the benefits of regular high-quality register-based population counts with the granularity of data provided by a full enumeration.

130. If data collected in the full enumeration are used to update population or other registers, this may violate one of the Fundamental Principles of Official Statistics stating that "individual data collected by statistical agencies... are to be used exclusively for statistical purposes." The legislative requirements to support this approach are noted in paragraph [133](#) below.

131. There are two major differences between this particular combined approach and the similar methodology using a combination of administrative registers with sample surveys that is discussed in paragraphs [143-151](#) below:

- (a) Variables not available from administrative registers are obtained through an exhaustive field operation, as in an enumeration-based census; and
- (b) The population count based on the population register is not necessarily accepted as the best possible but should be checked and corrected against reality through the complete enumeration. The census thus acts as an exhaustive evaluation of the coverage of the population register and allows for the reduction of both under-coverage and over-coverage.

3.11.2 Necessary conditions

132. The main technical and legal conditions for this type of census to be practicable are:

- (a) The availability of a population register: this need not necessarily be completely reliable for demographic purposes, but it must be reliable enough to serve as an initial means for determining how many people will be counted and where; and
- (b) Other administrative registers usable for census purposes: examples include tax lists, social security files, unemployment registers and educational qualification records.

133. This type of census, about its relationship with the population register, has two variants, depending on whether the census is simply supported by the population register, or the benefits are mutual, such that the population register uses the census operation to update and improve its information. In the latter case, two additional conditions are required:

- (a) The specific legislation governing the census and/or the population register must explicitly provide such use of the census operation to update the population register while preserving the statistical confidentiality in the strictly census-related information;
- (b) Technical measures must be applied to ensure that the population register information to be checked, and which will be used for both (administrative and statistical) purposes, is treated in a proper and different way, throughout the whole operation. In questionnaire design this may be achieved by isolating the population variables on specific pages. In the processing phase, files containing personal identifications should not contain statistical information.

3.11.3 Advantages and disadvantages

134. The population counts in this approach may be more precise than in a wholly enumeration-based census because of the generally more up-to-date information contained in the population register that helps to minimize coverage error. It may also be more accurate than in an exclusively register-based census (because of the checking against reality that a complete enumeration provides, which could correct for accumulated errors in a population register).

135. Information not available from a combination of data taken from registers is obtained from a traditional field operation approach, thus permitting maximum geographical and statistical detail.

136. The longitudinal perspective that the use of registers provides is also present in this census approach, for example by using the population register as the frame.

137. Disadvantages arise from the intermediate-point condition of this approach. For example, such combined approaches are much more expensive than exclusively register-based censuses, because of the cost of the field enumeration component of the data collection operation. However, they will generally be cheaper than the wholly enumeration-based census since the knowledge of the location where every person is registered permits the use of more efficient collection methods.

138. Response burden, other factors being equal, also falls somewhere between the minimum imposed in those censuses without any specific data collection operation and the maximum for censuses with a full enumeration and no administrative information support.

3.11.4 Implications for the various phases of census-taking

139. Pre-filling questionnaires with population register information is a complex technical task, especially when associated with the large census volume and with the constraints imposed by available technology. In addition, problems of personal data confidentiality might arise if some pre-filled data about other household members was accessible to the respondent or to other persons living in the particular dwelling being enumerated.

140. However, pre-filling has the potential to reduce the response burden and fieldwork costs.

3.11.5 Implications for content

141. The combination of registers and a full field enumeration permits maximum flexibility in the topic content, while reducing the response burden in comparison with a wholly enumeration-based census collecting the same information.

142. Compared with the method of combining registers and sample surveys (discussed below), the main advantage is the complete geographical coverage and conceptual detail of all the variables, whether available in the registers or not.

3.12 The combined census approach: registers and sample field data

3.12.1 Description

143. Some countries create census type statistics by using registers and/or other administrative data sources, together with information from sample field data for selected variables. This option is (like the combined census with full field enumeration described above) used by countries that do not have all census information available in registers. If this option is chosen, some census tables are produced by counting from register information and/or deriving information by integrating registers, while for other census tables information from sample field data have to be weighted to population totals. This is, however, only one way to merge register and survey data to obtain census-type results. Some countries (such as Italy, Israel and Switzerland) use a population register as the basis for the population count, and a census sample survey to evaluate the accuracy of the register addresses (and in some cases to assess the population register coverage errors), and to collect data on census variables not available in registers (and in some cases to check the quality of variables available from registers).

144. The sample size should be determined in such a way that the precision obtained for variables collected in the sample survey meets quality objectives. It should also be pointed out that this combined census approach can produce more frequent statistics if repeated more frequently than a full enumeration.

3.12.2 Necessary conditions

145. Legislation provides a key foundation for the use of administrative data sources for statistical purposes. As with the case of the use of registers with a full enumeration (discussed above) national legislation should allow the use of existing administrative data sources for statistical purposes rather than the re-collection of data whenever it is possible. Such legislation should also give powers to the NSO to access administrative data at the unit level with identification data to link them for statistical purposes. Furthermore, the appropriate legislation should provide a detailed definition of data protection. A country should only choose the option of a combined census if all variables not available in the administrative register sources can be captured in one or more census sample surveys. Moreover, it is a

prerequisite to be able to link the information from the different sources at the unit record level.

146. Legislation may also be required if countries decide that to achieve response rates in the survey equivalent to those in a full enumeration census, response is made compulsory. Recent declining response rates in social surveys make such an option particularly important to consider.

3.12.3 Advantages and disadvantages

147. The advantages of a combined census with sample field data are that it is much less costly than a census with full field enumeration and imposes less of a burden on respondents. An enumeration-based census can face many privacy objections to the seemingly intrusive collection of personal (and sometimes potentially sensitive) information. This increases the extent of non-response. There are generally fewer objections, and less risk of non-response, to a combined census in which data are collected only from a sample of the population. It may be the case that data from such a combined census will provide sufficiently reliable results because they are derived to some extent at least from registers covering the whole population.

148. A disadvantage is that this option may require more processing to produce the tables from the microdata as weighting problems may arise or, in case of integrated use of survey data and register data, the need of statistical modelling. Furthermore, depending on the size of the sample, it might not be possible to ensure the same geographic and statistical detail allowed by the full-field enumeration. Moreover, it may be more difficult to raise public awareness of the census as only a sample of the population will be involved in the enumeration element.

149. Another disadvantage may be a loss of precision for the variables collected in the sample survey. However, in the case of a yearly combined census, pooling of several (e.g. 3 or 5) yearly samples considerably increases the precision, though at the expense of being able to detect change over time.

3.12.4 Implications for the various phases of census-taking

150. Adopting a combined census approach is likely to be a lengthy undertaking. There are also a significant number of dependencies such as data availability and confidence that a supplementary survey will provide the required quality. Nevertheless, once implemented, it is normally quicker to produce results from a combined census with partial enumeration as this has the advantage that fewer questionnaires need to be checked and processed. However, because only sample information is available for some variables it is sometimes impossible to meet the level of statistical and geographical detail required by users.

3.12.5 Implications for content

151. As some required variables may have to be constructed from different administrative sources, the information derived from registers may be rather different from the result

obtained if everybody in the country provided direct responses. This implies that some extra data processing will be required if the results are expected to be comparable. If this is not done successfully, it may damage the comparability of the results among countries and over time. Registers have, on the other hand, the advantage that, generally, the information on the registered population is complete. It is becoming more and more advantageous if NSOs can make wider use of registers where they are relevant and suitable for the census.

3.13 Register-based censuses

3.13.1 Description

152. The development of a wholly register-based population census system is a long process, which might take many years or even decades. Many countries will choose to continue to retain elements of an enumeration-based census in some way even when they start moving towards a register-based approach. The first data items to be taken from registers can be addresses, basic demographic data items, civil registration information and income data. Usually, the share of administrative data increases stepwise census by census. It is essential, however, that countries have introduced a comprehensive and high-quality population register and a system of common identification numbers before they can attempt to link data from different administrative sources. The continuous updating of registers together with communication between the register systems must be effective.

153. The register-based population census system is built around a set of basic registers that contain comprehensive data on the units that are to be described in the population and housing census. These registers may include the data maintained in a population register and a register of buildings and dwellings, as well as data from a business register. Such registers should cover all people resident in the country (although the criteria for determining "residency" in a population register may vary from country to country), the buildings and dwellings in the country, and all the business companies (including all the institutions in the public sector) and their establishments. All statistical units should be linked to one another by means of the identification systems: there should be the capacity to link persons to household-dwelling units and to the dwellings and buildings in which they live, and for employed persons to be linked to their employers. Employers and buildings also need to be linked in order to determine workplace. Similarly, all units should be geographically located by using local area codes or map coordinates.

154. Among register-based countries, a few also use some data from pre-existing sample surveys to produce census variables that are either missing, or cannot be accessed, from registers. The difference between this approach and the one mentioned under the combined approach (where ad hoc sample surveys are conducted in order to collect data for information not available from registers) is that such data amount to only a very small proportion of the variables.

155. Population census data are produced using the method of register estimation in which several register and/or administrative sources are used simultaneously to define, for each statistical unit, the value of the relevant variable. Data from earlier population censuses and register data from the same point of time should also be consulted in constructing these

rules. These include rules on prioritisation between different sources in the event of contradictory data.

3.13.2 Necessary conditions

156. Legislation provides a key foundation for the use of administrative data sources for statistical purposes. National legislation must allow access to, and the use of, existing administrative data sources for statistical purposes rather than the re-collecting of data whenever it is possible. Such legislation should give powers to the NSO to access administrative data at the unit level with identification data and to link them for statistical purposes. Furthermore, the appropriate legislation should provide for sufficient levels of data protection.

157. It is also important that the general public appreciates and understands the benefits of using register sources for statistical purposes and that there is broad public acceptance of the use of these administrative data for purposes of statistical production. Open discussion and debate, explaining the rationale and benefits of the use of personal information held in registers, must always be considered a key principle. It is also important that the national register legislation is up-to-date, and the activities of register authorities are open and transparent.

158. One major factor that facilitates the statistical use of administrative data records is the application of unified identification systems across different sources. The data linkage must occur at the individual level. In the absence of such unified systems it is extremely difficult and laborious, if not impossible, to link unit data from different registers, which is a pre-requisite for register-based statistical production.

159. Definitions of data items in the administrative sources should be the same as in census, or they should be transformable to meet the census definitions. It is also essential to harmonize the concepts and definitions between registers. To ensure this, quality assessments should be carried out periodically.

160. If any of these conditions are not met, the country should continue to rely on the full enumeration population census as the primary source of benchmark population statistics.

3.13.3 Advantages and disadvantages

161. Reduced costs and increased frequency of outputs are without question the biggest advantages of using registers and/or administrative data sources over the field-enumeration census approach. With the introduction of a register-based system initial costs may be high, but field costs can be reduced to zero and particular census statistics (such as those relating to employment, buildings and dwellings, and housing conditions) can be compiled on an annual basis. A further key advantage of administrative sources is that the need for processing can be confined to those data items that have changed. In the long run costs are much reduced if information is collected just once and processed only if and when it changes, such as for example changes of address. Personal characteristics such as country of birth, citizenship, religion, levels of completed education and qualifications, and housing

characteristics such as period of construction, floor space and number of rooms change quite seldom (if at all in some cases).

162. Register-based statistics can be obtained for all geographical areas, since registers aim to cover the target population in its entirety, and because detailed geographical information can be obtained for all geographic units, municipalities, freely defined sub-areas and map grids of different sizes.

163. Register-based statistics are generally available every year. Growing information needs create new pressures to step up the production of regional statistics, but regional data from a decennial population census may not be sufficiently up-to-date to satisfy these needs. Again, this is a major asset of using register sources, allowing for more frequent statistics production.

164. The use of administrative data sources, however, involves certain drawbacks that need to be taken into account. One such disadvantage is the fact that register-based characteristics have to rely exclusively on the information held for the administrative purpose of the available register; this is invariably a non-statistical purpose. This imposes some restrictions with respect to the variables that are available for analysis and may also undermine international comparability. However, exceptions to these restrictions exist. Furthermore, registers and administrative sources are not exempt from coverage errors, e.g. some hard-to-reach population groups might not be covered by administrative sources, or population registers might be affected by over-coverage errors. Anyway, as already mentioned, the administrative "Signs of life" method could be used to assess and correct coverage errors of the population register through the use of other administrative sources.

165. The use of registers and administrative data also imposes on the statistical agency a dependency on the authorities responsible for holding and maintaining the registers and administrative data as well as on any changes in legislation and administrative policy and practices. It is therefore crucially important to have close collaboration between the NSO and the relevant authorities so that information on any such changes reaches the census agency as soon as possible. Ideally, where changes to the content and/or structure of those registers and administrative data being used for the census are being considered, the NSO should be consulted in advance.

3.13.4 Implications for the various phases of census-taking

166. Register-based systems can create problems with reference periods and consistency. For reasons of statistical reliability, it is important that change events are accurately recorded according to their true date. Information on dates of birth and death is usually accurate because it is recorded on the basis of certificates issued by the authorities, and in most cases the reference time point is therefore correct. Accurate information is also usually obtained on the dates of employment, unemployment and pension periods, whereas for periods of educational study the dates may be less accurate. In the event of a change of address the person who is moving may not provide notification sufficiently soon enough, or may neglect to do so altogether, particularly when moving abroad.

167. The linking of a person's data on such variables as place of work, occupation and income from different register sources may sometimes give rise to consistency problems. It

is, for instance, not always the case that the information on occupation and branch of industry describe the same period of employment.

168. Furthermore, there might be some items in the register system where the data linkage itself creates a particular difficulty. The data on employment pension, for example, may not use the same business code as the taxation and business registers, and therefore extra processing is needed to link individuals to the company where they are employed. As another example, the linking of business enterprises to the building where they are based is not always straightforward since the company address data may not necessarily be fully accurate, or they may differ from the information in the buildings register.

3.13.5 Implications for content

169. There are some data items that may have to be dropped from a wholly register-based population census system because the relevant information is simply not available from any register: these may include, for example, household composition characteristics, ethnicity, religion, language and mode of transport to work. An option would then be to collect such information from sample surveys, but then the census would no longer be register-based, adopting the “combined” approach that has been described in paragraphs [143-151](#).

170. Furthermore, without a census questionnaire, there would no longer be a collection tool for ad hoc needs. In many countries the population census system is an important vehicle of data collection that is used to meet emerging information needs to reflect changing social conditions (such as measuring economic migration). This flexibility would be lost when data are no longer collected by means of questionnaires.

Chapter 4 Designing and delivering a census field operation

4.1 Preparing for and delivering field operations

171. As the census process has evolved, so has the role of the field operation. Historically the role of the enumerator was to collect information on the doorstep about all those living at an address. Such an approach is still used in some countries though is inevitably both expensive and labour intensive.

172. All addresses would still be visited if the objective of the field operation is to enable households to respond. This could include field staff providing households with paper questionnaires.

173. A smaller field force is required where the role is to encourage non-responding households to respond by communicating the importance and requirement to complete. As well as encouraging, enumerators also provide guidance on how and who needs to return a questionnaire and where further support is available.

174. Whatever the role of the enumerator, field staff also need to have the means to record information about individual addresses they visit. This could include when visits took place, whether contact was made or whether an individual refused to participate.

4.2 Designing a field operation

175. Effective planning and preparation is essential given the complexity and expense of hiring large numbers of temporary field staff.

4.2.1 Sequencing of field activity

176. Field activity involves direct contact with the public so needs to be considered within the broader context of census communication and engagement plans. Media activity would for example normally begin before field visits took place, increasing awareness that the census is coming.

177. Some countries have developed a formal “wave of contact” model to effectively sequence where field activity takes place.¹⁰ This model is simply a timeline of when interventions are due to take place and provides an overview the different stages of how the census operation interacts with the public. It is essential that contact with householders is effectively sequenced to ensure efficient use of resources and to reduce the burden on the

¹⁰ Examples include for the Canadian Census ([Guide to the Census of Population, 2021, Chapter 7 – Field Operations \(statcan.gc.ca\)](#)) and the Census of England & Wales ([EAP149 - 2021 Census Statistical Design \(statisticsauthority.gov.uk\)](#)).

public. It would clearly be inefficient to begin field visits to remind householders without giving any time for mailed returns to have been completed and mailed back.

4.2.2 Testing and rehearsal

178. Small scale testing in the years prior to the census is used by many countries to refine field activities. By testing different approaches alongside each other a country can determine which are the most effective in a rehearsal or in the census itself. The value of testing can be seen with the evolving role of technology and particularly during the 2020 census round when changes had to be made in response to pandemic-related social distancing restrictions.

179. A large-scale rehearsal is used by many countries to evaluate readiness for the live operational period. An end-to-end rehearsal is most commonly carried out one or two years before the year of the census when technology and processes are in place. While the rehearsal generally is not used to test different approaches, it is necessary to incorporate lessons learnt in time for the census itself. Rehearsals are particularly important in countries who conduct a census every ten years where staff may have less experience of the census operation compared to countries with a more frequent cycle.

180. The emphasis of the rehearsal should be on evaluating overall readiness rather than on achieving the same levels of as in the census itself. It will also not be necessary to conduct a rehearsal in all areas. It is more useful to select a small number of areas which represent different collection challenges such as a densely populated conurbation in addition to a sparsely populated rural area.

4.2.3 Designing and training the field operation

181. Information from the previous census can be used to scope the size of the field force required and its distribution across the country. Taking a systematic approach to using this information is important. Assumptions need to be made about the level of response as part of the planning of the enumeration alongside information about the population density and socio-economic characteristic of each area. In the United Kingdom information from previous census and area characteristics are used in combination to create a "hard to count" index score for small geographic areas to aid planning field resource.¹¹

182. Modelling the size of the field operation based on such assumptions will contain inherent uncertainty. There will also be uncertainty about the ability to recruit and train field staff across all areas. "Mobile" field teams are recruited in some countries which can be moved across local areas or regions where there are unexpected patterns of lower response or where there are recruitment challenges. Rehearsals can be a useful opportunity to understand how such mobile resources are practically used.

183. Many countries reported that for the 2020 round the Covid pandemic had a significant impact on how they recruited and trained staff. Far greater use was made of online training which also brings significant savings.

¹¹ National Records of Scotland (2020). [Developing a Hard to Count \(HtC\) Index for Scotland's Census 2022](#).

4.2.4 Management information during the collection operation

184. As the live operational period is so short it is essential that timely management information is available to understand where response patterns are not as expected. Technology has improved the ability to understand how such a large and complex operation as the census data collection is performing.

185. The range and complexity of available information from a census operation is a challenge. Key metrics only should be identified and presented with deeper analysis and insight used to better understand response patterns when required. A rehearsal can be a useful way of refining such metrics. Online data capture has enabled a step change in the provision of up-to-date intelligence on response patterns with electronic field devices providing timely information on field activity.

186. Interpretation of field management information is difficult without an expectation of response patterns over the course of the collection period. Many countries have developed forecast models to provide a measure against which to understand performance. Assumptions underpinning these models are based on the previous census and can potentially be updated from rehearsal learning.

187. The ability to act on managing the information is as important as the information itself. Two elements are worth considering as part of this:

- (a) What interventions are available (such as media, field or post); and
- (b) How are decisions made.

188. Available interventions are dependent on the design of the census but are likely to consist of increasing:

- (a) Publicity and associated media communication. Using existing or adapted messaging to promote the importance of completing based on need or what has been shown to be most effective during collection.
- (b) Direct contact with households – Sending additional reminders using means such as postal mail, email, or SMS. Providing physical questionnaires for individuals who prefer non-digital methods.
- (c) Optimizing field visits – Increasing the number of in-person visits in low-response areas, adjusting visit schedules and enhancing the training of fieldworkers to improve engagement with respondents.
- (d) Targeted strategies for hard-to-count groups – Collaborating with local communities, religious and social organizations, and engaging community leaders to increase participation among specific population groups.

189. Decisions on using interventions need to be made in the context of the objectives of the census and balancing priorities across the country or region. Rehearsals are an opportunity develop an understanding of the decision-making process and census takers can also benefit from observing how other countries run their operational period.

190. During the 2020 round most countries experienced additional uncertainty because of the pandemic. Scenario testing approaches were used to good effect in understanding the intelligence, inventions and decision-making processes involved.

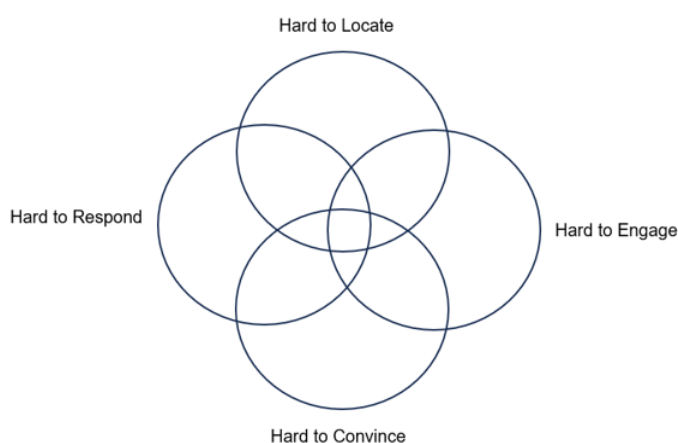
4.3 Adapting the design – hard to count groups

191. Increasingly complex and diverse populations mean the challenge of enumerating the entire population once, only once and in the right place has never been harder. Inevitably some elements of the population will be harder to count than others meaning adaptations to the standard collection design are likely to be necessary.

192. In the United States for example, a framework is used to consider hard-to-count population groups. The model recognizes segments of the hard-to-count population: Hard-to-Locate, Hard-to-Contact, Hard-to-Persuade and Hard-to-Interview ([Figure 1](#)).¹² An adapted version of this model is presented below.

Figure 1

Hard to count framework



Hard to Locate – Unknown addresses, gated communities where there maybe physical barriers to access

Hard to Engage – Difficult to make initial contact with including homeless and transient populations

Hard to Convince – Suspicious about need for a census, providing data to government or low levels of engagement with government generally

Hard to Respond – Includes language barriers or those with limited digital access.

193. An important aspect of this framework is that being “hard to count” is not simply about willingness. For example, a predominantly online census resulted in the England and Wales census identifying a “digitally hard to count” group including older age populations with less access to the internet. Historically this group has tended to be part of the population most willing to complete the census.

194. Adaptations of the standard design will depend on the groups identified but may include a mix of the following:

- (a) Clear messaging on census website and through trained staff (in the field or at contact centres) stating that:
- (b) No personal data will be shared with other organizations or government departments. Census data will only be used in the production of statistics.

¹² Further information on the United States Hard to Count Framework is available at [2020 Census Operational Plan v5.0](#).

- (c) The importance of census data and the ways in which data are used for policies that affect all parts of society.
- (d) Engagement with community groups and/or relevant sector organizations in the planning, research and operational delivery of the census. This could include the identification of preferences in how and when to engage communities.
- (e) Recruitment of field staff from local communities. The United States Census Bureau for example has an overarching strategy for hiring people who will work in the communities they live in. They make explicit reference to the importance of being able to speak languages of local communities. Other countries go further, making explicit commitment about field visits only being made by members of the same community.
- (f) Counts for people who are not sleeping in a house/flat (apartment) or other form of managed accommodation, potentially in partnership with local authorities and relevant charities. Integrated with broader design for collection of census data for homeless including at hostels and people living temporarily at an address where they have no permanent other address.
- (g) Tailored media campaigns for specific sectors including radio, television and online channels. This can include the use of “trusted voices” to promote and encourage response.
- (h) Availability of relevant resources such as paper questionnaires, translated questionnaires and support guidance to enable responses. Trained field officers able to point to these resources or to where further support is available.

4.4 Outsourcing

195. This section deals with census activities that are or might be outsourced: that is, performed or provided by a supplier or organization other than the NSO or census office. While countries conducting a fully register-based census generally have little or no need to outsource any census services, those countries employing any form of direct enumeration for their census generally have a greater need to outsource some activities. A list of census activities which NSOs may decide to outsource is given in this section, along with recommendations for factors that should be considered when outsourcing any of these. In particular, important recommendations are given relating to data confidentiality and quality requirements when outsourcing.

196. The complexity of much of the software and infrastructure required for many new and emerging technologies used for censuses may exceed the current technical capabilities of a census agency. It may therefore be necessary to outsource significant components of such technical elements, as well as non-technical activities such as large-scale recruitment of field staff. The advantages of doing so are:

- (a) External suppliers possess technical experience and expertise which would otherwise be unavailable within the NSO. Using this experience allows NSOs to focus on their main task of carrying out the census rather than on developing in-house procedures and skills that are not part of their core competencies.

- (b) The decennial or quinquennial cycle of many census activities means that some activities only need to take place once every ten years, by which time the pace of technological change may imply that the nature of the activity has evolved. By outsourcing, the NSO does not have to invest in the infrastructure or knowhow required for something that happens very infrequently.
- (c) Some census activities, such as enumeration with field staff or data processing, must take place within a short period, often requiring a concentrated period of peak staffing levels or the use of many electronic devices for data collection. Outsourcing can facilitate the management of these brief but intensive periods.

197. The appropriateness of outsourcing should be determined after subdividing the overall census operation into separate stages. Candidate activities for outsourcing might include (among others):

- (a) printing of questionnaires and other documents/materials
- (b) translations
- (c) transportation of questionnaires and/or field materials before and/or after enumeration
- (d) call centre/telephone help line
- (e) publicity campaign, public relations, social media or other communication services
- (f) design and/or provision of online response technology
- (g) design and web functionality for online outputs
- (h) recruitment and training of field staff
- (i) primary data capture and coding
- (j) post-processing questionnaire destruction
- (k) design and provision of questionnaire tracking systems
- (l) provision of mapping services
- (m) technological solutions for data storage, including Cloud solutions
- (n) data editing and/or imputation
- (o) quality assurance
- (p) evaluation

198. Many of these activities will be less relevant or not applicable at all to those countries that carry out a fully register-based census, in which the opportunities for effective outsourcing are clearly much reduced. The creation and maintenance by external agencies of the registers from which the census information is extracted, is not outsourcing in the generally-accepted meaning of the term.

199. The decision to outsource will depend on the requirements of the census agency, the availability of skills in-house and the ability of the agency to manage complex systems development projects. Total outsourcing might at first seem to be a simpler process to manage. However, it is unlikely that a census agency will choose to outsource the total solution to the census operation, but rather that components of the system will involve a

combination of outsourced elements, different external service providers working as contractors on specific projects, and in-house developments. There can be advantages to having several linked activities provided by a single contractor.

200. A clear understanding of the NSO's requirements is needed before any contracts can be tendered so that these can be specified unambiguously to the contractor. These include understanding the objectives of the project, the outputs to be achieved and the standards these outputs must meet (quality, timeliness, cost), and confidentiality and public sensitivity issues. Specifications must allow for the possibility of requirements and objectives changing over the lifetime of the project. How these changes will be agreed to and approved by the census agency and the provider needs to be determined from the outset.

201. Timetabling, including milestones for key deliverables linked to payment schedules, needs to be agreed with the contractor. Regular monitoring needs to be undertaken at the operational level. Processes and escalation procedures should be established to allow senior staff to monitor progress and to deal with any major issues that cannot be resolved at this operational level.

202. A mixed approach to systems development is one in which the overall solution consists of outsourced systems, systems developed by external contractors working alongside census agency staff and systems developed in-house. This approach can have many advantages, such as greater flexibility to adapt systems as more is learned through the systems development and testing programme and during the actual census processing operations. This can lead to improved data quality and savings in processing costs as systems are optimized. However, census agencies should be aware that, for such an approach, management becomes much more complex. The census agency must be skilled in the management of complex projects, have a clear understanding of business processes and be able to manage carefully the integration of both the technological and clerical processes. It is important, therefore, to set up a dedicated team within the NSO to draft and manage contracts, deal with contractors, monitor processes, oversee quality and liaise with statisticians. Such a team should also have sufficient familiarity with appropriate project management methods, both traditional and agile, since the latter are increasingly prevalent in the IT world and beyond. Team-based working, where external contractors work very closely with census agency staff, is essential to ensure the success of this method of systems development.

203. Throughout the overall process, activities should be conducted by a method that is tailored to meet the requirements of users (e.g. with respect to the accuracy and timeliness of the results), and that reassures the general public on matters relating to confidentiality and data protection. It is important that no part of the outsourced operations should be performed using a method that could result in loss of the trust of the general public. In judging the appropriateness of outsourcing, census agencies should therefore carefully consider the following factors:

- (a) strict protection of data confidentiality
- (b) a method of confidentiality assurance that satisfies the general public
- (c) relevant government policies and procedures
- (d) quality assurance measures
- (e) ability to manage and monitor the outsourced census tasks/activities

(f) control over the core competencies of the NSO.

204. Assurance of confidentiality should be considered paramount among these, since it is both a Fundamental Principle in its own right (see Annex II) and necessary as a means of maintaining the public support required for efficient and high-quality data collection. NSOs are responsible for data confidentiality, both in terms of reality and of perception. Consequently, outsourcing tasks that pose an actual or perceived risk to security or data confidentiality must be avoided. For all data collection or processing operations carried out by external suppliers, safeguards should be put in place to ensure that there is strict protection of confidentiality. This may be achieved, for example, by requiring external suppliers to encrypt data collected by them; by insisting upon intrusion tests into IT systems external to the NSO; by requiring evidence of data deletion after the project or mandate is completed; and by requiring companies providing IT services to demonstrate that they have the relevant certifications, e.g. the ISO-27001 certification.¹³ The outsourcing of such services should be considered carefully so that public trust and confidence in the census is not eroded. Where, for example, temporary enumeration staff are engaged under contract, this should be done in such a way that they are subject to strict monitoring and control, with the final responsibility for oversight resting with the census agency. Such field staff should be engaged in a way that ensures that their activities are governed by the relevant statistical legislation to preserve the confidentiality of the data that they collect. The requirements and criteria applied to external suppliers should be made public.

205. Another key issue to be considered in outsourcing is quality assurance. The census agency must be satisfied that the goods or services paid for are provided to an agreed and acceptable standard. In this respect, cost should not, ideally, be the first priority in considering and judging the successful bidder. Poor quality work, or any perceived risk to confidentiality posed by the lowest-priced bidder, could cause a significant loss of trust among users and the general public.

206. As part of any contract allocation process, potential contractors should be required to provide samples of their work, to give details of sites at which previous work can be inspected and/or to list referees who can verify their claims and credentials.

207. More detailed discussion of the issues to be considered in outsourcing and in the evaluation of software and hardware can be found in the Principles and Recommendations for Population and Housing Censuses – Revision 4, and the Handbook on the Management of Population and Housing Censuses.¹⁴

¹³ International Organization for Standardization (ISO) ISO/IEC 27001:2022, [Information security, cybersecurity and privacy protection - Information security management systems - Requirements](#).

¹⁴ UNDESA (2021). [Handbook on the Management of Population and Housing Censuses - Revision 2](#); ST/ESA/STAT/SER.F/83/Rev.2, New York, United Nations.

Chapter 5 Technology

5.1 Introduction

208. Technology has been used to assist in all phases of population and housing censuses. This chapter addresses general considerations and provides recommendations for the use and testing of technologies for the census. The focus is on the technological solutions that have become widespread in the 2020 round of censuses, such as electronic data collection tools and cloud technologies. Technologies for using the data from administrative sources for census purposes are also discussed. It is understood that new avenues for the use of technology, such as machine learning and artificial intelligence, are likely to unfold in the years leading to the 2030 census round.

5.2 Evaluation in advance

209. Technology has the potential to improve the coverage and data quality of the census, reduce costs and enable timelier dissemination of results. However, in the short term, the introduction of new technologies may increase costs. NSOs need to consider how the new opportunities provided by technological innovation may contribute to improving the data and operations as well as the environmental footprint of the census. Adoption of new technologies or methodological approaches should only be considered where there is a sound understanding of their benefits and where their developments can be managed.¹⁵

210. The feasibility of adopting any technology that is previously untested in a census environment should be carefully evaluated in advance, taking into consideration the national context, the relative costs compared with traditional solutions, the work needed for development and testing, the potential implications for the overall organization of the census operations, the potential effects on the quality of census results, and the impact on the general population and on the environment.

211. NSOs should undertake an evaluation well in advance of the census to determine what systems and processes are appropriate for their own situation. Issues to be considered include:

- (a) The relative costs of staff and clerical-based processes compared with costs of possible computer systems and associated infrastructure;
- (b) The technological capability and infrastructure within the NSO and the country as a whole;
- (c) The capacity of the NSO to manage complex and sophisticated systems development processes;

¹⁵ For a detailed discussion on the decision-making process for using a particular technology for collecting census data, see section B.4 in United Nations Department of Economic and Social Affairs (2019), [Guidelines on the use of electronic data collection technologies in population and housing censuses](#). New York: United Nations.

- (d) The availability of funding and time for developing and testing the technological solution.

212. Before the adoption of new technologies or methodological approaches, the NSO should have a clear understanding of the associated risks. How will the new technology perform? What will be the reactions of respondent, or census staff? Because of the long intervals between census cycles (5 to 10 years), opportunities to learn first-hand from new approaches may be limited.

213. In considering the introduction of innovations, the NSO should strongly consider learning from the experience of other census agencies internationally. Consideration may also be given to collaboration with other organizations in jointly testing new approaches or technologies before their introduction.

214. The complexity of much of the new software and the infrastructure required for many of the new and emerging technologies may go beyond the current technical capabilities of a NSO to manage. It is likely, therefore, that some countries will want to consider whether significant components of technical solutions to the census operation could be outsourced (see section [4.4](#)).

5.3 Testing

215. The NSO should adopt a strong testing strategy and consider testing activities as a priority for the census. From the technology perspective, testing should pertain to functional correctness, non-functional requirements, interfaces, error handling, performance, reliability, usability and security. Beside the testing cycle, the deployed solutions must be certified for cybersecurity.

216. It is recommended to include the following components in the testing cycle for census technology:

- (a) Unit tests of individual software components to identify bugs and facilitate code changes; they are usually automated and can be run frequently;
- (b) Field operations tests for new or modified procedures and technologies in data collection;
- (c) Systems and operational readiness tests in the production environment;
- (d) Tests for backup and recovery of data to verify that data can be reliably restored to its original state after being lost, corrupted or compromised;
- (e) Tests against ransomware attacks, to evaluate the effectiveness of defences and response and recovery capabilities;
- (f) Integrated volume and performance tests, also known as load or stress tests, simulating peak load on user interface and peak size of data;
- (g) Load stability measure test for the correctness of the system configuration, hardware and software for data processing;

- (h) Security testing – Conducting penetration tests to identify vulnerabilities and validate security measures;¹⁶
- (i) Non-functional testing for the performance, reliability, utility and other non-functional aspects of a software application;¹⁷
- (j) Functional tests – Ensuring that all software functions operate according to specifications and meet user requirements;¹⁸
- (k) Tests for new online services – Evaluating accessibility, functionality and user experience of newly implemented digital census platforms;¹⁹
- (l) System-integrated testing or interface testing of integration points between two or more systems;
- (m) Integrated end-to-end test of all integrated systems;
- (n) System acceptance test to confirm both functional and non-functional system requirements, using a comprehensive set of scenarios.

217. Testing of the efficacy and coherence of the entire census system, including any outsourced technology, is especially important where respondents are provided with multi-mode options for completing the census returns, such as a mobile phone, tablet or desktop computer. Each of these modes need to be tested for accessibility, user experience, availability, performance and security.

218. In the context of the rapid development of IT and the resulting significant changes in many technological elements of the census after the 2020 round, mandatory testing of the entire technological solution in a pilot census becomes especially important in preparing for the 2030 round census.

5.4 Management

219. Census operations involve a range of administrative processes that are common to other large-scale projects. For example, the planning of a complex operation such as the census would benefit from the use of project planning software and systems and applications for recruiting and paying large numbers of temporarily employed census enumerators. The NSO should consider how technology might assist in improving the efficiency and effectiveness of these operations. This can contribute both to containing the cost of the census and improving the overall quality of the census by allowing resources to be focused on the primary tasks of enumeration, processing and dissemination.

220. Technology solutions are now available which can combine multiple field management functions. Customer Relationship Management (CRM) can provide solutions for field application management, front-end website, enhanced communication through chat-bot functionality and a citizen helpdesk for knowledge management.

¹⁶ See for instance the [Web Security Testing Guide](#) developed by the Open Web Application Security Project® (OWASP®) Foundation.

¹⁷ See for instance Pezzè M., Young M. 2007. Software testing and analysis: process, principles, and techniques. Wiley.

¹⁸ Idem.

¹⁹ Idem.

221. Modern technologies provide opportunities to improve the management of field operations and thus the quality of the census itself. Multi-modal collection operations require that timely information be provided to census enumerators so that they do not visit households that have already submitted a census form. This is both an efficiency issue and a public relations issue.

222. While the key issue is the flow of timely information to the census enumerator, the same systems should also provide for a close to real time two-way flow of information between census managers and enumeration staff. Such monitoring of enumerator work will allow for more timely interventions where the data collection process is falling behind schedule or there are some problems with the quality of the data collected.

223. The NSO may need to rely on external organizations for key parts of the solution. Regardless of whether these systems are internal or external, they must adhere to internationally (e.g. ISO27000 family), regionally (e.g. NIS2²⁰ in the European Union) or nationally agreed cyber security standards. This is especially important as software for various external or internal operations (collection, processing, geographical information systems, imputation, dissemination) are provided by a variety of solutions (e.g. one-stop-shop, proprietary, custom developments).

224. A key factor in reducing risk is the relationship with the technology partners (contractors). Strong governance where the in-house census management team remains at the core, is critical to ensuring census systems are designed, implemented and delivered successfully.

225. A census management infrastructure should contain the following elements:

- (a) a register of dwellings with addresses and geospatial coordinates, in which all addresses are distributed by enumeration areas;
- (b) a register of enumerators and their contact details with the possibility of linking each of them to a certain enumeration area (from the register of dwellings) and the addresses that it covers – if this data collection method is used;
- (c) a register of devices for data collection (for example, tablet computers or smartphones) and their unique serial numbers with the possibility of linking them to the enumerators (from the register of enumerators) – if this data collection method is used;
- (d) a central census data storage facilitating the collection, processing and accumulation of all data linking to the respondent's residential address (from the register of dwellings) that are received by all data collection methods (online responses, enumerators data, data from administrative sources);
- (e) communication software to enable timely exchange between enumerators, supervisors and the census management team.

226. All elements of this infrastructure should be interconnected and managed centrally using software and technology tools specially developed for the census purposes. It is

²⁰ Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 [on measures for a high common level of cybersecurity across the Union](#).

recommended to perform the installation, configuration and performance check of the devices in the census management centre before delivering the devices to the field personnel.

227. An integrated field communication system can use, and build on, already existing IT infrastructure. This implies, for example, direct access to the national geocoding infrastructure that provides data of single addresses. The geospatial information (addresses, buildings, cadastral parcels) should rely on using permanent identifiers (see [Chapter 8](#)).

228. The central census data storage management tools provide the following functions:

- (a) Downloading of forms completed online (if this data collection method is used);
- (b) Verification of the forms' suitability for processing (availability of answers necessary for the respondent's identification);
- (c) Linking completed forms to the addresses of dwellings;
- (d) Creation of a confirmation, such as a QR code, of the successful participation in the census for the respondent's feedback (depending on the method of receiving the completed form, to the personal account of the online census respondent, by email or other means) and for the transmission to the enumerator – if this data collection method is used;
- (e) Downloading completed electronic questionnaires from the enumerators' devices, from administrative sources and other data collection channels used in the census, linking them to the addresses of dwellings;
- (f) Consolidation of versions of completed census forms obtained from all data collection channels used in the census relating to the same dwelling address – selection of the reference version, complementing it with data from other versions, removing duplicates;
- (g) Calculation and visualization of statistics for monitoring the progress of the enumeration, to identify issues requiring an intervention or adjustment.

229. Training and technical support for enumeration staff is an important issue. It should not be assumed that the people who are likely to be recruited for enumerator tasks are technically competent. Technology would facilitate the provision of training and technical support to enumerators, in particular if this needs to be done remotely.

230. NSOs could consider remote-access technology to support flexible working arrangements of staff who process the census data while ensuring data security and confidentiality.

5.5 Direct enumeration

5.5.1 Internet

231. For direct enumeration, it is recommended to offer the option of responding over the Internet as the first or preferred option.

232. Responses to electronic questionnaires reduce overall collection cost and achieve data of better quality. Like other electronic data collection modes, data processing time and cost are reduced compared to paper-based modes because data will be formatted and can be uploaded or captured directly into databases. Data quality may also be higher because the instrument can contain built-in edits and prompts.

233. Using the Internet as the medium means that the data is collected through self-enumeration rather than an interview. Self-administration of responses over the Internet does not require a visit of the enumerator and thus eliminates any influence that enumerators may have on the responses. By providing more privacy, it benefits the respondent's self-correction and edits.

234. The Internet option can be incorporated into any of the traditional methods of delivering and collecting census forms such as drop-off/pick-up, mail-out/mail back.

235. For all the above-mentioned reasons, the Internet response is clearly a preferable option for data collection in direct enumeration.

236. The key factor to be considered is managing the collection control operations – that is, ensuring that every household and individual is counted once and once only. This requires the ability to link each household and any individual within the household to its geographic location. Furthermore, if the design of enumeration additionally includes the collection of forms by enumerators, they must receive suitable and timely feedback to update their own collection control information so that they do not visit households that have already responded.

237. The potential level of take-up of an Internet option should be considered by assessing the proportion of the population who can access the Internet from home, the proportion who use broadband services, or the general use of the Internet for other purposes such as banking, filing tax returns or shopping.

238. Systems and processes that allow for Internet return of census forms will also need to be developed. These are proven to save costs by reducing enumerator workloads, data capture, printing and postage.

239. Data security is a very important issue and should be a key consideration in designing the infrastructure. Physically separate infrastructures should be set up to collect and to process the census information. Completed individual census forms, after their collection and capture, should be moved into a secure data processing infrastructure that is separate from the collection infrastructure.

240. A standard census questionnaire that is downloadable from the Internet requires much less infrastructure than a form that is completed online. However, downloadable forms generally require a greater level of computer literacy than online forms. They will not necessarily work on different computer configurations and there will be an expectation that the NSO will be able to deal with each individual problem. Recent experience has shown that respondents generally prefer completing the form online. For these reasons, forms for online completion are recommended.

241. Adopting the Internet response option requires the provision of credentials (usernames, passwords) to the respondents for accessing the online form. Methods of delivering the credentials include

- (a) Mailing the paper forms or letters
- (b) Delivery by enumerator directly to the respondent's address
- (c) Sending by email
- (d) Sending by Short Message Service (SMS)
- (e) Using the credentials of online public service portals or other online services that require a personal identification number

242. An online form offers the possibility of interactive editing to improve response quality that is not possible on a paper form. Respondents expect that the form offers guidance – at the very minimum that they will be sequenced through the form and asked questions that are relevant to their situation. To ensure a high quality of data collected via the Internet, it is important to provide mechanisms to control response errors on the form. Such control should be conducted in real time, and the respondent should be immediately able to modify any incorrect data. If contradictions are found in the respondent's answers, the online form should identify this and provide the respondent with the opportunity to correct one or more answers, or delete them, or confirm that reported situation exists in real life (even if it is not provided for by the developers of the form). However, a balance needs to be struck so that respondent burden of error checks is not so great that it discourages people from getting to the end of completing their form, reserving hard checks to priority questions such as age and sex. Another benefit of online design is that it may be designed to allow individuals to complete their own elements of the form more easily within a household design.

243. Providing the Internet option may contribute to improving the quality of the census by making it easier for some hard-to-enumerate groups to respond. Most countries report difficulties in enumerating particular population groups, for example, young adults and people living in secured accommodation where access is restricted. Some people with disabilities may also find it easier to complete an Internet form than a paper questionnaire. These groups are also more likely to be using the Internet for other purposes, and therefore, if available, this option should be promoted to these groups as a means of encouraging participation in the census.

244. Provision of sufficient infrastructure provides one of the major challenges for offering an Internet option. The census enumeration takes place over a relatively short period of time and involves the whole population of a country, and it is unlikely that the NSO will already have the needed infrastructure to cope with the peak demands of a census. It is therefore likely that the Internet solution can justifiably be outsourced. It may be necessary for collection procedures to be modified to constrain demand. For example, staggering the delivery of census questionnaires or invitation letters or requiring people outside predetermined target populations or areas to contact the NSO before they can use the Internet form may be a means of restricting use of the Internet form.

245. Census agencies should, therefore, assess how they wish to promote the use of the Internet. Such promotion should be determined by the capacity of the service to handle the expected load and should be coordinated with other data collection procedures. The public relations strategy should encompass assurances about the security and confidentiality of the information supplied via the Internet. Assuming that the Internet option is targeted to the whole population, the public relations strategy should also encompass managing public expectations about the ability to access the site during periods of peak demand. Simple

messages of so-called “graceful referrals” advising people to use the Internet option at off-peak times should be prepared and used, if necessary, on the census Internet site itself, through any census telephone inquiry service and in any media promotion.

246. The take-up of the Internet response option can be expected to increase above the levels observed in the 2020 census round. During the data collection, census agencies should constantly monitor the levels of public response and make an effort to increase the level of online response if necessary.

5.5.2 Portable devices

247. The increasing sophistication and the reduction in unit costs of communication using laptop computers, tablet computers and smartphones means that these may be a cost-effective solution for census data collection. Possible applications for such devices include the replacement of enumerator paper maps, address registers and lists and as a means of data collection in the field. They have possible applications in the full range of census collection methodologies from drop-off/pick up through to the collection of the census questionnaires.

248. Portable devices have the advantage of being able to provide real time two-way management information. Census managers can be informed of the progress of the collection operations as the enumerators deliver census forms and collect completed returns. Likewise, census managers can provide the enumerator, via the portable device, with updates on forms received and on households that need to be followed-up. Additionally, geospatial information for the collections (e.g. missing addresses, new developments) can be exchanged to allow efficient use of resources. Census managers can identify, in real time, areas where the enumeration is falling behind schedule or not meeting quality standards and instigate appropriate interventions (consider section [5.4](#)).

249. Centralized management of the portable devices for the census data collection includes the automation of the following functions:

- (a) Installation on the devices of the following: special software for the census data collection by the enumerator (the electronic questionnaire); list of dwellings addresses and maps of the enumeration area; metadata and classifiers used in the electronic questionnaire; tools for the monitoring the operation of the device and the enumerator; training materials for the enumerators;
- (b) Linking between the device, the enumerator and the enumeration area as elements of the corresponding registers (dwellings, enumerators and devices), update of the registers and links between their elements in the event of the enumerators or devices being replaced;
- (c) Online management and monitoring of each device’s operation after its initialization by the field staff;
- (d) Clearing the device of all information and software used for the census purpose after the successful transfer of the collected data to the central data storage at the end of the census and preparing the devices for a long-term keeping (conservation) or use for other purposes (for example, transfer to another agency).

250. The online management and monitoring of device's operation includes:

- (a) Obtaining information about the time when the device is turned on and off;
- (b) Obtaining geo-coordinates for completing each form and recording data about the data collection process, such as interview duration and the number of completed questions, errors and corrections in the forms;
- (c) Transmission to the devices of the addresses and the identification data of online respondents to enable the enumerator to verify the completeness of the enumeration at each address and make corrections if necessary;
- (d) Remote installation of software updates on the devices in case of emergency. It is recommended to use this only when critical software errors are detected during the census, since it is important to ensure the consistency of data collected using different software versions;
- (e) Locking the device in the event that a field worker reports the loss or theft of the device to prevent illegal use of the device or information leakage from it;
- (f) Providing a means of remote consultation of the enumerator with the central census office.

251. Use of portable devices should allow greater opportunities for increased efficiency in data collection. However, several technical issues need to be considered in using such devices:

- (a) Screen size may affect the ability of the enumerator to record and verify responses accurately. For the same reason, responding with mobile devices over the Internet risks fragmentation of data due to the small size of the screens.
- (b) The compact and lightweight devices with sufficiently large storage capacity are most convenient for the field work of enumerators. The brightness and contrast of the screen should be adjustable to use the device both in bright and in dark light.
- (c) To ensure the safety of data, completed information should be held in the devices for as short a time as possible. This time depends on how often the data synchronization processes are done, and is also determined by the time required for enumerators to finalize and verify completed questionnaires before synchronizing with the census data storage.
- (d) Devices should be able to deal with being offline for periods of time. The length of battery life should be considered in relation to the daily workloads of field staff. It may be worth providing an additional power bank for the device.
- (e) If system and software updates have to be made at the data collection stage, it is necessary to avoid the risks of loss of previously collected data or their inconsistency with the data collected after the update;
- (f) The GPS accuracy (e.g. in densely populated urban areas) and the mobile signal reception (e.g. mountainous or forest areas) may not be satisfactory on some areas of the country. An assessment of mobile web connectivity should be done particularly if the portable device uses web-based collection.

252. Solutions based on portable devices should be extensively tested before the census phase, both on their own and in interaction with other elements of census technology that do not use portable devices.

253. There is also a range of security issues associated with the use of portable devices:

- (a) There is a greater risk of being stolen or lost compared with bundles of paper forms. However, regular uploading of the data from such devices should minimize the need to re-enumerate areas if the devices are lost.
- (b) Measures are needed to protect the confidentiality of any data on the device, in the event of loss of the device, and in transmission of the data. Data stored on the devices should be encrypted and only accessible through dedicated protection measures (e.g. passwords, fingerprints);
- (c) Transmission of the data also needs to be secured through encryption and use of secure channels end to end;
- (d) Security software should be loaded to the device and must be compatible with the other applications on the device. However, security software and passwords add an extra level of complication in use. These security measures will add to the support costs.

254. The training tools for the portable devices should be uploaded to the device for the convenience of their use by the enumerators for the training and during the field work. They should cover all the elements of the enumerator's work, be interactive, have easy navigation and contain illustrative examples of the enumerator's reaction in all possible situations of using this device.

255. Census agencies should think ahead about using the large number of devices after the census. It is impractical to store devices for the next census since they can become technologically outdated and unusable in 5 to 10 years without using and recharging. Census agencies may transfer some of these devices to other users (e.g. the government organizations) while keeping some of the devices.

5.5.3 Telephone

256. In the past, automated telephone interviewing has been suggested as a potentially cost-effective solution for countries that have a short-form census questionnaire requiring only the capture of basic demographic information. However, no country applied it in the 2020 census round. Automated telephone interviewing is not recommended.

257. Computer Assisted Telephone Interviewing (CATI) method can be used to collect data via the census questionnaire and/or to verify and complete any missing data collected on a long-form questionnaire. The user-friendliness of such systems decreases greatly as either the number and complexity of the questions increase or the number of people in the household increases.

5.5.4 Design of the electronic questionnaire

258. The design of the electronic questionnaire is a very important part of the technological solution when responses are provided online or collected using portable devices. The design of the electronic questionnaire should take into account the following requirements:

- (a) Contain a complete set and a clear sequence of the questions, which are divided into open and closed questions;
- (b) Contain skip patterns by automatically displaying only the relevant questions and skipping those that are irrelevant or not applicable to particular respondents;
- (c) Consider all branching paths of the questionnaire, including for rare situations, so that each question is addressed to at least some subset of the population;
- (d) Provide response options with the choice of only one option or several answer options for closed questions, and if the "other" option is selected, allow the capture of the respondent's own answer;
- (e) Fit the entire one question and its answer on the device screen without scroll or skip to the next screen, if possible, because the hidden part of question or answer options may be missed when answering it;
- (f) Make available the help option as a text hint or a jump to the appropriate element of the metadata or training materials;
- (g) Provide for easy navigation between the questions to one respondent, between members of the same household and between different sections of the questionnaire (e.g. about the housing conditions, about the household, about the person);
- (h) Use built-in controls for the validity of the entered data, taking into account previously entered information about the respondent and other members of this household;
- (i) Display a progress bar for questionnaire completion as well as the general quantitative characteristics of the completed questionnaire, such as number of persons in the household and the percentage of relevant questions answered.

259. In the case of using an electronic questionnaire for both online self-completion by respondent and for enumerator's device, the design of the questionnaire may differ because the respondents have no knowledge of the census methodology, whereas the enumerator is pre-trained and familiar with census terminology and the metadata built in the questionnaire.

260. The online form should additionally contain a summary of the basic requirements for completing it by the respondent. These include:

- (a) A description of the general structure of the questionnaire and the sequence of its completion;
- (b) An estimated time of completing the questions per one respondent or one household;
- (c) A description of ways to call up help information and respond to error messages;

- (d) A description of the possibility to correct, delete or add some information to the previously completed questionnaire, if necessary;
- (e) The signs of successful and unsuccessful completion of the census process and further actions of the respondent (e.g. obtaining confirmation of participation in the census);
- (f) A way of feedback to NSO, such as a telephone number, email address of the census hotline or of the NSO, to evaluate the quality of online services or ask questions that were not answered when filling out the form;
- (g) The ability to get translation of the form into the most popular languages in the country if necessary;
- (h) The provision of answers to frequently asked questions with terminology accessible to respondents and a link to the page of the NSO website where the legal, methodological and organizational principles of the census are described.

5.5.5 Technology to support the enumeration of people with disabilities and without Internet access

261. When introducing new technologies, it is necessary to keep in mind that the census must cover the entire population, regardless of the used technical equipment and the respondents' proficiency of computer use.

262. Technology can support the enumeration of the impaired and digitally disconnected in two main ways: (a) in reaching respondents that do not have the necessary Internet connection; (b) to allow for as many people as possible to enter their responses electronically.

263. The digitally disconnected. In order to reach as many people as possible it will be required to identify locations that do not have proper Internet connectivity. One aspect that NSOs should consider in such cases is to offer a paper option. However, other options should also be explored such as deploying enumerators to gather information with portable devices using the Internet over a satellite, or giving the respondent a phone number to call so they can fill out their form by telephone.

264. Accessible internet response. Another aspect to consider is how people with disabilities could fill out their census form over the Internet. Internet response should follow accessibility standards as defined by the Web Content Accessibility Guidelines (WCAG) 2.2.²¹ While adhering to those standards technically, it is important to consider accessibility already at the stage of developing the content. Before developing any new features that could impact accessibility, consultation with a centre of expertise in accessibility and a user experience group should be performed to ensure that new functionalities are designed to be properly accessible. Examples of the applied features include:

- (a) Hidden text for auto-generated character mask fields, to inform vision impaired users of the necessary inputs required to be typed by the user and those that will be provided automatically;
- (b) Required colour contrast to ensure users can view text content;

²¹ World Wide Web Consortium (2024). [Web Content Accessibility Guidelines \(WCAG\) 2.2](#).

- (c) Techniques for associating labels with interactive controls to allow assistive technology to recognize the label and present it to the user, therefore allowing the user to identify the purpose of the control.

5.5.6 Data capture from paper questionnaires

265. Based on practices in the 2020 census round, it can be assumed that most countries with direct enumeration in their next census will use the Internet response option. The use of paper forms and optical recognition technology could be assumed as limited. Data collection with paper questionnaires may nonetheless be necessary because of respondents' preference or lack of access to the Internet. In comparison to data collection over the Internet or by using electronic devices, this requires additional processing steps such as scanning, data capture and possibly also keying by operators. The fact that the system needs to interpret different handwriting contributes to the complexity of the process.

266. For processing the paper questionnaires, it is recommended to use automated processes such as Intelligent Character Recognition (ICR).

267. Optical Mark Recognition (OMR) can be a cost-effective option where the census form contains only tick-box responses. Additional means of data capture or computer-assisted coding operation are required to handle write-in responses. However, OMR has largely been superseded by ICR technologies.

268. The most cost-effective option is likely to be a combination of digital imaging, ICR, repair and automated coding. An example of this process is briefly described below.

- (a) The census forms are processed through scanners to produce an image. Recognition software is used to identify tick box responses and translate handwritten responses into textual values. Confidence levels are set to determine which responses are of acceptable quality and which responses require further repair or validation;
- (b) Automated repair is designed to reduce the need for operator intervention and typically involves the use of dictionary look-up tables and contextual editing. The dictionaries are tailored according to the census question being processed. Thus, for example, the dictionary for country of birth question would only contain names of countries. Preparatory work on the construction of natural language dictionaries of terms will greatly increase the efficiency of coding;
- (c) Operator repair can be undertaken on images not recognized. This is only cost-effective for those questions where there is a high probability that the repaired data can then be automatically coded;
- (d) Automatic coding uses computerized algorithms to match captured responses against indexes. Those responses that cannot be matched are then passed to a computer-assisted coding process. For the responses that cannot be automatically coded, it is recommended to use a machine-learning algorithm that could replace human coders with as good and even better data quality and highly reduce cost. Data from a previous census can be used to train the machine-learning algorithm. Data from the current census testing cycle could also be used, especially if new

variables need to be coded and can be verified to be of equal or higher quality than the one achieved using human coders.

- (e) Further considerations on the use of digital imaging, ICR, repair, automated coding, Optical Mark Recognition (OMR) and Optical Character Recognition (OCR) are presented in the CES census recommendations for the 2020 round.²² Generative artificial intelligence can be expected to lead to new possibilities and replace keyers. However, it requires investment to build proper models to keep high quality of data.

5.6 Administrative data

5.6.1 Scope

269. The technologies applied for the use of administrative data differ from those for data collection in the field. The development and increase in the availability of new information and telecommunication technology (ICT) allows administrative registers to be utilized more widely in population and housing censuses. Bearing in mind the development of state-of-the-art technologies and the commitment of agencies to implement innovative solutions in censuses in the 2030 census round, it will be necessary to create or modernize the software and hardware infrastructure for collecting, storing and linking data from administrative sources and storing metadata on processes and products.

270. The quality of the source data has a large impact on the quality of output products. Therefore, the methodology for improving the quality of data from administrative sources, for example, by adjusting them to satisfy statistical requirements, is of vital importance. State-of-the-art ICTs may prove very useful here and have a key impact on improving the efficiency and effectiveness of these operations. For assessing the quality of administrative sources for use in censuses, reference is made to the UNECE guidelines on this matter, published in 2021.²³

271. As part of the preparatory work for the census, particularly in the design phase, the necessary technical requirements related to the use of data from administrative registers, which may affect the need to modernize infrastructure, should be determined in the following areas:

- (a) Data collection;
- (b) Data storage;
- (c) Data linking;
- (d) Storage of metadata on processes and products.

272. The application of several techniques of collecting data from administrative registers and other sources for use in population and housing censuses will require a more comprehensive organization and management processes and more complex systems.

²² UNECE 2015. [Conference of European Statisticians recommendations for the 2020 censuses of population and housing](#). Geneva: United Nations.

²³ UNECE 2021. [Guidelines for assessing the quality of administrative sources for use in censuses](#). Geneva: United Nations.

Modern technologies provide opportunities for improvement in this case as well. The process of collecting data from administrative registers should include the preparation of a data-collection strategy using various data-collection modes.

5.6.2 Security and confidentiality²⁴

273. It is crucial to consider the growing emphasis on data security, privacy and data protection in society. This is evident in the legal and statistical frameworks of many countries. Moreover, EU member states must comply to the General Data Protection Regulation (GDPR).²⁵ Consequently, there are increased requirements on how the agencies conducting a register-based population and housing census should receive and process data. To address these demands, a strong emphasis on the need-to-know principle and the processing of anonymized data is recommended.

274. Secure IT infrastructure is the necessary condition for data collection from administrative registers. A crucial issue connected with the process of data collection is the protection of data. Regardless of the technology applied, the data collection strategy should ensure information security. This requirement should be addressed at the early stages of designing the process of obtaining and gathering data from administrative registers and designing the proper software and hardware infrastructure. The technical issues concerning the coding of data transmission should be considered in detail, together with the use of secure transmission channels.

275. Appropriate technical and organizational measures should be implemented to protect the data against accidental or unlawful destruction or accidental loss (including backups), alteration, unauthorized disclosure or access.

276. Security must be implemented in multiple layers. Register owners, data-collecting NSOs and other partners must establish secure transmission channels with corresponding certificates to control access granted to collectors.

277. By organizing data into different "states" - such as source data, prepared data, statistical data and output data - authorization management can be effectively implemented for various roles and teams within the NSO. Data access should be enforced on a need-to-know basis, with anonymized identifiers and disclosure controls applied across all aggregation levels.

5.6.3 Data linking, transfer and storage

278. Modern technologies are useful in the process of linking records and data. After identifying the administrative sources to be used in the census, it would be necessary to map them and create application programming interfaces (API) for the automatic flow of data to the central.

279. Administrative sources are different from each other, both within different subject areas within a country and between countries. If possible, it is advised to use standardized APIs.

²⁴ See also section [7.1.1 Confidentiality principles](#).

²⁵ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 [on the protection of natural persons with regard to the processing of personal data and on the free movement of such data](#).

Regardless of the interface used or differences encountered, good metadata and good understanding of data are very important for their inclusion in the census.

280. Many countries are currently transitioning to cloud-based storage and computing (see section 5.9). Compared to traditional on-premises solutions, this shift offers new possibilities, including the potential for a more flexible, variable-controlled universe of data, or data lakes, rather than traditionally thematically stored, structured and updated data. These data lakes will place high demands on metadata and accurate periodization, made more feasible by the increased processing power of cloud-based computing. Centralizing the administrative data into a data lake would support the business process and can provide a strong and reliable infrastructure for storing, creating metadata and synchronizing the different sources of data.

5.6.4 Improving the administrative data

281. Various techniques are useful for converting administrative data into statistical data. With the procedure of automatic data cleaning in place, it is possible to eliminate errors in source data from administrative registers and edit the data efficiently.

282. Machine-learning models could be used, for example, in determining the “census address” of the individual or type of the private household.²⁶

283. Artificial intelligence (AI) could be used, for example, for determining the classification of the economic branch of employment. Classification using AI can be more efficient, give quality results and allow classifying a high percentage of cases. The classification models used for this purpose need constant updates and quality analysis to evaluate the results. It is understood that specific security and confidentiality requirements may not always allow working with such data and models in the cloud. There are also known limitations of using classification models developed in English in the context of other languages.

5.7 Output production and dissemination

284. Traditionally, census output comprises aggregated tables, statistics, illustrations and maps with appropriate metadata (see [Chapter 6](#)[Chapter 7](#)). The demand for evidence-based policy and planning generates a demand for census data from an increasingly wide range of users. Output systems therefore need to reach diverse users, ranging from those who would look for quick access to basic headline figures to those expecting to conduct advanced analyses.

285. Online dissemination via the Internet additionally allows for the design of products to meet better the needs of different kinds of census data users, for the cost-effective dissemination of a much wider range of census data and for the improved usability of the data. Application programming interfaces (API) should be made available to increase usability of the provided data.

286. Functionality and data content can be targeted to satisfy the different levels of users. This functionality should be seamless – from the simple to the sophisticated – with the users

²⁶ Using machine learning methods to determine type of private household in Switzerland: [ECE/CES/GE.41/2022/6](#).

being led by the nature of the query or analysis they are wishing to undertake using different products.

287. One of the main objectives of the census is to produce information for small geographic areas and for small population groups. Internet dissemination can support both types of use of the data. For small geographic areas, GIS technology can be used as means for both defining areas of interest in searching for data and for mapping of the outputs of the search. There is a range of software packages that can be used to zone in on populations of interest from large pre-defined matrix tables.

288. The Internet dissemination system should provide flexibility for users to export the results into a range of commonly available packages for statistical analysis, tabulation or mapping.

289. As the amount of data gathered increases, data visualizations have been introduced to help data users at all levels of experience to understand key information derived from the data. Data visualization can be used to communicate a message quickly, to simplify the presentation of large amounts of data, to see data patterns and relationships, and to monitor changes in variables over time.

290. It is recommended to disseminate census data on interactive online platforms where different user groups can create their own tables and visualizations (e.g. graphs, maps) according to their needs.

291. Focus should be on the application of the FAIR guiding principles for scientific data management and stewardship.²⁷ The principles emphasize the capacity of computational systems to Find, Access, Interoperate and Reuse data with none or minimal human intervention. The analytical solutions in the platforms may remain limited as this is not the main purpose of the census.

292. Census data users have very different levels of statistical literacy or computer proficiency. It is recommended that the NSO should consider the following groups of users:

- (a) Occasional users who mainly look at data visualizations or report highlights;
- (b) Intermediate users who customise visualizations or select specific data;
- (c) Technically advanced users who would download data to perform their own analysis and use application programming interfaces (API).

293. International standards such as SDMX should be considered a priority for formatting the output data and metadata that is made available to users.

294. Whatever the means of access or dissemination, protecting the statistical confidentiality of the census data is a prime consideration in any such systems and statistical disclosure control procedures should be in place.

²⁷ GO FAIR Initiative. Wilkinson M, Dumontier M, Aalbersberg I et al. (2016). [The FAIR Guiding Principles for scientific data management and stewardship](#). *Scientific Data* 3, 160018.

5.8 Storage and archiving

295. Data storage technology has evolved in line with new technology trends. Historically, data has been stored on-premises within the NSO, using traditional media tapes sometimes complemented by disk storage. However, as the volume of data has continued to increase exponentially, the capabilities of storage solutions have had to adapt. Many organizations are now considering implementing a hybrid storage approach, utilizing a mix of cloud and on-premises storage solutions based on individual needs.

296. Certain factors will need to be considered in determining what storage policy is appropriate for individual statistical organizations.²⁸ These include:

- (a) The risk for utilizing additional storage solutions that are off-premises.
- (b) New skillsets required to develop and maintain advanced storage solutions such as a hybrid approach. These can be difficult to obtain and costly to retain.
- (c) Each NSO should ensure that they understand their data in terms of data classification. This will aid the decision-making required when determining how to build their storage design capability;
- (d) As organizations consider new storage solutions, cyber security safeguards are required to identify, detect, protect, respond and recover from cyber risks and threats. Their cyber defence strategy will need to ensure storage protections are available in a hybrid environment.
- (e) There are many cloud-based storage approaches including glacier storage for long term retention of data that is not frequently used. Organizations that have relied in backing up all data using full, incremental or differential methods will need to understand to develop a deeper understanding of their data when leveraging the capabilities of these new storage approaches.
- (f) In partnering with external storage service providers, NSOs will need to ensure appropriate agreements are defined that meet their expectations in service delivery;
- (g) Storage and archiving should follow legal texts and well-established rules. For example, in the European Union, any scientific manuscript data should be kept for 10 years;²⁹
- (h) Backup and recovery procedures must be implemented and tested to perform any steps needed to restart the systems and services, to verify their operations and data integrity;
- (i) A business continuity plan is recommended to be in place and tested for the prevention and recovery of the systems and their related data for threats like natural disasters or cyber-attacks.

²⁸ See also section 8.1 Benefits and costs.

²⁹ Commission Decision (EU) 2021/2121 of 6 July 2020 [on records management and archives](#).

5.9 Cloud

297. Cloud computing is growing very rapidly and is expected to become the most common IT infrastructure in businesses globally. Cloud adoption strategies have ranged between cloud-only, cloud-first and, more recently, cloud-smart.³⁰

298. Cloud adoption is also becoming prominent for government entities worldwide, as they recognize the transformative potential of cloud computing in enhancing operational efficiency, scalability and service delivery. Embracing cloud technology allows them to optimize resource utilization, improve data accessibility and foster innovation across various domains.

299. The development of the cloud has evolved to include multiple platforms and service models. Service models include Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Platforms include public, private and community cloud. Each of these individual models can provide opportunities and challenges for statistical organizations in their adoption and deployment.

300. NSOs have to consider and evaluate several elements for the adoption of the cloud.³¹

- (a) Data sovereignty – a requirement that a cloud service provider guarantees that cloud services and underlying infrastructure is designed to provide data access in compliance with laws and regulations of the originating country of the data in question. Global cloud providers rely on global contracts that may not align to local laws and legislation. There may be legal restrictions concerning the geographical location of the provider's data centres.
- (b) Jurisdiction in the event of a dispute. This will require localized agreements agreed at a national level.
- (c) Data security measures and protocols the provider has in place.
- (d) Perception among the public, politicians and stakeholders regarding data security, privacy and control with cloud-based solutions.
- (e) Freedom to choose the best suited provider and consider the provider's track record and reputation in the industry.
- (f) Financial implications of the use of cloud.

301. A transitional approach to the adoption of the cloud with incremental steps could be appropriate for many statistical organizations. Beginning with less sensitive applications and systems and learning from the experiences can provide a greater degree of comfort to the key stakeholders making the decision to adopt the cloud. Ensuring that the risk is assessed and measured on an ongoing basis will also help with the transition.

302. Cloud infrastructure can bring important advantages if the census has a 5 to 10 years cycle. A benefit of using the cloud is the possibility to scale up and down easily when required. This could end up in cost saving for the census programme but requires nonetheless to proceed with caution and consideration of broader implications for the agency. For example,

³⁰ UNECE 2024. [Cloud for official statistics](#). Geneva: United Nations.

³¹ *ibid.*

on-premises infrastructure built for the census could be reused for other purposes of the agency. So, for the census programme, there will be cost-saving possibilities, but it should be evaluated at the level of the entire statistical system. For a shorter cycle such as an annual census, it may not be the best approach.

303. Further advantages are related to the investment to the new cloud technologies such as cloud-native and Platform as a Service. A multi-cloud architecture should also be considered in order of benefits from the strength of different cloud providers. For example, there could be one cloud infrastructure for the application and another one that will host the database.

304. Cloud infrastructure allows a lot of flexibility but should be strictly managed in order not to pay for infrastructure that is not used. Otherwise, using the cloud may turn out to be the more costly option. Cloud servers should be scaled down when not used and scaled up when required.

305. Cloud migration process should be well evaluated and well planned. Just migrating to the cloud to use another data centre would not be a recommended approach as it may cost more than staying on premises. Different countries should look at being cloud-smart, that is moving to the cloud by rebuilding the application into the cloud or leveraging on the cloud-native approach of building, deploying and managing application in cloud computing environments.

306. Using the cloud can bring important advantages to the census but is not always the best approach. It is recommended to do a thorough evaluation before moving to the cloud.

Chapter 6 Communications and outreach

6.1 The importance of communications for all phases of the census cycle

307. An integrated communications strategy, together with far-reaching publicity and information campaigns, play an essential role in ensuring the success of a census. It helps to raise awareness, educate the population, gain public support and trust and influence behaviours. This is especially the case for those countries adopting a field enumeration methodology, either wholly or in part, where the public is expected to participate actively in the census activities as respondents and, possibly, as temporary employees as part of either the field staff or in the data processing operation. But even among countries adopting an entirely register-based approach, where direct engagement with the public may be minimal, communication with the public and key stakeholders is vital to ensure acceptable levels of quality for such components as the relevance and accessibility of outputs.

308. During the collection phase, publicity and information campaigns are needed to inform the public that a census is taking place and to provide the necessary information to enable and encourage them to participate and, where relevant, to increase self-response. Special attention is often given to identifying and targeting harder-to-enumerate population groups to ensure consistent levels of response across the country. Essentially, the aim is to engage, inform, encourage, and, if necessary, enforce participation.

309. In recent years, collecting accurate population data has become increasingly challenging due to complexities in information gathering and the growing prevalence of misinformation and disinformation. Effective communication and publicity campaigns are more crucial than ever to inform the public about an upcoming census, explain objectives and processes, reassure the public about the safety and confidentiality of the information they are sharing, and ensure comprehensive coverage and reliable data collection. This is particularly important for countries employing field enumeration methods, either entirely or as part of a combined approach. But whether countries adopt a direct enumeration methodology, wholly or in part, or an entirely register-based approach, the communications function should remain consistent in all stages of the census cycle. Communicating the results of the census is equally important. The benefits of the census are only realized when the data and insights are published, and audiences can use them to make decisions.

6.2 Implications of the changing nature of census enumeration on communications

310. The ways in which census data are collected have undergone significant transformations over time, adapting to the evolving public environment and technological advances in each country. More countries are moving away from direct enumeration to greater use of registers and administrative data sources. Many reasons can justify and support

this new approach, including cost efficiency, reduced respondent burden, better timeliness and frequency, accuracy and coverage and resource allocation. In many countries, a register-based census approach or an ambition to move towards such an approach aligns with modern data practices, optimizing resource use and potentially providing more accurate and timely demographic information.

311. When NSOs decide to adopt a new census methodology, communicating changes is crucial for ensuring transparency and fostering trust among the public. Clear communication helps to explain the reasons behind the changes, the expected benefits, and how they might affect data quality and usage.

312. Consulting with the public, communities and stakeholders is essential for social acceptance, as it allows for addressing concerns, incorporating diverse perspectives and enhancing the legitimacy of the process. Furthermore, explaining that administrative data may improve efficiency and accuracy while maintaining privacy and data security can help build trust and acceptance. This inclusive approach can mitigate resistance, improve cooperation, and ultimately lead to more accurate and representative census data, which is vital for effective policymaking.

313. A slow transition in campaign messaging may be necessary for countries following this trend. NSOs which are still using a full field enumeration strategy but are considering adopting a combined census or register-based approach in the future should be transparent about their plans and launch consultations and awareness campaigns as soon as possible to ensure social acceptance. This should include communicating a willingness to dial back on or adapt such plans if they are found to not meet with the necessary social acceptance.

314. NSOs that are already using a register-based approach might also benefit from an effective communications strategy. They can inform the public about the nature and benefits of a register-based census and increase awareness of census data availability, build public trust in the census process by addressing privacy and data security concerns, engage key stakeholders, ensure that organizations providing administrative data are well-prepared and aligned with census requirements, and address quickly any issues or misinformation that may arise during the census process.

315. There exists a wide range of census collection methodologies employed across different countries worldwide and these methodologies evolve constantly. The recommendations presented in this chapter aim to inspire and establish high standards for census consultation, data collection and dissemination. However, it is essential to acknowledge that each country will need to evaluate these recommendations based on the specific methodology they employ and the resources available to them. Ultimately, it will be up to the NSO to determine which recommendations are applicable and feasible within their unique contexts, taking into account their existing practices, technological capabilities and resource constraints.

6.3 Consultation

316. In the early planning phases of the census, consultation with a wide range of stakeholders is necessary to ensure that user requirements are met, the questionnaire design

is effective, the methodology is accepted, working partnerships are forged and technical specifications are well understood.

317. A key area for consultation with users is establishing the requirements for statistical data on each census topic. Although there will likely be a set of core topics on which NSOs will want to collect information to fulfil international obligations (e.g., the present Recommendations and the European Union Census Regulations), many questions will be included to meet national and local requirements.

318. To justify the inclusion of particular census topics, consultation with the user community should aim to confirm the relative merits of the topics to be considered. The criteria for accepting these topics should be:

- (a) There is a demonstrated need for the information at both national and local area level;
- (b) Users' requirements cannot adequately be met by information from other sources;
- (c) Relevant questions should be shown, in tests, to have no significant adverse effect on the census, particularly the level of public response;
- (d) Practicable questions can be devised to collect data that is sufficiently accurate to meet users' requirements.

(Items c and d apply only to those countries using a questionnaire to collect answers from respondents).

319. Consultations should cover (where appropriate):

- (a) User requirements;
- (b) Census methodology;
- (c) Questionnaire design;
- (d) Enumerating harder-to-enumerate and special population groups;
- (e) Confidentiality and statistical disclosure;
- (f) Design, content and dissemination of outputs including metadata;
- (g) Field operations;
- (h) Language, community liaison or outreach programmes;
- (i) Data quality;
- (j) User satisfaction;
- (k) Post-census evaluation.

320. Some of these topics will be of interest to users and others to experts. They assist in planning a census that is responsive to stakeholders' needs and views while promoting broader understanding and support for census plans and activities.

321. The key user communities to be encompassed by such a programme of consultation should include (either individually or collectively):

- (a) Central government departments or organizations;
- (b) Local government authorities or organizations;

- (c) Academics and education service providers;
- (d) Ethnic or racial communities;
- (e) Public service providers;
- (f) Press and the media;
- (g) Religious groups;
- (h) Disability groups;
- (i) Market researchers;
- (j) Business, retailers and other commercial sectors;
- (k) Health service providers;
- (l) Housing groups.

322. Other key stakeholders may include international organizations, nonprofit organizations, communities of seniors, community of youth, partners with whom the census agency collaborates for the provision of specialist services and donors who may help fund elements of the census operation.

323. Consultation can occur through formal meetings with advisory or working groups comprising user community representatives and census authorities. Alternatively, public consultations, in-person or virtual, or electronic questionnaires can be used. The increasing accessibility and use of websites and social media enables such direct consultation and feedback to be carried out among a much wider audience than has previously been possible. In addition, census authorities may wish to consider *ad hoc* public meetings or bilateral meetings as means of discussing either specific census issues or more general plans and developments.

324. It is recommended to conduct separate consultations with different groups of users or stakeholders who share common interests and perspectives, such as administrators, planners, policymakers, demographers, market researchers and community leaders. This approach is preferable to holding simultaneous meetings for all data users, since it allows for more focused and tailored discussions catering to the specific needs and concerns of each group. Such combined meetings often prove to be less effective because there are substantial differences among users and stakeholders in their technical background and expertise, priorities and level of interest in the details of the census content and operation.

325. To have full and comprehensive metadata, census authorities should consult with stakeholders from diverse backgrounds, including government agencies, researchers, policymakers, and the public using, for instance, structured surveys, focus groups, or other consultations. Feedback may be collected to refine metadata descriptions, making them more intuitive and comprehensive (for more see section [7.3](#)).

326. Behaviour tests, pilot tests, focus groups and other tools can be used to understand how respondents interpret and react to census questions and instructions. This information can be harnessed to design better questionnaires and communications products. During a pilot, the effectiveness of census questions and instructions can be evaluated under typical field conditions.

6.4 Publicity and paid advertising

327. For countries that undertake a significant field operation, public acceptance and cooperation are essential to ensure the success of the census. A large-scale publicity and information campaign is recommended to inform the population of the census and to explain its purpose. Implementation of the publicity campaign should be done by experts in the field of communications, public relations, or advertising. When such expertise cannot be found within the NSO itself, it may be appropriate to outsource some or all this work (see section [4.4](#)).

328. The publicity programme may include:

- (a) A public relations campaign;
- (b) A community liaison (or outreach) programme;
- (c) An advertising campaign;
- (d) Monitoring of public opinion;
- (e) Social media and media relations, including monitoring of the mass media.

329. There are several main messages that census agencies will need to communicate to the public to maximize outcomes for the census. Key messages should also be framed based on the different stages of operations (pre-collection, collection, follow-up activities, post-collection). Key messages may include:

- (a) Privacy and confidentiality will be protected (individuals will not be identifiable in any published information, the personal information will only be used for statistical purposes, and there are penalties for enumerators and other staff who misuse personal information);
- (b) The census serves the public good as an important source of information to paint the most comprehensive and accurate picture of the society, an important evidence base for many national and sub-national policies, and a tool to plan for the future;
- (c) Filling in the form is a duty of the citizen, which will benefit their community and country;
- (d) Participation is mandatory (when relevant, based on the census laws).

330. Care is necessary in finding the correct balance between these different messages. For example, an over-emphasis on the mandatory nature of the census may serve to reinforce negative perceptions that the census is an imposition by the government on the population, rather than an activity for the common good (see further discussion of this in [Chapter 2](#)).

331. The following methods and media may be used in any part of the publicity campaign to reach one or more sectors of the community:

- (a) National and local press and magazines;
- (b) National, regional and local TV and radio;
- (c) Community-based media;

- (d) Press conferences, round table discussions and briefings;
- (e) Ad hoc statistical or scientific events;
- (f) Internet websites, social media and mobile technology;
- (g) Streaming platforms, Interactive app, Gamification;
- (h) Leaflets, posters, billboards;
- (i) Call centres (telephone helplines) and local drop-in help centres;
- (j) Paid or free advertising;
- (k) School promotions;
- (l) Email marketing.

332. Locations used to promote the census during the publicity campaign may include:

- (a) Regional or local government offices;
- (b) Schools, colleges and universities;
- (c) Banks, post offices, police stations, health facilities and other public user facilities like malls and gas stations;
- (d) Stations, airports, seaports and public transports;
- (e) Public libraries;
- (f) Local information help points;
- (g) Places of religious worship;
- (h) Factories and other workplaces;
- (i) Bars, pubs, theatres and other places of entertainment;
- (j) Sports facilities.

333. The publicity campaign should consist of several well-timed stages that align with different elements of the census operation, using a “wave methodology”. In the initial phase, leading up to the census, the first wave of the campaign should focus on raising awareness about the importance of the census while being mindful not to start too early and risk losing public interest. The campaign should explain the benefits of the census, not only to the country but also to individuals, emphasizing how their participation can make a difference. Messages used in the publicity campaign should help develop an emotional attachment and a sense of pride in completing the census.

334. As the enumeration phase approaches, a second wave of publicity messages should shift their focus to providing clear instructions on what people need to do and when, encouraging them to participate actively and complete their questionnaire online (if this option exists). This targeted approach will help maintain public engagement and ensure a higher response rate during the crucial enumeration period.

335. During a third wave, the reminder phase, some (but not too much) emphasis should be given to the mandatory nature of the census. The tone and content of messages and letters should be more assertive. Public assurances about confidentiality and data security should

be emphasized throughout the entire census operation. More emphasis can be given to enforcement and legal obligations during the non-response follow-up phase.

336. NSOs may want to extend their communications programme to include messages of gratitude and appreciation to the public for taking part in the census before transitioning into communicating census results and encouraging their use.

337. The languages used for advertising and other publicity media should reflect the variety of languages spoken in the country or specific regions. This will help to ensure inclusivity across the range of linguistic minority groups in the population. The effects of this inclusivity can be numerous: on an instrumental level it can make it easier for people to understand and absorb the messaging; it may also have a more subtle effect of making minority groups feel that they are being treated as an important part of the population, which may increase their willingness to respond to the census and the quality of answers they provide; a perception of inclusivity may also increase trust in and use of the census data.

6.4.1 Paid advertising

338. While television remains the leading platform for paid advertising, the role of digital media continues to gain momentum, including social media platforms which now increasingly leverage artificial intelligence (AI) technologies. The proliferation and popularity of streaming services, and advertising within those services, likely indicates a need to diversify spending across all the various platforms, naturally requiring larger budget allocations. The changing regulatory landscape will also be an important factor in how and where NSOs promote the census.³²

339. Paid advertising is ideal for national censuses, especially those using field enumeration methodology since it addresses the challenge of a short timeframe in which to encourage action and maximize self-response. Census communications campaigns must reach massive audiences while balancing the even bigger challenge of addressing historically undercounted and harder-to-enumerate populations. This type of message can be delivered to the masses through paid advertising in a relatively short time.

340. Additionally, paid advertising provides the opportunity to integrate the message across campaign channels and areas by easily establishing a standard “look and feel” for the messaging. Paid advertising lends additional support and trustworthiness to the messages delivered through, for example, earned and owned media.

341. Unlike other components of the publicity campaign, paid advertising provides the ability for rapid response, the reallocation of paid media spending and the refinement of messaging during the campaign. It also provides the ability to optimize, target and refine media placements throughout the campaign. Paid advertising can also be used to promote general and specific census results to target audiences.

342. It is recommended that paid advertising plans are developed and implemented with a relatively advanced timeline to take advantage of potential partnerships, to include census messaging in popular shows and to negotiate placement on live television events.

³² See e.g. [The Digital Services Act package](#) | [Shaping Europe's digital future \(europa.eu\)](#)

6.4.2 Branding

343. A well-crafted census “brand”, with a memorable logo and catchy slogan, can enhance the effectiveness of a country's census publicity campaign. Consistently using a distinct logo and slogan across all publicity efforts, including various media channels, printed materials and promotional items, will help the census establish a strong brand identity. The key is to leverage an existing, trusted brand or to create a logo and slogan that are easily recognizable, positively perceived, and that will survive the test of time.

344. When branding elements are communicated effectively from the early stages, they can boost brand recognition for the census. Clear visuals help validate mail packages, correspondence and information disseminated through websites, digital advertisements and other campaign materials, particularly when reinforced through television advertising. A strong census brand increases public awareness and builds trust and credibility, leading to higher participation rates and more accurate data collection.

6.4.3 Planning the advertising campaign

345. It is recommended to bring to the table diverse teams, preferably a mix of private contractors and representatives of the different hard-to-enumerate communities represented in the country. Paid media strategies benefit from having diverse voices involved in planning from the beginning to ensure adequate impact on harder-to-enumerate groups. Reaching these audiences requires more planning, in-depth thinking, and meticulous adaptation of communication products and strategies. NSOs might want to develop specific visuals, adopt a different tone, or call to action, and use different languages in these targeted communications.

346. An advertising campaign must maximize audience coverage through specially developed creative concepts. These concepts should be derived from rigorous expert testing, including focus groups, considering the needs and concerns of various target audiences and regional features. Robust research is strongly recommended before purchasing paid advertising. Data and metrics drive informed decisions about creative and advertising placement targeting specific audiences. Statistical agencies should continue leveraging internal agency statistics and research capabilities provided by agency staff or external service providers to “pre-inform” the campaign and any additional research. These internal capabilities enable smarter creative and purchasing decisions.

347. Communications and publicity teams should also keep open channels of communication with other teams or contractors responsible for earned media (unpaid promotion and visibility, e.g. media coverage), public relations, social media and establishing partnerships, as it is necessary to align messaging, promote awareness of activities and coordinate content and strategies. Paid advertising plays a critical role in validating the authenticity of information that respondents encounter on other platforms.

6.4.4 Digital advertising

348. Digital advertising will play a key role in future census campaigns. NSOs should allocate sufficient time to establish the optimal combination of display, search, video, social, mobile,

email, text messaging and audio streaming advertising, which will vary considerably between countries and cultures. Digital advertising, particularly at the local level, surpasses other mediums in its ability to deliver customized messaging to specific target audiences and can be optimized based on real-time data and insights.

349. The use of video streaming services has previously been limited for advertising purposes as many did not offer advertising options with their paid plans. This is changing as several streamers already allow for paid advertising or have announced those plans. This will allow even more flexible and adaptable ways to advertise on television.

6.5 Social media and misinformation and disinformation

6.5.1 Misinformation and disinformation³³

350. The rise of misinformation (that which is inadvertently false or misleading) and disinformation (that which is deliberately intended to mislead and cause harm) has become a significant global issue, impacting various aspects of society, including politics, health and security. The proliferation of false information, often spread through social media and other digital platforms, not only undermines public trust in institutions but also fuels social divisions and hampers effective policymaking.

351. Increasingly the media has a significant influence on people's behaviour and even minor distractions and mistruths can have a detrimental effect on the outcome of the census. Therefore, in developing their publicity campaign (whether outsourced or undertaken in-house), NSOs should give particular attention to preparing for unexpected events, such as negative attitudes, malicious lobbying, technical difficulties, delays and misleading information. It is advisable to have, in advance, up-to-date and flexible responses to a wide variety of questions and issues, and to be able to react quickly to unexpected negative (or positive) comments or unusual events to maintain a smooth census operation. It is also recommended that all official participants involved, from senior NSO officials to field managers, know their roles in the communication process both with the media and the public at large.

352. Monitoring of mass media involves an analysis of social media and mass media publications concerning the issues of the census, particularly the extent to which different population groups have been reached, as well as any census topics that are likely to be contentious or controversial in the specific cultural context of the country (e.g. ethnicity, migration or citizenship, gender, or any newly-introduced topics). This helps in the detection and prevention of the development of negative published comments on the census and the preparation of appropriate responses to negative comments and criticisms.

353. NSOs should consider the use of monitoring tools available via both social and digital media and develop clear escalation processes, reactive communications products, and strategies to counter negative sentiment or unusual events. During census operations, establishing collaboration with major social media entities is also critical since they can help counter misinformation and disinformation.

³³ See also [Box 4](#).

354. For more on preparing and implementing communications responses to unexpected events, see section [11.2.2](#).

6.5.2 Social media

355. Social media played a key role in encouraging respondents in many countries during the 2020 round of censuses. Informative content and creative engagement strategies moved people to start conversations, share content and complete questionnaires.

356. The use of social media facilitates real-time customer service, allows NSOs to deliver messages quickly and at the right time, generates earned media coverage and supports digital and local events. Furthermore, social media posts help answer common questions and increase census participation.

357. Social media can also become an indispensable tool for census crisis management, offering real-time communication, wide reach and rapid dissemination of critical information (see section [11.2.2](#)). Social media also serves as a two-way communication channel, enabling census officials to gather situational feedback and monitor public sentiment, which can inform response strategies. Additionally, its accessibility helps bridge communication gaps, ensuring that accurate information counters misinformation.

358. The social media approach can include content dissemination (occurring daily or multiple times per day at the height of the campaigns) through organic (unpaid) social media posting and sharing; collaboration with social media influencers; the use of customer service chatbots; and the use of livestream technology. Social media tactics and content need to be closely integrated with other campaign areas such as public and media relations, digital paid media, websites and campaign optimization activities.

359. Social media are powerful tools when used both as a promotional component and to combat online misinformation. The goal of social media should not only be to reach target audiences, but also to encourage them to engage in a conversation, share content and ultimately act by participating in the census.

360. Campaign research helps to identify the audiences and channels that should be prioritized through social media outreach, with particular attention given to how to reach harder-to-enumerate audiences. It is also important to determine the languages and messages that should be used to reach those audiences. Such insights will help NSOs to plan and prioritize efforts according to geographic locations as well as audience behaviours, beliefs, attitudes, values and media preferences.

361. When using social media, NSOs should:

- (a) Be proactive in understanding emerging social media platforms and their relevance for census operations. Identify the platforms most used by harder-to-enumerate populations and their purposes. For these audiences, social media may be the primary or only medium consumed. Tailor social media content to relevant audiences and platforms, with video often being the most impactful format;
- (b) Start planning two to three years before the actual census operation. Elevate social customer care and management of misinformation and disinformation to an agency-level “evergreen” (continuous) component;

- (c) Stay updated on the latest methods of analyzing and evaluating content, as social media technology evolves rapidly;
- (d) Be open to collaborating with influencers, particularly to reach harder-to-enumerate audiences. Early planning will help identify the right influencers for the right audiences and develop closer, more organic relationships, which are key to building lasting connections;
- (e) Develop easy-to-customize content for partners and external stakeholders. More flexible content will result in wider usage by stakeholders. Create easy-to-use toolkits with the ability for external partners and stakeholders to create their own templates. Building a social media hub for external partners and stakeholders to access promotional materials has proven beneficial;
- (f) Explore the potential for using AI, particularly for social media moderation and as part of search advertising;
- (g) Establish a dedicated team, either internally or externally, to monitor social media platforms and sentiment, answer questions and escalate potential issues
- (h) Involve users in the creation of UGC (User-Generated Content). When running contests, users can create content on their pages on their own.

6.6 Outreach, influencers and partnerships

362. Collaboration between NSOs and civil society is key to a successful census. As trust in government has been declining globally, it may become increasingly difficult for NSOs to convince their populations to participate in the census and use the resulting statistical data, especially when doing a field-based enumeration. Partnerships, collaborations and influencer engagement may help mitigate this trend by engaging trusted community voices. This strategy involves collaborating with, for example, local authorities, the non-profit sector, social media personalities and businesses to convey important messages in a more targeted, relatable and engaging manner.

363. Because of the particular importance of the role that local entities can play in planning and assisting in carrying out the census, NSOs may wish to establish special working relationships with such bodies through separate liaison mechanisms. Areas in which such partnerships can be beneficial to both the NSO and local organizations and individuals include:

- (a) Amplifying census messaging through their owned and earned channels;
- (b) Spreading awareness of census processes, timelines and requirements, while dispelling misinformation;
- (c) Conveying constituent information needs and concerns;
- (d) Advising on the characteristics of local populations, particularly the location of harder-to-enumerate groups (such as older persons or persons with disabilities) to determine the most effective means of carrying out the enumeration at the local area level;

- (e) Assisting with local recruitment of field staff and publicity; and
- (f) Ensuring the relevance and quality of results at the local area level.

364. To maximize the relevance and benefits of the census for the country's population, it is essential to facilitate and encourage participation from all sectors of society. Informing individuals about the personal and communal advantages of taking part may facilitate their participation. NSOs should consider forming partnerships with various groups, communities and organizations that are active in the economic, social and cultural spheres of the country. Civil society partners can help countries with enumeration-based censuses during all census phases, and countries with register-based censuses during data dissemination.

365. The decision of whom to partner with and how to establish these partnerships is ultimately up to each NSO. Potential collaborators could include local authorities, organizations representing ethnic communities, groups advocating for persons with disabilities, religious and faith-based organizations, housing associations and agencies working with homeless people. These groups often have extensive networks and strong relationships within their communities, built on mutual trust and understanding. It is important to make it easy for them to participate by providing ready-made, shareable resources and information.

366. By partnering with such trusted organizations, NSOs can enhance awareness and interest in the census among diverse groups. This collaboration can lead to increased participation, thereby ensuring a more comprehensive and meaningful census for everyone.

367. Public and private sector partnerships have been around for some time. Influencer engagement, on the other hand, is an emerging field arising from the widespread adoption of social media. An influencer is a person with a large social media following. By working with influencers during the field collection and dissemination phases, NSOs can leverage the trust and rapport these individuals have built with their followers to enhance public understanding of statistics and their relevance to everyday life. By engaging influencers who resonate with harder-to-enumerate demographics, NSOs can break through trust barriers and deliver their messages in a format and language that is more accessible and appealing to these groups. This strategy not only increases the reach of their messages but also increases the likelihood of these messages being understood and appreciated, resulting in higher census completion and recruitment rates.

368. Influencer marketing, especially unpaid, is a challenging but rewarding tactic if done correctly. Influencer reputations tend to fluctuate, so careful selection and vetting are critical to identifying the right ones. Although the influencers' interests do not necessarily need to be in the field of statistics or science, their social values must align with the NSO's, and their political views must be considered to ensure that the NSO retains its political neutrality. Appealing to these values and personalizing the approach may help to convince influencers to support the census.

369. When it comes to social media, authenticity is key. Paid influencers or partners may feel constrained by organizational parameters and not produce the most authentic work or have enough room for creativity. While securing their support without financial compensation can be challenging, it is not impossible, especially if the NSO focuses on those who value fact- and data-driven decision-making and who have a heightened sense of civic duty. NSOs should avoid imposing strict branding or messaging guidelines, allowing influencer content

to retain authenticity. Customized materials on demand can be offered and can provide reliable information about the census. This can help to dispel anti-census myths and misinformation.

370. Statistics and data, while essential, can often appear dry and difficult to understand. Influencers and other civil society partners can help to bridge this gap by translating complex information into content that is easy to digest and relate to, especially during data dissemination. For example, an influencer could use a short video to explain the impact of commuting statistics on daily life, using simple language and relatable examples. This not only makes the information more interesting but also shows its practical implications, making it more relevant to the audience. As a result, respondents may not only be more willing to use census data and support collection but also spread awareness through their extensive personal networks.

6.7 Segmentation, target audiences and harder-to-enumerate audiences

371. Segmentation is an exercise that uses data to divide audiences into specific, relevant, approachable groups based on characteristics, behaviour and preferences. It is the process by which key collection-impeding issues are brought to light and incorporated into a targeted, differentiated census communications campaign. The main purpose and objective of audience analysis is to use this information to make data-driven decisions on how to communicate about the census impactfully and efficiently. This exercise will help to identify harder- and easier-to-enumerate groups and to determine the best tactics, budget allocation and creative approach to reach these audiences effectively.

372. Segmentation should take place in the census pre-enumeration phase in order to have the strongest influence on the success of the population and housing censuses and the quality of data produced.

373. It is recommended to start by identifying key public issues impeding census data collection. They should be defined based on the existing situation of the country, considering the demographic, economic, ethnic, language and religious structure of the population. It is necessary to identify citizens' concerns to define the target audiences, as well as to select appropriate implementation methods to reach these groups effectively, inform them about the census, and foster a more positive attitude toward it.

374. Some basic issues common to countries with field enumeration-based censuses, either wholly or in part, relate to those individuals who:

- (a) Refuse to participate in social or communal activities;
- (b) Provide unreliable information about themselves;
- (c) Are difficult to locate, especially the more mobile youth.

375. Specific issues can include the following:

- (a) Regions within the country experiencing political and social instability, where the relationship between citizens and government authorities may be volatile;

- (b) The existence of groups reluctant to engage in public activities;
- (c) Lobbying efforts or individuals aiming to voice opposition to the census due to concerns over cost, perceived intrusion, confidentiality breaches, or ethical considerations.

376. In particular, the public's concerns may include that the census is or will be used for one or more of the following:

- (a) For fiscal (taxation) purposes;
- (b) To build a government database;
- (c) For the oppression of minority national, religious or identity groups;
- (d) To reveal illegal migrants;
- (e) To identify and control "anti-social elements" and persons on the outside of established society.

377. Moreover, respondents could be concerned that criminal elements will impersonate census-takers to gain access to property or personal information for the purposes, for example, of identity theft.

378. Once the key issues are identified, the next step is to pinpoint harder-to-enumerate audiences by analyzing their shared demographic and psychographic traits. These audiences can be both broad and specific. For example:

- (a) Socio-demographic groups:
 - i. Population in particular age groups (infants, children of school age and teenagers, men under 30, older people);
 - ii. Social groups by employment type (schoolchildren, students, the employed, homemakers, the unemployed population);
 - iii. Professional groups;
 - iv. Inhabitants of inner cities or other densely populated urban areas, and (in contrast) people living in remote rural areas;
 - v. Persons living in institutions or other multi-occupied dwellings.
- (b) Groups with specific concerns or sensitivities, or those living in particular circumstances (who may include):
 - i. Undocumented migrants;
 - ii. Persons without a fixed or legal residence;
 - iii. Uncooperative landlords who may not wish to report the presence of tenants such as migrants;
 - iv. Persons working far from their usual residence and family, or who may find it difficult to participate in the census procedures due to long periods of stay at work;
 - v. Inhabitants of areas where there are ethnic or religious tensions or conflicts.

379. Setting clear objectives at the outset of the project is crucial. It is necessary to define the goals to be achieved through segmentation, such as improved marketing effectiveness or enhanced audience understanding. The NSO should then assess what is already known about the audience and identify the gaps in knowledge that the project should address. This should be followed by planning how the results will be used. Developing an implementation plan will help to apply the findings of the segmentation effectively and to establish key performance indicators against which to measure success.

380. To make an audience analysis and segmentation project a success, it is essential to work with a solid foundation of research and understanding of the resources available within the NSO. The NSO should begin by identifying the data already available and the teams that can contribute to the project, such as methodologists, the communications or marketing team and the business office. They should then determine which data points and variables are essential for a comprehensive understanding of the target audience. They should outline the data available within the organization, keeping in mind privacy laws and regulations. These data might include demographic information, consumer behaviour patterns, or previous marketing response data. If internal data gaps are identified, such as a lack of behavioural or psychographic data, engaging external service and data providers may be necessary.

381. Once the segmentation is complete, the last step is to turn these insights into effective marketing strategies. The first step is identifying the most responsive segments from the analysis. Tailored messages should be developed which speak directly to the needs and preferences of these groups. For example, if a segment is identified as being particularly responsive to digital advertisements, more resources should be focused on online marketing efforts for that group. Similarly, if another segment prefers more direct communication, the use of mailings or face-to-face interactions should be considered. Aligning the marketing strategies with the preferences of each segment will increase engagement, improve response rates and make the most of the budget. The results should be reviewed regularly, and the strategies adjusted as needed to ensure continued effectiveness.

6.8 Recruitment

382. Field staff recruitment is essential to a successful census field enumeration. A robust communication campaign, in turn, is essential to recruiting these staff successfully.

383. Attracting quality candidates helps reduce attrition rates and census costs and ensures performance. Such country-specific factors as low unemployment rates, social polarization, political instability, conflict, the short-term nature of census jobs and after-effects of national or international crises may make it difficult to recruit for the census. The level of wages and flexible working conditions may not be sufficient to motivate people to apply and then stay in the job.

384. To enhance recruitment for census operations, it is recommended to develop a comprehensive understanding of the potential applicant pool, if resources are available.

385. Analysing data from previous census cycles and current labour market trends will help identify where candidates are located, how they consume information, and what motivates them. This analysis should focus particularly on harder-to-recruit candidates to maximize the

return on investment, while also refining strategies for easier-to-recruit groups through tailored messaging and channel selection.

386. Audiences that may be interested in census jobs include the following:

- (a) Young adults, especially students and those still living with parents;
- (b) Active seniors;
- (c) Partially employed or underemployed individuals;
- (d) Those who have worked for the census in the past (“census alumni”).

387. A communication campaign for field staff recruitment should not only raise awareness about census jobs, but also clearly explain the job conditions and responsibilities and connect the work to higher values that resonate with potential applicants. The use of simple, direct messaging and appealing visuals across selected communication channels will increase engagement. If resources are available, paid advertising can be an effective way to reach a wider audience of potential applicants, especially for harder-to-recruit populations.

388. Despite the focus on digital strategies, traditional local information distribution remains vital. Not everyone has online access, and patterns of access vary widely among countries, so local partners and staff, where available, may need to be engaged to distribute information locally. They know their neighbourhoods the best and can be very effective if equipped with the right communication tools. Advertising-mail cards can also be effective for reaching audiences that do not have access to the Internet (e.g., those in remote and rural areas).

389. Partnerships with local municipalities, non-profit organizations, businesses and influencers can extend the reach of recruitment efforts significantly. These collaborations can help disseminate information more broadly and attract a diverse range of applicants, if they are equipped with the right tools. Many municipalities and non-profit organizations have a vested interest in promoting local jobs.

390. The recruitment process itself should be clear and straightforward from the start. Communicating the tasks, requirements, process and timelines upfront will help manage applicants’ expectations. Keeping candidates informed with regular updates is crucial to maintain their interest and commitment. Simplifying the recruitment process to focus only on essential requirements will ensure that it is inclusive and does not deter marginalized populations. Shortening the recruitment timelines, or at least actively communicating with applicants throughout the recruitment process, can prevent candidates from seeking other employment opportunities.

391. Training for census employees should include clear guidelines on communications, social media engagement and the use of communication tools in the field. Field staff need to be well-prepared to identify and address local communication issues and to request support when necessary.

6.9 Communication aspects of dissemination

392. Following the data collection phase of the census, an information campaign is recommended to inform the public about the census results, to demonstrate how the statistical data collected are being used and, when appropriate, to thank the public for

participating in the census. Reassurances can also be given that privacy and confidentiality will continue to be respected. This will have the effect of strengthening the NSO's image and credibility.

393. The benefits from the census are realized when the data and insights are published, and audiences can use them to make decisions. To maximize the use of census data, it is vital to consider how data will be disseminated and promoted, both in countries which adopted a field enumeration methodology, wholly or in part, and in those which used an entirely register-based approach (for recommendations related to the dissemination of census data, see [Chapter 7](#)).

394. When developing census outputs, NSOs should consider delivering a range of products to meet the broadest possible range of user needs – from the citizen who wants to see themselves in the data to the expert analyst who wants programmatic access to the data so they can conduct their own analysis.

395. Creating user personas that cover the breadth of different user types helps to focus on meeting user needs. For example, technical users and expert analysts may welcome the ability to build their own data sets based on their needs. For citizens, the focus should be on accessible and engaging ways to interact with census insights. Interactive content, such as census maps, has broad appeal, enabling users to find, explore and compare data in their local areas.

396. To enhance data comprehension, NSOs can employ relatable scales such as football pitches (or other culturally-relevant references) and visual aids to illustrate population density effectively.

397. The following recommendations apply when determining suitable formats and content:

(a) Consider how users access information:

- i. Use of mobile telephones or similar handheld devices to access the Internet is now generally more common than desktop machines. Making content smartphone-friendly will open it up to a broader audience.
- ii. Be proactive. Social media can be an effective way of communicating the main points or letting people know about content on the census website. A schedule of upcoming releases is also helpful for people interested in the census results.

(b) Make sure it is easy to find the main insights quickly:

- i. Many users may not have much time at their disposal. This could be anyone from a policy decision-maker to a business owner or everyday citizen. Consider which information the users need and want most, and make sure the format helps people to find this information quickly.
- ii. Employ formatting features such as highlighting of main points and infographics, and use clear chart titles that tell the main takeaway message from a visualization.

(c) Local or personally interesting information helps engagement:

- i. Many users will be interested in local information and people like them, but will be less confident or unaware of how to extract that from a spreadsheet or

- report. Interactive resources can help users to access this without completing complex spreadsheet operations or reading long reports.
- ii. People relate emotionally more to people than to numbers.
 - iii. Customizable tools that allow users to see themselves in the data or facts for their area can be successful. For example, a quiz allows users to see data for people of their age.
 - iv. Including quotes and qualitative data drawn directly from users' experiences, e.g. from local authorities or charitable organizations, can help people to understand what the data means in the real world. Equally, the occasional use of graphics depicting people can help to create the necessary emotional connection, especially where the subject is not controversial.
- (d) Tools that explore data (maps, charts, interactives) add value:
- i. While more and more countries are offering interactive online tools to better serve all varieties of user needs in an efficient manner, the main census results should be presented clearly, not requiring users to search through an interactive tool. However, users may have specific questions that are not addressed in the provided commentary. Maps and mapping tools can be very helpful for researchers and other users wanting to compare parts of the country. Interactive charts that allow users to select places and see where a local area sits in a distribution can save users time and effort. They also reduce the barriers to understanding the content. (For more on interactive tools and visualizations including maps, see section [7.2](#)).

6.9.1 Raising awareness of census outputs

398. Since the benefits of the census are only realized when users use the data, it is important to ensure that users and potential users are made aware of the availability of census outputs.

399. NSOs can use owned channels, including social media, websites and newsletters to promote the outputs to their audiences.

400. The wide range of census results provides an opportunity to create multiple assets that raise awareness of specific results, web pages and tools.

401. Video, especially animation, can help to communicate the breadth of results and how the public can access them. "Talking head" videos with subject-matter experts allow more in-depth information about topics to be communicated. It is recommended to "drip-feed" these over weeks and months to take advantage of the large amount of data.

402. If a budget is available, paid advertising to promote general and specific results to target audiences should be considered. NSOs can also engage with social media influencers to promote results to niche audiences.

403. The main census results will be of interest to the media. In addition to news releases, census authorities should consider creating opportunities to promote census data. For example, inviting the press to a launch event at a school is a great way to promote key population figures.

404. To optimize the benefits of the census, effort should be put into promoting its value to new or potential users and explaining how they could benefit from census data. Using case studies of how different organizations from the private, public and non-profit sectors already benefit from census data is an effective way to illustrate how people and organizations can benefit from the census data.

405. Representative and membership organizations serve as crucial links between specific industries, professions and their members. Census articles published in their magazines and websites can effectively reach professionals interested in census data. Offering webinars that explain the available data and how to access it, along with providing toolkits and factsheets on the website, are practical approaches to help individuals get started with using and interpreting census data.

6.10 Evaluation and performance measurement

406. Understanding the effectiveness of communications and publicity strategies is crucial for optimizing investments and achieving organizational goals. By analyzing performance metrics, NSOs can gain insights into the strongest areas and identify opportunities for improvement.

407. Setting SMART (specific, measurable, achievable, relevant and time-bound) goals that align with the NSO's objectives provides a clear roadmap for communications efforts. For example, if an objective is to increase awareness of the census, a specific goal could be to achieve a 20 per cent increase in impressions within six months.

408. When developing communications and publicity goals, it is important to choose relevant Key Performance Indicators (KPIs). These metrics serve as valuable tools for measuring performance and tracking progress. Some useful KPIs include:

- (a) Impressions: the number of times that content is displayed or viewed, regardless of clicks;
- (b) Website traffic: the number of visitors to the census website;
- (c) Conversion rate: the percentage of visitors who take a desired action (e.g., completed their census online after clicking an online advertisement or downloading census data product);
- (d) Social media engagement: the quality and quantity of comments and shares;
- (e) Media mentions: the quality and quantity of media mentions;
- (f) Partnerships: the number of partnerships acquired;
- (g) Respondent relations: the number of questions received from the public and the number of questions answered.

409. Some key performance indicators can be tracked consistently, setting baselines for reference. At the beginning of the census cycle, reading and understanding the "post-mortems" from previous census cycles is crucial. This, along with new research and analysis, will help determine the baseline for the population's pre-campaign awareness of the census.

If conducting a census test, the communications should also be tested and their performance metrics assessed, to shape the next campaign.

410. Throughout a census campaign, it is recommended to analyze KPI data and feedback from the public regularly. This will allow for identifying trends, areas for improvement and opportunities for campaign optimization. Data analytics tools are very useful to collect and organize these data. A post-campaign analysis is recommended, using qualitative and quantitative data. A “post-mortem” report ensures effective campaign performance assessment and aids in understanding the population’s needs for future initiatives.

411. While strategies and campaign goals may change over census cycles, it is important to keep track of the same KPIs over time. This will ensure consistency and provide historical evidence of the communications and publicity team’s efforts and results.

412. It is important to note that while census KPIs focus on operational aspects of the census, the results also play a crucial role in informing policy decisions that impact people's lives. Census data provides vital insights into the demographic, economic and social characteristics of the population, enabling policymakers to make informed decisions about issues such as resource allocation, infrastructure planning and the provision of essential services. However, quantifying the direct impact of census results on specific policy decisions is inherently challenging (see section [10.3](#)). Despite such challenges, the census remains a critical source of evidence-based information for policymakers at all levels of government.

413. Effective communication can also play an important role in assessing the quality and cost-benefit payoff of the census, particularly through mechanisms such as user satisfaction surveys. These surveys provide valuable insights into the experiences and perceptions of stakeholders, enabling census authorities to identify strengths, address concerns and improve processes.

414. Communicating census evaluation results is also crucial for building transparency, trust and accountability. Such communication not only strengthens confidence in the census process but also helps to justify its costs by showcasing its value.

Chapter 7 **Dissemination and related topics: security, documentation, metadata and archiving**

7.1 Confidentiality and security

7.1.1 Confidentiality principles³⁴

415. Censuses collect information on each person and household in the country or territory. As described in [Chapter 3](#), census data may be collected or compiled through direct enumeration, through a compilation of information from registers and administrative sources, or through a combination of these. A census does not focus on the specific details about individuals, but rather on providing statistics about the community as a whole and groups within the community. The public, therefore, has a right to expect, and needs to be assured, that when personal information is provided in confidence, this confidence will be respected. Names, addresses and personal identification numbers (PINs) should be separated from other data as soon as possible in the census process, and not released, so that the output data contains no personal identifiers. The confidentiality requirement encompasses the whole census operation, ranging from the security of any personal information process (such as completed census questionnaires or individual information from population registers or administrative data sources) to the protection of the information contained in the outputs and made available publicly.

416. Assurances should be given to the public that all the personal information (such as names, detailed address information, government identification numbers, or internal linkage keys) will be treated in strict confidence by the census authorities and by any person who is employed by, or provides a service to, the census authority for the purposes of carrying out the census. Many countries have domestic legislation that protects such information, in the form either of specific census legislation or of more general legislation relating to statistical confidentiality or personal data protection and freedom of information. International human rights law also places an obligation on state actors to protect privacy.

417. The following additional principles should govern the treatment of the information obtained from any part of the census processes:

- (a) Only persons under the management of the census authorities, or agents acting on their behalf, should have access to any census-relevant personal information obtained;
- (b) Privacy of individuals must be given primary importance. Census-relevant personal information must therefore be processed in such a way that it will not reveal any personal information to the public. Additionally, when information is collected directly from respondents, individual household members should be given the

³⁴ See also section 5.6.2 Security and confidentiality.

opportunity, if they wish, to give personal information on a separate questionnaire in a way that will not reveal it to others in their household or to an enumerator. In censuses compiled using data from administrative sources, personal information should be stored separately from linkage keys, kept confidential and not revealed in the dissemination of results;

- (c) All members of the census organization and outside agents providing services to the census authority in connection with the census should be given strict instructions, and be required to sign legal undertakings, about confidentiality. They should be liable to prosecution for any breaches of the law;
- (d) The physical security of any documents or digital data stored for census production and containing personal information held by the census authorities, by field staff or by authorized agents, should be strictly enforced and, if deemed necessary, reviewed independently;
- (e) Any mode of accessing or processing personal census data should have strict safeguards to prevent unauthorized access;
- (f) In releasing statistics from the census, sufficient steps should be taken to prevent the inadvertent disclosure of information about identifiable individuals and households. Special precautions may apply to statistical outputs for small areas;
- (g) All data collected during the census that are no longer required for processing or analysis and contain personal information should be securely destroyed as soon as there is no longer a legal or operational need for their retention (see section 7.4), in order to prevent any possibility of subsequent unauthorized access or misuse. The destruction process should be documented and, if necessary, independently supervised.

7.1.2 Statistical disclosure control

418. Statistical disclosure control (SDC) is the process used to protect statistical data in such a way that they can be released without revealing confidential information that can be linked to specific individuals or entities.³⁵ The key objective of any SDC methodology should be to ensure a sufficient level of protection with minimum information loss and therefore maximum data utility retained. The SDC literature provides for a variety of standard risk and utility indicators to assess risk versus utility systematically and inform the choice of the most appropriate SDC setup for the country's data release programme.

419. Measures to prevent the disclosure of tabular data may include some, or all, of the following procedures:

³⁵ For a general overview, see e.g. Hundepool, A., J. Domingo-Ferrer, L. Franconi, S. Giessing, E. Schulte Nordholt, K. Spicer and P.-P. de Wolf (2012). Statistical disclosure control. In: Wiley Series in Survey Methodology. Wiley: Chichester; Hundepool, A., J. Domingo-Ferrer, L. Franconi, S. Giessing, R. Lenz, J. Naylor, E. Schulte Nordholt, G. Seri, P.-P. De Wolf, R. Tent, A. Młodak, J. Gussenbauer, K. Wilak (2024). [Handbook on statistical disclosure control, 2nd edition](#). Licensed under CC BY-SA 4.0; Möhler M., de Jonge E., Gussenbauer J., Jamme J., Młodak A., de Wolf P.-P. (2025), [Guidelines for Statistical Disclosure Control methods applied on geo-referenced data – 2025 edition](#), series: Manuals and guidelines, Eurostat, Publications Office of the European Union, Luxembourg. Made available under a CC BY-SA 4.0 license.

For a specific overview on census, see e.g. E. Schulte Nordholt, R. Tent, S. Giessing, M., Golmajer, F. Bach, M. de Vries, R. van de Laar, P.-P. de Wolf, N. Krol, 2024. [Guidelines for statistical disclosure control methods for census and demographics data](#).

- (a) Restricting the number of output categories into which a variable may be classified, such as aggregated age groups rather than single years of age, particularly for the older ages ("global recoding");
- (b) Where the number of people or households in an area falls below a minimum threshold, suppressing statistical output ("local suppression") – except, perhaps, for basic headcounts – or merging it with that for a sufficiently large neighbouring area;
- (c) Adding "noise" to the microdata records before producing tables ("pre-tabular noise"). For example, swapping some unit record characteristics of the most risky records by finding a match in the microdata based on a set of predetermined matching variables, and swapping all or some of the other variables between the matched records ("targeted record swapping");
- (d) Adding "noise" to the tables produced ("post-tabular noise"). For example, rounding cell values up or down to the nearest multiple of the predefined rounding base (conventional rounding) or adding noise of limited magnitude in a controlled and consistent way across tables (controlled noise injection, for instance with the "cell key method").

420. In the release of census microdata (such as microdata under contract or public use files) it is important to ensure the removal of all information from databases relating to name, address and any unique characteristics that might permit the identification of individuals. Microdata sets for scientific use allow for complex analysis beyond what is possible using the published tables, visualizations and indicators. Constructing a microdata sample, thereby providing access to only a fraction of the total population, adds a layer of protection while preserving information about population-level characteristics. In addition, applying global recodes and local suppressions to the microdata can diminish the risk of disclosure. Perturbing the microdata or making use of synthetic methods in a targeted way may also help to protect confidential information. Perturbation and synthetic approaches should be used within bounds and tested rigorously, as they have the potential to reduce the accuracy and utility of the microdata.

421. A systematic assessment of risk versus utility may indicate that a combination of several protection measures is most suitable for a given data release programme. Moreover, it is important to apply any SDC scheme consistently across the entire statistical output, as inconsistencies typically entail additional disclosure risks. Some of the noise-based methods mentioned in paragraph 419 were developed specifically to overcome known shortcomings of more traditional methods, such as excessive information loss and loss of consistency of local suppression in large table sets.

422. Interactive publication tools are becoming increasingly popular (see paragraph 426). Where these are used, it is important that the SDC scheme can be automated and integrated into these tools. Very flexible tools that serve highly customizable user requests by direct queries to the complete underlying microdata entail specific additional disclosure risks, for instance from scripted massive and systematic querying attacks. Dedicated SDC schemes are typically needed in such cases.

423. High geographical detail is one of the unique features of census outputs in many countries, reflected in the increasing trend towards releasing more data pertaining to the

smallest geographical units, nowadays often complemented by grid products (see section 8.9). However, releasing data on very small and non-overlapping geographical units entails specific additional disclosure risks (such as “geographic differencing” e.g. between administrative and grid boundaries) and quality constraints (such as mapping accurately the spatial distribution of population or other indicators), which should be accounted for in the SDC scheme. For example, post-tabular noise methods have been found effective by several countries during their preparation of the past census round.³⁶

424. Irrespective of the specific SDC scheme adopted, it is essential to explain to the users why and how these methods are applied and describe the broad properties of the scheme so that they are aware of the implications on output data. This holds in particular for SDC methods where released data look like untreated data, or for methods that may lead to a limited loss of internal additivity of tables. Educational efforts in this regard should obviously start with the NSO staff responsible for efficient data protection, and then this knowledge should be disseminated among data users and taught to people who handle statistics and data managers in various institutions and economic entities.

7.2 Dissemination

425. A census is not complete until the information collected is made available to users in a form, and to a timetable, suited to their ever-changing needs. Thus, in disseminating the results of a census, much emphasis should be put on responsiveness to users’ needs (see section 6.3) and on high standards of quality in the production of statistics (see Chapter 9). In accordance with the Fundamental Principles of Official Statistics, census results should be disseminated simultaneously to all users, and the greatest care should be exercised to avoid the inadvertent disclosure of information about identifiable individuals. Various statistical measures can be applied to protect confidentiality (see paragraphs 418–424).

426. There are several conventional ways of making the results of a census available to users:

- (a) As reports (either in hard copy or, more commonly, as digital media) containing standard and pre-agreed tabulations, usually at the national, regional or local district area level;
- (b) As ad-hoc reports comprising the standard census data but disaggregated by other sub-groups not previously published (a contribution towards the cost of production may be paid by the requester);
- (c) As data products available online through NSOs’ websites or other electronic media. These data products may range from aggregated to micro databases, available for online processing or free download, optionally equipped with dynamic or interactive data visualization tools including mapping features to enhance the value of the statistics;
- (d) As commissioned or customized outputs produced from a database, automated table builder or statistical data service, comprising customized cross-tabulations of variables not otherwise available from standard reports or abstracts. These should

³⁶ M. Möhler, J. Jamme, E. de Jonge, A. Mlodak, J. Gussenbauer, and P.-P. de Wolf, 2024. Guidelines for Statistical Disclosure Control methods applied on geo-referenced data.

conform to the same statistical disclosure controls as those applied to standard outputs; and

- (e) As microdata (often referred to as public use files), usually available only as a sampled fraction of the total population (often sampled at the household level to include individuals from the household) with SDC methods applied (see paragraphs 418–424). To balance the increased risk of disclosure when providing microdata, a combination of additional controls may be applied: potential data users are often screened; data are made available in a restricted format only; and data are often supplied or accessed under secure and strictly-controlled conditions where thorough steps have been taken to protect the confidentiality of the data.

427. Where customizable dissemination tools are not available or not sufficient to provide specific tabulations required by only a few users, such as certain government offices or specialized research organizations, these can be supplied on demand. Once produced, however, there should be no restriction on making them available publicly.

428. In many countries, the cost-effectiveness of printed census products is diminishing. Physical copies cannot reach as many users as an online publication and the opportunities for enhanced communication features are reduced in comparison to online products. Traditional publications, especially in printed form, are nearing complete obsolescence in many countries. While print publications can provide coherent and consistent commentary on individual topics and therefore may suit particular users or markets, users nowadays generally expect interactive, dynamic, digital forms of dissemination.

429. Data publications in electronic formats online should provide users with easy means of data retrieval in standard formats or through application programming interfaces (APIs), ideally complemented by user-friendly interactive functionalities to customize outputs. Immediate usability of the data tables online is the most important feature to ensure the searchability and relevance of the census information. International standards for metadata, such as the Statistical Data and Metadata eXchange standard (SDMX), should be used formatting output databases. Dissemination strategies should also be harmonized with any national government policies on open data.

430. Online tools for ordering, specifying, customizing and receiving census data products and public use samples (microdata) should be developed wherever possible, ensuring that appropriate measures are in place to protect the statistical confidentiality of the data and the security of transmission. In the design of census outputs, consideration should be given to all current and emerging forms of technology used by intended audiences, such as smart phones and other portable devices (for more on the role of technology in dissemination, see section 5.7). It is also important to consider the flexibility of the content that users will need. Trends change quickly and a comprehensive set of tables or products that can ensure rapid access to data is critical for the relevance of the census information. Online table builders allow users to customize their requests and query the database directly for immediate results. This reduces both the need for a very large number of pre-determined data tables and the requirement for users to conduct lengthy searches to see whether the information they seek has been published and to locate it.

431. Social media have become an increasingly popular and effective means of disseminating small amounts of census output, particularly to non-specialist users or for disseminating timely results relevant to events or important dates. The various social media

platforms currently available permit text, images and infographics to be used to highlight the usability of census outputs. The use of such media often demonstrates an NSO's commitment to engage and establish a dialogue with users in order to respond more readily to their questions and concerns (see section [6.5.2](#)).

432. Online access or dissemination of micro- and macro-databases on digital media can contribute greatly to an enlargement of the user base and thus to a greater demand for census data. It is important to weigh these advantages against two potential limitations:

- (a) Some cross-tabulations may have particular quality issues because of non-response, sampling or processing errors, or as a result of processing or imputation procedures. Census authorities should establish procedures for warning potential users about such problems to help safeguard the credibility of the entire census. Some NSOs suppress the release of certain cross-tabulations for reasons related to substantive quality, although such a policy may alienate users. Other NSOs release such cross-tabulations in accordance with a clear policy that takes into account both substantive and technical considerations;
- (b) Some detailed cross-tabulations, and all files with individual records, pose the risk of disclosing information about identifiable individuals, in violation of the rules on census confidentiality. This issue is discussed more fully in paragraphs [415–424](#).

433. Both the substantive quality and confidentiality issues need to be addressed, and appropriate safeguards established. With such safeguards in place, neither issue should prevent the dissemination of a wide range of census products.

434. A range of products should be made available to meet the constantly-evolving requirements of users. There is likely to be a need for most or all of the following (specific needs should be determined through appropriate consultation rather than assumed):

- (a) National, regional and local area summaries;
- (b) Reports on key findings on particular topics, supplemented by detailed results and analyses, either in a standard form for areas down to the more local geographic levels, or as more detailed disaggregated statistics on particular topics and populations;
- (c) Population profiles or key summary statistics for small areas and small population groups;
- (d) Spatial and graphical analyses, including a census atlas, possibly complemented by interactive graphical analysis or mapping tools allowing for user-customized analysis;
- (e) Value-added products such as area and household classifications;
- (f) Supplementary metadata covering definitions, classifications, and coverage and quality assessments. The specific metadata will differ for enumeration-based, combined and register-based censuses, but should be fully comprehensive no matter which census design is used.

435. The dissemination of census results should adhere to a predetermined, structured plan, including a pre-announced timetable. National figures should be released promptly according to the schedule, followed by the subsequent release of disaggregated data after a

comprehensive processing phase, all in accordance with the established plan. Timeliness is a significant concern in the release phase, and efforts to shorten the release period should be made while ensuring the integrity of the data (for more on timeliness and punctuality, see [Chapter 9](#)).

436. The initial release of population counts is generally awaited with great anticipation among a wide range of users including central government, policymakers, the media and the general public. Thus, some countries release provisional results very soon after enumeration is completed. Provisional results, which provide a general picture of population trends, are subject to change once the full data processing and verification operations have been completed. Data users should be made aware of the implications of using provisional population counts, which may differ substantially from the finally produced and validated figures. The nature of provisional results should be very clearly communicated to the media to avoid creating a mistaken impression that the final figures constitute a correction of earlier "errors".

437. The schedule and description of upcoming releases of final results and products should be made public early in the census process. This can help to maintain public interest in the census as well as to manage expectations of users. Release schedules should be planned carefully and conservatively to enable NSOs to meet them to the greatest extent possible, and any changes that do occur should be communicated to the public as soon as possible. The releases can be staggered, from simple, short descriptive summaries covering a country's major geographical divisions initially, to more comprehensive cross-tabulations and descriptive thematic and analytical reports later on.

438. Census data should, as far as possible, be provided to the public free at the point of access or delivery, in accordance with the first Fundamental Principle of Official Statistics (relevance, impartiality and equal access). In cases where charges are necessary (such as for customized or commissioned outputs), such charges should be set to make access to the results affordable to all types of users. Flexible interactive publication tools that process customized data queries automatically (see paragraph [426](#)) may help to address custom user needs efficiently and thus increase the value of free-of-charge data releases. Online dissemination options have reduced reliance on extensive paper outputs (see paragraph [428](#)). However, there may still be specific needs for NSOs to provide a paid print-on-demand service to supply census material to users who are unable to access or receive digital copies. Such users should not be disadvantaged by the lack of paper-based output.

439. Products should be developed which allow statistical and geographical information to be delivered together with GIS and the use of APIs to meet the broadest possible range of needs, and with as much flexibility and inter-connectivity as possible, within the constraints imposed by the requirement to ensure confidentiality (see paragraph [423](#)). Some desirable properties of products include:

- (a) Users should be able to find information quickly and simply;
- (b) NSOs will increase the value of their census data greatly by embedding graphic and mapping capabilities within products. Ideally, users should be given the possibility to generate graphs and maps easily for themselves, and then to print, save and download them, making them available for further use. Several countries have found that cooperation with commercial agencies is valuable for production of such products (see section [4.4](#));

- (c) Open data formats should be prioritized, allowing the integration of census information with other databases, thus widening the range of ways in which the data can be used.

440. Thematic mapping and data visualization have become important elements of dissemination of outputs. They appeal to NSOs because of their ability to engage users and to increase the reach of census data. Data visualization is a broad field, with content and structures ranging from simple infographics to sophisticated tools for multi-dimensional data analysis. Data visualization may present difficulties for some census agencies due to high costs, infrastructure requirements and the need for compliance with individual countries' technical requirements (e.g. accessibility, common look-and-feel). The skills required for effective visualization may be in short supply, and there may be problems with dedicating sufficient resources to developing such skills, especially given widespread budgetary constraints. However, users are now expecting web content to be visual, engaging and personalized, so NSOs should give high priority to developing a data visualization capability.

441. Since creating data visualizations can entail high production costs, NSOs should attempt to achieve a balance between producing these and producing the more traditional tabular data products, which not only have lower production costs but are preferred by some user groups. While there is a strong trend towards expanding visualization programmes in countries of the UNECE region to make census outputs more accessible for the general public, it is important for NSOs to continue to serve key users who prefer to use very rich raw tabular data for their own analyses. In the latter case, efficient and user-friendly online data access interfaces are important (e.g. APIs; see paragraph 429) and automatized online self-service tools (e.g. table builders; see paragraph 430) may support more efficient and targeted dissemination. A thorough understanding of user segments and their specific needs is therefore required. Dedicated research should be undertaken to better understand end users' data needs (for more on user segmentation see Chapter 6). There is no one-size-fits-all solution and many NSOs account for this by maintaining dedicated units or teams responsible for data visualization technology (whether census-specific or NSO-wide).

7.3 Documentation and metadata

442. An important component of any country's programme for disseminating the results of its census is a comprehensive portfolio of supporting documentation and metadata to help explain, clarify and enhance the value of the statistical outputs. Documentation and metadata should enable users to draw valid comparisons with data from previous censuses or other data sources.

443. A metadata system provides supplementary information on characteristics of the census data. An NSO's metadata system should be based on international standards, while meeting any specific national requirements. Since a census and its results are often closely connected with other statistical activities, it is recommended for the census metadata system in each country to use the same elements as the metadata system of the NSO as a whole. It is often necessary, however, for the census metadata to contain some elements that are used only for that census. The metadata system should also facilitate the widest possible international comparability of data.

444. The metadata (as well as the metadata system) used for the 2030-round censuses should ensure comparability with data from previous censuses, while at the same time including any new elements arising from developments since the previous census. The metadata systems of individual NSOs should also reflect the extent to which they use data from direct enumeration and administrative data sources.

445. A metadata system should encompass, as a minimum:

- (a) Definitions of terms and concepts used;
- (b) Data dictionary or glossary of terms;
- (c) Explanatory notes to the tables;
- (d) Classifications and nomenclatures;
- (e) The census questions (if the information was collected using direct enumeration);
- (f) The purposes for which the information was collected, particularly in the case of administrative data;
- (g) The data sources used, particularly where data are derived from administrative sources;
- (h) Data collection methods – Description of the methods used for data collection (e.g., online questionnaires, field interviews);
- (i) Data quality and error estimation – Information on potential sources of error, data validity and reliability.

446. For indicators for which international standard classifications have been created, those international classifications should be used. For indicators that cannot be classified by such international classifications, it may be necessary to create new nomenclatures. Supporting documentation may need to cover a wide range of specific issues such as: basic methodology, coverage, response rate, data sources, pilots and tests, derived variables, Internet responses, imputation, and post-enumeration surveys, as well as reports covering more general descriptions of the census operation as a whole and the quality of the data. As a minimum, countries should produce quality and coverage measurements, such as response rates (nationally and locally) and levels of data imputation (for the data source as a whole and for individual topics). More details about recommended documentation of coverage and quality are given in [Chapter 9](#).

447. Methodological reports are particularly important in cases where the methodology has changed since the previous census (such as moving from a census based entirely on direct enumeration to a wholly or partially register-based approach). Such changes are likely to affect the definitions and concepts used, and hence the comparability between censuses. Such limitations of comparability should be made very clear to users through the methodological reports.

448. Census authorities should consult with stakeholders to understand their metadata requirements, including their varying levels of statistical literacy and ability to interpret the metadata. Consultations should include users from diverse backgrounds, including government agencies, researchers, policymakers and the public. Feedback could be gathered in a range of ways, including structured surveys, focus groups, or other consultations (see

section 6.3). This feedback should be used to refine metadata descriptions, making them more intuitive and comprehensive.

7.4 Archiving and access to closed census records

449. The census is a special statistical data source, which in many cases offers comparable information covering regular intervals over a period of as much as 100–150 years. Census data is valuable not only for present-day decision makers and users, but also for future generations. The NSO or national archiving agency has the large responsibility to handle, archive and store this unique data source, maintaining this special historical picture of society for the future.

450. Many countries retain the census information relating to individual persons and households only for as long it is required for data processing and the production of the statistical results, or until the entire census operation is conducted. However, the scientific, historical and genealogical value of the individual records should not be underestimated when considering the overall costs and benefits of the census. NSOs may decide to allow access – whether public or restricted – to the full set of census records after a specified period of closure. If countries do intend to retain the records for research in this way, they should ensure that there is a robust legal and physical framework in place to protect the security and confidentiality of the records until they become open to the public.

451. National governments should recognize that the ability of NSOs to collect information from the general public in any future censuses or surveys may be seriously compromised if assurances given about the confidentiality of the information collected are not honoured. Public confidence in the security and confidentiality of the personal information processed for the census should therefore be treated as paramount.

452. Closure of census records should extend to cover a period that is sufficient to protect the confidentiality of the information, particularly any sensitive information, about living people, or at least to minimize the risk of breaching such confidentiality. The period of closure in many countries is prescribed specifically by statute and varies from country to country. Other countries may rely on more general provisions within data protection and freedom of information legislation to keep confidential records closed until the risk of disclosure of personal information about living individuals has expired. A period of 100 years is therefore recommended, although with increasing life expectancy, countries may consider extending this threshold according to national circumstances.

453. In addition to requests for public access, NSOs may also receive requests from other government agencies for access to census records for the purpose of validating or corroborating existing information when historical records are sparse or non-existent. Access to these records should be considered when compelled by law or if it clearly serves the public good.

454. In addition to archiving the census records (for those countries that do so) it is important for all countries to ensure the preservation of, and easy access to, all the metadata and procedural or operational material, including all project management documentation, created during the entire census process. Not only does this provide a valuable audit trail when evaluating the success and effectiveness of the census, but it will also enable future

census planners to learn from the successes achieved, and the challenges faced, by their predecessors. In doing so, countries should ensure that, as technology develops rapidly, the media and systems on which this valuable information is archived are reviewed regularly to ensure that it can be retrieved readily whenever it may be required in future years, perhaps as much as 20–50 years hence.

Chapter 8 Geospatial information and small area statistics for censuses

8.1 Benefits and costs

455. Geospatial and statistical data governance is crucial to avoid duplication of work and to enable sharing of data. Geospatial data plays a key role in revealing insights, patterns and trends, and thereby supports decision-making.

456. For the use of geographic information systems (GIS) in censuses, the following benefits and costs need to be considered:

(a) Benefits:

- i. Closer linkage between maps for enumerators and map-based products for users;
- ii. Enriched dissemination of census data as they can be visualized with reference to geographic areas for easy understanding by users;
- iii. The cost of intercensal updating of the base map is lower with a digital base map, enabling, among other things, the construction and updating of sampling frames;
- iv. Producing duplicate maps may be less expensive with a GIS solution;
- v. GIS has increased ability to undertake quality assurance of geographic boundaries;
- vi. GIS allows NSOs to have a greater ability to perform spatial queries and advanced analyses;
- vii. The space needed to store input maps for digital purposes is much reduced.

(b) Costs:

- i. GIS requires additional technical expertise;
- ii. GIS requires a higher level of computing infrastructure;
- iii. A clerical census system can proceed on the basis of basic maps. However, use of GIS in this task requires that a digital map base exists. If it is necessary to create the digital map base, which requires significant lead times as well as significant funding. In both cases, more experienced technical staff are required;
- iv. In most cases, the preparation of maps or GIS are not the core business of a statistical office.

8.2 GIS technology and GIS for census needs

457. Census information at accurate and standard geographic levels is essential to facilitate comparative analysis and achieve better quality of geospatial statistical data production. In the context of a census, it is crucial to have georeferenced data at the level of x, y coordinates.

458. The location of a given census unit should be described using coordinates (in the coordinate system commonly used in the country), especially taking into account the register identifiers of territorial units and address features (including the identifiers of administrative division units, locality identifiers and street identifiers).

459. For the purpose of conducting enumeration and disseminating results, the address point coordinates should be determined with an accuracy of several metres.

460. With the aim of facilitating the management of spatial data concerning the location of census units, the coordinate system adopted should be homogenous for the whole country or territory.

461. A geographic information system (GIS) can be seen as a system of hardware, software and procedures designed to support the capture, management, processing, analysis, modelling and display of spatially-referenced data.

462. Careful planning should be undertaken to plan for a complete GIS that can solve complex census operational planning issues, providing solutions for managing operations, identifying, and resolving enumeration coverage problems, monitoring field operations, enforcing quality controls, producing detailed georeferenced inventories, and supporting a variety of dissemination platforms, products and formats.

463. GIS technology should be considered only at a level appropriate to the skills and resources available and should constitute an integral part of the overall work of the organization. Cooperative arrangements with a national mapping agency or other agencies should be pursued, particularly regarding the acquisition and maintenance of base map data, which usually is not the responsibility of the statistical office. Therefore, as many administrative sources as possible should be reviewed for presence of spatially-referenced data and tested for the possibility of using it for statistical purposes. The United Nations Integrated Geospatial Information Framework (UN-IGIF)³⁷ provides a basis and guide for developing, integrating, strengthening and maximizing geospatial information management and related resources supporting NSOs in seeing themselves in the national geospatial data production ecosystem.

464. Given the great potential of geospatial information for censuses, statistical offices should pursue the development or implementation of GIS and integration of geospatial information whenever possible, including for intercensal surveys. The integration of statistical and geospatial information must be an objective of NSOs, understanding themselves as important institutions that produce and consume geospatial information.

465. In recent years, many countries have adopted GIS to facilitate census mapping in the production of enumeration maps and dissemination products. As their cost is decreasing, geospatial technologies and inputs are being made available free of charge or openly, and

³⁷ UNSD - UN-GGIM

the basic technology is now well established. This trend can be expected to continue and expand in future census rounds. It is likely that the census could help to increase the capacity of the statistical office (or the country as a whole). The adoption of GIS should therefore be seen as an important strategic decision, with impacts that go beyond the operation of the census.

466. The scope of geospatial and statistical data integration is very complex. The challenge is to understand how to achieve this integration in the most effective and consistent way. Developing a coherent and systematic approach for linking statistical and geospatial data requires considerable commitment and time.

467. The best way to achieve a consistent integration is having a common method for enabling statistical and administrative data to be geospatially referenced, preferably in connection with the Global Statistical Geospatial Framework (GSGF),³⁸ which enables comparisons within and between countries. The GSGF framework consists of five principles that are considered essential to integrate statistical and geospatial information. Moreover, GSGF is a high-level framework which facilitates consistent production and integration approaches for geo-statistical information. It is a generic framework that permits the application of the principles to local circumstances.

468. The creation of a geocoding (see section 8.7) infrastructure for statistics and its integration into the statistical production process does not demand a complete redesign of enterprise architectures and statistical production processes. Small and stepwise improvements are possible. However, integration of statistical and geospatial information is a cornerstone in the modernization of official statistics.

8.3 Address point approach or reference to an address point

469. Census information at accurate and standard geographic levels is essential to facilitate comparative analysis and achieve better quality of geospatial statistical data production. In the context of a census, first of all it is crucial to have georeferenced data at the level of x, y coordinates. The introduction of x, y coordinates and address points in census data enables a shift from area assignment (census districts) to point assignment. The change of the assignment mode allows for more flexible grouping and presenting data collected in statistical units smaller than the commune, i.e. in statistical regions, census enumeration areas or even in very small areas, such as a grid with a cell size of one square kilometre. It also facilitates the creation of spatially-oriented microdata that would enable geo-statistical analysis in a user-defined area.

470. Wherever possible, data should be collected with reference to an address point; results can then be disseminated using any desired spatial divisions.

471. The address point approach refers to the strategy of geocoding census data using addresses to facilitate geocoding. Geocoding address data is usually done through specialized software or via an address register. In certain cases, manual geocoding of certain addresses that have not been geocoded otherwise must be added.

³⁸ UNDESA (2019). [Global Statistical Geospatial Framework](#). New York: United Nations.

472. Geocoding of address points offers the following advantages:

- (a) Addresses are a common part of data that is used or collected for census purposes. Geocoding this data can therefore be done in existing workflows with minor adjustments. Connecting this address data to geographical coordinates broadens the possibilities for analysis. Address points offer a high level of detail that presents analytical benefits. In addition, using the address point approach is robust against postal and administrative restructuring, and is therefore more suited to comparing data from different census rounds;
- (b) The availability of a precise coordinate for the location of each household can tie each individual response to a precise location where it was collected, which offers great flexibility for disseminating results by geographic units.

8.4 The importance of maps for censuses

473. Mapping has been an integral part of censuses for a long time and continues to be widely used irrespective of the type of census. Over the years, census maps have played a critical role in all processes from preparation to dissemination of census results.

474. The census-mapping programme should be developed at a very early stage of census planning, considering the conditions and available resources. Statistical offices should evaluate available mapping options by considering the following factors:

- (a) Available geographic resources;
- (b) Requirements for new technologies and approaches;
- (c) Available funds and allocated time frame;
- (d) Staff capacity needed for new approaches; and
- (e) Requirements for developing an ongoing geographic system.

475. Evaluation of these factors will determine the best mix of technology and other approaches for each individual case.

476. Today maps play an important role, especially in the dissemination of census results, as they allow the main characteristics of the population and housing units in the different territories to be represented. Users are increasingly interested in census statistics at a very detailed territorial level.

477. Another important aspect is to strengthen collaboration between NSOs and mapping agencies for the development of a common GIS and a geospatial framework. The development in these areas would produce numerous benefits, such as working on shared geographic areas, standardizing spatial concepts and codes, facilitating data integration and improving the dissemination of census data at finer spatial levels.

8.5 Cooperation/collaboration on integrating census data with geospatial information

478. Integration of statistical and geospatial information consists of the use of geospatial information for the production and dissemination of statistics. Integration can take place at any stage of the statistical production process, as described by the Generic Statistical Business Process Model (GSBPM)³⁹ and in more detail in the geospatial view of it (GeoGSBPM).⁴⁰ The integration includes geocoding of statistics, spatial analysis and statistical maps. As part of the integration process the following steps may occur:

- (a) Geocoding statistical information at unit-record level;
- (b) Processing statistical information using spatial analysis techniques with the purpose of selecting information or deriving new information with a focus on spatial characteristics, e.g. buffering around spatial features;
- (c) Supporting a more efficient and flexible statistical production process with geospatial information, e.g. for surveying and sampling, in the case of field operations;
- (d) Combining final statistical data with geospatial information on the level of database gives the possibility to conduct geospatial analyses and to present the results on statistical maps;
- (e) Improving the quality of existing statistical products by adopting spatial models, e.g. producing information on commuting patterns by calculating journey times based on detailed transport networks.

479. All statistical phenomena that can be associated to a location are in principle relevant for the integration of statistical and geospatial information. Location in this context means the location of the individual observation at unit record level. In most cases the location will be a point with coordinates or a precise address. However, other spatial reference frameworks such as lines or polygons are relevant as well representing, e.g. road segments or areas with a certain land cover.⁴¹

480. Cooperation and collaboration on integration of census data and geospatial information can be a viable strategy to utilize the existing capabilities of other national actors. The opportunities and constraints of collaborating or cooperating with other actors depend heavily on the local statistical and administrative system. The roles and responsibilities of the involved actors therefore must be adapted to the local systems.

481. Regardless of the structure of the statistical geospatial framework, it is important to record the data only once to reduce errors and enable synergies.

482. Both NSOs and national mapping agencies play an important role in data governance. The integration of statistical and geospatial data has been playing an increasingly important role and offers one of the most promising paths to provide reliable and detailed information including census information about population and housing that can result in new insights.

³⁹ UNECE (2019). [Generic Statistical Business Process Model GSBPM](#).

⁴⁰ UNECE (2021). [Geospatial view of Generic Statistical Business Process Model GeoGSBPM](#).

⁴¹ European Forum for Geography and Statistics. [Terminology](#).

8.6 Designing common geographies

483. A common set of geographies based on traditional statistical and administrative geographies should be used to display, report and analyse census information.

484. According to the GSGF, a common set of geographies ensures the consistent geospatial aggregation, comparability and dissemination of statistical data. Data are uniformly allocated to smaller administrative segments or statistical units such as mesh blocks that are divided according to political, property, or topological subdivisions.

485. Aggregation and disaggregation methods enhance quality, assessment, consistency, comparability and use of data.

486. The common geographies should be based on authoritative data and also be included in the National Spatial Data Infrastructure (NSDI). The governance and management of common geographies include the agreed scale, reference dates, coding systems, resolution and accuracy of geographies. The framework of geographies also needs to be developed continuously in line with emerging user needs.

487. The concepts for understanding the delineation methodologies used to maintain common dissemination geographies are potentially complex, but it is important that they are understood and used by stakeholders. For this purpose, providing documentation on the delineation methodologies for the dissemination geography and its lifecycle and changes is essential.

8.7 Geocoding

488. Geocoding is the process of transforming a description of a location or location information (such as an address, name of a place, or coordinates) to a location on the earth's surface. In other words, geocoding is a way to ensure "data know where they are". It is also defined as translation of one form of location into another (ISO 19133:2005).

489. For the purposes of the GSGF, geocoding is generally defined as the process of geospatially enabling statistical unit records so that they can be used in geospatial analysis.

490. More specifically, geocoding is the process of linking unreferenced location information, often in the form of a text string (e.g. an address or address identifier), that is associated with a statistical unit, to a geocode. Alternatively, the geocode can be incorporated directly into the statistical unit record.

491. The condition for geocoding is the availability of high quality physical address, property or building identifiers, or other location descriptions, in order to assign accurate coordinates and/or a small geographic area to each statistical unit.⁴²

492. Geocoding refers to the process of linking geographical coordinates to address information. Geocoding is therefore the prerequisite to processing address information to make it usable in a geographic context. A register of addresses, buildings and dwellings

⁴² European Forum for Geography and Statistics. [Terminology](#).

would provide a suitable basis for such geocoding, and it would therefore be important to keep it up-to-date.

493. A high-quality, comprehensive, updated and georeferenced address register of each building and dwelling can give great support in planning and organizing a census. It can play a central role in many fieldwork operations and provide the key to accurate delivery, collection and follow-up of questionnaires.

494. The best way to associate each address with a location in physical space of a map is to specify its coordinates in a proper geographic reference system. With geographic coordinates, addresses can be entered in available maps or into the GIS. If it is not possible to get coordinates it is recommended at least to geocode addresses by finding associated geographic coordinates from other geographic data. For example, as geographic coordinates of an address, the coordinates of the centre point (centroid) of the enumeration areas to which the address belongs could be taken.

495. It is crucial to consider carefully how this linkage is performed and to ensure the geographic accuracy of the resulting data. Typically, buildings are sourced from administrative records in a geographic format. It is advisable to verify that the distance between a building and the coordinate used for its address is consistent with the reality. There may be instances where an address has an estimated coordinate that is distant from the building it represents.

496. To increase acceptance and usability of a register, it is necessary to include a common and stable identifier (ID). This would greatly facilitate data exchange, cooperation, updating geospatial information and the production of related statistics.

8.8 Supporting field work with maps and GIS tools

8.8.1 Planning for the use of geospatial technology

497. Digital maps can be used for the planning, preparation and management of the census, and throughout all the stages of conducting the census, including pre-enumeration.

498. With a view to drawing up the census documentation on digital maps, performing geo-statistical analyses and presenting output data on digital maps, a pre-enumeration assumption should be made that appropriate GIS tools compatible with spatial microdata will be used already at the stage of delineation of enumeration areas.

499. It is necessary to design the databases comprising the locations of census units, which should be obtained from the NSO or the mapping agency.

8.8.2 Applying GIS and mapping to ensure coverage and facilitate census operations

500. It is necessary to verify the correctness of data concerning census unit locations. Such verification may be performed on the basis of data coming from administrative sources – a referential register comprising address points usually kept by the mapping agency.

501. If no such administrative sources are at hand, the accuracy of data concerning census unit locations may be verified at the pre-enumeration stage, during which the enumerators' task is to verify and adjust (where necessary) the spatial location of individual census units, using handheld devices equipped with GPS.

502. Accurate data on census unit locations ensure efficient management of enumerators' work, in terms of assigning census questionnaires, monitoring enumerators' activities and monitoring the progress of the census enumeration at each stage.

8.8.3 Accuracy requirements, standards, database design, geographic hierarchy and coding schema

503. It is crucial to obtain the locations of census units as x, y coordinates. The location of a given census unit should be specified by means of coordinates and descriptive attributes, especially taking into account the register identifiers of territorial units and address features, including the identifiers of administrative division units, locality identifiers and street identifiers.

504. For the purpose of conducting the enumeration and disseminating results, the address point coordinates should be determined with an accuracy of several metres (no more than seven metres).

505. With the aim of facilitating the management of spatial data concerning the location of census units, the coordinate system adopted should be homogenous for the whole country.

8.8.4 Production of digital maps of enumeration areas for fieldwork and operations

506. Production of digital maps of enumeration areas may be done by using data from authoritative geospatial data and services such as national spatial data infrastructures. The acquisition of census locations makes it possible to design the map services and dedicated applications to display maps by both enumerators and their supervisors. Below is a sample content of the digital map to be used by census supervisors. It can consist of the following layers:

- (a) The administrative division boundaries;
- (b) The statistical division boundaries;
- (c) Cadastral data: cadastral parcel boundaries, building contours (depending on the completeness of acquired data);
- (d) Road and street network;
- (e) Address points (census unit locations along with x, y coordinates);
- (f) Some topography elements such as bodies of water and railway lines

507. An orthophoto map and orthoimages obtained from very high spatial resolution satellite images may serve as the background for these layers.

8.8.5 Allocation of field workers to enumeration areas

508. The digital map enables an interactive allocation of workload for field workers using the GIS technology. The visualization of census units against the division into enumeration areas fosters the accurate determination of the workload to be performed in a given enumeration area and its adequate division among enumerators.

509. The location of census units can then be verified during the pre-enumeration round. The pre-enumeration round could be aimed at verifying the existence of buildings and supplementing the list with missing address points. Additionally, during the pre-enumeration round enumerators have a chance to familiarize themselves with the area where they will later perform enumeration.

510. During the pre-enumeration round enumerators could not only confirm, remove or modify building data in respect of the address points assigned, but also inspect the entire census areas entrusted to them.

8.8.6 Use of GIS for logistics, planning and operations

511. GIS technology can be used to assign work to individual enumerators, as well as to monitor their activities and provide the necessary assistance. The tasks are assigned on the basis of the statistical division of the country. The GIS system can be used to entrust enumerators with the tasks located in the vicinity of their place of residence. However, it is a good practice to assign enumerators to census areas other than those containing or in the immediate vicinity of their direct places of residence.

512. Census supervisors of the teams of enumerators should provide front-line support to enumerators. They should also be equipped with a desktop GIS tool which will allow them to monitor the fieldwork performed by enumerators.

8.8.7 Use of enumerators map application on hand-held devices during data collection

513. Enumerators could use a map module to find their way to the location of the address. Due to the continuous access to the map and the possibility to determine their locations, enumerators will be able to effectively plan their work and visit units located close to one another on the same day.

514. With the aim of ensuring enumerators' safety, the mobile application on hand-held devices should be equipped with an alert function to notify the local leader or supervisor of any emergency situations and to provide support (emergency service, police) through an embedded GPS module.

8.8.8 Monitoring progress and management of field enumeration

515. The census progress and completeness could be also monitored on maps. Visualizing the census units on maps makes it possible to monitor the census completeness at any

aggregation level (i.e. by census area, statistical region, local level or regional level), and to verify each census unit individually, in terms of the correctness of the conduct of the census.

516. While monitoring the census completeness, supervisors can monitor, on an ongoing basis, the workload of each enumerator and decide on reallocating tasks between individual enumerators, with the aim of ensuring a smooth course of census operations.

517. The GIS module also makes it possible to monitor enumerators' work in real time by displaying their routes and verifying whether the completed questionnaires are sent to the system from the locations where interviews have been conducted.

8.9 Grids

518. Most countries are able to geocode census information at the level of individual geographic coordinates and subsequently obtain aggregate data at any spatial level and even at the 1km² grid level.

519. Providing grid-level census data is not only useful to better understand small territories, even regardless of administrative boundaries, and to study local dynamics, but it is necessary to enable policy actors to adopt intervention policies based on the specificities of local realities.

520. From the point of view of Common geographic classification (Principle 3 of the GSGF), the grid type geographies complement administrative and statistical geographies.

521. Gridded data can be both a rich source of information and a consistent geography for disseminating and integrating information. Recent global efforts have culminated in the development of a Discrete Global Grid Systems (DGGs) standard which has been developed under the auspices of the Open Geospatial Consortium (OGC). This system offers further options in the use of grids within the context of the principle of common geographies and in geospatially-enabled statistics.

522. To evaluate the comparability of census statistics between different areas, it is necessary to harmonise the data according to international standards. It is therefore important to accompany statistics for the grid with quality metadata.

523. More information regarding the confidentiality and disclosure implications of using grid square and other small area geographies are explained in section [7.1](#).

8.10 Data collection

524. Depending on the geographical frame and the technology used, geocoding may need to be done at the same time as data collection using inputs from GPS systems and putting a mark on a map. The management of the data providers (register owners) is necessary for ensuring that the relationship between the statistical office and data providers remains positive, and for recording and responding to comments, queries and complaints.

525. In addition to the traditional collection of data by enumerators and supplementing this data by geocoding, register, administrative data and even big data are increasingly used.

Therefore, it is necessary to ensure the quality of address data, as they are crucial for the correct geocoding of individual data from alternative sources. Geocoded data should be treated in the same way, regardless of its source. This applies especially to censuses using data from registers and administrative sources.

8.11 Census data dissemination through maps and maps portals

526. Statistical offices should understand GIS as an important tool for spatial analysis and dissemination of census data. Interactive maps, geoportals, and user-centred geography construction tools tend to be more direct and simple ways to interpret information than tabular data, especially for the lay public. NSOs provide vital information about current population, demographic events and future trends to policymakers in a range of sectors, such as health care, education, infrastructure planning and natural resource management; and the availability of spatially-referenced census databases is an essential prerequisite to facilitate the use of demographic data.

527. Maps make it easier to present, analyse and disseminate census results after data processing. The cartographic presentation of census results provides a powerful means for visualizing the outcomes of a census. This supports the identification of local patterns of important demographic and social indicators. Maps are thus an integral part of policy analysis in the public and private sectors.

528. Dissemination of census results in the form of map outputs plays an increasingly important role in data dissemination. In this way, maps are effectively used to link statistical data with the geographic area to which they relate. The results of the statistics are thus easier to understand by the general public and not only to a narrow circle of experts.

529. As for thematic maps, the priority indicators for the population and housing census are the total number of population and dwellings. Other important indicators are age, sex and/or gender, education, employment, types of census household, type of dwelling, form of dwelling ownership, number of rooms and others. Creating maps using the same set of indicators allows countries to compare their evolution over time in a meaningful way. Maps are an invaluable aid when comparing results even at a lower than national level. New technologies provide great flexibility in building informative and visually appealing maps.

530. In addition to classic thematic maps, the creation of grids for the spatial representation of data is increasingly used in statistics. When creating grids, it is necessary to follow a uniform coordination system, which is necessary for the correct connection of geodatabases and the creation of correct map outputs.

531. Nowadays, many tools are available for implementing solutions that allow the user to visualize the boundaries of administrative and statistical geometries and map census indicators such as those identified above. These tools must have an intuitive interface and make it possible to navigate interactively on the map and obtain the census statistical value for each territorial unit, including small area statistics.

532. Options for defining distribution criteria, changing the colour palette, or even statistical analysis tools for exporting data are increasingly sought after by users.

8.12 Small area statistics and small area data aggregation

533. In addition to the enumeration areas, census maps can define smaller geographical areas. In many countries, these areas are called small statistical areas or census blocks. In situations where it is possible to count the number of housing units or people for each small area, automatic or semi-automatic spatial aggregation processes are used to delineate the enumeration area.

534. The size of the enumeration areas can vary across the territory, depending on various factors, including the type of settlement in the territory (e.g., urban or rural). As a rule, there is no predefined value for small statistical areas or census blocks. The definition of their geometry is usually based on territorial criteria and the definition of functional geographies that allow for convenient spatial analyses. However, concerns about the number of housing units or individuals these areas include must be taken into account, to avoid confidentiality problems when publishing results.

535. The possible use of these small statistical areas to delineate functional geographies makes it easier to understand regional dynamics and define public policies.

536. For production of small area statistics, population and housing census data collected to the level of x, y coordinates will make a foundation for aggregation to the area that is the subject of statistical analysis of certain social, demographic and economic characteristics. Moreover, for many countries, the census data will also provide a unique source of solid information to develop sampling frames.

8.13 Confidentiality and disclosure control in the geospatial context

537. The growing demand for detailed georeferenced statistical data requires the use and promotion of advanced and efficient Statistical Disclosure Control (SDC) methods. The staff of NSOs should have a broad knowledge of various SDC methods and tools, be able to apply them to obtain sufficiently safe and useful data to be released. The knowledge of efficient ways of protecting the privacy of data stakeholders or customers is also important for many data custodians, who collect data to perform their activities and tasks. Users of statistical data (e.g. students, scientists and analysts) should also be aware of the benefits, drawbacks and expected effects of SDC methods. Detailed information about SDC methods is provided in section [7.1.2](#).

538. Census and geospatial data used to create geospatially-enabled statistics should only be released publicly in a manner that complies with privacy and confidentiality legalisation and prevailing community expectations. The ability to identify personal and confidential information may be possible within data when collected and securely stored but should be anonymised to an appropriate degree when disseminated. Disclosure control process is independent from GIS tools. GIS is used only to visualize and analyze data that should be already anonymised before dissemination stage (see section [7.2](#)).

8.14 Detection of changes in the territory as input to maintain an updated geostatistical framework

539. Cartography and maps in general are a support for carrying out the different stages of censuses and surveys. The maps ensure complete coverage of the territory, support data collection, supervision of the load assigned to field personnel, processing, analysis of results and dissemination of the results.⁴³

540. A permanently updated cartography allows the different stages of the development of a census to be carried out in a more efficient way. In order to ensure cartographic updating that reflects changes in the territory as a continuous process, it is essential to take advantage of technological advances that include the widespread availability of personal computers, handheld computers and personal digital assistants, GPS and GIS software, and low-cost aerial and satellite imagery (including automated processes for the detection of new human settlements on images for updating the base cartography).⁴⁴

541. The updating of the base cartography is the input for the definition of the common geographies of the statistical and geospatial framework, so the identification of the places where there is the greatest growth in the observation units, such as population, housing, and economic establishments, among others, requires substantial resources.

542. Some of the elements that must be updated in the cartography are: roads, administrative division boundaries, reference elements such as accurately named and presented roads and waterways, and landmark features, such as schools, place of worship, post offices, parks and large buildings based on blocks and localities.⁴⁵ The updating of the base maps will result in better precision and completeness of the enumeration areas and, consequently, a more effective collection of information.

⁴³United Nations (2025). [Principles and Recommendations for Population and Housing Censuses - Revision 4](#) (version 31 March 2025), Part three.IV.B. The role of geospatial information in the census (page 141)

⁴⁴Ibid., Part three.IV.C. Geospatial information technology for census (page 144)

⁴⁵Ibid., Part three.IV.F.(iii) Updating maps or digital mapping data (page 157)

Chapter 9 Quality management

9.1 The need for a quality management programme

543. The product of any census of population and housing is information, and confidence in the quality of that information is critical. The management of quality must therefore play a central role within any country's census.

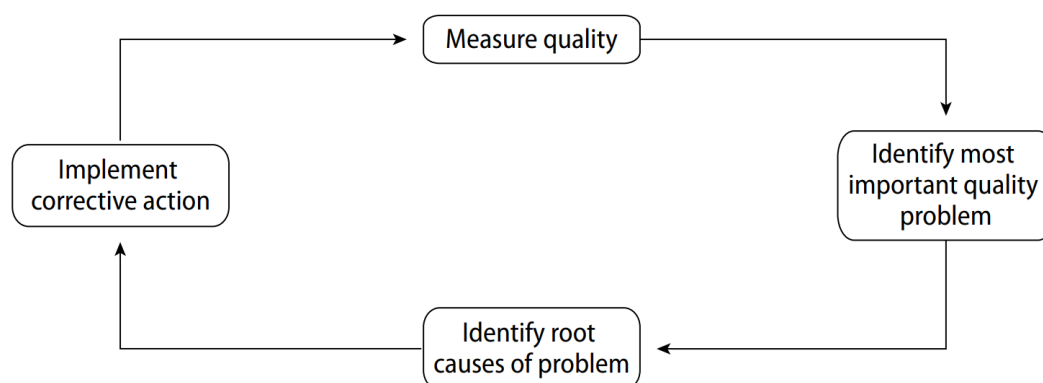
544. A quality management programme is an essential element in the overall census programme, regardless of whether it is a traditional, register-based or combined census, and should touch on all activities during planning, the development period, operational activities such as data collection and processing, through to evaluation and dissemination of results.

545. The focus of any quality management programme is to prevent errors from occurring or reoccurring, to detect errors easily and early enough to allow taking corrective actions. Without such a programme, the census data, when finally produced, may contain errors, which might severely diminish the usefulness of the results. If data are of poor quality, then decisions based on these data can lead to costly mistakes. Eventually the credibility of the entire census may be called into question.

546. Establishing a quality management programme and setting quality standards at the planning stage is crucial to the success of the overall census operation. The quality management programme should be developed as part of the overall census project and integrated with other census plans, schedules and procedures. Furthermore, it should not be seen as a stand-alone exercise, but it should be part of a broader approach to quality management across the NSO.

547. A major goal of any quality management programme is to systematically build in quality from the beginning through the sound application of knowledge and expertise by employees at many levels, and through defined quality assurance processes and reviews. It will also include reactive components to detect errors so that remedial actions can be taken during census operations, as represented by the well-known Quality assurance circle ([Figure 2](#)).

Figure 2
Quality assurance circle



Source: Principles and Recommendations for Population and Housing Censuses – Revision 3, United Nations, New York, 2017.

548. Lessons learnt from previous censuses and experience learnt by other NSOs are very useful to plan for a quality management programme for the current census. Therefore, a well-documented evaluation of previous experiences is of critical importance so that errors detected from previous censuses or similar activities are used as the basis for developing a quality management for the next census. Also, the integration of census activities with other NSO's core activities should be promoted, in order to avoid the loss of institutional knowledge that might follow the end of each census activities (especially in countries where censuses are conducted are discrete projects). Firstly, this chapter defines the different dimensions of "information quality" and then describes a framework that can be used to manage quality across these dimensions through the full census lifecycle. Furthermore, it presents a paragraph devoted to quality management in register-based and combined censuses. Finally, it includes a short paragraph with some additional guidance concerning quality assurance in an outsourcing environment. Section 9.6 provides further guidance about how the framework can be applied in practice to each dimension and additional detail on the following topics: operational quality control; questionnaire design; management of coverage error; systems development; methods of census evaluation (including a case study on content evaluation); measuring record-linkage quality; measuring editing and imputation quality.

9.2 Defining information quality

549. It is generally accepted that there are six dimensions of statistical quality.⁴⁶ They are described below.

9.2.1 Relevance

550. The relevance of statistical information reflects the degree to which it meets the needs of users. The challenge for a census programme is to balance conflicting user requirements so as to go as far as possible in satisfying the most important needs within resource

⁴⁶ E.g. see [Handbook on the Management of Population and Housing Censuses, Revision 2](#).

constraints. This dimension of quality is particularly important in census content development and in dissemination. Related to relevance is “completeness”, defined as the degree to which statistics fully cover the phenomenon they are supposed to describe.

9.2.2 Accuracy

551. The accuracy of statistical information is the degree to which the information correctly describes the phenomena it was designed to measure. It is usually characterized in terms of error in statistical estimates and is traditionally broken down into bias and variance. While bias refers to non-sampling errors, variance refers to sampling errors, therefore, in a census context, variance only applies in situations where a short form/long form strategy is used (i.e. the full questionnaire or long form is completed only for a sample of households), or where only a sample of records is processed. Sampling errors are typically measured and communicated using the Mean Squared Error (MSE) framework and/or through confidence intervals. However, such measurements do not cover non-sampling errors, which are particularly important in the context of censuses, where the aim is to capture the full population. Accuracy can also be described in terms of major sources of error (for example coverage, sampling, non-response, response, data capture, coding).

552. For statistics derived from administrative data, the key sources of error in the context of censuses are non-sampling errors, i.e. representation (coverage) and measurement errors.⁴⁷

553. Representation errors (errors relating to the target units) might occur if data are not reported correctly to the data supplier resulting, for example, from non-registration or delayed self-registration on an administrative register (e.g., birth, death, or full population register). Some data records may not be transmitted to the NSO because of technical problems or be transmitted with errors if administrative sources are not regularly updated by the data supplier (resulting in duplicates and/or omissions).

554. Implausible or missing values are indicative of measurement errors (that is, error within variables) and may reduce the accuracy of the raw data. To assess whether a value is implausible or missing, it is important to examine not only specific records, but also variable distributions for all records. Reasons for a lack of accuracy might be technical, such as errors in the process of data transfer. Or a lack of accuracy may be systematic. For example, this may result from an inadequate submission or maintenance on the part of the data supplier, particularly if the variable is not of administrative importance for the data supplier, therefore it is not systematically recorded (e.g. a person's occupation in the population register). Missing values may also be due to an administrative source (or variables on a source) being only recently established.

555. It should be noted that representation errors may cause measurement errors where the unit of statistical measurement changes. For example, a person missing in the administrative population register may lead to an understated value for the variable “size of household”. For an overall coverage assessment of a dataset, an examination of both over- and under-

⁴⁷ Zhang, L.-C. (2012). Topics of statistical theory for register-based statistics and data integration. *Statistica Neerlandica* 66: 41–63.

coverage is needed. Under-coverage may be of particular importance with respect to “hard-to-reach” populations.

9.2.3 Timeliness

556. Timeliness refers to the delay between the time reference point (usually census day) to which the information pertains and the date on which the information becomes available. Often for a census there are several release dates to be considered in a dissemination schedule. Typically, there is a trade-off against accuracy. Timeliness can also affect relevance. Related to timeliness is “punctuality”, defined as the degree to which the availability of the data meets pre-announced release dates.

9.2.4 Accessibility

557. The accessibility of statistical information refers to the ease with which it can be obtained. This includes the ease with which the existence of information can be ascertained, as well as the suitability of the form or medium through which the information can be accessed. The data obtained are of great value to many users including central government, local administrations, private organizations and the public at large. To maximize the benefit of the information obtained, it should be widely accessible to all of these potential users. Consequently, censuses often provide a mix of free products, standard cost products and a user pay service for ad hoc commissioned or customized products. The strategy adopted and the cost of the services also affects accessibility. Related to accessibility is “clarity” i.e. the degree to which the data are understood (regardless of how accessible they are), particularly for non-experts, which is in turn related to interpretability (see below).

9.2.5 Interpretability

558. The interpretability of statistical information reflects the availability of supplementary information and metadata necessary to interpret and use it. This information usually covers the underlying concepts, definitions, variables and classifications used, the methodology of data collection and processing, and indications of the accuracy of the information.

9.2.6 Coherence

559. Coherence reflects the degree to which the census information can be successfully brought together with other statistical information within a broad analytic framework and over time. Data are most useful when comparable across space, such as between countries or between regions within a country, and over time. More and more emphasis is also put on enabling comparison of geography over time, as well as maintaining consistency and comparison of census topics from one census to another. The use of standard concepts, definitions and classifications - possibly agreed at the international level - promotes coherence. Comparability can be seen as a special case of coherence, where coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar, while comparability is the degree to which data can be compared

across countries, regions, subpopulations and time. The degree of quality on coherence can be assessed via a programme of certification and validation of the census information as compared to corresponding information from surveys and administrative sources. Equally important is internal coherence of data, referring to the consistency of information across different topics of the census and census outputs.

560. Related to both comparability and accuracy is the dimension of reliability, which can be defined as the degree of closeness of initial estimates to subsequent estimated values. Administrative data, by nature, can be subject to improvements in accuracy over time (e.g., coverage can improve, as lagged registrations and de-registrations become available, and the quality of measurements can also improve). Therefore, an NSO can make use of “new” data to improve their census statistics, revising previous estimates. However, this needs to be balanced against user needs with respect to revisions.

561. Section 9.4 is devoted to quality assessment of administrative sources, with specific reference to the four quality assessment stages (Source, Data, Process and Output) identified as relevant for administrative sources.

9.3 A quality management framework

562. Quality management is generally considered to have five main components.⁴⁸ They are described below.

9.3.1 Setting quality targets

563. Setting census quality targets for each of these dimensions at the outset of the census programme enables all involved to know what they are aiming to achieve and, crucially, to determine what it will cost. Early publication of these targets also involves stakeholders, users of the data in particular, to comment and feed in their requirements. In reality, there will be iterations of such targets as initial aspirations may turn out to be unaffordable or unachievable in the time available. Having such a discussion is crucial at the outset to enable realistic, affordable targets to be set and stakeholder expectations to be managed.

564. Simplistically, setting quality targets enables an NSO to answer the question “What does good look like?” and enables a dialogue with stakeholders about “How good is good enough?”.

565. It is easier to set targets for some dimensions than others. It is relatively straightforward to set targets for accuracy, timeliness and accessibility. For example, simple targets could be of the form:

- (a) Accuracy: “We will aim to produce national population estimates that are within X per cent of the (unknown) true value with 95 per cent confidence.”⁴⁹;

⁴⁸ See UNDESA (2021). [Handbook on the management of population and housing censuses, Revision 2](#). New York: United Nations.

⁴⁹ For an actual example of early declaration of accuracy targets, see e.g. accuracy targets (95% confidence intervals of +/- 0.2% nationally and +/- 3% for each local authority) set by the UK Office for National Statistics (ONS), para 1.7 in HM Government (2018). [Help shape our future: the 2021 census of population and housing in England and Wales](#).

- (b) Timeliness: "We will aim to publish our first population estimates within one year of census day";
- (c) Accessibility: "We will aim to disseminate all outputs online."⁵⁰

566. Setting targets for some of the other dimensions, however, is not so straightforward, and it is sometime helpful to consider setting process-related, rather than outcome-related, targets. For example:

- (a) Relevance: "We will consult with users on the required census content at least two years before finalizing the content of the census questionnaire".

567. It is clear that even such simplistic targets will have a significant impact on cost and timetable, hence the necessity of considering such aims early in the planning process. It is suggested, therefore, that all NSOs should set targets for each dimension of quality at the early stages in the census programmes, and that these should be published to enable stakeholder views to be taken into account. It is particularly important to set targets for accuracy.

9.3.2 Quality design

568. Having set quality targets, it is necessary to consider whether or not the census statistical and operation design is capable of meeting those targets. This can draw on experience of previous censuses or wider international experience.

569. Pre-census tests (or pilots) provide a useful vehicle for planning and developing the actual census. Census tests can be conducted as a national sample (useful for testing content, mail and/or Internet response, and other questionnaire-related features of the census), or as a site test (useful for testing operational procedures). Other pre-census testing could involve cognitive testing of the questionnaire, research and testing of the automated processes for address list development, questionnaire addressing and mail out, messaging (styles of initial contact letters and reminders and content of mail materials) and the mail contact strategy, data collection, data capture, data processing, communication approaches, conducting research into the use of administrative records, improved cost modelling and improved methods of coverage measurement.

570. Prior to conducting the actual census, a complete rehearsal provides an opportunity to test the full array of operations, procedures and questions, much like a play's dress rehearsal provides an opportunity to "address any remaining issues" before the actual event.

571. Such testing should result in a review of the initial quality targets to confirm their achievability. It may at this point be necessary to change budgets, timetables, or the targets themselves if testing has shown them to be unachievable. Rehearsals should, therefore, be undertaken late enough in the planning stage to be able to assess the final census design yet earlier enough to enable any necessary changes to be implemented.

⁵⁰ [The 2021 census consultations held by ONS](#) provide a useful example of a comprehensive users' consultation programme. In June 2015, ONS launched a public consultation asking census users for their views on the topics that the 2021 Census questionnaire in England and Wales might cover. Anyone could take part in this consultation, which closed in August 2015, and the resulting users' feedback has been informing further research contributing to the development and testing of appropriate census questions. The outcome of the consultation is described [in the report](#), published on 23 May 2016, which provided an overview of the evaluation process used to assess the responses and summarizes the results of the evaluation.

9.3.3 Operational quality control

572. Because of the size and complexity of census operations, it is likely that errors of one kind or another may arise at any stage. These errors can easily lead to serious coverage or content errors, cost overruns or major delays in completing the census. If not anticipated and controlled during implementation they can introduce non-sampling error to the point of rendering results useless.

573. To minimize this risk, it is essential to monitor and control errors at all stages of census operations, including pre-enumeration, enumeration, document flow, coding, data capture, editing, tabulation and data dissemination. Every national census organization should establish a system of operational quality control.

574. The dimensions of quality outlined above are overlapping and interrelated and each must be adequately managed if information is to be fit for use. Each phase in executing a census may require emphasis on different elements of quality. Again, this requires careful design at the outset to identify:

- (a) The types of errors that may occur at each phase of the operation;
- (b) What information is required to enable such errors to be identified, should they occur;
- (c) How this information will be collected in a timely fashion during live operations; and
- (d) What actions will be taken should the error be found to have occurred (ideally before the phase is complete).

575. Quality control requires careful planning and testing. Operational quality control processes and systems should be included in both pre-census tests as well as rehearsals to ensure they work as expected during census operations.

576. There is no single standard operational quality control system that can be applied to all censuses or even to all steps within a census. Census designers and administrators must keep in mind that no matter how much effort is expended, complete coverage and accuracy in the census data are unattainable goals. However, clear quality targets should sit at the heart of decision-making processes and efforts to first detect and then to control errors should be at a level that is sufficient to produce data of a reasonable quality within the constraints of the budget and time allotted.

577. The development of a Risk Management plan identifying potential risks and strategies for dealing with them is also crucial to ensure a sound operational quality control system. The Risk Management Plan should identify potential risk events and their probability of occurring, provide measures of potential impact, offer strategies for dealing with risks if they occur, and identify the area(s) responsible for addressing each risk event. The Plan should be a dynamic document where risks can be modified as needed (see [Chapter 11](#)).

9.3.4 Quality assurance and improvement

578. Once data collection and processing operations are complete, it is essential that final statistics are quality assured and, where possible, improvement made to the results prior to publication if significant problems are discovered.

579. Quality assurance can be through comparison with statistics from other surveys, through comparison with statistics from administrative data sources, or through analysis of information collected as part of operational quality control. But such quality assurance is challenging, and sufficient time should be allowed from the outset to enable such studies to be completed prior to publication.

9.3.5 Quality evaluation and reporting

580. It is generally recognized that a population census is never perfect and that, despite rigorous quality control and quality assurance, errors can, and do, occur. Most errors in the census results are classified into two major categories: coverage errors and content errors. Coverage errors are those that arise due to omissions or duplications of persons or housing units in the census enumeration. Content errors are errors that arise in the incorrect reporting or recording (or linking) of the characteristics of persons, households and housing units enumerated in the census. A third type of error classified as operational error can occur during field data collection or during data processing.

581. Many countries recognize the need to evaluate the overall quality of their census results and employ various methods for evaluating census coverage as well as certain types of content error. In fact, some countries, the United Kingdom for example,⁵¹ includes coverage assessment as an integral part of the census process and aims to publish all results after an adjustment for coverage error. Most countries, however, undertake coverage assessment only as part of their evaluation process, as described in section [9.6.14.1](#).

582. A comprehensive evaluation programme should, however, also include assessments of the success of census operations, in each of its phases. Countries should ensure, therefore, that their overall census evaluation effort addresses the census process (hereafter referred to as operational assessments), as well as the results (referred to as evaluations). Together, operational assessments and evaluations tell us "How well we did". A third component of a comprehensive research includes experiments. Experiments tell us "How can we do better?" Thus:

- (a) Operational assessments document: final volumes, rates and costs for individual operations or processes, using data from production files and activities; quality assurance files and activities; and information collected from debriefings and lessons learned. Operational assessments can include some discussion of the data, but do not involve explanation of error. The final volumes, rates and costs can be broken out by demographic, geographic level, and housing unit and/or person-level data at intermediate stages of operations or processes. Operational assessments may also document operational errors, although they will not

⁵¹Office for National Statistics (ONS), released 19 December 2022, ONS website, methodology. [Coverage adjustment for Census 2021 in England and Wales](#).

necessarily include an explanation of how those errors affect the data. For administrative sources used in the census, operational assessment documents should include: quality assurance files and activities related to the processing of the different administrative sources, including actions taken to improve the fitness-for-use of the admin sources;

- (b) Evaluations analyse, interpret and synthesize the effectiveness of census components and their impact on data quality and coverage using data collected from census operations, processes, systems and auxiliary data collections. For register-based and combined censuses, evaluations should also include measures such as the rates of record linking and imputation, the use of methods such as the signs-of-life and their impact on census coverage. In addition, evaluations should also be made on the impact on census output, especially for countries transitioning to admin-based census;
- (c) Experiments are quantitative or qualitative studies that must occur during a census to have meaningful results to inform planning of future censuses. The census provides the best possible conditions to learn about the value of new or different methodologies or technologies and typically involve national surveys with multiple panels.⁵²

583. Evaluation efforts that focus on census results should generally be designed to serve one or more of the following main objectives:

- (a) To provide users with some measures of the quality of census data to help them interpret the results;
- (b) To identify as far as is practical the types and sources of error to assist the planning of future censuses; and/or
- (c) Feed into the quality assurance and improvement processes and serve as a basis for constructing a best estimate of census aggregates, such as the total population, or to provide census results adjusted to take into account identified errors.⁵³

584. Evaluations of the completeness and accuracy of the data should be made by all countries, and should be issued with the initial census results to the fullest extent possible, including the detail of the methods used. In order to ensure transparency about data quality and enhance users' confidence in the census results, it is important to assess quality of census data as much as possible prior to their release, and to make this information publicly available, even though, in order to provide detailed coverage results and information on how accurately the census counted certain population groups, it might be necessary to wait for the results of the Post-Enumeration Survey (PES) or other coverage surveys (see section 9.6.14.1). Additional results can be issued after the initial results are published. However, the evaluations of the completeness and accuracy of census data should also be included in the evaluation or quality report.

⁵² For example, the US Bureau of the census conducts experimental studies to identify potential topics for early 2030 Census life cycle research and testing. In general, decennial census experiments involve comparisons (usually of response rates) between a control group that reflects 2020 Census production methods or procedures and a treatment group(s) that tests modifications to them. See: [Census Evaluations and Experiments](#).

⁵³ For example, [ONS adopted changes to coverage estimation processes](#) based on quality assurance (validation and evaluation) processes.

585. If census estimates are adjusted in the light of quality assurance and evaluation activities (including adjustments to population counts), countries are encouraged to thoroughly document the type of changes (whether at the microdata or aggregated level) and their extent. Furthermore, countries are encouraged to document and publish the methodologies used for imputation of total non-response, detailing the techniques and rationale. They should also report the magnitude of these imputations.

586. More broadly, an assessment of all six dimensions of quality should ideally be made against the initial targets set, with the results published. Such evaluations and measurements can be valuable to indicate priorities and establish quality targets standards for the next census, thus completing the quality cycle.

587. A number of methods exist for carrying out census evaluations and, in practice, many countries use a combination of such methods to fully serve these objectives. A short guidance on methods of census evaluation is provided in section [9.3.5](#).

588. Finally, census quality reports should also describe any Statistical Disclosure Control method used to ensure data confidentiality and the resulting consequences on data quality (such as the level of loss of accuracy).

589. Indeed, ensuring data confidentiality is an indispensable element for maintaining the trust of respondents and the integrity of the NSO. If respondents believe or perceive that a national statistical office does not protect the confidentiality of their data, they will be less likely to cooperate or provide accurate information in future censuses. This may in turn affect the accuracy and relevance of the resulting statistics.

590. Therefore, NSOs should aim to determine optimal Statistical Disclosure Control (SDC) methods and solutions that minimize disclosure risk while keeping information loss to a minimum. Users of census data should be aware of the logic and the broad methodology behind statistical disclosure control methods applied to data, and their impact on census data, especially at lower geographies (such as at the squared kilometre grid level).

9.4 Ensuring quality in register-based and combined censuses

591. Administrative sources may be used to enhance or to supplement a field enumeration-based census, to conduct a combined census, or in the construction of a fully register-based census. In the last census round there has been a clear trend towards increased use of administrative data in censuses across the countries of UNECE region and beyond, in line with a more generalized trend towards increased use of administrative data for statistical production, further increased and/or accelerated as a result of the COVID-19 pandemic, particularly to support the production of census statistics where field data collection has not been possible or has been delayed.⁵⁴

592. Additional dimensions are usually considered (e.g. the institutional environment, linkability, accuracy of record linkage, accuracy of conflict resolution) when assessing quality

⁵⁴ Where the shift towards more use of administrative data has been expedited by the impact of the COVID-19 pandemic, this has required rapid changes and improvements to data collection and processing systems across both administrative organizations and NSOs. The need to deliver new services and support to the public has led to the development of new administrative processes and systems. See UNECE (2021), [Keeping count: conducting the 2020 round of population and housing censuses during the Covid-19 pandemic](#).

of administrative sources for use in censuses. Indeed, even though the six standard quality dimensions (see section 9.2) capture many relevant aspects of administrative data quality, alone they are considered not always sufficient to assess the quality of administrative data (Daas et al, 2008, p. 2).⁵⁵

593. Many quality considerations must be taken into account before incorporating the use of administrative sources into a census. It is important that NSOs understand the strengths and limitations of administrative data in order to make the right decisions about the use of such data⁵⁶. The pandemic has also had a significant impact on the quality and content of administrative sources.⁵⁷

594. In a census context, the quality of administrative data used should be considered in relation to the ways data are collected and processed by data suppliers and NSOs, through to the final census outputs. Throughout the process, errors may occur which will compromise quality. Assessing the quality of administrative sources requires mapping the errors which may occur before and after the data is supplied to NSOs and determining how any such errors can be mitigated (e.g. through changes to collection, processing and/or integration with other sources).

595. Quality measurement and assurance should be undertaken throughout all stages of the framework. More precisely, four stages of production have been identified in relation to the use of administrative sources in censuses, applicable regardless of census type (i.e. regardless of the census process in which administrative sources are being used), broadly related to the lifecycle of using administrative data in the census:

- (a) Source stage: understanding, evaluating and working to acquire a source;
- (b) Data stage: receiving the actual data and assessing its quality;
- (c) Process stage: processing the administrative data for use in the census;
- (d) Output stage: assessing the quality of the census outputs that use administrative data.⁵⁸

596. The quality of administrative data may be assessed, by identifying the key quality dimensions at each stage and the respective tools and indicators for quality assessment. Besides the six standard quality dimensions, additional dimensions are taken into account.

597. In the **Source stage** (a), information is gathered about an administrative source through communication with the data supplier and by reviewing existing metadata. At this Stage, the focus is on assessing the relevance of the source against the needs of the census, considering the dimensions of accuracy, timeliness, coherence and comparability, accessibility and interpretability. An assessment is also made about the institutional

⁵⁵ Daas, P.J.H., J. Arends-Tóth, B. Schouten and L. Kuijvenhoven (2008). Quality Framework for the Evaluation of Administrative Data. Paper presented at the European Conference on Quality in Official Statistics.

⁵⁶ See [Guidelines on the use of registers and administrative data for population and housing censuses](#).

⁵⁷ For example, some types of interactions with health services may have decreased (with people avoiding health care services due to concerns about catching the virus) while others have increased (with people registering to be tested, treated or vaccinated), does impacting the coverage of health registers; while the pressures on the public and administrative organizations due to the pandemic have impacted the timeliness and accuracy of other administrative data. Examples include delays in registrations of births and reductions in the level of quality assurance (with resources being temporarily diverted elsewhere). See UNECE (2021), Keeping count: conducting the 2020 round of population and housing censuses during the Covid-19 pandemic.

⁵⁸ See [Guidelines for assessing quality of administrative sources for use in censuses](#).

environment, including whether or not the data supplier can meet the needs of the NSO, considering factors such as the strength of the relationship with the supplier and the status of the supplier.

598. In the **Data stage** (b) of the assessment, data are received from the data supplier and are assessed through analysis and comparisons with other data sources. Besides standard quality dimensions, other dimensions such as validation and harmonization arrangements put in place upon data transfer to NSO and linkability (defined as availability of adequate linkage variables) are involved at this stage.

599. During both the Source and Data stages, the assessment and measurement of quality is set against many data quality dimensions, using various tools and indicators, e.g. comparisons with alternative sources will reveal measurement or representation errors, to be measured against set accuracy targets. The information and insight gained through the Source and Data Stages are useful not only to determine whether a particular source could be used in the census, but also to determine the necessary processing of the administrative data for use in a census.

600. In the **Process stage** (c), administrative data are transformed using the information gained at the Source and Data Stages.⁵⁹ The processes commonly carried out on administrative sources for census use are: record linkage; assessment of coverage errors (e.g. by using the “signs of life” methodology), resolving inconsistencies from different sources, editing and imputation. The quality of administrative data at this stage is to be assessed against several dimensions including accuracy of record linkage (where multiple sources are linked), accuracy of conflict resolution (referred to the methods for deciding between sources where different sources are linked and the same attributes are available in them), accuracy of editing and imputation (where census variables or units are derived or constructed through imputation or modelling techniques).

601. Finally, in the **Output stage** (d), the quality assessment of census outputs which use administrative data is carried out. Conceptually, this is no different from the assessment of the outputs of a questionnaire-based census, while at the same time it will provide valuable information about where there may be limitations or concerns about the administrative data, or the processing of these data, which were not identified initially at the Source, Data and Process Stages. There is an iterative process of assessment, which can inform both ongoing improvements to the administrative sources (working with the data supplier to improve the source) and improvements to the processing of the administrative data by the NSO.

9.5 Ensuring quality in an outsourcing environment

602. Some countries may wish to outsource certain parts of census operations. The motivations and considerations for outsourcing have already been discussed more fully in section 4.4. In the context of quality management, the outsourcing of components of census

⁵⁹ As data in population registers and other administrative sources are not primarily collected for the purpose of a census, usually cannot be used directly in a census, due to conceptual and definitional differences. There are also limitations of coverage, completeness, and accuracy. A transformation process is therefore required.

operations still requires the census agency to take full responsibility for, and manage the quality of, the census data. This aspect should never be delegated.

603. In setting up outsourcing arrangements, the census agency needs to ensure that it continues to have the ability to both understand and manipulate those elements that contribute to final data quality.

604. Some approaches to outsourcing put an emphasis on “turnkey” arrangements, in which contractors deliver systems according to a set of predetermined client specifications with the expectation that the client focuses solely on the outputs and not the internal workings of the system. This assumes that the census agency completely understands and can fully anticipate all data quality issues that might arise during the census and has included these in the specifications. The client is not expected to have any understanding of how these systems work or how they might contribute to the final outputs. Any changes to the system typically require cumbersome processes to determine contract responsibilities and heavy financial costs. This sort of approach effectively hands over the quality of the census data to the contractor, while the risks associated with intervention remain with the census agency. It removes any flexibility and greatly restricts the ability of the census agency to react to quality problems that emerge during processing. This “turnkey” approach is not recommended.

605. Suppliers should be made fully aware of the quality targets set at the outset of the census programme, and the quality requirements of the outsourced components that enable the overall census quality targets to be achieved. Operational quality control should apply to outsourced services in the same way as those that are carried out internally.

606. Even when components are outsourced, census agency staff should have an understanding of how such systems work, for example, automatic text recognition engines and coding algorithms, and have the ability to change the tolerances or parameters of these systems at little cost and in a timely manner during processing. Varying these parameters will allow the census agency to determine and manage the appropriate balance between data quality, cost and timeliness as processing progresses.

9.6 Implementing a quality management programme

9.6.1 Introduction

607. Quality must be managed in an integrated fashion within the broader context of undertaking the entire census programme. Census management will require input and support from all functional areas, and it is within this context that trade-offs necessary to ensure an appropriate balance between quality and concerns of cost, response burden and other factors will be made. There needs to be adequate staff with people able to speak with expertise and authority while being sensitive to the need to weigh competing pressures regarding dimensions of quality and other factors to reach a consensus. Those responsible for each aspect of census work must be equipped with appropriate expertise. Each of them will need to develop and implement strategies addressing many aspects of quality. In doing so they must be sensitive not only to their own quality requirements but also to their interactions with quality requirements of others. Strategies to facilitate the necessary information sharing and joint consideration of cross-cutting quality issues are vital.

608. Quality requirements need to receive appropriate attention during design, implementation and assessment. Subject matter experts will bring knowledge of content, client needs, relevance and coherence. Statistical methodologists bring their expertise on statistical methods and data quality trade-offs, especially with respect to accuracy, timeliness and cost. Operations experts bring experience in operational methods, and concerns for practicality, efficiency, field staff, respondents and operational quality control. The systems experts bring knowledge of technology standards and tools that will help facilitate achievement of quality, particularly in the timeliness and accuracy dimensions. In collaboration with subject matter experts, dissemination experts will bring a focus to accessibility and interpretability.

609. This section provides further guidance about implementing a quality management programme. Firstly, the six dimensions of quality are taken in turn, with a description of how the five components of the quality management framework might apply to each. Later sections then provide further detail on:

- (a) Operational quality control;
- (b) Questionnaire design;
- (c) Management of coverage error;
- (d) Systems development;
- (e) Census evaluation;
- (f) Measuring record linkage quality; and
- (g) Measuring editing and imputation quality in register-based censuses.

610. As a reminder, the six dimensions of quality are:

- (a) Relevance;
- (b) Accuracy;
- (c) Timeliness;
- (d) Accessibility;
- (e) Interpretability; and
- (f) Coherence.

611. and the five components of the quality management framework are:

- (a) Setting quality targets;
- (b) Quality design;
- (c) Operational quality control;
- (d) Quality assurance and improvement; and
- (e) Quality evaluation and reporting.

9.6.2 Managing relevance

612. The programmes and outputs of a National Statistical Office (NSO) must reflect the country's most important information needs. Relevance for the census must therefore be managed within this broader context. At the stage of setting quality targets it is necessary to discuss how much change in the questionnaire (or the information to be taken from registers) will be contemplated. In cases of severe budget restrictions, some countries have agreed to a policy of minimal change or no change to minimize testing requirements and quality risks. Clearly, this impacts the relevance of the final statistics, but having such discussions at the outset, with stakeholders, is essential.

613. At the stage of quality design, relevance is managed through processes to assess the relevance of previous census content and to identify new or emerging information gaps that may be appropriately filled via the census. Major processes to achieve this can be described as client and stakeholder feedback mechanisms and programme review and data analysis. Information from these processes can then be used to ensure the relevance of census content and outputs.

614. Important feedback mechanisms might include: consultations with key government departments and agencies; advice from professional advisory committees in major subject matter areas; user feedback and market research; ad hoc consultations with interested groups; and liaison with statistical offices from other countries.

615. While the primary purpose of data analysis is to advance understanding of phenomena, it also provides feedback on the adequacy and completeness of the data used in the analysis. By identifying questions that the census data cannot answer it can pinpoint gaps and weaknesses. This must be taken in the context of the analytic potential of other data holdings of the NSO. There is a reduced focus on relevance during Operational quality control and Quality assurance and improvement, but the emphasis increases again for Quality evaluation and reporting, when the published outputs can be reviewed to consider how well they met the originally stated information needs.

9.6.3 Managing accuracy

616. Management of accuracy requires attention during all five steps in the quality management framework. Firstly, when setting quality targets, accuracy targets should be set as these will fundamentally affect the census costs and design.

617. During quality design, parameters and decisions will have a direct impact on accuracy. This includes the design of later components of the quality management framework. The accuracy achieved will depend on the explicit methods put in place for operational quality control and quality assurance and improvement. If these processes are not built in from the outset, including the required data collection processes and feedback loops, it will be much more challenging for them to be implemented effectively.

618. A number of key aspects of design should be considered in every census to ensure that accuracy concerns are given appropriate attention:

- (a) Explicit consideration of overall trade-offs between accuracy, cost, timeliness and respondent burden during the design phase;

- (b) Adequate justification for each question asked and appropriate pre-testing of questions and questionnaires in each mode of collection, while also ensuring that the set of questions is sufficient to meet requirements;
- (c) Assessment of the coverage of the target population. This relates to the adequacy of the geographic infrastructure upon which collection and dissemination geography will be based. It may also relate to the adequacy of address lists to be used in areas where mail out of census questionnaires takes place;
- (d) Proper consideration of sampling and estimation options. For example, sampling could be used at the collection stage through the use of short and long form questionnaires in order to reduce respondent burden and collection costs. Alternatively, sampling could be introduced after collection, by processing only a sample of records, at least for a subset of characteristics, in order to produce more timely results or to control processing costs. In either case, careful consideration should be given to the size and design of the sample and to the weighting and other estimation procedures needed;
- (e) Adequate measures in place for facilitating and encouraging accurate response, following up non-response and dealing with missing data;
- (f) Proper consideration of the need for operational quality control;
- (g) Appropriate quality assurance for the final statistics.

619. While individual programme managers may have considerable flexibility in implementing specific practices and methods, this should be done in an integrated fashion within the overall management of census quality.

620. A good design will always contain protection against implementation errors through, for example: adequate selection and training of staff; suitable supervisory structures; carefully written and tested procedures and systems; and operational quality control procedures.

621. Mechanisms for operational quality control should be built into all processes as part of the design. Information is needed to monitor and correct problems arising during implementation. This requires a timely information system that provides managers with the information they need to adjust or correct problems while work is in progress. There is an overlap here with quality assurance and improvement and quality evaluation and reporting as much of the information collected during operational quality control is also needed to assess whether the design was carried out as planned, and to identify problem areas and lessons learned from operations in order to aid design for future censuses.

622. Some examples of activities that could be undertaken to manage and monitor accuracy during implementation and operations are:

- (a) Regular reporting and analysis of response rates and completion rates during collection;
- (b) Monitoring non-response follow-up rates;
- (c) Monitoring interviewer feedback;
- (d) Monitoring coverage checks and controls;
- (e) Monitoring of edit failure rates and the progress of corrective actions;

- (f) Monitoring of results of quality control procedures during collection and processing;
- (g) Monitoring of expenditures against progress; and
- (h) Development, implementation and monitoring of contingency plans.

623. Where applicable, the activities outlined in paragraph 622 above should be at different geographic levels or aggregations that are useful for each level of management, including those suitable for supervising and correcting the actions of groups or individuals involved.

624. Accuracy is multidimensional. Indicators may touch on many aspects of census collection, processing and estimation. Primary areas of assessment include the following:

- (a) Assessment of coverage error, both under-coverage and over-coverage. In most countries this is done via a post-enumeration coverage survey and using dual system estimation methods.⁶⁰ Comparisons with official population estimates, typically projections from the previous census, are often also used as an assessment tool;
- (b) Non-response rates and imputation rates (including imputation rate of total non-response);
- (c) Data capture error rates, coding error rates;
- (d) For register-based/combined censuses, linkage error rates (i.e. errors in the record linkage process: e.g. false positives/negatives);
- (e) For register-based/combined censuses, editing rate i.e. the number of corrections needed to resolve inconsistencies between sources at micro-data level;
- (f) Measures of sampling error, where applicable; and
- (g) Any other serious accuracy or consistency problems with the results. This relates closely to coherence and allows for the possibility that problems were experienced with a particular aspect of the census resulting in a need for caution in using results.

9.6.4 Managing timeliness

625. Planned timeliness is a decision to be made when setting quality standards, refined, if necessary, during quality design, if resources or practicalities indicate that the ideal timeframes are not achievable. There are often important trade-offs to be made with accuracy and relevance. More timely information may be more relevant but less accurate. So, although timeliness is important it is not an unconditional objective. Many of the factors described under accuracy apply equally here. Timeliness is also directly affected by fundamental time requirements to collect and process census data giving an adequate allowance for operational quality control and quality assurance and improvement. It might be tempting to aim for challenging timeframes for outputs at the early stages in census preparations, but

⁶⁰ In alternative to the Dual System Estimation method, the Triple System Modelling could be considered in case the dependence between the census and the post-enumeration survey, cannot reasonably be considered low. See e.g. Bernard Baffour, James J. Brown and Peter W.F. Smith (2013), [An investigation of triple system estimators in censuses](#), Statistical Journal of the IAOS 29 (2013) 53–68; and Richard A. Griffin (2014), [Potential uses of administrative records for triple system modelling for estimation of census coverage error in 2020](#), Journal of Official Statistics, Vol. 30, No. 2, 2014, pp. 177–189.

these should be tempered by the experience gained from any quality evaluation of previous census operations.

626. Major information releases should have publication dates announced well in advance. This helps users plan and provides internal discipline in working within set time frames.

627. For customized/commissioned information retrieval services, the appropriate timeliness measure is the elapsed time between the receipt of a clear request and the delivery of the information product to the client. Service standards should be in place for such services and announced beforehand.

9.6.5 Managing accessibility

628. Census information must be readily accessible to users. Statistical information that users are unaware of, cannot locate, are unable to access, or cannot afford to purchase is of no value to them. In most statistical offices, corporate-wide dissemination policies and delivery systems will determine most aspects of accessibility. Decisions about output dissemination methods and policies are often made late in the census process, as the focus is often on the challenges of data collection and processing. This can lead to later time and resource pressures, to the detriment of accessibility. Explicitly setting aims and policies when setting quality targets for the other dimensions of quality can help reduce this impact, as it enables costs and development timescales to be better estimated during quality design.

629. In determining information product definition and design, managers should take careful account of client demands. Market research and client liaison will help determine these. The proposed aims and output designs, having been defined, can then be discussed with users, with appropriate modifications, in a controlled way. Whilst not strictly operational quality control or quality assurance and improvement, there are nonetheless parallels to these components in such discussions.

630. In today's world the Internet is the primary dissemination vehicle. It should include not only the data released but also information about the data (metadata) such as data quality statements and descriptions of the concepts, definitions and methods used. Use should also be made of appropriate links to the NSO's corporate dissemination vehicles.

631. Finally, as part of quality evaluation, client feedback should be monitored on the content of the output products and on the mode of dissemination with a view to future improvements.

632. The information needs of the analytic community present some particular requirements. Analysts often need access to microdata records to facilitate specific analyses. This presents special challenges in order to continue to respect the requirements for the maintenance of the confidentiality of census data. A number of means could be used to address these needs. Public use microdata files, typically a sample of census records that have been pre-screened to protect confidentiality can be valuable for analysts. Custom retrieval services where specific analyses, designed by external analysts, can be conducted by staff of the statistical office may meet the needs of some analysts.

9.6.6 Managing interpretability

633. Managing interpretability is primarily concerned with providing metadata. Information needed by users to understand census information falls under three broad headings: the concepts, definitions and classifications that underlie the data; the methods used to collect and process the data; and measures of data quality. The first of these also relates to coherence.

634. A further aid to users is the interpretation of census information as it is released. Commentary on the primary messages that the data contains can assist users in initial understanding of the information. As with accessibility, interpretability can be addressed in all five components of the quality management framework.

635. As for register-based/combined censuses, the complexity of administrative data may impact the accessibility and clarity output quality dimension from a data user's perspective. That is, users of the census data may find it difficult to understand the impact on the quality of the census outputs derived from factors such as the use of different concepts, definitions, reference dates, or the fact of being subject to lags in the updating of information and, more generally, from the fact that administrative data have not been collected for statistical purposes. Countries are encouraged to provide users with the relevant information on the use of administrative data and on the impact this may have on the quality of census outputs, especially when transitioning from a field-based to a register-based census.

9.6.7 Managing coherence

636. Coherence is multidimensional. Objectives for coherence of census data include:

- (a) Coherence of census data within itself;
- (b) Coherence with data and information from prior censuses;
- (c) Coherence with other statistical information available from the statistical office on the same or related phenomena; and
- (d) Coherence with information from censuses of other countries.

637. Aims for coherence should be set when setting quality standards as these will drive decisions during quality design. For example, there will be trade-offs to be made about the degree with which to standardise across programmes within NSOs and, for international standards, between countries. Subsequent decisions during quality design will need to be made about the development and use of standard frameworks, concepts, variables, classifications and nomenclature for all subject matters that are measured.

638. The census must ensure that the process of measurement does not introduce inconsistency between its data and that from other sources. Managers of other statistical programmes are, of course, equally responsible for this aspect of coherence.

639. There is usually less of an emphasis on coherence during operational quality control, but the emphasis increases again during quality assurance and improvement when the emerging census results can be compared with other available sources (whether published statistics or administrative data, for example). This can highlight differences in interpretation of definitions between statistical outputs, or, indeed, errors in either the census or other

surveys. Although this is more correctly concerned with managing accuracy, there is an overlap with managing coherence when issues of definition and their interpretation arise.

640. After publication of census results, analysis of those data that focuses on the comparison and integration of information between the census and other sources will give insights to inform quality evaluation and reporting and the degree to which quality has been achieved in coherence. The census data should be analysed for domains and aggregations, both large and small that are considered important. Such analysis should consider totals, distributions, relations between variables or sets of variables, relations between domains, growth rates, as appropriate. Comparisons should be made to data from prior censuses and to comparable survey data.

641. While other surveys or other sources of data covering census topics certainly offer views on the quality of the census, there are limitations to the information they provide and the comparisons that can be made according to the sources. Therefore, data users should be guided in exercising caution in how they interpret differences.

642. NSOs should explain which population comparisons are possible, and provide guidance on how to interpret differences between demographic benchmarks and census results. E.g. results from the Labour Force Survey data are generally used for making comparisons about the population labour market (economic activity) status. In this case, users should be helped in interpreting differences due to data collection and questions design.

643. As for register-based/combined censuses, the administrative sources may be subject to changes over time and inconsistencies in the way the data are collected across segments of the population. It might also happen that a new data source (an administrative register or any other source) is chosen for a particular census variable (e.g. in The Netherlands the educational attainment register (integrated source from several registers) has replaced the Labour Force Survey as a source for educational attainment. The impact of these changes on census results should be carefully evaluated and explained to census users.

9.6.8 Operational quality control

9.6.8.1 Census activities requiring operational quality control

644. A number of census processes involve massive operations, either manual or automated. Examples of such operations include dwelling listing operations, preparation of maps, printing of census materials, enumeration procedures, data capture and editing and coding (both manual and automated). Specific operational quality control procedures are particularly relevant and important for each of these.

645. Dwelling listing operations are commonly conducted by enumerators prior to delivery, or as questionnaires are dropped off at dwellings. It is particularly important at this stage to minimize both under-coverage and over-coverage of dwellings. To that end, enumerators' procedures should include quality checks to ensure the quality of their work. As well, supervisors should have planned spot checks as listing work starts, and planned quality control procedures should be applied as work is completed.

646. When census questionnaires are delivered, it is usually done on the basis of a list of addresses extracted from an address register. Address register maintenance itself will involve

several steps of quality management. Nonetheless, prior to its use, the address list should be validated to confirm that each dwelling exists and is included with correct address and geo-coding information, and that no non-dwellings are included. Allowance should be made for dwellings under construction that may be completed prior to the census. If not done via administrative sources, including the use of postal code information and addresses, this validation requires a large operation in the field and is subject to errors. Since this work must be parcelled out to individual enumerators in batches, acceptance sampling quality control procedures will be appropriate. Again, spot-checking and close communications with supervisors will be important quality assurance steps.

647. Enumeration, whether by interviewing or by collecting completed questionnaires from the dwellings on the list, is similar. Usually one enumerator is responsible for all work in an enumeration area and will be required to implement a number of quality checks on their own work. Further acceptance sampling procedures, implemented by supervisors, will ensure the quality of various aspects of the enumerators' work.

648. Data processing is one of the crucial steps by which raw census data are converted into a complete edited and coded master file useable for tabulations. In some of these processes the data are being transformed (for example data capture, coding) while in others the data are being corrected (for example edit and imputation). New errors can occur in any of these operations.

649. Countries may find it useful to use applications to provide tools that help ensure data quality, such as:

- (a) A collection application that can provide consistency and completeness checks, automatic skips and alert messages, and GPS (Global Positioning System) coordinates of the household dwelling to check the enumerator's presence;
- (b) A control application for the enumeration supervisor that provides the results above as well as other summary information about each enumerator's cases, including information that signals outliers or other unexpected results;
- (c) A data transfer application at central level, with all the necessary security features (data encryption, data bandwidth fluidity) to avoid data loss in the field;
- (d) A web application/dashboard for monitoring data quality via real-time indicators for management teams in the field and at central level.

9.6.8.2 Operational quality control methods

650. Clearly a census operational quality control regime comprises a wide variety of mechanisms and processes acting at various levels throughout the census programme. An important technique applicable in many census operations is statistical quality control. It primarily addresses accuracy, although depending on the operation it may also address other elements of quality. What follows is some brief basic information on quality control. For a complete explanation of these methods, the reader should refer to a standard text or reference such as Duncan (1986), Hald (1981) or Schilling (2017).⁶¹

⁶¹ Duncan, A.J. 1986. *Quality Control and Industrial Statistics*. Fifth edition. R.D. Irwin Inc., Illinois. Hald, A. 1981. *Statistical Theory of Sampling Inspection by Attributes*. Academic Press, New York. Schilling, E.G., & Neubauer, D.V. (2017). [Acceptance Sampling in Quality Control \(3rd ed.\)](#). Chapman and Hall/CRC.

651. The success of any operational quality control programme depends on laying down quality standards or requirements; determining appropriate verification techniques; measuring quality; and providing for timely feedback from the results of the programme so that effective corrective action may be taken.

652. Sample verification, complete (or 100 per cent) verification, or spot checks are the usual quality control techniques adopted in censuses.

653. Verification can be dependent or independent. In dependent verification, a verifier assesses the work of a census worker by examining that work. However, the verifier may be influenced by the results obtained in the initial operation. In independent verification a job is verified independently by a verifier without reference to the original work. The original results and those of the verifier are compared; if the results agree then the work is considered correct; if not, a third, often expert, verifier may resolve the difference.

654. For each operation, the quality control programme should determine which approach is appropriate and will achieve the goals of the programme while also staying within the budget.⁶²

9.6.9 Questionnaire design

655. The design of the census questionnaire(s) takes into account the statistical requirements of the data users, administrative requirements of the census, the requirements for data processing, as well as the characteristics of the population. Because censuses often involve multiple collection methods, testing must be performed to ensure that questionnaires will work properly for all applicable methods. The questionnaire should include elements aimed at ensuring accurate coverage of the population (for example who to include, who not to include, where to be enumerated). Qualitative testing is required to check these issues and should cover an adequate variety of situations encountered in the population. In terms of content, quality management approaches for a census are similar to those for a sample-based survey. Qualitative tests and cognitive interviews should be planned to ensure that questions are clear and properly understood not only by the general population but also by any special groups to whom certain questions are targeted or for whom there are particular issues of concern (for example, the elderly, persons living alone, or those with language difficulties).

656. Web-based questionnaires can provide options not available to their printed counterparts. These options can ensure greater quality in terms of question response and coverage. Checks on such serve as opportunities for detecting inconsistencies and presenting them to respondents for correction or confirmation.

⁶² Complete verification theoretically assures a complete check of the work in an operation. However, verifying all items can be time consuming and very costly. In many operations, complete verification is only used as the operation is starting up. Once it is shown that the quality is meeting the required standard, sample verification procedures may be implemented. Sample verification reduces the cost and can yield results almost as reliable as 100 per cent verification, if the sample is selected using probability sampling. Acceptance sampling is a quality control technique that establishes a sample design and decision rules to determine which batches are acceptable or unacceptable, and is usually used in jobs like manual editing, coding, and key entry data capture where work is assembled in lots or batches. Each batch is either accepted or rejected on the basis of the verification of a sample chosen from the batch based on probability methods. The sampling plan is designed so as to provide an outgoing error rate below a certain value, called the average outgoing quality limit. This method is applicable to processes which are fairly predictable in terms of their outputs, and which consistently produce output that meets the quality standard – the process is then ‘in control’. Census operations where this may be applicable include: the printing of forms; automated data capture via intelligent character recognition (ICR) or optical mark recognition (OMR); and the scanning of forms for ICR/OMR.

657. The design of electronic questionnaires for data collection via CAPI, CAWI and CATI methods require additional considerations to make the data entry process intuitive for the enumerator or respondent. Some essential functional features that should be used in the design of the electronic questionnaires include:

- (a) Questionnaire navigation should allow enumerators/respondents to move relatively freely through the questionnaire in order to enter responses in the most effective way, giving the ability to pause and resume at the last answered question with a "save and continue later" functionality. On the other hand, the design should impose some restrictions on navigation, for example, by preventing enumerators/respondents from entering certain questions without having first obtained responses from other, earlier, questions;
- (b) Skipping/automated routing is one of the most important error reducing features in electronic questionnaires. It obviates responding to questions that should be skipped. It also avoids the converse – skipping questions that should be asked, thus minimizing the need to impute for missing responses. Basic skips allow the response to a particular question to determine whether or not the next question is relevant, while complex skips are those that either use responses from several previous questions to determine whether the next question is relevant;
- (c) Pre-coding allows relevant questions to be answered from pre-coded drop-down menus. In some cases, drop-down menus could be altered dynamically, depending on previous responses, so that the interviewer is never presented with an impossible response code;
- (d) Validation: Real-time data validation checks can correct inadmissible or inconsistent responses that could be the result of either interviewer or respondent error, thus reducing the amount of post-enumeration data edits.

658. The testing programme should ensure that these features are thoroughly tested prior to questionnaire finalization.

659. All of these factors should be tested on a small scale (qualitative testing) and then on a large one with a significant number of respondents. A large-scale test can detect a variety of potential issues that qualitative testing cannot. Such tests also make it possible to compare different design and format possibilities via split sample designs. The large-scale test also facilitates assessing how well the questionnaire fits into other census operations (for example collection, data input, coding).

660. The design and presentation of a web-based questionnaire to the respondent will differ from the paper version. Special care must be taken to minimize any potential mode effects arising from differences between the paper and electronic versions of the questionnaire, and between the different modes of compilation of electronic questionnaires (e.g. between CAWI i.e. self-enumeration and CAPI where an interview will be conducted). Hence, this should be an important topic to be considered in the testing programme for the questionnaire.

9.6.10 Measuring record linkage quality

661. One key aspect in the usage of administrative sources for censuses is the linkage process of various data sources. Often, determining the quality of a dataset will require its

linkage to another dataset for comparison. Also, if the NSO relies on more than one source of administrative data for its census, it is necessary to be able to link data from the different sources at the unit/record level. The degree of success of such linkage will affect both the accuracy and the relevance of the input data.

662. A common unique identifier reduces the effort required to link the data by making it easier to evaluate the completeness and accuracy of matching. In the absence of such an identifier, it is more difficult to link data reliably. In this case, record linkage using multiple variables that are common to the units in each data source (typically, name, date of birth, sex and address) may be possible. In this case, the NSO needs to be assured that such “matching” variables are of sufficient quality in all sources. Such a process may require deterministic and probabilistic record linkage strategies.

663. This process may take place inside the NSO as part of the process stage, or outside the NSO, e.g. within the population register. In the case of record linkage taking place outside the NSO, a thorough documentation of the processes by the data-providing agency is crucial for quality assessment. Even though the existence and usage of universal identifiers should ensure the high quality of the record linkage performed by the third-party agency, the quality of it should be assessed in the source and data stage through the use of metadata and information provided by the data-providing agency. In addition, a cross-validation of the data provided is possible in the processing stage, if the data structure allows it. If record linkage is carried out inside the NSO as part of the census, the NSO has much more direct control over the process.

664. The quality of record linkage can be assessed by statistical analysis, clerical reviews, or additional surveys. These allow for the calculation of quality measures such as false positives/negatives and recall value (see Quality measures for record linkage). However, regardless of the stage, a detailed and transparent measurement and reporting of record linkage processes’ quality is important in order to ensure the quality of the final product, a detailed and transparent documentation is vital to quality assessment and potential future improvements.

Quality measures for record linkage in the Germany register-based population census test

665. In the case of the register-based population census test in Germany, a 12 percent sample of the German population was used to compare the results of the original 2022 census survey with that of a probabilistic record linkage model.

666. In this process, the record linkage aims at matching the population register to records from ten administrative sources using a probabilistic record linkage strategy. The use of survey data from the 2022 census as external reference data allows for the calculation of quality measures for each administrative source and for the census database as a whole. The record linkage process is complemented by clerical reviews of potential matches and by statistical analysis, in order to optimize and validate the record linkage model.

667. The confusion matrix ([Table 1](#)) is the baseline for the calculation of quality measures in record linkage using external reference data.

668. The basic classification problem in record linkage is the match of records present in different sources and referred to the same person. In this perspective, the record linkage

process aims at matching units already present into the census dataset (e.g. in the population register) with units in different administrative sources, and at associating them with the same code or id.

Table 1
Confusion matrix in record linkage

		Classification Model	
		Match (Predicted positive)	Non-Match (Predicted negative)
Actual population/ Reference data	Existence (Positive)	True Positives (TP)	False Negatives (FN)
	Non-Existence (Negative)	False Positives (FP)	True Negatives (TN)

669. In a simplified form, a classification decision exists for every record representing a person in the census database regardless of whether a record matches another record in a different source or not. The reference data, e.g. a survey or another administrative source, serves as the external benchmark. Through the cross-tabulation between the variable indicating the existence of the unit in the reference data and the variable indicating the of the classification model, it is possible to categorize the data under four cases. From these four cases, the quality measures precision, recall and accuracy can be derived (Table 2).

Table 2
Quality measures for record linkage

Precision	$\frac{TP}{TP + FP}$
Recall	$\frac{TP}{TP + FN}$
Accuracy	$\frac{TP + TN}{TP + TN + FN + FP}$

9.6.11 Measuring imputation quality in register-based censuses

670. The need for data editing and imputation does not decrease when administrative sources are used, as the existence of multiple data sources can be in itself a source of inconsistencies (when several register sources are used simultaneously to define, for each statistical unit, the value of the relevant variable, it becomes necessary to include rules for prioritization between different sources in the event of contradictory data). Under-coverage of data sources, data linkage problems and the use of sample data can lead to missing values that might require specific solutions. Improper imputation methods can lead to erroneous results. Therefore, an increasing need arises to assess the quality of data editing and imputation procedures.

671. An important aspect of quality assurance for register-based censuses is imputation of missing values. This process is especially relevant for census variables that are taken from a non-integral source (i.e. a source that does not cover the entire population). In that case, mathematical methods are often used to make inferences for the population, by using deterministic and probabilistic imputation and weighting.

672. For a sound interpretation of results, it is important to disseminate imputation rates for each cross-tabulation in the publication. Results for certain cross-tabulations that are insufficiently covered by any data source might not be published at all. For instance, Statistics Netherlands uses Labour Force Surveys as a source for the census variable Occupation. Any cell value that is covered by less than 25 observations is not published, due to a lack of confidence.

673. If imputation or weighting is applied, the accuracy of these methods should be evaluated. Several methods are available. The distribution of a variable with and without imputations can be compared, comparisons can be made with other sources and mathematical methods can be applied. The latter includes: 1) analytical expressions for estimating confidence intervals, 2) resampling techniques like Bootstrapping and Jackknife and 3) cross-validation methods that apply estimation methods to observed records to assess estimation error.

674. The assessment of imputation quality is not limited to the accuracy of individual imputations, but especially for a census it is also relevant to consider implications for all possible cross-tabulations, e.g. the number of 53 year-old, females with a certain educational level. In this respect, Chambers (2006) defines four criteria to evaluate imputation accuracy: 1) predictive accuracy 2) distributional accuracy; 3) estimation accuracy and 4) imputation plausibility.⁶³

⁶³For further details, see Ray Chambers (2006): "Evaluation Criteria for Editing and Imputation in EUREDIT". In: [Statistical Data Editing. Vol. 3](#). United Nations Statistical Commission, 2006, pp. 17–27.

Box 1

Use of imputation for missing values in a register: the imputation of educational attainment in the Dutch register-based census

In the Dutch register-based census, the variable “educational attainment” is derived from the so-called Educational Attainment File (EAF).

The coverage of this data sources is selective as the data cover approximately two thirds of the population; while younger persons are integrally observed, older persons are covered on a sample basis. All missing educational levels are estimated at micro level. This is done by a so-called multinomial logistic regression model, which takes the selectivity of data collection into account. The model has been exclusively designed for the census. This means that the imputed educational levels are not used for any other purpose.

A first step in the validation consists of a logical check of the estimated model. The estimated regression coefficients should not be extremely small or high, as this might point out to technical difficulties in estimating the model. Moreover, the estimated regression coefficient should conform to logical expectations, e.g. a positive correlation between income and educational level.

The final validation consists of a thorough comparison of the results with other educational statistics. Comparisons are not only made for the Dutch population as a whole, but also for detailed subpopulations, e.g. the distribution of the educational levels by geographic area, sex and age. Any significant deviations from other publications should be explainable.⁶⁴

9.6.12 Managing coverage error

675. Coverage is a critical element of accuracy. It has a direct influence on the quality of population counts and an indirect impact on the quality of all other data produced by the census. Thus, the coverage concerns should be taken into consideration in the design and implementation of most census activities. Enumeration area boundaries should be carefully defined and mapped to ensure that no area is omitted or included twice. Instructions and training on dwelling coverage for staff engaged in dwelling listing and enumeration should be clear, explicit and easy to understand. The target population must be well defined and related instructions and questions for both interviewers and respondents need to be carefully developed and thoroughly tested.

676. Clarity and simplicity of instructions concerning place of residence for enumeration is vital to help ensure people are enumerated exactly once and at the correct location. This is particularly important in minimizing over-coverage. Questionnaires should include guidance or questions to assist with situations where it may be unclear whether certain persons should be included or not. Special procedures should be developed for difficult to enumerate population groups (for example remote areas, collectives or group quarters, persons with literacy or language difficulties). Processing procedures should be developed with a view to

⁶⁴For further detail see: Statistics Netherlands (2017), [Mass imputation for Census estimation](#), and Jacco Daalmans (2017), [Mass imputation for Census estimation](#), Statistics Netherlands Discussion paper 2017/4.

minimizing the risk of erroneously cancelling, losing or artificially creating households. A well-crafted publicity campaign can play an important role in promoting census awareness and response, thus helping minimizing coverage error.

677. All of these steps, along with appropriate training, supervisory checks and quality control during operations will help minimize coverage error. Nonetheless some coverage error is unavoidable. Hence it is important to measure, analyse and report on coverage error. This is best done via an independent post-enumeration survey of a sample of census areas or via a Reverse Record Check methodology. Results of coverage studies provide an important evaluation of the current census and can also provide valuable guidance for the next census. Results in conjunction with the census counts themselves are a critical input for population estimation programmes. Analysis of census results vis-à-vis demographic projections of the population from the previous census can also be informative.

678. In the case of a register-based census (or of the register-based component of a combined census), the issue of over-coverage of registers is frequently considered. If, for example, people have not officially declared their emigration, their records may be kept unchanged in administrative registers, and consequently be the cause of over-coverage in the census. In Slovenia, a special survey with a focus on plausible unregistered emigration was conducted in 2016.⁶⁵ On the other hand, when the unregistered population is deemed significant, the under-coverage of registers is also assessed. In the Netherlands, for the 2010 census round, the difference between the registered population and the usual resident population was measured by estimating the under-coverage of the population register through a capture-recapture methodology (applied to the Population Register linked to the Employment Register and the Crime Suspects Register).

679. Another possible means of measuring coverage errors in register-based censuses is to create a residency index on the basis of the records held in multiple registers in order to determine a so-called “signs of life” score (see paragraph 766 for the “Signs of life method”). The approach is to define for all possible residents the “sign of life” as a binary score (with a value 0 or 1) for each record in each register. Using these signs of life as explanatory variables, it is possible to build a model to estimate the size of under- and over-coverage.

9.6.13 Systems development

680. Systems development is a cross-cutting topic which can have a major impact on quality. In particular, the related dimensions of quality are accuracy, timeliness and accessibility. A modern census makes use of numerous automated systems to operate, manage and control a range of activities from the field staff payroll to data capture, edit and imputation, coding, dissemination and others. This pervasive influence makes it very important that an integrated view be taken in the design of the overall architecture as well as the individual design and implementation of systems.

⁶⁵The sample frame consisted of persons for whom labour force status had to be imputed in the 2015 Census (15,500 persons); the second sample group consisted of persons marked in the administrative data (CPR) as non-residents, but where data on their labour force status in Slovenia could be found in at least one out of the nine sources (2,700 persons).

681. A standard methodology for systems development should be implemented and should include steps such as:

- (a) Overall system architecture design;
- (b) Design and analysis of individual systems;
- (c) Programming or building of systems;
- (d) Functional testing of components and then of systems;
- (e) Testing of interfaces between systems;
- (f) Volume testing and user acceptance testing;
- (g) System delivery and implementation; and
- (h) Evaluation.

682. This should be done within a configuration management approach to:

- (a) Manage change;
- (b) Accommodate the re-use of standards and best practices;
- (c) Ensure that all requirements remain clear and valid;
- (d) Communicate each of these to developers and users promptly and precisely; and
- (e) Ensure that results conform to requirements.

683. Specifications should be well written and carefully analysed to produce functional requirements. A standardized approach for change management is required. Ensuring the interoperability of different systems that can communicate with each other is particularly important. At each stage, the performance should be evaluated, and outputs should be checked to conform to requirements. Many of the systems developed for a census will be used by numerous key entry, coding, editing and other clerical staff. Consequently, it is very important that user interfaces be carefully designed and thoroughly tested. More generally, a well-developed standardized testing strategy should be applied throughout in an integrated fashion.

684. The transition from paper to digital data collection introduces a new operation: that of developing a data capture system. Specific quality concerns related to the development of Computer Assisted Personal Interviewing (CAPI) applications and Computer Assisted Web Interviewing (CAWI) applications have been discussed in the section on Questionnaire design.

685. Consideration should be given to the development of an IT field management system to handle tasks that are not directly related to the interview. This will include logging in to the system, the ability to assign and receive assignments, complete and review questionnaires, track progress, and the ability to synchronize data. Once an enumerator is logged into the operational control system and has selected an assignment the questionnaire can be prefilled with data such as the enumerator and geographical codes which will reduce human error. Additionally, it can be helpful to prefill paradata such as device id, interview start time and software versions.

9.6.14 Methods of census evaluation

686. Given the importance of the accuracy of census statistics, and the budgets involved, it is common for census programmes to undertake extensive evaluation of the census process. Census coverage and content evaluation are a particular focus of such exercises, but they often also cover wider issues such as the effectiveness of publicity campaigns, project management or contract management.

9.6.14.1 Coverage evaluation

687. In some countries the evaluation of census coverage forms an integral part of the census quality assurance and improvement component of the quality management framework, and feeds directly into the published census results. In other countries, it is a separate exercise, with the results used to adjust the published census results when producing subsequent population estimates.

688. Both gross and net error must be taken into account in developing the overall evaluation plan. Gross coverage error in a census is defined as the total of all persons omitted, duplicated, or erroneously enumerated. Net coverage error takes into account the underestimates due to omissions and the overestimates due to duplications and erroneous inclusions. When omissions exceed the sum of duplications and erroneous inclusions, a net undercount is said to exist; otherwise, a net over-count results. Similarly, both gross and net content errors have to be considered in the evaluation design.

689. The choice of coverage evaluation methods to be used depends upon the evaluation objectives and the method of undertaking the census (that is, whether based on field work or population registers). Common methods (that can be applied to both field and register based censuses) include:

- (a) Post-enumeration surveys to measure the accuracy of the census (by independently surveying a sample of the population, the post-enumeration survey estimates the proportion of people and housing units potentially missed or counted erroneously in the census, usually within a Dual System Estimation model or so-called capture-recapture method, with the PES being the second "capture" while the census itself is the first "capture");
- (b) Comparisons of results with other data sources including previous censuses, current household surveys and/or administrative records;
- (c) Demographic analysis;
- (d) Ethnographic and social network methods to study the effects of mobility on census coverage or to measure census coverage of specific sub-populations.

690. For register-based censuses, it is also possible to compare data from a past traditional census with register data from the same time. Data linkage at the individual level can enable estimation of both under and over coverage. Longitudinal databases would enable such estimates to be carried forward, even though this would become less and less relevant the further away in time the last traditional census has been conducted.

9.6.14.2 Content evaluation

691. Common methods for content evaluation include:

- (a) Post-census surveys designed to measure error in specific census questions (see a case-study below);
- (b) Record-checking, in which individual census records are matched against alternative sources and specific data items are checked for accuracy;
- (c) Quality control techniques such as internal consistency checks;
- (d) Surveys to determine customer satisfaction with data collection instruments or questionnaire assistance; and
- (e) Focus group interviews to learn how or why respondents behave in a certain way.

Box 2

The use of a post-enumeration survey to assess content error (UK Census Quality Survey)

The Census Quality Survey (CQS) used in the UK is a voluntary post-enumeration re-interview survey which asks each of the census questions again. It is a much smaller operation than census collection, using trained interviewers.

The UK ran a CQS after their 2021 Census. Invitation letters were sent to 110,000 households asking them to contact headquarters to arrange an interview. The achieved number of interviews was 8,700 households containing 16,000 residents: a household response rate of 7.9 per cent, sufficient for analysis.

The achieved sample differed demographically from the known population, and so weighting was used to produce more representative results. For individuals, this was based on age, sex, ethnic group, whether the respondent lived in England or Wales, and whether the individual's response was given by proxy. For household-level questions, weighting was based on the demographics of residents in the household, plus the household's accommodation type and whether the household responded to the census online or on paper.

An agreement rate and associated confidence interval were calculated for each question.

Where people gave different answers, this might have been a mistake in completing the census or a mistake answering the survey. This means the CQS does not attempt to give an exact measure of "respondent error" in the census, but does indicate which questions might be more subject to that error, and the possible scale of such error.

Trained interviewers carried out the CQS, and took extra measures to help people interpret the questions correctly: explaining categories and definitions more clearly than they may have noticed when they filled in their own census form.

The CQS results were not used to amend the final data, but were published to help users understand likely quality issues.

The highest agreement rate overall in 2021 was for sex, at 99.3 per cent. The lowest was for national identity, at 59.2 per cent. Agreement rates tend to be lower for questions that are subjective or harder to evaluate: where the answer changes over time, and where there are more, or finer-grained, options.⁶⁶

Examples of a household and an individual question:

Landlord

The household section of the Census 2021 questionnaire asked people who did not own their own home who their landlord was, choosing from one of six options.

The weighted agreement rate for this question was 88.0 per cent.

The most common disagreement was where respondents stated that they rent from a "council/local authority" on one survey, but on the other survey they say they rent from a "housing association, housing co-operative, charitable trust, registered social landlord".

The disagreements may simply reflect uncertainty of the respondents, as social housing could be allocated by applying to the local council, and this may have been clarified by the interviewer.

The issue of respondent error on this question in the 2021 Census is noted in the [Housing quality information for Census 2021 methodology](#).

National Identity

Respondents were asked whether they identified as British, English, Welsh, Scottish, Northern Irish, or any other national identity. Respondents could select as many options as they wanted.

The agreement rate for this question was 59.2 per cent, the lowest of any question on the survey. This was driven almost entirely by respondents disagreeing on whether they identify as British, English, or both British and English. Three-quarters of disagreements in the CQS data are among and between these three categories.

Agreement rates vastly improve to 93.1 per cent when generalising to just three groups – "any individual or combination of UK national identities", "any UK plus 'other'" and "(just) other". In this case, most disagreement occurs when people identified with just UK national identities on the census, but UK plus another nationality on the CQS. This may be the result of CQS interviewers clarifying the question and probing for further categories of response.

9.6.14.3 Designing an evaluation programme

692. The following basic recommendations can be applied to any evaluation programme:

- (a) Begin planning the evaluation programme early in the census cycle. Early planning and design of a structured evaluation programme allows appropriate consideration and accommodation of evaluation and experiment needs during the census design;

⁶⁶ Office for National Statistics (2023). [Census Quality Survey for Census 2021 in England and Wales](#).

- (b) Decide the high-level scope and focus of research programmes before developing research proposals. Define general selection guidelines or criteria, select research topics, and identify high-level research questions before designing the evaluations and experiments. Identify areas to meet the needs of external data users and internal census planners and set evaluation priorities accordingly;
- (c) Develop study plans for each evaluation and experiment. These project-level plans then become the designated baseline documentation for achieving programme research goals;
- (d) Develop a standardized Change Control Plan, which describes a protocol to initiate a change process. Recommendations for change (including the reasons for the change and critical implications) are submitted to a Change Control Board which then assesses implications of the change and approves or disapproves it;
- (e) Develop a milestone schedule for planning, designing and implementing the research programme. Include in the milestone schedule dates for issuing results of the operational assessments, evaluations and experiments. Changes to the schedule should also go through the Change Control process;
- (f) Anticipate delays or the need to cancel some planned evaluations. During a census, staff may become overburdened with either too much evaluation work or too much of a combination of evaluation and production work. Attrition of project managers is often inevitable and can also be a reason to delay or cancel evaluations;
- (g) Explore ways to incorporate real-time evaluations during the course of the census.

Chapter 10 Census costs and benefits

10.1 Planning and monitoring costs

693. With wide variation in both census design and financial practices among countries, no single approach to census budgeting and cost control can be recommended, but some key principles are common to all situations.

694. First, an effective budget should be based on a list of all the key components of the census operation. Irrespective of the census design, these components will generally correspond to the eight phases of the Generic Statistical Business Process Model (GSBPM),⁶⁷ which may therefore serve as a helpful basis both for designing the budget and for monitoring actual costs. The relative weight of each of these phases among the total census budget will vary significantly according to the census design, and this may provide useful information to guide decisions about future censuses.

695. Second, if a country's census legislation requires the census plan and associated budget to be approved by Government, it is essential to obtain such approval and to secure the necessary resources from the national budget well in advance of the start of census operations. Delays in obtaining legal approval and budget allocations can have very significant adverse effects on census outcomes, including increased costs, reduced public trust and even postponement of the census, so it is critical that adequate lead times are incorporated into census planning from the outset. Such lead times vary by country, so no specific recommended time frame can be given. Planning for obtaining approvals should include a consideration of the possible impacts of changes in government, the possibility that a census plan or draft budget may be rejected, and the time needed to prepare revised versions. As detailed in [Chapter 11](#), unforeseen circumstances can lead to government shutdowns or other legislative delays (for example as was experienced in many countries in connection with the Covid-19 pandemic). To the greatest extent possible, lead times for obtaining budgetary approval should include a buffer for such possible delays so that they do not prevent the timely receipt of resources for the census.

696. Third, actual costs should be recorded carefully, with costs allocated to the corresponding part of the planned budget. Such recording of census costs is important not only for monitoring adherence to the budget of the current census, but also for providing information to guide development of both the design of, and the budget for, future censuses; albeit with the understanding that actual costs will change with trends in prices, wages, population structure and census methodology. Accurate recording of costs is facilitated by robust financial management and accounting systems, which have the associated advantages of ensuring rapid payments to staff and suppliers and enabling efficient auditing.

697. The complexity of carrying out a census means that the operations and their associated costs will rarely align exactly with plans. Changes in the prices of major components of census costs should be monitored on a regular basis, adjusting the census budget or modifying the

⁶⁷ UNECE (2025). [Generic Statistical Business Process Model GSBPM, version 5.2](#). The eight phases are: Specify needs; Design; Build; Collect; Process; Analyze; Disseminate; Evaluate.

census plans accordingly. The development of the census budget is usually an incremental process in which rough initial estimates are replaced gradually by more detailed and precise statements of resource requirements. Sufficient contingency should be built into the system to accommodate unexpected additional costs and increases in planned costs (see Chapter 11). As far as possible the approach should be discussed and agreed with funding agencies in advance, and any risks associated with changes of costs assessed fully.

698. Where some or all of the census data are obtained from administrative sources, or where administrative sources are used in support of other census functions, the task of estimating and evaluating census costs may be complicated. Depending on both the funding models for these sources and the goals of the cost-accounting operations, it may be appropriate to record the whole or part of the cost of these sources, or to calculate just the costs of those operations required to prepare data for the census.

699. Similarly, in NSOs that use or are moving towards an integrated system of population and migration statistics, it may be difficult to identify those specific costs that are attributable to the census as distinct from ongoing costs of regular population and migration statistics, or operating costs of the NSO as a whole.

700. Whatever decisions are made regarding the allocation of costs, the approach taken should be made as transparent as possible.

701. Given the potential for wide variation in such decisions, countries must be cautious of making international comparisons of census costs. Differences in census content, organization and operations, as well as different approaches to cost accounting, can make such comparisons difficult or misleading.

10.2 Managing and controlling costs

702. Each component or phase of the scheme used to design the census plan and budget (whether phases of the GSBPM or other organizing framework) should be analyzed separately in terms of planned and incurred costs. This will permit each phase to be scrutinized for ways to manage and control costs.

703. Costs may be optimized by harnessing the latest available technologies for collecting, storing, processing and disseminating census data, as well as for monitoring and managing census operations (see chapters on technology, dissemination and geospatial information for more on each of these areas). However, decisions to adopt new technologies should be made only after evaluating carefully the costs and benefits of possible options. In some cases, the cost-savings arising from a change in methodology such as adopting a new technological solution may only be realized after some time, which can be many years, or when applied at scale. This may be the case, for example, when a new technological solution requires initial investment in expensive hardware or software or staff training. Certain cost-saving technological solutions might introduce dependency on a particular supplier or product, and the risks entailed in this should be considered very carefully.

704. Some possible avenues to mitigate these risks while benefiting from the cost-saving potential of technology include leasing rather than purchasing equipment; sharing equipment among countries; or reaching agreements with other entities, such as government

agencies or educational institutions, to purchase used census equipment when no longer needed.

705. Outsourcing elements of the census is another potential cost-saving option (see section 4.4).

706. An important means of promoting cost awareness within the census office and thereby helping to keep costs under control is to involve administrative and supervisory staff in the task of estimating and monitoring costs locally.

10.3 Assessing the benefits of the census

707. Census offices may be required, whether by law or by public demand, to demonstrate the benefits of the census. This can aid in justifying the often very expensive undertaking of a census to government and to the public, and can guide decisions about specific census products, by offering information on the benefits that they provide to be weighed against the marginal cost of their production.

708. Work under the Conference of European Statisticians on assessing and understanding the value of official statistics⁶⁸ has articulated the great challenges entailed in trying to enumerate the benefits of a census, especially when such assessment is intended to be quantified in monetary terms. While some countries have undertaken quantitative assessments of the benefits of their censuses, the methods used vary widely and no universal approach can be recommended.

709. It is, however, recommended to undertake a systematic assessment of the uses and benefits of census data and products, whether this assessment is quantitative or qualitative in nature. Such assessment can serve many purposes: helping to communicate the value added by the current census, which can in turn foster public and governmental support for future censuses; informing decisions around census content, methodology and dissemination products; helping to gain an understanding of the actual and potential users of census data; and prioritizing among different dissemination tools and services produced by the NSO in relation to the census.

710. Evaluation of the benefits of a census could include comparisons between outcomes that have been informed by census data, and those that might, hypothetically, arise in the absence of census data, where old, incomplete or non-official data sources (or no data) have to be used instead. They could also aim to identify cases in which census outputs have contributed directly to delivering or monitoring specific policy goals.

711. Since the social and economic benefits of a census are extremely difficult to quantify, a useful alternative or supplementary approach is to gather case studies highlighting uses of census data. These can serve an important communications purpose (see [Chapter 6](#)).

712. A comprehensive assessment of the benefits of a census should also keep in mind that it is not only the data and data products that may have value. The employment provided by the field operation, the economic impacts of census expenditures, the upskilling and

⁶⁸ Available at <https://unece.org/vos>

enhanced corporate knowledge of NSO staff, and the social cohesion that may be prompted by the national mobilization for a census, are some of the many indirect benefits that could be considered.

713. The approach(es) taken to assess the benefits of a census should, as with the costs, be documented clearly and transparently and made public.

Chapter 11 **Emergency preparedness and contingency planning**

11.1 Introduction

714. The proper conduct of a population and/or housing census requires thorough planning which often spans years of work by dedicated and knowledgeable staff. However, those plans can be interrupted by unexpected and very serious events, such as natural disasters, pandemics, cyberthreats or war. These serious events can lead to a failure, cancellation, or delay to a census, if there is no time or ability within a country to respond properly. But it is not just these serious situations that can cause census-takers great grief. Given the enormous complexity of censuses, slower-moving disasters or incidents such as labour issues, anti-government sentiment or technical challenges can cause considerable problems for census managers.

715. Unfortunately, the context for census-taking is increasingly complex and risk-prone. Censuses are more complicated and expensive with new technologies and techniques being adopted. In addition, it seems that these more complex censuses are being administered in a world with added risks. For example, in the 2020 round of censuses, countries managed a worldwide pandemic, increased natural disasters (some associated with climate change), a new level of cybersecurity challenges and tight labour markets. Some countries had time to manage and adapt to the rapidly changing context, and others needed to adapt “on the fly”, with varying levels of capacity to do so.

716. As compared with direct enumeration-based censuses, register-based censuses face fewer risks. Register-based censuses do not involve the extensive planning, sizeable workforce and significant logistical challenges associated with their enumeration-based counterparts. They do, however, face their own challenges, such as availability, completeness and accuracy of administrative sources, data integration and maintenance, and public acceptability, and therefore still require emergency management and contingency planning.

717. In response, this chapter is intended to provide advice for countries wishing to manage issues and risks related to censuses. It is designed to support census-takers in all phases of a census but especially during high-risk periods such as during the field operations of an enumeration-based census. This chapter should also support all census managers, regardless of the type of census that they are undertaking in their country, or the nature of the risks with which they are faced.

11.2 A framework for emergency preparedness and contingency planning

718. Emergency preparedness and contingency planning is a large topic and could mean different things to different people. Essentially, the following is designed to show how to

avoid issues in the first place by effectively using the planning phase for risk mitigation, but also how to undertake contingency planning to support census takers when the inevitable happens: that is, when something goes wrong after the planning phase, when the census is being executed. The following is also designed to provide support and ideas for when, despite good planning and emergency management, a census has some sort of major breakdown of its intended plan.

11.2.1 Effective documentation of inherent risks to the conduct of a census, and their possible mitigations (risk registry)

719. To avoid or manage risk, one must first identify it. Census-takers should be aware of their most important risks and set up processes to document them, with a resulting “risk registry”. According to the International Organization for Standardization (ISO) in their risk management standard ISO 31000, risks are “...anything that generates uncertainty or creates a deviation from the expected”.

720. In a census context, these are issues that may threaten the proper execution of a census, the quality of the data, the security of the information collected, or the availability of human or financial resources. As one is planning to conduct a census – either enumeration-based, based on administrative data or registers, or combined – time should be dedicated to initial and follow-up discussions with the census management teams, in order to identify and manage risks. Ask yourselves, “what are the threats to this census”? Build upon previous experiences when identifying risks – what happened the last time, and can that happen again?

721. With each identified risk should come an assessment of the likelihood of occurrence and the degree and nature of the impact of the risk if it were to come to fruition. To each of occurrence and impact, a scale should be applied to determine the risk level for each identified risk without mitigation (for example, low, moderate, high or extreme). With this assessment, one should be better aware of the vulnerability of the census to various threats.

722. Next, standard risk management would suggest that census managers and experts discuss mitigations, or ways to lower the likelihood of occurrence and/or the impact of any threat to a census. Statistical agencies may not have the capacity to act on all risks, so prioritize and take action to first mitigate the greatest risks to the census, and/or those risks which are most likely to affect the census in the near term.

723. The best way to deal with a risk is to avoid it altogether through mitigating steps, but not all risks are fully within the control of the statistical agency. It may be important to discuss risk mitigations with external partners, such as Information Technology (IT) contractors, postal agencies, printing firms, media, labour providers, administrative data providers, or any other key stakeholder in the proper conduct of a census.

724. In case of emergency that leads to the suspension of census work, it is important to make maximum efforts to preserve the results of census work achieved by that time and to ensure that they can be used without losses when the situation is settled (such actions as retaining the team of census solution developers, continuing preparatory work in a less active mode, using a pause in work for in-depth research on issues that require it, etc.).

Box 3

Mitigating Covid-19 risks to the Canadian census

The worldwide pandemic was declared about 14 months before Census Day (12 May 2021). It was clear to Statistics Canada that there was both a high likelihood that the field operations of the (enumeration-based) census would be conducted in the context of the pandemic and that with the existing plans there would be a high likelihood of a major detrimental effect on objectives (response rate) without mitigations.

To develop these mitigations, early into the pandemic a two-day meeting of field operations experts was organized, with the goal of developing new strategies that would lower Covid-19 risks to data quality, as measured by the collection response rate. These new high-level strategies resulted in multiple “outstanding issues” (OIs) or problem statements, the solutions for which were delegated to staff with the knowledge and skill to address them properly. Each OI was classified according to the census operation and prioritized. High-priority and early-operation OI solutions were developed and approved first by census management. Once approved by census management, the mitigating activities associated with each OI were actioned by the individual teams responsible for those parts of the census. Mitigations were developed for field operations, communications, IT, methodology and processing teams.

The process was effective, resulting in over a hundred major changes to the census in a relatively short period of time. By late 2020, the process to establish most risk mitigations was complete, allowing teams to prepare for a new plan that would be actioned in 2021. The Census of Population in Canada managed a very successful field operation despite heavy waves of Covid-19 during the census year, hitting their 98 per cent collection response rate target.

11.2.2 Proper emergency management, governance and decision-making (Emergency management plan)

725. Censuses can be some of the most complex operations that governments undertake. With complexity comes a large number of “moving parts” which will be exposed to events that are not anticipated or even controlled by the census-taker. Natural disasters are a good example: although the census manager may know they can affect their operation, there is no predicting when, where or the extent to which they will impact a census. Even with the best risk management plan and mitigations in place, a census is too complex and, by definition, too exposed to external factors, to anticipate every potential issue. As a result, the statistical agency should be prepared to respond to the unexpected. With proper emergency management, governance and decision-making, censuses can weather some difficult storms very effectively.

726. Every census should have a process in place to identify, classify and respond to the inevitable emergency. Key members of the census team should know what to do in case of emergency during crucial phases of their census. They need to be able to determine whether an emergency is underway, how to classify the severity of the emergency, whom to contact when it occurs and how contact can be made, so that solutions can be put into place.

727. If the current activities are being impacted by an unforeseen event, the census has an emergency. Census team members must have available to them the necessary information to detect any new issues and respond to them using communication lines to other team members, senior officials and perhaps the general public. For example, in today's census environment, censuses that are based on direct enumeration are making greater use of internet questionnaires, so real-time metrics can be monitored to ensure the proper functionality of that service for the public. Or, both for enumeration-based and for register-based censuses, the massive databases need monitoring for cyberthreats. Should there be an issue detected during such monitoring, the person viewing that information must be able to interpret what is happening, classify the degree of the emergency and communicate to others to establish a plan and resolve the issue.

728. When the emergency is detected, it should be assessed for its severity. Census team members responsible for the component of the census impacted by the event should be trained on various severity definitions during the planning phase of the census (i.e. before the census is executed). In the example in the paragraph above, when the event impacting the internet response service is detected, the information should be shared with the census manager responsible for that service, who is trained and authorized to determine the emergency's severity level. Is what is being detected a slowdown of the service that might be of minor annoyance to the user? Or are there indications of a broad interruption of internet response, such as a cyberattack?

729. The severity level of the emergency as determined by the responsible manager should trigger a pre-determined response. For example, a high severity event could require a meeting of the full census management team within a short period (e.g., no later than one hour) after detection, and require faster resolution, relative to a low severity event. At that meeting, the situation should be described by the responsible manager, who should then present information on the nature of the emergency, its cause (if known) and any remediations. If possible, there should be an estimate of when any impacted census operations will be fully operational again, which will be particularly valuable for communications and any downstream activity that may experience a subsequent impact.

730. The census emergency response may require strong support from risk management teams throughout the national statistics organization.

Box 4

A new threat to censuses: misinformation and disinformation

Censuses face a new threat of misinformation and disinformation, which is unlikely to go away any time soon. Exploiting weakness in internet literacy and mistrust in government, sophisticated actors can launch campaigns to divert attention away from a census or to embarrass governments by disrupting operations. Censuses now need to invest in tools to monitor social media, the most common channel through which dis/misinformation campaigns are conducted.

These “social listening” tools comb through large databases of publicly available social media posts to find incorrect information being shared about censuses. When detected, a statistical agency can decide to intervene as appropriate with responsive communication tactics, to correct the record and re-establish the facts regarding the census. Not all situations will be the same, and some require the development prior to the execution of a census, of relationships with major social media companies. If a major dis/misinformation campaign is detected, the statistical office should be able to quickly contact the platform(s) on which the incorrect information is circulating, and request that posts be removed before more damage is inflicted on the census. Other interventions may be necessary, such as countering the offending posts with information in the social media accounts of the statistical agency, or through “fighting misinformation” pages on the statistical agency’s website.

While powerful and effective, social listening tools must be used carefully, however. While reviewing only publicly-available information, there is a risk that government census-takers could be perceived as invading privacy. As a result, before these tools are used, privacy experts should be consulted and offered an opportunity to approve or reject the proposed social listening.

731. In more complicated, high-visibility or prominent situations, managers should promptly report anticipated or actual problems to their manager responsible for communications, to get the required guidance, advice and support to maintain the public’s confidence in the census.

732. Timeliness is critical to building trust. If the statistical agency does not fill in the information vacuum, others will. Timely communications can minimize the impacts of challenges, risks or issues. During an emergency, information demands increase, both internally – briefing up and across, and externally – the public, media, partners, stakeholders. Aligning efforts is important to ensure the information provided to the public is consistent.

733. Messaging needs to consider the public’s perception of risk and address specific concerns to be effective. In addition, the need to protect operationally-sensitive information must be balanced with the desire to be transparent in communications to and with the public.

734. To detect and respond to an emergency, a census should have an Operations Centre where employees have access to tools that track relevant operational data. When a census is underway, a number of operational metrics are available to staff, who should be presented with those data in real time and with an archive for reference as well. Prior to the execution of a census, those data can be specified in advance, using expertise from previous cycles. The

resulting “Management Information System” (MIS) will gather information from various systems and present them in a way that allows managers to detect and respond to incidents.

735. In the event of an emergency, census managers should be prepared to communicate within their organizations, including parts of the organization outside the normal responsibility of the census. As mentioned earlier, priority should be taken to communicate first with the census team, to ensure a timely response. However, internal communication to senior leaders in the organization and political staff may be required, depending upon the severity of the incident. Also, should they be implicated in the response, or impacted by the emergency, external contractors may need to be notified.

736. In addition to providing tools for employees tracking MIS systems for signals of trouble, the physical Operations Centre can be a place to meet to discuss the issues and respond. The Operations Centre should be a place where communications crises are managed and should have access to facilities and equipment to record video and to develop other content to be broadcast on the internet and other media. To monitor any ongoing situations and detect any new ones, the facility should have access to television, radio and internet broadcasts.

737. It is recommended that the Operations Centre be both a physical and virtual space. Should a physical space not be available (which was the case for many countries during the Covid-19 emergency), staff should have all the same tools that exist in the Operations Centre available to them while working remotely. From a location away from the census office, the fundamental requirements for staff should be to have access to MIS and other reports, and have an ability to communicate via phone and video calls. Any capacity to respond to an emergency should not be impeded by the closure of a census management office location.

11.2.3 Use of practice sessions such as “tabletop exercises” to condition staff on how to react in the event of a crisis to a census (team conditioning)

738. While it is impossible to anticipate all possible scenarios, key census staff should be prepared for anything. After establishing a risk registry and emergency management protocols, prior to the execution of a census, census teams should practice what they might encounter. These practice sessions can take various forms and can be adapted for different types or levels of census staff. For example, one might be targeted toward IT staff, while another might be for the management team. Overall, however, the national statistical agency should ensure that all parts of the organization involved in the census have at least one practice session, including the national statistical organization’s senior executives.

739. These exercises are an effective method to condition census staff on emergency management. The exercise should involve staff members, who should be made aware of all (generic) emergency management protocols already developed. With that knowledge in hand, participants in the exercise will be introduced to various scenarios, which should be based on potential issues identified in the risk registry. When the scenarios are presented, staff should reflect on the best next steps that should be taken. Everyone at the sessions should be expected to contribute and provide feedback on the reflections of other team members to the scenarios.

740. During the conduct of practice exercises, team members may find themselves uncomfortable. This is part of the nature of the exercises – the whole point should be to get used to very difficult situations. As a result, participants will find themselves unsure of what to suggest as solutions to the situations they are practicing. Furthermore, these practice sessions should include scenarios which are progressively more difficult to deal with. It will be impossible to imagine and practice all scenarios that census managers might find themselves in. However, they should be realistic and designed by knowledgeable individuals who use the previously developed risk registry. The sessions should not seek to develop an ability within the team to know all steps to follow in all emergencies, but instead the sessions should develop a more general ability within the census team to respond quickly and effectively during the execution of a census.

Box 5

Updating methodological, organizational and technical assumptions as a result of the Covid-19 pandemic in Poland

In Poland, the Covid-19 pandemic started in the period when Statistics Poland was preparing to conduct the second round of testing before the main census activities.

As per the organizational plan, the census in Poland was preceded by two trial censuses, which were intended to verify the planned methodological, organizational and technical solutions. The focus was on verifying conceptual assumptions, testing the architectural framework and operational principles.

The second of these census tests was scheduled for April 2020, less than a month after the declaration of the Covid-19 epidemic in Poland. Initially, Statistics Poland considered abandoning this test. However, it was decided to carry it out while taking necessary precautions to protect the health of respondents and census enumerators. In addition to the original objectives, the second trial census was also intended to test the flexibility of the management system and its resilience to crisis events in the face of an existing pandemic. The experience and observations gained from it contributed to the introduction of many changes for the actual census, which was conducted in 2021 under pandemic conditions.

Key changes included:

- introduction of flexibility in the use of computer-assisted telephone interview (CATI) and computer-assisted personal interview (CAPI) channels, by field enumerators and the on the same mobile device;
- access to a larger telephone database of respondents, by extending the list of registers used to prepare the list of persons and addresses;
- extension of the census operations period from three to six months, while monitoring the need to suspend data collection (in the event of a high wave of illnesses);
- maximum emphasis in communication to the public was given to the use of the available internet response channel;
- a shift to 100 per cent remote work for office staff.

With the 2021 census occurring under pandemic conditions, the census was affected by changes to the behaviour of the population due to health risks and restrictions on basic freedoms. As a result, it was necessary to monitor the data collection phase even more rigorously than under "normal" conditions, in order to take additional ad hoc measures, as necessary.

These solutions were successful, as evidenced by the successful and timely completion of the census. A high completion rate of the census was achieved, resulting in good quality data. In addition, the safety of staff and the population was protected by a strong focus on the internet response, which also allowed Statistics Poland to achieve significant financial savings over the planned census budget.

11.2.4 Ensuring fast workflow during an emergency

741. Census teams understand the importance of their work and therefore respond well during emergencies. Without structure and good management, some census teams will work to do “whatever it takes” to ensure success despite setbacks. However, techniques other than hard work and long hours can be applied in an emergency situation, to ensure the completion of the work without unnecessary negative effects on the people working during the emergency.

742. One likely requirement of a census emergency will be fast workflow and strong communication to ensure the impacted components of the census are aware of what is changing, so they can adapt as well. During a census emergency, solutions must be found quickly and acted upon appropriately. As described above, once an issue is detected a quick response will be required.

743. The census manager in the statistical organization has an obligation to orchestrate the census team such that the resolution to the problem is efficient and effective. Lean management techniques can be applied, such as Kanban boards and quick, frequent “stand up” or “sprint” meetings. Lean management techniques such as these should be applied in order to make sure the full census team is working on the correct priorities and that these new priorities are communicated to the affected team members.

744. Census-takers run a sort of data factory. There is an assembly line of inputs that are being transformed into data outputs, and the factory line must continue running, even when it is impacted by some unforeseen event. This data factory, unlike the manufacturing factory, has elements that remain hidden from view by the manager and team members. Depending upon the severity of the emergency, the census manager and the broader team may feel the need to find ways to see what changes are required to remedy a crisis, to ensure priorities are being actioned and at the speed necessary.

745. One way in which census managers can “see” the factory line is to create virtual and real Kanban boards during an emergency. The Kanban technique will have the team develop and act upon problem statements describing the response to an emergency. For example, if there has been an attempted cyberattack, a problem statement might declare an issue that needs to be resolved, such as “Re-open internet portal” and a team is assigned to resolve the issue. There might be related issues created by the cyberattack, for the communications team or the downstream operations. After the creation of the various issue statements, they can be placed into a “to do list” or Kanban board. The census manager thus has an optic on the work created by the emergency, and can meet with the team regularly, perhaps in the form of quick sprint meetings, to make sure the work to re-establish regular operations is moving at a fast pace. The Kanban board is also an effective way for other members of the team to see if there are any implications of the work of another team on their area of responsibility.

11.2.5 Developing a contingency in the event of main plan failure

746. Despite our best efforts, censuses can fail to reach their full objectives. Disruptions to the execution of a census are inevitable and may severely impact the expected data quality. Contingency plans can be developed in advance for the most significant risks, particularly in situations where advance planning can help ensure a thoughtful, integrated and

comprehensive response. Such plans describe activities that will be required by whom and when, possible impacts to quality, cost and timelines, important dates to be considered, and a well-developed communications strategy. A contingency plan's efficacy is further amplified by active management involvement, which helps to ensure that plans are comprehensive, realistic and applicable, and the extent to which resources and support will be available or could be recruited.

747. In a practical sense, when risks are looming, a census-taker can respond in a number of ways. The best scenario is that the risk is fully mitigated such that it does not develop into an issue. Another situation might require a census-taker to cancel or pause a census, as was the case for many countries in the 2020 round when they were impacted by the Covid-19 pandemic. However, if a census risk cannot be fully mitigated or avoided, the issues that are created may not always be manageable. So much can be beyond the control of the census-taker, and with censuses becoming increasingly complex (such as with combined censuses or those using large amounts of administrative data from multiple sources), there is always the risk that the main plan fails. What does a statistical agency do in that case?

Box 6

Responding to a Category Two Cyclone in the New Zealand Census

Like many countries around the world, New Zealand is susceptible to extreme natural events. These have impacted census-taking in the past, including the 2011 Census which had to be delayed by two years following a major earthquake in Christchurch.

Early in the 2023 Census lifecycle, ten significant risks were identified by Statistics New Zealand which could impact running a successful census (including a natural disaster risk) due to past experiences. In the planning phase an Incident Management Plan (with three severity levels) and an Operations Plan were developed, in which the roles required to run the census operations centre were identified. Census managers were trained in a New Zealand government-wide incident management system to enable coordinated responses with other government agencies, including Police and Civil Defence, if required.

In the Census Dress Rehearsal, one year out from Census Day, the Incident Management Plan and Operations Plan were tested and reviewed and refined afterwards. In the build-up to the Census Day in March 2023, a series of incident practice exercises ranging in severity and for a variety of scenarios was conducted. Some of these scenarios also involved members of the executive governance board overseeing the census so that they understood their roles if an incident was rated sufficiently significant to trigger their active involvement.

On 13 February, two days before the start of the census field operation, Cyclone Gabrielle reached New Zealand. Even before it hit, incident management processes had commenced, with the pending extreme weather event being triaged as a level three incident – the most severe. As the incident response kicked in, everybody knew their roles, how to fulfil them, and who the decision-maker was, thanks to the preparation that had taken place previously. By the time the devastating impact of the cyclone was known, a decision had already been made to delay the census field operation in affected areas and to proceed with caution in unaffected areas. Government funding to cover the additional costs was secured at short notice and a recovery plan was also in preparation with strong engagement and involvement of local communities in the affected areas.

A month after the cyclone, the field operation commenced in cyclone-affected areas. With a mixture of using some prepared contingency plans, some new plans developed “on the fly” and strong local community support it was possible to complete a successful collection operation in areas still dealing with the aftermath of the cyclone. The overall successful delivery of the 2023 Census in New Zealand was made possible by the emergency planning and preparedness that took place beforehand.

748. Unfortunately, the options may be limited. For countries conducting enumeration-based censuses, there may be an option to accelerate plans to use administrative data. While the available administrative data may not be suitable to replace all planned data variables and on the original timelines, NSOs may be able to perform the basic function of a census with an administrative population count. If the risk of main plan failure is high enough, an

NSO might consider a parallel administrative count, to ensure the timely delivery of population counts in any scenario.

749. While it may not be considered as such, a robust administrative data plan for enumeration-based census-takers can be an effective “insurance plan”, and therefore an incentive for investment in administrative data, technology to manage it, and expertise within the census team on how to use administrative data properly for census-taking. Being ready for the use of administrative data as a “back-up” can be an important aspect of a country’s contingency plan.

750. An additional contingency might be to prepare for the release of only the minimum output required by data users of a census. To do so, national statistical organizations should prioritize outputs, such as is what is required under regulation by the European Union.

751. For register-based censuses, a disruption of the census would likely involve a communication plan and an adjustment of the timeline of the census, to allow a restart of the process when the disrupting event has passed. If this is the case, there would be an impact on other programmes that are dependent upon the census, such as an extension or temporary introduction of intercensal population estimates.

11.2.6 Extending risk management practices

752. Each statistical agency faces a unique journey in establishing and maturing risk and crisis management practices. When they first adopt these practices, they face foundational challenges and often must focus on developing initial risk assessment frameworks, securing buy-in from stakeholders, and integrating risk and crisis management into planning. In contrast, as agencies mature in their ability to manage risk, they often grapple with different issues, such as deepening stakeholder engagement, integrating tool support across teams, and fostering a culture that emphasizes risk management at all levels.

753. By proactively managing risks, a statistical agency enhances its credibility, supports informed decision-making, improves efficiency and fosters organizational resilience. Ultimately, such an investment is a testament to the agency’s commitment to excellence and accountability in serving the public interest.

Part B Census Topics

Chapter 12 Population bases

12.1 General definitions

754. The recommendations and conventions set out in this chapter have been prepared with a view to ensuring that the census allocates each person to one, and only one, place of usual residence. This is important in an international context to avoid persons either being counted in the populations of more than one country or not being counted at all. The same principle applies within a national context. The following paragraphs provide definitions that should be applied in the context of census operations.

755. **Enumeration** means the act of collecting data about a person (or household), irrespective of whether this occurs with the direct participation of that person (or household) through a field operation, or indirectly using data already recorded in administrative sources or population registers.

756. **Population** is any set of persons attributed to a geographic entity who meet defined criteria at a specified reference time; these criteria should help to identify the qualifying characteristics that clarify which particular population is being referred to (such as the usually resident population or the working population).

757. To meet national requirements, a country may have an interest in various “populations”. To facilitate clarity in international comparisons, it is recommended that the descriptions of these populations (in terms of qualifying characteristics, and their associated adjectives and labels) make use of terminology and meanings that are as close as possible to the meanings used in the international context.

758. A country may wish to enumerate all persons present in their territory and/or supposedly belonging to the population of interest. The **population to be enumerated** is the set of persons whom the country decides should be covered by the census, regardless of their subsequent exclusion from any specific population count, as defined below. The **enumerated population base** is composed of those persons who have actually been enumerated. This may or may not equate to the target population (the population to be enumerated); that is, the coverage of the census may represent either an under-count or an over-count.

759. The **population base** is the population used for the compilation of statistical aggregates in a particular tabulation. This may be a sub-set, or the whole, of the population to be enumerated. A country may adopt more than one population base (for different statistical purposes), but one of these should always be the population base used for international comparison purposes (most often the “usually resident” population).

760. For particular statistical needs, countries may wish to adopt an additional or supplementary⁶⁹ population base – such as the daytime or workplace population. This should

⁶⁹See: [In-depth review of use cases for supplementary population bases](#). Conference of European Statisticians Seventy-second plenary session, June 2024.

be seen as an addition to the population bases used for international comparison purposes, and not an alternative.

761. A **population count** is the aggregate obtained by the simple addition of individual records from the enumerated population base. A “population estimate” is the aggregate obtained as the outcome of a statistical method of estimation. Therefore, both the population count and the population estimate refer to a specific population base and are empirical measures.

762. The **census reference time** is the time to which any information collected in a census refers. It can be either a precise moment of a day, usually midnight (“census reference moment”), or a period of time (“census reference period”), or a day selected as indicative of a period (“census reference average day”). Some topics will refer to a particular moment (providing stock data), others to a period (flow data), and usually the census reference period includes the census reference time. The “census day/period” is the day/period in which a census is carried out. There is a risk that this will be confused with the census reference time, and countries should guard against this in the internal and external documentation of the census.

12.2 Recommended population base

763. The **place of usual residence** is the place where the enumerated person usually spends their daily rest, assessed over a defined period including the census reference time.

764. The population base to be used for international comparison purposes is the usually resident population. The **usually resident population** of a country is composed of those persons who have their place of usual residence in the country at the census reference time and have lived, or intend to live, there for a continuous period of at least 12 months. A “continuous period” means that absences (from the country of usual residence) whose durations are shorter than 12 months do not affect the country of usual residence. The same criteria apply for any relevant territorial division (being the place of usual residence) within the country.

765. If a country cannot adopt the usually resident population as its population base (or as one of its population bases), it should put all possible efforts into producing estimates that are as close as possible to the usually resident population using its own population base(s).

766. As part of the estimation process in register-based censuses, whenever reference is made to actual geographic places for the usually resident population base, it could be replaced by the registered place of residence. In practice, an increasing number of register-based countries apply additional estimation methods often denoted as “signs of life”. These methods typically link various administrative or other auxiliary data sources to obtain an indication of actual presence of persons in the place where they are registered. International guidelines mention signs-of-life methods as a good practice.⁷⁰

⁷⁰See e.g. UNECE (2018). [Guidelines on the use of registers and administrative data for population and housing censuses](#). Geneva: United Nations.

UNECE (2021). [Guidelines for assessing the quality of administrative sources for use in censuses](#). Geneva: United Nations.

767. On the basis of the definition of the place of usual residence, persons usually resident in the place of enumeration but absent, or expected to be absent, at the census reference time for less than one year should be considered as “temporarily absent persons” and thus included in the total population.

768. The group of **absent persons living abroad** (former members of a household who now live or are expected to live in another country) for one year or more can be particularly important in countries experiencing high levels of emigration. Some countries try to estimate emigration in the census by collecting data on these persons, for instance using an emigration module in the questionnaire. Previous experiences⁷¹ have shown that the census is unlikely to provide an accurate count of the total number of emigrants residing abroad. However, such an approach may provide some information on sub-sets of emigrants, such as those who emigrated recently and those who have close family ties in the country.

769. If data on absent persons living abroad for one year or more are to be collected through the census, their information (in terms of numbers and characteristics) should be distinguished clearly from the information collected for the usually resident population. Every effort should be made to avoid absent persons living abroad from being included in the usually resident population. This may include, for example, listing absent persons living abroad on a separate section of any census enumeration form, with clear instructions to both respondents and enumerators.

770. A total usually resident population count for each territorial division would normally be compiled by adding persons who are usually resident and present to those who are usually resident but temporarily absent. However, it is not always possible to collect information about persons absent from their place of usual residence, particularly if a whole household is temporarily absent at the census reference time. Provision must therefore be made to collect information about such persons at the place where they are found at the census reference time, and if necessary “transfer” them to their place or territorial division of usual residence, using the information recorded about their place of residence. This may be done, for example, by including in the census enumeration all persons and households present on the census day, and assigning them to their correct place of usual residence using the information collected. Alternatively, or in parallel, a follow-up visit by enumerators to apparently occupied dwellings where there was previously no contact with residents may allow information to be collected on persons and households who are usually resident at that census reference time but were temporarily absent on census day. Care must be taken in such processes to avoid double enumeration whereby a person or household is incorrectly recorded as usually resident at more than one address.

771. Each country should compile a figure for the total usually resident population, and the detailed tabulations should in general be provided on this basis. In those countries where the total population figure has been adjusted for under- or over-enumeration (usually measured by use of a post-enumeration survey or by comparison with other sources), both the enumerated figure (the population count) and the adjusted population figure (the population estimate) should be shown and described. However, national legislation may prevent this or, conversely, make it an obligation. The detailed tabulations may, however, be based only on the population that was actually enumerated.

⁷¹ See [Handbook on Measuring International Migration through Population Censuses](#). UN Statistical Commission, Forty-eighth session, March 2017

772. The composition of the usually resident population should be described in detail in the census report(s). As far as is possible given the census data sources and methodologies adopted by a country, the total usually resident population should include all persons who have their usual residence in the country or relevant territorial division, regardless of their legal status.

12.3 Particular cases

773. There are various population groups for which some uncertainty may arise about their inclusion in the usually resident population of a country. The following persons should be included:

- (a) Persons present at the census reference time to whom the concept of usual residence does not apply (such as nomads and vagrants), irrespective of whether or not they meet the 12-month criterion;
- (b) Persons who regularly live in more than one country during a year, if the reporting country is the one where they live most of the time, irrespective of whether or not they are present in the reporting country at the reference time;
- (c) National military, naval and diplomatic personnel and their families, located outside the country, irrespective of their duration of stay abroad;
- (d) Foreign persons working within the country for international businesses or organizations (but not including foreign diplomats or military forces) and their families, provided that they meet the criteria for the usual residence in the country;
- (e) Seafarers and people working on fishing boats usually resident in the country but at sea at the census reference time (including those who have no place of residence other than their quarters aboard ship);
- (f) Irregular or undocumented migrants, who are foreigners and who are staying in a country without the appropriate documentation, provided that they meet the criteria for the usual residence in the country;
- (g) Asylum seekers and persons who have applied for, or been granted, refugee status or similar types of international protections, regardless of the type of accommodation they live in, providing they meet the criteria for usual residence in the country;
- (h) Children born in the twelve months before the census reference time and who, at the census reference time, are expected to be resident in the country for 12 months or more based on the intention of the household members that they live with.

774. For (f) and (g) above, the intention is not to distinguish these persons separately, but rather to ensure that they are not missed from the enumeration. This includes the children of people falling under categories (f) and (g), as well as unaccompanied and separated children⁷²

⁷² For the definition of unaccompanied and separated children, please see the definition provided in the Inter-Agency Guiding Principles (<https://www.unhcr.org/sites/default/files/legacy-pdf/4098b3172.pdf>): "Separated children are those separated from both parents, or from their previous legal or customary primary caregiver, but not necessarily from other relatives. These may,

living in institutional household (e.g., in residential alternative care facilities) or private households (e.g., in foster families).

775. The following persons should instead be excluded from the usually resident population of a country:

- (a) Persons who regularly live in more than one country during a year, if the reporting country is NOT the one where they live most of the time, irrespective of whether or not they are present in the reporting country at the census reference time; and
- (b) Foreign military, naval and diplomatic personnel and their families, located in the country, regardless of their duration of stay.

776. For persons who, at the census reference time, have spent, or are likely to spend, twelve months or more living in a communal establishment or institution, the institution should be taken as the place of usual residence. Examples of persons living in institutions include patients in hospices or long-stay hospitals, persons in nursing homes or convalescent homes, children in residential alternative care facilities, prisoners and those in juvenile detention centres.

777. The examples in paragraphs [773–775](#) above are provided for guidance, primarily for countries conducting a field data collection for the census. It is recognized that determining whether members of certain population groups should be included in or excluded from the usually resident population can be challenging, particularly for countries using registers.

778. It may be particularly problematic to determine the country of usual residence or the place of usual residence within the country for persons who work or study away from home.

779. The principal home may be defined as an address that a person has an established link with, even if this is not their current place of usual residence as defined in paragraph [763](#). This is particularly relevant for persons who study or work away from home. The established link with the principal home may be on the basis of one or more factors, such as past and intended future usual residence at that address, or the ongoing usual residence at that address of members of the person's family nucleus.

780. [Table 3](#) summarizes the recommended guidelines of classification for students and workers who live away from the principal home for 12 months or more. For the sake of conformity with the global Principles and Recommendations for Population and Housing Censuses – Revision 4 issued by UNSD, students in tertiary education should be allocated to their term-time address, when studying within the country. When studying abroad they should not be included in the population of the country of their principal home, since their place of usual residence should be the term-time address in the country where they study, even if they regularly return to the principal home. However, it is acknowledged that in some countries there may be considerations (such as higher coverage during field enumeration, or a particularly large number of emigrating students) that would justify the allocation of these students to their principal home.

therefore, include children accompanied by other adult family members. Unaccompanied children (also called unaccompanied minors) are children who have been separated from both parents and other relatives and are not being cared for by an adult who, by law or custom, is responsible for doing so."

781. There are other population groups for which some uncertainty may arise in defining their place of usual residence within the country. The recommended conventional treatment of these cases is as follows:

- (a) For persons without a usual residence, such as homeless or roofless persons, nomads, itinerant migrants and workers, the place of usual residence should be the place of enumeration;
- (b) When a person regularly lives in more than one residence within the country during the year, the place of usual residence should be the place where the person spends most of their time, or their registered place of residence, irrespective of whether or not the person is present in that place at the census reference time;
- (c) A child who alternates between two households within the country (for instance following their parents' separation or divorce) should consider the household where they spend the majority of the time, or their registered place of residence, as their place of usual residence. Where an equal amount of time is spent with both parents, the place of usual residence should be the same as that of the parent or household with whom the child is living at the census reference time.

782. For the national military, naval and diplomatic service personnel and their families located outside the country the following classification rules should be applied:

- (a) If they are residing abroad for less than 12 months and they are intending to return to the place of departure, they should be allocated within the country in accordance with the rules for usual residence. In particular, they could be allocated to (by decreasing order of priority):
- (b) The principal home address within the country, if any; or the duty station within the country to which they were attached before leaving;
- (c) If they are residing abroad for at least 12 months or if they are not intending to return to the place of departure (although returning to the country within a 12-month period), they should be attributed to a "virtual place" (extra-region) of the country of departure.

Table 3

Guidelines for determining usual residence status of workers and students living away from the principal home for 12 months or more

<i>Category</i>	<i>Place of work or study</i>	<i>Regular* return to principal home</i>	<i>Inclusion in the usually resident population of the country</i>	<i>Place of usual residence within the country</i>
Workers	In the country	Yes	Yes	Principal home
		No	Yes	Own address
	Abroad	Yes	Yes	Principal home
		No	No	None
Children in a family nucleus** in education below tertiary level***	In the country	Yes	Yes	Principal home
		No	Yes	Principal home
	Abroad	Yes	Yes	Principal home
		No	Yes	Principal home
Adults in a family nucleus** in education below tertiary level***	In the country	Yes	Yes	Principal home
		No	Yes	Term-time address^
	Abroad	Yes	Yes	Principal home
		No	No	None
Persons not in a family nucleus** in education below tertiary level***	In the country	Not applicable	According to usual rules	According to usual rules
	Abroad	Not applicable	According to usual rules	According to usual rules
Students in tertiary education ****	In the country	Yes	Yes	Term-time address^
		No	Yes	Term-time address^
	Abroad	Yes	No	None
		No	No	None
Student workers	Persons who study and work at the same time will be allocated to the pertinent country or territorial unit according to the rules for students or workers depending on which activity – work or study – is considered the main activity.			

Notes:

* "Regular" is taken to mean more than twice each month.

** See paragraph 979 for the definition of family nucleus.

*** ISCED 2011 levels 0–4.

**** ISCED 2011 levels 5–8.

^ Term-time address is the address at which a schoolchild or student lives while attending their studies. This may or may not be the same as their principal address.

Chapter 13 Geography

13.1 Introduction

783. One of the distinguishing features of censuses of population and housing is the extent to which a comprehensive specification of geographic characteristics can be undertaken, as well as the cross-tabulation of other characteristics, such as demographic, economic or ethnocultural, by geography.

784. As described in [Chapter 3](#), one of the important features of a census is that, since it covers the complete universe of interest, characteristics of the population can be given at the smallest geographical levels, without being subject to the errors that can arise when using statistical estimates based on survey samples.

785. Once the population base has been determined it is then possible to examine how this population is located geographically. As described in [Chapter 12](#), the “location” of each individual is generally taken to mean where they have their place of usual residence, i.e. where they most often spend their nightly rest. [Chapter 8](#) explains in detail how such location can be specified using geospatial information.

13.2 Location of place of usual residence (core topic)

786. The location of place of residence is the precise location of the “usual place of residence” as defined in paragraphs [763](#) and [764](#).

787. The location of the place of residence should be coded to the smallest possible civil division and, to the greatest extent possible, geo-referenced to the precise geographical coordinates⁷³ of the address point. In the absence of such coordinates, a precise and complete postal address should be recorded for geocoding purposes. The purpose is to enable tabulations and spatial aggregations to be referenced to any small geographic or administrative subdivisions and, if possible, to grid squares (see section [13.6](#)). The link between the census information and the location of the place of residence should form a permanent and integrated part of the census information at the unit record level.

13.3 Locality (derived core topic)

788. For census purposes, a **locality** is defined as a distinct population cluster or settlement; that is, the area defined by population whose places of usual residence are located in neighbouring or contiguous buildings.

⁷³ In the EU and continental Europe the geographic coordinates should refer to the European Terrestrial Reference System 1989 (ETRS89, EPSG 4258). In regions outside continental Europe the geographic coordinates may also refer to the global coordinate reference system WGS-84 (EPSG code 4326).

789. Such buildings referred to in this definition may either:

- (a) form a continuous built-up area with a clearly recognizable street formation; or
- (b) though not part of such a built-up area, comprise a group of buildings to which a locally recognized place name is uniquely attached; or
- (c) though not coming within either of the above two requirements, constitute a group of buildings, none of which is separated from its nearest neighbour by more than 200 metres.

790. In applying this definition certain land-use categories should not be regarded as breaking the continuity of a built-up area (and accordingly should not be counted in applying the 200-metre criterion above). Such categories include: industrial and commercial buildings and facilities, public parks, playgrounds and gardens, football fields and other sports facilities, bridged rivers, railway lines, canals, parking lots and other transport infrastructure, churchyards and cemeteries.

791. This definition is intended to provide general guidance to countries in identifying localities and in determining their boundaries, and it may need to be adapted in accordance with national circumstances and practices. The population not living in clusters as defined above may be described as living in scattered or isolated buildings. Whatever definition of a locality is adopted for the census, it should be given in detail in the relevant census report and/or metadata.

792. Localities, as defined above, should not be confused with the smallest civil divisions of a country. In some cases, the two may coincide. In others, however, even the smallest civil division may contain two or more localities as defined. On the other hand, some large cities or towns may comprise two or more civil divisions, which should then be considered only as sub-divisions of a single locality rather than as separate localities.

793. A large locality of a country (that is to say, a city or a town) is often part of an urban agglomeration, which comprises the city or town proper and also the suburban fringe or thickly settled territory lying outside, but adjacent to, its boundaries. The urban agglomeration is, therefore, not identical with the locality but is an additional geographical unit, which may include more than one locality. In some cases, a single large urban agglomeration may comprise several cities or towns and their suburban fringes. The components of such large agglomerations should be specified in the census results.

794. Countries are recommended to develop their census statistics for localities in accordance with national needs and capabilities. In doing so, they should try to approach as closely as possible the concept of the population cluster as defined above. Countries which tabulate statistics only for civil divisions should, as a minimum, endeavour to compile data on the total population of each part of a civil division containing a population cluster, or part of a population cluster, of at least 2,000 inhabitants and so provide a basis for making a more clear-cut distinction between urban and rural areas and their populations (see paragraphs [798-805](#) below).

795. It is recommended that the population be classified by size of locality according to the following size-classes:

- (1.0) 1,000,000 or more inhabitants
- (2.0) 500,000 - 999,999

- (3.0) 200,000 - 499,999
- (4.0) 100,000 - 199,999
- (5.0) 50,000 - 99,999
- (6.0) 20,000 - 49,999
- (7.0) 10,000 - 19,999
- (8.0) 5,000 - 9,999
- (9.0) 2,000 - 4,999
- (10.0) 1,000 - 1,999
- (11.0) 500 - 999
- (12.0) 200 - 499
- (13.0) Population living in localities with less than 200 inhabitants or in scattered/isolated buildings
 - (13.1) Population living in localities with 50-199 inhabitants
 - (13.2) Population living in localities with less than 50 inhabitants or in scattered/isolated buildings

796. This classification could also be applied to analyse other relevant population bases such as the economically active population, households, families and dwellings (though it may be necessary to adopt different scales).

13.4 Location of living quarters (core topic)

797. As defined in section [17.2.2](#), living quarters are those types of housings that are the usual residences of one or more persons. It is therefore possible to classify living quarters to the same detailed geography as "location of place of residence" (paragraph [786](#) above), and the definitions and classifications set out in paragraphs [788-796](#) and [798-818](#) apply equally. The extent to which they are used will vary according to each country's statistical needs for information on localities and smallest relevant civil division.

13.5 Urban and rural areas (derived core topic)

798. For purposes of international comparisons, countries should define **urban areas** as localities with a population of 2,000 or more, and **rural areas** as localities with a population of fewer than 2,000 and sparsely populated areas. Some countries might also wish to consider defining urban areas in other ways, for example in terms of:

- (a) administrative boundaries;
- (b) built-up areas; or
- (c) the area for which services such as shops, educational facilities, recreational facilities, employment, are provided.

799. The approach taken should be described clearly in the relevant census report and/or metadata.

800. For national purposes, as well as for international comparability, the most appropriate unit of classification for distinguishing urban and rural areas is the locality as defined in paragraph 788 above. The decision of whether to use the locality or the smallest civil division as the unit of classification depends on the needs and circumstances in each country.

801. Countries that use the smallest civil division as the unit should endeavour to obtain results that correspond as closely as possible to those obtained by countries that use the locality as the unit.

802. The approach to be adopted to achieve this aim will depend mainly on the nature of the smallest civil divisions in the countries concerned. In some countries the smallest civil divisions (and the average number of inhabitants) are relatively small and generally do not contain more than one population cluster (or part of a larger population cluster). If it is not feasible for some of these countries to use the locality as the unit, they should make use of the concept of the multi-communal agglomeration (that is, treat as single units groups of two or more contiguous minor civil divisions that form part of the same population cluster). It is also suggested that minor civil divisions at the periphery of such an agglomeration be included in the agglomeration if a major part of their resident populations live in areas belonging to the continuous built-up area of the agglomeration, and that minor civil divisions containing one or more isolated localities be classified according to the number of inhabitants of the largest population cluster within the unit.

803. The situation is different in the case of countries in which the smallest civil divisions (and the average number of inhabitants) are relatively large and often contain two or more population clusters of varying sizes. If it is not feasible for some of these countries to use the locality as the unit, they should endeavour to use units smaller than minor civil divisions for this purpose; for example, parishes, enumeration districts and grid squares. They should endeavour to use these smaller units as building blocks and to aggregate them to correspond as closely as possible with the boundaries of localities in the same way as described above in the case of multi-communal agglomerations. If it is not feasible for some countries to adopt this approach, they should endeavour to develop new approaches to the classification of entire minor civil divisions in ways which will yield results that are as comparable as possible with those obtained by using the locality as the unit.

804. It is recommended to group localities or similar units into the following categories:

- (1.0) 1,000,000 or more inhabitants
- (2.0) 250,000 to 999,999
- (3.0) 100,000 to 249,999
- (4.0) 50,000 to 99,999
- (5.0) 10,000 to 49,999
- (6.0) 2,000 to 9,999
- (7.0) Fewer than 2,000 inhabitants.

805. Countries should develop typologies of localities or similar areas based on additional criteria that could be used to distinguish different types of areas within particular categories

of the recommended classification. For example, some countries may wish to subdivide category (1.0) (and in some cases category (2.0) as well) to distinguish agricultural localities from other types of small localities. Some countries may wish to subdivide one or more of the intermediate categories to distinguish market towns, industrial centres, service centres, etc. Some countries may wish to subdivide the large urban agglomerations included in categories (4.0) to (7.0) to distinguish various types of central and suburban areas. Extensions of the classification in these and other ways would enhance its analytical usefulness.

13.6 Grid square characteristics

13.7 *Population grid (derived non-core topic)*

806. For census purposes, a **population grid** is a geo-referencing framework for population, with fixed and unambiguously defined locations of equal-area grid cells. The grid adopted should be fully specified with reference to a specific grid standard and projection.

807. Each grid cell contains the aggregated number of persons for whom the location of place of usual residence (as described in paragraph 786 above) is geo-referenced to a point located within the grid cell. In countries in which such aggregation is not possible, the population grid could be disaggregated from the smallest civil division using estimation methods based on auxiliary information such as land use maps, built-up area detection, or cadastral information.

808. In addition to assigning usual resident individuals to a grid, the same grid can be used to assign people to their place of work or location of school, college or university. The same grid could also be used for assigning households, families and dwellings.

809. The size of each grid cell should be 1km². Countries may also wish to create other grid cell sizes to meet national requirements.

810. To permit cross-national interoperability, it is recommended that countries make use of a shared, internationally agreed grid (such as INSPIRE⁷⁴ for Europe).

811. Although the topic is included in these Recommendations as a non-core topic, countries are strongly urged to use grid square data. For those in continental Europe that do so, the grid system should be defined in line with the INSPIRE legal framework.⁷⁵ In regions outside of continental Europe, countries may define their own grid based on a geodetic coordinate reference system compliant with the International Terrestrial Reference System (ITRS) and a Lambert Azimuthal Equal Area projection, following the same principles as laid down for the INSPIRE grid. In this case, an identifier for the coordinate reference system should be created and included in the metadata of the population grid.

812. Census statistics have, in the past, usually been produced in relation to administrative areas or specific census output areas. Population grids are very useful complementary output

⁷⁴ Infrastructure for Spatial Information in the European Community. For more information see [the INSPIRE Knowledge Base](#).

⁷⁵ Commission Regulation (EU) No 1253/2013 of 21 October 2013 amending Regulation (EU) No 1089/2010 implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services.

systems offering several advantages. Grid cells are all of the same size, making them perfect for area- or distance-based comparisons (e.g. for comparing accessibility to services), and for the construction of customizable, interactive mapping tools for dissemination (see section 7.2). Grids are stable over time and hence independent of changes in civil divisions or borders. They permit the easy integration of data from other sources and on other topics (such as climate data). Grid cells are flexible as they can be assembled to form areas reflecting a specific purpose or study area. Grid systems can be constructed hierarchically in terms of cell size, thus matching study areas from the local to the global level.

813. Grids are very powerful for spatial analysis in an international and cross-border context as they are not affected by variation in municipality size between countries. However, grid statistics may give rise to concerns over confidentiality or significance of the data in thinly populated areas, or when data come from a sample source. Therefore the topics for which grid statistics are to be produced should be selected carefully, and the choice should always represent a compromise between the demand for detailed and flexible statistics and data protection concerns (for more details on this, see section 7.1).

13.8 Degree of urbanization (derived non-core topic)

814. **Degree of urbanization**⁷⁶ classifies the areas in which persons have their place of usual residence as being densely populated areas, intermediate density areas, or thinly populated areas. The classification is based on a combination of geographical contiguity and minimum population thresholds applied to the 1 km² population grid cells (defined in paragraph 806 above). These grid cells all have the same shape and size, which avoids distortions caused by units varying in size.

815. The degree of urbanization creates a classification of local administrative units/municipalities as follows:

- (a) Densely populated areas have more than 50 per cent of their population living in high-density clusters⁷⁷ (urban centres).
- (b) Intermediate density areas have more than 50 per cent of their population living in urban clusters, but are not densely populated areas.
- (c) Thinly populated area has more than 50 per cent of their population living in rural grid cells.

816. Degree of urbanization may also be used to create an alternative classification of areas as being either "urban" or "rural", with intermediate and densely populated areas being classified as "urban" while thinly populated areas are classified as "rural".

⁷⁶ The Degree of urbanization (DEGURBA) classification was developed by the OECD and the European Commission (Directorates General Regional Policy and Urban Development, Agriculture, Eurostat and the Joint Research Centre); see [Applying the Degree of Urbanisation – A methodological manual to define cities, towns and rural areas for international comparisons in its latest version](#)

⁷⁷ Each high-density cluster should have at least 75 per cent of its population in densely populated local administrative units/municipalities. This also ensures that all high-density clusters are part of at least one densely populated local administrative unit/municipality, even when this cluster represents less than 50 per cent of the population of the local administrative units/municipalities.

817. In the above classification of local administrative units/municipalities, the following definitions, population and density⁷⁸ thresholds should be used:

- (a) High-density clusters (urban centres) are clusters of contiguous grid cells of 1 km² with a density of at least 1,500 inhabitants per km² and a minimum population of 50,000. Contiguity for high-density clusters does not include the "diagonal" (that is, cells with only the corners touching), and gaps in the cluster are filled (that is, those cells surrounded by high-density cells).
- (b) Urban clusters are clusters of contiguous grid cells of 1 km² with a density of at least 300 inhabitants per km² and a minimum population of 5,000. The same "contiguity" rule for high-density clusters, described at (a), also applies, but gaps in the cluster are not filled (that is, cells surrounded by urban cells).
- (c) Rural grid cells are grid cells which do not belong to an urban cluster.

818. As local administrative units/municipalities vary considerably in area, this methodology will lead to a closer match between high-density clusters and densely populated local administrative units/municipalities in countries with small local administrative units/municipalities than in those with large local administrative units/municipalities. To take this difference into account, the classification can be adjusted as following:

- (a) A densely populated local administrative unit/municipality can be classified intermediate as long as 75 per cent of its high-density cluster population remains in densely populated local administrative units/municipalities.
- (b) A thinly populated or intermediate density local administrative unit/municipality can be classified as densely populated if it belongs to a group of local administrative units/municipalities with a political function and if the majority of population of this group of local administrative units/municipalities lives in a high-density cluster.

13.9 Commuting characteristics

819. The following topics examine issues associated with commuting from home to workplace, school, college or university. Accurate commuter flows are important for a whole raft of reasons including transport planning, housing development and economic development.

13.10 Location of place of work (core topic)

820. The **location of place of work** is the precise location in which a currently employed person performs his/her job. The location should preferably be coded to the precise address

⁷⁸ In Europe, the same threshold has been used in all countries. In other regions of the world, however, the two density thresholds may need adjusting up or downward.

and/or geographic coordinates⁷⁹ or, if this is not possible, to the smallest possible civil division.⁸⁰

821. The main reason why place of work information is collected is to link it with place of usual residence in order to shed further light on commuter flows in addition to that provided by mode of transport to work, distance travelled and time taken. The precise address of place of work should be collected and the data coded to the smallest possible civil division in order to establish accurate commuter flows from the place of usual residence to the place of work. Information on persons who do not have a fixed place of work but who report to a fixed address at the beginning of their work period (for example bus drivers, airline crew, operators of street market stalls that are not removed at the end of the workday) should refer to that address. This group may also include individuals who travel to work, on a regular basis, across the border to a neighbouring country. However, it may not be possible to allocate the place of work of some persons, such as sailors, fishers and offshore workers. Such persons should be coded as having “no fixed place of work” (see classification in paragraph 823 below).

822. In order to monitor commuter flows, a classification comparing location of place of work and location of place of residence is recommended. Commuting should be measured between place of origin and place of destination of the daily journey. It should be noted, however, that for some persons in employment, the place of origin may not necessarily be their place of usual residence if they have, of example, a separate week-day address from which they usually travel to work.

823. The following classification is recommended:

- (1.0) Same minor civil division as place of residence
- (2.0) Other minor civil division within same major civil division as place of residence
- (3.0) Other major civil division
- (4.0) Abroad
- (5.0) Other place of work
 - (5.1) Offshore installation
 - (5.2) No fixed place of work

824. Minor civil division refers to the lowest level of geography for which commuter flows should be measured. Depending on national circumstances and user requirements this could be small areas (such as wards or communes) or areas at a higher level (such as municipalities or districts). Major civil division refers to a higher level of geography such as municipalities (if the minor division is small areas) or counties/departments (if the minor division is municipalities or districts).

825. An alternative and more detailed two-digit classification may be considered by some countries that wish, for example, to identify, separately, persons working at home or longer-distance commuters:

⁷⁹ In the European Union and continental Europe the geographic coordinates should refer to the European Terrestrial Reference System 1989 (ETRS89, EPSG 4258). In regions outside continental Europe the geographic coordinates may also refer to global coordinate reference system WGS-84 (EPSG code 4326).

⁸⁰ It is recognised that where the location of place of work is outside the country it is generally only necessary to code it to the country concerned.

- (1.0) Same minor civil division as place of residence
 - (1.1) Working at home
 - (1.2) Working elsewhere within the same minor civil division
- (2.0) Neighbouring minor civil division
- (3.0) Other minor civil division
 - (3.1) In same major civil division
 - (3.2) In some other major civil division
- (4.0) Abroad
- (5.0) Other place of work
 - (5.1) Offshore installation
 - (5.2) No fixed place of work.

13.11 Location of school, college or university (non-core topic)

826. By including this topic in their census, countries can extend the scope of their data on commuting patterns to cover pupils and students in addition to the coverage of the employed provided by place of work. In order to maintain comparability with the place of work topic, the location of school, college or university should be coded to the same level of geography.

13.12 Mode of transport to work (or to place of education) (non-core topic)

827. **Mode of transport to work** relates to the journey made on most days. For people making several journeys or using more than one mode of transport, the mode of transport used for the greatest distance should be indicated. People not travelling to work should be classified as having no journey.

828. The following classification is recommended⁸¹:

- (1.0) Rail
 - (1.1) National/international rail network
 - (1.2) Metro/underground
 - (1.3) Tram/light railway
- (2.0) Bus, minibuss or coach

⁸¹ The Joint UNECE, International Transport Forum (ITF) and Eurostat [Glossary for Transport Statistics](#) (5th edition, 2019) gives a detailed classification of modes of passenger transport. See section B.II 'Transport Equipment (vehicles)' and section J. 'Passenger mobility' for details. Countries in which particular forms of transport are especially common, such as moped, taxi, minibuss or scooter, may wish to amend or augment this classification to allow identification of such modes.

- (3.0) Car or van
 - (3.1) Driver
 - (3.2) Passenger
- (4.0) Other
 - (4.1) Motorcycle
 - (4.2) Pedal cycle
 - (4.3) Walk
 - (4.4) Boat or ferry
 - (4.5) Other
- (5.0) No journey made
 - (5.1) Working at home
 - (5.2) Other reason

829. Some countries may wish to amend or augment this classification to allow identification of such modes of transport such as e-bikes or e-scooters which are increasing rapidly in popularity, or consider further subdividing category (3.1) to distinguish person who drive alone from those who drive with other passengers, though this would require collecting additional information in the census.

830. In order to provide more complete information on commuting patterns, some countries may wish to extend the topic of mode of transport to include daily journeys made by children and students to their respective place of education. As for the mode of travel to work, the mode of transport used for the greatest distance in the journey should be indicated. The classification set out in paragraph [828](#) should be adopted.

13.13 Distance travelled to work (or to place of education) and time taken (non-core topic)

831. Countries may wish to collect information on the **distance travelled to work (or place of education)** on a daily basis and the time taken with a view to monitoring the extent to which persons are living at greater distances from their place or work (or education), and the impact which traffic congestion has on the travel time taken. When collecting this information, consideration should be given to the address from which the journey commenced.

Chapter 14 Migration and mobility

14.1 Introduction

832. The United Nations Recommendations on Statistics of International Migration and Temporary Mobility⁸² refer to the concept of **international mobility** that includes all movements that cross international borders within a given year. Within this broad concept, **international migration** is defined as a change in the country of residence whereas **international temporary mobility** includes all other international border crossings (events).

833. In previous rounds of population censuses, the focus of the recommendations was on international migration without reference to temporary migration. However, temporary migration can have significant societal and economic consequences, similar to those of international migration. Due to the potential impact on the society and the economy and the increasing need to collect information on temporary populations, the United Nations Recommendations on Statistics of International Migration and Temporary Mobility recognize the importance to collect information on international temporary mobility, in addition to international migration. Collecting information on temporary populations is recommended for the censuses of the 2030 round. All information regarding temporary populations is considered as non-core, given the difficulties of collecting information on this topic and the specificities of groups of interest depending on the country.

834. National legal frameworks and country-specific contexts need to be considered when planning and conducting the enumeration of all mobility (including temporary mobility) populations, and when developing concepts to capture their characteristics and attributes. The present recommendations apply regardless of whether countries are collecting census data through direct enumeration, or using administrative registers or other sources.

835. There are three different aspects relevant to migration and mobility that can be identified through the census:

- (a) Measurement of stocks and in-flows of international migrants and of other groups relevant to international migration, with information on timing and geographical patterns of their international migration;
- (b) Measurement of stocks and in-flows of temporary populations (if possible), with information on the timing and geographical patterns of their mobility (this may not be possible in some countries, namely those using data from registers); and
- (c) Measurement of stocks and flows of internal migrants, with information on the timing and geographical patterns of their internal migration.

⁸²United Nations (2025). [Recommendations on Statistics of International Migration and Temporary Mobility](#). New York: United Nations.

14.2 Population groups relevant to international migration

836. Two population groups relevant to international migration are usually identified in population censuses among those with usual residence in the country: the foreign-born population and the population with foreign citizenship (incl. stateless population):

- (a) **Foreign-born population** consists of persons whose place of birth is in another country. This group corresponds to the stock of international migrants that migrated at least once in their lives and reside outside their country of birth at the census reference time. Persons born in the country are defined as "native born";
- (b) **Foreign citizens** do not have the citizenship of the country and are citizens of another country, or are stateless. Foreign citizens are predominantly foreign born. However, depending on the citizenship laws of certain countries, some children born in the country to foreign-citizen parents may be legally classified as part of the foreign citizen population. Alternatively they may automatically be granted the right of citizenship of the country and considered to be "native born" and therefore not part of the foreign citizen population. Persons having the citizenship of the country are defined as "citizens" or "nationals".

837. Information may be collected in the census that can provide a classification of the population based on the following topics:

- (a) Joint use of "country of birth" and "country of citizenship"; or
- (b) Joint use of "country of birth", "country of citizenship" and the country of birth of parents.

838. These topics are discussed below. Based on the two core topics - "country of birth" and "country of citizenship" - the following population groups, identified in [Table 4](#), can be classified:

- (a) Native-born:
 - i. Citizens or nationals: persons born in the country with the citizenship of the country. This group largely comprises native-born persons with national background. This group comprises the population groups (1), (5) and (9) as classified in [Table 4](#). It also includes descendants of foreign-born persons who acquired citizenship of the country after birth;
 - ii. Foreign citizens: persons born in the country without citizenship of the country (population groups (2), (6) and (10) in [Table 4](#)). This group mostly consists of descendants of the foreign born who have not acquired the citizenship of the host country. In most countries this population group will represent only a small proportion of the overall population;
- (b) Foreign-born:
 - iii. Citizens or nationals: persons born abroad with the citizenship of the host country (population groups (3), (7) and (11) in [Table 4](#)). This group largely consists of persons with parents of national background who were born abroad, or of persons with foreign background who have acquired host country citizenship;

- iv. Foreign citizens: persons born abroad without the citizenship of the country (population groups (4), (8) and (12) in [Table 4](#)). This group includes foreign-born immigrants who have not acquired the citizenship of the host country.

839. Based on the same two core topics together with the non-core topic “country of birth of parents”, the following alternative classification of population groups is identified in [Table 4](#):

- (a) Descendants of foreign born: This group consists of persons born in the country with at least one parent born abroad (population groups (5), (6), (9) and (10) in [Table 4](#). In population censuses, the focus is generally restricted to those persons whose parents were born abroad (often referred to as “second generation immigrants”). Third generations descendants of foreign-born parents can only be distinguished if the country of birth of grandparents is also collected in addition to that of the parents;
- (b) Persons whose parents are of mixed country of birth background: These are defined as persons with one parent born in the country and the other parent born abroad (population groups (9)–(12) in [Table 4](#)). This group can represent a significant and growing share of the population in some countries. It is recommended that, if possible, this group should be shown separately in census outputs;
- (c) International migrants: The Recommendations on Statistics of International Migration and Temporary Mobility⁸³ define an international migrant as “a person who has changed his or her country of usual residence and established a new residence in the country within a given year”. According to this definition, the stock of international migrants present in a country is defined based on duration-of-stay criteria in accordance with the usual residence concept specified in Chapter 12 (paragraph 764), using one of the following criteria: a) the place where the person has lived continuously for most of the preceding 12 months (that is, for at least 6 months and one day), not including temporary absences for holiday or work assignment, or intends to live for at least 6 months and one day; b) the place where the person has lived continuously for at least the preceding 12 months, not including temporary absences for holiday or work assignment, or intend to live for at least 12 months. This group includes all foreign born (population groups (3), (4), (7), (8), (11) and (12) in [Table 4](#)) plus those native born who have ever resided abroad.⁸⁴ This group encompasses recent arrivals (provided they meet the criteria of actual or intended duration of stay to be considered residents) as well as persons who may have migrated to a country (called the host country) and have resided in this country for many years. Some may have obtained the citizenship of the host country, while others may still be considered foreign citizens.

⁸³ See Annex D: Glossary of terms of the Recommendations, in United Nations (2025). [Recommendations on Statistics of International Migration and Temporary Mobility](#). New York: United Nations.

⁸⁴ It is assumed that all foreign born are international migrants and that they all resided or were expected to reside in the country of birth for at least one year. Also included should be children under the age of one year who migrate with their parents and who may not have resided abroad for at least one year.

Table 4

Classification of population according to country of birth of parents, country of birth and citizenship

Country of birth of parents	Country of birth of census	Citizen-ship	Description of the population group				
Both parents born in country of census	Born in country of census	Citizen or national	1. Native-born nationals with national background: persons with the country's citizenship and whose parents were born in the country. This group usually includes the large majority of the population.				
		Foreign citizen	2. Native-born foreign population with national background: foreign citizens who were born in the country and whose parents were also born in the country. In practice this usually constitutes only a small population group. It may include members of the so-called "third generation", persons with double citizenship who report only the foreign one or other persons with special cases.				
	Born abroad	Citizen or national	3. Foreign-born nationals with national background: nationals who were born abroad but whose parents were born in the country. This group usually includes children of emigrants returned to the country of origin of their parents. This group can be sizeable, especially in countries that have experienced large emigration flows in the past. Foreign-born adopted children will also be part of this group.				
		Foreign citizen	4. Foreign-born foreign population with national background: foreign citizens who were born abroad but whose parents were born in the country. Children of former emigrants can also be included in this group, if not entitled to national citizenship. This group is usually small.				
Both parents born abroad	Born in country of census	Citizen or national	5. Native-born nationals with foreign background: persons born in the country whose parents were born abroad. This group includes children of international immigrants who have got the citizenship of the host country, either at birth or by naturalization.	These two groups jointly form the group of descendants of foreign born. This group is also defined as native born with foreign background	Persons with foreign background	Part of 'second generation'	
		Foreign citizen	6. Native-born foreign population with foreign background: foreign citizens born in the country but whose parents were born abroad. In this group there are children of immigrants who did not get the citizenship of the host country.				
	Born abroad	Citizen or national	7. Foreign-born nationals with foreign background: nationals born abroad whose parents were also born abroad. This group includes the foreign-born immigrants who got naturalized.	These two groups jointly form the foreign born with foreign background.			
		Foreign citizen	8. Foreign-born foreign population with foreign background: This group includes the foreign-born immigrants living in the host countries and keeping their original citizenship. In many countries this is the largest group among all those with foreign background.	This group is often referred to as the "first generation".			

Country of birth of parents	Country of birth	Citizen-ship	Description of the population group	
Mixed (one parent born in the country and one born abroad)	Born in country of census	Citizen or national	9. Native-born nationals with mixed background: persons with the country's citizenship born in the country with one parent born in the country and another born abroad. This is usually a small population group, but it can be sizeable in countries with high immigration.	Persons whose parents are of a mixed country of birth background
		Foreign citizen	10. Native-born foreign population with mixed background: foreign citizens who were born in the country with one parent born in the country and another born abroad. In practice this is a small population group in most countries, since citizenship would be acquired either through <i>ius soli</i> or through <i>ius sanguinis</i> .	
	Born abroad	Citizen or national	11. Foreign-born nationals with mixed background: nationals who were born abroad with one parent born in the country and another born abroad. This group usually includes children of emigrants returned to the country of origin. This group can be sizeable, especially in countries that in the past experienced large emigration flows.	
		Foreign citizen	12. Foreign-born foreign population with mixed background: foreign citizens who were born abroad with one parent born in the country and another born abroad. Children of former emigrants can also be included in this group, if not entitled to national citizenship. This group is usually small.	

Part of 'second generation'

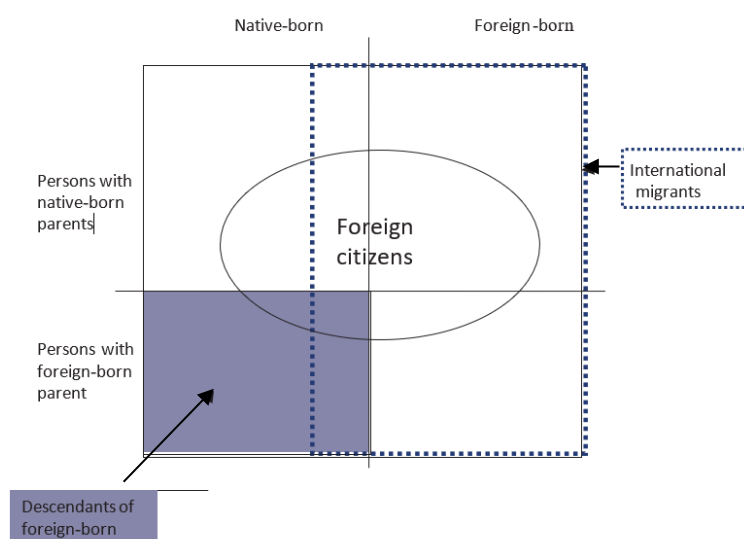
840. The groups defined above are not mutually exclusive and they can overlap to a great extent (Figure 3). However, each group is relevant to different aspects of the migration and integration process and represents a potential target for different programs and policies. The size of each group clearly depends on the country, its legislation and its migration history.

841. The group of persons with a foreign background is composed of those persons whose parents were both born outside the country (population groups (5)–(8) in Table 4). Members of this group may or may not have directly experienced an international migration.

842. Persons whose parents were born in the country form the group with a national background (population groups (1)–(4) in Table 4). As noted in paragraph 839 (b), those persons who have one parent born in the country and the other born abroad form the group with mixed country of birth background (population groups (9)–(12) in Table 4).

Figure 3

Native born, foreign born, foreign citizens, descendants of foreign born and international migrants



843. Countries that do not ask for country of birth of parents but do ask about acquisition of citizenship can approximate information on foreign/national background by using the following rules:

- (a) Persons having national citizenship since birth will be considered as having national background;
- (b) Persons who have received national citizenship by naturalization or other means will be considered as having foreign background; and
- (c) Persons without national citizenship (that is all foreign citizens) will be considered as having foreign background.

844. When using the topic on citizenship acquisition (see para. [861](#)) to identify national/foreign background, the following issues should be considered:

- (a) Persons with foreign background cannot be identified if, by the time of their birth, their foreign-born parents had already acquired the citizenship of the country; and
- (b) Persons whose parents are of mixed country of birth background cannot be identified using the topic of citizenship acquisition.

845. Persons with national/foreign background cannot be identified through information on citizenship acquisition in countries where granting of citizenship is based on the country of birth (the *jus soli* principle).

846. Analytical classifications can be built by using jointly "country of birth", "country citizenship" and "country of birth of parents". The classifications built using respectively place of birth/citizenship and place of birth/place of birth of parents/citizenship are particularly important since they allow the identification of various population groups relevant to international migration. A full description of these classifications is given in [Table 4](#).

847. In all topics related to international borders (country of birth, country of birth of parents, country of citizenship, country of previous or current residence), reference should be

made to the boundaries existing at the census reference time. If there have been boundary changes that have affected the designation of a person's country of birth since the birth, it may be necessary to make an allowance for them in order to record the person's current country of birth. This can have important implications in countries that originated from the splitting of a former country, since many persons that moved within the borders of the former country may now be counted as international migrants, if reference is made to their country of birth or their country of previous residence. It is therefore important to pay attention to the interpretation of data from these countries, particularly in relation to these two topics.

848. Wherever possible, complementary tabulations on population stocks relevant to international migration should be provided, distinguishing persons who migrated before the break-up of the former country from those who did so after the break-up. Persons who were born in a particular territory but whose country of birth has changed due to boundary changes should not be counted as foreign born.

14.3 Topics relevant to international migration

14.3.1 Country of birth (core topic)

849. Information on country of birth is essential for the analysis of international migration. As a measure of internal migration countries may need to collect information on place of birth within the country – see paragraph [880](#))

850. The **country of birth** is the country in which the place of birth of a person (see paragraph [880](#)) is located. Country of birth is used to distinguish between native-born and foreign-born residents. It should be noted that the country of birth of a person is not necessarily the same as his or her country of citizenship, which is a separate census topic (see paragraphs [856-860](#)). The country of birth may refer either to the country where the physical birth occurred or to the country in which the mother was usually resident at the time of the birth if this is different. Countries should explain the concept adopted in the census report(s) and any accompanying metadata.

851. For purposes of international comparability, as well as for internal use, information on country of birth should be collected based on international boundaries existing at the census reference time. It is recommended that the information on this topic be collected and coded in the most feasible detailed manner. For the foreign-born population, the collection of information on the specific country of birth is recommended so as to permit the classification by country based on the three-digit alphabetical codes presented in the classification issued by the United Nations Statistics Division.⁸⁵ For respondents who were born outside of the country of enumeration but cannot identify their country of birth, at least the continent or region where that country is located should be collected.

852. Countries may consider including a category "born in the country", in their outputs, based on the boundaries at the time of the event for those countries where it may be sensitive to describe some respondents as "foreign born" if they had had to leave their place of

⁸⁵ Standard Country or Area Codes for Statistical Use, [ST/ESA/STAT/SER.M/49](#).

residence because of war or political disruption. In general, the “foreign-born” category should refer to where there has been an act of physically crossing a national border.

14.3.2 Country of birth of parents (non-core topic)

853. Countries with a significant number of immigrants may want to collect information on the country of birth of both parents. This information on the country of birth of parents (father and mother) should be collected of all resident persons adopting the same criteria as for country of birth. This topic permits the identification of the group of descendants of foreign born. Special attention should be paid in collecting this topic in countries where boundaries have undergone major changes (see paragraph [847](#)).

854. Information on country of birth of parents can be used, in combination with information on country of birth of the enumerated person, to identify native-born children of the foreign-born population (the so-called “second generation”), as well as to study the integration processes and outcomes of migrants and their descendants. Moreover, in countries that have experienced return migration, information on this topic allows the identification of foreign-born children of native-born parents.

855. In case of adopted children, reference should always be made to the legal parents rather than to the natural parents.

14.3.3 Country of citizenship (core topic)

856. **Citizenship** is defined as the particular legal bond between individuals and their countries, acquired by birth or naturalization according to national legislation. Citizenship is used to identify the population of foreign citizens, that is, those persons resident in the country but who do not hold the citizenship of that country of enumeration.

857. Country of citizenship should be collected separately from information on country of birth as the two are not necessarily the same.

858. Information on country of citizenship should be collected for all persons and coded in the most feasible detailed manner, based on the three-digit alphabetical codes presented in the classification issued by the United Nations Statistics Division.⁸⁶ This classification of countries and areas serves as a useful tool for developing a classification of citizenships. Attention should be paid in considering those dependent territories included in the classification above but that may not have their own citizenship. For reasons of international comparability, each country should collect information on country of citizenship according to the list of countries recognized by the United Nations, rather than whether it recognizes a particular country.

859. Provisions should be made to identify stateless persons, that is, persons who are not considered as citizens or not considered as nationals by any state under the operation of its law.⁸⁷ The category “stateless persons and those without a recognised nationality status” is

⁸⁶ Ibidem.

⁸⁷ See EGRIS, 2023, [International Recommendations on Statelessness Statistics](#) (IROS). To better assess the profile of the stateless population, countries may wish to collect – for persons who declare not having a citizenship or are unsure – information

considered suitable for the census. It is not likely in censuses to be able to fully distinguish those who are stateless (without a recognised statelessness status) from those whose nationality is unclear.⁸⁸

860. Information on all citizenships held by respondents should be collected, to identify the population with dual or multiple citizenships. It is recommended that when collecting information on dual citizens consideration be given to which is the first and the second country of citizenship with the first being the reporting country, which is the country of citizenship where the respondent lives.⁸⁹

14.3.4 Citizenship acquisition (non-core topic)

861. Countries with a significant number of naturalized persons may want to collect information on the year of acquisition of national citizenship and the way it was acquired, either at birth, by marriage or naturalization, or by some other means according to the national legislation.

862. In countries that have emerged from the break-up of former states, an additional typology of citizenship acquisition may be added which should refer to those who received national citizenship when the new state was created. This typology should include those who were recognized as national citizens when the regulation on citizenship of the newly created state came into force.

14.3.5 Ever resided abroad and year of arrival in the country (core topic)

863. This topic focuses on all persons who have ever resided outside the current country of usual residence, regardless of country of birth or citizenship, and regardless of other changes of usual residence that may have occurred inside the country. In order to collect information on this topic, individuals should be classified depending on whether or not they have ever had a usual residence abroad. Information on this topic allows the identification of all international migrants (see paragraph 839(c)). For those who have ever resided abroad, the year of arrival in the current country of residence should also be collected.

864. The purpose of this topic is to measure duration of residence of international migrants in the host country. It is preferable to measure duration using the year of arrival, rather than the number of years elapsed since arrival in the country, because time of arrival is likely to yield more accurate information.⁹⁰ In order to have more detailed information on the time of arrival, information may also be collected on the month of arrival.

865. The year of arrival should be the calendar year when the person most recently established usual residence in the country. Accordingly, guidance to enumerators and respondents should emphasize that this topic relates only to the most recent immigration to

on country of birth of parents (paragraph 853), country of previous usual residence abroad (paragraph 867), and total duration of residence in the country (paragraph 870).

⁸⁸ EGRIS, 2023, [International Recommendations on Statelessness Statistics](#) (IROS), paragraph 154

⁸⁹ Countries part of the European Union may wish to consult the Eurostat guidelines: Implementing core variables in EU social surveys, Draft Methodological Guidelines, 2011, for determining how to report dual citizenships.

⁹⁰ For those arrived in recent years the individual calendar year should be recorded while broader time intervals could be used for those arrived in previous periods.

the country since difficulties of understanding may occur where a person has undertaken multiple migrations and established residence in the country on more than one occasion. Recording the year of arrival provides an alternative to pre-coded answers in terms of time intervals for most recent arrival.

866. Some countries may, for national policy needs, also wish to collect information on the year that permanent residency was granted for international migrants. This may be different from the year of arrival, and provides a measure of the duration of the time permanent residency (that is, the legal right to live in a country as a permanent resident) was granted. Likewise, some countries may also choose to collect the year of first arrival to derive the entire period of duration in the country, which may be useful in conducting studies on immigrant integration (see also paragraph [870](#) below).

14.3.6 Country of previous usual residence abroad (non-core topic)

867. For persons that have ever resided abroad, the country of previous residence may also be recorded. This should be the country in which the person last established a usual residence prior to the move to the country of enumeration. This may not necessarily be the country from which the person travelled to the country of enumeration.

868. For purposes of international comparability, as well as for internal use, information on country of previous residence should be collected on the basis of international boundaries existing at the census reference time. It is recommended that the information on this topic be collected and coded in the most feasible detailed manner, based on the three- digit alphabetical codes presented in the classification issued by the UN Statistics Division.⁹¹

869. Place of previous usual residence within the country should be collected as a separate topic for all persons (see paragraph [884](#)). It is an important topic for analysis of internal migration as well as to capture information on returning nationals to the home country.

14.3.7 Total duration of stay in the country (non-core topic)

870. This topic focuses on the total duration of residence in the country of international migrants. Total duration is defined as the total number of years that the international migrant has resided in the country, taking into account all periods of residence including the current one. This topic provides additional information with respect to the year of most recent arrival (see paragraph [863](#) above) for those persons who have established residence in the country on more than one occasion.

14.3.8 Reason for migration and temporary mobility (non-core topic)

871. Some countries may wish to collect information on reasons for international and/or internal migration and/or temporary mobility. This topic should refer to the main reason that drove the respondent to undertake the most recent mobility move. It is recommended that only one main reason for migration be recorded. It may be most appropriate to include this

⁹¹ Standard Country or Area Codes for Statistical Use, [ST/ESA/STAT/SER/M/49](#).

topic as a sub-topic of the item on residence abroad (see paragraph [867](#)) or as a sub-topic of the item on the previous place of usual residence (see paragraph [884](#)).

872. Examples of some of more common reasons for migration and temporary mobility are:

- (a) Work (including to invest or start a business) or employment (including military service);
- (b) Education and training;
- (c) Marriage, family reunification or family formation;
- (d) Forced displacement (e.g. refugees, asylum seekers, people with temporary protection status);
- (e) Deportation or involuntary return;
- (f) Housing;
- (g) Health;
- (h) Retirement;
- (i) Environment and climate;
- (j) Social and political factors.

14.3.9 Refugee and refugee related populations (derived non-core topic)

873. The [International Recommendations on Refugee Statistics \(IRRS\)](#) adopted by the United Nations Statistical Commission in March 2018 ([Decision 49/115](#)),⁹² provide a set of specific recommendations to improve the collection, collation, disaggregation, reporting and overall quality of statistics on populations forcibly displaced across borders. The recommendations are intended to help those countries that wish to collect information on this topic to improve national statistics on the stocks and flows and characteristics of refugee and refugee related populations, and to help make such statistics comparable internationally.

874. In this chapter, it is recommended to adopt the 2018 Statistical Framework of the Recommendations, in particular referring to the different groups belonging to refugee and refugee-related populations with reference to collecting data on stock and flows.

875. The population in scope of these recommendations includes refugees, asylum seekers, those admitted for subsidiary, complementary and temporary forms of protection, and others admitted for other international protection reasons. It also includes people who have returned home after seeking international protection. Additionally, it includes those who are not refugees themselves, but have a refugee background, such as naturalized former refugees, children born to refugee parents who are not refugees themselves, and reunified family members from abroad. It is important to note that the recommendations only include persons entering the country to flee from persecution, disturbed public order, war or violence in the country of origin, or those with a similar background. Persons migrating to a country due to economic deprivation, or due to climate change and other human-made disasters in their home country are excluded from the scope of these recommendations, unless they also

⁹² UN and EUROSTAT, 2018. [International Recommendations on Refugee Statistics \(IRRS\)](#) (mainly chapter 3: Defining refugee and refugee related populations for the purpose of statistical measurement).

are in need of international protection to the extent that they cannot return home. In the data collection process of those countries that wish to collect such data, it's recommended to distinguish between the three main groups in the scope:

- (a) Persons in need of international protection, including prospective asylum seekers, asylum seekers, persons with determined protection status (refugees, those admitted for complementary and subsidiary forms of protection, and those admitted for temporary protection), and others in refugee-like situations;
- (b) Persons with a refugee background, comprising naturalized former refugees, children born to refugee parents, reunified refugee family members from abroad and others with a refugee background;
- (c) Persons returned from abroad after seeking international protection. This category includes repatriating refugees, repatriating asylum seekers, persons returning from international protection abroad and others who are returning from seeking international protection abroad.

14.3.10 Temporary mobility (non-core topic)

876. **Temporary mobility** refers to all persons who were present in the country of enumeration at the reference time but were not residents. Including, for example, those associated with daily commuting, tourism, pilgrimage, business, health care, visits to family or friends, employment (seasonal labour) and education. Temporary populations include forcibly displaced persons who stay in the country of enumeration for less than the minimum duration required in order to be considered part of the resident population, such as asylum seekers in transit, refugees who move to another country or return, and environment or climate related mobility.

877. Some countries may be interested in meeting their own needs, collecting information about the size and characteristics of the temporary population and its characteristics, as well as information about flows of this type of mobility. For these countries, it is recommended to collect data on temporary populations in the 2030 round of censuses. Some countries may be interested in collecting data only on some types of temporary populations. In any case, countries that decide to collect data on temporary populations are encouraged to collect data on the reason for their presence in the country of enumeration and collect social and economic characteristics similar to those collected for international immigrants, in particular characteristics such as country of birth, country of citizenship, and date of arrival to the country. Emphasis is recommended on movements associated with: (a) the labour market (cross-border workers, engaged in seasonal work, other types of employment); (b) utilization of education or training services; (c) utilisation of health care or medical care services; and (d) asylum seekers and those with protection as refugees.

14.3.11 Population groups relevant to internal migration

878. **Internal migrants** are broadly defined as persons who are usually resident in a particular geographical area and who have previously been resident in another geographical area in the country of enumeration. Internal migrants, as identified in the census, are,

therefore, specifically defined as those who are usually resident in a civil division at the census reference time and who have previously been resident in another civil division within the country. In order to provide relevant information on internal migrants, a detailed classification should distinguish local, intra-regional or inter-regional moves (as well as any international moves). Geographic areas and civil divisions are defined by each country, but movements within the smallest civil divisions should be considered as “residential mobility” rather than internal migrations.

879. Persons who are international migrants – who, regardless of country of birth or citizenship, have at some point in their lives been usually resident in another country – may also be counted as internal migrants if, after their international move, they have also moved internally and they were resident elsewhere in the country prior to the census.

14.4 Topics relevant to internal migration and mobility

14.4.1 Place of birth (core topic)

880. Place of birth is relevant for the analysis of internal migrants. **Place of birth** can be collected according to either the geographical unit in which the birth took place or to the place of usual residence of the mother at the time of the birth. Countries should collect information according to the criterion that best suits their information needs. Some countries may collect information according to both criteria. As with the topic “country of birth” (paragraph 849), countries should explain the concept adopted in the census report(s) and any accompanying metadata. For persons born in the country, information on the smallest civil division should be collected. For persons born outside the country, it is sufficient to collect information on the country of birth.

881. Information on place of birth of the native-born population is primarily used to investigate internal migration. However, for countries that have been recently formed from parts of previously separate entities, such information may be of use in assessing the relative size of population segments from each of those entities and their distribution throughout the country.

882. For the latter purpose, it is usually sufficient to collect information only on the major civil division (state, province or department, for example) where the place of birth is located. If desired, more detailed information on smaller civil divisions can be collected and used for accurate coding of the major division or for presenting data for smaller areas. However, to assist in such coding, a detailed and accurate index of place names, linking the smaller civil divisions to its higher geography is required.

883. For studies of internal migration, data on place of birth in terms of major civil divisions alone are inadequate. For an understanding of movements of people since birth, it is necessary to collect information as required according to the information needs of a country, bearing in mind that (a) the boundaries of administrative units such as cities and other civil divisions may change over time, which will give rise to ambiguity in data reported; and (b) the costs of coding reported data to these smaller units may be prohibitive especially where there are many units and the population is highly mobile. To overcome the first problem, to the extent possible both national and sub-national boundaries should refer to the boundaries

applying at the census reference time. Countries should address the second problem in the light of their own circumstances.

14.4.2 Previous place of usual residence and date of arrival in the current place (core topic)

884. This topic provides information on geographic and time patterns of migration moves to the current place of residence. It is recommended that the place of previous residence should be identified in terms of the smallest civil division.

885. In operational terms this topic can be implemented in two modes:

- (a) Extensive mode: by enquiring into "year and month of arrival in the current place of usual residence" plus "previous place of usual residence"; or
- (b) Reduced mode: by enquiring into "place of usual residence one year prior to the census".

14.4.2.1 Year and month of arrival in the current place of usual residence

886. In the extensive mode, year and month of arrival should be the calendar year and month when the person most recently established residence in the current place of usual residence. The information is important for measuring both long- and short-term internal migration. In order to reduce the burden on respondents' (when information is collected in the field), month of arrival could be asked only of those who arrived in the calendar year before the census.⁹³ The previous place of usual residence should be defined in terms of the smallest civil division. From the joint use of the two topics it is possible to analyse patterns and timing of internal migration. If previous place of usual residence was outside the country, the country of residence should be collected (see paragraph [867](#)).

14.4.2.2 Place of usual residence one year prior to the census

887. The reduced mode is primarily intended to allow patterns of recent migration to be studied. If the place of usual residence one year prior to the census was within the country, the smallest civil division should be identified. If the place of usual residence one year prior to the census was outside the country, only the country of residence need be collected (see paragraph [867](#) above).

888. The information on persons that arrived in the current place of residence during the last year collected through the reduced mode can be compared to the corresponding information provided by the extended mode. However, the extensive mode also provides important information on migrations events that took place in previous years. Countries should select either one or the other of the two modes based on their information needs.

889. However, both the extensive and reduced mode provide only partial information on international migration, and it is therefore recommended that countries include the topic

⁹³ For those arrived in recent years the individual calendar year should be recorded while broader time intervals could be used for those arrived in previous periods.

"ever resided abroad and year of arrival in the country" (see paragraph 863 above) to collect more precise information on the timing of international migration.

14.4.3 Place of usual residence five years prior to the census (non-core topic)

890. If information on the place of usual residence one year prior to the census is collected (in the reduced mode of the topic "place of usual residence and date of arrival in the current place"), the place of usual residence five years prior to the census could also be collected. This extension of the time interval allows the capture of a larger number of moves but at the cost of an increased uncertainty about the exact timing of the migration. As with the one-year enquiry, if the place of usual residence five years prior to the census was within the country, the smallest civil division should be identified, but if the place of usual residence was outside the country, only the country of residence need be collected.

14.4.4 Reasons for internal migration (non-core topic)

891. Some countries may wish to collect information on reasons for internal migration, especially when the country intends to collect data on internally displaced persons. This topic should refer to the main reason that drove the person to undertake the most recent migratory move. It is recommended that only one main reason for migration be recorded. Examples of more common reasons are listed in paragraph 872.

14.4.5 Internally displaced persons⁹⁴ (derived non-core topic)

892. The 2020 International Recommendations on Internally Displaced Persons defines IDP as the situation of persons who have been forced or obliged to leave or abandon their homes and who have not crossed an internationally recognized border.

893. In countries where massive flows of internal migration have occurred because of dramatic events like wars, social or political unrest, natural or environmental disasters, it is important to measure the magnitude of such movements. However, the count of the stock of IPDs is often difficult to enumerate because of multiple occurrences of movements and diversity of causes of mobility, as well as because of protection concerns or risks attached to such movements. Nevertheless, countries may have specific legal and administrative responsibilities for administering the needs of IPDs, for which information collected in the census would be required. At the international level, it is recommended that countries that wish to collect data on this topic adopt the statistical framework that distinguishes between four main categories on official statistics:

- (a) IDPs (or persons who have displacement-related protection needs and vulnerabilities). This group is considered the main group and it is proposed to divide it into three subcategories according to the location of the persons who still need protection and to vulnerabilities at the measurement time: 1. Persons who are located in the displacement location (IDPs in locations of displacement); and,

⁹⁴ Based on chapter 3 in the [International Recommendations on Internally Displaced Persons Statistics \(IRIS\)](#) (March 2020).

2. Persons who returned to their place of habitual residence (IDPs in locations of return); and 3. IDPs who have settled elsewhere in the country (IDPs in other settlement locations);
- (b) Children of at least one IDP parent: Should be counted as a separate but related statistical category;
- (c) Other non-displaced family members of IDPs: Should not be included as a statistical category in official IDP statistics;
- (d) Those who have overcome key displacement-related vulnerabilities: No longer within the stock of IDPs but recommended to be reported on as a separate statistical category. It is proposed to divide this group into three subcategories according to the location of the persons who are no longer within the stock on IDPs: 1. persons who integrated in the displacement location (Locally integrated); 2. persons who returned and reintegrated in their place of habitual residence (Returned and reintegrated); and 3. persons who have settled and integrated elsewhere (Settled elsewhere and integrated).

894. It is recommended to refer to the stock and flows statistics of the IDPs. New cases in the stock (inflows) include individuals defined as IDPs (according to the three categories defined above – category a) and include births of women who are IDP or whose father is IDP (category b). Outflows include persons who are No longer within the stock of IDPs (category d), emigration of IDPs and deaths of IDPs.

895. It is recommended to derive data on IDPs using the cause of internal migration topic. It should be noted that for some groups, the question about the reason for internal migration may not be sufficient to derive the required information. Especially "persons who returned to their place of habitual residence" and "persons who are no longer within the stock of IDPs.". Therefore, it may be necessary to add additional questions to collect all the required information.

896. Further relevant details, such as date of arrival and main reason of displacement, the place of previous residence and the place of current residence are important characteristics of IDPs and may be obtained by cross-tabulation with other topics.

Chapter 15 Demography

15.1 Introduction

897. The demographic characteristics of sex, age and marital status are core variables that are fundamental in classifying and reporting on other information from the census to foster understanding of socioeconomic and demographic issues. In the case of sex and age, it is essential to record this information for every person for whom census information is collected or compiled. If this information is incomplete, it should therefore be derived or imputed for census purposes rather than being reported as “not stated”. In the case of marital status, as discussed below in paragraph 922, it is recommended to collect this information at least for persons aged 15 years and over.

898. A population census may provide an opportunity to collect the data needed for estimating fertility at both national and sub-national levels. The use of a population census as a vehicle for producing fertility estimates is particularly important in countries lacking a reliable registration system for the production of vital statistics, because of the opportunity that census data can provide for estimating vital rates that would not otherwise be available. Even in countries with complete birth registration, however, some demographic topics – such as numbers of children born alive, children still living, and age at marriage or union – are still of great value as they can be cross-tabulated with socioeconomic or other characteristics collected in the census, which would not be possible with civil and vital registration data alone. For example, the census allows collecting data on children born to immigrants before their arrival to the country, which are not captured in the civil registration system.

15.2 Sex (core topic) and gender (non-core topic)

15.2.1 Sex (core topic) and gender (non-core topic)

899. **Sex** is designated as a core topic and relates to biological attributes that result in one being labelled as male or female. Disaggregating the other demographic, social and economic characteristics by sex is important, as is the use of sex data for survey controls. Some countries are moving from collecting information on sex to collecting information on gender. This may or may not be accompanied by the collection of information on sex at birth in order to derive information about gender. While these concepts are often used interchangeably, they are distinct from sex.

900. The sex (male or female) of every individual should be recorded in the census or taken from the appropriate administrative record for countries using a register. Sex-disaggregated data is a fundamental requirement to understand variations in the experiences of males and females when it comes to a host of demographic, social and economic characteristics such as ageing, marital status, living arrangements, educational attainment, labour force status, migration and disability.

901. With growing awareness of the distinction between sex and gender, as well as the increasing visibility of gender minority populations, some countries have started collecting information on gender or gender identity in their census. Thus, at this time gender is recommended as a non-core topic for countries that want to measure the gender diversity of their population in a census. Because sex and gender are often conflated, it is important to make clear what is being measured.

902. **Gender** is broadly defined as a multidimensional concept that includes psychological, social and behavioural aspects. Gender identity is generally an individual's self-perception or sense of belonging as a man/boy (masculine), woman/girl (feminine) or non-binary person (a person who is not exclusively man or woman). Transgender people are those who define their gender identity differently from their sex that was registered or recorded at birth.

903. There is diversity in the way in which countries approach inclusion of sex, gender or both sex and gender in data collection. This is highly dependent upon cultural context.

15.2.2 Testing and Research

904. While the existing methods to collect information on gender demonstrate significant differences, all are supported by rigorous ongoing testing programmes. Countries have published robust research on topic development, question wording and response options based on knowledge from cognitive testing and focus groups. Information exists on field testing that includes examining collection methods by mode, with considerations for the privacy of respondents. Country collaborations have occurred to understand data processing methods and evaluations. Information outlining dissemination strategies is available that considers the delicate balance between confidentiality and the need for disaggregated gender data.

905. There are still many areas where additional gender research is needed. There is limited information about proxy reporting, where one person responds for all household members. Since research shows that gender identity forms at a variety of ages and that the number of people that one shares one's identity with can vary, there are potential implications that are yet to be understood.

906. Another consideration is whether there are distributional differences when comparing responses for the core variable of sex compared to responses for either sex assigned at birth or gender. This consideration may become important where census data is used in downstream products such as intercensal estimates, population estimates or as survey controls. To measure a small population like the transgender population accurately, the alignment of sex and sex assigned at birth are relevant issues. Currently, Statistics Canada is using census data on gender as survey controls for their monthly Labour Force Survey.

15.2.3 Census data collections

907. Countries that have collected information on gender have used two different approaches.

908. Canada, Ecuador and New Zealand used a question design commonly referred to as the "two-step approach", where a question on gender is paired with a question on sex at

birth. Canada and New Zealand modernized their most recent censuses using gender as the default demographic for output. Canada now asks, "What was this person's sex at birth?" as opposed to "What is this person's sex?" as used in the 2016 census. This question's response options of male and female remained unchanged across censuses. The next question asked, "What is this person's gender?" with response options of "Male" and "Female" with a write-in option "Or please specify this person's gender."

909. Ecuador used a similar two-step approach, although they had more detailed response options for the gender question, including "Male", "Female", "Trans male", "Trans female", "Nonbinary" and "Does not know/ Does not respond."

910. It is important to note that when using a two-step approach, it is necessary to use responses from both parts of the question to derive gender.

911. Censuses in the United Kingdom took a different approach, and this varied between countries. In England and Wales and in Scotland the core sex question was maintained, asking "What is your sex?". Later in the England and Wales questionnaires, respondents were asked "Is the gender you identify with the same as your sex registered at birth?", with response options of "Yes", "No" and a write-in response. In Scotland, the second question asked, "Do you consider yourself to be trans or have a trans history?" with response options of "No" and "Yes, please describe your trans status", with a write-in. The question includes the note "Trans is a term used to describe people whose gender is not the same as the sex they were registered at birth."

912. The data from England and Wales showed that while there is confidence in the gender identity estimates at a national level, there are some patterns in the data that are consistent with – but do not conclusively demonstrate – that some respondents may not have interpreted the question as intended, for example, people with lower English language skills in some areas. At the time of preparing these Recommendations, findings have not yet been released in Scotland to determine how the second question asking about being "trans" or having a "trans history" performed.

15.2.4 Incorporating population register data

913. In the New Zealand census, if the sex assigned at birth or gender responses did not include a usable value, information was gleaned from administrative data sources where the concepts align.

914. Countries using administrative data sources may need to consider the reference period for the given sex response. That is, does the recorded value represent one's "sex at birth" or sex as of the reference period (i.e. end of year). Each country will need to weigh the importance of this distinction based on their national priorities and nationally available data.

15.2.5 Recommendations

915. While research on how to measure sex and gender is evolving, it is imperative that the existing validated research guide census data collections. This is particularly important for small and vulnerable population groups. Using the existing methods, it is important to determine whether collecting sex as a core variable is sufficient in the census or if information

on gender is needed as a non-core topic. To inform this decision countries may consider whether collecting information on gender adds value within their policy, public opinion, and legal context given the sensitivity of the topic.

15.3 Age (core topic)

916. Information on date of birth should be collected to obtain information on age. This yields more precise information than collecting data on exact age at the census reference time. Collecting information on the date of birth allows for the tabulation of data in two ways: by year of birth and by completed years of age. Date of birth also allows age to be calculated relative to points in time other than the census reference time.

917. Since age is one of the most important topics collected in a census, used in many tabulations and analyses, information on age must be as complete and accurate as possible. If information on age is missing, imprecise or contradictory, imputation based on other individual or household entries should be undertaken.

918. In countries where the exact date of birth may be difficult to collect for a significant proportion of the population, the census questionnaire could allow calendar quarter or season of the year to be substituted. However, in census questionnaires with specifically designated response boxes for day/month/year, such write-in responses as season of the year would not be codable. In some cultures, newborn children may be considered to have age 1: in countries where this practice is common, care must be taken to distinguish these cases.

919. Impossible ages, such as children older than their parents, should be edited. If age in years is collected, attention must be given to parents mistakenly reporting their infant's age in months. Care should be taken in collecting and assuring the quality of information on the age of older persons, since misreporting can be more common at the older ages.

920. Children, young persons and older persons are age groups often requiring special focus in thematic analyses of census data. Any census characteristic in which age is expected to play a role (such as socioeconomic characteristics) should be readily cross-classified against age. Countries should ensure that the definitions and classifications used in the census meet the needs of likely users of data on these groups.

15.4 Legal marital status (core topic)

921. Legal marital status is defined as the conjugal status of each individual in relation to the marriage laws or customs of the country (sometimes also referred to as the *de jure* marital status).

922. Information on the legal marital status of each person should be collected at least for persons aged 15 years and over. However, since the minimum legal age (or the customary age) for marriage varies between countries, and since the population may also include young persons who have been married in other countries with lower minimum ages, it may be

necessary to employ a lower age threshold for the collection of information on legal marital status.

923. The following basic classification of the population by marital status is recommended:

- (1.0) Never married
- (2.0) Married
- (3.0) Widowed and not remarried
- (4.0) Divorced and not remarried.

924. All persons living in consensual unions (see paragraph 934) should be classified as “never married”, “married”, “widowed” or “divorced” in accordance with their *de jure* (legal) status.

925. In countries with legal provision for registered/legal partnerships or marriage of same-sex or same-gender couples (depending on whether the legal provisions apply to sex or to gender), additional categories may be included in the category of the “married”, for example:

- (2.1) Spouse of a different sex (or gender)
- (2.2) Spouse of the same sex (or gender).

926. Alternatively, the classification may be expanded, for example, as:

- (1.0) Never married
- (2.0) Married
 - (2.1) Spouse of a different sex (or gender)
 - (2.2) Spouse of the same sex (or gender)
- (3.0) Registered or other legal partnership
 - (3.1) Partner of a different sex (or gender)
 - (3.2) Partner of the same sex (or gender)
- (4.0) Widowed and not remarried
- (5.0) Divorced and not remarried.

927. In some countries there may be a policy or user need to distinguish male same-sex couples and female same-sex couples. This can be achieved by considering the combination of sex and legal marital status according to this expanded classification.

928. The term “spouse” may be replaced, in collection instruments and/or in dissemination products, by terms appropriate to the language and the culture of each country, such as “husband/wife”. Many languages lack a gender-neutral word for “spouse”, or the word may carry certain connotations that may affect understanding or willingness to answer. Thorough testing for acceptability and impacts on data quality should be conducted, both when introducing any expanded classification to account for same-sex or same-gender partnerships, and when choosing terms to be used in questionnaires and for dissemination.

929. A separate category for “legally separated” may be necessary in countries where the legislation includes provisions for this status, as distinct from “married” or “divorced”. Some

countries may also wish to identify separately within the “married” category, those persons who are remarried.

930. Unless a separate category is used for annulled marriages, individuals whose marriages have been annulled should be classified according to their marital status prior to the annulled marriage.

15.5 De facto marital status (core topic)

931. **De facto marital status** is defined as the status of each individual in terms of their actual living arrangements within the household being enumerated, regardless of that person’s legal marital status.

932. Information on this topic should be collected for persons of the same age categories as those for whom information on the legal marital status is collected.

933. The recommended classification is:

- (1.0) Person living with spouse or partner (registered or in a consensual union) having usual residence in the same household
- (2.0) Person not living with spouse or partner (registered or in a consensual union) having usual residence in the same household.

934. Two persons are taken to be partners in a consensual union when: they have usual residence in the same household, they are not married to, nor in a registered/legal partnership with, each other, and they have a marriage-like relationship to each other. People in such a relationship are also known as “cohabiting partners” or a “cohabiting couple”.

935. Some countries may wish to facilitate analysis of non-cohabiting marriages and consensual unions; that is, where the criteria above are fulfilled with the exception of having usual residence in the same household (or where a couple is legally married but not having usual residence in the same household); in which case countries should add to the above classification (3.0) “Person with spouse or partner (registered or in a consensual union) not having usual residence in the same household”.

936. An optional distinction may be made within category (1.0) between (1.1) “Person living with spouse or partner of a different sex (or gender)” and (1.2) “Person living with spouse or partner of the same sex (or gender)”.

937. Information on *de facto* marital status can also be derived from information collected on topics related to household and family characteristics of persons, characteristics of family nuclei and characteristics of private households, based on the relationship to the reference person or the full household relationship matrix where used (see section [16.3.2.2](#)). Where such a matrix is not used, it is necessary in censuses employing direct enumeration to ask a specific question on living arrangements.

938. In countries where census information is derived from administrative registers, data on consensual unions and non-cohabiting unions may not readily be available.

15.6 Total number and sex of children born alive (non-core topic)

939. Information on the total number of children born alive can be collected in the census in countries in which such information is needed for estimating fertility using indirect techniques. In countries with unreliable or incomplete registration of births, census information on this topic can be useful for assessing the completeness of the registers and for estimating levels of lifetime fertility of older cohorts.

940. This topic can be sensitive for mothers who have experienced stillbirths, as well as for those who have given birth outside of a socially sanctioned union. This should be considered carefully in the testing programme. If included in the census, information on total number of live-born children should be collected for all women aged 15 years and older. In populations where significant fertility occurs at younger ages, the lower limit should be adjusted accordingly.

941. The data collected on total number and sex of live-born children should, in principle, include all children born alive during the lifetime of the women concerned up to the census date (that is, excluding foetal deaths and stillbirths). Adopted children should not be included. The number recorded should comprise all live-born children, whether born within the present marriage or other form of partnership or a previous one, whether born within a union or outside of one, within the country or abroad, and regardless of whether such children are still alive at the census reference time or where they are living.

15.7 Date(s) of legal marriage(s) of ever-married women: (i) first marriage and (ii) current marriage (non-core topics)

942. Information on dates/duration of marriage can be valuable for fertility statistics, and extends the knowledge that can be derived from data on number of live-born children. In the case of women who have been married more than once, information may be obtained on the dates of both the first marriage and the current marriage.

943. For women who are widowed, separated or divorced at the census reference time, "date of/age at/number of years since the dissolution of first marriage" should be collected. Information on dissolution of first marriage (if applicable) provides the data necessary to calculate "duration of first marriage" as a derived topic at the processing stage. In countries in which duration of marriage is reported more reliably than age, tabulations of children ever born by duration of marriage yield better fertility estimates than those based on children born alive classified by age of the woman. The duration of marriage can be obtained by subtracting the age at marriage from the current age, or directly from the number of years elapsed since the marriage took place. Some countries may find it useful to also collect the order of the current marriage.

15.8 Date(s) of the beginning of the consensual union(s) of women having ever been in consensual union: (i) first consensual union and (ii) current consensual union (non-core topics)

944. Information on dates/duration of consensual union(s) can be valuable for the same reasons as the corresponding information on marriage(s) (paragraph [942](#)).

945. In the case of women who have been in consensual union more than once, it is recommended to obtain information on the dates of both the first and the current consensual union. Information on dates/duration of consensual union(s) can be combined with the information on the date(s) of legal marriage(s).

946. It should be recognized that the beginning, and thus the beginning date, of a consensual union may be imprecise.

Chapter 16 Household and family

16.1 Introduction

16.1.1 Clarifying the analytical perspective

947. This chapter provides recommended definitions and classifications for the following three themes: (1) household characteristics, (2) family characteristics, and (3) household and family characteristics of persons. Methodological considerations relevant to each theme are also described.

948. Many phenomena can be examined equally from the perspective of the private household, the family nucleus, or the individual. For instance, statistics related to one-parent families could be examined from the perspective of the household (e.g., number of households composed of a one-parent family), the family (e.g., number of one-parent families), or the person (e.g., number of persons/children/parents in one-parent families). Each perspective may yield substantively different results owing to the different numerators and denominators involved. NSOs should therefore always make clear the analytical perspective when disseminating products related to household characteristics, family characteristics or household and family characteristics of persons. NSOs should also make it clear that any data or classifications relating to the characteristics of families are restricted to families in private households, and the data and classifications related to the household and family characteristics of persons are restricted to the population living in private households.

16.1.2 Establishing household membership of the population

949. The recommendations in this chapter are rooted in the concepts of institutional households and private households. It is recommended that the place of usual residence be used to determine whether a person resides in an institutional household, a private household, or neither. If only legal residence is available (for example when using register-based enumeration), then that information can be used if it is judged to reflect the usual residence situation of the population with acceptable accuracy.

16.2 Household characteristics

16.2.1 Institutional households

16.2.1.1 Definitions

16.2.1.1.1 Institutional household

950. A group of persons for whom housing and often daily necessities are being provided by an institution (for the definition of an institution see paragraph [1065\(b\)](#)).

951. There may be differences between countries in the ways in which the boundary between the population living in private households, or in institutional households, or in non-institutional collective living quarters is drawn. The definitions used should therefore be explained clearly in the census reports and metadata, and attention should be drawn to any differences between national practice and these recommendations.

16.2.1.1.2 Person living in an institutional household

952. A person whose place of usual residence is at an institution. This includes people who have no other place of usual residence and who are residing at an institution on the census reference date, provided they are in-scope for census enumeration.

16.2.1.2 Methodological considerations

16.2.1.2.1 Validation exercises

953. Prior to the census enumeration, it is recommended that countries carry out an institutional household validation exercise. This validation exercise or other form of “frame maintenance” should be based on a database of all institutions that is updated in each pre-census cycle, utilizing administrative data where possible. Each known institution should be contacted to confirm its status and to obtain a correspondent’s contact information. This inquiry could take the form of a brief survey questionnaire to identify, among other things, the nature and functions of the collective living quarters, the presence of private households attached to or within the institution (section [16.2.1.2.2](#)), the type of populations who may reside there (i.e., adults only, adults and/or children, or children only) and whether certain key services are offered to members (the provision of care, food, etc.) For countries following a direct enumeration approach, this communication should also include information about the forthcoming census enumeration and the method in which it will occur.

16.2.1.2.2 Distinction of private households within or attached to an institutional household

954. Any person living in a private household within or attached to the institution’s collective living quarters should be excluded from the population living in an institutional household (see section [16.2.1.1.2](#)). For example, employees of the institution who live alone or with their family at the institution (or in housing units located beside but separate from the collective living quarters of the institution) should be treated as members of private households.

16.2.1.3 Type of institutional household (non-core topic)

955. The following categories are recommended for classifying institutional households:

Total – Institutional households

- (1.0) Residential care facilities for adults and/or children (e.g., hospitals, hospices, palliative care units, residential units for people with (mental, physical or sensory) disabilities, rehabilitation facilities, reintegrative housing facilities, other long-term care facilities, such as homes for the elderly and nursing homes)
- (2.0) Correctional and custodial facilities (including those for juveniles)
- (3.0) Residences for students
- (4.0) Military bases and government vessels
- (5.0) Shelters or refuges for adults and/or children (e.g., shelters for unhoused persons, asylum seekers)
- (6.0) Religious establishments

956. Given the large variation across countries in the prevalence and nature of institutional households, this classification should be considered a guideline only regarding the most common institutional household types. The examples in parentheses should be considered non-exhaustive.

957. Countries can opt to further distinguish types 1.0 to 6.0 where relevant for the country-specific setting. When possible, countries should distinguish residential care facilities and other institutional establishments which provide accommodation and services exclusively to children (e.g., aged 0 to 17 years).

16.2.2 Private households

16.2.2.1 Definitions

16.2.2.1.1 Private household

958. The definition of a private household is different for countries that follow the housekeeping concept versus those that follow the household-dwelling concept. The definition used will have an important impact on the number and type of private households. Countries should therefore clearly communicate the chosen definition in disseminated products. See section [16.2.2.2.1](#) for more details.

16.2.2.1.2 Private household (housekeeping approach)

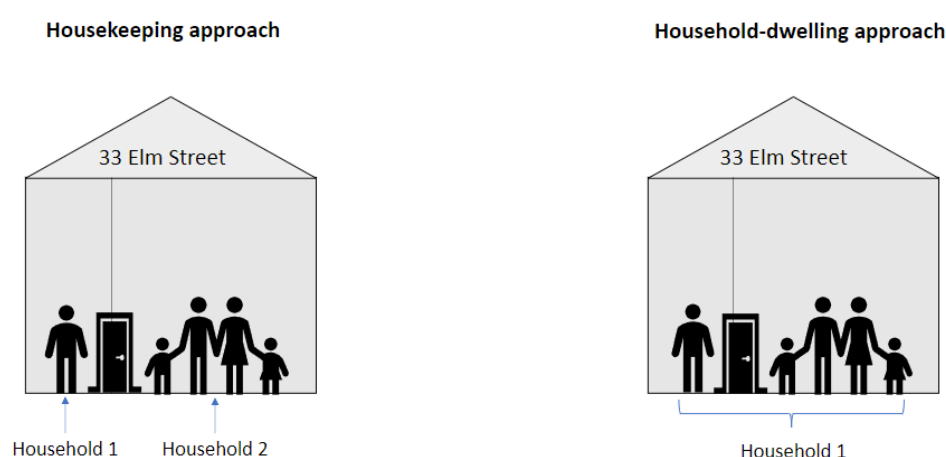
959. Under the **housekeeping approach**, a private household is defined as a person or group of persons who occupy a whole or part of a private housing unit as their place of usual residence. Persons form a separate private household within a given housing unit if they live in a separate room (or rooms) which does not join with any of the other occupants of the housing unit. In multi-person private households, the persons may be related to one another, unrelated to one another, or some combination of the two.

960. When following this concept, countries should distinguish between **boarders** and **lodgers** where relevant. Boarders take meals with the rest of the housing unit and generally share the household facilities. Boarders should therefore be members of the same private household as the other occupant(s) of the household unit. Lodgers, however, rent part of the housing unit for their exclusive use. Lodgers should therefore belong to a different private household than the other members of the housing unit.

961. As illustrated in [Figure 4](#), under the housekeeping approach, the number of private households is usually larger than the number of private occupied housing units.

Figure 4

Two main approaches to define private households



16.2.2.1.3 Private household (household-dwelling approach)

962. Under the **household-dwelling approach**, a private household is defined as a person or group of persons who occupy a whole private housing unit as their place of usual residence. In multi-person private households, the persons may be related to one another, unrelated to one another, or some combination of the two.

963. In the household-dwelling approach, the number of private households is equal to the number of private occupied housing units.

16.2.2.1.4 Three-or-more-generation household

964. A household that includes at least three separate generations of the same family (that is, persons linked by biological, spouse/partner or adoptive relationships). Most commonly, this includes one or more children, their parent(s) and their grandparent(s).

16.2.2.1.5 Skip-generation household

965. A private household that includes at least one grandparent and one or more of their grandchildren, with no parent of the grandchild(ren) present.

966. Note: countries that identify skip-generation households will need to decide whether these situations are considered to form either (a) a family nucleus, or (b) an extended family but not a family nucleus. This choice must be carefully considered and communicated. See section [16.2.2.3](#) for more details.

16.2.2.2 Methodological considerations

16.2.2.2.1 Household-dwelling versus housekeeping approach

967. Results of the 2023 country practices survey showed a near-equal division of countries that conceptualize households based on the housekeeping approach (section [16.2.2.1.2](#)) versus the household-dwelling approach (section [16.2.2.1.3](#)).

968. In recent decades, many countries have seen a growing prevalence of living arrangements such as living with extended family members, multiple families sharing a housing unit, or a family sharing their living space with one or more unrelated persons. Given these trends, the chosen definition of private household is important, as the number of private households will usually be larger under the housekeeping concept in comparison with the household-dwelling concept, particularly the number of one-person households. The choice of private household definition will also impact the relevance and feasibility of certain classifications, as discussed later in this chapter. As a result, countries should clearly indicate in their disseminated products whether they use the housekeeping approach or the household-dwelling approach.

16.2.2.2.2 Register-based versus direct enumeration census methodology

969. Results of the 2023 survey of country practices indicated a near-equal division in terms of the number of countries who use a register-based census methodology, a census methodology based on direct enumeration, or a methodology combining direct enumeration, register and/or administrative data i.e., a “combined” approach. Like the choice of housekeeping versus household-dwelling approach, the overall census methodology used will impact the conceptualization of private households. For instance, countries utilizing a population register may not be able to determine all or any extended-family relationships, precluding the identification of certain types of households.

16.2.2.2.3 Skip-generation household distinctions

970. Some countries identify skip-generation households (section [16.2.2.1.5](#)). If identified, countries should make clear the following in their disseminated products:

- (a) Whether skip-generation relationships are considered to form a [family nucleus](#) or not; and
- (b) If skip-generation relationships are considered to constitute a family nucleus, this exception to the standard definition of a family nucleus must be clearly communicated. The consequences of this broadened conceptualization of a family nucleus on the classifications of household type, family nucleus type and various family and household characteristics of persons must also be carefully considered and communicated. Otherwise, there may be conceptual discrepancies that arise across various inter-related classifications. For instance, if person A is a

grandparent in a skip-generation family nucleus, it must then be determined whether that grandparent is then classified as having a family status of "grandparent in a skip-generation family nucleus" or alternatively as a "parent in a family nucleus". Under the latter approach, it is imperative to clarify in notes that some persons in the "parent" category are grandparents in skip-generation families. The relative prevalence of skip-generation households in each country setting should guide this decision-making process.

16.2.2.3 Classifications

16.2.2.3.1 Private household size (derived core topic)

971. The following classification of private households⁹⁵ by size is recommended:

Total – private households

- (1.0) 1 person
- (2.0) 2 persons
- (3.0) 3 persons
- (4.0) 4 persons
- (5.0) 5 persons
- (6.0) 6 or more persons.

16.2.2.3.2 Private household type (derived core topic)

972. The following classification of private households⁹⁶ by type is recommended:

Total – private households

- (1.0) One-family-nucleus households without additional persons
 - (1.1) Couple without children
 - (1.2) Couple with children
 - (1.3) One-parent family
- (2.0) Other family households
 - (2.1) Three-or-more-generation households
 - (2.2) Multiple-family households (excluding three-or-more-generation households)
 - (2.3) One-family households with additional persons not in a family nucleus (excluding three-or-more-generation households)
- (3.0) Non-family households
 - (3.1) One-person households

⁹⁵ For the definition of private households, see Definitions.

⁹⁶ Ibidem.

(3.2) Two-or-more-person non-family households

973. See paragraph [979](#) for the definition of family nucleus and section [16.4.1](#) for the definition of child in a family nucleus.

974. The distinction of categories 2.1, 2.2 and 2.3 is optional. Particularly for countries following a housekeeping approach, it may not be possible to distinguish all or any of these “other family households” which require the identification of various extended-family relationships.

975. In household categories 2.0, 2.1, 2.2 and 2.3 other unrelated or related persons may also be present in the household.

976. In household category 3.2, none of the members form a family nucleus.

977. Countries may choose to further distinguish:

- (a) The type of couple in categories 1.1 and 1.2 (for instance, distinguishing married versus non-married couples, and the sex or gender of the persons in the couple);
- (b) The sex or gender of the parent in category 1.3;
- (c) The age of children in family nuclei, if there are pertinent age grouping distinctions in that specific country setting (e.g., couples without children, couples with at least one child aged 24 or younger, couples with all children aged 25 or older);
- (d) The family structure in category 2.3, i.e., whether the family is composed of a couple with or without children or is a one-parent family.

978. Some countries using a register-based method may only be able to identify married couples. If this is the case, the household types 1.1 and 1.2 must be labelled accordingly i.e., “Married couple with children”, “Married couple without children.” See section [16.3.2.4](#) for additional guidance.

16.3 Family characteristics

16.3.1 Definitions

979. **Family nucleus.** Two or more persons living in the same private household who together form a couple (with or without children) or a one-parent family. Within a family nucleus, all inter-person relationships are limited to direct (first-degree) relationships, that is, between spouses or partners or between parent(s) and children.

980. **Reconstituted family.** A family nucleus composed of a couple with children in which at least one child is the biological or adopted child of only one spouse or partner in the couple.

981. **Extended family.** Two or more persons living in the same private household who are related through a biological, spouse/partner or adoptive relationship, even if the relationship is non-direct (for example, two cousins living together). All members of a given [family nucleus](#) (see paragraph [979](#)) are also members of the same extended family.

16.3.2 Methodological considerations

16.3.2.1 Register-based versus direct enumeration methodology

982. Countries that use a register-based or combined census methodology are less likely to be able to produce information on reconstituted families and extended families. For this reason, the recommended classifications related to these family structures are optional.

16.3.2.2 Reference-person approach versus relationship matrix approach (core topic)⁹⁷

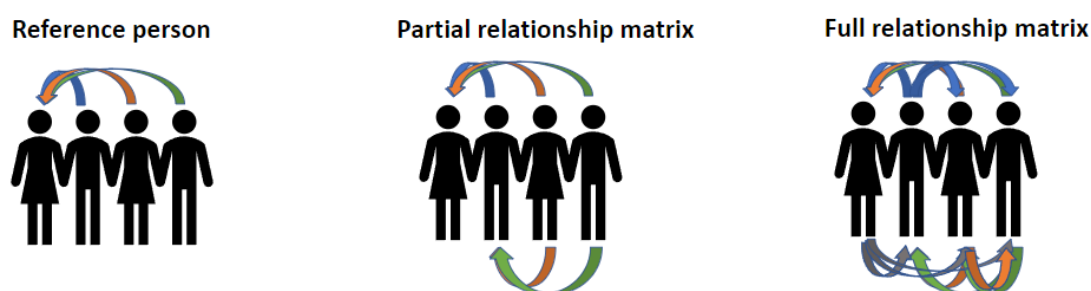
983. Information should be collected for all individuals living in private households on their relationship with other members of the household. Data on this topic are needed for use in:

- (a) Identifying private household types;
- (b) Identifying family nuclei and family nucleus types within a given private household; and
- (c) Identifying the household and family characteristics of persons within a given private household.

984. There are various methods of determining relationships within a private household, each offering their own benefits and challenges. The three main approaches used by countries are illustrated in [Figure 5](#) and described below.

Figure 5

Approaches to determine relationships within the household



985. **Reference-person approach:** the relationship between one person - the “household reference person” - and each other member of the household is determined. Family and household types and individual family statuses are then derived from that information.

⁹⁷ This topic corresponds to the topic called “Relationship between household members” in the CES Recommendations for the 2020 Censuses of Population and Housing.

According to the 2023 survey of country practices, most countries continue to use this traditional reference-person approach.

986. Determining which member of the household is the reference person requires careful consideration. In the past, the person considered to be the “head” of the household was generally used as the reference person, but this concept is no longer used in many countries. It has also sometimes been proposed that the oldest person or the person who contributes the most income to the household should be the reference person. However, given that the question's main purpose is to assign family status, family type and household type, both approaches have weaknesses. The automatic selection of the oldest person may be undesirable because in three-or-more-generation households, the broadest range of explicit kin relationships can be reported where the reference person is selected from the middle generation. Similarly, the selection of the person with the highest income may be a person who will not necessarily solicit the broadest range of explicit kin relationships.

987. For countries using a direct enumeration for their census methodology, it is recommended to provide clear instructions to the respondent to list the members of the household in a specific order:

- (a) Begin with an adult (the reference person), followed by their spouse or partner (if applicable) and then any children of that person (if applicable);
- (b) Next, add any other household members.

988. Despite providing clear instructions to respondents about how to order members of the household on the initial roster listing, inevitably these instructions will not always be followed as intended. To help mitigate this challenge, response options in terms of relationships to the reference person should be exhaustive for all (other) household members, and not conditional on their listing order.

989. When the household's reference person is chosen carefully, this approach gives accurate information for most household and family types. In certain cases, however, such as in multiple-family households, this method may not always provide sufficient information; as a result, greater levels of imputation and inference are needed to determine each household member's family characteristics.

990. **Full relationship matrix approach:** all possible inter-person relationships within a given private household are determined.

991. Used by a growing number of countries, the full relationship matrix approach provides the most complete detail on living arrangements within the household, particularly for large households involving a mix of related and unrelated people. This approach also makes possible in theory the identification of relationships that are traditionally not captured by the reference-person approach, such as siblings living in the same household together as foster children, or various relationships existing within “other family households”.

992. Conversely, the full relationship matrix approach also presents several disadvantages. For countries whose census is based on direct enumeration, the additional information to be collected makes the questionnaire more time-consuming and burdensome for respondents to complete - especially for larger households - as well as literally lengthier in the case of paper-based questionnaires, increasing printing costs. In comparison with the reference-person approach, the full relationship matrix approach is also typically much more expensive

from an operational perspective, requiring higher resources in terms of coding and processing than the reference-person approach.

993. These challenges can be mitigated somewhat by adopting a **partial relationship matrix approach**. In contrast to the full relationship matrix approach, under a partial relationship matrix approach, a complete relationship matrix is only collected for a subset of all household members (the first 5 persons listed in the household roster, for instance). Additional household members can then be asked, alternatively: only about their relationship to a household reference person; only about their relationship to their “nearest neighbour” in the household roster (e.g., person 6’s relationship to person 5), or a combination of these two options.

994. While a relationship matrix approach is more likely to be adopted by countries using direct enumeration for their census methodology, it is sometimes possible for countries using a register or combined methodology to take this approach to relationship identification, provided information about two given household members can be linked to one another on their respective register data.

995. In summary, countries contemplating the adoption of a relationship matrix approach should first execute thorough feasibility analyses of adopting this method, both in terms of public acceptability (via qualitative and quantitative testing) and by conducting a cost-benefit evaluation of the additional operational and resource requirements contrasted with the added nuance and richness of information. In some cases, the new processing requirements may be net neutral if for instance, by having complete household relationships it reduces the need for complex imputation processes that previously filled in the gaps. Where feasible, the full relationship matrix method is the recommended approach to identify household relationships since it provides the most comprehensive information.

16.3.2.3 Sex and gender-based distinctions

996. Along with societal changes over recent decades, the intersection of family, sex and gender in censuses is also changing. According to the 2023 survey of country practices, about half of surveyed countries made a distinction in their last census between opposite-sex and same-sex couples. In recent years, some CES countries have begun to distinguish sex from gender in their census, and to classify couples according to the gender of each member of the couple. Other countries have plans to collect gender and sexual orientation in future censuses. At the same time, for some countries, these types of distinctions are not planned to be collected or disseminated. The terminologies, definitions and classifications used by statistical agencies to measure these concepts are emerging and constantly evolving. See section [15.2](#) for more information and guidance.

997. In contrast to the previous edition of these Recommendations, the present chapter does not make any sex or gender-based distinctions in its definitions or classifications related to household and family characteristics. Countries can nevertheless opt to make these additional distinctions when possible.

16.3.2.4 Couple type distinctions

998. Countries vary in terms of the information collected and disseminated about couple families. These variations relate to the specific legal or fiscal implications of various types of

couples in each country setting as well as the country's (in)ability to identify certain types of couples in their census. For instance, it may be impossible to identify non-married or otherwise non-registered couples if countries are using a register-based census methodology; for others, only partial information may be available (e.g., for those unregistered or unmarried couples who share a common child). In the present chapter, definitions and classifications related to couples do not make distinctions based on couple type; that is, whether the couple is married, non-married in some type of legally or formally-recognized partnership, or in another form of non-married co-residing relationship. Countries can nevertheless opt to make these types of distinctions where possible. It is recommended that, when these distinctions are made, the various types of couples are clearly defined, particularly when there are legal implications attached.

999. The phenomenon of couples living apart, i.e., spouses or partners who do not share a place of usual residence, is of growing interest, and countries are encouraged to evaluate the feasibility of collecting and disseminating information about this phenomenon via their censuses if not collected elsewhere. If collected, this phenomenon should be clearly distinguished from co-residing couples. Otherwise, countries should make clear in their disseminated products that information about couples and individual membership in a couple is restricted to persons who share a place of usual residence in a private household with their spouse or partner.

1000. Similarly, countries should also make clear the distinction between a person's marital status versus their family characteristics (i.e., whether they are part of a couple family nucleus within a private household). Generally, marital status is collected for the total population (including those living in institutional households) while family characteristics are typically only collected for the population living in private households. There are also situations where a person may be married, living in a private household, but not living with their spouse. This can occur when, for example: the person's spouse or partner is residing in a long-term care institution or other institution; during a pre-divorce separation period; or when economic or housing barriers prevent spouses or partners from establishing a new residence together, among other reasons. In short, the number of married persons in the total population will not necessarily equal the total number of persons in married couples living in private households.

16.3.2.5 Determining family nuclei in three-or-more-generation households

1001. In cases where a private household includes three-or-more generations of the same family, family nucleus status should be prioritized for the two youngest generations where applicable. provides examples of how family nucleus status should be determined ([Table 5](#)).

Table 5

Determination of family nuclei within three-or-more-generation households

Scenario	Person	Age of person	Relationship to reference person	Resulting family nucleus status of person
1	Person A	25	Reference Person	In a family nucleus: One-parent family
	Person B	3	Son	

Scenario	Person	Age of person	Relationship to reference person	Resulting family nucleus status of person
2	Person C	58	Mother	Not in a family nucleus: Living with other relatives
	Person A	25	Reference Person	In a family nucleus: One-parent family
	Person B	3	Son	
	Person C	58	Mother	In a family nucleus: Couple without children
	Person D	59	Father	

16.3.2.6 Acknowledging the limitations of an address-based approach to the measurement of families

1002. Countries should include guidance in reference documentation on the limitations of the “address-based” approach used in censuses to identify families. Specifically, countries should emphasize that the census concept of a family is based around the place of usual residence among persons in private households, which may not always capture a comprehensive portrait of the family structure and living arrangements of all persons. This is particularly true for persons who split their time living in two or more households, for example, children with shared parenting arrangements; students who sometimes live at their parental home and other times at a student dormitory; spouses or partners who live together part of the year and separate for part of the year for work or other reasons. NSOs should clearly document how the place of usual residence is determined in these situations.

16.3.2.7 Classification: type of family nucleus (derived core topic)

1003. The following classification of family nuclei⁹⁸ by type is recommended:

Total – family nuclei in private households

- (1.0) Couple family
 - (1.1) Without children
 - (1.2) With child(ren)
- (2.0) One-parent family

1004. Countries can opt to make any of the following additional sub-categories:

- (a) Of types 1.0, 1.1 and 1.2 based on the type of couple, including sex or gender-based distinctions;
- (b) Of types 1.2 and 2.0 based on age groupings of the youngest child;
- (c) Of type 1.2 based on whether or not the couple family is a reconstituted family (see the classification Reconstituted family type);

⁹⁸ For the definition of family nucleus, see para. 979.

- (d) Of type 2.0 based on the sex or gender of the parent.

16.3.2.8 Reconstituted family type (derived non-core topic)

1005. The following classification of reconstituted families⁹⁹ by type is recommended:

Total – Reconstituted families

- (1.0) With no common children
 - (1.1) Only one spouse/partner has at least one biological/adopted child
 - (1.2) Each spouse/partner has at least one biological/adopted child who is not the biological/adopted child of the other spouse/partner
- (2.0) With at least one common child
 - (2.1) The spouses/partners have at least one common child and only one spouse/partner has at least one biological/adopted child who is not the biological/adopted child of the other spouse/partner
 - (2.2) The spouses/partners have at least one common child and each spouse/partner has at least one biological/adopted child who is not the biological/adopted child of the other spouse/partner

1006. In most cases, countries will only be able to identify reconstituted families if they use a relationship matrix approach to identify relationships within the household.

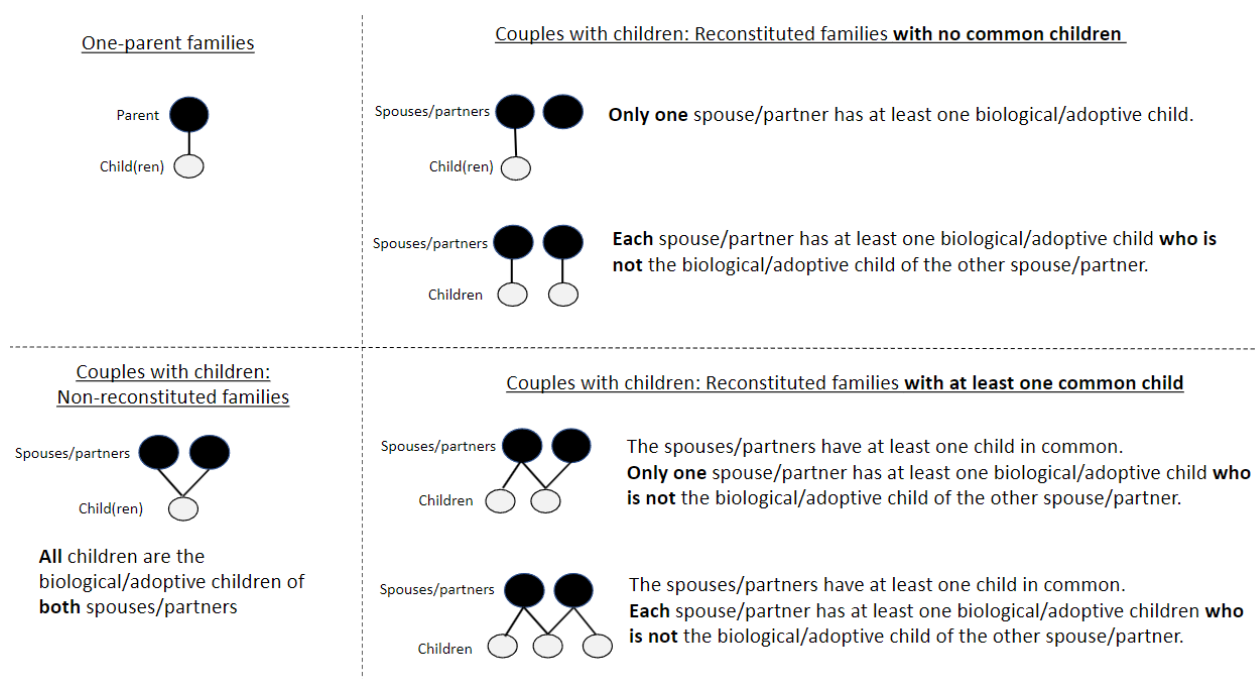
1007. Countries can opt to make additional distinctions of reconstituted families based on the sex or gender of each member of the couple and the type of couple.

1008. It can be difficult to communicate the possible variations in the structure of reconstituted families (i.e., the differences between categories 1.1, 1.2, 2.1 and 2.2); visual aids such as Figure 6 below have been found to be helpful in aiding comprehension.

⁹⁹ For the definition of reconstituted family, see para.980.

Figure 6

Family nuclei with children including reconstituted families and their various configurations



16.4 Household and family characteristics of persons

1009. Countries should follow international standards with respect to age-based restrictions for household and family characteristics of persons. Specifically, only persons aged 15 and older can live alone, be part of a couple, or be a parent. Persons aged 14 and younger should not be the “reference person” when deriving household relationships; there should be at least one person aged 15 and older in every private household. Countries should ensure their editing and imputation processes consider these age-based standards when deriving household and family characteristics of persons.

16.4.1 Definition: child in family nucleus

1010. A person who lives in the same private household as at least one of their biological or adoptive parents and who does not have a spouse, partner or child(ren) of their own living in the same household. The child in a family nucleus may be of any age or marital status.

1011. Foster children are excluded from the family nucleus and the extended family of the foster parent(s) and should be considered as living with non-relatives.

1012. A child who alternates between two or more households within the country (for instance following their parents’ separation or divorce) should consider the household where they spend the majority of the time, or their registered place of residence, as their place of usual residence. Where an equal amount of time is spent in two or more separate households,

the place of usual residence should be the one where the child is staying at the census reference time. (See paragraph [781\(c\)](#))

16.4.2 Methodological considerations

16.4.2.1 Impact of overall methodology

1013. As a result of their overall census methodology, not all countries will be able to measure certain classifications related to the household and family characteristics of persons. For instance, countries that use a register-based (as opposed to direct enumeration) census methodology may have more difficulty identifying whether an individual is living with members of their extended family. Additionally, countries using a reference-person approach (as opposed to relationship matrix approach) to identify relationships within the household may not be able to capture all inter-personal relationship details within the household, particularly in multiple-family households.

16.4.2.2 Presence of parents in household of person

1014. Along with the phenomenon of grandchildren living with grandparents, most countries have seen an increasing number of older (adult) children living with their parent(s). Indeed, if considered as a form of multi-generational living, the phenomenon of a two-adult-generation household is likely much more prevalent than a three-or-more-generation household¹⁰⁰, as indicated in a recent study of the United States¹⁰⁰. Adult children may live with their parents for a variety of reasons, including: to manage housing costs or in response to housing shortages; to support and care for their aged parent; to receive informal childcare assistance from their child's grandparent; for companionship; for cultural normative reasons.

1015. The classification "Presence of person's parent(s) in the household" is recommended for examining this living arrangement.

16.4.2.3 Presence of grandparents in household of person

1016. Some member countries have witnessed growth over recent decades in the phenomenon of three or more generations of a family sharing a place of usual residence. The flows of care and support within these households are not necessarily unidirectional and can depend on the age and individual family situation of each respective generation. Less commonly, grandchildren and grandparents may live together without the middle generation present, in a skip-generation household. The prevalence and therefore the relevance of these living arrangements vary across and within countries.

1017. Countries interested in disseminating information on these phenomena should do this not only from the perspective of the household but also from the perspective of the person - specifically, from the perspective of young children (for example, those aged 14 and under). When examined from the point of view of young children, the rates of prevalence tend to be much higher and arguably more meaningful than those obtained from a household lens. The classification "Presence of person's grandparent(s) in the household" is recommended for this purpose.

¹⁰⁰ Pew Research Center, March 2022, [Financial issues top the list of reasons U.S. adults live in multigenerational homes](#).

16.4.3 Classifications

16.4.3.1 Household status of person (derived core topic)

1018. The following classification of the population by household status is recommended.

- (1.0) Person in a private household
- (2.0) Person not in a private household
 - (2.1) Person in institutional household
 - (2.2) Other

16.4.3.2 Private household type of person (derived core topic)

1019. The classification Private household type can be transferred to the person level as follows.

Total – persons in private households

- (1.0) In one-family-nucleus households without additional persons
 - (1.1) In a couple-without-children household
 - (1.2) In a couple-with-children household
 - (1.3) In a one-parent-family household
- (2.0) In other family households
 - (2.1) In a three-or-more-generation household
 - (2.2) In a multiple-family household (excluding three-or-more-generation households)
 - (2.3) In a one-family-nucleus household with additional persons not in a family nucleus (excluding three-or-more-generation households)
- (3.0) In non-family households
 - (3.1) In a one-person household
 - (3.2) In a two-or-more-person non-family household

16.4.3.3 Family nucleus status and household living arrangement of person (derived core topic)

1020. The following classification of the population by family nucleus status and household living arrangement is recommended:

Total – persons in private households

- (1.0) Person is in a family nucleus
 - (1.1) Spouse or partner in a couple
 - (1.1.1) Without children
 - (1.1.2) With child(ren)

- (1.2) Parent in a one-parent family
- (1.3) Child
- (2.0) Person is not in a family nucleus
 - (2.1) Living with others
 - (2.1.1) Living with other relatives (non-relatives may also be present)
 - (2.1.2) Living with non-relatives only (includes foster children)
 - (2.2) Living alone

1021. The term "other relatives" refers to other persons to whom the person is indirectly related, that is, they are not part of the same family nucleus, but they are nonetheless linked through an indirect biological, spouse/partner or adoptive relationship. Examples include cousins, nieces and nephews, aunts and uncles.

1022. For the most complete portrait of a person's household and family characteristics, it is recommended to cross this classification with the Private household type of person classification.

16.4.3.4 Presence of the person's parent(s) in the household (non-core topic)

1023. The following classification of the population by presence of parent(s) in the household is recommended:

Total – persons in private households

- (1.0) Living with at least one parent
- (2.0) Not living with a parent

1024. Countries utilizing a register-based census methodology may not be able to identify these living arrangement details.

1025. Countries should include the age group and family nucleus status of the person as an additional variable in the disseminated table product to make the information in this classification substantively meaningful.

16.4.3.5 Presence of the person's grandparent(s) in the household (non-core topic)

1026. The following classification of the population by presence of grandparent(s) in the household is recommended:

Total – persons in private households

- (1.0) Living with at least one grandparent
 - (1.1) And two parents
 - (1.2) And one parent
 - (1.3) And without parents
- (2.0) Living without grandparents
 - (2.1) With two parents

- (2.2) With one parent
- (2.3) And without parents

1027. Countries utilizing a register-based census methodology may not be able to identify grandchild-grandparent relationships.

1028. Countries should include the age group and family nucleus status of the person as an additional variable in the disseminated table product to make the information in this classification substantively meaningful.

16.4.3.6 Extended family status of person (derived non-core topic)

1029. The following classification of the population by extended family status is recommended:

Total – Persons in private households

- (1.0) Person is in an extended family
 - (1.1) In a family nucleus
 - (1.2) Not in a family nucleus
- (2.0) Person is not in an extended family

1030. This classification can be used to derive some categories of the classification of the family nucleus status and household living arrangement of person (section [16.4.3.3](#)). For instance, persons whose extended family status is sub-type 2.0 (not in an extended family) and who live in a multi-person household would have a family status and household living arrangement of "living with non-relatives only." Persons whose extended family status is sub-type 1.2 (in an extended family, not in a family nucleus) would have a family status and household living arrangement of "living with other relatives (non-relatives may also be present)."

16.5 Household-housing topics

1031. The following topics do not relate specifically to relationships within households. They instead refer to housing-related topics which are examined from the perspective of private households.

16.5.1 Sole or shared occupancy of housing unit by private household (non-core topic)

1032. The following classification of the private households by sole or shared occupancy of the housing unit is recommended:

- (1.0) Private households which have sole occupancy of a housing unit
- (2.0) Private households which share a housing unit with one or more other private households

1033. This classification applies to private households. It can only be used by countries that use the housekeeping approach to define private households. For countries that use the household-dwelling approach, all private household will fall under Category 1.0.

1034. Category 2.0 may be sub-divided to distinguish households sharing a housing unit with one, two, or three or more other households.

16.5.2 Tenure status of household (non-core topic)

1035. The following classification of the private households by tenure status of the housing unit is recommended:

- (1.0) Households of which at least one member is the owner of the housing unit
- (2.0) Households of which no member is the owner of all or part of the housing unit
 - (2.1) Households of which a member is a main tenant of all or part of the housing unit
 - (2.2) Households of which a member is a sub-tenant of an owner occupier or main tenant
- (3.0) Households occupying all or part of a housing unit under other form of tenure

1036. This classification applies to private households. It is recommended for use at the one-digit level and optional at the two-digit level.

1037. In view of the diversity of legal arrangements internationally, countries should describe fully in their census report or relevant metadata the coverage of each of the categories in the above classification. These descriptions should specify, where applicable, the treatment of households which:

- (a) Live in housing units as members of different types of housing cooperatives;
- (b) Live in housing units rented from an employer under the terms of the contract of employment of one of the household members; and
- (c) Live in housing units provided free of charge by an employer of one of the household members or by some other person or body.

1038. Some countries may wish to extend the recommended classification to distinguish these or other groups of households that are of interest for national purposes. Households that are in the process of paying off a mortgage on the housing unit in which they live or are purchasing their housing unit over time under other financial arrangements, should be classed as (1.0) in the classification.

16.5.3 Rent and other housing costs (non-core topic)

1039. Rent is the amount to be paid in respect of a specified period for the space occupied by a household including, in some cases, local rates and ground rent. Payments for the use of furniture, heating, electricity, gas and water and for the provision of special services like washing and cooking should be excluded.

1040. With regard to the costs of heating and hot water, the practices differ in different countries. In some countries the heating and hot water are normally included in the rent, in other countries they are not, while still in some other countries both practices can exist in parallel. It is important, therefore, that countries which include this topic in their census clearly define whether the heating and hot water are included in the rent or not. The recommendation would be to exclude heating and hot water expenditures from the rent. The ideal solution would be to produce the rent information separately without heating and hot water expenditures and to report the expenditures for heating, hot water (and electricity if applicable) separately.

1041. Nominal rent paid may not correctly reflect the real rates. For instance, an individual housing allowance determined on the basis of a means test and paid by housing authorities directly to the property owner should be included in the rent; and if a public sector property owner on the basis of a means test charges a rebated rent, the full rent should be recorded. It may also be possible to collect information on, for example, whether the tenant is a relative or an employee of the property owner, or whether he performs any function or office as part of his rent, in order to appraise the actual rent paid.

1042. If this topic is included in the census, it may be desirable (and less sensitive) to obtain information on the range within which the rent paid falls rather than on the exact amount paid.

1043. In addition to the amount of rent paid by renting households, it may be useful to collect information on the housing costs of each household. Such costs could include, for example, information on monthly mortgage payments, the provision of utility services and local taxes if these are not available from the information collected from the housing topics.

Chapter 17 Housing

17.1 Introduction

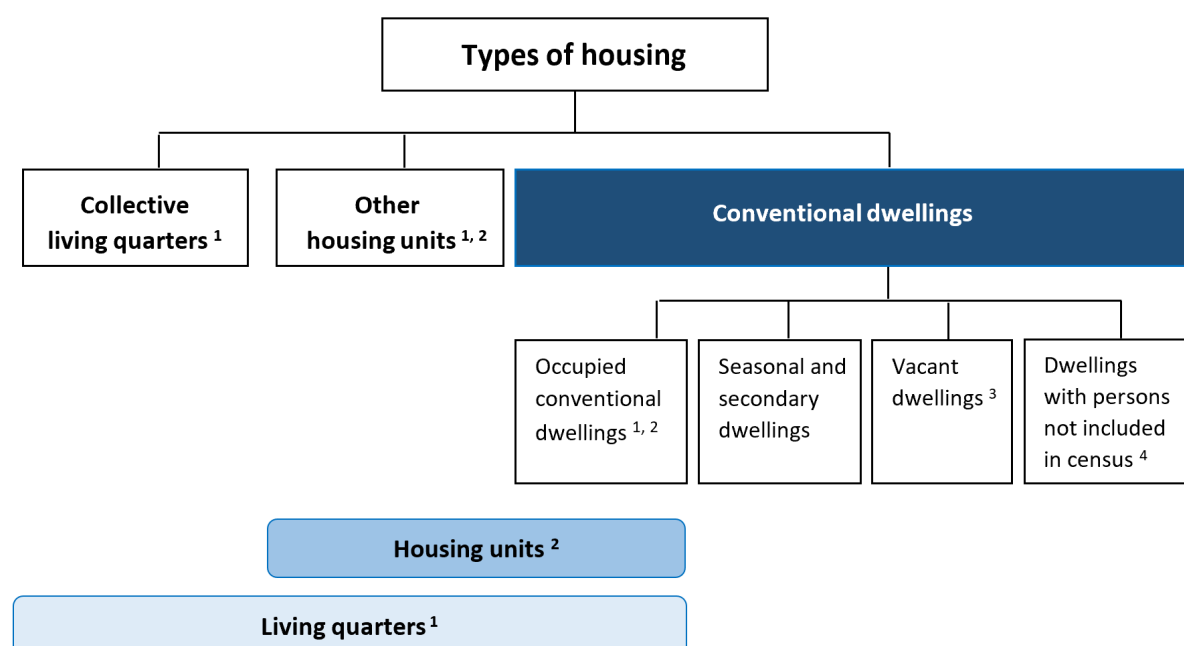
1044. This chapter focuses on housing topics and on the relationship between the population and their living quarters. Housing topics are the characteristics of housing units and buildings on which information is usually collected in a housing census (whether or not this is carried out at the same time as the population census). Some topics that can be related to the housing unit, such as the core topic "tenure status of household" and the non-core topics "sole or shared occupancy" and "rent", have been included among the characteristics of private households in [Chapter 16](#) because the principal unit of enumeration for these topics is generally the household.

1045. For the housing topics presented in this chapter, the main unit of enumeration is the "conventional dwelling", but some characteristics refer to other types of housing unit. An exception is the topic "housing arrangements", which describes the relationship between the resident population and their living quarters, and which, therefore, refers to individuals. [Table 6](#) shows the several types of housing unit to which one or more of the characteristics refer. These are defined in paragraphs [1050–1065](#) below.

1046. The "building" in which a dwelling is located is regarded as an indirect but important unit of enumeration for housing censuses, since the information concerning the building (such as building type, material of construction of external walls and certain other characteristics) is required to describe properly the living quarters located within the building. In a housing census, the questions on building characteristics are normally framed in terms of the building in which the (sets of) living quarters being enumerated are located, and the information is recorded for each of the housing units or other sets of living quarters located within it.

1047. Not all of the topics recommended in this chapter are relevant for all types of housing. [Table 7](#) shows, for each type of housing, whether the topic is designated in these Recommendations as core or non-core, and whether information can be collected in the census for that type of housing. The reasons for not applying a particular topic to a particular housing type vary. For some types of housing the topic is not relevant. In other cases, the topic may be difficult or impracticable to include in a census. This is particularly likely to be the case for those dwellings that are vacant at the census reference time or during the period of census data collection. Finally, the topic may not be appropriate or necessary for particular types of housing arrangements, such as the collection of information on household amenities in collective living quarters.

Table 6
Types of housing



Notes:

¹ "Occupied conventional dwellings", "other housing units" and "collective living quarters" together represent the sum of all "living quarters", and to qualify must be used by at least one person as their usual residence at census reference time in order to be counted (see section [17.3.2](#)).

² The sum of "occupied conventional dwellings" and "other housing units" represents the subset of "housing units" (see section [17.3.3](#)).

³ A dwelling can be deemed "vacant" for one of a number of reasons (see paragraphs [1082–1084](#)).

⁴ "Persons not included in census" are those who are temporarily present in the dwelling at the census reference time but who are not considered part of the total usually-resident population (see paragraph [1057](#)).

17.2 Definitions

17.2.1 Buildings

1048. A **building** is defined for the purposes of these Recommendations as any independent structure containing one or more dwellings, rooms, or other spaces, covered by a roof and enclosed within external walls or dividing walls which extend from the foundations to the roof, whether designed for residential or for agricultural, commercial, industrial or cultural purposes or for the provision of services. Thus a building may be, for example, a detached house, apartment building, factory, shop, warehouse, garage or barn.

1049. The building containing conventional dwellings as defined below is an important unit, since information on type of building and period of construction is required to describe the dwellings within the building and for formulating housing programmes.

Table 7
Housing topics

Topic	Enumeration units ²	Types of housing and housing arrangements				
		Primary homeless ¹	Collective living quarters	Other housing units	Occupied conventional dwellings	Seasonal and secondary dwellings, vacant dwellings, dwellings with persons not included in census
					(CONVENTIONAL DWELLINGS)	
				(HOUSING UNITS)		
			(LIVING QUARTERS)			
Type of living quarters	LQ	●	Core	Core	Core	●
Housing arrangements	I	Core	Core	Core	Core	●
Occupancy status of conventional dwellings	D	●	●	●	Core	Core
Characteristics of secondary, seasonal and vacant dwellings	D	●	●	●	●	Non-core
Type of ownership	D	●	●	●	Core	o
Occupancy by number of private households	HU	●	●	Non-core	Non-core	●
Number of occupants	LQ	●	Core	Core	Core	●
Useful floor space and/or number of rooms	HU	●	●	Core	Core	o
Density standard	HU	●	●	Core	Core	●
Type of rooms	HU	●	●	Non-core	Non-core	o
Water supply system	HU	●	●	Core	Core	o
Toilet facilities	HU	●	●	Core	Core	o
Bathing facilities	HU	●	●	Core	Core	o
Hot water	HU	●	●	Non-core	Non-core	o
Sewage disposal	HU	●	●	Non-core	Non-core	o
Kitchen	HU	●	●	Non-core	Non-core	o
Type of heating	HU	●	●	Core	Core	o
Main type of energy used for heating	HU	●	●	Non-core	Non-core	o
Availability of electricity	HU	●	●	Non-core	Non-core	o
Availability of piped gas	HU	●	●	Non-core	Non-core	o
Availability of air-conditioning	HU	●	●	Non-core	Non-core	o
Accessibility to dwelling	HU	●	●	Non-core	Non-core	o
Position of dwellings within the building	HU	●	●	●	Non-core	o
Type of building	D	●	●	●	Core	o
Number of floors in building	D	●	●	●	Non-core	o
Lift	D	●	●	●	Non-core	o
Period of construction	D	●	●	●	Core	o
Materials of the building	D	●	●	●	Non-core	o
State of repair of building	D	●	●	●	Non-core	o

Notes:

● Not measured or not applicable in the census.

o May be difficult to measure in a census. Some countries may collect or have available this information. Information on seasonal and secondary dwellings and the information on vacant dwellings concerning all the characteristics should be shown separately.

¹ Including all persons who are not usual residents in any category of living quarters (see para.1077)

² Enumeration units: I=Individuals; LQ=Living Quarters; HU=Housing Units; D=Dwellings.

17.2.2 Living quarters

1050. **Living quarters** are those types of housing that are the usual residences of one or more persons. They are structurally separate and independent places of abode that:

- (a) have been constructed, built, converted, or arranged for human habitation, provided that they are not, at the census reference time, being used for other purposes and that they are occupied at the census reference time; or
- (b) though not intended for habitation, were in use for such a purpose at the census reference time.

1051. The concept of "living quarters" is qualified by the definitions of the main categories into which they are divided, namely:

- (1.0) Occupied conventional dwellings;
- (2.0) Other housing units: such as huts, cabins, shacks, caravans, houseboats, barns, mills, caves or other shelters used for human habitation at the census reference time;
- (3.0) Collective living quarters, such as hotels, institutions and camps

17.2.3 Housing units

1052. A **housing unit** is a separate and independent place of abode intended for habitation by a single household, or one not intended for habitation but used as a usual residence by a household at the census reference time. This includes "occupied conventional dwellings" and "other housing units" as defined below.

1053. For the purposes of international comparability, it is recommended that information should be collected and presented separately on "occupied conventional dwellings" and (where possible) "other housing units".

17.2.4 Conventional dwellings

1054. **Conventional dwellings** are structurally separate and independent premises, which are designed for permanent human habitation at a fixed location and are not used wholly for non-residential purposes (such as commercial purposes) at the census reference time. A conventional dwelling consists of a room or suite of rooms and its accessories (for example lobbies, corridors) in a permanent building or structurally separated part thereof. It need not necessarily have a bathroom or toilet available for the exclusive use of its occupants.

1055. A conventional dwelling is "separate" if it is surrounded by walls and covered by a roof so that a person, or a group of persons, can isolate themselves from other persons for the purposes of sleeping, preparing and taking meals, or protecting themselves from the hazards of climate and environment. It is independent when it has direct access from the street or from a public or communal staircase, passage, gallery or grounds: that is, when the occupants can enter and leave without passing through another household's accommodation.

1056. A **permanent building** is a building that was constructed to be structurally stable for at least 15 years. Some countries may prefer to define permanence in terms of the method of construction or in terms of the building materials used. Detached rooms that are used for habitation and are clearly designed to be used as part of the conventional dwelling (for example a room or rooms above a detached garage) should be included as part of the building.

1057. Conventional dwellings can be classified as being occupied; of seasonal or secondary use; vacant; or having present only persons who are not included in the census:

- (a) A conventional dwelling is classified as an **occupied conventional dwelling** if it is a usual residence of one or more persons regardless of temporary absences at the census reference time such as holidays or stay in a hospital. An "occupant" of a conventional dwelling is a person who has usual residence in the dwelling;
- (b) A conventional dwelling which is **reserved for secondary or seasonal use** is classified as such even if the dwelling is temporarily occupied at the census reference time by persons who are usually resident in another dwelling (an example is given in paragraph 1085);
- (c) A conventional dwelling is defined as being **vacant** if it is unoccupied because it is either for sale or rent, abandoned, due for demolition, or newly built and not yet occupied;
- (d) A conventional dwelling is defined as a **dwelling with persons not included in census** if it is (temporarily) occupied only by persons who are not included in the census such as visitors, short-term migrants, foreign military, naval and diplomatic personnel and their families.

1058. All conventional dwellings should be counted for census purposes whether or not they are occupied (that is, have at least one usual resident) – although many of the topics apply only to occupied conventional dwellings.

1059. Because of their importance, conventional dwellings are further classified by occupancy and type of building. However, countries may also wish to sub-divide occupied conventional dwellings using the core housing infrastructure (presence of a kitchen, water supply, toilet, bathing and heating facilities).

17.2.5 Other housing units

1060. **Other housing units** are those that do not come fully within the category of a conventional dwelling either because they are mobile, semi-permanent or improvised, or are not designed for human habitation, but which are nevertheless used at the census reference time as the usual residence of one or more persons who are members of one or more private households.

1061. The definitions applicable to the several types of "other housing units" are set out below:

- (a) A **mobile housing unit** is any type of living accommodation which has been made to be transported (such as a tent) or which is a moving unit (such as a ship, yacht, boat, barge or caravan) and which is both designed for human habitation and is

occupied at the census reference time, that is, it is somebody's usual residence. Individual components of nomad or other travelling people encampments should be included in this category rather than being classified as collective living quarters (see paragraph 1065). Passenger quarters, such as in passenger ships, railroad cars and aircraft, should not be considered as "other housing units" and the persons who happen to be travelling in them at the census reference time should not be counted as living in such vehicles;

- (b) A **semi-permanent housing unit** is an independent structure such as a hut or a cabin which has been constructed with locally available crude materials such as wooden planks, sun dried bricks, straw or any similar vegetable materials for the purpose of habitation by one private household and which is used as the usual residence of at least one person at the census reference time. Such units are not expected to maintain their durability for as long a period of time as a conventional dwelling;
- (c) **Other housing units designed for habitation** (sometimes referred to as "improvised housing units") comprise independent, makeshift shelters or structures such as shacks and shanties, which have been built from unconventional or waste materials, which, though they may be regarded as being unfit for human habitation, are used as the usual residence of at least one person at the census reference time;
- (d) **Other housing units not designed for habitation** comprise premises in permanent or semi-permanent buildings such as stables, barns, mills, garages, warehouses or offices, which have not been built, rebuilt, converted or arranged for human habitation but are, nevertheless, used by one or more private households as their usual residence at the census reference time. This category also includes natural shelters such as caves, which are used by one or more private households as their usual residence at the census reference time.

1062. "Improvvised housing units" and "other housing units not designed for habitation" may also be summarised under the concept of "informal housing".

1063. Premises not initially designed or constructed for human habitation, but which have been converted for the purpose of habitation by a private household and which fulfil the requirements of a conventional dwelling should not be included in this category, but, instead, classified as conventional dwellings.

17.2.6 Collective living quarters

1064. **Collective living quarters** comprise premises which are designed for habitation by large groups of individuals or several households and which are used as the usual residence of at least one person at the census reference time.

1065. The definitions applicable to the several types of "collective living quarters" are set out below:

- (a) A **hotel** is a separate and independent set of premises comprising all or part of a permanent building or set of buildings which by the way it has been built, rebuilt or converted is designed to provide accommodation on a fee basis and which is

used as the usual residence of at least one person at the census reference time. Motels, inns, boarding houses, pensions, rooming houses and other lodging houses are included in this category. If the accommodation that is occupied by a private household residing in a hotel or similar establishment fulfils the requirements of a conventional dwelling, it should be classified as such. Otherwise it should be classified as part of the collective living quarters;

- (b) An **institution** is a separate and independent set of premises comprising all or part of a permanent building or set of buildings which by the way it has been built, rebuilt or converted is designed for habitation by a large group of persons who are subject to a common authority or regime or bound by a common objective or personal interest, and which is used as the usual residence of at least one person at the census reference time. Such collective living quarters usually have certain shared common facilities such as cooking and toilet facilities, baths, lounge rooms or dormitories. This category includes premises such as nurses' hostels, student residences, hospitals, sanatoria and convalescent homes, welfare institutions including residential alternative care facilities for children, monasteries, convents, military and police barracks, prisons and reformatories. Persons who have their place of usual residence at an institution, should be considered as part of an institutional household (see section [16.2.1.1.1](#));
- (c) A **camp** is a separate and independent set of premises comprising all or part of a semi-permanent or temporary structure or set of structures which by the way it has been built, rebuilt or converted is designed for the temporary accommodation of groups of persons with common activities or interests, and which is used as the usual residence of at least one person at the census reference time. Such collective living quarters usually have certain common shared facilities such as cooking and toilet facilities, baths, lounge rooms or dormitories. This category includes military camps, refugee camps and camps for housing workers employed by agriculture, logging, mining, construction or other enterprises;
- (d) Other types of collective living quarters may be identified as those that do not conveniently fall within any of the categories [\(a\)](#)–[\(c\)](#) above. These may include traditional or urban kibbutzim, some old age communities, or other types of communal establishments that meet the broad definition of collective living quarters given above.

1066. Housing units located within the grounds or building containing a hotel, institution, or camp, and fulfilling the requirements of a conventional dwelling, should be identified and counted separately.

17.3 Housing topics

17.3.1 Characteristics of living quarters, housing units and conventional dwellings

1067. The majority of topics in this chapter refer to characteristics and amenities of housing units, which include occupied conventional dwellings and other housing units. A few topics

refer to characteristics of living quarters, which include housing units and collective living quarters, and one topic refers to the housing arrangements of both individuals and household.

1068. For some of the topics, countries may also wish to collect information on conventional dwellings that are reserved for seasonal and secondary use, but which, at the census reference time are vacant or which are occupied with residents not included in census, in addition to occupied conventional dwellings. It may be difficult to obtain information on these conventional dwellings as, in many cases, they may not appear on mailing lists of conventional dwellings or, as these conventional dwellings are not (permanently) occupied, there may be no one present at census time. Where information is collected, however, the same classifications described in this chapter, or simplified modifications, are recommended.

1069. Information on some of the characteristics of housing units could also be obtained for collective living quarters. However, given the nature of collective living quarters, in some cases the information may not be collected and presented in the same way as for housing units. For instance, with regard to toilet or bathing facilities, the relevant information may relate to how many people use on average the same facility.

1070. Priority should always be given to obtaining information on occupied conventional dwellings, which should be presented separately from other types of housing (including other housing units, seasonal and secondary dwellings, vacant dwellings, dwellings with residents not included in census and collective living quarters). In this way it would be possible to assess the quality of life associated with the different types of housing. If information is obtained on collective living quarters, where possible it should be presented separately for the different categories of collective living quarters described in paragraph [1065](#).

17.3.2 Type of living quarters (core topic)

1071. Type of living quarters relate to occupied conventional dwellings, other housing units and collective living quarters. Living quarters are defined in paragraph [1050](#).

1072. It is recommended that living quarters be classified by type as follows:

- (1.0) Occupied conventional dwellings
- (2.0) Other housing units
 - (2.1) Mobile housing units
 - (2.2) Semi-permanent housing units
 - (2.3) Informal housing units
 - (2.3.1) Designed for habitation
 - (2.3.2) Not designed for habitation
- (3.0) Collective living quarters
 - (3.1) Hotels, rooming houses and other lodging houses
 - (3.2) Institutions
 - (3.3) Camps

(3.4) Other collective living quarters.

1073. This classification is recommended at the one-digit level but optional at the two- and three-digit level.

1074. All occupied conventional dwellings and other housing units must be in use by at least one person as their usual residence at the census reference time in order to be counted as part of living quarters.

1075. Since institutions can be of several different types, countries may sub-divide category (3.2) in the above classification to present detailed data on different categories of institutions. Within this context, consideration could be given to the categories of institutional households presented in section [16.2.1.3](#) and the institutions listed in paragraph [1065\(b\)](#) above. Countries may also wish to sub-divide category (2.3) in the above classification to present data on improvised housing units ("other units designed for habitation") and other housing units not designed for habitation as is referred to in paragraphs [1061\(g\)](#) and [\(h\)](#).

17.3.3 Housing arrangements (derived core topic)

1076. Housing arrangements cover the whole population and refers to the type of housing where a person is a usual resident at the census reference time. This covers all persons who are usual residents in different types of living quarters (including those who are primary homeless persons as defined in paragraph [781](#)).

1077. The concept of "housing arrangement" ensures that the whole population is classified according to all the units counted in the housing census, including the consideration of those who are primary homeless persons (the "roofless") living without any form of shelter.

1078. Based on the person's place of usual residence (cross-reference to the definition of usual residence), the following classification by housing arrangement is recommended:

- (1.0) Occupants living in a conventional dwelling
- (2.0) Occupants (that is persons with a usual residence) living in another housing unit – such as a hut, cabin, shack, caravan, houseboat, or a barn, mill, cave or other shelter used for human habitation at the census reference time
- (3.0) Occupants living in collective living quarters such as a hotel, institution or camp
- (4.0) Primary homeless persons who are not usual residents in any living quarters category and cannot be assigned to any of the other categories.

1079. This classification is considered at the level of individuals.

1080. The number of occupants in the first three categories is the number of persons who usually reside in the living quarters, including persons who may be temporarily absent at the census reference time, but excluding people temporarily present at the census that usually live elsewhere (see paragraph [763](#) for the definition of "place of usual residence"). As the type of living arrangements under categories (2.0) and (3.0) may vary across the UNECE region, countries may wish to sub-divide these categories (see paragraphs [1071–1075](#)).

17.3.4 Occupancy status of conventional dwellings (core topic)

1081. Occupancy status refers to whether or not a conventional dwelling is the place of usual residence of one or more persons.

1082. Dwellings which are the usual residence of one or more persons are classified as being occupied whether or not the occupants are present or temporarily absent at the census reference time. Conventional dwellings which are not the place of usual residence of any person can be classified as being vacant, in seasonal or secondary use (whether or not being temporarily occupied by persons who are usually resident in another dwelling at the census reference time, see also paragraph 1085), or temporarily occupied by persons not included in the census (see paragraph 775 in the chapter on population bases).

1083. The following classification is therefore recommended:

- (1.0) Conventional dwellings which are the usual residence of one or more persons at the census reference time (occupied conventional dwellings)
- (2.0) Conventional dwellings which are not the usual residence of any person at the census reference time
 - (2.1) Conventional dwellings reserved for seasonal or secondary use
 - (2.2) Dwellings without usual or seasonal or secondary residence
 - (2.2.1) Vacant dwellings for sale
 - (2.2.2) Vacant dwellings for rent
 - (2.2.3) Vacant dwellings for demolition
 - (2.2.4) Dwellings occupied by persons not included in the census
 - (2.2.5) Other vacant or not known.

1084. The classification is recommended at the one- and two-digit level but optional at the three-digit level. Categories (2.2.1) and (2.2.2) may be further sub-divided to show the length of time the dwelling has remained unoccupied – as an indication of the situation in the housing market in the area concerned, though it is recognized that this information may be difficult to collect in a census. Information on category (2.2.3) and depending on the census mode in category (2.2.4) may also be difficult to collect.

1085. Conventional dwellings that are used during the working week only by persons who are usually resident in another conventional dwelling at their family home should be considered as part of (2.0) “Conventional dwellings which are not the usual residence of any person at the census reference time” because the persons using the conventional dwelling are not usual residents of the dwelling.

17.3.5 Characteristics of dwellings with no occupants at the time of census (non-core topic)

1086. This topic relates to those characteristics for which information might be collected on seasonal or secondary dwellings, vacant dwellings and dwellings with persons not included

in the census (see paragraph 775). The range of characteristics to be included will depend on the individual requirements of countries and the enumeration methodology adopted.

1087. The majority of topics in this chapter relate to occupied conventional dwellings. However, there may be interest in collecting information on, at least, some of the main characteristics of all conventional dwellings. In the core topic "Occupancy status of conventional dwellings" (paragraphs 1081–1085 above) the number is obtained of all conventional dwellings, including seasonal, secondary and vacant dwellings, and those and with occupants that are not included in census. However, in addition to the total numbers, some countries may also wish to collect information on other characteristics in order to be able to produce more detail on the total housing stock. Such characteristics might include, for example:

- (a) Number of rooms and/or useful floor space (see paragraphs 1100–1107 below);
- (b) Amenities, such as water supply system (paragraph 1115), toilet facilities (paragraph 1120), bathing facilities (paragraph 1124), type of sewage disposal system (paragraph 1131) and kitchen (paragraph 1133); or
- (c) Type of building (paragraph 1159), position of dwelling within the building (paragraph 1154) and number of floors in the building (paragraph 1163);

1088. These characteristics may be applied with the classifications in the corresponding paragraphs below or with their simplified modifications. This information should be reported separately from the information on occupied conventional dwellings.

1089. In addition to dwellings that are fit for habitation all year round, countries may also wish to collect similar information on premises that are not designed to be used throughout the year (such as mountain huts and primitive cabins). If countries collect such information, it should ensure that it is not included in the data on conventional dwellings as such premises are not considered to be part of the potentially available housing stock.

1090. The metadata must make the concepts underlying the collection of the information clear. The main approach should be that the information on secondary and seasonal dwellings covers those dwellings that are at the disposal of one household on at least an annual basis. For other circumstances, double counting, which may occur, for example, where there is joint ownership of a secondary dwelling by two or more households, should be avoided.

17.3.6 Type of ownership (core topic)

1091. This topic refers to the type of ownership of dwelling as distinct from the land on which the dwelling stands.

1092. The following classification of dwellings by type of ownership is recommended:

- (1.0) Owner occupied dwellings
- (2.0) In co-operative ownership
- (3.0) Rented dwellings
 - (3.1) In private ownership

(3.2) Owned by the local or central government or by non-profit organizations

(3.3) Mixed ownership

(4.0) Other types of ownership.

1093. This classification is recommended for occupied conventional dwelling at the one-digit level but optional at the two-digit level.

1094. The topic "type of ownership" should not be confused with the household characteristic of "tenure status of households" (see section [16.5.2](#)) as it relates to status of the dwelling as distinct from that of the household. For example, in the topic "tenure status of household" the category (1.0) represents all households where a member is the owner of the housing unit, while in the topic "type of ownership" the category (1.0) represents all conventional dwellings occupied by their owner.

1095. If any sub-divisions of category (1.0) or (2.0) are distinguished for national purposes, the types of ownership included in each of the sub-divisions should be clearly described in the census report(s).

17.3.7 Occupancy by number of private households (derived non-core topic)

1096. This topic relates to the occupancy of all housing units in terms of the number of occupying households. It is only relevant for countries which use the "housekeeping unit" concept of the private household (see paragraphs [959-961](#)).

1097. The following classification of housing units by single or shared occupancy is recommended:

(1.0) Housing units occupied by a single household

(2.0) Housing units occupied by two households

(3.0) Housing units occupied by three or more households.

17.3.8 Number of occupants (core topic)

1098. The number of occupants of a living quarter is the number of people for whom the living quarter is the usual residence.

1099. A classification of the total number of living quarters according to the type (occupied conventional dwellings, other housing units and collective living quarters) and the number of occupants should be adopted (for example, dwellings with one person, two persons, etc.). The average number of occupants per each type of living quarter should also be derived.

17.3.9 Useful floor space and/or number of rooms of housing units (core topic)

1100. **Useful floor space** is defined as "the floor space measured inside the outer walls, excluding non-habitable cellars and attics and, in multi dwelling buildings, all common

spaces". Alternatively, countries may prefer to adopt another concept of living floor space, defined as "the total floor space of rooms within the dwelling" where the concept of a "room" is as defined in paragraph 1104 below. If this concept is used it should clearly be defined in the census report(s) and relevant metadata to avoid confusion in international comparisons.

1101. Information concerning useful floor space should be collected for all housing units, and particularly for occupied conventional dwellings, so that the density standard using this indicator can be calculated (see paragraphs 1108–1110 below). Countries should also report the average useful floor space per housing unit.

1102. The following classification of housing units by area of floor space is recommended:

- (1.0) Under 30 square metres
- (2.0) 30 and less than 40 square metres
- (3.0) 40 and less than 50 square metres
- (4.0) 50 and less than 60 square metres
- (5.0) 60 and less than 80 square metres
- (6.0) 80 and less than 100 square metres
- (7.0) 100 and less than 120 square metres
- (8.0) 120 and less than 150 square metres
- (9.0) 150 square metres and over.

1103. Alternatively, or in addition, countries should report the total number of rooms and the average number of rooms per housing unit.

1104. A **room** is defined as "a space in a housing unit enclosed by walls reaching from the floor to the ceiling or roof covering, at least to a height of two metres above the ground, of a size large enough to hold a bed for an adult (at least four square metres) and at least two metres high over the major area of the ceiling". Thus, normal bedrooms, dining rooms, living rooms, habitable cellars and attics, servants' rooms, kitchens and other separate spaces used or intended for habitation all count as rooms if they correspond to the definition above. For the specific definition of kitchen and handling of any deviation therefrom in the census, see paragraphs 1133–1135. A kitchenette (that is, a kitchen of less than 4 square metres), verandas, utility rooms (for example boiler rooms, laundry rooms) and lobbies do not count as rooms; nor do bathrooms and toilets (even if they are more than 4 square metres). Rooms without windows, for example cellars below ground – however large – should not generally be counted, unless they are functionally used for domestic purposes – which might include large lobbies with writing tables or internal bedrooms with no windows, for example.

1105. The following classification of number of rooms is recommended:

- (1.0) One room
- (2.0) Two rooms
- (3.0) Three rooms
- (4.0) Four rooms
- (5.0) Five rooms

- (6.0) Six rooms
- (7.0) Seven rooms
- (8.0) Eight rooms
- (9.0) Nine rooms or more.

1106. Classification by number of rooms – so that the density standard (as classified in paragraph [1110](#) below) can be calculated – is recommended for occupied conventional dwellings and optional for other housing units.

1107. Rooms used only for business and professional purposes should preferably be counted separately as it is desirable to include them when calculating the number of rooms in a housing unit but to exclude them when calculating, for instance, the number of persons per room. Each country should indicate in its census report(s) and relevant metadata how such rooms have been treated. At the lower quality end of dwellings, which constitute “other housing units”, there may be difficulties in defining rooms and useful floor space. Countries should then note the number of “other housing units” for which information could not be collected. These housing units are to be excluded from housing density standards. Information on useful floor space and number of rooms for conventional dwellings should always be reported separately.

17.3.10 Density standard (derived core topic)

1108. For the purpose of comparison, countries should collect both the number of rooms per occupant and the useful floor space in square metres per occupant where possible.

1109. The following classification of useful floor space per occupant is recommended:

- (1.0) Under 10 square metres per occupant
- (2.0) 10 and less than 15 square metres per occupant
- (3.0) 15 and less than 20 square metres per occupant
- (4.0) 20 and less than 30 square metres per occupant
- (5.0) 30 and less than 40 square metres per occupant
- (6.0) 40 and less than 60 square metres per occupant
- (7.0) 60 and less than 80 square metres per occupant
- (8.0) 80 square metres and over per occupant.

1110. The following classification for number of rooms per occupant is recommended:

- (1.0) Less than 0.5 room per occupant
- (2.0) 0.5 and less than 1.0 room per occupant
- (3.0) 1.0 and less than 1.25 rooms per occupant
- (4.0) 1.25 and less than 1.5 rooms per occupant
- (5.0) 1.5 and less than 2 rooms per occupant
- (6.0) 2 and less than 2.5 rooms per occupant

(7.0) 2.5 and less than 3 rooms per occupant

(8.0) 3 or more rooms per occupant.

1111. If the information is collected for other housing units or for collective living quarters, it should be shown separately from that for conventional dwellings.

17.3.11 Type of rooms (non-core topic)

1112. Some countries may wish to provide more specific information on overcrowding within housing units by providing information on the number of certain types of rooms within housing units.

1113. Some countries consider that the number of bedrooms provides a more accurate indicator of overcrowding, especially where overcrowding is defined by an algorithm derived from the number of bedrooms and the age, sex and relationships of members within the household. However, for such purposes, a room that is used as household living space should not be included as a bedroom.

1114. The count of the following categories of rooms for housing units is recommended:

(1.0) Reception and living rooms

(2.0) Bedrooms.

17.3.12 Water supply system (core topic)

1115. Countries should collect information on water supply systems for all housing units but should report it separately for occupied conventional dwellings.

1116. The following classification of occupied conventional dwellings and other housing units by type of water supply system is recommended:

(1.0) Piped water in the housing unit

(1.1) From a community scheme

(1.2) From a private source

(2.0) No piped water in the housing unit

(2.1) Piped water available within the building but outside the housing unit

(2.1.1) From a community scheme

(2.1.2) From a private source

(2.2) Piped water available outside the building

(2.2.1) From a community scheme

(2.2.2) From a private source

(2.3) No piped water available.

1117. This classification is recommended at the one-digit level and optional at the two and three-digit levels.

1118. A community scheme is one, which is subject to inspection and control by public authorities. A public body generally operates such schemes but, in some cases, they are operated by a co-operative or a private enterprise.

1119. It is recognized that some countries, where the proportion of conventional dwellings equipped with piped water is very high, almost 100 per cent nationally, may not feel that the collection of such information at the one-digit level in the census is justified in comparison with other more relevant or discriminating topics. Nevertheless, these countries could consider collecting more information at the two-digit level. However, depending on the method of data collection, it may be difficult to obtain such information.

17.3.13 Toilet facilities (core topic)

1120. Countries should collect information on toilet facilities for all housing units but should report it separately for occupied conventional dwellings.

1121. The following classification of occupied conventional dwellings and other housing units by type of toilet facilities is recommended:

- (1.0) Flush toilet in the housing unit
- (2.0) No flush toilet in the housing unit
 - (2.1) Toilet of other type in the housing unit
 - (2.2) Flush toilet available within the building but outside the housing unit
 - (2.2.1) Private (that is, for the exclusive use of the occupants of the housing unit)
 - (2.2.2) Shared (that is, shared with occupants of another housing unit)
 - (2.3) Flush toilet available outside the building
 - (2.3.1) Private
 - (2.3.2) Shared
 - (2.4) Toilet of other type within the building but outside the housing unit
 - (2.4.1) Private
 - (2.4.2) Shared
 - (2.5) Toilet of other type outside the building
 - (2.5.1) Private
 - (2.5.2) Shared

1122. This classification is recommended at the one-digit level and optional at the two and three-digit levels.

1123. As is the case with water supply system, it is recognized that some countries, where the proportion of dwellings equipped with a flush toilet is very high, almost 100 per cent nationally, may not feel that the collection of such information in the census is justified in comparison with other more relevant or discriminating topics.

17.3.14 Bathing facilities (core topic)

1124. All countries should collect information report on bathing facilities for all housing units but should report it separately for occupied conventional dwellings.

1125. It is recommended that the following classification of bathing facilities be used:

- (1.0) Fixed bath or shower in the housing unit
- (2.0) No fixed bath or shower in the housing unit
 - (2.1) Fixed bath or shower available within the building but outside the housing unit
 - (2.1.1) Private
 - (2.1.2) Shared
 - (2.2) Fixed bath or shower available outside the building
 - (2.2.1) Private
 - (2.2.2) Shared
 - (2.3) No fixed bath or shower available.

1126. This classification is recommended at the one-digit level and optional at the two and three-digit levels. A fixed bath or shower is one, which has fixed connections to both a water supply and a waste pipe leading outside the building.

1127. Some countries in which the use of a sauna is commonplace may wish to identify such use, either inside or outside the housing unit, separately from other bathing facilities.

1128. Again, it is recognized that some countries, where the proportion of dwellings with bathing facilities is very high, almost 100 per cent nationally, may not feel that the collection of such information in the census is justified in comparison with other more relevant or discriminating topics.

17.3.15 Hot water (non-core topic)

1129. Information should be given separately on the availability of hot water within occupied conventional dwellings and, depending on the availability of information, within other housing units. Each country should define the concept of "hot water".

1130. A classification similar to that given for the availability of bathing facilities would be appropriate.

- (1.0) Hot water tap in the housing unit
- (2.0) No hot water tap in the housing unit
 - (2.1) Hot water tap available within the building but outside the housing unit
 - (2.2) Hot water tap available outside the building
 - (2.3) No hot water tap available.

17.3.16 Type of sewage disposal system (non-core topic)

1131. It is preferable that countries collect information on the type of sewage disposal system in all housing units but report it separately for occupied conventional dwellings. It is recommended that countries that use the building as a unit of data collection, should report on the type of sewage disposal system to which the building is connected, and to assign this information to the housing unit.

1132. The following classification of occupied conventional dwellings and of other housing units by type of sewage disposal system is recommended:

- (1.0) Wastewater empties into a piped system connected to a public sewage disposal plant
- (2.0) Wastewater empties into a piped system connected to a private sewage disposal plant (for example a septic tank built for a single housing unit or a small group of dwellings)
- (3.0) All other arrangements (for example, wastewater empties into an open ditch, a pit, a cesspool, a river, the sea)
- (4.0) No sewage disposal system.

17.3.17 Kitchen (non-core topic)

1133. It is recommended that where occupied conventional dwellings and other housing units are classified by number of rooms they should also be classified by availability of a kitchen. A **kitchen** is defined as a room (or part of a room) of at least 4 square metres or two metres wide that has been designed and equipped for the preparation of the principal meals and is used for that purpose, irrespective of whether it is also used for eating, sleeping or living.

1134. The kitchen is counted as a "room" in these recommendations (see paragraph 1104). Since certain countries apply different practices in this respect, it is important to be able to count the number of rooms both with the kitchen included and with it excluded. This will make international comparisons possible.

1135. The definition of a kitchen adopted for the census should be given in detail in the relevant census report and metadata, and attention should be drawn to any deviations from the general definition given above. In particular, countries should indicate how they have classified dwellings in which meals are prepared in a room that is also used for other activities.

1136. The following classification of dwellings by availability of a kitchen is recommended:

- (1.0) With a kitchen
- (2.0) With a kitchenette (that is, a separate space of less than four square metres or two metres width of floor space)
- (3.0) Without a kitchen or kitchenette
- (4.0) Cooking facilities are provided in another type of room.

17.3.18 Type of heating (core topic)

1137. Countries should report separately the type of heating in occupied conventional dwellings and other housing unit.

1138. The following classification of occupied conventional dwellings and of other housing units by type of heating is recommended:

- (1.0) Central heating
 - (1.1) Central heating from an installation in the building or in the housing unit
 - (1.2) District heating
- (2.0) No central heating
 - (2.1) Heating facilities or equipment available in the occupied conventional dwelling or other housing unit
 - (2.1.1) Stove
 - (2.1.2) Fireplace
 - (2.1.3) Portable electric heater
 - (2.1.4) Other
 - (2.2) No heating at all.

1139. This classification is recommended at the one-digit level and optional at the two-digit level.

1140. A housing unit is considered as centrally heated if heating is provided either from a community heating centre or from an installation built in the building or in the housing unit, established for heating purposes, without regard to the source of energy. Some countries may wish to include additional subcategories in this classification so as to obtain information that can be used for energy planning (see also the following non-core topic on "main type of energy used for heating").

17.3.19 Main type of energy used for heating (non-core topic)

1141. In addition to the core topic type of heating, some countries may also wish to collect information on the main type of energy used for heating purposes. If this information is available, it should be reported separately for occupied conventional dwellings and other housing units.

1142. The following classification of occupied conventional dwellings and of other housing units by main type of energy used for heating purposes is recommended:

- (1.0) Solid fuels
 - (1.1) Coal, lignite and products of coal and lignite
 - (1.2) Wood and other renewable wood-based products
 - (1.3) Other
- (2.0) Oil

- (3.0) Gaseous fuels
 - (3.1) Natural gas
 - (3.2) Other (including liquefied gases)
- (4.0) Grid electricity used for heating (excluding heating pump)
- (5.0) Ambient heat (heat pump)
- (6.0) Solar energy
- (7.0) District heating
- (8.0) Other types of energy.

1143. Ground heat falls under (5.0) Ambient heat (heat pump), except if coming from a centralised facility supplying multiple dwellings, in which case it falls under (7.0) District heating.

1144. Countries should indicate in the census report(s) and relevant metadata how the main type of energy was selected in a housing unit where two types of energy were used equally for heating purposes.

17.3.20 Electricity (non-core topic)

1145. Countries collecting information on the availability of electricity within the housing unit should report it separately for occupied conventional dwellings and other housing units.

1146. The following classification of occupied conventional dwellings and of other housing units by the availability of electricity is recommended:

- (1.0) Electricity available in the housing unit
- (2.0) No electricity available in the housing unit.

17.3.21 Piped gas (non-core topic)

1147. Piped gas should be defined as natural or manufactured gas which is distributed by pipeline, and the consumption of which is recorded by gas meters. Countries collecting information on the availability of piped gas should report it separately for occupied conventional dwellings and other housing units.

1148. A classification similar to that recommended for availability of electricity would be appropriate.

- (1.0) Piped gas available in the housing unit
 - (1.1) For both heating and cooking purposes
 - (1.2) For heating purposes only
 - (1.3) For cooking purposes only
- (2.0) No piped gas available in the housing unit.

17.3.22 Air conditioning (non-core topic)

1149. Some countries may wish to record air conditioning as a housing quality measure, but the use and importance of this topic as a housing measure may vary across countries. If this information is collected it should be reported separately for occupied conventional dwellings and other housing units.

1150. The following classification of air conditioning is recommended:

- (1.0) Air conditioning available in the housing unit
 - (1.1) Central air conditioning from an installation in the building or in the housing unit
 - (1.2) Independent air conditioning unit(s) available in the housing unit
- (2.0) No air conditioning available in the housing unit.

17.3.23 Accessibility to dwelling (non-core topic)

1151. Some countries may want to collect information on the accessibility to dwellings, in particular with reference to accessibility by persons with disabilities. Countries collecting this information should report it separately for occupied conventional dwellings and other housing units.

1152. The following classification of accessibility to the front door of the dwelling is recommended, based on the presence of steps/stairs, ramps and lifts/elevators:

- (1.0) Access to the dwelling is possible without steps/stairs
 - (1.1) Access to the dwelling is possible without ramp or lift/elevator
 - (1.2) Access to the dwelling requires using only a ramp
 - (1.3) Access to the dwelling requires using only a lift/elevator
 - (1.4) Access to the dwelling requires using a ramp and a lift/elevator
- (2.0) Access to the dwelling requires using steps/stairs
 - (2.1) Access to the dwelling requires using only steps/stairs
 - (2.2) Access to the dwelling requires using steps/stairs and a ramp
 - (2.3) Access to the dwelling requires using steps/stairs and a lift/elevator
 - (2.4) Access to the dwelling requires using steps/stairs, a ramp and a lift/elevator

1153. Note that if any number of steps/stairs are required to access the dwelling, it would fall under category 2.1-2.4. When selecting the category, the most accessible option available should be chosen, regardless of use.

17.3.24 Position of dwelling in the building (non-core topic)

1154. Some countries may want to collect information on the position of dwellings within the building. This information can be used as an indicator of accessibility to dwellings, possibly

in conjunction with the non-core topic accessibility to dwelling. Countries collecting this information should report it separately for occupied conventional dwellings.

1155. The following classification of dwellings by position in the building is recommended¹⁰¹:

- (1.0) Dwellings on one floor only
 - (1.1) Dwelling on the ground floor of the building or lower (below ground level)
 - (1.2) Dwelling on the first or second floor of the building
 - (1.3) Dwelling on the third or fourth floor of the building
 - (1.4) Dwelling on the fifth floor of the building or higher
- (2.0) Dwellings on two or more floors
 - (2.1) Dwelling on the ground floor of the building or lower (below ground level)
 - (2.2) Dwelling on the first or second floor of the building
 - (2.3) Dwelling on the third or fourth floor of the building
 - (2.4) Dwelling on the fifth floor of the building or higher.

1156. The sub-categories of (2.0) "Dwellings with two or more floors" each refer to the lowest floor of the dwelling with two or more floors.

17.3.25 Characteristics of buildings containing dwellings

1157. The building containing conventional dwellings is an important unit since information on building characteristics such as type of building and period of construction is required to describe the dwellings within the building and for formulating housing programmes. The definition of building is given in paragraph 1048. The topics included in this section refer to occupied conventional dwellings as primary unit of enumeration. The main interest is to report on the characteristics of occupied conventional dwellings. The idea is not to describe the characteristics of buildings per se, but instead to count the number of dwellings in buildings with different characteristics.

1158. Countries may wish to collect characteristics of buildings for other housing units than occupied conventional dwellings, such as collective living quarters, or for all conventional dwellings. If they do so, they should report the information separately for occupied conventional dwellings.

17.3.26 Dwellings by type of building (core topic)

1159. Dwellings may be classified by type of building where they are placed.

1160. The following classification for dwellings by type of building is recommended at the one-, two- and three-digit level.

- (1.0) Residential buildings

¹⁰¹ The convention used here conforms with that used in many European countries, whereby 'first floor' refers to one level higher than the ground floor.

- (1.1) Detached house (houses not attached to any other buildings)
 - (1.1.1) Detached houses with one dwelling
 - (1.1.2) Detached houses with two dwellings (with one above the other)
- (1.2) Semi-detached house (two attached dwellings)
- (1.3) Row (or terraced) house (at least three attached or connected dwellings each with separate access to the outside)
- (1.4) Apartment buildings
 - (1.4.1) Apartment buildings with three to nine dwellings
 - (1.4.2) Apartment buildings with 10 or more dwellings
- (1.5) Other residential buildings
- (2.0) Non-residential buildings.

1161. For some purposes, it might be useful to classify the buildings by the number of dwellings that they contain. The following classification is recommended at the one- and two-digit level:

- (1.0) Conventional dwellings in residential buildings
 - (1.1) Conventional dwellings in residential buildings with one dwelling
 - (1.2) Conventional dwellings in residential buildings with two dwellings
 - (1.3) Conventional dwellings in residential buildings with three or more dwellings
- (2.0) Conventional dwellings in non-residential buildings.

1162. If no information on the classification under paragraph [1160](#) is available, the breakdown of buildings by the number of dwellings a building contains might be obtained by direct enumeration.

17.3.27 Dwellings by number of floors in the building (non-core topic)

1163. This topic refers to the number dwellings in a building analysed by the number of floors of the building, where the number of floors is counted from the ground floor of the building upwards (and is irrespective of the number of floors of the dwelling).

1164. The following classification of the number of floors in a building is recommended:

- (1.0) 1 floor
- (2.0) 2 floors
- (3.0) 3 floors
- (4.0) 4 floors
- (5.0) 5–9 floors
- (6.0) 10–19 floors
- (7.0) 20 floors or more.

17.3.28 Lift (non-core topic)

1165. It is suggested that information on the presence of a working lift/elevator in multi-storey buildings might be collected. Countries collecting this information for all housing units should report it separately for occupied conventional dwellings. The information should not be limited to just the presence of a lift, but it should report if the lift is operational for most of the time and is subject to regular maintenance. It could also be useful to collect information on the size of the lift (relevant for use, for example, by physically handicapped persons and ambulance services) and whether the lift goes to the ground floor.

1166. Some countries may also want to collect information on the availability of a working lift with reference to individual dwellings in a building. In this case, information should be collected on whether or not the lift stops on the same floor as the dwelling.

17.3.29 Dwellings by period of construction of building (core topic)

1167. Period of construction is measured in terms of the date when the building was completed.

1168. It should be noted that the date in which a particular dwelling was constructed may not necessarily be the same as that in which the construction of the building itself was completed. The following classification of dwellings by the period in which the construction of the building containing them was completed is recommended:

- (1.0) Before 1919
- (2.0) 1919 – 1945
- (3.0) 1946 – 1960
- (4.0) 1961 – 1970
- (5.0) 1971 – 1980
- (6.0) 1981 – 1990
- (7.0) 1991 – 2000
- (8.0) 2001 – 2010
- (9.0) 2011 – 2015
- (10.0) 2016 – 2020
 - (10.1) 2016
 - (10.2) 2017
 - (10.3) 2018
 - (10.4) 2019
 - (10.5) 2020
- (11.0) 2021 – 2025
 - (11.1) 2021

- (11.2) 2022
- (11.3) 2023
- (11.4) 2024
- (11.5) 2025
- (12.0) 2026 – 2030
- (12.1) 2026
- (12.2) 2027
- (12.3) 2028
- (12.4) 2029
- (12.5) 2030
- (13.0) 2031 – 2035
- (13.1) 2031
- (13.2) 2032
- (13.3) 2033
- (13.4) 2034
- (13.5) 2035

1169. This classification is recommended at the one-digit level and optional at the two-digit level.

1170. Dwellings in buildings, which have undergone thorough reconstruction since they were originally built, may be classified to the period in which the building was originally constructed or to the period of latest reconstruction according to national requirements. Each country should indicate in its census report(s) and metadata how such dwellings have been classified.

17.3.30 Dwellings by materials of which specific parts of the building are constructed (non-core topic)

1171. Information on the materials of which specific parts of buildings containing dwellings are constructed may be used, in conjunction with data on other topics (such as period of construction) for assessing the quality of dwellings. Some countries may wish to collect data on the materials of which the outer walls, the roof, the floors, or other parts of the building are constructed.

1172. The following classification of dwellings by the main structural material of which the outer walls of the building containing them are constructed is recommended:

- (1.0) Wood
- (2.0) Unburnt clay (may be omitted by countries where this is not important)
- (3.0) Burnt clay (e.g. bricks, blocks, panels)
- (4.0) Stone

- (5.0) Concrete (including in situ cast concrete, reinforced concrete, blocks, panels)
- (6.0) Steel frame
- (7.0) Prefabricated units – generally factory-constructed and brought to the site and erected
- (8.0) Other material (to be specified)
- (9.0) Mixed materials (that is, a combination of building materials).

1173. Information on the thermal insulation of the building may be used for energy efficiency indicators of the building as well as an indicator for wellbeing. Some countries may wish to collect data on the thermal isolation of the external facade, the top storey ceiling, the basement ceiling, or the floor against the ground.

1174. Information on green roofs and walls may be used for climate indicators as well as an indicator for wellbeing. Some countries may wish to collect data on green roofs and walls of buildings.

17.3.31 Dwellings by state of repair of the building (non-core topic)

1175. This topic refers to whether the building is in need of repair and the kind of repair needed.

1176. The recommended classification of dwellings according to the state of repair of the building is recommended:

- (1.0) Repair not needed
- (2.0) In need of repair
 - (2.1) Minor repair
 - (2.2) Moderate repair
 - (2.3) Serious repair
- (3.0) Irreparable

1177. "Minor repair" refers mostly to the regular maintenance of the building and its components, such as fixing a cracked window or inoperative lock, or removing graffiti from the front wall and so forth.

1178. "Moderate repair" refers to correcting more substantial defects such as gutters missing on the roof (where they are normally used), large areas of broken plaster and stairways with no secure hand railing.

1179. "Serious repairs" are needed to remedy more serious structural defects of the building such as missing covering material (for example, shingles, tiles), cracks and holes in the exterior walls, and missing stairways.

"Irreparable" refers to buildings that are beyond repair, that is, because of the seriousness of the structural defects it is deemed more appropriate or necessary to demolish them rather than to undertake repairs. This usually refers to buildings with only the frame left standing, without complete external walls or roof, windows or doors

Chapter 18 Education

18.1 Introduction

1180. This chapter covers the topics related to both formal and non-formal education that may be collected or compiled as part of a census. In the text that follows, references to "collecting" or "asking for" information, and to "census questions", are applicable to countries using field enumeration for part or all of their census. Those using administrative sources, which are more constrained in their ability to adjust the sources to meet census purposes, may interpret such references as guidance for classifying and presenting information on educational characteristics.

1181. The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines an educational programme as "a coherent set or sequence of educational activities or communication designed and organized to achieve pre-determined learning objectives or accomplish a specific set of educational tasks over a sustained period".¹⁰² Within this definition, educational activities are "deliberate activities involving some form of communication intended to bring about learning".¹⁰³

1182. While most such educational activities are likely to be undertaken at schools or universities (or their equivalents), it is possible that education can be provided outside these institutions. The definitions given in the International Standard Classification of Education (ISCED) specifically note that the communication required to constitute education may be "between two or more persons or an inanimate medium and persons" and "may be verbal or non-verbal, direct/face-to-face or indirect/remote, and may involve a wide variety of channels and media".¹⁰⁴ For the purpose of international comparisons, countries should compile their data in accordance with the latest revision of ISCED.¹⁰⁵

18.2 Educational attainment (core topic)

1183. **Educational attainment** is defined as the highest ISCED level successfully completed by an individual. Educational attainment is usually measured with respect to the highest education programme successfully completed, which is typically certified by a recognized qualification.

1184. It is recommended to collect data on educational attainment for all persons aged 15 years and over. Some countries may decide to apply a lower age threshold to meet national needs (the Principles and Recommendations issued by UNSD propose a threshold of age 5

¹⁰² UNESCO Institute for Statistics (UIS). 2012. [International Standard Classification of Education: ISCED 2011](#). Montreal: UIS, paragraph 11.

¹⁰³ *Ibid.*, paragraph 12.

¹⁰⁴ *Ibid.*, paragraph 13.

¹⁰⁵ *Ibid.* Detailed information and resources on ISCED can be found at <https://isced.uis.unesco.org/>

years, and previous editions of the present Recommendations proposed a threshold of 10 years of age). To permit international comparisons, any tabulations of educational attainment not cross-classified by detailed age should distinguish at least between persons aged less than 15 years and those aged 15 years and over, and between persons aged less than 25 years and those aged 25 years and over.

1185. Countries may also consider collecting further information on levels of education not successfully completed. This may be achieved by collecting or compiling information on whether a higher level than the one attained has been started and interrupted, or if studies are ongoing at the higher level. Alternatively, a question on the highest grade completed may be appropriate. Recognized intermediate qualifications are classified at a lower level than the programme itself. Information on intermediate qualifications or on the highest grade completed can thus be used to identify those who have or have not completed a given level of education.

1186. The data collected should, in all cases, be coded according to ISCED-A (Attainment) levels. The following ISCED-A levels should be distinguished:

- (a) ISCED level 0: Less than primary education
- (b) ISCED level 1: Primary education
- (c) ISCED level 2: Lower secondary education
- (d) ISCED level 3: Upper secondary education
- (e) ISCED level 4: Post-secondary non-tertiary education
- (f) ISCED level 5: Short-cycle tertiary education
- (g) ISCED level 6: Bachelor's or equivalent level
- (h) ISCED level 7: Master's or equivalent level
- (i) ISCED level 8: Doctoral or equivalent level.

1187. It is important to note that the meaning of ISCED-A level 0 in the classification of educational attainment is different from the meaning of level 0 in ISCED 2011 for the classification of education programmes, ISCED-P (see paragraph [1206](#)). For educational attainment, level 0 means not having successfully completed ISCED level 1. This includes all individuals who: have never attended an education programme; have attended some early childhood education (defined as ISCED level 0 in the classification of education programmes); or have attended some primary education but have not successfully completed ISCED level 1.

1188. Special attention must be paid to establishing the appropriate level/grade equivalence for persons who received their education under a different system from that currently in place in a country, such as a previous educational regime or a foreign educational system. In the latter case, countries may wish to collect information on the foreign country (or foreign system followed in the same country) from which the education was received.

1189. Necessary deviations from the recommended definitions and classifications resulting from specificities of the national education system should be explained in the census reports and relevant metadata. If national priorities make it necessary to publish the results using the designations used for the schools within a country, then the categories distinguished for national users should be mapped to those needed for international comparisons. Countries coding educational attainment to a national standard classification can establish

correspondence with the most recent version of ISCED, either through double coding or through mapping from the detailed attainment categories of the national classification to the ISCED classification.¹⁰⁶

1190. It is important to recognize that under certain circumstances a level of education may have been completed successfully even though a relevant qualification was not obtained. Relatedly, it is also important to note that the definition given above (paragraph 1183) states that educational attainment is “typically” certified by a recognized qualification: but such certification is not universal. Non-formal education, for example, may not be accompanied by any expectation or possibility of certification. It is therefore recommended to collect data on educational attainment and on qualifications (see below, paragraphs 1192-1193) separately, or in such a way that it is possible to draw the distinction between them. If data are not collected separately, or the distinction is not possible, this should be made clear in any census publications.

1191. Countries in which non-formal education is commonplace may wish to collect separate information on educational attainment achieved through non-formal programmes.

18.3 Educational qualifications (non-core topic)

1192. An **educational qualification** is the official confirmation, usually in the form of a document, certifying the successful completion of an education programme or a stage of a programme. Qualifications can be obtained through:

- (a) successful completion of a full education programme
- (b) successful completion of a stage of an education programme (intermediate qualifications), or
- (c) validation of acquired knowledge, skills and competencies, independent of participation in an education programme.

1193. It is recommended that information on educational qualifications be collected at least for all persons who have successfully completed a formal course of study at the post-secondary level of education. Such information should include the title of the highest degree, diploma or certificate received, with an indication of the field of study if the title does not make this clear.

18.4 Field of education and training (non-core topic)

1194. **Field of education and training**, as defined in ISCED, is the broad domain, branch or area of content covered by an education programme or qualification.

1195. Beside educational attainment, the field of education and training of a person represents a second important dimension of their qualifications. Information on the distribution of educated persons by field of education and training is important for

¹⁰⁶ The UNESCO Institute for Statistics maintains a [database with ISCED mappings](#).

examining the match between the supply and the demand for suitably qualified workers within the labour market. It is equally crucial for planning and regulating the production capacities of different levels, types and branches of educational institutions and training programmes. Titles, degrees, diplomas and further training received, as well as experience gained on the job, constitute additional components of a qualification.

1196. Information on the field of education and training should primarily be collected for persons within the adult population who have attained secondary education or above. This means that the information collected should relate principally to persons aged 15 years and over who have completed secondary, post-secondary or tertiary education or other organized education and training programmes at equivalent levels of education. Data collected on fields of education and training should be coded according to the International Standard Classification of Education: Fields of Education and Training 2013 (ISCED-F 2013).¹⁰⁷ In general, the field of education and training should be collected with reference to the highest level of qualification achieved.

18.4.1 Interdisciplinary or multidisciplinary studies

1197. It may not be straightforward to identify the exact field(s) of education and training of persons with interdisciplinary or multidisciplinary specializations. In these cases, countries should identify the major or principal field of education and training. Where there is insufficient information available to determine the relative shares of learning credits or intended learning time, the programme or qualification should be classified in the field listed first in its title. Where a main subject cannot be identified because the programme or qualification covers several fields, none of which dominates, the programme or qualification should be classified in an inter-disciplinary category. However, for national purposes countries may wish to identify specialization in different ways depending on the planned use of this information and data processing capacities.

1198. The most common approach is to collect information that identifies only one principal field of education and training. However, this results in loss of information about the other fields, and about the interdisciplinary nature of the studies which is an important feature in its own right. Another approach is to accept multiple responses to the census question (or allow multiple fields in administrative records), in which case appropriate data processing facilities for handling and tabulating multiple responses must be in place. If necessary, the data collection and processing procedures could be adapted to enable the distinction between principal and secondary fields of education and training.

1199. To facilitate international comparison, countries that follow established national nomenclature should adopt the classifications and coding of fields of education and training of the most recent version of ISCED. Countries coding "field of education and training" to a national standard classification can establish correspondence with the most recent version of ISCED either through double coding or through mapping from the national classification of fields to the ISCED classification. Guidance on classifying education programmes within the ISCED framework is available in International Standard Classification of Education: Fields of Education and Training 2013 (ISCED-F 2013). The classification is accompanied by a

¹⁰⁷ UNESCO Institute for Statistics (UIS) (2014). [International Standard Classification of Education: Fields of Education and Training 2013 \(ISCED-F 2013\)](#). Montreal: UIS.

comprehensive description of each field, with detailed examples of subjects that are included and excluded within each field.

18.5 School attendance (non-core topic)

1200. **School attendance** is defined as regular attendance at any accredited educational institution or programme, public or private, for organized learning at any level of education (including post-secondary). Instruction in a particular skill delivered by a provider that is not part of the recognized educational structure of the country (for example, in-service training courses in factories), is not considered "school attendance" for census purposes.

1201. Data on school attendance should refer to the census reference time. If the census is taken during a school vacation period, school attendance during a specified period just before the vacation should be taken into account.

1202. The concept of school attendance is different from, but complementary to, that of enrolment as normally covered by school statistics derived from administrative records. Attendance means the day-to-day presence of participants at an institution of learning. Enrolment refers to the formal registration of the participant at the start of the course, for example the registration of a school pupil at the start of the school year. A person may be enrolled but does not attend, for example, due to illness. A person attending a training programme may not be formally enrolled in a school or an educational institution.

1203. The definition of attendance as day-to-day presence at an institution of learning is most relevant to primary and secondary education. There may be other instances where a person is enrolled and participating actively in a course of education to achieve a qualification, but does not attend any institution regularly. Examples of this include participation via an Internet-based course of study, correspondence courses and certain modes of tertiary education, which require only infrequent attendance.

1204. Depending on national priorities, the data collected may be restricted to attendance in primary and secondary education. More broadly they may refer to all modes of participation in all levels of education, and information on active participation in a course of study towards a qualification may be gathered. In every case it should be possible to draw a distinction between each type of participation, and this should be made clear in the relevant census reports and/or metadata.

1205. Information on school attendance relates typically to the population of official school age, which in general ranges from 5 to 29 years but which varies from country to country depending on the national education system. In cases where data collection is extended to cover attendance in early childhood education, and/or other systematic education and training programmes organized for adults in productive and service enterprises, community-based organizations and other non-educational institutions, the age range may be adjusted as appropriate. Note that those persons "outside the labour force" (see section 19.3.3) who are classified as "students" will include only a subset of all persons attending school, since some of those attending school may be classified as "employed" or as "unemployed".

1206. The data collected should, in all cases, be coded according to ISCED-P (Programme) levels. The following ISCED-P levels should be distinguished:

- (a) ISCED level 0: Early childhood education
- (b) ISCED level 1: Primary education
- (c) ISCED level 2: Lower secondary education
- (d) ISCED level 3: Upper secondary education
- (e) ISCED level 4: Post-secondary non-tertiary education
- (f) ISCED level 5: Short-cycle tertiary education
- (g) ISCED level 6: Bachelor's or equivalent level
- (h) ISCED level 7: Master's or equivalent level
- (i) ISCED level 8: Doctoral or equivalent level.

18.6 Literacy (non-core topic)

1207. **Literacy** has been understood historically as the ability both to read and to write, distinguishing people as either literate or illiterate. A person who can, with understanding, both read and write a short, simple statement on their everyday life is, by this definition, considered to be literate. A person who cannot, with understanding, both read and write such a statement on their everyday life is considered to be illiterate. A person capable of reading and writing only figures and their own name should be considered illiterate, as should a person who can read but not write and one who can read and write only a phrase that has been memorized. It is now widely accepted, however, that literacy is a continuum of skills rather than a binary variable with only the values "literate" and "illiterate". As such, countries should consider distinguishing broad levels of actual literacy skills during data collection.

1208. Literacy is an applied skill and needs ideally to be measured in relation to a particular task such as reading, with understanding, a news article or writing a letter or message. Reading and writing may be measured separately to allow simpler questions to be asked and to enhance analytical power.

1209. The collection and tabulation of statistics on literacy during the population census should not be based on inferred correlations between literacy, school attendance and educational attainment.

1210. The language or languages in which a person can read and write is independent of literacy. In multilingual countries, however, information on the ability to read and write in a particular language may be essential for informing educational policy (for more on language, see section [21.4](#)).

1211. UNESCO recommends that literacy tests should be administered in order to verify, as well as improve, the quality of literacy data. Standardized questions can be used to increase comparability: UNESCO's reference database of model questions can be consulted. However, administering a literacy test to all household members in the course of census enumeration may prove impractical and costly. Instead, administering such a test to a sample of respondents may be considered. Alternatively, a simple question on reading and writing literacy may be more appropriate.

1212. It is recommended that data on literacy be collected for all persons 10 years of age and over. To permit international comparisons of data on literacy, however, any tabulations of literacy not cross-classified by detailed age should at least distinguish between persons under 15 years of age and those 15 years of age and over.

Chapter 19 Economy

19.1 Introduction

1213. Statistics on the economic characteristics of persons are needed from population censuses for many reasons. Information on the productive activities of persons is vital to establish a comprehensive picture of the economic structure of a country, and the work patterns, labour market participation and extent of labour underutilization of its population. This information, when combined with other personal, household and dwelling characteristics collected in the census, enable assessments of the socio-economic situation of persons and households, which are essential to inform the formulation and planning of a wide range of economic and social policies and programmes related to employment creation, poverty reduction, work-life balance, vocational education and training, provision of social security and other social benefits, gender equality and social inclusion.

1214. Such statistics can be obtained from a traditional census or other sources such as household-based surveys, business surveys or administrative data sources. These other sources can have certain limitations. Household surveys, especially labour force surveys, are particularly well suited for generating a broad range of statistics on the economic characteristics of the population at aggregate levels, such as national and broad regional groupings. Data obtained from labour force surveys, however, are subject to sampling error and therefore, rarely provide reliable estimates for small areas, small population groups, or detailed groups of industries and occupations. In contrast population censuses can provide certain core statistics at the lowest levels of aggregation for such small population groups and for detailed occupation and industry groups. Administrative data sources e.g. may have good quality of occupational and industry coding. However, they may not have the same comprehensiveness in population activity coverage, excluding productive activities that are informal or unpaid.

1215. The population census also provides benchmark information to which statistics from other sources can be related. Population censuses, either traditional censuses or based on administrative data sources, likewise provide sample frames for most household-based surveys, including labour force surveys.

1216. In the UNECE region a growing number of countries are deriving census information on economic characteristics from administrative data sources. For international comparability, it is recommended that countries provide accurate and detailed information on the sources, definitions and methodology that are used.

1217. In deciding which topics relating to the economic characteristics to include in the population census, countries should assess the existence of other sources of the statistics and their complementary uses, as well as take into accounts what is relevant for national purposes. The aim should be to cover core topics needed as benchmark information for the preparation of sample frames, and to provide essential statistics for small areas and small population groups, and for small occupation and industry groups, as relevant in the national context.

1218. International resolutions and guidelines to produce statistics relating to the economic characteristics of the population are adopted by the International Conference of Labour Statisticians (ICLS) and endorsed by the Governing Body of the International Labour Organization (ILO).¹⁰⁸ Recommendations on topics amenable for inclusion in population censuses are discussed in general in [Box 7](#).

Box 7

New international recommendations concerning statistics of work, employment and labour underutilization

In October 2013, the Nineteenth International Conference of Labour Statisticians (ICLS) adopted the Resolution concerning statistics of work, employment and labour underutilization.¹⁰⁹ This Resolution replaced the previous international recommendations relating to the measurement of the economically active population, employment, unemployment and underemployment dating from 1982 (13th ICLS) and related guidelines.

These new standards adopted at the 19th ICLS introduced a number of important revisions, among which are: a conceptual framework for work statistics consistent with the System of National Accounts; guidelines for separately measuring different forms of work, including a more targeted definition of employment as “work for pay or profit”, and for expanding the range of measures of labour underutilization beyond the traditional unemployment. New terminology was also introduced, as relevant, and terms considered to be out-of-date, particularly the “economically active/inactive population” were replaced with “labour force/ outside the labour force”.

Important elements from the 13th ICLS resolution of the economically active population, employment, unemployment and underemployment essential to the internal consistency of the statistics remain unchanged. The refinements of the definition of employment and introduction of measures of labour underutilization may result, however, in breaks in the historical series of statistics of the economically active population, employment, unemployment and underemployment. In particular, productive activities carried out without pay, such as those listed below, are no longer included within the scope of employment:

- Production of goods intended for own final use by the household;
- Unpaid work by apprentices, interns and trainees;
- Organization-based volunteer work;
- Direct volunteering to produce goods for other households.

Participation in these activities is now to be measured separately through the defined forms of work identified as: own-use production work, unpaid trainee work and volunteer work, respectively.

Countries are encouraged to develop their statistical system to cover work statistics,

¹⁰⁸ See <http://www.ilo.org/stat>. The complete labour statistics standards are available at: [Standards and guidelines on labour statistics - ILOSTAT](#).

¹⁰⁹ See ILO (2023). [Resolution to amend the 19th ICLS resolution concerning statistics of work, employment and labour underutilization](#). 21st International Conference of Labour Statisticians.

including statistics on the labour force, based on their specific national needs and resources. In the case of the measures affected by the 19th ICLS Resolution it is of utmost importance that the institutions and persons responsible for planning and managing the production of statistics on the economic characteristics of the population develop a strategic and coordinated approach that takes into account all official sources of the statistics, including the population census, labour force survey and other household-based surveys and administrative records. Data users will need to be kept well informed of the process, including by widely disseminating the relevant metadata and by maintaining parallel series for a specified period following their implementation.

19.2 Conceptual framework for work statistics

19.2.1 Work

1219. Measurement of the economic characteristics of the population is based on the conceptual framework for work statistics (see Box 7). In this framework, **work** is defined for reference purposes as “any activity performed by persons of any sex and age to produce goods or to provide services for use by others or for own use”.

1220. The integrated framework of the System of National Accounts¹¹⁰ confines the concept of labour input to the input to the production activities within the SNA production boundary, although in the extended accounts on unpaid household service work a broader concept of production is applied. On the other hand, the various forms of work identified in the 19th ICLS Resolution concerning statistics of work, employment and labour underutilization, as presented in [Figure 7](#), can be aligned to either the general production boundary, when all forms of work are included, or the SNA production boundary, when direct volunteer work providing services and the production of services by households for own final use are excluded. Exceptions are owner-occupied housing services and the production of domestic and personal services by employing paid domestic staff. In this respect, it is worth noting that activities may move in and out the SNA production boundary. For example, due to digitalisation, one can observe changes from households buying services from travel agencies to arranging travel themselves, or using the services provided by supermarkets to using self-service checkouts. On the other hand, one can observe a trend of purchasing services which were traditionally produced by households themselves, e.g., using the services of kindergartens instead of taking care of children at home. Whatever the case, there is a clear link between what is defined as production in the SNA and the notion of labour.

1221. The conceptual framework for work statistics identifies five mutually exclusive forms of work (type of productive activity) for separate measurement, see [Figure 7](#). These forms of work are distinguished on the basis of the intended destination of the production for own final use; or for the use of others, i.e. other economic units, and the nature of the transaction i.e. monetary or non-monetary transactions and transfers, as follows:

- (a) “Own-use production work”, comprising production of goods and services for own final use;

¹¹⁰United Nations, System of National Accounts 2025 (New York, forthcoming), chapter 16.

- (b) "Employment work", comprising work performed for others for pay or profit;
- (c) "Unpaid trainee work", comprising work performed for others without pay to acquire workplace experience or skills;
- (d) "Volunteer work", comprising non-compulsory work performed for others without pay;
- (e) "Other work activities", including activities as unpaid community service and work by prisoners, when ordered by a court or similar authority, and unpaid military or alternative civilian service, which may be treated as a distinct form of work for measurement (such as compulsory work performed without pay for others).

Figure 7
Forms of work and the System of National Accounts

<i>Intended destination of production</i>	<i>for own final use</i>		<i>for use by others</i>						
<i>Forms of work</i>	Own-use production work		Employment (work for pay or profit)	Unpaid trainee work	Other work activities	Volunteer work			
	of services	of goods				in market and non-market units		in households producing	
						goods	services		
<i>Relation to SNA</i>		<i>Activities within the SNA production boundary</i>							
		<i>Activities inside the SNA General production boundary</i>							

Source: Diagram 1 in the Resolution to amend the 19th ICLS resolution concerning statistics of work, employment and labour underutilization. [Report of the Conference – 21st International Conference of Labour Statisticians](#). Appendix 2, Resolution II. Geneva: International Labour Office, 2024.

1222. During a given reference period, persons may engage in one or more forms of work in parallel or consecutively, that is, persons may be employed, volunteering, doing unpaid trainee work or producing for own final use, in any combination.

1223. To meet different objectives, countries may measure the economic characteristics of the population in the census with respect to their participation in one or in several forms of work. In particular, this may include measurement of:

- (a) "Persons in employment" is essential as part of the preparation of labour force statistics that include unemployment and other measures of labour underutilization. It is needed to assess the labour market participation of the population, and to classify the population according to their labour force status in a short reference period (see section [19.3](#));
- (b) "Persons in own-use production of goods" is especially important in countries where particular groups of the population engage in agriculture, fishing or hunting and gathering for own final consumption, including for subsistence (see section [19.5](#)), and to enable integration of the population census with the agricultural census (see [Chapter 20](#));

- (c) "Persons in unpaid trainee work" may be advisable where unpaid apprenticeships, internships and traineeships may be a main mechanism of labour market entry for particular groups such as youths or for specific occupations such as mechanics or tailors, given their small size and limited availability of alternative statistical sources.

1224. Given the need for detailed probing, the measurement of participation in own-use provision of services, unpaid trainee work and volunteer work is more appropriate through household surveys or, if desired, through the census by means of a long form applied to a sub-set of the population.¹¹¹

1225. Additional information may also be collected in the population census in order to classify the population according to their main form of work based on self-declaration, in a short or long reference period.

19.2.2 Working time

1226. The concept of **working time** comprises the time associated with productive or work activities and the arrangement of this during a specified reference period.¹¹² Working time relates to each form of work.

1227. The number of persons engaged in a given form of work provides only a very rough estimate of the volume of work performed, particularly when the work is performed on a part-time, casual or occasional basis. Information on working time is necessary to prepare estimates of the volume of work or labour input for the national accounts. It is also essential to support the design, monitoring and evaluation of economic, social and labour market policies and programmes targeting labour market flexibility, work-life balance and conditions of work, including situations of underemployment due to insufficient working time (that is, time-related underemployment) and of excessive working time.

1228. The population census can provide information on the hours usually worked and hours actually worked (see definitions in paragraphs 1299 and 1300). Where the census is the only available data source it may as a minimum incorporate a single question on hours usually worked for persons in employment and for persons in own-use production of goods, as relevant (see paragraph 1308). The inclusion of hours usually worked can be useful for countries concerned about the relevance for some users of the one-hour criterion in the definition of employment.

19.2.3 Population coverage and age limits

1229. Information on the economic characteristics of the population should in principle cover the entire population, regardless of country origin, citizenship or geographic location of their place of work. In practice, a lower age limit is usually set in accordance with the conditions in the country.¹¹³ For compiling child labour statistics, the relevant international standards

¹¹¹For more details see Resolution concerning statistics of work, employment and labour underutilization, adopted by the Nineteenth International Conference of Labour Statisticians (Geneva, 2013), paragraphs 22(c) and 37–39.

¹¹²Resolution concerning the measurement of working time, adopted by the Eighteenth International Conference of Labour Statisticians (Geneva, 2008).

¹¹³ Resolution concerning statistics of work, employment and labour underutilization, adopted by the Nineteenth International Conference of Labour Statisticians (Geneva, 2013), para. 65.

identify the target population as all persons in the age group from 5 to 17 years.¹¹⁴ Countries in which many children participate in employment or in other forms of work, including in agriculture, will need to select a lower minimum age than countries where work of children is uncommon. Census tabulations of economic characteristics should at least distinguish between persons under 15 years of age and those 15 years of age and over.

1230. In general, an upper age limit for measurement of economic characteristics of the population is not recommended, so as to permit comprehensive coverage of work activities of the adult population and to examine transition between employment and retirement. Many people continue to be engaged in different forms of work beyond retirement age and the numbers involved are likely to increase as a result of factors associated with the ageing of populations. Countries may, however, wish to balance the cost of collecting and processing information relating to the productive activities of older persons (e.g. those aged 75 years or more) and the additional response burden imposed on them against the significance and reliability of the information provided.

19.3 Labour force status (core topic)

1231. Persons may be classified in a short reference period according to their labour force status as being employed, unemployed, or outside the labour force' as defined below in sections [19.3.1–19.3.3](#).

1232. A classification of persons by their labour force status provides important information about their relation to the labour market, in particular to work for pay or profit, in a short reference period. The three categories of labour force status, i.e. employed, unemployed or outside the labour market, are mutually exclusive and exhaustive. While even during a short period persons may be engaged in multiple activities, to establish their labour force status, priority is given to employment over the other forms of work and over unemployment; and to unemployment over outside the labour force, see [Figure 8](#). Thus, for example:

- (a) A volunteer worker who also has a part-time employee job should be classified as employed;
- (b) A person growing crops for own final use and who is also seeking and available for employment should be classified as unemployed; and
- (c) A person who has a part-time job, working only a few hours for pay and who is also seeking another job, should be classified as employed.

1233. The sum of persons in employment plus persons in unemployment comprises the labour force, see [Figure 8](#).¹¹⁵

1234. The labour force status of persons is established with regards to a short reference period of seven days or one week, which may be the last seven days prior to the specified census day, the last completed calendar week, or a specified recent fixed week. For comparability purposes, it is particularly useful to apply a short-reference period with the same total duration (such as a reference week) for the census as for the national labour force

¹¹⁴ [Resolution concerning statistics of child labour](#), adopted by the Eighteenth International Conference of Labour Statisticians (Geneva, 2008), para. 9.

¹¹⁵ Formerly also referred to as "currently active population".

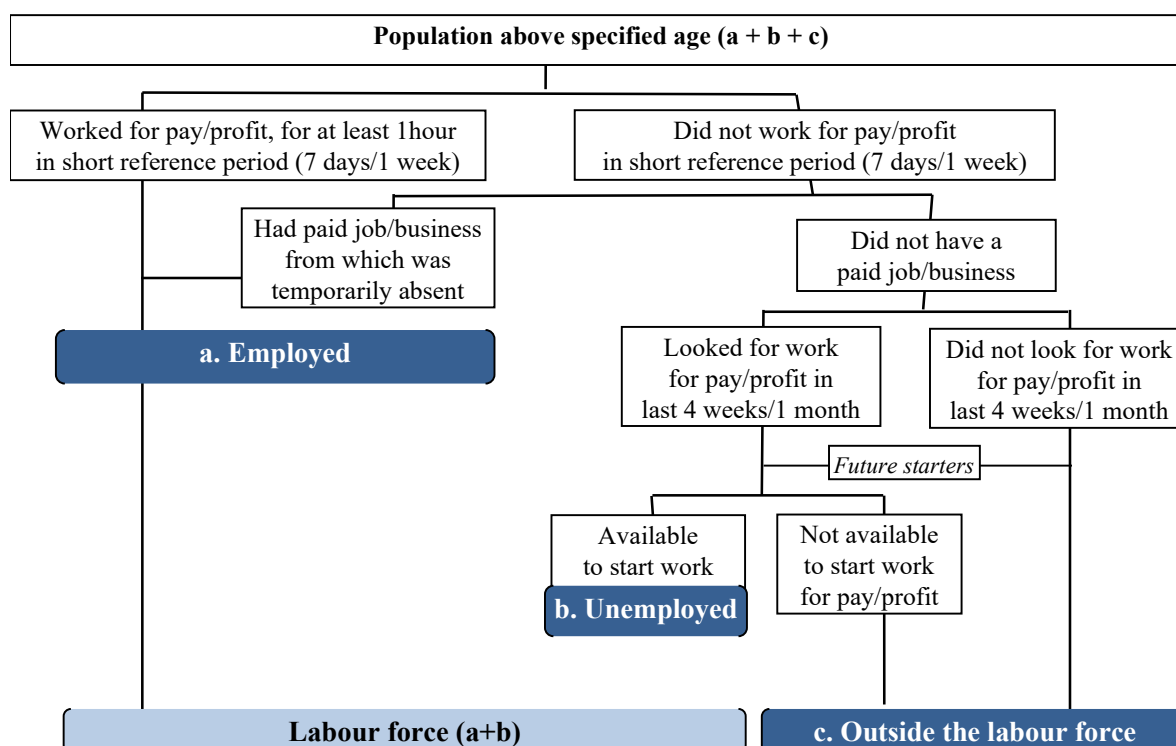
survey, if any. This short reference period serves to provide a snap-shot picture of labour market participation in the country around the time of the census. As such, the labour force, that is, persons in employment plus persons in unemployment, reflects the supply of labour for the production of goods and services in exchange for pay or profit at a specified point in time. Seasonal variations in employment and unemployment levels, which may be significant both in industrialized and in developing economies, will not be captured. Assessments of such temporal variations in work patterns are more adequately captured through sub-annual household surveys (for example monthly, quarterly).

1235. If probing questions in an interview or using detailed questions in a self-administered census questionnaire, the determination of the labour force status of a person may be influenced by respondents' or enumerators' subjective understanding of the concepts of employment and unemployment. In this regard, particular attention should be given to special groups for which the determination of the labour force status may be difficult, e.g. youths, women and elderly persons after the normal age of retirement, and those working as contributing family members. To reduce underreporting, enumerators need to be explicitly instructed, or the questionnaires specifically designed.

1236. Given the importance of reliable data on labour force status, serious consideration should be given to minimizing classification errors.

Figure 8

Classification of working age population by labour force status



19.3.1 Employed persons

1237. **Employed persons** are all those above the specified age who, during a short reference period of seven days or one week, were engaged in any activity to produce goods or provide services for pay or profit. The notion “for pay or profit” refers to work done as part of a transaction in exchange for remuneration payable in the form of wages or salaries for time worked or work done or in the form of profits derived through market transactions from the goods and services produced. It includes remuneration in cash or in kind, whether actually received or not, payable directly to the person performing the work or indirectly to a household or family member.

1238. Two categories of persons in employment are:

- (a) Employed persons “at work,” that is, who worked for pay or profit for at least one hour; and
- (b) Employed persons “not at work” due to working-time arrangements (such as shift work, flexitime and compensatory leave for overtime) or to a “temporary absence” from a job for pay or profit.

1239. Use of the one-hour criterion serves to ensure coverage of all types of job, including part-time, temporary or casual jobs, thereby supporting identification of all persons in employment and analysis of their working conditions. This is also a prerequisite for the consistency of employment statistics with national accounts data on production.

1240. Persons on “temporary absence” from a job, including as employees or self-employed should be considered in employment, provided that they were “not at work” for a short duration and maintained a job attachment during the absence. The existence of a job attachment should be established on the basis of the reason for the absence and, in the case of certain reasons, the continued receipt of remuneration or the total duration of the absence (in general not more than three months¹¹⁶). Reasons for absence include:

- (a) Those where job attachment is generally maintained, and thus, do not require further probing, such as sick leave due to own illness or injury (included occupational); public holidays, vacation or annual leave; and periods of maternity or paternity leave as specified by legislation; and
- (b) Those requiring further assessment of continued receipt of remuneration or total duration including parental leave, educational leave, care for others, other personal absences, strikes or lockouts, reduction in economic activity (for example temporary lay-off, slack work), disorganization or suspension of work (for example due to bad weather, mechanical, electrical or communication breakdown, problems with Information and Communication Technology (ICT), and shortage of raw materials or fuels).

¹¹⁶ According to paragraph 29(c)(i) of the [Resolution to amend the 19th ICLS resolution concerning statistics of work, employment and labour underutilization](#) (ILO, 2023), the threshold may be greater than three months if the return to employment in the same economic unit is guaranteed.

19.3.1.1 Treatment of specific groups

1241. According to international standards, the following groups of persons should be classified as in employment, see 19th ICLS (International Conference of Labour Statisticians):

- (a) Persons with a job for pay or profit who, during the reference period were on training or skills-enhancement activities required by their job or for another job in the same economic unit;
- (b) Apprentices, interns and trainees who receive remuneration in cash or in kind;
- (c) Persons who work for pay or profit through employment promotion programmes;
- (d) Persons who work for their own economic units to produce goods mainly for sale or barter, even if part of the output is consumed by the household or family;
- (e) Persons with seasonal jobs during the off-season, if they continue to perform some tasks and duties for the job, excluding, however, the fulfilment of legal or administrative obligations (for example, pay taxes);
- (f) Persons who either work in a market unit operated by a family member living in the same or in another household (that is, contributing family workers) or perform tasks or duties of an employee job held by a family member living in the same or in another household;
- (g) Regular members of the armed forces and persons on military or alternative civilian service who perform this work for pay in cash or in kind.¹¹⁷

1242. Excluded from employment are:

- (a) Apprentices, interns and trainees who work without pay in cash or in kind (that is, persons engaged in unpaid trainee work);
- (b) Participants in skills training or retraining schemes within employment promotion programmes, when not engaged in the production process of an economic unit;
- (c) Persons who are required to perform work as a condition of continued receipt of a government social benefit such as unemployment insurance;
- (d) Persons with seasonal jobs during the off season, if they cease to perform the tasks and duties of the job;
- (e) Persons who retain a right to return to the same economic unit but who were absent for reasons specified in paragraph [1240\(b\)](#), when the total duration of the absence exceeds the specified threshold or if the test of receipt of remuneration is not fulfilled;
- (f) Persons on indefinite lay-off who do not have an assurance of return to employment with the same economic unit;
- (g) Persons who work to produce goods intended mainly or exclusively for consumption or use by the household or family, even if a surplus or part of the output is sold or bartered (that is, own-use production of goods, see section [19.5](#));

¹¹⁷ See International Standard Classification of Occupations: ISCO-08/ International Labour Office - Geneva: ILO, 2012. p. 357.

- (h) Household members who provide unpaid services for consumption or use by their household (that is, own-use provision of services);
- (i) Persons who work voluntarily and without pay to produce goods or services through or for other economic units, including market, non-market units and households (that is, volunteer work).

1243. Information should be given in the census reports describing how the above-mentioned groups and other relevant groups were treated.

19.3.2 Unemployed persons

1244. **Unemployed persons** are all those above the specified age who (a) were not in employment, (b) carried out activities to seek employment during a specified recent period and (c) were currently available to take up employment given a job opportunity.

1245. To be classified as unemployed, a person must satisfy all of the three criteria, where:

- (a) "Not in employment" (that is, not engaged in work for pay or profit) is assessed with respect to the short reference period for the measurement of employment as defined in paragraph 1237;
- (b) To "seek employment" refers to any activity, when carried out during a specified recent period comprising the last four weeks prior to enumeration or calendar month, for the purpose of finding a job or setting up a business or agricultural undertaking. This includes also part-time, informal, temporary, seasonal or casual employment, paid apprenticeships, internships or traineeships, within the national territory or abroad. Examples of such activities are:
 - i. Arranging for financial resources;
 - ii. Applying for permits or licences;
 - iii. Looking for land, premises, machinery, supplies or farming inputs;
 - iv. Seeking the assistance of friends, relatives or other types of intermediaries;
 - v. Registering with, or contacting, public or private employment services;
 - vi. Applying to employers directly, or checking at worksites, farms, factory gates, markets or other assembly places;
 - vii. Placing or answering, newspaper or online job advertisements; and
 - viii. Placing or updating résumés on professional or social networking sites online;
- (c) "Currently available" serves as a test of readiness to start a job in the present, assessed with respect to the same short reference period that is used to measure employment. Depending on national circumstances, the reference period may be extended to include a short subsequent period not exceeding two weeks in total, so as to ensure adequate coverage of unemployment situations among different population groups.¹¹⁸

1246. Unemployment has been one of the most widely used measures of labour underutilization. However, it only captures persons in situations of complete lack of work for pay or profit, and where opportunities for job search exist. In circumstances where there are

¹¹⁸ In EU countries, the reference period to assess "current availability" comprises the reference week and the subsequent two weeks.

few channels for seeking employment or where labour markets are limited in scope, or when labour absorption is inadequate, unemployment will not capture fully all persons with an unmet need for employment. Separate identification of underutilized persons (included in the potential labour force, see paragraph 1252) supports better assessment of the different types of underutilization affecting labour markets across settings, and more targeted policymaking.

1247. It may be useful to distinguish first-time jobseekers, who have never worked before, from other jobseekers in the classification of the unemployed. To do so, however, may require an additional question regarding previous work experience, which may impose too much of a burden for a population census.

19.3.2.1 Treatment of specific groups

1248. Also classified as unemployed according to international standards are:

- (a) Future starters, defined as persons “not in employment” and “currently available” who did not “seek employment” because they had already made arrangements to start a job within a short subsequent period, set according to the general length of waiting time for starting a new job in the national context but generally not greater than three months);
- (b) Participants in skills training or retraining schemes, within employment promotion programmes, who on that basis were “not in employment”, not “currently available”, and did not “seek employment” because they had a job offer to start within a short subsequent period generally not greater than three months;
- (c) Persons “not in employment” who carried out activities to migrate abroad in order to work for pay or profit but who were still waiting for the opportunity to leave;
- (d) In accordance with the priority rules to establish their labour force status, persons who during the reference period were mainly students, homemakers, pensioners, registered unemployed or engaged in forms of work other than employment (for example, own-use production work, volunteer work) and who at the same time were “not in employment”, carried out activities to “seek employment” and were “currently available”, as defined above, should be classified in unemployment. Information should be given in the census reports on how persons in these and other specific groups were treated.

19.3.3 Persons outside the labour force

1249. Persons outside the labour force comprise all those in the working-age population, who in the short reference period were neither employed nor unemployed as defined above, including persons below the minimum age specified for the collection of economic characteristics.

1250. Different classifications of persons outside the labour force may be used for analytical purposes. Particularly useful for informing labour market and social policies and programmes are classifications by degree of labour market attachment and by main reason for not entering the labour force. These alternative classifications can be derived from the same

questions used to identify the unemployed and may be used separately or in combination to enable further analysis.

1251. Persons outside the labour force may be classified by the degree of labour market attachment into the following groups:

- (a) Unavailable jobseekers, that is, those "seeking employment" but not "currently available";
- (b) Available potential jobseekers, that is, those not "seeking employment" but "currently available";
- (c) Willing non-jobseekers, that is, those neither "seeking employment" nor "currently available" but who want employment;
- (d) Others, that is, persons neither "seeking employment" nor "currently available" who do not want employment.

1252. The classification of persons outside the labour force by degree of labour market attachment allows identification of the potential labour force, computed as the sum of (a) unavailable jobseekers plus (b) available potential job seekers. Together with unemployment, the potential labour force is a key measure of labour underutilization. It is relevant both in more and less developed settings, especially

- (a) Where the conventional means of seeking employment are of limited relevance;
- (b) Where the labour market is largely unorganized or of limited scope;
- (c) When labour absorption is, at the time, inadequate; or
- (d) Where persons are largely self-employed.

1253. Although not a part of the potential labour force, the group (c), willing non-jobseekers represents a group of persons outside the labour force with an expressed interest in employment and is particularly relevant for social and gender analysis in specific contexts.

1254. Persons outside the labour force may also be classified by their main activity or reason for not entering the labour market. Some persons may be classifiable in more than one category. In such situations, priority should be given to the possible categories in the following order:

- (a) Attending an educational institution' refers to persons outside the labour force, who attended any regular educational institution, public or private, for systematic instruction at any level of education, or were on temporary absence from the institution for relevant reasons corresponding to those specified for employed persons "not at work".
- (b) "Performing unpaid household services" refers to persons outside the labour force engaged in the unpaid provision of services for their own household, such as spouses and other relatives responsible for the care and management of the home, children and elderly people. Domestic and personal services provided by domestic employees working for pay in somebody else's home are considered as employed in line with the definition of employed persons.

- (c) "Retiring on pension or capital income" refers to persons outside the labour force who receive income from property or investments, interests, rents, royalties or pensions from former employment.
- (d) "Other reasons" refer to all persons outside the labour force who do not fall into any of the above categories, for example, children not attending school, those receiving public aid or private support and persons with disabilities unable to work.

1255. Additional reasons for not entering the labour force that are considered particularly important at national or regional level, such as "engaged in own-use production of goods" should also be taken into account in the classification of population outside the labour force.

19.4 Characteristics of jobs and/or establishments

1256. Once the labour force status of persons has been established, additional important topics regarding the labour market participation of the population relate to the characteristics of their jobs and of the establishments in which they work. These include, in particular, status in employment, occupation, place of work, industry, institutional sector, working time and income.

1257. A job is defined as the set of tasks and duties performed or meant to be performed by one person for a single economic unit. Person may have one or several jobs during the reference period. The main job is that with the longest hours usually worked even if the employed person was not at work in the reference period.

1258. Job-related characteristics are generally collected in reference to the main job for a person in employment and may also be collected in reference to the last main job (if any) for persons not in employment. This allows for classification of the labour force and of persons outside the labour force by characteristics of their (last) main job. Once the (last) main job is identified, it is essential that all subsequent questions refer to that same job, even if the respondent was not at work in the reference period. The census questionnaire or the census information taken from registers/administrative records should be designed in a way that will ensure that the variables "status in employment", "occupation", "industry" and "institutional sector" are measured for the same job.

1259. The collection of data on characteristics of the last main job of unemployed persons, especially occupation, industry and status in employment, may be useful in order to inform policies aimed at promoting employability and job creation. To serve this purpose, it is recommended to set a time limit for past employment experience (for example, during the last five or ten years) and only collect information on the characteristics of the last main job if it was held within the time limit.

1260. When secondary jobs held in the reference period are also identified, the questionnaire should be designed so as to enable clear and separate identification of characteristics relating to main and secondary jobs. Identification of secondary jobs is particularly important in countries where multiple job holding is commonplace, particularly in agriculture, and when collecting information on income from employment and working time, in order to support analysis of the relationship between employment, income and poverty.

19.4.1 Status in employment (core topic)

1261. Status in employment refers to the type of explicit or implicit contract of employment with other persons or organizations that the employed person has in their job. The basic criteria used to define the groups of the classification are; the type of economic risk, to which the worker may be exposed to the loss of financial or other resources in pursuance of the activity and the unreliability of remuneration; and the type of authority over the organization of the work and over the economic unit for which the work is performed. Care should be taken to ensure that an employed person is classified by status in employment on the basis of the same job used for classifying the person by "occupation", "industry" and "sector".

1262. With the adoption of the 20th ICLS Resolution concerning statistics on work relationship¹¹⁹ a new classification of status in employment ICSE-18 was introduced. ICSE-18 includes ten detailed categories of status in employment that all jobs can be categorized in thus creating the opportunity to provide a more detailed picture of the different work relationships.

1263. One significant change with ICSE-18 is that these ten categories also can be organized in two ways: ICSE-18 according to the type of authority (ICSE-18-A) and ICSE-18 according to the type of economic risk (ICSE-18-R).

1264. When organized by authority, ICSE-18 distinguishes between independent workers and dependent workers, making it useful for various types of labour market analysis such as the impact of economic cycles and government policies. When organized by economic risk, it categorizes workers into those employed for profit and those employed for pay. This hierarchy is typically preferred for national accounts, identifying wage employment, and producing statistics on wages, earnings and labour costs.

1265. Identifying the ten detailed categories in ICSE-18 may require additional questions to correctly identify them. Accordingly, it will be important to balance the benefits of providing detailed statistics with the extra burden and cost of including these questions in a census. A recommended approach to minimize burden and costs while still obtaining key statistics is to limit the identification of ICSE-18 to selected aggregated categories. This includes identifying employers, independent workers without employees, and contributing family workers, as defined by ICSE-18 based on authority.

1266. The most recent international standard is ICSE-18-A (employment categories based on authority), which is as follows:

Independent workers

- (1.0) Employers
 - (1.1) Employers in corporations
 - (1.2) Employers in household market enterprises
- (2.0) Independent workers without employees
 - (2.1) Owner-operators of corporations without employees

¹¹⁹ 20th International Conference of Labour Statisticians, Geneva 10–19 October 2018 [Resolution concerning statistics on work relationship](#).

- (2.2) Own-account workers in households and market enterprises without employees

Dependent workers

- (3.0) Dependent contractors
- (4.0) Employees
 - (4.1) Permanent employees
 - (4.2) Fixed-term employees
 - (4.3) Short-term and casual employees
 - (4.4) Paid apprentices, trainees and interns
- (5.0) Contributing family workers

1267. **Employers** are persons who operate their own business on their own or in partnership with others and who employ one or more persons as employees on a regular basis. In case there is a need to test the regularity of the employee, this should be understood as having at least one employee during the reference period and at least two of the three weeks immediately preceding the reference period, even if one or more employees were engaged only for a short period. ICSE-18 distinguishes between two types of employers: employers in corporations and employers in household market enterprises.

1268. An **independent worker without employees** is a person who operates a business alone or with partners but does not hire anyone regularly, except themselves, their partners and contributing family workers. This category corresponds to "own-account worker" in ICSE-93.

1269. Employers and independent workers without employees can, if feasible and relevant, be further categorized based on whether they operate a corporation or a household market, leading to the identification of the detailed categories: employers in corporations, employers in household market enterprises, owner-operators of corporations without employees and own-account workers in household market enterprises without employees. This would require determining if the enterprise is incorporated.

1270. **Dependent contractors** are persons whose activities depend on another entity that exercise operational and/or economic control over the activities. They are not employees of that entity as they have a commercial agreement but are dependent on that unit for organization and execution of the work, income, or for access to the market. By definition, dependent contractors lack regular employees and do not own or operate an incorporated enterprise. Dependent contractors are a new category in ICSE-18, sharing characteristics of both independent workers and employees.

1271. The separate identification of dependent contractors typically requires additional questions to establish whether there is a dependent relationship and if control is exercised. In a Census, this might not be relevant unless there is a strong national need.

1272. If deemed relevant to distinguish dependent contractors from independent workers or employees, a minimized approach in a Census, or in a more suitable source as the Labour Force Survey, could be used to get a broad estimation of the share of dependent contractors in the country. The measurement should be restricted to non-employees with commercial

agreements that do not have regular employees and do not own an incorporated enterprise, focusing on identifying whether these persons have a main client or an intermediary client that sets the price for the goods and services produced.¹²⁰

1273. An **employee** is a person who is in employment for pay, on a formal or informal basis, and who do not hold controlling ownership of the unit (enterprise, a non-profit institution, government unit or household) in which they are employed.

1274. ICSE-18 provides for detailed categories of employees: Permanent employees, fixed-term employees, Short-term and casual employees and Paid apprentices, trainees and interns. If feasible and relevant these four detailed groups can be identified by establishing whether the employee has a permanent agreement until retirement (or until further notice) or a fixed-term agreement, and whether the fixed term-agreement is less than three months or three months or more. Paid apprentices, trainees and interns are employees who work to acquire workplace experience or skills in a trade or profession and receive payment in return for work performed. They can potentially be identified separately through a pre-coded category.

1275. **Contributing family workers** are persons who assist a family member or a household member in a market-oriented enterprise operated by the family or household member. They do not receive regular payments, such as a wage or salary, in return for the work performed, but may receive some irregular payment. They do not make the most important decisions affecting the enterprise or have responsibility for it.

1276. Member of a producers' cooperative do no longer constitute a status in employment category. In general, members of a producers' cooperative are to be considered independent workers in ICSE-18 but may under some circumstances be regarded as dependent contractors if they depend significantly on the cooperative in terms of access to market, organization of pricing of the work and fulfil the criteria to be classified as dependent contractors.

1277. Seasonal workers, domestic workers, home-based workers and workers in multi-party work relationships (including agency workers, and employees providing outsourced services) are according to the Resolution concerning statistics on work relationships so called cross-cutting categories as these would be groups that consists of several different status in employment categories.¹²¹

1278. When members of the armed forces paid in cash or in kind are counted among the employed, they should be included in the category of employees. However, because of the wide range of national practices in the treatment of the armed forces, it is recommended that census tabulations and related notes provide an explicit indication of the status in employment category in which they are included.

1279. The treatment of additional groups such as work gang (crew) members, franchises, sharecroppers, communal resource exploiters, workers in cooperatives, outworkers and crowd workers can be found in the conceptual framework for Statistics on Work relationships as these groups are no longer addressed explicitly in the Resolution.

1280. In most census questionnaires, the information concerning status in employment will be captured through pre-coded alternatives where only a few words can be used to convey

¹²⁰ For the recommended approach for identifying dependent contractors see [ICSE-18 manual](#).

¹²¹ The definition and treatment of these groups is provided in paragraphs 73–124 of the [Resolution concerning statistics on work relationships](#), adopted by the 20th International Conference of Labour Statisticians.

the intended meaning of each category. This may mean that classification of some of the situations on the borderline between two or more categories will be carried out according to the subjective understanding of the respondent rather than according to the intended distinction. This should be kept in mind in designing the questionnaire and also when presenting the resulting statistics.

1281. Countries that rely on the direct use of administrative records for the classification of persons according to status in employment, may find that e.g. the group contributing family workers and dependent contractors cannot be separately identified. Those who would have been classified to this group when using a questionnaire may either be classified as part of one of the other groups or in the case of contributing family members, excluded from persons in employment. One possibility for countries relying on administrative records to better integrate ICSE-18 is to use ICSE-18-R, with the employment categories based on risk. If using ICSE-18-R, it is recommended that data for at least two main categories (1) "Workers in employment for profit" and (2) "Workers in employment for pay", should be separately tabulated, and data on employees should be identified.

1282. Activities in areas such as agriculture, fishing, hunting and gathering intended mainly for own consumption by the household are not considered employment and therefore not to be included in ICSE-18. Instead, participation in these productive activities is to be measured through the separate concept of own-use production of goods (see section 19.5) and categorized according to the International Classification of Status at Work (ICSaW-18).¹²² Countries relying on administrative data sources in their census will typically lack information on participation in own-use production of goods and are recommended to survey this specifically, e.g. in the Labour Force Survey (see paragraph 1307).

19.4.2 Occupation (core topic)

1283. **Occupation** refers to the type of work done in the main job by the person employed (or the type of work done in the last job held if the person is unemployed), irrespective of the industry or the status in employment in which the person's job is classified. The type of work is considered in terms of the main tasks and duties performed in the job.

1284. For purposes of international comparison, it is recommended that countries make it possible to prepare tabulations in accordance with the latest revision of the International Standard Classification of Occupations (ISCO). An updated Standard is expected in 2028. At the time the present set of census recommendations was approved the latest revision was the one adopted by a Tripartite Meeting of Experts in Labour Statistics in 2007 and endorsed by the Governing Body of the International Labour Organization (ILO) in 2008 and known as ISCO-08.¹²³

1285. Countries coding occupation according to a national standard classification should establish correspondence with ISCO either through double coding or through mapping from the detailed groups of the national classification to ISCO.

¹²² Paragraph 59 of the [Resolution concerning statistics on work relationships](#), adopted by the 20th International Conference of Labour Statisticians.

¹²³ International Standard Classification of Occupations (ISCO-08) Volume 1, Structure, Group Definitions and Correspondence Tables (Geneva, International Labour Office, 2012). [The ISCO companion guide](#) is also available to assist countries using ISCO-08. A new standard is expected in 2028 and should be used.

1286. Countries should code the collected occupational data at the lowest possible level of ISCO or a related national classification supported by the information given in each response. In order to facilitate detailed and accurate coding, it could be useful for the census questionnaire to ask each employed person for both the occupational title and a brief description of the main tasks and duties performed in the job. Information provided in response to the industry questions (see section [19.4.3](#)) may also be used to assist in the coding of occupation data.

19.4.3 Industry (core topic)

1287. **Industry** (branch of economic activity) refers to the kind of production or activity of the establishment or similar unit in which the main job(s) of the employed person was located during the time reference period established for data collection on economic characteristics.¹²⁴

1288. For purposes of international comparisons, it is recommended that countries compile information on industry according to the latest revision of the International Standard Industrial Classification of All Economic Activities (ISIC).¹²⁵ Countries belonging to the European Economic Area should refer to the latest version of the Statistical Classification of Economic Activities in the European Community (NACE). Countries coding industry according to a national standard classification should establish correspondence with ISIC either through double coding or through mapping from the detailed groups of the national classification to ISIC.

1289. It is recommended that the name and address of the establishment should also be collected, see also paragraph [1293](#). Countries with business registers that are complete and up to date can then use this response as a link to the register in order to obtain the industry code given there to the establishment.

1290. In preparation for the coding of the industry responses that cannot be matched to a pre-coded register, the organization responsible for the census should create a coding index that reflects the type of responses that will be given on the census questionnaire.

19.4.4 Type of workplace (non-core topic)

1291. Two main topics related to the place of work of persons in employment are the type of workplace and its geographic location. The **type of workplace** refers to the nature of the place where the person performed their main job and distinguishes between the home and other workplaces, whether fixed or otherwise.

1292. Three main categories, or a variation based on national circumstances, are recommended for classifying the type of workplace:

¹²⁴For those persons who are recruited and employed by one enterprise but who actually work at the place of work of another enterprise (called "agency workers" or "seconded workers" in some countries), there would be user interest in gathering information about the industry of the employer as well as the industry of the place of work. However, the collection of both would be more appropriate in a labour force survey rather than in a population census. The industry of the actual place of work may provide more reliable reporting of the "industry" variable in a population census. Any such choice should, however, be consistent with the treatment of this group in the system of National Accounts.

¹²⁵United Nations, forthcoming. [International Standard Industrial Classification of All Economic Activities, Revision 5 \(ISIC Rev. 5\)](#).

- (a) Work at home; This category includes those who perform the tasks and duties of their main job from within the home, such as farmers who work and live on their farms, homeworkers including persons teleworking from own home, self-employed persons operating (work)shops or offices inside their own homes, and persons working and living at work camps;
- (b) No fixed place of work; This category should be restricted to persons who, in performing the tasks and duties of their main job, travel in different areas and who do not report daily in person to a fixed address as a work base, for example, travelling salespersons, long-distance commercial vehicle drivers, seafarers, fishers and own-account taxi drivers. It also includes ambulant vendors, operators of street or market stalls that are removed at the end of the workday, construction workers working at different sites during the reference period and push-cart operators;
- (c) With a fixed place of work outside the home; All other persons in employment should be included in this category, including persons who move around in their job but have a fixed-base location to which they report daily, such as bus and taxi drivers (with a base), train and airline staff, and operators of street and market stalls that are not removed at the end of each workday. This group may also include individuals who travel to work, on a regular basis, across the national border to a neighbouring country. Fixed place of work outside the home includes: client's or employer's home; employer's workplace or site; own business premises; or client's workplace or site.

1293. The geographic location of the place of work can provide useful information for planning when used together with information on place of residence. To this end, countries may collect, for employed persons with a fixed place of work outside the home, information on the local of place of work (see section [13.10](#)) or the reporting place during the reference period.

1294. It is likely that for some jobs, performance is at more than one location (for example, at home some of the time or season and in a fixed location outside the home at other times) or the category cannot be clearly distinguished. This may be the case for persons teleworking from own home, a group which is growing in many countries, and, thus, of special interest to stakeholders. One approach would be to select the place where the individual spends or spent a major part of his or her working time. However, if deemed relevant for countries, separate identification of such groups may be preferred. For countries using registers as the main source in the Census, the type of workplace will not be possible to identify. Questions on workplace would often be more suitable in surveys as the Labour Force Survey (LFS).

1295. Additional questions may also be asked on the method of travel to work in order to produce statistics on travel-to-work patterns, valuable as basis for transportation planning. Persons not travelling to work should be classified as "no travel to work".

19.4.5 Institutional sector of employment (non-core topic)

1296. The **institutional sector of employment** relates to the legal organization and the principal functions, behaviour and objectives of the enterprise with which a job is associated.

1297. Following the definitions provided in the most recent version of the System of National Accounts,¹²⁶ distinction should be made between the following institutional sectors:

- (a) Corporations, comprising non-financial and financial corporations (incorporated enterprises, private and public companies, joint-stock companies, limited liability companies, etc.) as well as quasi-corporations and non-profit institutions (hospitals, schools etc. that charge fees to cover their current production costs);
- (b) General government, comprising central, state and local government units together with social security funds imposed or controlled by those units, and non-profit institutions engaged in non-market production controlled and financed by government, or by social security funds;
- (c) Non-profit institutions serving households (for example religious institutions, professional societies, sports and cultural clubs, charitable institutions, aid agencies) that provide goods or services to households (free or at prices that are not economically significant) and whose main resources are for voluntary contributions;
- (d) Households, defined for the purposes of economic characteristics as a natural person or group of natural persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food. Institutional households (section 16.2.1) also belong to the household sector. Households may engage in production activities and the household sector include unincorporated market enterprises for the purpose of producing goods or services for sale or barter on the market.

19.4.6 Working time (non-core topic)

1298. Information on two distinct concepts of working time can be collected in a population census: hours actually worked, and hours usually worked.

1299. **Hours actually worked** is defined as the time spent in a job for the performance of activities that contribute to the production of goods and services during a specified reference period. It covers the time spent in "direct hours", in "related hours", "down time" and short "resting time". "Direct hours" is the time spent carrying out the tasks and duties of the job – and may be performed in any location. "Related hours", while not leading directly to goods produced or services provided, is the time spent maintaining, facilitating or enhancing productive activities, including upkeep of the workplace, changing time or decontamination of work clothes, purchasing or transporting materials, waiting for business, customers or patients, on-call duties, travelling between work locations, and work training or skills enhancement required by the economic unit. In practice, "down time" includes unavoidable, temporary interruptions to work (for example machinery or Internet breakdown, lack of supplies). "Resting time" is inactive time for short rest or refreshment in the course of performing job-related activities, (for example coffee breaks). Longer breaks for meals, time spent not working because of vacation, holidays, sickness, industrial disputes, commuting to

¹²⁶United Nations, forthcoming. [System of National Accounts 2025](#).

work (if not also performing job tasks or duties) and educational leave even if paid, are excluded from hours actually worked.

1300. **Hours usually worked** is defined as the typical value of the hours actually worked in a job per short reference period (for example one week) over a long observation period (month, quarter, season, year) that comprises the short reference period itself. This “typical value” of time worked during a normal or typical week may be the modal number of the hours actually worked in the short period as distributed over the long period. This would include overtime hours regularly worked whether paid or unpaid. Days and hours not usually worked and unusual periods of overtime are not included.

1301. The inclusion of hours usually worked can be useful for countries concerned about the relevance for some users of the one-hour criterion in the definition of employment. For countries relying on registers, it is also useful to have an alternative source for hours worked for persons in own-use production, see paragraph [1228](#).

19.4.7 Income (non-core topic)

1302. Countries may wish to collect information on the amounts of income received by individual persons or households during a specified reference period, from any source. If this topic is included in the census, it is recommended that data be obtained from all persons above a specified age, whether they are employed or not. Income should be measured at the household level, or for each individual in the household.

1303. **Income** may be defined as all receipts whether monetary or in kind (goods and services) that are received by the household or by individual members of the household at annual or more frequent intervals but excluding windfall gains and other such irregular and typically one-time receipts. Household income covers:

- (a) Income from employment (both paid and self-employment);
- (b) Income from the production of goods for own final use;
- (c) Income from the provision of household services for own final use;
- (d) Property income;
- (e) Current transfers received.¹²⁷

1304. The collection of reliable data on household income, especially income from self-employment and property income, is extremely difficult in general field inquiries, particularly population censuses. The inclusion of non-cash income further compounds the difficulties. Collection of household income in a census, even when confined to cash income, presents special problems in terms of burden of work, response errors and so forth. Therefore, this topic is considered more suitable in a sample survey of households or from administrative data such as tax or social security records. Depending on the national requirements, countries may nonetheless wish to obtain limited information on personal or household income, by covering only some of the income components (such as, income from employment), for shorter reference period (such as one month), and restricted only to cash income. As thus

¹²⁷See [Resolution concerning household income and expenditure statistics](#), adopted by the Seventeenth International Conference of Labour Statisticians (Geneva, 2003), paragraphs 4–5.

defined, the information collected can provide some input into statistics that have many important uses.

1305. According to international standards on the subject, the income from employment of employed persons should include wages and salaries of employees, income of members from producers' cooperatives and the mixed income of employers and own-account workers operating business and unincorporated enterprises. In addition to the income from employment of employed household members, the total income of the household should include, for example, the interest, dividends, rent, social security benefits, pensions and life insurance annuity benefits of all its members. The Handbook on Household Income Statistics provides further guidance on concepts and methods related to this topic.¹²⁸

1306. The concepts involved in determining income are not simple to grasp and respondents may be unable or unwilling to provide exact information. For example, income should include social security, pension fund contributions and direct taxes withheld from employees' salaries, but some persons will undoubtedly not include these amounts in reporting their salaries. Significant items of total household income may also be excluded or misstated. Despite instructions given to enumerators, the data collected can therefore be expected to be approximate. Accordingly, in the presentation of results it is usually appropriate to use broad income or earnings size-classes. As an aid to the interpretation of the results, tabulations of the data should be accompanied by a description of the items of income assumed to be included and, if possible, an estimate of the accuracy of the figures.

19.5 Participation in own-use production of goods (core topic)

1307. In some countries the production of goods for own final use (such as foodstuffs from agriculture, fishing, hunting and gathering, water, firewood and other household goods) represents an important component of the livelihood of a part of the population. If relevant in the country, collecting information in the population census on the number of persons engaged in this form of work (own-use production of goods was previously included within the concept of employment) should be considered regardless of whether this is the main or a secondary activity of a person. Such information is essential for benchmarking purposes, especially where household surveys are not frequent, for comprehensive sectoral analysis particularly of work in agriculture, forestry and fishing, and to enable integration between the population census and the agricultural census. Countries relying on administrative data sources in their census will lack information on participation in own-use production of goods and are recommended to survey this specifically, e.g. in the Labour Force Survey.

1308. Persons in **own-use production of goods** are all those above the specified age who, during a specified reference period, performed any activity to produce goods for own final use. The notion "for own final use" is interpreted as production where the intended destination of the output is mainly for final use by the producer in the form of capital formation, or final consumption by household members, or by family members living in other households.

¹²⁸See [Canberra Group Handbook on Household Income Statistics, second edition, 2011](#).

1309. According to the international standards, any activity to produce goods (within the SNA production boundary) covers work performed for at least one hour in the following activities, when the intended destination of the output is mainly for own final use, as specified above:

- (a) Producing and/or processing for storage agricultural, fishing, hunting and gathering products;
- (b) Collecting and/or processing for storage mining and forestry products, including firewood and other fuels;
- (c) Fetching water from natural and other sources;
- (d) Manufacturing household goods (such as furniture, textiles, clothing, footwear, pottery or other durables, including boats and canoes);
- (e) Building, or effecting major repairs to, one's own dwelling, farm buildings, etc.

1310. For measurement purposes, the intended destination of the output is established in reference to the specific goods produced, based on self-declaration (that is, mainly for own final use). In the case of goods from agriculture, fishing, hunting or gathering intended mainly for own consumption, a part or surplus may nevertheless be sold or bartered.

1311. Persons may engage in own-use production of goods as a main secondary activity, throughout the year on a seasonal basis. To ensure complete coverage, the census questions on participation in own-use production of goods should be applied to all persons above a specified age for collecting information on the economic characteristics of the population, irrespective of their labour force status. The reference period may refer to the last 12 months, calendar year, agricultural year or season, as relevant to national circumstances. Where pertinent, the choice of reference period should promote coherence with the agricultural census.

1312. For assessments of the volume of work performed by persons in own-use production of goods, particularly when using a long reference period, it may be useful to collect information on working time, in particular hours usually worked (see paragraph 1228), or on broad categories such as part-time or full-time, part-time year or full-time year, numbers of months, as feasible and relevant to the main uses of the statistics.

19.6 Informal employment (non-core topic)

1313. **Informal employment** is defined as any activity of persons to produce goods or provide services for pay or profit that is – in law or in practice – not covered by formal arrangements such as commercial laws, procedures to report economic activities, income taxation, labour legislation and social security laws and regulations. Informal employment includes the activities carried out in relation to an informal job, creating a link between the definition of an informal job and the definition of informal employment. Persons holding informal jobs includes independent workers (employers and own account workers) that owns and operates an informal enterprise, and dependent workers whose job do not have a formal status in relation to the legal administrative framework or whose activities are not effectively covered by formal arrangements. The operational definition of informal and formal jobs thus depends on the persons status in employment category, holding the specific job.

1314. Informal employment is a non-core topic defined in the Resolution concerning statistics on the informal economy, adopted at the 21st International Conference of Labour Statisticians in October 2023. The Resolution replaces the two preceding standards, which separately defined the informal sector and informal employment.¹²⁹ It encompasses a comprehensive statistical framework for the informal economy, incorporating conceptual and operational definitions for its various statistical components, including the informal sector and informal employment. Administrative data sources will typically exclude productive activities that are not covered by formal arrangements (see paragraph 1214). The measurement of participation in informal employment will often be more appropriate to collect through household surveys.

1315. As several criteria are applied for defining informal and formal jobs it would be a need to limit the criteria used to reduce the response burden, if measured in a census.

¹²⁹Respectively: [the Resolution concerning statistics of employment in the informal sector](#), fifteenth International Conference of Labour Statisticians, 1993. and [the Guidelines concerning a statistical definition of informal employment](#). Seventeenth International Conference of Labour Statisticians, 2013.

Chapter 20 Agriculture

20.1 Introduction

1316. A majority of CES countries conduct an agricultural census separate from their population and housing census.

1317. The present chapter is dedicated to the collection in the population census of information on agricultural activity. This type of information can be collected by countries for use in a subsequent agricultural census, for instance to facilitate the preparation of the frame of agricultural holdings in the household sector. Although the topic of the chapter could be considered as part of the economic topics considered in the census discussed in Chapter 11, it is presented in a separate chapter due to the special character of this topic, which is also related to the agricultural census.

1318. The chapter begins with a discussion of the relation between population and housing censuses and agricultural censuses. Then, two non-core alternative topics on agriculture are presented. With the first topic, at the household level, information is collected on whether any member of the household is engaged in own-account agricultural production activities during the year preceding the census, at their place of usual residence or elsewhere. This information can be restricted to limited items or may include a more comprehensive agricultural module. With the second topic, also at the household level, information is collected on the size of the farm (land area or number of plots) used for agriculture and the number of livestock reared (for the main livestock species) on the census day.

20.2 The relationship between population and housing censuses and agricultural censuses

1319. As noted in section 3.5, the relationship between the population and housing census and the agricultural census is often limited to the coordination of data collection in households involved in agricultural production. An increasing number of countries are looking at ways to strengthen this relationship with the objective of better integrating their data collection activities. There are, however, a number of issues to consider when relating the two censuses, most significantly that they use different units of enumeration. The unit of enumeration in the agricultural census is the agricultural holding, which is the economic unit of agricultural production, while the units of enumeration in the population census are the household and the individual within the household. However, in many developing countries, most agricultural production activities are in the household sector, and households and agricultural holdings are very closely related, often in a one-to-one relationship. Establishing links between the two censuses is particularly relevant for such countries.

1320. Another conceptual issue is the reference periods used by the two censuses. The population census normally collects information about a person's main job or work activity during a short reference period (usually one week prior to the census), while the census of

agriculture collects information on work on agriculture during the year preceding the census because of the seasonality of many agricultural activities. In consequence, users may find some agricultural activity data from the agricultural census more comprehensive than from the population census because the latter may not identify persons connected with agricultural activity on a seasonal basis or as a secondary activity. On the other hand, the population census provides data on all persons working in agriculture, including as paid employees. The latter information (paid employees) is outside the scope of the agricultural census as its focus is on households with own-account agricultural production. To get a complete picture, agricultural data users will need both agricultural census data and population census data.

1321. In planning the population and housing census, every opportunity for developing the relationship between it and the agricultural census should be explored. This can take several forms. Definitions used in the population and housing censuses should be compatible with those used in the agricultural census so that meaningful comparisons can be made between the two data sets. The population and housing census can also be of use in the preparation of the agricultural census, such as in the demarcation of enumeration areas or the preparation of the frame for the agricultural census.

1322. In planning the national census programme, serious consideration should be given to the possibility of collecting key agricultural information as part of the population and housing census exercise that would facilitate the preparation of an adequate frame of agricultural holdings in the household sector for a subsequent agricultural census. This integration could be achieved through pre-census cartographic work and/or listing exercise, or by adding two additional questions to the census questionnaire. In the latter case, an additional item at the household level could be included on whether any member of the household is engaged in own-account agricultural production activities. Additional data also at the household level could be collected on the size of the farm (land area or number of plots) used for agriculture and the number of livestock reared (for the main livestock species) on the census day. These items are included in the present recommendations as non-core topics. Where countries choose to adopt this approach of using the population and housing census to establish a frame for the agricultural census, the agricultural census should be conducted as soon as possible after the population and housing census, while the frame is still up-to-date.

1323. This approach is detailed in the World Programme for the Census of Agriculture 2030¹³⁰ and Guidelines for Linking Population and Housing Censuses with Agricultural Censuses.¹³¹

1324. Linking population and agricultural census data in countries where most agricultural production activities are in the household sector can bring many benefits. This could add considerable analytical value to data sets from both censuses and save on data collection costs. Many of the demographic and activity status data collected in the population census are also collected in the agricultural census. If data from the two censuses could be linked, it would no longer be necessary to collect these data again in the agricultural census, while still allowing for comprehensive cross-tabulations

¹³⁰ Food and Agriculture Organization of the United Nations, World Programme for the Census of Agriculture 2030, Statistical Development Series No. 20 (Rome, 2026).

¹³¹ Guidelines for Linking Population and Housing Censuses with Agricultural Censuses with Selected Country Practices, Food and Agriculture Organization of the United Nations and the United Nations Population Fund, Rome, 2012.

1325. A few countries conduct the data collection for the population and agricultural censuses as a joint field operation. This is feasible only in countries with extensive methodological and field experience. Normally, each census retains its separate identity and uses its own questionnaire, but field operations are synchronized so that the two data collections can be done at the same time by the same enumerators. Occasionally, the two censuses are merged into one, particularly in countries where fieldwork costs are high and logistical challenges make costly conducting the two censuses separately. This may have a number of advantages; however, as this is an increasingly complex operation, its impact on field operations and data quality needs to be carefully considered. Errors or shortcomings in the design and execution would impact equally on both censuses

20.3 Own-account agriculture production (non-core topic)

1326. As mentioned in paragraph [1322](#), some countries may want to include a first non-core topic at the household level in the population census to identify households engaged in own-account agricultural production. This refers to households raising livestock or using land (wholly or partly) for agricultural purposes. Households with members engaged in agricultural activities only as paid employees would not qualify. This information is useful to enable further agriculture-related analysis of the population census and for use as a frame for a subsequent agricultural census or other surveys. In this case, information should be collected for all households on whether any member of the household is engaged in any form of own-account agricultural production activities.

1327. Where possible, information should be collected to identify whether the household is engaged in any form of own-account agricultural production, covering the main agricultural activities important to the country (which can include crops, livestock and related activities). As noted earlier, a year-long reference period is necessary to capture seasonal variations, which would not be possible with the shorter reference period used in other topics pertaining to economic characteristics. Information may also be collected on aquaculture, forestry and fishery activities where these are important for a country. For countries wishing to collect a more comprehensive agricultural module, the essential data items recommended by the FAO World Programme for the Census of Agriculture 2030 and the FAO/UNFPA Guidelines for Linking Population and Housing Censuses with Agricultural Censuses can be collected.

1328. Agricultural production activities refer to Groups 011, 012, 013, 014 and 015 of the International Standard Industrial Classification (ISIC) (Rev. 5.0) namely:

Group 011: Growing of non - perennial crops

Group 012: Growing of perennial crops

Group 013: Plant propagation

Group 014: Animal production

Group 015: Mixed farming

1329. Where aquacultural production is important at the household level, information can also be collected on whether any member of the household is engaged in any form of own-

account aquacultural production activities. Aquacultural production activities refer to Group 032 of ISIC (Rev 5.0).

20.4 Measure of farmland area and number of livestock (non-core topic)

1330. As mentioned in paragraph [1322](#), some countries may want to complement the above topic by including a second non-core topic to collect information at the household level on the size of the farm (land area or number of plots) used for agriculture and the number of livestock reared (for the main livestock species) on the census day. This helps assess the extent of a household's agricultural activities and to define a suitable threshold for the census of agriculture (e.g. a minimum size limit for inclusion). For countries seeking a more comprehensive picture of agricultural activities within population and housing censuses, gathering data on employment in agriculture and own-use production of goods is recommended.

1331. "Agricultural activities" encompass all the major agricultural production activities relevant to the country (including crops, livestock, and related activities listed at paragraph 1329). Information on aquaculture, forestry, and fishing can also be collected if significant for the country.

1332. Countries aiming for more extensive agricultural data can include an agricultural module with selected data items suggested by the FAO World Programme for the Census of Agriculture 2030 and the FAO/UNFPA Guidelines for Linking Population and Housing Censuses with Agricultural Censuses.

Chapter 21 Ethnocultural characteristics

21.1 Introduction

1333. Information on the ethnocultural characteristics of the population is relevant for developing migration, integration, equality and minority policies. Countries may wish to collect information on the distribution of ethnic identities among the population, first or main languages, the knowledge and practice of languages, and religious affiliation. The combined collection and analysis of data on several ethnocultural characteristics may be particularly informative for the understanding of a country's cultural diversity.

1334. All of the topics covered in this chapter are non-core topics. There are several reasons for this, which also constitute important considerations for any country collecting such information in a census:

- (a) Some ethnocultural characteristics are politically sensitive. In some countries, collection of information on these topics in official statistics is prohibited by law.
- (b) Ethnocultural characteristics may be subjective, or have a subjective dimension. Countries will adopt different concepts and definitions according to the prevailing understanding in each country, as well as to fulfil national policy needs.
- (c) Countries using registers or other administrative sources for all or part of their census may be unable to use the census as a means of providing information on these characteristics, or may face constraints in the concepts and definitions used. For example, they may be limited to compiling information on formal membership of a church or religious community, or on the official language of communication used between the government and a household.
- (d) Some ethnocultural characteristics identify very small populations, and members of minority groups may be vulnerable to discrimination. Special care may therefore be required in designing census procedures and outputs relating to ethnocultural characteristics, in order to reassure the public that appropriate data protection and disclosure control measures are in place.

1335. The right of respondents to declare their identity freely and openly is essential. The Human Rights-Based Approach to Data (HRBAD)¹³² stresses that this right to self-identification is a crucial element in data gathering and that it should be given high priority to the greatest extent possible, when dealing with subjective, dynamic or sensitive topics (such as ethnicity, indigenous status, religion, language, gender. As essential aspect of this principle is that individuals must have the option to disclose, or to withhold, sensitive information about their personal characteristics, and data collection activities should be conducted in accordance with the human rights principle of 'doing no harm'. As such, countries may wish, if national legislation permits, to make questions on these topics

¹³² United Nations Human Rights (2018). [A Human Rights-Based Approach to Data: leaving no one behind in the 2030 Agenda for Sustainable Development](#).

voluntary. Alternatively (and ideally, in order to make it possible to distinguish simple non-response from deliberate non-provision of information) questions can be mandatory: but in this case it is imperative that they include a “prefer not to answer” option so that individuals may withhold the personal information. Answers to such questions should never be imputed where they are left unanswered or the “prefer not to answer” option is indicated.

1336. Countries may opt to implement special monitoring mechanisms related to the collection of data on ethnocultural characteristics, to guarantee free declaration, faithful enumeration (in cases where enumerators are used) and data protection.

1337. In drafting and testing census questions, defining concepts, developing classifications and designing statistical outputs, consultations should be undertaken with representatives of ethnic, language and religious communities. Engaging with such groups to foster understanding of the procedures, reasons for, and conduct of the census and the collection of information on these topics as part of it, can promote transparency, inclusion, equality of treatment and willing participation in the census. Thus, careful attention to this aspect can have positive spillover effects for the census exercise as a whole.

21.2 Ethnicity (non-core topic)

1338. Countries with long-established multi-ethnic communities, recently arrived immigrant populations and/or indigenous populations may wish to collect information on the ethnic composition of the population or of certain sub-groups of the population. This information is relevant for the understanding of the cultural diversity of the population, the position of ethnic groups, including indigenous groups, in society, and the definition and monitoring of equality and anti-discrimination policies. Ethnicity may provide a more accurate picture of the nature of immigrant or immigrant-descendant populations than can be obtained from information on country of birth or country of parents’ birth alone, which conceals ethnic diversity among immigrants from a given country; fails to reflect the ethnic diversity among the descendants of immigrants beyond the second generation; and masks non-immigrant indigenous ethnic diversity.

1339. Ethnicity is a concept based on a perceived affiliation with a group arising from shared historical and territorial origins (e.g. regional, national, tribal), as well as on cultural characteristics, such as language, religion and/or customs and ways of life.

1340. There is no internationally agreed definition or classification of ethnicity for statistical purposes. Countries may have their own definitions and classifications of ethnicity for statistical purposes, or these may be derived from national administrative or legal imperatives. The concepts employed and the intended uses of the information vary widely among countries. Countries should document the basic criteria and classification procedures for ethnicity and should inform data users about the concepts on which they are based.

1341. The concept of ethnicity should not be confounded with country of citizenship or country of birth. In languages (including English) where the term for “nationality” is commonly understood to be largely or wholly synonymous with citizenship, this term should not be used interchangeably with ethnicity, to avoid causing confusion among either respondents or data users.

1342. Many factors can affect the reporting of ethnicity in a census, including: respondents' understanding or views about ethnicity; awareness of their family background; the number of generations that have lived in a country or the length of time since immigration; political sensitivities or social factors associating positive or negative connotations with certain ethnic identities. Since ethnic identity is not a fixed characteristic but a dynamic one influenced by many social forces, and since the range of ethnicities identified by individuals and by society is equally dynamic, classifications of ethnicity may need to change between censuses in order to reflect society at a point in time.

1343. Since ethnicity is subjective and based on self-identification, these factors do not necessarily render the collected data "low quality" or incomparable; but they do mean that trends over time in the ethnic composition of a population will be a result of interactions among these many factors. For example, growth over time in a given ethnic group may be a result not only of new arrivals who identify with that ethnicity, but also of a tendency for people to identify with that ethnicity who previously identified differently.

1344. Ethnic identity can be measured using a variety of concepts, including ethnic ancestry or origin, ethnic group, cultural origin, nationality, minority status, tribe, language, religion or various combinations of these concepts. For census purposes, affiliation with certain ethnic group should ideally be distinguished from affiliation with a language and/or religious group, although there may be considerable overlap in some cases.

1345. In some countries, ethnicity is understood (whether culturally or within official administrative systems) to be related to physical or racial characteristics of the population. Data on physical or racial characteristics may be used to identify visible minorities or racialized groups.

1346. Countries may endeavour to collect information on the ethnicity of respondents' parents and grandparents, to gain a deeper understanding of the origins of the population and of integration processes. However, the collection of information on persons other than the data subject and other household members via a census is not recommended.

21.2.1 Collecting and reporting data on ethnicity

1347. The method and the wording of the question(s) used to collect ethnicity data can influence how respondents report their ethnic identity. In addition to any pre-coded response options, census questions should, where possible, provide the facility for write-in (open) responses, as this enables free self-declaration. It should be possible to report mixed ethnicities (more than one ethnic affiliation or a combination of ethnic affiliations), as well as to indicate "none", "not declared" or "prefer not to answer", either in the write-in facility or as a distinct option. Some countries have found that such a separate option increases non-response and impacts data quality. This possibility should be considered during testing and weighed against the desire to give respondents the possibility to avoid answering.

1348. Instructions for completing the census should explain how respondents are expected to report the ethnicity of children whose parents are of different ethnicities.

1349. In censuses using enumerators to collect information from respondents, countries should consider very carefully the existence of any ethnic tensions or sensitivities in the

national context. Instructions for enumerators should emphasize that ethnicity must be freely reported by the respondents and not assumed by the enumerators. It may be necessary to introduce specific quality control procedures to ensure that this instruction is followed.

1350. When producing classifications of ethnic groups for census outputs, it is important to consider the risk of inadvertent disclosure for small groups and/or small geographic areas. While disclosure must be avoided, it is also important not to set a release threshold so high that ethnic minorities become masked in census outputs.

21.3 Religion (non-core topic)

1351. **Religion** is generally regarded as a set of beliefs and practices, usually involving acknowledgment of a divine or higher being, power or principle, by which people order the conduct of their lives both practically and in a moral sense. For the purposes of collecting information in a census, this concept may be defined as either:

- (a) a religious or spiritual belief or faith, regardless of whether or not this belief or faith is represented by an organized group or body; or
- (b) an affiliation with, or membership of, an organized group or body having specific religious or spiritual tenets and/or practices.

1352. Countries that are traditionally multi-denominational or that have significant immigrant populations with different religions may wish to collect data on religion, either in addition to, or instead of, data on ethnicity. The decision to collect and disseminate information on religion in a national census depends on several considerations and national circumstances, including the national needs and expected uses for such information and the sensitivity, legal obligation or prohibition, or social acceptability of using the census as the source for such information.

1353. Depending on the specific needs and circumstances in a country, data could be collected on any of the following aspects of religion:

- (a) formal membership of a church, temple or a religious community
- (b) identification with a certain religion, religious community or denomination
- (c) religious belief, whether practiced or not
- (d) religion in which a person was brought up
- (e) religious attendance or observance.

1354. The sensitive nature of census questions on religion necessitates special care to reassure the public of the existence of appropriate data protection and disclosure control measures. The public should be informed of the needs and uses for such information and the concepts and definitions used, both in collection instruments and in dissemination products.

1355. Where information on religion is gathered directly from respondents it should be based on the free self-declaration of respondents. Some countries may set a minimum age threshold for the collection and dissemination of information on religion for children, as determined by national circumstances and user needs. If young children are included, clear

instruction should be given as to how their religious identity or affiliation should be determined.

1356. It should be made very clear if response is voluntary. In some countries, religion questions must be voluntary by law. As with ethnicity (see paragraph 1347), it is preferable to include the facility for write-in (open) responses and to give respondents the option to declare “no response” or “prefer not to answer”, rather than making the question voluntary. As in the case of ethnicity, the risk of increasing non-response by including this as a separate option should be considered and tested. Religion questions should also offer a “no religion” option which is distinct from the non-response option, allowing respondents to indicate that they do not have any religion, and thus permitting the separate identification of the non-religious population from those who chose not to respond.

1357. There is no internationally-agreed definition or classification of religion for statistical purposes. A classification should be comprehensive, exhaustive, and should be developed to reflect as fully as possible the diversity of the population in question. It should include groups of religions, individual religions, and subsets of religions such as religious denominations, administrative and organizational groupings, and independent religious groups, as well as belief systems typically not considered as conventional religions. If there is a significant and diverse non-religious population, countries may develop a classification that can identify separate groups within this population, such as Agnostic, Atheist and Humanist. When selecting labels for categories within a classification, countries should test the social acceptability of the labels chosen. For example, in some countries it has been found that terminology based on the identity rather than the name of the religion is preferred (e.g. “Muslim”, “Jewish” and “Christian”, rather than “Islam”, “Judaism” and “Christianity”).

21.4 Language (non-core topic)

1358. Countries may wish to collect data on languages that are currently spoken, understood and/or written, as an additional means of measuring cultural identity and integration. This may be especially relevant in traditionally multilingual countries or those with significant immigrant populations, but even countries less characterized by these features may wish to produce such data in the context of the growing importance of knowledge economies and the globalization of trade.

1359. In countries with more than one official language, it may be necessary to produce data on the use of the official languages to meet legislative or policy requirements.

1360. Depending on information needs, for countries wishing to include this topic in the census it is recommended to collect or produce data on one or more of the following concepts:

- (a) First languages spoken or learned at home in early childhood
- (b) Knowledge of language(s), defined as the ability to speak and/or write (and/or otherwise communicate) a specified language (e.g. the national official language(s) or significant minority languages), to a pre-defined level
- (c) Usual language(s), defined as the language(s) most often currently spoken

- i. at home (for all persons)
- ii. at work (for employed persons)

(d) Main language(s), defined as the language(s) which the person best commands.

1361. Concepts and definitions used should account for the use of languages that are conveyed and/or understood by means other than conventional reading and writing, such as signed languages and Braille.

1362. Data collection instruments should permit the reporting of multiple languages, and instructions to respondents should make this clear. If relevant to national circumstances and if feasible within the data collection method, some degree of ranking may be used where the knowledge or use of multiple languages is reported. This enables the census to capture information on respondents who have acquired multiple languages, whether during childhood or subsequently, thus providing a fuller picture of the linguistic diversity of a country's population.

1363. The collection and dissemination challenges of permitting multiple responses in language questions (as is also true for ethnicity and religion) may be significant, and special care must be taken to protect confidentiality in census outputs.

1364. As with ethnicity and religion, the population of many language groups can be small. It is therefore recommended that countries should include a facility to provide a write-in (open) response to any question on knowledge or use of languages. For literacy questions, standardized measurement tools should be used (see also section [18.6](#)).

1365. As in the cases of ethnicity and religion, concepts and definitions used should be clearly explained, both to respondents during data collection and to data users in dissemination products. Census instructions should make clear to users of sign language that they should include these in their responses.

1366. As for religion, any classification used for outputs should be as comprehensive and exhaustive as possible to reflect fully the national circumstances (within the constraints of disclosure control rules), and should be tested for social acceptability regarding both the completeness of the classification and the choice of labels applied to categories. Special testing may be required to ensure that the design of questions and the designation of categories in outputs are acceptable to relevant population groups in the case of sign language or any language that may be seen as sensitive (such as languages used by vulnerable minorities).

Chapter 22 Disability

22.1 Rationale for inclusion of disability in censuses

1367. A census can provide valuable information on disability in a country. For countries that do not have regular special population-based disability surveys or disability modules in ongoing surveys, the census can be the only source of information on the frequency and distribution of disability in the population at national, regional and local levels. Countries that have a registration system providing regular data on persons with the most severe types of impairments may use the census to complement these data with information related to the broader concept of disability based on the International Classification of Functioning, Disability and Health (ICF) described below. Census data on disability can be used for planning programmes and services related to prevention, mitigation and rehabilitation; for monitoring disability trends in the country; for evaluation of national programmes and services concerning the equalization of opportunities, and for international comparison of the prevalence of disabilities in countries, including in the context of internationally-agreed monitoring frameworks such as the Sustainable Development Goals (SDGs) or their successors. Census data on disability can also be used by countries to produce and disseminate the statistics required in order to comply with the Convention on the Rights of Persons with Disabilities.¹³³

1368. Three major classes of purpose for measuring disability in a census are:

- (a) To provide services, including the development of programmes and policies for service provision and the evaluation of these programmes and services. The provision of services at the population level includes, but is not limited to, addressing needs for housing, transportation, assistive technology, vocational or educational rehabilitation, and long-term care.
- (b) To monitor the level of functioning in the population. Monitoring levels of functioning includes estimating rates and analysing trends. The level of functioning in the population is considered a primary health and social indicator, which characterizes the status of the population in a society.
- (c) To assess equalization of opportunities. The assessment of equalization of opportunity involves monitoring and evaluating outcomes of anti-discrimination laws and policies, and service and rehabilitation programmes designed to improve and equalize the participation of persons with impairments in all aspects of life.

1369. The intent of these purposes for measurement is consistent with that of the World Programme of Action concerning Disabled Persons (WPA),¹³⁴ which provides a valuable guide for conceptualizing the uses of data on disability. The WPA outlines three major goals for policy formulation and programme planning, internationally: equalization of opportunities, rehabilitation and prevention. The common goal is to promote the participation of persons

¹³³ See article 31 "Statistics and data collection" of [the Convention on the Rights of Persons with Disabilities](#).

¹³⁴ World Programme of Action concerning Disabled Persons, United Nations, New York, 1983.

with disabilities in all aspects of life by preventing the onset and consequences of impairments, promoting optimal levels of functioning, and equalizing opportunities for participation.

1370. The assessment of equalization of opportunity is the purpose that can be best achieved in a census. It is this purpose that is considered when determining “disability status” (see paragraph 1377).

1371. The definition outlined in paragraph 1377 requires that disability be defined in terms of limitations in basic activity functioning that would place a person at greater risk than the general population of restricted performance or participation in the organized activities (such as educational attendance or work participation).

1372. While assessment of equalization of opportunities might seem to require measurement of both activities and participation, such an approach does not help to identify changes in the level of participation in the population in response to changes in opportunities. It only reflects the circumstances of those who, because of unfriendly environments or lack of assistive devices, are experiencing restrictions in participation. Approaching the assessment of equalization of opportunity by recognizing the link between a basic level of activity and subsequent participation can reduce some of the methodological challenges.

1373. Disentangling the conceptual dimensions of basic activity limitations that result from impairment, from the more complex activities associated with participation provides the opportunity to determine the intervening mechanisms that facilitate or interfere with performance of tasks and organized activity. At the analysis stage, persons who are identified with or without disabilities on the basis of their ability to perform basic activities can be compared in relation to their participation in organized activities (such as school and work). This comparison can assess the equalization of opportunities. The separation between activities and performance differentiates approaches for the purpose of monitoring functioning in the population and for the purpose of assessing equalization of opportunity. When assessing opportunity equalization, the connection between the conceptual elements is made during analysis, whereas for monitoring functioning the connection is done during data collection.

1374. Within the framework of the ICF Model and its four major dimensions (body structure and function, activity, participation and environment), an activity-oriented set of questions, located at the simplest and most basic level, should be used to capture the basic activity elements required for a good measure of the risk of participation restrictions.

1375. The adoption of an activity-oriented approach is also used in the European Health Status Module developed by Eurostat within the European Statistical System. Although it has been designed for more extended data collection activities such as the European Health Interview Survey, it still can be used to identify questions to measure activity limitations in a census. This module also includes the Minimum European Health Module (MEHM),¹³⁵ a set of three general questions characterizing three different concepts of health (self-perceived health, chronic morbidity and activity limitations).

1376. Given the complexity of disability definition and measurement, and, in certain cultures, the sensitivity attached to identifying a person as having a disability, it is recommended that

¹³⁵ The following link refers to the methodological manual for the European Health Interview Survey (EHIS wave 2), which includes model questions and guidelines on [the Minimum European Health Module \(MEHM\)](#) (see pages 13 to 17).

several functional activity domains be defined whereby people can respond to questions about their difficulty performing those activities rather than directly enquiring whether they have any disability.

22.2 Disability status (non-core topic)

1377. Disability status characterizes the population as those with and without a disability. **Persons with disabilities** are defined as those persons who are at greater risk than the general population for experiencing restrictions in performing specific tasks or participating in activities. This group includes persons who experience limitations in basic activity functioning, such as walking or hearing, even if such limitations are ameliorated by the use of assistive devices, a supportive environment or plentiful resources. Such persons may not necessarily experience limitations in tasks, such as bathing or dressing, or participation in activities, such as working, shopping or attending a place of worship, because the necessary adaptations have been made at the person or environmental levels. These persons should still, however, be considered to be at greater risk for restrictions in activities and/or participation than the general population because of the presence of limitations in basic activity functioning and because the absence of the current level of accommodation would preclude their current levels of participation.

1378. A comprehensive measure to determine disability should include the six domains of functioning identified by the Washington Group on Disability Statistics:¹³⁶

- (a) walking
- (b) seeing
- (c) hearing
- (d) cognition
- (e) self-care
- (f) communication.

1379. The first four domains are essential for determining disability status, while the fifth and sixth domains permit a more comprehensive measure for determining disability status.

22.3 Disability framework and terminology

22.3.1 International Classification of Functioning, Disability and Health (ICF)

1380. The ICF is a classification system issued by the World Health Organization (WHO), offering a conceptual framework with concepts, definitions and terminology, and

¹³⁶ More information on the Washington Group on Disability Statistics is available at <https://www.washingtongroup-disability.com>.

classifications of contextual components associated with disability, including both participation and environmental factors.

1381. The ICF distinguishes multiple dimensions that can be used to monitor the situation of individuals with a disability. The system is divided into two parts, each with two components;

(1.0) Functioning and disability, which include the components:

(1.1) Body functions and body structures (impairments)

(1.2) Activities (limitations) and participation (restrictions)

(2.0) Contextual factors which include the components:

(2.1) Environmental factors

(2.2) Personal factors

1382. The ICF provides classification schemes for all these elements except for personal factors.

22.3.2 Census questions

1383. A census format offers only limited space and time for questions for one topic such as disability. Since the ICF offers several dimensions for use to develop a census measure, it is best to focus on a few of those dimensions, leaving the remaining dimensions for use in more extensive household surveys. Short sets of disability questions, which can be included in censuses and extended sets to be recommended for inclusion in population-based surveys have been developed and tested. The aim of the recommended sets is to improve comparability of disability data across countries. An example of short set of disability questions that can be used in population censuses is the Short Set on Functioning developed by the Washington Group on Disability Statistics (WG-SS).¹³⁷ Extended sets of disability questions designed for population-based surveys are not suitable for use in censuses because of their length of complexity, time constraints, and special training required for the enumerators, impossible to provide in a population census.

1384. Due to the sensitivity of the topic, it is recommended that special attention should be paid in designing census questions to measure disability. The wording and the construct of questions greatly affect the precision in identifying the persons with disabilities. The result can also be significantly influenced by the data collection method used (interview or self-compilation). Ideally, each domain should be asked through a separate question.¹³⁸ The language used should be clear, unambiguous and simple. Negative terms should always be avoided.

1385. The disability questions should be asked about each single household member aged five years and above and general questions on the presence of persons with disabilities in

¹³⁷ The Washington Group on Disability Statistics (WG) focuses on international measures of disability and has developed these questions. <https://www.washingtongroup-disability.com/question-sets/wg-short-set-on-functioning-wg-ss/>

¹³⁸ When domains are combined such as asking a question about seeing or hearing, respondents frequently are confused and think they need to have difficulty in both domains in order to answer yes. In addition, having the numbers with specific limitations is useful for both internal planning and for cross national comparisons.

the household should be avoided. Information on census questions on disability for children is provided in [Box 8](#).

1386. If necessary, a proxy respondent can be used to report for the family member who cannot respond for himself or herself. Scaled response categories can also improve the reporting of disability. The census questions on disability endorsed by the Washington Group include four response categories:

- (a) No difficulty;
- (b) Yes – some difficulty;
- (c) Yes – a lot of difficulty; and
- (d) Cannot do [function] at all

1387. Disability prevalence is determined based on any response that is “a lot of difficulty” or “cannot do at all” for any of the domains.

1388. The European Health Status Module (see paragraph [1375](#)) includes a set of standard questions for various domains and can be used as source to develop census questions in three of the four core domains (seeing, hearing and walking). There is also a set of questions for use on national censuses for gathering information on the four essential domains.¹³⁹ The questions have been designed to provide comparable data cross-nationally for populations living in a great variety of cultures with varying economic resources. The objective is to identify persons with similar types and levels of limitations in functional activities regardless of nationality or culture. It is not the purpose of these questions to identify every person with a disability within every community. The questions may not meet all the needs for disability statistics, nor will it replicate a population evaluated across a wider range of domains that would be possible in other forms of data collection or in administrative data.

1389. The information that results from measuring disability status is expected to:

- (a) represent the majority, but not all persons with limitation in basic activity functioning in any one country;
- (b) represent the most commonly occurring basic activity limitations within any country; and
- (c) capture persons with similar problems across countries.

1390. The questions identify the population with functional limitations that have the potential to limit independent participation in society. The intended use of these data would be to compare levels of participation in employment, education, or family life for those with disability versus those without to see if persons with disability have achieved social inclusion. In addition the data could be used to monitor prevalence trends for persons with limitations in the particular basic activity domains. It would not represent the total population with limitations, nor would it necessarily represent the “true” population with disability, which would require measuring limitation in all domains.

¹³⁹ For more information see [the Washington Group web site](#).

Box 8

Census questions on disability for children

To measure disability among children accurately, questions need to cover a comprehensive range of functional domains and administration of such questions needs to be done to the child's mother or primary caregiver. A specific set of questions to identify children with disabilities, called Child Functioning Module (CFM), has been developed through a collaboration between the Washington Group on Disability Statistics and UNICEF.¹⁴⁰ In addition to collecting data on domains related to physical, sensory and cognitive functioning, the CFM includes questions on difficulties in psychosocial functioning. The questions need to be answered by the mothers or primary caregivers, as these are the best informants when obtaining information on children.

Because of the space restrictions inherent in the census format, and given that the child's mother or primary caregiver is unlikely to be the respondent to the census questionnaires, the CFM is not best suited for use in censuses.

Countries may consider using the Washington Group Short Set on Functioning (WG-SS). However, the use of the WG-SS has limitations when used for children. The WG-SS, like any other set of questions, should never be used to capture disability in children less than five years of age. For children aged 5 to 17 years, the use of the WG-SS will significantly underestimate the size of the population of children with disabilities. The reason is twofold. Firstly, it is because the WG-SS does not capture information on key domains of child functioning, including learning, interacting with peers, coping with change, focusing attention and management of emotions. Secondly, when data are collected from respondents other than the child's mother or primary caregiver as it is the case in a census, the likelihood of underestimating the size of the population of children with disabilities increases significantly. For these reasons, if the WG-SS is used for children aged 5 to 17 years, it is essential to emphasize in the presentation of the results that the size of the population of children with disabilities is underestimated.

22.4 Use of the census to screen for disability and follow-up with other surveys

1391. Countries that are planning specialized surveys on disability may want to use the census to develop a sampling frame for these surveys and include a screening instrument to identify persons who will be interviewed subsequently. The definitions and the instruments used for this purpose are very different from the ones used to assess equal opportunities. The main purpose of a screening is to be the most inclusive as possible in order to identify the largest group of people who could be further studied. The screening question should be designed so that false negatives (that is, persons who have disabilities but are not identified in the

¹⁴⁰ Loeb, Mitchell, et al., 'The Development and Testing of a Module on Child Functioning for Identifying Children with Disabilities on Surveys. I: Background', *Journal of Disability and Health*, vol. 11, no. 4, 2018, pp. 495–501. More information on the CFM is available in: United Nations (2025). *Principles and Recommendations for Population and Housing Censuses - Revision 4* (version 31 March 2025), para. 5.229.

census as having disabilities) are minimized, while false positives (persons who are identified with disabilities in the census but in reality they do not have disabilities, as assessed in the largest instrument used in the follow-up survey) should be less of a concern.

1392. Within the framework of the ICF, the census screening may include all of the three main dimensions of body structure and function, activity and participation. This will allow for keeping a broad approach to the follow-up survey where the different aspects of disability can be better studied.

1393. The same recommendations highlighted in paragraphs [1384-1390](#) should also be considered when a screening module is designed.

1394. Before embarking on using the census to develop a frame for a follow-up survey, it is important that the legal implications of using personal census data for this purpose are fully considered. Respondents should be informed beforehand that the data may be used for follow-up studies, and national authorities responsible for ensuring the privacy rights of the population may need to be consulted in order to obtain their approval.

1395. Further detail on disability can be found in the United Nations Principles and Recommendations – Revision 4, Part five, Chapter IV (Definitions and specifications of topics), section D (Demographic and social characteristics), sub-section 9 (Disability status), paragraphs 5.214-5.236.

Annexes

Annex I Core and non-core topics

Core topics	Non-core topics
Geography	
Location of place of usual residence (para. 786)	Population grid (derived) (para. 806)
Locality (derived) (para. 788)	Degree of urbanization (derived) (para. 814)
Location of living quarters (para. 797)	Location of school, college or university (para. 826)
Urban and rural areas (derived) (para. 798)	Mode of transport to work (or to place of education) (para. 827)
Location of place of work (para. 820)	Distance travelled to work (or to place of education) and time taken (para. 831)
Migration and mobility	
Country of birth (para. 849)	Country of birth of parents (para. 853)
Country of citizenship (para. 856)	Citizenship acquisition (para. 861)
Ever resided abroad and year of arrival in the country (para. 863)	Country of previous usual residence abroad (para. 867)
Place of birth (para. 880)	Total duration of residence in the country (para. 870)
Previous place of usual residence and date of arrival in the current place (para. 884)	Reason for migration and temporary mobility (para. 871)
	Refugee and refugee related populations (derived) (para. 873)
	Temporary mobility (para. 876)
	Place of usual residence five years prior to the census (para. 890)
	Reasons for internal migration (para. 891)
	Internally displaced persons (derived) (para. 892)
Demography	
Sex (para. 899)	Gender (para. 899)
Age (para. 916)	Total number and sex of children born alive (para. 939)

Core topics	Non-core topics
Legal marital status (para. 921)	Date(s) of legal marriage(s) of ever married women: (i) first marriage and (ii) current marriage (para. 942)
De facto marital status (para. 931)	Date(s) of the beginning of the consensual union(s) of women having ever been in consensual union: (i) first consensual union and (ii) current consensual union (para. 944)

Household and family

Private household size (derived) (para. 971)	Type of institutional household (para. 955)
Private household type (derived) (para. 972)	Reconstituted family type (derived) (para. 1005)
Reference-person approach versus relationship matrix approach ¹⁴¹ (from para. 983)	Presence of the person's parent(s) in the household (para. 1023)
Type of family nucleus (derived) (para. 1003)	Presence of the person's grandparent(s) in the household (para. 1026)
Household status of person (derived) (para. 1018)	Extended family status of person (derived) (para. 1029)
Private household type of person (derived) (para. 1019)	Sole or shared occupancy of housing unit by private household (para. 1032)
Family nucleus status and household living arrangement of person (derived) (para. 1020)	Tenure status of household (para. 1035)
	Rent and other topics (para. 1039)

Housing¹⁴²

Type of living quarters (para. 1071)	Characteristics of dwellings with no occupants at the time of census (para. 1086)
Housing arrangements (derived) (para. 1076)	Occupancy by number of private households (derived) (para. 1096)
Occupancy status of conventional dwellings (para. 1081)	Type of rooms (para. 1112)
Type of ownership (para. 1091)	Hot water (para. 1129)

¹⁴¹ This topic corresponds to the topic called "Relationship between household members" in the CES Recommendations for the 2020 Censuses of Population and Housing.

¹⁴² See paragraph [1047](#) and Table 7 to determine whether the topic is core, non-core or not recommended for different types of housing.

Core topics	Non-core topics
Number of occupants (para. 1098)	Type of sewage disposal system (para. 1131)
Useful floor space and/or number of rooms of housing units (para. 1100)	Kitchen (para. 1133)
Density standard (derived) (para. 1108)	Main type of energy used for heating (para. 1141)
Water supply system (para. 1115)	Electricity (para. 1145)
Toilet facilities (para. 1120)	Piped gas (para. 1147)
Bathing facilities (para. 1124)	Air-conditioning (para. 1149)
Type of heating (para. 1137)	Accessibility to dwelling (para. 1151)
Dwellings by type of building (para. 1159)	Position of dwelling in the building (para. 1154)
Dwellings by period of construction of building (para. 1167)	Dwellings by number of floors in the building (para. 1163)
	Lift (para. 1165)
	Dwellings by materials of which specific parts of the building are constructed (para. 1171)
	Dwellings by state of repair of the building (para. 1175)
Education	
Educational attainment (para. 1183)	Educational qualifications (para. 1192)
	Field of education and training (para. 1194)
	School attendance (para. 1200)
	Literacy (para. 1207)
Economy	
Labour force status (para. 1231)	Type of workplace (para. 1291)
Status in employment (para. 1261)	Institutional sector of employment (para. 1296)
Occupation (para. 1283)	Working time (para. 1298)
Industry (para. 1287)	Income (para. 1302)
Participation in own-use production of goods (para. 1307)	Informal employment (para. 1313)

Core topics	Non-core topics
Agriculture	
	Own-account agriculture production (para. 1326)
	Measure of farmland area and number of livestock (para. 1330)
Ethno-cultural characteristics	
	Ethnicity (para. 1338)
	Religion (para. 1351)
	Language (para. 1358)
Disability	
	Disability status (para. 1377)

Annex II The Fundamental Principles of Official Statistics as they relate to population and housing censuses

Introduction

1396. The need for a set of principles governing official statistics became apparent at the end of the 1980s when countries in Central Europe began to change from centrally planned economies to market-oriented democracies. It was essential to ensure that national statistical systems in such countries would be able to produce appropriate and reliable data that adhered to certain professional and scientific standards. Towards this end, the Conference of European Statisticians developed and adopted the Fundamental Principles of Official Statistics (FPOS) in 1992.¹⁴³ Statisticians in other parts of the world soon realized that the principles were of much wider, global significance. Following an international consultation process, a milestone in the history of international statistics was reached when, at its Special Session of 11-15 April 1994,¹⁴⁴ the United Nations Statistical Commission adopted the very same set of principles - with a revised preamble - as the United Nations Fundamental Principles of Official Statistics. The principles were then endorsed by the United Nations General Assembly during its 68th session on 29 January 2014.¹⁴⁵ This was an historic recognition of their importance as a basic framework for official statistics at the global level.

The ten principles

- (1) Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honour citizens' entitlement to public information.
- (2) To retain trust in official statistics, the statistical agencies need to decide, according to strictly professional considerations including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.
- (3) To facilitate a correct interpretation of the data, the statistical agencies are to present information according to scientific standards on the sources, methods and procedures of the statistics.

¹⁴³ Economic Commission for Europe, Report of the 8th meeting, 15 April 1992.

¹⁴⁴ The Statistical Commission adopted a revised preamble for the Fundamental Principles at its forty-fourth session in 2013.

¹⁴⁵ United Nations General Assembly Resolution 68/261, Fundamental Principles of Official Statistics, adopted on 29 January 2014. [A/RES/68/261](#).

- (4) The statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics.
- (5) Data for statistical purposes may be drawn from all types of sources, be they statistical surveys or administrative records. Statistical agencies are to choose the source regarding quality, timeliness, costs and the burden on respondents.
- (6) Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes.
- (7) The laws, regulations and measures under which the statistical systems operate are to be made public.
- (8) Coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system.
- (9) The use by statistical agencies in each country of international concepts, classifications and methods promotes the consistency and efficiency of statistical systems at all official levels.
- (10) Bilateral and multilateral cooperation in statistics contributes to the improvement of systems of official statistics in all countries.

Why the principles matter for censuses

1397. As part of the thirtieth anniversary celebrations in 2022, UNECE launched [a website](#) in which the relevance and importance of each of the principles was explained in everyday language. Each of the ten principles constitutes an essential part of the overall governance structure of official statistics as a whole, and each entails a range of behaviours for NSOs, their staff and their senior leaders in order to uphold them. While they apply to the entire system of official statistics, they have a special relevance for censuses since these are in many countries one of the largest, most resource-intensive and most high-profile undertakings of the NSO.

1398. The FPOS have been incorporated into the standards, principles, definitions, legal frameworks, and codes of practice of most national and international statistical systems. Enshrining them into law is immensely valuable. As explained in [Chapter 2](#), incorporating such matters as confidentiality, data security, scientifically-driven decision making and the political independence of census offices into law can strengthen public trust, which in turn can increase the willingness with which the public will respond to a census or agree to the use of a census design built on the use of administrative data pertaining to them. This enhanced trust, in turn, can lower costs as NSOs need to expend less effort soliciting engagement; can enhance the quality of the census data, as coverage is greater and answers are more likely to be complete and truthful; and can render the resulting census data more valuable, since value drives from being used, and people are more likely to use the information when they trust that it is accurate.

1399. Enshrining the fundamental principles in law is not enough, by itself, to ensure that they are fulfilled.

1400. The principles have to be translated into institutional governance structures, public assurances, and guidelines for staff. Processes must be established by which decisions, especially in borderline cases, are taken in such a way that they build up a set of consistent case-laws within the statistical system or at least within the NSO. These guidelines for ethical and professional behaviour should be interpreted by staff, through training and implementation, as part of their everyday data collection, processing, and dissemination work. The senior statisticians in NSOs should give a model of behaviour to all other staff in this respect, and contribute to promoting the ethical foundations of official statistics with all stakeholders, the media and the public.

1401. The notion of a national statistical system is used here as the sum of all public bodies that are producers of official statistics in the sense defined by the relevant national legislation. The eighth principle asks that these producers do not act in isolation, but are coordinated. In addition, the statistical system should include any coordinating or advisory bodies for official statistics foreseen by the statistical legislation or set up on the basis of this legislation.

1402. In the case of public bodies other than the NSO (or statistical offices at regional or local level) acting as producers of official statistics, the fundamental principles of official statistics imply that statistical tasks are subject to the statistical legislation, and that they are clearly separated in the organization chart from other tasks assigned to this department, ministry or agency. The notion of producer of official statistics (and of the statistical system) does not necessarily include therefore an entire ministry, department or agency, but only those organizational sub-units that have regular tasks as producers of official statistics in the above sense. Where such sub-units are led by a named senior responsible statistician this adds further to statistical governance control and greater public reassurance. All government units other than producers defined in this way are considered as potential users of official statistics. This clarification is important because the notion of professional independence refers to this boundary in terms of decisions to be made within the statistical system. Also, the exchange of data subject to statistical confidentiality should not be extended to government units other than the statistical producers in the above definition or research institutions.

1403. Population and housing statistics are some of the most publicly visible activities of national official statistics, in particular where there is direct data collection such as in the census in most countries, and therefore adherence to these principles is of particular importance. NSOs must ensure that population censuses, both in reality and in the perception of users and respondents, are in line with these principles, so that the credibility not only of the census, but of the entire NSO and the whole statistical system are not compromised. It is therefore recommended that any specific legislation on the population census in countries where a general statistics law with explicit recognition of the fundamental principles is in force, explicitly acknowledges the applicability of these principles for the census.

Privacy and confidentiality

1404. In the context of a population census, the most important principle for the population as the provider of the information is the interference with personal privacy at the time of data

collection (when there is direct data collection), and the subsequent confidential use of their individual information. The fifth principle refers to the selection of sources in consideration of the burden on respondents. Deciding the balance between the public good value of a statistic and the private life intrusion of the data collection is one of the most difficult tasks facing a statistics office. In the context of a census, where a response to the inquiry may be mandatory, it is likely that the national parliament must debate that balance and enshrine the outcome in legislation. Where a member of the public is to be compelled by the state to reveal matters that are private to them, an unambiguous mandate for such collection is of the essence, especially if refusal to supply such information on demand could result in legal sanctions against the individual.

1405. When private and personal information is obtained under compulsion, it is all the more important to guarantee its confidentiality. The sixth principle refers to the use by statistical authorities of individual data, whether they refer to natural or legal persons,¹⁴⁶ to be strictly confidential and used exclusively for statistical purposes. When collecting individual data from respondents through surveys or censuses, statistical producers must state this pledge, which in most countries is enshrined in national legislation, very prominently in order to persuade respondents to participate and to provide correct information. The term “statistical purposes”¹⁴⁷ in this context excludes the use of such information for any decisions by a government or public sector authority (including courts) targeted at an individual unit. Thus, it eliminates the possible perception of respondents that the individual information they provide in good faith about themselves could be used against them. Secondly, the principle ensures that the statistical producers are seen to take seriously the concern of respondents about the privacy of the information they provide.

1406. The clearest way for statistical producers to comply with this principle is the so-called “one-way” principle for individual data referring directly or indirectly to protected units. Statistical producers can receive such data, but, with the two possible exceptions mentioned below, should never release or make accessible such data. The one-way principle should apply to all individual data, irrespective of the source (census, survey, or administrative source). Survey and administrative data should be covered by the same statistical confidentiality provisions, or separate provisions with equivalent effect, in all stages of collection, processing and dissemination, from the moment they are handed over to a statistical producer.

1407. Statistical legislation may prescribe two exceptions to the ban on statistical authorities making protected individual information partially accessible: the exchange of individual information between statistical producers bound by the same or equivalent laws, policies and Code of Practice; and the granting of access to microdata files with individual data, under certain conditions, to approved researchers. The first exception has to be strictly limited to purposes of official statistics, and the second exception to tabulation/analysis by approved researchers in a controlled environment.¹⁴⁸ Because of the ban on non-statistical use of microdata, the use of the first exception is especially delicate if the statistical producer at the

¹⁴⁶ The protection of the statistical unit ‘natural person’ is not effective if the ‘household’ is not also protected. Dwellings or buildings are not protected unless there is an indirect risk of disclosure for a person.

¹⁴⁷ The term ‘statistical purpose’ should not be interpreted as allowing the use of individual information for tables. Statistical purposes also cover the matching of individual information with other sources of official statistics.

¹⁴⁸ Both exceptions may be limited to national partners, or extend to cover statistical departments of supra- and international organizations in the first case, or researchers abroad or being part of an international research network in the second case. National legislations and practices differ in this respect.

receiving end is a division of a larger government unit whose main task is the non-statistical use of data, as a minimum, the national statistical legislation has to be fully applicable to the statistical producer in order to make such a statistical producer eligible to receive confidential census microdata from the NSO. Most effective are legislative protections that travel with the data, meaning the non-disclosure and statistical purposes only protections apply wherever the data are being processed.

1408. It is of overriding importance that NSOs are perceived as completely trustworthy with respect to confidentiality. For this reason, requests for release of individual data for non-statistical purposes should always be refused. If, on the basis of legislation in areas other than official statistics, such an access for non-statistical purposes is lawful (for example, in the case of data originating in administrative sources, or in the case of a dual-purpose census) such access should be provided by other appropriate government authorities, and not by NSOs.

1409. The sixth principle implies not only the exclusion of disclosure by direct identification of units (through names, addresses, or generally available reference numbers), but also by indirect identification (through a combination of characteristics, or as part of a narrowly defined small aggregate). It also implies strict security rules for handling questionnaires and stored individual data. The recommendations in the context of a population census are presented in more detail in Chapter 5.

Integrity

1410. In the context of the population census, integrity is the strict adherence to all Fundamental Principles of Official Statistics throughout the various stages of the census operations by all institutions and persons involved. The task of any NSO is to set the standards of integrity and to make sure that these standards are observed by its regular staff, its temporary staff especially recruited for the census, and staff of any other (public or private) organization to which certain parts of the operations may be assigned or sub-contracted.

1411. Population and housing censuses are an integral part of the system of official statistics in each country. They are therefore expected to encompass the fundamental principles of official statistics. The seventh principle, in particular, states that *"the laws, regulations and measure under which the statistical systems operate are to be made public"*. This implies that the legal basis is of fundamental importance for the census.

1412. Some considerations on integrity aspects related to the relationship between the NSO and respondents are presented in paragraphs [1441](#) and [1442](#) below.

Professional independence

1413. The delimitation of professional independence for a statistical authority is important. This is especially so for an operation like a population census, where the NSO is dependent on government budgets (at national, regional and local level, plus international donors where applicable) and a mandate for data collection from the national legislature. The Fundamental Principles assist in deciding the matters that fall into the responsibility of the professional

statistician. The Principles require the selection of data sources, statistical methods, and processing procedures to be decisions of professional statisticians, only. These are important matters in the context of a Census, and professional independent decisions by statisticians should therefore be subject to scrutiny. However, for professional independence to be meaningful the scrutiny should be carried out by an independent statistical standards authority or by the national legislature, and not by Ministerial government.

1414. In terms of processes, professional independence means that, while a variety of stakeholders, especially major users, will be consulted about professional issues, the decisions in the scope of professional independence will be taken entirely within the system of official statistics and not by Ministerial government or any political body. "Within the statistical system" can mean by the head of the NSO, with possible involvement, for major issues, of an advisory board like a statistical standards authority that is set up by the relevant legislation on official statistics, or of a body composed of all or some producers of the national statistical system. In the case of population census, the census law may provide for a special census committee to play a role in such decisions. Whatever the form of decision-making mechanisms within the statistical system of a country, it is crucial that the relevant law enshrines very clearly that all bodies involved are subject to the fundamental principles (which preferably are also enshrined in a general statistics law). Decisions that are necessarily beyond the scope of those that can legitimately be taken by professionally independent government statisticians should be made by the national legislator, after debating proposals made to the legislator by the national statistics office. Other than some residual responsibilities, such as presenting material for debate in the legislature and providing assurances to the legislature about the adequacy of budget for the proposal(s) made to the legislature, there is no substantial role for ministerial government in census taking. The primary function of Ministerial government is to respond, as a key user of statistics, to the NSO's consultations on statistical needs.

1415. The importance of professional integrity in census statistics is so high that the head of the NSO should decide on the allocation of overall resources for official statistics between subject areas, with only the total budget decided at the political level as part of the budgetary process). Where this is not achieved, it is all the more essential that visible professional independence, free from any Ministerial government influence, decides:

- (a) the design of data collection instruments for official statistics with respect to coverage, questionnaires and the terminology used therein, selection of respondent units (in the case of non-exhaustive coverage). This extends to the design of pilot surveys and post-enumeration surveys;
- (b) the choice of administrative sources to be used in the preparation of the census, or (as in the case of register-based censuses) in the implementation phase;
- (c) the follow-up of non-response in the case of primary data collection, or the verification process of administrative data by the persons concerned and the respective follow-up of non-response in this approach;
- (d) the choice of methods and strategies for editing raw data (from primary data collection or from administrative sources), for imputing missing information or for correcting erroneous information, for classifying open-ended questions, and for combining various sources in the best possible ways (either at unit or aggregate level);

- (e) the choice of the aggregates to be compiled from the census to be disseminated as results of official statistics, including the terminology used for these aggregates and the ways of compiling them;
- (f) the ways in which these results are disseminated in full respect of the relevant fundamental principles, including the timing of the release;
- (g) the standards, methods and processes of quality control for the various steps of the operation, and the decisions whether certain aggregates cannot be released because of insufficient quality;
- (h) the ways in which census data are used for improving other outputs or activities of official statistics (benchmarking of time series, use as sampling frame); and
- (i) the way in which edited unit level data from the census are organised, documented and stored to facilitate additional tabulation on request according to specifications of individual users (statistical services) and for any later use in official statistics (analytical studies).

1416. Two general qualifications concerning the input of professional statistical advice to the decisions of the legislature are worth making. The first issue is linked to another fundamental principle: the issue of response burden in primary data collection (the fifth principle). This includes response obligations, the consideration whether certain questions, especially in the context of a census, may be considered as too much of an intrusion into privacy, and the issue of penalties for respondents who refuse to comply with response obligations. The second issue is about the division of work and the allocation of responsibilities between the various players and bodies of the statistical system of a country for the various parts of a statistical programme in a country, assuming that all of them are subject to the statistical legislation. For a basic operation like the census that is exclusively for statistical purposes, the overall responsibility is normally allocated with the NSO as the major producer of official statistics and coordinator of the statistical system, even though certain elements may be assigned to other players in the statistical system.

1417. In the context of a traditional population census, the details that will be enshrined by law and secondary legislation based on this law are often of a more detailed character than for other primary data collections for official statistics such as sample surveys. There is therefore a certain risk of Ministerial government getting involved in decisions that are listed above as being the core of professional independence. In order to prevent the involvement of Ministerial government in the preparation of detail of legal text proposals, the primary and secondary legislation for censuses should not go beyond listing the characteristics to be covered by the census in a general way, leaving the exact wording of questions in the questionnaire to the statistical system. Legal texts about census should not contain an exhaustive list of tables as outputs, but if any specification of the output at legal level is considered to be unavoidable, it should be in general terms, leaving the exact definitions and the methods of aggregation entirely to the statistical system. The most important aspects of output specification in legal terms refer to impartiality and possibly timeliness.

1418. For the choices to be made under professional independence, the responsible players within the statistical system “need to decide according to strictly professional considerations, including scientific principles and professional ethics” (the second principle), so that the results of official statistics are as reliable a picture of the characteristics of a society as

possible. In most cases, such decisions are not made in a void; there is a recognised stock of international and national professional standards and good professional practices of official statistics for many of the decisions listed above; they can and in most cases should be considered as a valid option at national level, not only because they facilitate international comparisons, but mainly because they offer an impartial and professionally sound solution about methodological issues.

1419. A specific problem of professional independence in the context of a census may arise from the pressure from certain ministries and outside interest groups to see certain characteristics included. This should be avoided by ensuring ministries are visibly included in the NSO's consultations on characteristics for the census. The NSO should publish consultation responses and explain how those responses have assisted the NSO in its decisions. No other form of "pressure" is acceptable and should be reported to the national statistical standards authority or the national parliament.

Impartiality

1420. Impartiality is an important consideration for all phases of the statistical production and dissemination process. It implies, among others, the use of factual and stable terminology for the results to be disseminated, the use of understandable, non-offensive terminology in questionnaires, and the avoidance/correction of any biasing factors in collecting, processing and presenting results, such as the complete omission of certain groups of the population. The most important aspect, however, is the impartiality in making results of official statistics available to all users.

1421. Impartiality in dissemination has several aspects; all results declared as official results have to be publicly accessible, and the dissemination of these results has to be simultaneous for all users, including government users, at dates determined by the statistical system, and not by Ministerial government. Therefore, it is good practice for NSOs to have an advance release calendar. The advance release calendar may be a rolling one, where the release dates become gradually more precise over time. Results may be released as provisional and final in order to be timely, but the principle of impartiality in dissemination must be respected in all cases.

1422. As with other issues within professional independence, the selection of results and the choice of the dates of release have to be based on professional considerations. Once checked for quality and consistency, results should be released as soon as possible. Concerns that certain results may be unwelcome or untimely from the point of view of the government or other important stakeholders should never be taken into account, whether these concerns are expressed explicitly or as second-guessing on the part of statisticians. This would be an infringement of the fundamental principles.

1423. Dissemination is the part of official statistics where attempts to undermine strict adherence to integrity are most likely. Therefore, it is very important that the NSO has acquired a reputation for being strict in this respect in all areas of official statistics, so that there is no room for deviation from an established standard in the particular case of the population census. If there is not a clear history in this respect, the population census, through its high public profile, is an excellent opportunity to build up and promote a new standard of

integrity to be applicable throughout official statistics during and after the census. A solution is to issue census results to Parliament, followed immediately by release of the same material to the public. This arrangement would make pressure from Ministerial government for privileged access an abuse of Parliamentary procedure.

1424. Advance information to certain government departments is sometimes given under embargo, but this practice should be minimised, scrutinised, and the arrangements made public. The purpose of this advance information is that key users in the government can prepare themselves for confronting questions of the media with respect to policy implications of these results. It is not to invite them to comment on the way the NSO disseminates the results. Therefore, this advance information, if used at all, has to be limited in time (not exceeding one day), because the greater the time, the greater the risk of a breach of the embargo, or of attempts to interfere with the dissemination by the NSO.

1425. An often neglected, but essential part of both professional independence and impartiality is the choice of terminology for the results to be disseminated. Decisions about this terminology should be made entirely within the statistical system (that is they should not be imposed from outside), and they need to demonstrate impartiality. There should therefore be a limit to the use of catchwords or the language of advocacy for certain policies, in releases by official statisticians.

1426. Countries may differ in their practice about what impartiality implies for the provision of explanatory comments together with the release of new results. The minimum is to add the definitions and other technical explanations about the coverage and accuracy of the results, so that at least expert users can receive guidance on the correct use. In view of the dissemination to the media and the public at large, this may not be sufficient, especially for benchmark results such as the census. Explanations need to be added that help media, and through them the public, to help them to understand the most significant elements of this new information, and to transform the quantitative information into everyday language that can be easily understood and put into relation to other, non-statistical, information, but without coming into conflict with impartiality. As a minimum, it is the duty of NSOs to distinguish, in quantitative terms, between those parts in developments/differences that are due to changes in methodology when they occur, and those that correspond to “real” changes or differences.

1427. The selection of the most important elements among the many aspects of the new census results for the so-called “story-telling”¹⁴⁹ is not always easy, but marked differences over time, across geographies (both within and between countries), and between population groups are certainly a first promising approach. The message for the media and the public is certainly enriched by comments that allow pointing to causal factors of a development or of differences between groups and areas that show up in the results; but in order not to be in conflict with impartiality, comments of this nature made by official statisticians have to be backed by facts and should never be policy-prescriptive. The Data Quality Assessment Framework (DQAF) of the IMF¹⁵⁰ insists that “products of statistical agencies/units are clearly identified as such”, or, in other words, that comments by other units than the NSO, whether they contain policy-prescriptive comments or not, are clearly separated from NSO products and releases. The art of adding relevant comments to statistical releases is gained with

¹⁴⁹ See the [UNECE Making Data Meaningful guides](#).

¹⁵⁰ IMF (2003). [Data Quality Assessment Framework and Data Quality Program](#).

experience and feedback from users, and should be based on a general policy of the NSO applicable to all areas. The principle of impartiality has to avoid any bias or partisan jargon. The risk of biasing the information is especially present when using charts or maps, where the first impression is the prevailing one for most non-expert users.

1428. Whereas the strict application of the principle of simultaneous dissemination to all users is standard for economic statistics, it is sometimes less strictly applied in demographic and social statistics. There is no professional reason why such a difference between subject areas should persist. One argument is that, because of the low periodicity of certain results in demographic and social statistics, these results need to be discussed and verified with the assistance of outside experts before they are released. However, quality management is an integral part of statistical processes whatever the subject area and the periodicity, and where quality management includes the assistance of outside experts, statistical producers have to make sure that no leakage to ministries or interest groups can arise as by-product of the quality assurance process. This risk is minimised when the necessary expertise for quality control is within the statistical office, or at least within the national statistical system.

1429. A special problem in the context of impartiality arises from the use of aggregate census results for "allocation purposes". This covers uses such as the allocation of seats in the Parliament or other bodies proportional to the benchmark population, or the funding of local governments from the national budget on the basis of statistical parameters, such as the benchmark population. It also covers schemes where funding is tied to eligibility criteria for local or regional entities, one of them being a population (or population ratio) threshold. When the benchmark is renewed through a new census round, fears that the outcome would be unfavourable to one body or another, or be inequitable, may be presented to the NSO in order to influence its choice of methods. If these issues are presented in consultation as issues relevant to NSO decisions this may be acceptable, but in any other circumstance it is not. It risks introducing biases and deviations from good professional practice and standards, and in doing so, the principle of impartiality of official statistics would be violated, since the choice of methods should not be influenced by such considerations (nor by considerations of how the country's ranking in an international league table would be influenced).

1430. An answer to these concerns that is fully compatible with integrity considerations is to clarify the responsibilities of official statisticians and those responsible for the allocation processes, in the light of the fundamental principles. It is the decision of the latter, and not of official statisticians, to define statistical parameters (and certain subjective weights to aggregate them) as key for their decisions on allocation or eligibility. However, their choice is not constrained by the results of official statistics published by the NSO; other options may be a subset of the official overall results (that is excluding certain components), or "adding in" some other elements that are measured separately (provided that sufficiently reliable statistics are available for these elements). The NSO would certainly be able to compile any key according to user specification. However, this should not replace the officially released benchmark result as defined by statisticians, but rather be an additional product with its own status. The distinction between the two is that the NSO bears the full responsibility for the official results, whereas for the user-specified concept, the NSO is only responsible for the accuracy of the information. The responsibility for the concept and the terminology lies with users outside the statistical system.

Institutional safeguards for the NSO following from professional independence and impartiality

1431. Confidentiality, professional independence and impartiality are the key ingredients for the integrity of the NSO and the whole statistical system from the point of view of users and respondents. It is not sufficient that these principles are mentioned in laws. They have to be associated by institutional and organizational safeguards for the NSO and its head. For building and maintaining trust in the eyes of the media, the public, all users and respondents alike, both the existence (and respect) of these safeguards and the clear implementation of all fundamental principles in everyday practice by the NSO are essential.

1432. First and foremost, the NSO has to be free of non-statistical assignments that may create conflict of interests with its core task of producing unbiased statistics about relevant phenomena in the society, or with its obligation to use individual data exclusively for statistical purposes. Any such assignments would prevent the NSO from being perceived as impartial and would risk in being equated with an advocacy instrument for government policies.

1433. Secondly, it is essential that there is no official or unofficial clearance process involving government bodies outside the statistical system for the release of results, for whatever area of official statistics including the census. NSOs must have the right to communicate directly with the media in order to fulfil their dissemination function, without being forced to channel their messages through intermediate government bodies.

1434. Thirdly, as a corollary of professional independence, the head of the NSO has the full responsibility for the professional quality of the results, for the integrity of the whole chain of processes leading to these results and for the strict application of the confidentiality rules for individual data. The process of selecting and appointing the head of the NSO and other senior staff, and the legal and other means of protecting the head against any interference from government or pressure from other interest groups in matters falling under professional independence, or affecting impartiality or confidentiality, is crucial for the integrity and the perception of integrity of official statistics.

1435. In the context of the census, a special organizational issue with implication for integrity may arise through the involvement of government bodies in the data collection process of traditional censuses that are not considered part of the statistical system, notably bodies at local and regional level. Such bodies may have responsibilities other than official statistics that have the potential to create conflicts of interest. It is therefore important that, in addition to stipulating in the law that they are fully subject to the fundamental principles, notably for confidentiality, for all activities in the context of the census, methods to check their compliance are set up and implemented as part of the quality control processes. In view of the eligibility (or non-eligibility) criteria, local administrations may also be tempted to influence the overall results for their area in order to increase (or reduce) the prospects of falling under a certain government scheme (for example introducing bilingual administration if the linguistic minority reaches a certain percentage of the total population). In such cases, special organizational measures that ensure checks and balances at local level may have to be set up on a mandatory basis through the census legislation in addition to the quality control measures of the NSO.

1436. When activities of official statistics are outsourced to private operators (which can be a cost-effective solution for a large and infrequent operation such as the census), the contracts should specify the obligations of the contractors in the same way as if the activity were carried out within the NSO. Any data processed by such contractors must be used by a private contractor only within the terms of the contract, excluding any other purposes, statistical or otherwise. The census law should prescribe that penalty provisions for violations, such as confidentiality breaches, are also applicable to staff from such contractors working for the census.

1437. Any form of delegation of parts of the census activity to either public or private organizations does not in any way diminish the full responsibility of the NSO for the integrity of the whole process from the beginning to the end, and for the official results.

Transparency

1438. The principle of transparency (the third principle) is a necessary counterpart to professional independence. It ensures that official statisticians are fully accountable to the community of users, respondents and taxpayers for their decisions under the umbrella of professional independence. All methods used in the production and dissemination process should be made transparent, so that critical users can question the choices made and ask for reasons. The IMF DQAF asks that for major changes in methodologies advance notice be given before results are disseminated. All dissemination of results must be accompanied by detailed information on sources and methods, which should be accessible to anybody. If results do not reach predefined quality levels, they should be marked accordingly, or not released at all, with the reasons explained publicly and the background material for this decision being open to scrutiny. Any quality assessment of census operations, or parts of it, should also be publicly accessible.

1439. If the principle of transparency seems to impose a burden on NSOs, it is necessary to prevent and counter any accusation of unaccountable “black box” behaviour, which is frequently the first step in accusing statisticians to give in to interference or pressure aimed at shaping results in a certain direction. Transparency is necessary in today’s official statistics, since even in the case of exhaustive operations like censuses results are no longer compiled exclusively as frequency counts, sums or averages, but as a complex and iterative sequence of algorithms including components of “estimation” based on editing, imputing, extrapolating and combining different sources. Transparency is also the prerequisite of making use of the fourth principle, which entitles all statistical producers to comment on erroneous interpretation and misuse of statistics by a third party (including government users of statistics). The decision on when to make use of this right comes under professional independence and lies with statisticians without the need for approval from outside the statistical system.

1440. Another element of transparency is the seventh principle, by which *“the laws, regulations and measures under which the statistical system operate are to be made public”*. Censuses have a particularly voluminous range of regulations, instructions and manuals, given the large number of staff used for most types of censuses, especially traditional ones.

Such material should be available to anybody either on request, or made generally accessible through the web.

Relationship to respondents

1441. According to the fifth principle, burden on respondents is a mandatory consideration for all decisions regarding the choice between primary and secondary data collection and the design of primary data collection. The way this principle is applied in reality is, together with the confidentiality pledge, the essence of the integrity aspect for the relationship between the NSO and respondents. This is especially relevant for a primary data collection in the form of a traditional census where all persons in a country are subject to a response obligation.

1442. The elements of integrity in the relationship to respondents are:

- (a) a selection of questions, strictly based on relevance and the proven inadequacy of less burdensome forms of data collection such as sample surveys;
- (b) a serious effort of testing questionnaires in various local environments through pilot surveys, and of drawing the necessary conclusions by dropping problematic items from the census and directing users towards other forms of data collection;
- (c) a well-designed publicity campaign, starting well ahead of the census date;
- (d) dissemination of clear information to each household, at the latest when the data are collected, about the purposes of the census, the legal basis, the use of the data and the public authorities that have access to individual data, the confidentiality measures, the obligations for respondents and the possible consequences of non-compliance, combined with information where and how additional information about the census can be obtained;
- (e) a way of contacting households and persons at the time of data collection that is proportionate, non-intrusive, and takes into account the sensitivities of special population groups. This implies that field staff is well instructed and trained, and selected so as not to increase resistance from respondents; and
- (f) a carefully designed stepwise policy of reminder/re-contact, and a clearly stated policy when to make use of penalty provisions for non-compliance and for starting an infringement procedure.

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Conference of European Statisticians

Recommendations for the 2030 Round of Population and Housing Censuses

The population and housing census is an important pillar of a national statistical system, providing data on the population and its social, demographic and economic characteristics. In June 2025, the United Nations Economic and Social Council adopted a resolution urging Member States to conduct at least one population and housing census under the 2030 World Population and Housing Census Programme, from 2025 to 2034.

The Conference of European Statisticians Recommendations for the 2030 Round of Population and Housing Censuses provide guidance and assistance to countries in the planning and execution of their population and housing censuses. They reflect the reality and needs of countries of Europe, North America, Central Asia and other countries participating in the Conference of European Statisticians. The Recommendations facilitate and improve the comparability of census data through the identification of a core set of census topics and the harmonization of concepts, definitions and classifications.

The Conference of European Statisticians endorsed the Recommendations in June 2025.

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