



FSO Quality Report

20 Economic and social situation of the population

Neuchâtel, March 2022

SILC18 Quality report

The Federal Statistical Office (FSO) publishes on its website quality reports providing information about the methodology and the definitions used as well as on the quality of the statistical results, thus facilitating interpretation and understanding. The reports are produced first and foremost in order to meet the requirements of Eurostat. For this reason they are only compiled for a limited number of statistics.

The concept of the quality reports is based on the European Statistics System's (ESS) concept of quality contained in the [European Statistics Code of Practice](#).

Statistical presentation

Statistical concepts and definitions

F = Fully comparable L = Largely comparable P=Partly comparable NC = Not collected

Total hh gross income (HY010)	Total disposable hh income (HY020)	Total disposable hh income before social transfers other than old-age and survivors' benefits (HY022)	Total disposable hh income before all social transfers (HY023)
F	F	F	F

Imputed rent (HY030)	Income from rental of property or land (HY040)	Family/ Children related allowances (HY050)	Social exclusion payments not elsewhere classified (HY060)	Housing allowances (HY070)	Regular inter-hh cash transfers received (HY080)	Interest, dividends, profit from capital investments in incorporated businesses (HY090)	Interest paid on mortgage (HY100)	Income received by people aged under 16 (HY110)	Regular taxes on wealth (HY120)	Regular inter-hh transfers paid (HY130)
L	F	F	F	F	F	F	F	F	NC (included in HY140G)	F

Cash or near-cash employee income (PY010)	Other non-cash employee income (PY020)	Income from private use of company car (PY021)	Employer's social insurance contributions (PY030)	Cash profits or losses from self-employment (PY050)	Value of goods produced for own consumption (PY070)	Unemployment benefits (PY090)	Old-age benefits (PY100)	Survivor's benefits (PY110)	Sickness benefits (PY120)	Disability benefits (PY130)	Education-related allowances (PY140)	Gross monthly earnings for employees (PY200)
L	NC (included in PY010)	NC	F	F	NC	F	F	F	F	F	F	L

The source or procedure used for the collection of income variables	The form in which income variables at component level have been obtained	The method used for obtaining target variables in the required form
In Switzerland, compensation offices collect social security contributions while calculating and paying out allowances and benefits. The Central Compensation Office, which centralises data, is able to provide information on income arising from paid employment and self-employment, on income received by people under the age of 16, on 1st pillar old-age, survivor or disability pensions, on unemployment benefits and loss of earnings allowances. Information contained in the register of the Central Compensation Office (CCO) is used to fill in item non-response and validate or amend responses given by telephone. Most income variables are collected solely through the CATI. However, in regard to some income sub-components, this information was reconciled with data from the Central Compensation Office register to improve reliability. This relates to the following income sub-components: Cash profits or losses from self-employment (PY050G) and income received by people aged under 16 (HY110G). From SILC2017 on, survivor and disability pensions (PY110G and PY130G), First-pillar old-age pensions (PY100G), Unemployment benefits (PY090G) and loss of earnings allowances (sub-components of HY050G and HY060G) are not collected anymore through the CATI, but only filled in with registers. Employee cash or near-cash income (PY010G) is only surveyed through CATI in certain particular cases, but for most people the question is not asked. The Swiss Social Assistance Statistics register enables the HY060G to be filled.	Respondents are asked to provide gross amounts for all income variables except cash or near-cash employee income (PY010G) and cash profits or losses from self-employment (PY050G). In this instance, the CATI respondent may give gross or net income. Income taken from the CCO register corresponds to gross amounts.	Employee cash or near-cash income (PY010G) Net income from employment is gross income minus social insurance contributions. These contributions, comprise various insurances: state pension funds (first pillar) and occupational pensions (second pillar). Contribution rates for the first pillar are fixed, whereas those relating to the second pillar vary by age and gender, pension plan and sector of employment. Contributions may even vary between companies. Premium rates for accident insurance depend on employer and wage level. Rates vary greatly from one pension plan to another. Data from the FSO Swiss Earnings Structure Survey can be used to calculate average contribution rates by industry (NOGA). As such, gross-net conversion rates by sector of employment, age bracket and gender were used for calculating gross income for the few people for which CATI is used. Cash profits or losses from self-employment (PY050G) Self-employed workers pay first-pillar social-insurance contributions on their income. Membership of an occupational pension plan is optional. Self-employed workers' rates are obtained from a sliding scale. Net income can be determined by using the appropriate rate.

Employee cash or near-cash income (PY010G)/Non-cash employee income (PY020G)

Data is taken from registers (CCO) and includes *Benefits in kind* (PY020G), which cannot be distinguished from *Employee cash or near-cash income* (PY010G).

Regular Taxes on wealth (HY120G)/ Tax on income and social contributions (HY140G)

Wealth tax is not distinguished from income tax. Both types of taxation feature under *Tax on income and social contributions* (HY140G). It also includes mandatory health-insurance premiums (LAMal).

Total disposable household income (HY020)

In contrast to Eurostat directives, the variable *Non-cash employee income* (PY020G) is part of total gross household income because this component is not distinct from employee income within the CCO register (see PY010G above). Conversely, the variable *Company*

car (PY021G) is not included as this is not computed.

Gross monthly earnings for employees (PY200)

It is calculated using PY010 and PY020 and, as indicated above, PY010 includes *Non-cash employee income* (PY020G).

Value of goods produced for own consumption (PY070G)

This variable is not collected as the value of goods produced for own consumption is not a material income component in Switzerland. According to the FSO Household Budget Survey, this variable represented in 2018 an average of 0.1% of gross income.

Statistical processing

Detailed information concerning sampling frame, sampling design, sampling units, sampling size, weightings and mode of data collection can be found in this section. Such information is mainly used for the computation of the accuracy measures.

Source data

After a four years transition, all waves now have been drawn from the SRPH survey frame.

Sampling design and procedure

Type of sampling design
Proportional, stratified design
Stratification and sub stratification criteria
The seven major geographical regions (level NUTS2)
Sample selection schemes
Distribution of the sample within each stratum is defined by the size of these strata in the sampling frame. The sample is formed on a rotating basis. Every year, four sub-samples are surveyed. A little more than one-quarter of the sample is renewed every year to replace households that have finished their 4 year cycle.
Sample distribution over time
Fieldwork for the SILC survey was carried out by a private research institute, DemoSCOPE, between March and September.

Sampling unit

Sampling units (one-stage) are households made up of permanent residents in Switzerland in which, wherever possible, all individuals aged 16 or over are interviewed (two-stage). Non-permanent residents living in a household with at least one permanent resident are also included.

Sampling rate and sampling size

Concerning the SILC instrument, three different sample size definitions can be applied:

- the actual sample size which is the number of sampling units selected in the sample
- the achieved sample size which is the number of observed sampling units (household or individual) with an accepted interview
- the effective sample size which is defined as the achieved sample size divided by the design effect with regards to the at-risk-of poverty rate indicator

Given that the effective sample size has been already treated in the section dealing with sampling errors, in this section the attention focuses mainly on the achieved sample size.

Frequency of data collection

Fieldwork for the SILC survey was carried out by a private research institute, DemoSCOPE, between February and September. Addresses of the households in the sample were split into four distinct batches, independent from rotational groups. A few days before the activation date of each batch when interviewers started calling, survey introduction letters were sent out to the households concerned. By using time distribution, management of contacts and appointments could be optimised in line with the research institute's resources. Moreover, one of our targets for all households was to minimise the time between letter receipt and initial contact. As shown in the annexed table, most interviews occurred between March and June.

Data collection

Mode of data collection

The survey institute DemoSCOPE based in Adligenswil (LU) conducted the SILC interviews in 2018 for the first time. Data are collected using a questionnaire completed over the phone (CATI). In some cases, when households refuse to take part in the CATI, a face-to-face questionnaire (CAPI) is offered. If households choose this option, all members of that household are expected to participate in this type of interview.

1-PAPI (% of total)	2-CAPI (% of total)	3-CATI (% of total)	4-Self administrated (% of total)
0	0.2	99.8	0

The mean interview duration

The mean interview duration per household is calculated as the sum of the duration of all household interviews (included grid interviews) plus the sum of the duration of all personal interviews, divided by the number of household questionnaires completed. Only households accepted for the database have to be considered.

Average interview duration = 62.6 minutes.

Data compilation

Weighting procedure

See appendix Weightings

Estimation and imputation

See appendix Estimation and imputation

Accuracy and reliability

Definition

Closeness of computations or estimates to the unknown exact or true values that the statistics were intended to measure.
Reliability of the data, defined as the closeness of the initial estimated value to the subsequent estimated value.

The concept of accuracy refers to the precision of estimates computed from a sample rather than from the entire population. Accuracy depends on sample size, sampling design effects and structure of the population under study. In addition to that, sampling errors and non sampling errors need to be taken into account. Sampling error refers to the variability that occurs at random because of the use of a sample rather than a census and non-sampling errors are errors that occur in all phases of the data collection and production process.

Accuracy - overall

In terms of precision requirements, the EU-SILC framework regulation as well the Commission Regulation on sampling and tracing rules refers respectively, to the effective sample size to be achieved and to representativeness of the sample. The effective sample size combines sample size and sampling design effect which depends on sampling design, population structure and non-response rate.

Sampling error

EU-SILC is a complex survey involving different sampling design in different countries. In order to harmonize and make sampling errors comparable among countries, Eurostat (with the substantial methodological support of Net-SILC2) has chosen to apply the "linearization" technique coupled with the "ultimate cluster" approach for variance estimation. Linearization is a technique based on the use of linear approximation to reduce non-linear statistics to a linear form, justified by asymptotic properties of the estimator. This technique can encompass a wide variety of indicators, including EU-SILC indicators. The "ultimate cluster" approach is a simplification consisting in calculating the variance taking into account only variation among Primary Sampling Unit (PSU) totals. This method requires first stage sampling fractions to be small which is nearly always the case. This method allows a great flexibility and simplifies the calculations of variances. It can also be generalized to calculate variance of the differences of one year to another.

The main hypothesis on which the calculations are based is that the "at risk of poverty" threshold is fixed. According to the characteristics and availability of data for different countries we have used different variables to specify strata and cluster information. In particular, countries have been split into four groups:

1. BE, BG, CZ, IE, EL, ES, FR, IT, LV, HU, NL, PL, PT, RO, SI, UK and HR whose sampling design could be assimilated to a two stage stratified type we used DB050 (primary strata) for strata specification and DB060 (Primary Sampling Unit) for cluster specification;
2. DK, DE, EE, CY, LT, LU, AT, SK, FI, CH whose sampling design could be assimilated to a one stage stratified type we used DB050 for strata specification and DB030 (household ID) for cluster specification;
3. MT, SE, IS, NO, whose sampling design could be assimilated to a simple random sampling, we used DB030 for cluster specification and no strata;

Sampling error - indicators

	AROPE			At risk of poverty (60%)			Severe Material Deprivation			Very low work intensity		
	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)
Total	17.4	0.8	1.5	14.6	0.7	1.4	2.1	0.4	0.8	6.1	0.6	1.2
Male	16.7	0.9	1.8	14.1	0.9	1.7	2.3	0.6	1.1	6.0	0.7	1.4
Female	18.1	0.8	1.5	15.0	0.7	1.4	1.8	0.3	0.6	6.3	0.6	1.3
Age0-17	21.0	1.8	3.5	19.0	1.8	3.5	3.3	1.2	2.3	5.4	1.1	2.1
Age18-64	14.8	0.8	1.5	11.0	0.7	1.4	2.2	0.4	0.7	6.4	0.6	1.1
Age 65+	23.3	1.0	2.0	23.1	1.0	2.0	0.3	0.1	0.2			

Non-sampling error

Non-sampling errors are basically of 4 types:

- Coverage errors: errors due to divergences existing between the target population and the sampling frame.
- Measurement errors: errors that occur at the time of data collection. There are a number of sources for these errors such as the survey instrument, the information system, the interviewer and the mode of collection
- Processing errors: errors in post-data-collection processes such as data entry, keying, editing and weighting
- Non-response errors: errors due to an unsuccessful attempt to obtain the desired information from an eligible unit.

Two main types of non-response errors are considered:

Unit non-response: refers to absence of information of the whole units (households and/or persons) selected into the sample.

Item non-response: refers to the situation where a sample unit has been successfully enumerated, but not all required information has been obtained

Coverage error

The w1 sample is drawn from the FSO SRPH survey framework. This framework contains data from the population register, based on cantonal and communal registrations. These data are extremely reliable despite the possibility of minor errors due mainly to the time it can take to update the register when some or all of the household move house. When a household and the individuals it contains is included in the sample, the composition of the household as defined in the SRPH is checked in the grid questionnaire. If the composition is incorrect as certain individuals have left the household, they continue to be monitored (split w1). If, in contrast, an individual living in the household was not included in the SRPH composition, they will nevertheless be monitored in the longitudinal survey. In this event, the probability of being sampled directly, in one's household according to SRPH is added to the probability of being sampled indirectly in one's actual household. This problem has been corrected by the weighting in terms of weight distribution.

Over-coverage - rate

	Main problems	Size of error
Cross sectional data	• Over-coverage • Under-coverage • Misclassification	• 0.02% • 0.45% • NA

Measurement error

Source of measurement errors

Measurement errors in the SILC survey may arise from the following sources:

- **The questionnaire**, owing to its structure, form, content, and the way in which questions are formulated. Moreover, as the questionnaire is available in three national languages, errors relating to translation or text interpretation may arise.
- **Data-collection method** (CAPI or CATI).
- **Interviewers** may influence the answers given by the respondent.
- The **respondent** may unwittingly or otherwise supply erroneous information.

While such errors are inevitable, the following processes have been implemented to keep such errors to a minimum.

Building process of questionnaire

The SILC survey is comprised of five questionnaires:

- A **grid questionnaire** which is answered by an individual – wherever possible an adult – who is well aware of the household's composition. The person answering the questionnaire basically has to check that the register information is correct.
- A **household questionnaire** which preferably is answered by the individual responding to the grid questionnaire or who at the very least is well aware of the household's economic situation. It gathers information on housing conditions and sources of income that are difficult to attribute to household members.
- An **individual questionnaire** for all household members aged 16 or over.
- An **adult proxy form**, which replaces the individual questionnaire if the person concerned is unable to respond (e.g. due to disability or an extended leave of absence). This may be answered by another individual aged 16 or over.
- A **child proxy** for each child aged 12 years or under, which is submitted to the person answering the household questionnaire once the latter has been completed.

Questions focus on Eurostat variables and modules, in addition to extra modules that may be requested by other FSO departments or by the government. In 2018, the national module "Wealth" concerning household and individual questionnaire was added. These various questionnaires were drawn up under Eurostat regulations and are similar for the two data-collection methods (CATI and CAPI). Income components were collected in detail, wherever possible from the individual directly concerned, or otherwise through the proxy (in which case total income and source of income are noted).

Questions concerning income focus on income sub-components so that the respondent does not have to add up amounts, and to minimise the risk of item non-response. Likewise, to keep errors of estimation, memorisation or comprehension to a minimum, respondents have the option of stating either annual or monthly amounts for all types of income. For income stemming from employment or self-employment, respondents can provide gross or net figures. Where these alternatives are not helpful enough to respondents, it is then possible to provide an annual estimate or choose ranges of answers (ordinal categorical). These ranges are used as imputation boundaries. However, this rarely occurs as most income amounts regarding employment are filled with register data.

Interview training

The FSO staff were able to listen in on interviews and interviewers whose performance was insufficient were retrained and removed from the SILC survey if problems persisted. FSO members of staff were included in the sample as test households.

On the request of the FSO, the DemoSCOPE institute organised intermediate training sessions for interviewers on specific SILC topics. The institute trained special groups of interviews to contact certain households, for example those who had already refused to take part in the survey.

Quality control

To limit data-collection errors, filters and input controls (plausi-online) were inserted into CATI and CAPI. These plausibility checks can be used to detect incoherent responses in relation to other variables or unusual answers (e.g. amounts which are too low or too high) as well as input errors by the interviewer (e.g. an extra zero added to an amount).

A wide selection of baseline questionnaire variables were evaluated using cognitive interviews aimed at pinpointing comprehension problems. As the Swiss SILC questionnaire is drawn up in the three official languages (German, French and Italian), consistency analysis is conducted between the three versions.

As SILC questionnaires are relatively long and complex, it is particularly important to check that the CATI program corresponds precisely to the questionnaire's specifications.

Two types of control are carried out:

- Qualitative controls of the CATI system, in comparison with the questionnaire's specifications (existence and order of questions, repeat of questions and arrangements in the three languages, question readability and presentation, and workings of filters and plausi-online).
- Quantitative controls, with approximately 15 predefined response scenarios input into the CATI system. These data are then exported and compared with the expected response codes.

Non response error

Non-response errors are errors due to an unsuccessful attempt to obtain the desired information from an eligible unit. Two main types of non-response errors are considered:

Unit non-response which refers to the absence of information of the whole units (households and/or persons) selected into the sample. According to the Commission Regulation 28/2004:

Household non-response rates (*NRh*) is computed as follows:

$$NRh = (1 - (Ra * Rh)) * 100$$

Where *Ra* is the address contact rate defined as:

Ra = Number of address successfully contacted / Number of valid addresses selected

and *Rh* is the proportion of complete household interviews accepted for the database

R_h = Number of household interviews completed and accepted for database / Number of eligible households at contacted addresses

Individual non-response rates (NR_p) will be computed as follows:

$$NR_p = (1 - (R_p)) * 100$$

Where R_p is the proportion of complete personal interviews within the households accepted for the database

R_p = Number of personal interview completed / Number of eligible individuals in the households whose interviews were completed and accepted for the database

Overall individual non-response rates ($*NR_p$) will be computed as follows:

$$*NR_p = (1 - (R_a * R_h * R_p)) * 100$$

For those Member States where a sample of persons rather than a sample of households (addresses) was selected, the individual non-response rates will be calculated for 'the selected respondent', for all individuals aged 16 years or older and for the non-selected respondent.

Item non-response which refers to the situation where a sample unit has been successfully enumerated, but not all the required information has been obtained.

Unit non-response - rate

Cross sectional data											
Address contact rate (R_a)*		Complete household interviews (R_h)*		Complete personal interviews (R_p)*		Household Non-response rate (NR_h)*		Individual non-response rate (NR_p)*		Overall individual non-response rate ($*NR_p$)*	
A*	B*	A*	B*	A*	B*	A*	B*	A*	B*	A*	B*
86.5	72.5	60.5	45.6	98.0	98.0	47.7	66.9	2.0	2.0	48.7	67.6

* All the formulas are defined in the Commission Regulation 28/2004, Annex II

A* = Total sample; B = * New sub-sample

Item non-response - rate

The computation of item non-response is essential to fulfil the precision requirements concerning publication as stated in the Commission Regulation No 1982/2003. Item non-response rate is provided for the main income variables both at household and personal level.

Item non-response rate by indicator

see appendix Item non-response

Processing error

Data entry and coding	Editing controls
The data-preparation process is long and complex. The various stages of the process are used to improve the quality of the collected data. Basic data processing is conducted as follows: • Data input by interviewers • Online plausibility checks • Integrity checks on data exported by the research institute (format of variables, method, filters, basic ties between individuals and households) • Data consolidation (construction of uniform income components on an annual basis and construction of other variables) • Integration of register data and quality control (consistency and excessive values). • Imputation • Weighting • Calculation of national target variables and EU-SILC European variables Controls are implemented in each of these stages to limit the occurrence of processing errors. To maximise the scope for detecting programming errors, a dual control is put in place for important program along with the systematic alternation of the step leader every year. During consolidation stages, Excel tables are used to document rules of consolidation.	Stages of consolidation process sub-components separately but with no tests for quality. As such, they do not identify errors arising from confusion between various income sources, which may lead to the inputting of duplicate entries. The occupational pension plan system in Switzerland is relatively complex as it is comprised of three "pillars": the compulsory state pension, occupational pension and voluntary private contributions. Some people, especially the elderly, sometimes have trouble correctly identifying their sources of income (1st pillar - 2nd or 3rd pillar; income from employment - self-employment, etc.). The vast majority of interviews are conducted by telephone and respondents have to rely solely on their own recollections in answering the questionnaires. The quality-control stage, designed to keep this kind of error to a minimum, is comprised of various tests on income variables, such as detection of duplicate entries (identical sum but located under another income variable, same amount but assigned to a different member of the household, etc.), identification of excessive values and possible inconsistency between various sources of income. Quality control combines automatic and manual processing. Regarding manual processes, documentation setting out the main processing rules has been introduced, with a dual check used for doubtful cases. Nevertheless, manual processes hinge heavily on the subjectivity of the person carrying them out and are problematic in terms of reproducibility and process duration. When working with SAS data, the logging of changes is also problematic. A fluent organisation is required to avoid losing traceability of changes and to retain the possibility of backtracking should an error be identified at a later stage. As such, for each sub-stage, an input file and an output file (corresponding to the file after revisions) are both created, making it possible to detect what has been modified and to retrieve variables' initial values.

Imputation - rate

see appendix Estimation and imputation

Coherence and comparability**Definition**

Adequacy of statistics to be reliably combined in different ways and for various uses and the extent to which differences between statistics can be attributed to differences between the true values of the statistical characteristics.

According to the Regulation (EC) No 1177/2003 of the European Parliament and of the Council concerning EU-SILC: "Comparability of data between Member States shall be a fundamental objective and shall be pursued through the development of methodological studies from the outset of EU-SILC data collection, carried out in close collaboration between the Member States and Eurostat".

Although the best way for keeping the comparability of data is to apply the same methods and definitions of variables, small departures of the definitions given by Eurostat are allowed in EU-SILC. In this way, the mentioned Regulation in its article 16th says: "Small departures from common definitions, such as those relating to private household definition and income reference period, shall be allowed, provided they affect comparability only marginally. The impact of comparability shall be reported in the quality reports."

The coherence of two or more statistical outputs refers to the degree to which the statistical processes, by which they were generated, used the same concepts and harmonised methods. A comparison with external sources for all income target variables and the number of persons who receive income from each 'income component' will be provided, where the Member States concerned consider such external data to be sufficiently reliable.

Comparability - geographical

Reference population

Reference population	Private household definition	Household membership
The reference population is people living in private households (i.e. not in institutions) where at least one of the residents lives permanently	A private household is a person or group of people who live in the same unit of accommodation and who pool expenditure for necessities.	Making up a same household are: • All persons who regularly live in the same accommodation • Subtenants, visitors, servants or au pairs, providing that they live in the household for a duration of no less than 6 months or who do not have other accommodation • Persons with or without family ties who live in the accommodation but who are absent for no longer than 6 months • Persons with family ties for whom the accommodation is the main residence and who have been absent for longer than 6 months but who plan to return to live there • Children living in shared custody

Reference Period

Period for taxes on income and social insurance contributions	Income reference periods used	Reference period for taxes on wealth	Lag between the income ref period and current variables
Social insurance contributions are calculated on the basis of income. Correspondingly, the reference period will be the same as for income, 2017.	Reference period for income variables is 2017	Amounts relating to (income and wealth) taxation are from the 2017 calendar year	As interviews took place between March and September 2018, the time lag between 2017 data and those corresponding to the time of the interview is 9 months at the most.

Comparability - over time

See appendix Coherence.

Coherence - cross domain

See appendix Coherence.

Coherence – internal

See appendix Coherence.

DataSet Comment

Definition

Supplementary descriptive text.

A detailed report was written for SILC 2014, describing the changes in method and sampling frame. SILC 2018 is very much comparable. This report is available under:

<https://www.bfs.admin.ch/asset/en/be-e-20.03.04.05>

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