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**20 Economic and social situation of the population**

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# Quality Report

(Based on) 2014 EU-SILC cross-sectional data,  
Switzerland

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## Foreword

The main purpose of this report is to provide detailed documentation of the consequences of the change in the survey base, in terms of methodology and of results.

The SILC survey in Switzerland started in 2007. This intermediate report concerns only the cross-sectional data from EU-SILC 2014.

Switzerland published 2014 SILC findings on 25 April 2016. Indicators in Switzerland use a definition of income that takes imputed rent into account in contrast to the common cross-sectional EU indicators posted on the web by Eurostat on 21 April 2016. Updating of 2014 SILC data was finalised on 4 April 2016. Statistics contained in this report are based on this latest version.

Fieldwork for the SILC survey is carried out by a private research institute. Further information has been collected from several registers.

Euro equivalents (€) for sums given in Swiss francs (CHF) have been calculated based on the exchange rate (CHF 1= €1.2311) provided by Eurostat for calculating the 2014 indicators.

## 1. Sampling

### 1.1. Type of sampling plan and stratification

The sampling plan of the SILC survey in Switzerland uses a proportional, stratified design structured around the seven major geographical regions (level NUTS2\*). Distribution of the sample within each stratum is defined by the size of these strata as set out by the federal census of 2000.

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. Basic socio-demographic information for children below 16 is gathered using the grid questionnaire to which an adult responds.

### 1.2. Sampling framework

The first sample (wave 1) was drawn from the SRPH survey base in 2014. Previously, the sample had been drawn from the CASTEM (v2-3-4) survey base. This means that the sample for SILC14 consisted of a combination of people drawn from two different survey bases. This change in the survey framework had an impact on several stages of the survey. For this reason an outline of the structures and differences between these two frameworks is given below.

#### *CASTEM*

This FSO survey framework for surveys of households and target individuals was used until 2013. It is based on the directories of landline telephone numbers operated by all providers in Switzerland, as well as ex-directory landline numbers. Households with no landline connection do not appear in the directories. The advantage of this base was the availability of a telephone number for all households sampled, although some numbers lay outside the framework (secondary residences for example: overall over-coverage of 5% for SILC13). Its greatest disadvantage was the under-coverage of all households without a landline and only mobile telephones (ALTEL households, see below). Another drawback was the lack of information on the household and its members other than the person's name under which the number was registered. With regard to total non-response households, only the location was known, which was why a non-response survey was introduced (see 2.2).

#### *SRPH*

The new survey framework is based on the communal and cantonal population registers in which all persons resident in Switzerland have to be registered. The registers contain information such as the names of people living in a household, their age, sex, nationality AVS/AHV insurance number, etc. but not their telephone number. This valuable information can be used to simplify the questionnaire grid but also to better establish the profile of non-respondents (see Weightings ch. 4), or to link AVS/AHV numbers with other register data (see 3.1) for the whole of the gross sample.

The main consequence of the change in the survey framework was the introduction of a new sub-population with no known landline number. This sub-population, which has been increasing in size for several years, represented roughly 19% (persons living in households with no known landline number) of the wave 1 gross sample in 2014. In this document, such households or persons are called ALTEL, whereas persons with a known landline number are called CASTEM. Once the SRPH sample has been drawn, the sample is completed with a list of telephone numbers that telephone operators are obliged to make available to the FSO, in accordance with the Federal Statistics Act. This list contains all private landline numbers, including those that are ex-directory. Once these numbers have been added to the sample, some 25% of addresses still have no known number (ALTEL households).

As ALTELS are not representative of the population, analyses were carried out to determine their and to measure the impact of their introduction to the sample on the main indicators (ch.7.4). Results shown in the

Table 1 show that ALTELS represent a younger population (50% of ALTELS are aged under 44) that tends to live alone or as a couple, and one that contains more foreigners from Southern Europe and other countries.

**Table 1 Comparison of the composition of sub-populations ALTEL and CASTEM in the SRPH, by various socio-demographic characteristics.** Colours highlight the over/under-representation in relation to the total population.

Distribution of households	ALTEL %	CASTEM %	Total %
<b>Age group of the oldest person in household</b>			
Up to age 34	25.3%	8.3%	12.9%
35 - 44 years	25.5%	19.7%	21.3%
45 - 54 years	23.8%	27.6%	26.6%
55 - 64 years	14.0%	18.9%	17.5%
65 - 74 years	7.0%	13.7%	11.9%
75 years and more	4.4%	11.9%	9.9%
<b>Household type</b>			
110: Single person aged under 65	18.6%	7.0%	10.2%
130: Single person aged 65 years or older	3.3%	5.9%	5.2%
210: Couple aged under 65 without child	18.1%	13.9%	15.0%
230: Couple aged over 65 without child	4.9%	14.0%	11.5%
300: Couple with at least one child (aged under 25)	35.7%	40.6%	39.3%
400: Single person with at least one child (aged under 25)	6.9%	4.8%	5.4%
500: Couple with adult child(ren) (at least one aged over 25)	6.9%	7.2%	7.1%
900: Other	5.5%	6.7%	6.4%
<b>Household composition by sex</b>			
Men and women	71.1%	83.2%	79.9%
Only men	16.0%	6.5%	9.1%
Only women	12.9%	10.3%	11.0%
<b>Distribution of persons</b>			
<b>Nationality group</b>			
Swiss	62.8%	80.8%	75.9%
Northern and western Europe	8.5%	6.1%	6.7%
Southern Europe	12.3%	6.4%	8.0%
Other countries	16.4%	6.8%	9.4%
<b>Residence permit</b>			
None (Swiss nationals)	62.8%	80.8%	75.9%
C permit	19.9%	13.3%	15.1%
B and other permits	17.2%	5.9%	8.9%

Over-representation:  $\geq 1.5$  times

Over-representation: [1.2 and 1.5[ times

Under-representation:  $\geq 1.5$  times

Under-representation: [1.2 and 1.5[ times

Whereas the CASTEM register was composed of telephone numbers, and therefore of addresses and households, the type of sampling used for the SRPH is based on households with a certain number of persons. Should an error occur in the framework (if a person leaves the household, for example, or two actual households are drawn as one in the SRPH), all co-residents living in the household will be monitored starting from wave 1 (see adaptation of monitoring rules). This situation did not arise with CASTEM.

### 1.3. Sample size and allocation criteria

The sample size per stratum is the product of the number of households living in the major regions as determined by the census of 2000 (proportional, stratified sample).

**Table 2 Sample distribution in terms of households per stratum, wave 1, 2014**

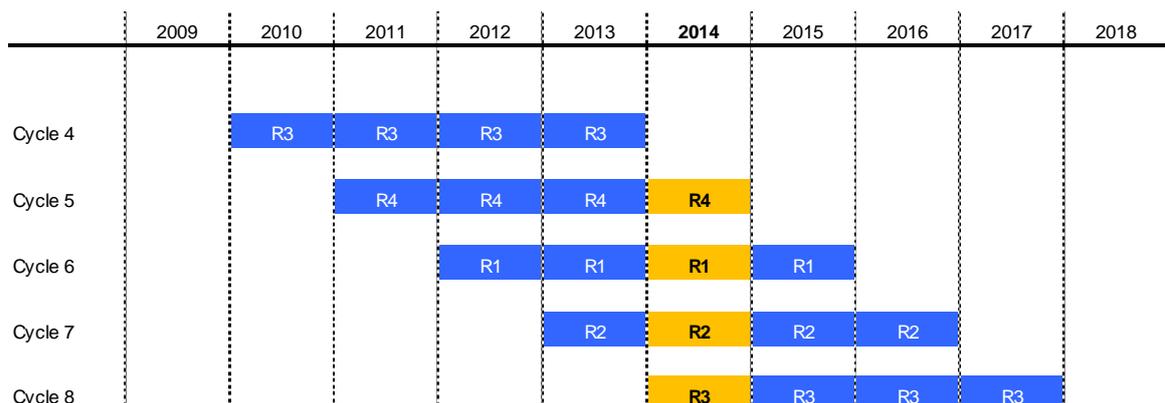
Stratum	Canton	2000 census	Gross sample (households)
			Real
Lake Geneva region	VD, VS, GE	18.22%	720
Espace Mittelland	BE, FR, SO, NE, JU	22.92%	905
Northw est Sw itzerland	BS, BL, AG	13.86%	547
Zurich	ZH	18.22%	720
Eastern Sw itzerland	GL, SH, AR, AI, SG, GR, TG	13.70%	541
Central Sw itzerland	LU, UR, SZ, OW, NW, ZG	8.75%	346
Ticino	TI	4.33%	171
<b>Total</b>		<b>100.00%</b>	<b>3950</b>

The sample drawn in 2014 was added to samples from 2011, 2012 and 2013 (see 1.4). The structure of the net sample, adjusted for non-response, is detailed in section 2.4.

### 1.4. Renewal of sample: rotational groups

The sample is formed on a rotating basis. Every year, four sub-samples picked using the scheme set out under 1.2 are surveyed. One-quarter of the sample is renewed every year to replace households that have finished their 4 year cycle. Each new cycle is allotted the number of the rotational group that has expired.

**Figure 1 Time distribution of rotational groups**



The 2014 SILC sample is thus composed of :

- units selected in 2011 (cycle 5, R4) which are in their fourth and last interview year
- units selected in 2012 which are in their third interview year (cycle 6, R1)
- units selected in 2013 which are in their second interview year (cycle 7, R2)
- new units selected in 2014 which are in their first interview year (cycle 8, R3)

Household participation over several years is important because changes in living conditions for Swiss resident households can be measured, yielding a better understanding over a period of time of phenomena such as the impact of young people's entry into the labour force, that of a birth, a divorce or retirement. Furthermore, with one-quarter of the sample renewed annually, births and migrations can be taken into account.

## 1.5. Breakdown of sample into time-activated batches

Addresses of the households in the sample were split into three distinct batches, independent from rotational groups. On the activation date of each batch, survey introduction letters were sent out to households concerned (Table 3). 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. Telephone interviews began on 19 March and ended on 3 July, at which point the marginal rate of new respondent households had dropped to close to zero.

Table 3 indicates the number of addresses activated by batch, the percentage of the total, the activation date (i.e. when the introduction letter was sent out) and the number of effective workdays at the research institute. The three batches were similar in size.

**Table 3 Breakdown of gross sample addresses into time-activated batches**

	Number of households	%	% cumulated	Activation date
Batch 1	3 588	33.45%	33.45%	19.03.2014
Batch 2	3 585	33.41%	66.86%	31.03/2.4.2014[1]
Batch 3	3 555	33.14%	100.00%	24.04.2014
<b>Total</b>	<b>10 728</b>	<b>100.00%</b>		

[1] Activation date for the Bern centre is later than that for Lausanne

A table of the breakdown of interviews over time (appendix 9.4) indicates that the majority take place between March and May.

## 1.6. Sampling errors

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 (see 1.2). 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 as a longitudinal. 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.

- Under-coverage : 0.45%
- Repetition: no information
- Over-coverage : 0.02%

## 2. Fieldwork

The FSO prepares the questionnaire and sends the letters of notification. All telephone contacts are then made by a private survey institute, MIS Trend, on behalf of the FSO.

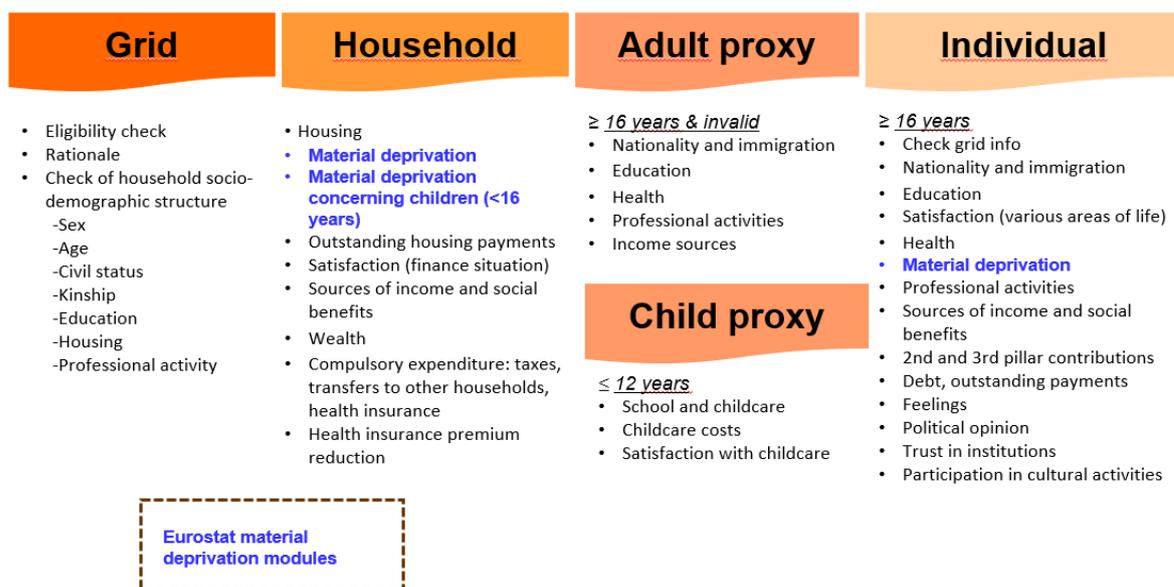
### 2.1. Questionnaire

#### Questionnaire structure

The SILC survey is comprised of five questionnaires (Figure 2):

- A grid questionnaire which is answered by an individual – wherever possible an adult – who is well aware of the household's composition. Informations from SRPH enabled the size of the grid to be reduced in comparison to 2013. 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.

Figure 2 Coordination of 2014 questionnaires



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 2014, the Eurostat module “Material deprivation” concerning household and individual questionnaires 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 who was 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, see section 18 on the exhaustiveness of income sources). These ranges are used as imputation boundaries.

### ***Testing questionnaire quality***

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 from 2008 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.

The findings from these various cognitive tests were used to adapt some formulations and improve accompanying instructions. On the whole, findings from cognitive interviews were relatively positive, with most SILC questions giving rise to only minor issues.

### ***Management of metadata by the SDMX system***

The SILC questionnaire is managed in SDMX\*. This means that changes to questions can be traced in the survey institute's CATI system as automatically as possible (phrasing, question order and response format and method) in order to avoid programming errors. Only online plausibility checks and filters have to be programmed manually, even if they are also documented in SMDX\* (in SDMX\* metadata filters are defined on the basis of criteria for a question to be asked whereas the CATI system works with filters that refer to the next question).

### ***Testing programming of questionnaires in the CATI system***

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:

1. 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).
2. 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.

## **2.2. Contacts with households**

Contacting the households allows us to keep them informed, to rekindle the initial contact and to motivate them to participate in the survey. A detailed plan of the stages of household contact is shown in the appendix 9.6.

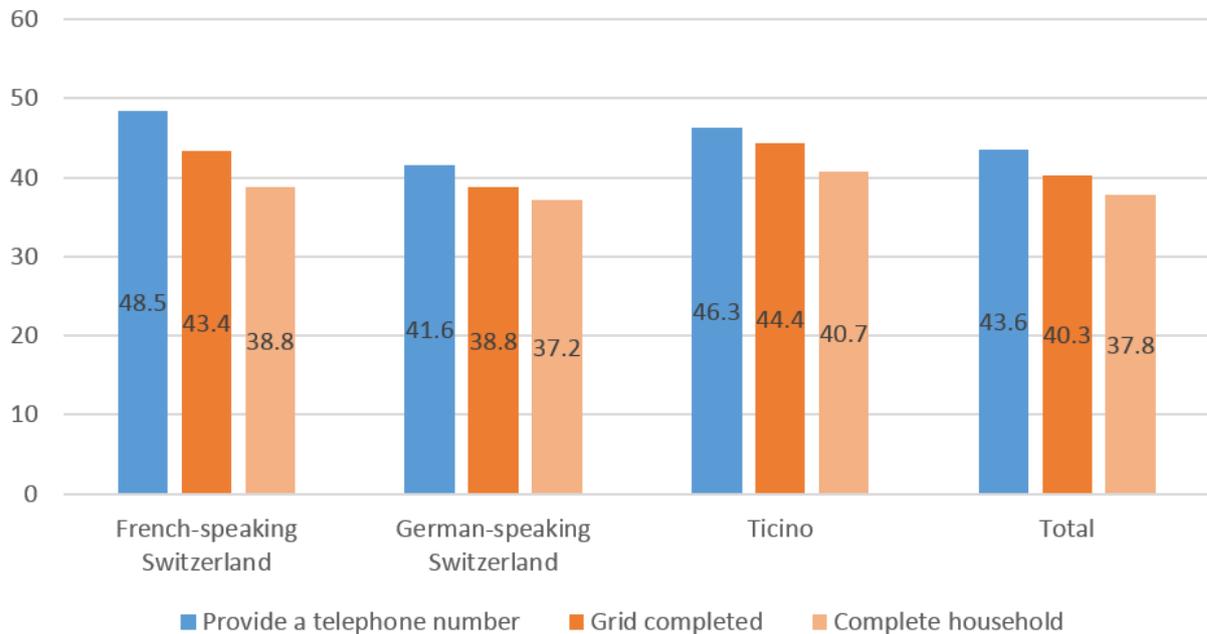
With the new survey framework, in wave 1, a household and everyone it includes are sampled, whereas previously the household linked to the telephone number was sampled. Furthermore, the names, first names and ages of all household members of the sampled household are now known and enable post to be addressed individually. As a result of tests carried out to assess cost-effectiveness and the perception of respondents with regard to the different ways in which the initial letter was addressed, it was decided to send one letter per married couple that could be identified as such in the household, as well as one letter per unmarried adult (aged 18 and over). For households comprising two people who were not identified as a couple, one letter was sent, addressed to both names.

Although the new survey framework contains a great deal of socio-demographic information on the household composition, it does not include a telephone number. The new survey base, therefore, has to be combined with the former base CASTEM to allow the household to be contacted following the initial letter. Households without a land-line telephone number or registered mobile number (ALTEL households, approx. 25% of gross sample) can only be contacted by post. Members of such households aged 18 and over (see below conditions applying to addressing of multiple letters) are sent a letter containing an unconditional compensation of CHF 5, asking them to inform us of their telephone number. They have several ways of doing this: by text, email or fax, by internet on the MIS site using the user name and password sent with the initial letter, or by telephoning the MIS\* hotline. If the households do not reply, a first reminder is sent by post, followed by a second one.

Ultimately, 43.6% of ALTEL households gave us their telephone number: mobile (70.4%), land-line (22.0%) or both (3.5%); the remainder were work numbers. It should be noted that although less than half of households gave us their number, more than 90% of those households who did so completed

the household questionnaire and at least one individual questionnaire (complete households, Figure 3). Households for which no number could be obtained were either refusals, changes of address, deaths or simply households with no reaction.

**Figure 3 Proportion (%) of active replies from ALTEL numbers and response rate of these households (N=791).**



The decision was taken to send an unconditional compensation (enclosed with the letter to ALTEL, regardless of whether a number was given or not) following tests conducted in 2013. Three options were tested to compare the effect of an unconditional compensation: CHF 15, CHF 5 and no compensation. The effect of a compensation of CHF 5 proved to be the most effective. It led to an increase of more than ten percentage points in the rate of telephone numbers given as well as in the rate of interviews conducted. A compensation of CHF 15 on the other hand, is counterproductive and led to lower response rates than with the CHF 5 option. The results are shown in the Table 4 below. Following these tests, and on the basis of a much higher rate of replies with a compensation, it was decided to send a voucher or CHF 5 with the ALTEL letters starting from 2014.

**Table 4 Results of tests for ALTEL compensation, by amount of unconditional compensation**

Unconditional compensation	Amount (CHF)	% of tel nos. reported	% of interviews conducted	n
With		56.90%	52.10%	401
	15.-	54.20%	50.20%	201
	5.-	59.50%	54.00%	200
Without		44.70%	41.70%	199

The method of contacting households in wave 2 to wave 4 has not changed from previous years. Each household receives one letter informing it that it will be contacted again soon to take part once more.

The whole sample is contacted in three distinct batches (see 1.5), for a more even distribution of work for those carrying out the survey and to avoid too long a gap between the initial letter and the first contact by telephone. Initial telephone contact is made as soon as possible after the letter is sent out. Depending on people's availability, some or all of the questionnaires can be answered. In the event that some questionnaires remain to be completed, telephone appointments are scheduled to encourage the utmost participation from all persons aged 16 or over. Depending on circumstances, interviewers may suggest participation in the face-to-face survey (CAPI\*). Except in the event of outright refusal (hostile refusal with threats or refusal in writing), the households or individuals (individual questionnaire) who in the first instance refuse to take part in the survey are contacted again by post and then by telephone (follow-up after refusal) by specialist interviewers.

Households from wave 1 who, despite the follow-up, still refuse to participate, or whom cannot be reached by telephone, receive a letter asking them at least to fill in the quality survey. The letter contains postage stamps worth CHF 5 as compensation. The quality survey is a short paper questionnaire that

collects basic information about household composition, the individual contributing most to the household's income and tenure status. These data allowed us to draw up the profile of non-respondents and to carry out appropriate weightings up until 2013. This information is, however, rendered superfluous due to the information obtained from the SRPH, but the quality survey was continued in 2014 to enable methods to be compared ("old method" of calculating weighting, see ch.4) based on the same data (see 7.3). This led to 420 questionnaires being completed by non-respondents from wave 1. For the following waves, the quality survey is unnecessary as the grid questionnaire has been completed in wave 1.

### Screening

When initial letters are returned to the FSO because the addressee cannot be found, the most recent addresses are looked for in the SRPH then sent to the survey institute who tries to contact them. A manual search based on Directories data enabled 51 telephone numbers to be found before letters were sent.

Mobile telephone numbers and email addresses, requested at the end of questionnaires issued in wave 1, can often be used to get back in touch with people who have moved. Part of this procedure is shown in Appendix 9.6.

## 2.3. Data collection by survey institute

Data are collected using a questionnaire completed over the phone (CATI\*). This task is conducted by a research institute, M.I.S Trend, working out of Lausanne (French- and Italian-speaking regions) and Bern (German-speaking regions). 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. As a proportion of all individuals responding to the individual questionnaire (RB250=11+13), 96.1% were interviewed through CATI\*. CAPI\* concerned only 19 (17+2) people, equating to 0.1% of the total number of persons interviewed. The remaining proportion represented proxy\* questionnaires, answered by another member of the household (Table 5). Altogether, 11 678 people within complete households agreed to answer the individual questionnaire, or act as a proxy for another household member.

**Table 5 Breakdown of data collection mode by rotational group**

Rotational group	R1		R2		R3		R4		Total	
Wave	3		2		1		4			
Joined panel	2012		2013		2014		2011			
	n	%	n	%	n	%	n	%	n	%
CAPI	2	0.1%	9	0.3%	6	0.2%	0	0.0%	17	0.1%
CATI	2 574	95.9%	2 752	96.1%	3 166	95.9%	2 729	96.5%	11 221	96.1%
Proxy	0	0.0%	1	0.0%	1	0.0%	0	0.0%	2	0.0%
	107	4.0%	103	3.6%	130	3.9%	98	3.5%	438	3.8%
<b>Total</b>	<b>2 683</b>	<b>100.0%</b>	<b>2 865</b>	<b>100.0%</b>	<b>3 303</b>	<b>100.0%</b>	<b>2 827</b>	<b>100.0%</b>	<b>11 678</b>	<b>100.0%</b>

To improve the reliability of income estimates, administrative data provided by the Central Compensation Office (CCO\*) were used to supplement survey data (see ch. 3).

### Interviewer training

Interviewers assigned to the SILC survey at the research institute (MIS Trend\*) are all experienced practitioners who have worked satisfactorily on other surveys or on the SILC survey in previous years. Interviewers are based at one of two call centres, Lausanne or Bern.

Interviewers must take part in two training evenings (totalling about 7 hours) during which the project and relevant issues are presented by survey managers from the FSO\* and the research institute. Interviewers also familiarise themselves with the questionnaire's structure by training in pairs, supervised by call-centre managers and various other supervisors.

Interviewers are supplied with a range of documentation for information purposes during the theoretical class, comprising documents sent to households for establishing contact (letter, SILC leaflet and newsletter) as well as a handbook. The handbook contains the following information:

- An overview of the SILC survey
- The main goals of the survey
- A presentation of the annual module and main changes relative to the previous year.
- The survey process (the five questionnaires and respective durations)

- Rules to be followed when conducting face-to-face interviews (CAPI\*)
- Specific information on family ties, education and training, occupation, companies and various income sources
- Case for participating (compensation)

### ***Monitoring the fieldwork***

On a daily basis, the research institute delivers each day's statistics to SILC staff, who then conduct supplementary analysis. The purpose of fieldwork monitoring is to gain a daily overview of how the survey is progressing, determining the right time for activating address batches (see 1.5) and defining optimum survey duration. Monitoring should also be used to identify quickly any performance shortfalls between call centres or between address batches and to immediately take remedial action by alerting the research institute's call centres. Not only can this be used to visualise problems fully but monitoring also substantiates actions in relation to the survey institute, for example if we request an increase in the number of interviews assigned to a call centre. Having a view of key fieldwork stages provides an important repository of information for improving fieldwork year after year. A sample monitoring curve is shown in Appendix 9.5.

### ***Listening in at call centres***

The SILC team regularly makes unannounced visits to call centres for listening in on interviews, making it possible to detect problems arising in the management of appointments, and in the marketing and processing of the questionnaire.

### ***Interviewer selection***

A whole range of measures are taken to ensure that interviewers provide good-quality work. Interviewers working on the SILC survey are picked from amongst the most experienced staff at the research institute. A large portion of interviewers assigned to the SILC survey are the same year after year. Interviewers also receive a bonus in line with their field performance. The research institute pledges to identify rapidly those interviewers who accumulate more refusals or item non-response than usual, or who do not perform satisfactorily in the processing of interviews.

### ***Compensation***

To keep non-response to a minimum, a selection of compensatory products is offered to each individual aged 16 or over who answers the individual questionnaire. Research conducted by the Swiss Household Panel (Lipps, 2008) showed that response rates were higher amongst respondents who had the choice between several types of reward as opposed to those offered a set item of compensation. Assuming a similar type of behaviour from respondents to the SILC survey, each respondent to the individual questionnaire had the choice between two types of gift with a value of around CHF 15 (€12.50):

1. A public-transport voucher
2. Voucher to see one film free at the cinema

This choice of condition-dependent compensation is offered in the survey introductory letter to minimise the unit non-response rate. Compensation is sent out quickly, in a separate dispatch, to all those who have answered the individual questionnaire to encourage other household members (aged 16 or over) who have not yet answered the individual questionnaire to do so.

## **2.4. Achieved sample size**

The 2014 EU-SILC sample amounted to 6 792 usable households, including 1 934 households in wave 1 (Table 6). The sample contained 12 962 individuals aged 16 or over. From this group, 12 945 individual questionnaires could be filled out or completed, either through individual or proxy\* interview or by cross-referencing with registry data with regard to income data. In total, 17 individual questionnaires were completely missing as they could not be matched with the registers and had to be imputed for all of their income data. Information on nine people come only from the CATI as they could not be matched with the registers.

**Table 6 Size of 2014 sample by rotational group**

Rotational group	R1		R2		R3		R4		Total	
Wave	3		2		1		4			
Joined panel in	2012		2013		2014		2011			
Accepted household interviews DB135=1	1 585	23.3%	1 647	24.2%	1 934	28.5%	1 626	23.9%	6 792	100.0%
Persons 16 years and over (RB245=1,2,3)	2 983	23.0%	3 177	24.5%	3 695	28.5%	3 107	24.0%	12 962	100.0%
Total completed information (RB250=11,12,13)	2 981	23.0%	3 171	24.5%	3 690	28.5%	3 103	24.0%	12 945	100.0%
Information completed only through individual or proxy interviews (RB250=11)	1	11.1%	4	44.4%	4	44.4%	0	0.0%	9	100.0%
Information completed solely from registers (RB250=12)	298	23.5%	306	24.2%	387	30.5%	276	21.8%	1 267	100.0%
Information completed from both interviews and registries (RB250=13)	2 682	23.0%	2 861	24.5%	3 299	28.3%	2 827	24.2%	11 669	100.0%
Entirely imputed individual interviews (RB250=14)	2	11.8%	6	35.3%	5	29.4%	4	23.5%	17	100.0%

## 2.5. Response 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 formulated 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.

## 2.6. Non-response errors

The gross sample of the 2014 EU-SILC survey contained 9 838 addresses (. For the other variables whose content could only be completed by the individual response to the CATI, non-response is around 10%.

**Table 7).** In the first wave, the rate of eligible addresses was low (78.0%), despite the move to the SRPH. Whereas previously the sampling frame was a register of telephone numbers, which allowed contact to be made with respondents in a single step, it is now a register of individuals whose addresses, but not always their telephone numbers, are known (ALTELS). Although the addresses of individuals sampled are correct in the vast majority of cases, obtaining their telephone numbers may be problematic if they do not have a landline telephone number or a registered mobile number.

The new sampling frame offers significantly better coverage than the previous CASTEM frame; however, for the new households included in the survey for which no phone number is known, the rate of non-contacted addresses is high. If these individuals fail to provide a telephone number on which they can be contacted after receiving several letters asking them to do so, they are coded as DB120=21 *address cannot be located*. Naturally, this figure has increased significantly since the move to the SRPH, rising from 181 in 2013 to 802 in 2014 (see table below), while the number of cases of 'address does not exist' (DB120=23) has fallen from 462 to 21. This sharp fall in the contact rate for eligible addresses Ra pushed up the household non-response rate, from 33% in 2013 to 45.6% in 2014 in the first wave.

The rate of contact for eligible addresses was 90.4% overall, but was significantly higher for waves 2 to 4. A total of 6,792 households were deemed complete, which corresponds to 81.0% of the eligible addresses. As a reminder, a household is deemed complete when it has responded to the grid and the household questionnaires and at least one individual aged 16 or over has responded to the individual questionnaire.

Regarding individual non-response, the non-response rate was very low (less than 0.1%), as a large proportion of information was filled out from registers. For the other variables whose content could only be completed by the individual response to the CATI, non-response is around 10%.

**Table 7 Household and individual response and non-response rates**

Rotational group		R1	R2	R3	R4	
Wave		3	2	1	4	
Joined panel		2012	2013	2014	2011	Total
<b>Household non-response</b>						
Total sample	DB110=1 to 11	2 116	2 098	3 665	1 959	9 838
At the same address as last interview	DB110=1	1 707	1 825	0	1 656	5 188
Household no longer in-scope or address not contacted	DB110=3,4,5,6,7,11	204	116	0	149	469
New household for this wave	DB110 = 2, 8, 9	205	157	3 665	154	4 181
Address contacted	DB120=11	167	118	2 842	137	3 264
Address cannot be located	DB120=21	38	39	802	17	896
Address does not exist	DB120=23	0	0	21	0	21
Address contacted	DB110=1 or DB120=11	1 874	1 943	2 842	1 793	8 452
Valid household selected	DB110=1 or DB120=11,21,22	1 912	1 982	3 644	1 810	9 348
<b>Ra - Address contact rate</b>		<b>98.0%</b>	<b>98.0%</b>	<b>78.0%</b>	<b>99.1%</b>	<b>90.4%</b>
Interview accepted for database	DB135 = 1	1 585	1 647	1 934	1 626	6 792
Number of eligible households	DB130=11, 21, 22, 23, 24	1 874	1 943	2 775	1 793	8 385
<b>Rh - proportion of complete household interviews accepted for database</b>		<b>84.6%</b>	<b>84.8%</b>	<b>69.7%</b>	<b>90.7%</b>	<b>81.0%</b>
<b>NRh-Household non-response rate</b>		<b>17.1%</b>	<b>16.9%</b>	<b>45.6%</b>	<b>10.2%</b>	<b>26.8%</b>
<b>Individual non-response</b>						
Information or interview completed	RB250 = 11, 12, 13	2 981	3 171	3 690	3 103	12 945
Information completed from both interview and registers	RB250=11,13	2 683	2 865	3 303	2 827	11 678
Number of eligible persons (aged 16 or over)	RB245 = 1, 2, 3	2 983	3 177	3 695	3 107	12 962
<b>Rp - Rate of individual interviews or information completed through registries (%)</b>		<b>99.9%</b>	<b>99.8%</b>	<b>99.9%</b>	<b>99.9%</b>	<b>99.9%</b>
<b>NRp - Individual non-response rate (%)</b>		<b>0.1%</b>	<b>0.2%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.1%</b>
<b>*NRp-Overall individual non-response rate</b>		<b>17.2%</b>	<b>17.1%</b>	<b>45.7%</b>	<b>10.3%</b>	<b>26.9%</b>
<b>RpInd-Individual interviews response rate</b>		<b>89.9%</b>	<b>90.2%</b>	<b>89.4%</b>	<b>91.0%</b>	<b>90.1%</b>
<b>NRpInd-Individual interviews non-response rate</b>		<b>10.1%</b>	<b>9.8%</b>	<b>10.6%</b>	<b>9.0%</b>	<b>9.9%</b>

## 2.7. Interview duration

Table 8 shows the number of observations along with average, minimum and maximum durations, and the standard deviation of the duration, for each type of questionnaire. Interview duration differs depending on the questionnaires answered by the interviewees, and moreover differs between incoming households (wave 1) and those interviewed within waves 2, 3 or 4. Generally speaking, the survey is on average more burdensome for households in wave 1. This is however slightly shortened due to the use of data from the SRPH that households only have to check.

For households in wave 1, the person answering the grid and household questionnaires is interviewed for 21.5 minutes on average. The individual questionnaire lasts for an average of 29.4 minutes. Altogether, one person answering - during wave 1 - the grid questionnaire, the household questionnaire and the individual questionnaire spends an average of 51 minutes on the phone.

For households in waves 2 to 4, the grid interview and the household interview last for 18-20 minutes in total. The individual questionnaire on average takes between 23 and 25 minutes. The individual questionnaire has the most variable duration, depending chiefly on a person's income and occupation. Overall, in 2014, a person in wave 2, 3 or 4 answering the grid questionnaire, and the household and individual questionnaires spends 43 minutes on the phone, on average. Individual proxy\* interviews last slightly more than 5 minutes on average, whereas child proxy\* interviews are completed in under 2 minutes on average.

The average duration by household for answering all the 2014 questionnaires is 62.5 minutes.

**Table 8 Duration (in minutes) of the various questionnaires by rotational group in regard to complete households**

Rotational group	R1	R2	R3	R4	Total
Wave	3	2	1	4	
Joined panel	2012	2013	2014	2011	
<b>Grid</b>					
n	1 585	1 647	1 934	1 626	6 792
Maximum	22.52	20.03	29.77	24.75	29.77
Average	4.01	3.94	5.43	3.91	4.37
Total standard deviation	0.06	0.05	0.07	0.05	0.03
<b>Household</b>					
n	1 585	1 647	1 934	1 626	6 792
Maximum	48.25	62.75	86.80	88.92	88.92
Average	14.67	15.08	16.06	14.66	15.16
Total standard deviation	0.12	0.13	0.14	0.14	0.07
<b>Individual</b>					
n	2 576	2 761	3 172	2 729	11 238
Maximum	101.93	85.12	110.67	94.73	110.67
Average	24.13	24.36	29.38	23.03	25.40
Total standard deviation	0.15	0.14	0.15	0.15	0.08
<b>Individual proxy</b>					
n	107	104	131	98	440
Maximum	15.47	13.58	18.30	14.30	18.30
Average	5.26	4.93	6.41	5.27	5.53
Total standard deviation	0.26	0.25	0.25	0.24	0.13
<b>Child proxy</b>					
n	484	506	653	496	2 139
Maximum	13.65	8.15	12.10	7.12	13.65
Average	1.93	1.88	1.78	1.79	1.84
Total standard deviation	0.06	0.05	0.05	0.05	0.03

### 3. Use of register data

Register data is used for the weighting (integrated calibration), to compensate for partial non-response and to validate or correct information about income given by telephone.

In Switzerland, compensation offices collect social security contributions while calculating and paying out allowances and benefits. The Central compensation Office (CCO\*), 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, and on unemployment benefits. The social assistance statistics in Switzerland contain information on the income of persons receiving social assistance benefits.

#### 3.1. Reconciliation with registers

##### **CCO\* income data**

The Central Compensation Office (CCO\*) is a Swiss public body that provides services in relation to “first pillar” social insurance (old-age and survivor benefits, disability benefits and loss of income). One of the main missions of the CCO\* is to centralise information on pensions and allowances paid out by first-pillar insurance funds and on contributions paid in by insured persons. This information is derived from the many compensation funds around the country. Data on disposable income at the CCO\* varies in quality. The register of pensions and allowances is an administrative repository. Data therein is of a complete nature and is rapidly available. In contrast, the individual-account register regarding income on which contributions are paid is a statistical register and is not exhaustive. Some offices refuse to hand over data or do so belatedly. The CCO\* estimates that some 95% of income on which contributions are due is recorded in this database. Income from self-employed persons is a particular issue. Self-employed workers pay contributions using instalments with the total amount adjusted at a later date based on their tax return for the year. For this reason, the self-employment income totals reported to the CCO do not meet the needs of the SILC.

Information obtainable by the CCO\* is as follows:

- Cash or near-cash employee income (PY010G)
- Presence of self-employment income (PY050G)
- Unemployment benefits (PY090G)
- Income received by people aged under 16 (HY110G)
- First-pillar pension (sub-component of PY100G)
- Survivor pension (sub-component of PY100G)
- Disability pension (sub-component of PY130G)
- Allowances for disabled children (on a case by case basis)
- Family allowances (used to check quality controls)

The CASTEM register did not contain AVS/AHV numbers and, although searches on the basis of names and dates of birth resulted in a very high level of matching, a certain number of cases continued to pose a problem. With no AVS/AHV number, CCO data was unobtainable. The SRPH, which supplies the AVS/AHV numbers of all sampled persons, enables CCO data of the sampled persons to be obtained more quickly and more completely. For co-residents who were not part of the initial sample, a search must be carried out for the AVS/AHV number, which in very rare cases may fail and not deliver the CCO income. In the end, there were only 28 persons for whom no AVS/AHV number was known, resulting in a matching rate of 99.82%.

Income stated by individuals taking part in the phone survey (CATI\*) does not always match the registry information, so a choice must be made between the above two sources. A strategy for integrating CCO\* register data into the CATI\* data was implemented, giving precedence either to registry or CATI\* information depending on professional and private circumstances. Decision tables document all the possible cases that arise with the integration of CCO\* data. Owing to possible confusion amongst respondents, wages are processed jointly with self-employment income. This applies to first-pillar pensions as well.

##### **SHS statistics\***

These exhaustive statistics are based on different cantonal and communal registers. The data, like those from the CdC, allow completion of missing data in non-response cases or correction of data given to CATI for the HY060G variable (*Social exclusion not elsewhere classified*). Analysis of these data have indeed shown that the amounts reported to CATI were generally lower than those actually received (SHS register).

### **Register of AVS/AHV and AI/IV funds**

This source is used to a limited extent to consolidate the presence/absence – but not the amount – of self-employed income in cases that pose a problem. This additional source is particularly useful when the information presented by the CATI and CdC is contradictory as it allows a decision to be made in favour of one of the previous sources and then to impute (where relevant) an amount for the self-employed income.

## **3.2. Distribution of collection method for information on income variables**

The missing data, whether due to unit non-response (non-respondent in a household deemed complete) or partial non-response (only certain responses missing) result in a loss of data quality and are especially problematic for income variables. Eurostat stipulates a response rate of 100% for these sub-components, so the missing values have to be filled in using imputation procedures (see ch.5). The tables below show to what extent the various sources of information were used.

For a majority of persons (90.0%, Table 9), income data were obtained through a combination of register and CATI\* information (RB250=13). For only 0.1% of individuals were data derived solely from CATI\* information (RB250=11). Amongst total individuals returning a unit non-response (9.9%), data concerning 1 267 of them were obtained from the register (RB250=12). For the remaining 17 people corresponding to unit non-response, concerning whom data could not be obtained from the CCO\*, income sub-components were gathered solely with the help of imputations (RB250=14).

All these information sources must occasionally be supplemented by imputations whenever one or more subcomponents is missing.

**Table 9 Sources of information for personal income.** Each information source may be supplemented using imputations where values are missing

Rotational group	R1		R2		R3		R4		Total	
Interview wave	3		2		1		4			
Joined panel	2012		2013		2014		2011			
	n	%	n	%	n	%	n	%	n	%
CATI	1	0.0%	4	0.1%	4	0.1%	0	0.0%	9	0.1%
CCO	298	10.0%	306	9.6%	387	10.5%	276	8.9%	1 267	9.8%
CATI + CCO	2 682	89.9%	2 861	90.1%	3 299	89.3%	2 827	91.0%	11 669	90.0%
None	2	0.1%	6	0.2%	5	0.1%	4	0.1%	17	0.1%
<b>Total</b>	<b>2 983</b>	<b>100.0%</b>	<b>3 177</b>	<b>100.0%</b>	<b>3 695</b>	<b>100.0%</b>	<b>3 107</b>	<b>100.0%</b>	<b>12 962</b>	<b>100.0%</b>

## **3.3. Non-response to certain questions**

Table 10 shows non-response to Eurostat aggregates. It indicates the number of households with an income component above 0 and details the exhaustiveness of information sources. *Complete information* means that no information as regards household or individual components was missing. The percentage of partial information indicates the proportion of households in which at least one income component at individual or household level is missing. Data taken from the Central Compensation Office (CCO\*) is not considered as imputed. Information is considered missing when all sub-components are missing.

**Table 10 Completeness of information for household-level income aggregates before imputation**

	Households with income aggregate >0		Households for which information is					
			complete		partial		missing	
	n	%	n	%	n	%	n	%
HY010 Total household gross income	6 792	100.0%	2 277	33.5%	4 515	66.5%	0	0.0%
HY020 Total disposable household income	6 776	99.8%	2 165	32.0%	4 611	68.0%	0	0.0%
HY022 Total disposable household income before social transfers other than old-age and survivor benefits	6 651	97.9%	2 830	42.5%	3 821	57.5%	0	0.00%
HY023 Total disposable household income including old-age and survivor benefits	5 097	75.0%	2 203	43.2%	2 893	56.8%	1	0.0%

Completeness of information in regard to household components is shown in Table 11. Some components (marked with an <sup>a</sup>) such as *Social exclusion not elsewhere classified* (HY060G), *Regular inter-household cash transfer received* (HY080G) or *Tax on income and social contributions* (HY140G) are aggregates derived from several household or individual variables. The calculation for completeness of information is identical to the above aggregates.

Health-insurance premiums, included under *Tax on income and social contributions* (HY140G), have been modelled deterministically for all individuals in accordance with canton of residence and the person's age <sup>1</sup> and are not considered as imputed (see 5.3).

Where respondents were unable to provide a precise amount for this income component, a range of values was offered to the person. An amount was then imputed from within this range. Information here is considered as partial. This concerns variables in the following Table 11 and Table 12 marked with an <sup>f</sup>: *Tax on income and social contributions* (HY040G), *Interest, dividends, profit from capital investments in unincorporated business* (HY090G) and *Regular inter-household cash transfer paid* (HY130G).

**Table 11 Completeness of information for household-level income aggregates before imputation**

	Households receiving the component		Households for which information is					
			complete		partial		missing	
	n	%	n	%	n	%	n	%
HY030G Imputed rent	3 134	46.1%	0	0.0%	0	0.0%	3 134	100.0%
HY040G <sup>f</sup> Income from rental of a property or land	699	10.3%	585	83.7%	55	7.9%	59	8.4%
HY050G <sup>a</sup> Family/Children related allowances	2 226	32.8%	1 497	67.3%	729	32.7%	0	0.0%
HY060G <sup>a</sup> Social exclusion not elsewhere classified	1 263	18.6%	0	0.0%	1 263	100.0%	0	0.0%
HY070G Housing allowances	41	0.6%	24	58.5%	0	0.0%	17	41.5%
HY080G Regular inter-household cash transfer received	544	8.0%	491	90.3%	0	0.0%	53	9.7%
HY090G <sup>af</sup> Interest, dividends, profit from capital investments in unincorporated business	6 165	90.8%	2 740	44.4%	3 240	52.6%	185	3.0%
HY110G Income received by people age under 16	147	2.2%	144	98.0%	0	0.0%	3	2.0%
HY130G <sup>f</sup> Regular inter-household cash transfer paid	1 116	16.4%	1 058	94.8%	31	2.8%	27	2.4%
HY140G <sup>a</sup> Tax on income and social contributions	6 792	100.0%	5 978	88.0%	814	12.0%	0	0.0%

[a] variables aggregate

[f] range of values, for at least one of the sub-component if this is an aggregate

Table 12 shows the same information as above but in relation to individual income components. Components *Employee cash or near-cash income* (PY010G), *Cash benefits or losses from self-employment* (PY050G), *Old-age benefits* (PY100G), *Survivor benefits* (PY110G), *Disability benefits* (PY130G) and *Gross monthly earnings for employees* (PY200G) are aggregates of several different individual income variables. *Employee cash or near-cash income* (PY010G) includes benefits in kind that cannot be distinguished from gross income (see 6.2.1).

As with household variables, questions providing ranges of possible answers were used whenever respondents were unable to provide precise amounts, in order to minimise non-response in regard to the following components: *Employee cash or near cash income* (PY010G), *Cash benefits or losses from self-employment* (PY050G), *Pension from individual private plans* (PY080G), *Old-age benefits* (PY100G), *Survivor benefits* (PY110G) and *Disability benefits* (PY130G).. Once again, information is considered as partial. The variable *Employers' social insurance contributions* (PY030G) was calculated on the basis of gross and net income from salaried employment and is not considered as imputed.

<sup>1</sup> Basic healthcare insurance is mandatory in Switzerland. Premiums are paid to private-sector insurers.

Hence there is no partial information, even in cases where this was calculated on the basis of an imputed income.

**Table 12 Completeness of information within various income sub-components sampled at individual level**

		Individuals receiving the income component		Individuals for whom information is					
		n	%	complete		partial		missing	
		n	%	n	%	n	%	n	%
PY010G <sup>af</sup>	Employee cash or near cash income	8 601	55.0%	8 261	96.0%	337	3.9%	3	0.0%
PY030G	Employer's social insurance contribution	8 601	55.0%	8 601	100.0%	0	0.0%	0	0.0%
PY035G	Contributions to individual private pension plans	4 091	26.1%	4 091	100.0%	0	0.0%	0	0.0%
PY050G <sup>af</sup>	Cash benefits or losses from self-employment	1 070	6.8%	881	82.3%	167	15.6%	22	2.1%
PY080G <sup>f</sup>	Pension from individual private plans	279	1.8%	223	79.9%	5	1.8%	51	18.3%
PY090G	Unemployment benefits	396	2.5%	394	99.5%	0	0.0%	2	0.5%
PY100G <sup>af</sup>	Old-age benefits	3 405	21.8%	3 139	92.2%	263	7.7%	3	0.1%
PY110G <sup>af</sup>	Survivor' benefits	271	1.7%	266	98.2%	5	1.8%	0	0.0%
PY120G	Sickness benefits	15	0.1%	13	86.7%	0	0.0%	2	13.3%
PY130G <sup>af</sup>	Disability benefits	408	2.6%	403	98.8%	5	1.2%	0	0.0%
PY140G	Education-related allowances	91	0.6%	83	91.2%	0	0.0%	8	8.8%
PY200G <sup>a</sup>	Gross monthly earnings for employees	6 438	41.1%	6 307	98.0%	130	2.0%	1	0.0%

[a] variables aggregate

[f] range of values, for at least one of the sub-component if this is an aggregate

### 3.4. Quality control

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 (see 3.1 and 6.2.3), 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.

## 4. Weightings

The size of the SILC sample is limited in comparison to the population to be analysed. To compensate for these imperfections, an adequate weighting has to be used during the analyses of survey data. In fact, this weighting takes into account the probability of a household being included in the sample and therefore also the fact that we are dealing with a stratified sample. Although the samples are representative of the population living in Switzerland, the same cannot be said for the people who actually respond to the survey. Certain types of households and persons are more willing to respond than others. If data were not weighted, the results would therefore be biased towards the characteristics of the households who are more willing to respond.

The extent of variability in sampling can be estimated by variance, the coefficient of variation or by the confidence intervals of an estimator. The analytic procedures of statistical software are based on the assumption that the sample was the result of simple random sampling. This is not the case for the SILC survey (proportional stratified sample). Furthermore, these procedures take into account neither the corrections made for non-response nor the marginal calibration, giving them the tendency to underestimate variance and thereby also underestimating confidence intervals. For this reason weights must be used in order to correctly estimate confidence intervals during analysis.

The probability of responding cannot be separated from the characteristics of households or individuals. There is also a sizeable risk that this probability is not independent of the variables of interest (income, risk of poverty). The whole point of weightings, therefore, is to determine the characteristics of persons/households that do not respond and to increase the weights of persons/households who most resemble them. The same approach is taken by reducing the weights of households/persons most like the profiles that are most willing to respond. The last stage, called calibration, enables the sample's weight to be balanced so that the totals of the socio-economic characteristics of the weighted sample coincide as far as possible with the known totals of these characteristics in Switzerland's permanent resident population.

The large quantity of information available in the new survey base has allowed us to simplify the weighting process and to improve its quality at the same time. Henceforth, thanks to registers, numerous variables including certain income components, are available for the entire sample. This results in a better correction for non-response and consequently in the improved quality of final estimates. Furthermore, all variables known for the entire sample are also known for the entire Swiss population, resulting in a calibration that is much more finely-tuned than before.

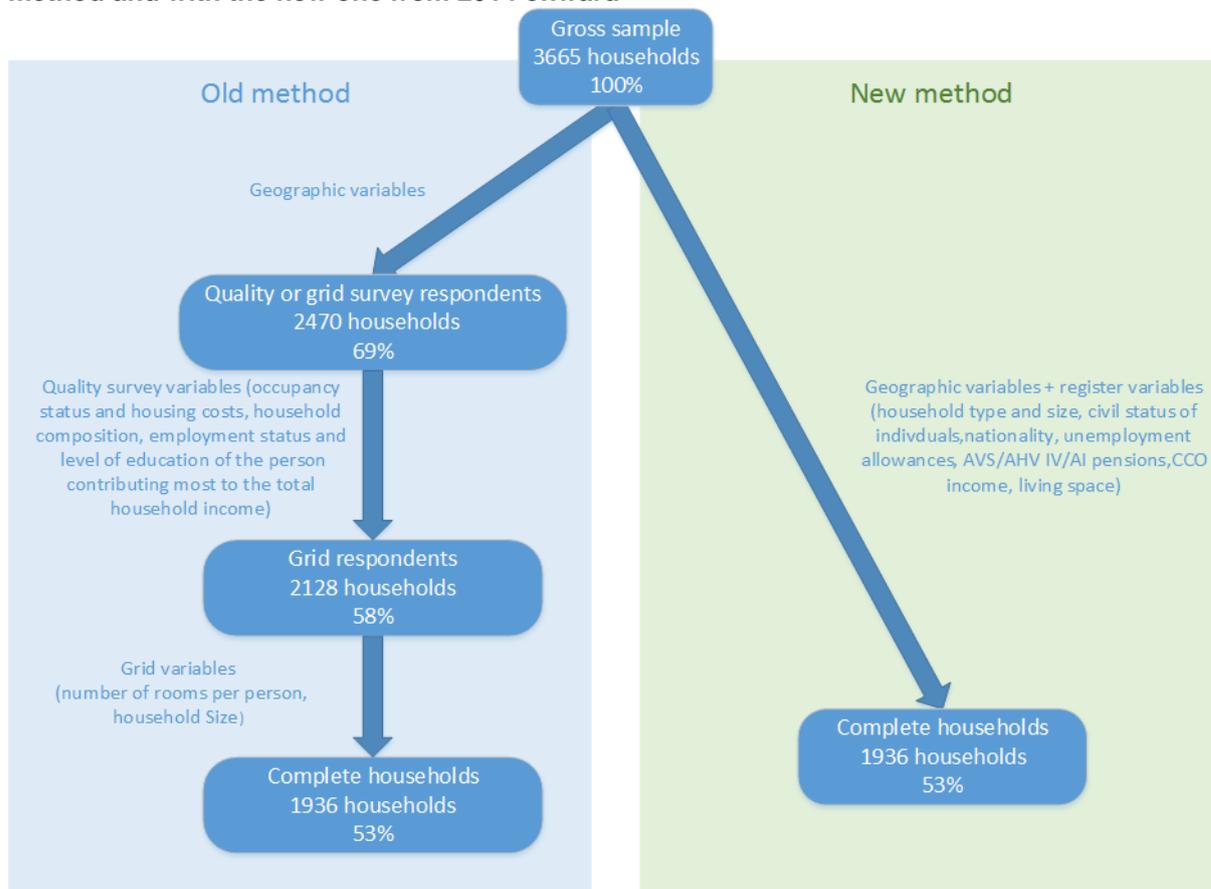
Previously it was indeed difficult to draw up a profile for the total non-respondents to the initial stages of the survey because the survey base CASTEM\* contained very little information on households and their members. The only variables available for all households were geographic variables related to the place of residence (region, size of commune, linguistic region, type of commune, etc.). In order to overcome this problem, a quality survey (i.e. non-response survey) was conducted among all households that we had been unable to contact by telephone or that had refused to reply to the grid questionnaire. The aim was to collect highly explanatory information that would explain the probability of responding to the grid questionnaire (dwelling occupancy status, housing costs, household composition, age/sex/civil status/nationality of household members, employment status and level of education of the person contributing most to the total household income). Some households that had not responded to the main survey did, however, respond to this short paper questionnaire, enabling us to obtain some basic information on these households and to adjust the weights of responding households in the first stage.

In order to compare the quality of dealing with non-response using the old method with that of the new one, the quality survey was conducted once again in 2014 and the two weighting methods were used side-by-side to assess their impact on the revision of the same data.

### 4.1. Correction for non-response

Until 2013, the household weight in wave 1 had to be corrected at three levels (households in total non-response, respondents to the grid or to the quality survey, and complete households). From 2014, using the new weighting method, non-response is only corrected once (see Figure 4). For waves 2 to 4, household weight is only corrected for non-response to the current wave, as was the case previously.

**Figure 4 Correction process for household non-response in wave 1, with the old weighting method and with the new one from 2014 onward**

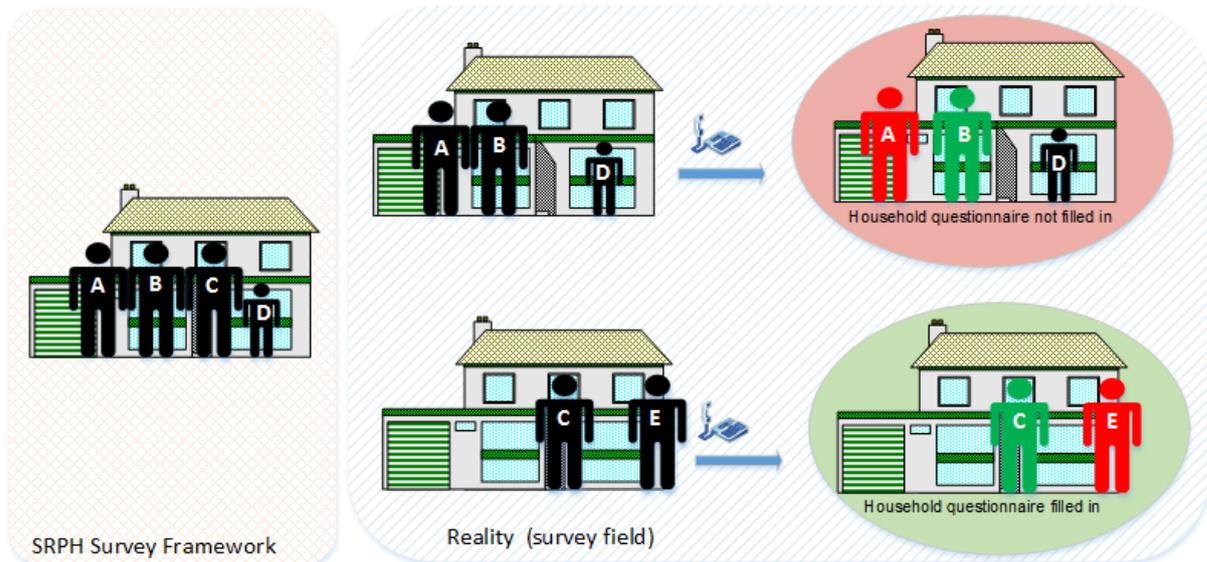


#### 4.1.1. Old method

In each stage, a process of segmentation is carried out to establish the factors that best explain total non-response. This modelling is done at individual level, which may lead to different weights between individual members of the same household. This weight is then corrected so that it is the same for all household members at the weight-sharing stage. Further details on this weighting method can be found in the [2013 quality report](#).

#### 4.1.2. New method

As the SRPH survey framework is register-based, there may be a slight discrepancy between the structure of households at the time the sample is drawn for wave 1 and the real situation at the moment the survey institute calls households (see Figure 5). This can cause problems, for example if a household member drawn on the basis of SRPH has recently moved and at the time of the first telephone contact is living in a new household (person C in the example below). As the sampling units are persons living in households that have been drawn from the sample, both “field” households have to be followed and their members are all considered as being longitudinal. In this example, if person C lives with a new person (E), not included in the initial sample because they were not present in the household ABCD that was drawn, this person is called “cohabitant of wave 1”. This person is treated in the weighting process as longitudinal.

**Figure 5 Illustration of non-response in survey-framework and field households**

This sampling is followed by a phase of non-response after the initial telephone contact. After this stage, households that are complete in their “field” composition are considered as responding households. A household is complete when it has replied to the grid questionnaire, to the household questionnaire (house on a green background above) and at least one (longitudinal) member has replied to the individual questionnaire (green person). In the above example, household CE is complete but household ABD is not because it did not respond to the household questionnaire (house on red background).

One problem is that we are departing from the classic schema of two-phase direct sampling because the composition of the households observed in the field does not necessarily correspond to that of the framework. It is difficult in such cases to establish a clear-cut response status for certain drawn households, as in the example above. Some individuals can also belong, in the field, to a responding household although they are not a member of one of the households selected in the framework (person E). Such individuals are selected indirectly.

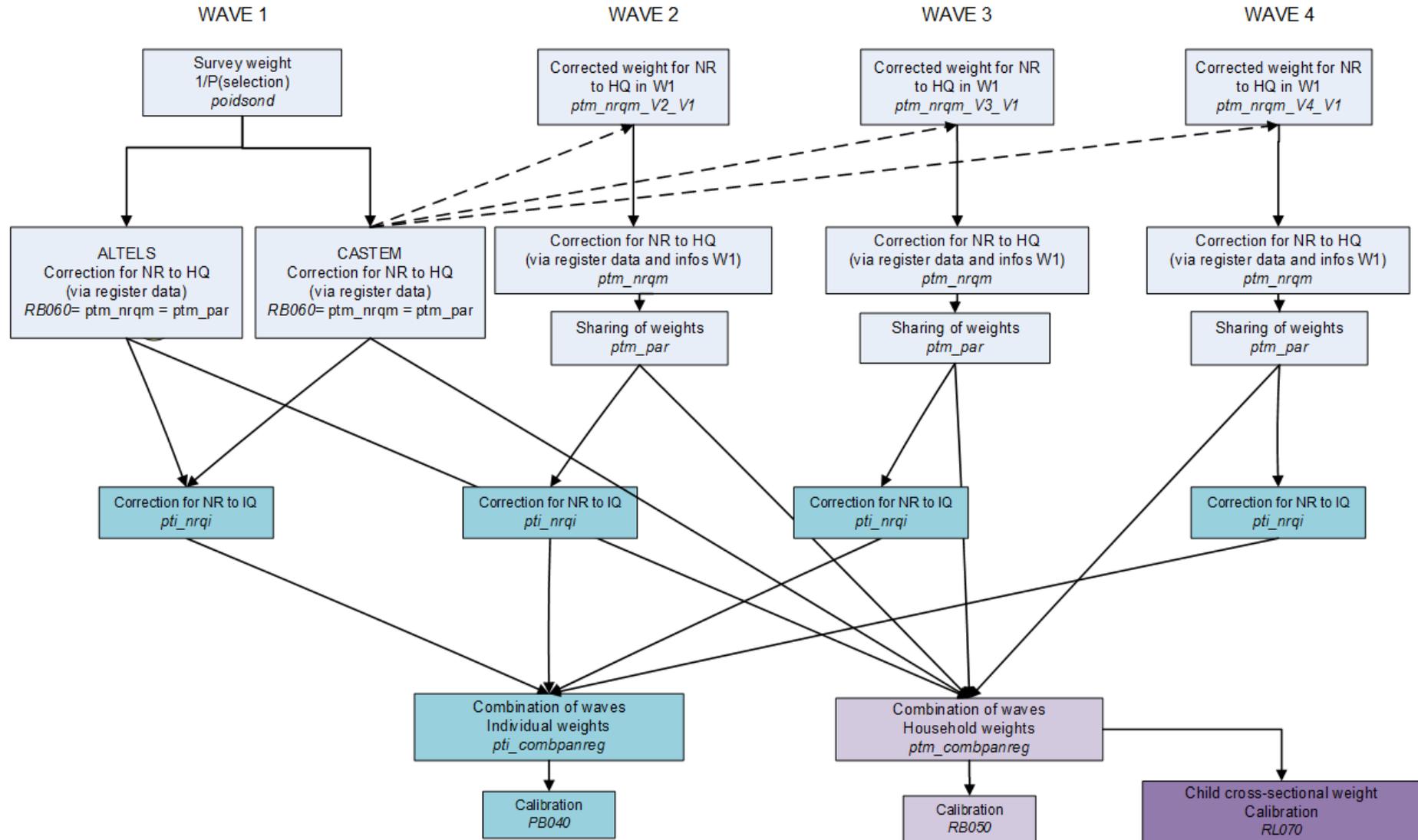
Although the notion of household may vary between the framework and the field, this is not the case for individuals. For individuals who belong to one of the households selected in the framework, it is possible to establish an unequivocal response status (respondent or not). This prompted us to formalise the selection procedure into a direct, two-phase survey of individuals belonging to one of the households in the framework, through which (indirect) access could be obtained to households in their “field” composition.

Initially the weighting process will correct non-responses to the household questionnaire (see ch. 4.1.2.1 and 4.1.2.2). A model is created to establish whether or not an individual belongs to a complete household. This does not take into account the fact that an individual may have replied or not to the individual questionnaire (this would be done in the correction for individual non-response). Modelling at individual level enables the use of individual and household variables, leading to more precise results than could be obtained with modelling at household level. We should point out that although the response status is defined at individual level, we ensure that when estimating response probabilities, individuals belonging to the same “field” household have the same estimated response probability (i.e. the same  $ptm\_nrqm$  weight), since all individuals from the same “field” household always have the same response status to the household questionnaire.

The correction process for household non-response is different for the sample of wave 1 (originating from the SRPH survey framework) than for waves 2, 3 and 4 (originating from CASTEM). The initial weight or the survey weight from wave 1 has to be corrected for non-response in the current wave, but does not require weight sharing with cohabitants (see 4.1.2.3). For waves 2 to 4, the survey weight has already been corrected for non-response in wave 1 but has to be corrected for non-response in the current wave, then shared with the new cohabitants. The weighting process is shown in Figure 6 below).

Subsequently, the probability of response to the individual questionnaire will have to be modelled on the basis of this household weight for persons living in complete households (see 4.1.2.3).

**Figure 6 Schema of 2014 weighting process** IQ = individual questionnaire, HQ = household questionnaire NR non-response



#### 4.1.2.1. Correction process for household non-response in wave 1

The solution chosen here is to calibrate the net sample (respondents) to the drawn gross sample (SRPH) and then to inverse the g-weights (ratio between the calibrated weight and the survey weight) as an estimate of the probabilities of response. So that the probabilities of response are the same for individuals in the same “field” household, the calibration is included at the level “field” household. The survey weight is the opposite of the probability of an individual being selected, which is given to all individuals in the sampled households.

To do this, we start by establishing explanatory auxiliary variables for non-response. As non-response is highly dependent upon whether a household has a landline or not (response rate of 59.5% for castem as opposed to 37.8% for altels, the sample was divided into two and different variables were retained for altels and castems.

A disadvantage of the chosen method of non-response correction, based on a calibration of the net sample to the gross sample is that, in contrast to segmentation or logistic regression, there is no automatic method for selection of auxiliary variables.

Before selecting the auxiliary variables, the sample was reorganised so that for each level, we had at least 150 persons belonging to a complete household. This reorganisation was also carried out prior to the household or individual calibrations of the other waves. The explanatory power of the non-response of a wider group of variables was then tested and only the most significant ones retained.

For the selection of auxiliary variables, a segmentation algorithm at individual level was applied in an attempt to detect any intersections between relevant variables. A logistic regression at individual level was also used, based on the assumption that if, for example, households comprised of elderly people had a low probability of responding, the logistic regression ought to detect that age has an influence on the probability of responding. These two instruments should be understood more as tools that enable us to intuitively select the variables to be used in the calibration rather than a method whose results have to be followed to the letter.

For reasons of stability in the weighting process, the variables selected in 2014 to correct for non-response, both individual and household, will be kept for the coming years.

Once the variables were selected (see Table 13) the integrated calibration was carried out. The probability of responding was the opposite of the g-weight, which has to be greater than 1 for the response rate to be less than 1. The calibration was, therefore, conducted using the logit method, enabling limits to the g-weight to be selected in order to avoid this problem. For wave 1, the limits used for response probabilities were 0.3 and 0.85.

##### *Castem*

When choosing the explanatory variables by segmentation, we decided to freeze the first two branches of the segmentation tree and to keep a fixed intersection of two variables (Married family with child(ren)\* and Family with child(ren)\* composition of household by nationality).

The calibration converged during 6 repetitions with a concordance rate of 69.2%.

##### *Altel*

The calibration converged during 11 repetitions with a concordance rate of 73%.

The concordance rate can assess the model by measuring the degree of similarity between the ranked values observed and those predicted by the model. This was calculated using the [SAS procedure](#) “Rank Correlation of Observed Responses and Predicted Probabilities “.

**Table 13 Variables tested and retained to correct for non-response.** Crosses represent the variables tested. Those retained and used in the calibration are coloured light green, those frozen in the model are dark green.

Variable	Codes used	households		W234	individuals
		W1 castem	alitel		
Age group of the oldest person in household	1 : Up to age 34 2 : Age 35 - 44 3 : Age 45 - 54	X	X	X	X
Age groups	1: age 0-15 2 : age 16-20 3 : age 21-34 4 : age 35-44	X	X	X	X
Sex	1: man 2: woman	X	X	X	X
Civil status	1: Single 2: Married	X		X	X
Nationality group (2 groups)	1: Switzerland / Northern and Western Europe		X		
Nationality group (4 groups)	1: Switzerland 2 : Northern and Western Europe	X		X	X
Household composition by nationality	0: Only Swiss 1 : Foreign and Swiss mixed	X	X	X	X
Household composition by sex	0 : Male and female 1 : Only male	X	X	X	X
Type of family	110: Single person aged under 65 130 : Single person aged under 65 210 : Couples aged over 65, without other household members 230 : Couples aged under 65, without other household members	X		X	X
Type of family and number of children	301: Family household with 1 child 302 : Family household with 2 children			X	X
Intersection: married* family with at least one child		X			
Intersection family with at least one child* household composition by nationality	0: Only Swiss 1 : Foreign and Swiss mixed	X			
Household size according to SRPH	1: 1 person household 2 : 2 person household 3 : 3 person household	X	X	X	X
Maximum household level of education (dichotomous)	Professional education and training/advanced professional education and training/no training			X	
Residence permit	1: Seasonal worker (A) 2: Residence permit (B) 3: Permanent residence permit (C) 4: Residence permit with employment (Ci) 5: Temporarily admitted foreign national (F) 6: Cross-border commuter (G) 7: Short stay permit (L)	X	X	X	X
Interested in politics	1: 0-6 with (0= no interest / 10 = maximum interest)			X	
Lives in household with very low work intensity	0: Does not live in household with very low work intensity			X	
Employment status in 4 groups	1: occupa in (1,5) full-time paid work (min. 37 hours/week) / unpaid work in family business/farm 2 : occupa in (2, 3, 6) part-time paid work (1 - 36 hours/week) / work in sheltered workshop 3 : occupa in (4, 7, 9, 10, 11, 12, 13) In education / domestic tasks (max. age 64/65) / other pensioner / unemployed / other situation (continuing education, unpaid leave, ...) / Military or civil compulsory service / Apprentice 4 : occupa in (8, 14) retired (pensioner) AVS/AHV, pension fund, early retirement) / child not at school			X	
Presence/absence of supplementary benefits in household	0: no 1: At least one in household	X		X	X
Number of unemployment allowances in household	0: No unemployment allowance 1: One or more unemployment allowances	X	X	X	X
Number of disability pensions in household	0: No AIIA pension 1: One or more AIIA pensions	X		X	X
Number of old-age pensions in the household	0: No old-age pension One or several old-age pensions 1: One or several old-age pensions	X	X	X	X
Number of incomes from employment in household (2 groups)	0: No income from employment 1: 1 or more incomes from employment		X		
Number of incomes from employment in household (4 groups)	0: No income from employment 1 : 1 income from employment 2 : 2 incomes from employment 3: 3 incomes from employment 4 : 4 or more incomes from employment	X		X	X
Group of total equivalent incomes CCO	1 : <=P50 2 : >P50		X		
Group of total equivalent incomes CCO	1 : [P0-P20] 2 : [P20 - P40] 3 : [P40-P60]	X		X	
Material deprivation 3 out of 9 items	0: No deprivation 1: Deprivation			X	
At risk of poverty status at 60% of median total equivalent household income CCO	0: Not at risk of poverty 1: At risk of poverty			X	X
Language region	1: German 2: French 3: Italian 4: Romansh	X		X	
Major region	1: Lake Geneva Region VD, VS, GE 2 : Espace Mittelland BE, FR, SO, NE, JU 3 : North-West Switzerland, BS, BL, AG 4 : Zurich ZH	X		X	X
9 categories of commune typology	1: Centres (CEN) 2 : Suburban municipalities (SUB) 3 : High income municipalities (RE) 4 : Semi-urban municipalities (PERI) 5 : Tourist municipalities (TOUR)	X		X	
Size of household's commune	1: 100 000 inhabitants and more 2 : 50 000 - 99 999 inhabitants 3 : 20 000 - 49 999 inhabitants 4 : 10 000 - 19 999 inhabitants	X		X	X
Moved house (change of building) in past 2 years	0: No move 1: Change of building	X	X	X	
Dwelling ownership status	0: not owner of own dwelling 1: owner of own dwelling			X	
Rent and accommodation costs	1: 0-1000 2 : 1000 - 1500 3: 1500 and more			X	
Living space per household member	1: <= 20m2/pers 2: > 20m2/pers	X	X	X	X
Intersection between arp60_cco and age group	4 groups				X
Belongs to P10 of individual cco income	0: no 1: yes				X
Belongs to P50 of individual cco income	0: no 1: yes				X
Belongs to P20 of individual cco income	0: no 1: yes				X
Belongs to P80-P100 of individual cco income	0: no 1: yes				X
Belongs to P10 of equivalent household income	0: no 1: yes				X
Belongs to P50 of equivalent household income	0: no 1: yes				X
Belongs to P20 of equivalent household income	0: no 1: yes				X
Belongs to P80-P100 of equivalent household income cco	0: no 1: yes				X

#### 4.1.2.2. Correction process for household non-response in waves 2, 3 and 4

The principle is the same as for correction for non-response in wave 1, except that the initial population is persons drawn from the framework and whose household was complete in wave 1. The initial weights are those that their household had after correction for non-response to the household questionnaire in wave 1.

The auxiliary variables retained for correcting non-response between wave 1 and the current wave are not the same as those retained to correct non-response in wave 1, because the two response mechanisms are different, especially due to the fact that the balance between refusal and unreachable is very different in wave 1 to that in waves 2, 3 and 4. Firstly, from this point on we have more auxiliary information since the information collected in wave 1 can be used in addition to the information gathered from the registers. The set of variables under consideration as auxiliary variables is thus composed of variables from registers that were already available for the correction of non-response in wave 1 (with the same groups of levels), as well as information collected in wave 1 such as interest in politics, level of education or the at-risk-of-poverty-status. Secondly, there is no longer a distinction between *altel* / non-*altel* for the correction of non-response between wave 1 and the current wave, since we work on the assumption that persons have already been contacted in wave 1 (therefore there is no *altel*) and have accepted to participate.

The same auxiliary variables are retained for the correction of non-response in waves 2,3 and 4. Initially, however, the selection process was done wave by wave in order to retain the most explanatory variables for each wave. The most explanatory set of variables of the three waves was then used.

The reference population and consequently the relevant information from registers vary depending on the wave that we are addressing. For

- Wave 2 we use the SPRH of September N-2
- Wave 3 we use the SPRH of September N-3
- Wave 4 we use the SPRH of September N-4

The sum of each of these weights before correction for non-response is therefore representative of various targeted reference populations. In wave 3 for example we begin with the weight *ptm\_nrqmW3\_W1* (calculated in N-2) and we use the SRPH of September N-3 (date sample was drawn in w3). It should be noted here that the SRPH survey framework between 2010 and 2013 was an “individual” framework containing characteristics of persons. It was not used for the sample selection for household surveys. The changeover to a household framework was made in 2013, which is why SILC was drawn for the first time in 2014 from this new framework.

The following results were obtained:

- Wave 2: 7 repetitions, 72.4% concordance
- Wave 3: 6 repetitions, 70.7% concordance
- Wave 4: 6 repetitions, 71.1% concordance

#### **Weight sharing**

For wave 1, weight sharing is not necessary as the cohabitants of wave 1 inherited the weight of their household during the correction for non-response.

The weight *ptm\_nrqm* of waves 2 to 4 obtained by modelling (calibration) above were given to all household longitudinals. The weight sharing stage allows a part of these weights to be attributed to cohabitants who joined longitudinal households since the first wave. The weight after sharing is the shared transversal household weight: *ptm\_par*.

The shared household weight is the same as the sum of the weight of household longitudinals divided by the number of longitudinals and initially present cohabitants in the household. In our case, we considered that all cohabitants were initially present in the survey base.

$$ptm\_par = \frac{\sum_{i=1}^L ptm\_nrqm_i}{L + P}$$

With *i*: individual

*L*: number of longitudinals in the household

*P*: number of initially present cohabitants in the household

#### 4.1.2.3. Correction for non-response to the individual questionnaire

As mentioned above, individual weight is calculated from household weight. Another correction for non-response with regard to the individual questionnaire this time, has to be carried out first.

To correct for non-response to the individual questionnaire, the initial weight is the household weight adjusted for complete /incomplete non-response and shared between cohabitants, *ptm\_par*. It is positive for both longitudinals and cohabitants who responded to the individual questionnaire and who belong to a complete household. This weight represents the populations from wave 1 from each of the panels before being merged. Their sum total among all individuals from the current wave therefore represents roughly 4 times the size of the population.

The correction for non-response to the individual questionnaire is carried out in the same way as that for the household questionnaire, but the entire process is done for all waves at the same time.

The variables (Table 13) are tested and then selected by segmentation and by logistic regression. These will be used for the correction for individual non-response in subsequent years in order to guarantee continuity in the process.

The calibration is then conducted on the basis of the variables selected.

## 4.2. Combination of waves

As the household weights were corrected for non-response to the household questionnaire and shared between the cohabitants of waves 2 to 4, the next stage, at household level, will be to merge the waves. The process of wave merging is the same as in previous years. The weights adjusted for non-response to both the individual and household level, are combined for all waves by major geographic region.

The weights used for merging waves were all calculated during wave 1 of each of the panels. They therefore represent the population in wave 1 of each of the panels and their sum corresponded therefore to the number of individuals in Switzerland in wave 1. By grouping together the 4 waves and therefore the 4 corresponding sets of weights, the weights' total is close to 28 million, i.e. four times the Swiss population. The adjustment factors enable us to reduce this number, by major region, to approximately 7.2 million individuals. The value of these factors is calculated using the method developed by Merkouris (see "[Estimation transversale dans le cas des enquêtes auprès des ménages à panels multiples](#)"). This approximate amount will be adjusted later in the final calibration to correspond to the exact total of the Swiss population.

For individual weights, adjustment is done simply by counting the number of individuals per major region and per wave and by looking at the percentage this number represents in relation to the total number of individuals in the major region concerned for all waves. This percentage (allocation factor) defined by wave and by region is then multiplied by the weight adjusted for the non-response (*ptm\_par*) of each individual in the wave and region concerned.

For households, the merging of four waves is done according to the same method, and by replacing individuals by households.

## 4.3. Final calibration

The aim of this calibration is to adjust the weights so that the totals according to certain calibration variables are identical in the sample to those of the population in December 2013.

The individuals retained in the calibration framework are selected from the framework of 31.12.2013. The calibration framework contains all individuals (even those belonging to the non-permanent population) from households that could potentially be selected in the sample (at least one person in the permanent resident population in a private household at their main place of residence).

The target population is all persons who belong, in the field, on the day of the survey, to one of the households from the selection framework. Therefore, children born after 31.12.2013, as well as foreigners who arrived after this date, or non-permanent residents, belong to the target population if they belong to a framework household.

This definition enables us to ensure consistency between the household composition in the field and at the time of interviews and income recorded in the field during the survey. It does however lead to technical problems during the calibration, as certain responding individuals are not linked with the calibration framework meaning that some of the information necessary for the calibration is not available for them.

When this is the case, the auxiliary calibration variables are imputed to such persons and the weights are then calibrated as if all respondents were actually a sample from the calibration framework. The calibration is integrated so that all persons from the same field household have the same final weight. By calibrating in this way to the calibration framework we can ensure that the total of the final weights is the same as that of the 31.12.2013 framework and that it is consistent from one year to the next.

**Selection of calibration variables**

Variables such as age (by age group) and sex were retained as a matter of course. Other register variables of great interest, because certainly related to non-response, can now be used for the final calibration as they are now available for the entire gross sample (SRPH).

Some of the variables used in the calibration have already been used to correct for non-response. This is a deliberate choice and can be explained by the fact that the reference populations are not the same. In fact, the calibration was made on the totals of the framework variables from December N-1, whereas the correction for non-response was made using the variables from September N-1, N-2, N-3 and N-4. A variable such as age group, for example, therefore takes different values in the correction for non-response and in the calibration.

Other variables are also used: household type, civil status, nationality (4 groups), major region, household size (5 categories), CCO income (binary value for grouping into income quintiles), poverty threshold in relation to CCO income (binary value by age group), Gini (linearised), S80/S20. The list of variables retained for the household and individual calibration can be found in Table 14.

**Table 14 Variables used for the household and individual calibrations**

Variable	Codes used	household	individual
At risk of poverty status at 60% of median total equivalent household income	0: Not at risk of poverty 1: At risk of poverty	X	X
Intersection between ARP60_cco and cl_age_pondmen_calage	0: if ARP60_cco = 0 1: if ARP60_cco = 1 and cl_age_pondmen_calage = 1 2: if ARP60_cco = 1 and cl_age_pondmen_calage = 2	X	X
Age groups	1: age 0-17 2: age 18-24 3: 25-49 years	X	X
Intersection between revtot_eq_ccohhS20 and revtot_eq_cco_hh	Continue	X	X
Type of family	110: Single person aged under 65 130: Single person aged over 65 210: Couples aged over 65, without other household members 230: Couples aged under 65, without other household members	X	X
Major region	1: Lake Geneva Region VD, VS, GE 2: Espace Mitteland BE, FR, SO, NE, JU 3: North-West Switzerland, BS, BL, AG 4: Zurich ZH	X	X
Household size according to SRPH	1: 1 person household 2: 2 person household 3: 3 person household	X	X
Linearised with Gini framework index	Continue	X	X
Civil status	1: Single 2: Married	X	X
Nationality group	1: Switzerland 2: Northern and western Europe	X	X
Intersection between revtot_eq_ccohhS80 and revtot_eq_cco_hh	Continue	X	X
Indicative that the total equivalent household income by cco source is < P10	0: no 1: yes	X	X
Indicative that the total equivalent household income by cco source is < P50	0: no 1: yes	X	X
Indicative that the total equivalent household income by cco source is < P20	0: no 1: yes	X	X
Indicative that the total equivalent household income by cco source is < P80	0: no 1: yes	X	X
Sex	1: man 2: women	X	X

In order to establish the relevance of the variables chosen, comparisons were made of the variance obtained for the principle SILC indicators between a complete model using the entire set of variables available, and the proposed selection. The results obtained allowed us to approve the selection of calibration variables.

As is the case for the correction for non-response, the variables selected will be used in the calibration process over the next few years.

#### **4.4. Cross-sectional weighting for children**

The weight for children is calculated so that specific variables such as childcare in structures in or outside of school can be weighted.

It is calculated on the basis of the household weight. Correction for total unit non-response to the child proxy\* is not necessary as the non-response rate is zero. Children born after 31.12.2013 must be excluded from the weightings. Children aged 13 to 16 are not processed.

Eurostat recommends starting with variable RB050 and calibrating it on the total of individuals for each age between 0 and 12 inclusive. Nevertheless, weights adjusted for non-response to the household questionnaire, `ptm_combpan_reg`, have already been calibrated to the age groups by means of the integrated calibration to obtain RB050, which Eurostat does not recommend for the household weight. A second calibration to the age groups alone does not appear appropriate. Therefore the sex \* age are used for the calibration, using the raking ratio method of CALMAR2\*, as previously.

#### **4.5. Analysis of weight differentials**

The final household weights RB050 were analysed over several years in order to test the continuity of the response process modelled by weighting, to detect any errors and to assess the impact of changing the weighting method.

The graphics below show the the differential of the probability of responding modelled by weighting ( $1/(\text{average weight of sub-group}/\text{total average weight})$ ) for some socio-demographic categories. Values above than 1 indicate that the sub-group's probability of responding, as modelled by the weights, is higher than average and that therefore this sub-group tends to respond better than average. In contrast, values below 1 indicate that the sub-group's probability of responding, as modelled by the weights, is lower than average and that therefore this sub-group tends to participate in the survey less well than average.

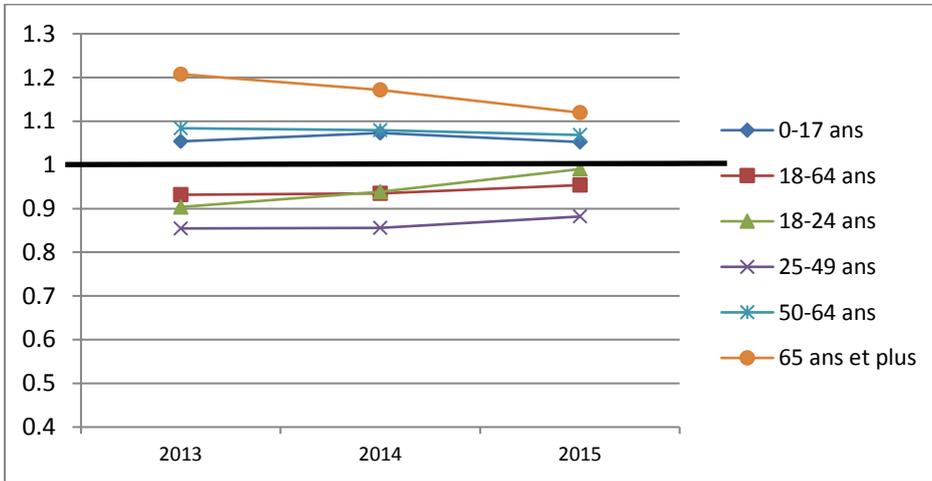
As well as identifying the sub-groups that have a greater/smaller probability of responding, these values also allow us to ascertain whether the new weighting process has substantially changed the weights of certain sub-groups. As the current weighting is, in principle, of better quality, a considerable change in the weight differentials by sub-group enables us to detect any gaps in the old weighting system, which used much fewer auxiliary variables than the current one. This can, however, be confused with another effect. The introduction of the altel population increases the coverage of profiles of persons in this group (see Table 1). We ought, therefore, to see a decrease in the variations in weight, with a slight increase in the weight of elderly people (very rarely altels) and a decrease in the weight of profiles of the altel type since their representation among respondents is similar to that of the population. This balancing could be extended until 2017 when the entire sample will have been drawn from SRPH.

As ALTELS are not in fact representative of the population, some analyses were conducted during the first sampling in SRPH to establish their profile and to measure the impact of their introduction on the main indicators. Some of the results calculated on the basis of wave 1 showed that the ALTELS represented a population that tended to be young (50% are younger than 44), who often lived alone or in a couple and was more likely to contain foreigners from Southern Europe and other countries.

Elderly persons were more willing to respond than working-age adults and 25-49 year-olds were the least well-represented (Figure 7). Until now the latter were also less well-represented in the sample as they were most

often alters. Furthermore, the weight of persons aged over 65 declined with the 2014 weighting, but also in 2015. As the weighting process was the same in 2014 and 2015, it is possible that the gradual decline of the weight of persons aged over 65, and the increase of those aged 18-49, are related to the gradually improving coverage of alters (than in wave 1 in 2014 then in W1 and W2 in 2015).

**Figure 7 Change in the differential of response probability by age, as modelled by the new weighting method**



**Figure 8 Change in the differential of response probability by nationality type, as modelled by the new weighting method**

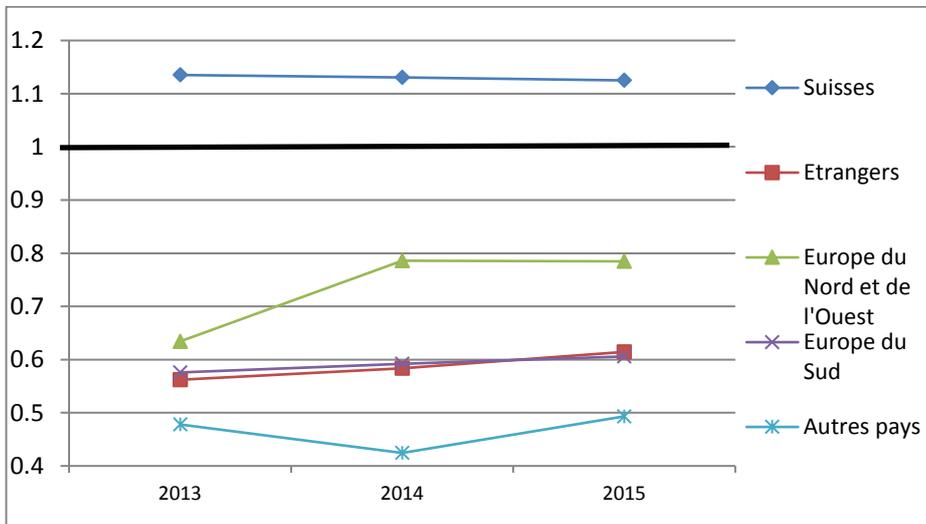
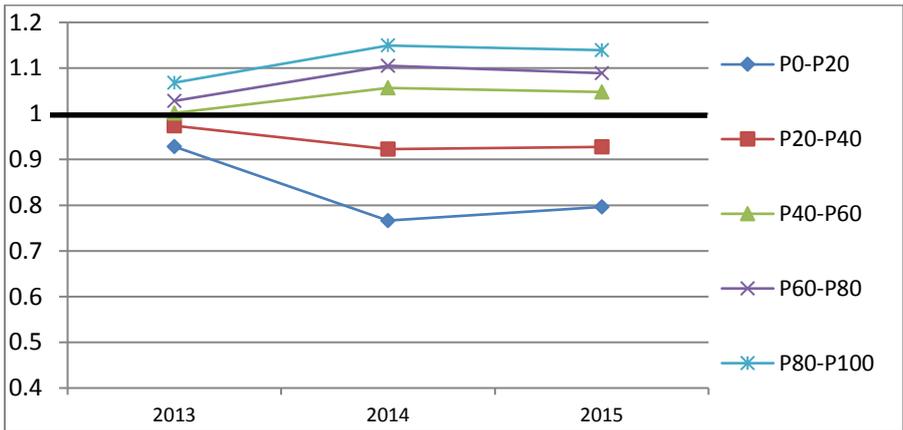


Figure 8 shows that the response differential for Swiss nationals remains stable, whereas that of foreign nationals is much less so. It grew in particular between 2013 and 2014 for foreign nationals from Northern and Western Europe, whereas it fell for those from non-European countries. These two categories saw their differential grow between 2014 and 2015, but these are also the categories most represented among alters. It should also be noted that until 2013, correction for non-response and the calibration were made without distinguishing between the sub-groups of foreign nationals. The availability of register data enabled us, from 2014 onward, to reuse these same categories of foreign nationals in the correction for non-response and the final calibration.

Whereas the change-over to SRPH and the new weighting reduced weight dispersion by age categories, the reverse effect can be seen by quintiles of equivalent disposable income (Figure 9), although the order of weights in relation to the quintile remain the same. Thus, from 2014, the new weighting method attributes a bigger weight to small incomes and a proportionately smaller weight to large incomes. In other words, the new weighting method models a smaller response probability for smaller incomes and a larger one for big incomes. This could be due to the introduction of income variables taken from registers in the weighting process. However, households that are financially better off are more willing to respond, with a gradual decline by income quintile.

**Figure 9 Change in the differential of response probability by equivalent disposable income, as modelled by the new weighting method**



## 5. Imputation procedure

As far as possible, data are supplemented from external sources (CCO\* or other). Where this is not possible, imputations are carried out for all variables required for calculating a household's disposable income. Other questionnaire variables are not imputed.

All imputation tasks are conducted using the IVEWare\* macro and the multiple imputation method, which is based on a multivariate regression model.

Concerning individuals, a distinction was made between respondents (R) and item non-respondents (INR), who provided only some of the requisite information, and unit non-respondents (UNR), who refused to answer the individual questionnaire. There are different cases of non-response requiring imputation at household or individual level:

Individuals:

- Item non-response (INR) → imputation of missing income sub-components
- Unit non-response (UNR) → imputation of presence/absence of each income sub-component, followed by imputation of amount where appropriate

Households:

- Item non-response (INR) → imputation of missing income sub-components

Unlike individuals, a household can only correspond to item non-response, as households that are unit non-respondents are not valid.

### 5.1. Preliminary stages

#### 5.1.1. Standardisation

Standardisation aims to calculate a standard annual full-time income per individual. For example, if a person has worked for six months part-time (50%), the resultant income will be multiplied by 4 ( $12/6 \times 100/50$ ) to arrive at a standardised value. This is the basis, which is similar for all individuals, on which imputations will be carried out. Imputed income amounts are then unstandardised on the basis of known information (duration and work-time quotient) for each individual and income sub-component.

For item non-response cases (INR), information used for income standardisation (work-time quotient, number of months worked, indication of period to which income corresponds) may be missing. Known information from respondents (R) is then used to impute these missing values. Income from this grouping can then be standardised as well.

Similarly, household variables stretching over a limited period are multiplied to arrive at standardised 12-month values.

#### 5.1.2. Homogeneous imputation groups (HIG)

To impute missing values as accurately as possible, homogeneous imputation groups (HIG) are set up, within which imputations are conducted.

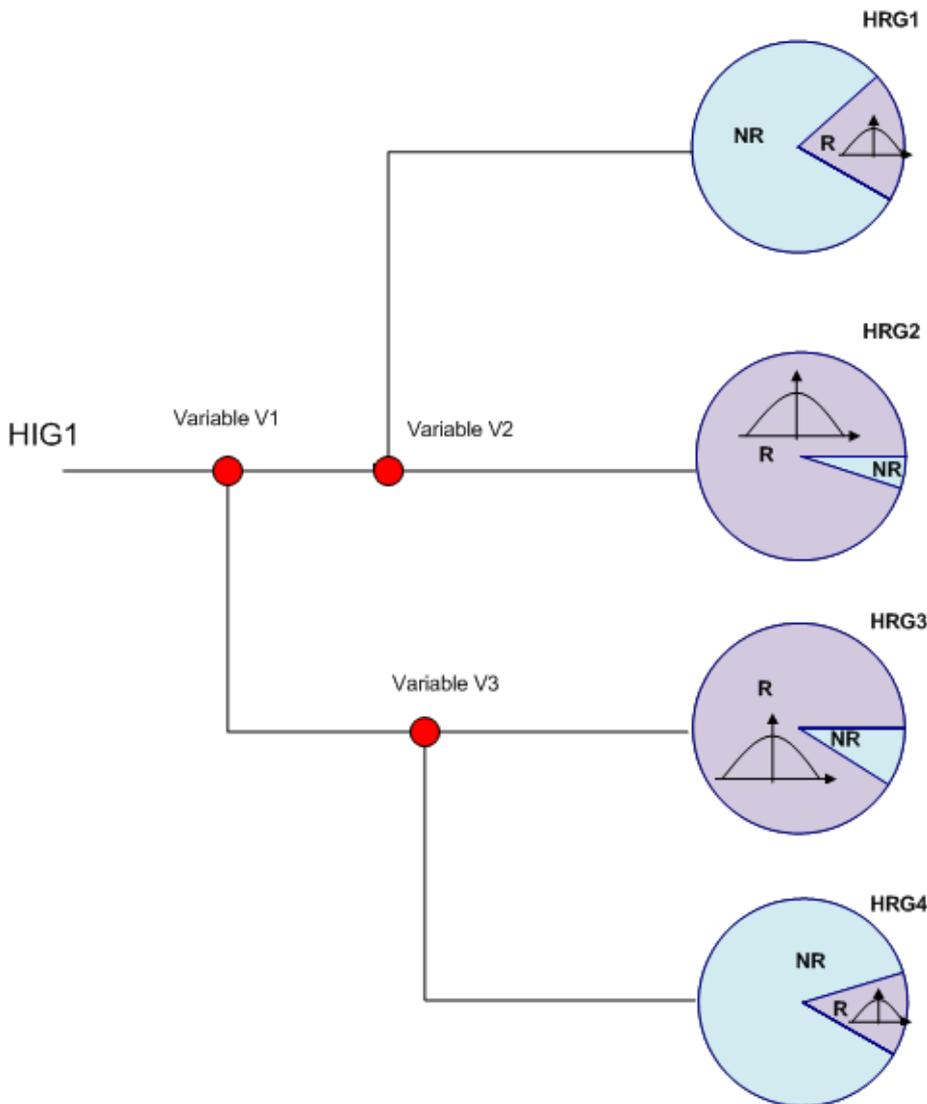
Groups of homogeneous individuals or households are created on the basis of specific shared features (explanatory variables) using a segmentation algorithm. Auxiliary variables used for segmentation purposes must be known in regard to both respondents and non-respondents for the income sub-component in question. This segmentation tree is created by modelling the fact that one unit has a standardised amount for the income sub-component that is higher or lower than the median of the standardised incomes of that particular branch on the tree. An example is shown in Appendix 9.2. HIGs are set up for each income variable.

### 5.1.3. Homogeneous response groups (HRG) within HIGs

Amongst individuals making up a HIG, a given variable will have respondents and non-respondents. Mirroring the principle used in creating HIGs, homogeneous response groups (HRG) are created by subdividing HIGs with the help of a segmentation algorithm, but this time based on the response (or lack thereof) to the question concerning the given variable. The aim is to create subsets of individuals with the highest probabilities of providing a homogeneous response to the given variable. To achieve this, some variables allowing for the best possible, though parsimonious, separation of groups of individuals that provided similar types of responses (response or non-response) are identified.

For each HRG, the aim is to obtain the median value from respondents. Medians taken from each HRG are used to model the missing values from the HIG's non-respondents. This procedure is supported by the hypothesis that probability of response is correlated with the amount of the income sub-component in question. Consequently, the median is used as the explanatory variable for modelling the missing income figures within the HIG. An example is shown in the following diagram (Figure 10).

**Figure 10 Process for creating HRGs.** In this example, a segmentation tree is created for HIG1. Three variables, V1, V2 and V3, are used to differentiate the four homogeneous response groups as accurately as possible. Medians calculated in regard to respondents in these HRGs will be used as explanatory variables for modelling missing values in HIG1.



## 5.2. Imputation of income variables

### 5.2.1. Individuals showing item non-response

Income variables are standardised using the aforementioned method. Within each HIG, missing amounts for each income sub-component are imputed by IVEWare\*, then unstandardised to correspond once again to the duration and quotient of employment, whether actual or imputed.

### 5.2.2. Individuals showing unit non-response

Before imputing an income to unit non-respondents, the probability of an income sub-component being received must first be determined on the basis of the scant personal information available from grid and household questionnaires. A procedure is therefore implemented for each individual in order to impute the probability of a non-zero amount existing for each income sub-component.

Within the HIGs, for each individual, an iteration of 50 imputations is carried out on the basis of their grid profile, attributing a value of either 1 (amount>0) or 0 (amount=0). An average of these values indicates the probability that this person receives the income sub-component in question. Individuals who are unit non-respondents and who have the greatest probability of having a given income value will be imputed an amount by IVEWare\*. To determine the number of them to whom an amount (>0) will be imputed, we take a percentage equivalent to that of individuals possessing the sub-component in question amongst the group of respondent individuals and individuals that have undergone imputation in regard to item non-response.

Selected individuals will then be imputed an income using a method similar to that used for item non-respondents. In contrast, where data is lacking for income standardisation, non-standardised income is imputed, determined on the basis of respondents' actual incomes. This is based on the assumption of a similar distribution of standardisation factors amongst respondents, individuals undergoing imputation for item non-response and those imputed for unit non-response within the HIGs that have been set up.

### 5.2.3. Households showing item non-response

The same process is applied as for individuals showing item non-response.

## 5.3. Imputation of other variables

### **Health insurance premiums**

Annual health-insurance premiums are imputed deterministically on the basis of two core factors: city of residence and the person's age bracket (26 or over, 19-25 and 18 or less). For babies aged below 12 months, annual premiums are calculated depending on number of months as at 31 December 2013.<sup>2</sup> These sums feature under the variable *Tax on income and social contribution* (HY140G).

### **Total housing costs (HH070)**

In computing the variable *Total housing costs* (HH070), the sum of ancillary costs is missing for some individuals. Amongst information providers, it was noted that rent after costs was tightly correlated with rent before costs (*Current rent related to occupied dwelling* HH060,  $R^2=0.96$ ). *Total housing costs* (HH070), was therefore imputed on the basis of a straightforward regression using the variable *Current rent* (HH060). Where both variables were missing, an amount was imputed using IVEWare\*.

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<sup>2</sup> Source: [Federal Public Health Office \(OFSP\)](#)

## 5.4. Checking imputations

Specific checks are carried out to verify the reliability of imputations. These include:

- Comparison of distribution curves for both observed and imputed values
- Chart representation of variation coefficients relating to the 50 imputation iterations for each value that is to be imputed
- Control of combinations of sub-components for a same individual between information providers and recipients of URN imputations

## 5.5. Imputed rent

Fictional or imputed rent (HY030G) corresponds to the savings made by a property owner or tenant living rent free or paying rent below the market price compared with a tenant paying market-price rent. It is calculated for people who have reported to CATI that they are property owners or tenants enjoying a preferential rent, a subsidy or who live rent-free.

For property owners, a “rent” is imputed in line with market prices and according to the characteristics of their dwelling. Actual expenses and mortgage interest paid by the owners (according to CATI) are deducted from this “rent”.

The Heckman model recommended by Eurostat is used to remove bias due to the part of the population that does not pay rent. This modelling combines a logistic and a linear regression. The dependent variable of the logistic model is the fact of being a market-price tenant or not (owners, tenants with a below market-price rent or rent free). In the next step, the linear regression’s dependent variable is the amount of rent. The linear regression uses *the inverse Mills ratio*, which was estimated in the first part of the model (see 9.3).

For tenants with a reduced rent, the rent plus expenses reported to the CATI are deducted as well as utility charges in relation to the dwelling (electricity, water, gas etc.) This calculation is different to the one recommended by Eurostat in order to be consistent with the one made for owners. This is because in the questionnaire it is too difficult for owners to separate expenses that are similar to those paid by tenants (electricity, water, gas) from those that are dissimilar (insurance, renovation, maintenance, etc.). We therefore deduct expenses and charges related to the dwelling for both tenants and owners

Imputed rent is included as a source of income in calculating income aggregates (gross, disposable, equivalent disposable) disseminated by Switzerland. This is, however, not true of the aggregates disseminated by Eurostat.

## 6. Comparability

### 6.1. Basic concepts and definitions

#### **Reference population**

The reference population is people living in private households, i.e. not in institutions, where at least one of the residents lives permanently

#### **Private household**

A private household is a person or group of people who live in the same unit of accommodation and who pool expenditure for necessities.

#### **Household membership**

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 periods**

Reference periods for income variables may differ depending on respondent, who may provide annual amounts for 2013 or monthly amounts corresponding to the 12 months preceding the interview. Information obtained from the CCO\* concerns the year 2013. Amounts relating to (income and wealth) taxation are from the 2013 calendar year. Social insurance contributions are calculated on the basis of income. Correspondingly, the reference period will be the same as for income, either 2013 or the previous 12 months.

### 6.2. Components of income

#### 6.2.1. Differences between the swiss definitions and EU-SILC definitions

#### **Total disposable household income (HY020) / Employee cash or near-cash income (PY010G)/Non-cash employee income (PY020G)**

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. Where an amount was given during the CATI\*, this will be added to the employee CATI income for the sake of consistency. In a majority of cases, data is taken from registers (CCO\*) and includes *Benefits in kind* (PY020G), which cannot be distinguished from *Employee cash or near-cash income* (PY010G). Otherwise,

#### **Regular taxes on wealth (HY120G) and 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). This component also includes mandatory health-insurance premiums (LAMal, see ch. 5.3).

#### **Social insurance contribution (PY030G)**

Social insurance contributions include the following:

- Old age and survivor insurance (AHV/OASI)
- Disability insurance
- Allowance for loss of earnings Unemployment Insurance Pension funds (BVG/LPP occupational pensions, known as the "second pillar")
- Risk coverage (death and disability)
- Accident insurance

These contributions are not surveyed during the CATI\* and are instead calculated using the difference between gross and net income from employment (see section 6.2.3).

**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 2008 an average of 0.1% of gross income.

**6.2.2. Sources**

Most income variables are collected solely through the CATI\*. However, as indicated in section 3.1 in regard to some income sub-components, this information was reconciled with data from the CCO\* register to improve reliability. This relates to the following income sub-components:

- Employee cash or near-cash income (PY010G)
- Cash profits or losses from self-employment (PY050G)
- First-pillar old-age pensions, survivor and disability pensions (PY100G, PY110G and PY130G)
- Income received by people aged under 16 (HY110G)
- Unemployment benefits (PY090G)

The Swiss Social Assistance Statistics register \* enables the HY060G to be completed.

**6.2.3. The form in which income variables at component level have been obtained**

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. To obtain gross values we used a different method for the following two income variables.

**Employee cash or near-cash income (PY010G)**

Net income from employment is gross income minus social insurance contributions. These contributions, shown in Table 15, 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<sup>3</sup>. 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.

**Table 15 Rates of social insurance contributions for employees in 2013 (year of reference for the income)**

Type of social contribution	Rate (%)
<b>1st pillar</b>	
Old age and survivor insurance (AVS)	4.2
Disability insurance (AI)	0.7
Allowance for loss of earnings (APG)	0.25
<b>Occupational benefits (2<sup>nd</sup> pillar)</b>	
Pension funds (LPP)	variable rate
Risk coverage (death and disability)	variable rate
<b>Mandatory insurance</b>	
Accident insurance	variable rate
Unemployment Insurance	1.0 for a portion of wage up to CHF 126 000 0.5 for a portion of wage upwards of CHF 126 000

<sup>3</sup> Contributions may vary between companies. Premium rates for accident insurance depend on employer and wage level.

**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 amongst those shown in Table 16. Note, however, that a minimum sum of CHF 480 (€ 383) is charged on an annual income below CHF 9 400 (€ 7 799).

**Table 16 Rate of social insurance deductions (first pillar) on gross income of self-employed workers in 2013 (year of reference for the income)**

Annual income of at least	But below	Rate of deduction from income
Fr. 9 400.-	Fr. 17 200.-	5.223%
Fr. 17 200.-	Fr. 21 700.-	5.348%
Fr. 21 700.-	Fr. 24 000.-	5.472%
Fr. 24 000.-	Fr. 26 300.-	5.596%
Fr. 26 300.-	Fr. 28 600.-	5.721%
Fr. 28 600.-	Fr. 30 900.-	5.845%
Fr. 30 900.-	Fr. 33 200.-	6.093%
Fr. 33 200.-	Fr. 35 500.-	6.342%
Fr. 35 500.-	Fr. 37 800.-	6.591%
Fr. 37 800.-	Fr. 40 100.-	6.840%
Fr. 40 100.-	Fr. 42 400.-	7.088%
Fr. 42'400.-	Fr. 44 700.-	7.337%
Fr. 44 700.-	Fr. 47 000.-	7.710%
Fr. 47 000.-	Fr. 49'300.-	8.084%
Fr. 49 300.-	Fr. 51 600.-	8.457%
Fr. 51 600.-	Fr. 53 900.-	8.829%
Fr. 53 900.-	Fr. 56 200.-	9.202%
Fr. 56 200.-		9.700%

## 7. Coherence

It is difficult to quantify the consequences of the change in the survey base on the development of SILC results due to the large number of cumulating effects. On the one hand, the change in the survey frame expanded the target population in wave 1, with the introduction of households called ALTEL\*, with no landline number, who did not, therefore, belong to the CASTEM register used previously. On the other, the availability of a great deal of information on both non-respondents and respondents led to a new process for the calculation of weighting (see ch. 4). In addition to these two effects comes the less important fact that the new weighting method uses a slightly smaller number of persons. Indeed, with the former weighting method, valid individuals were those belonging to a household that had responded to the grid in w1 and was complete in the current wave. With the new method, only those persons belonging to a complete household in wave 1 and in the current wave are kept. The new weighting uses a large number of auxiliary variables that are not available for individuals whose household did not respond to the household questionnaire in w1. This tightening up of criteria led to the elimination of 199 individuals from households that were complete in 2014 but who were incomplete in w1.

A large number of analyses have been carried out in order to attempt quantification of the consequences of these different effects. In the tables below, the SILC results are often presented with the “new weight”, i.e. the one calculated with the new weighting method, and with the 2014 weight calculated with the method used until 2013, known as the “old weight”. The difference between these two types of results is mainly due to the change in the weighting method and to a lesser extent to the 199 individuals mentioned above. The difference between the 2013 and the 2014 “old method” results is thus attributed to the “annual change/change in framework/introduction of ALTELS” group of effects.

### 7.1. Impact of the new weighting

#### 7.1.1. Structural impact

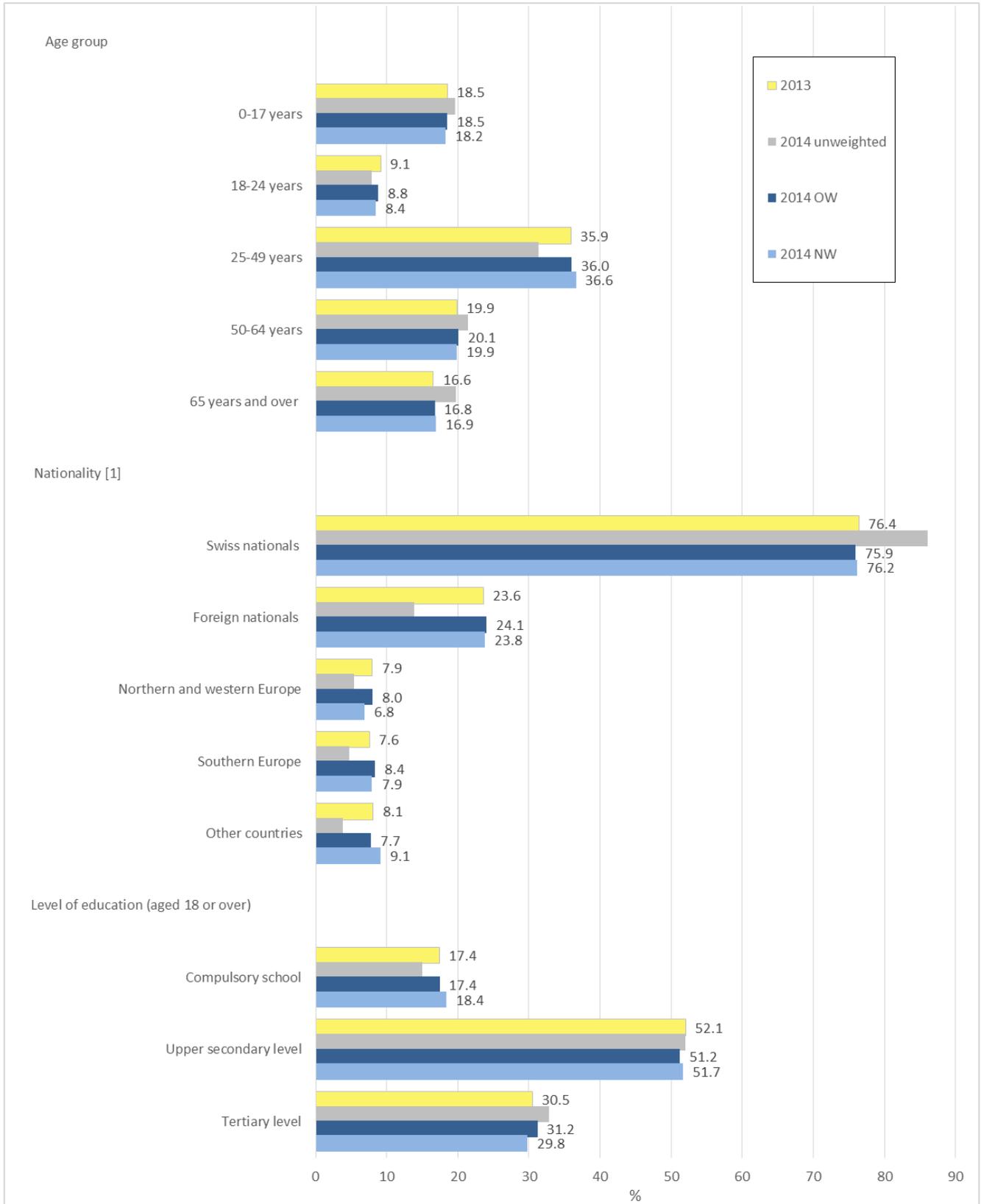
The most pronounced structural change is an increase of 240,085 in the size of the population estimated by SILC between 2013 and 2014. The greatest part of this increase is due to revision of the calibration. With the old weighting method, the final calibration was made on the population and household statistics (STATPOP), whereas with the new method, the final calibration is made on the SPRH which is comprised of non-permanent residents living in a household with at least one permanent resident, which was not the case with the base used previously. The total of the population of December 2013 estimated by the 2014 SILC was therefore 8,020,447.

To a lesser extent, the changeover to the SRPH and the new weighting have impacted on the distribution of certain groups within the population. The Figure 11 and Figure 12 below show the proportion estimated in SILC 2014 of some socio-demographic groups for whom a change has been observed. The most important changes between 2013 and 2014 concern the following groups:

- although the foreign population has remained relatively stable, its composition has changed considerably with the new weighting and the proportion of non-European foreigners has increased by almost 1%, whereas that of foreigners from North and East Europe has fallen by almost as much.
- the frequency of different types of household has been slightly modified, with, in particular, an increase (from 8.1% to 10.5%) in the frequency of persons aged under 65 who live alone. This increase seems to be mainly due to the new weighting and to a lesser extent to the introduction of ALTELS, who, as mentioned in ch. 1.2. are more likely to be persons living alone, and relatively young.
- the proportion of persons with a low education level (compulsory schooling only) has increased (17.4% to 18.4%), whereas that of persons with tertiary education has declined (30.5% to 29.8%).

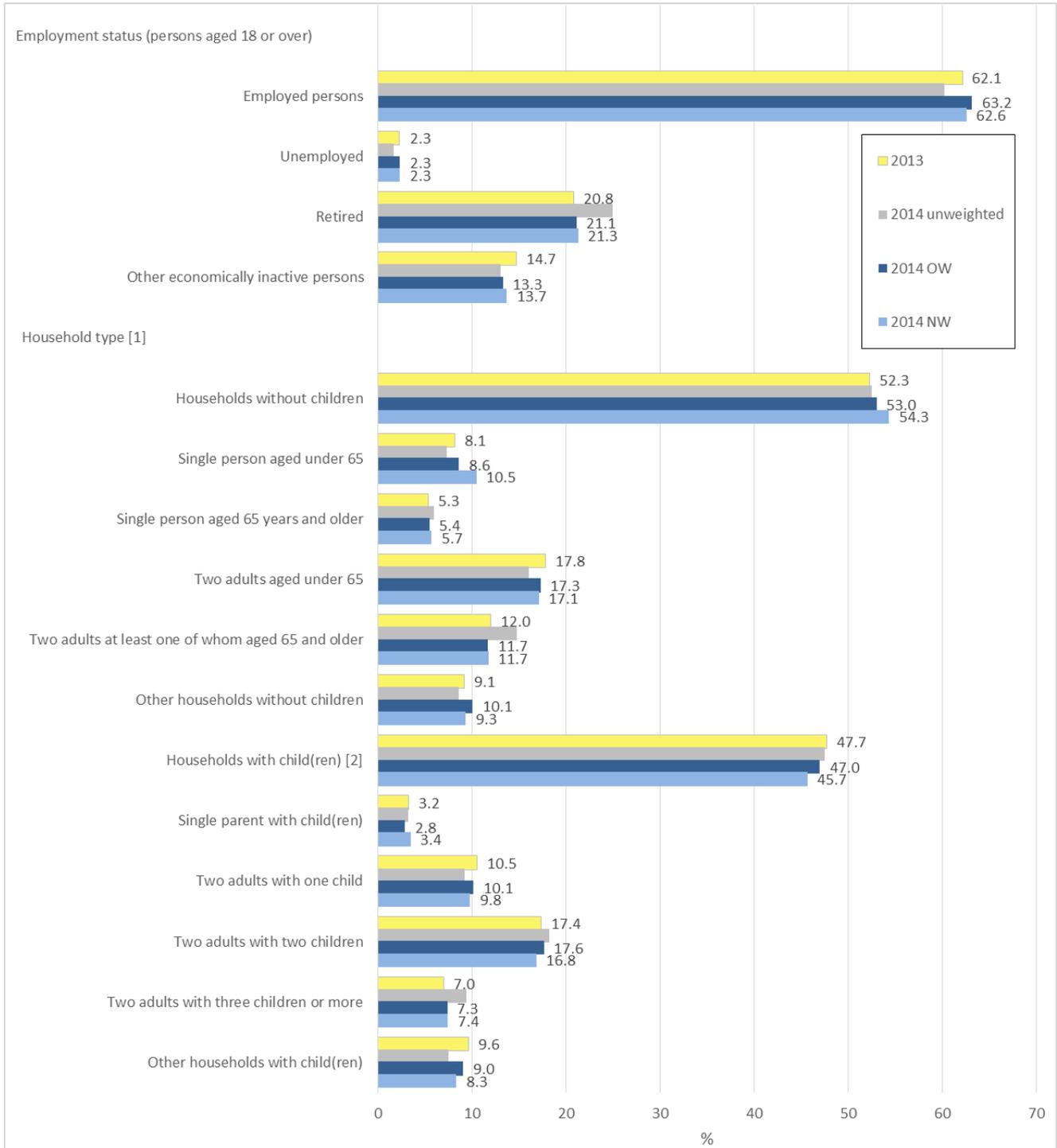
It is worth noting that although the old weighting compensated overall for a large part of the total non-response, the new weighting, due to the large number of new auxiliary variables available from the registers, fine-tunes this compensation. Comparisons of population structures with another FSO survey are available in chapter 7.2.1.

**Figure 11 Population distribution (as %) on the basis of the SILC for some socio-demographic categories, in 2013, and in 2014 without weighting, with the old weighting method (OW) and with the new weighting method (NW).**



[1] Northern and western Europe: Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Iceland, Liechtenstein, Luxembourg, Monaco, Norway, Netherlands, United Kingdom and Sweden; Southern Europe: Andorra, Vatican City, Spain, Greece, Italy, Portugal and San Marino.

**Figure 12 Population distribution (as %) on the basis of the SILC for some socio-demographic categories, in 2013, and in 2014 without weighting, with the old weighting method (OW) and with the new weighting method (NW).**



[1] Persons living in a household with these characteristics.

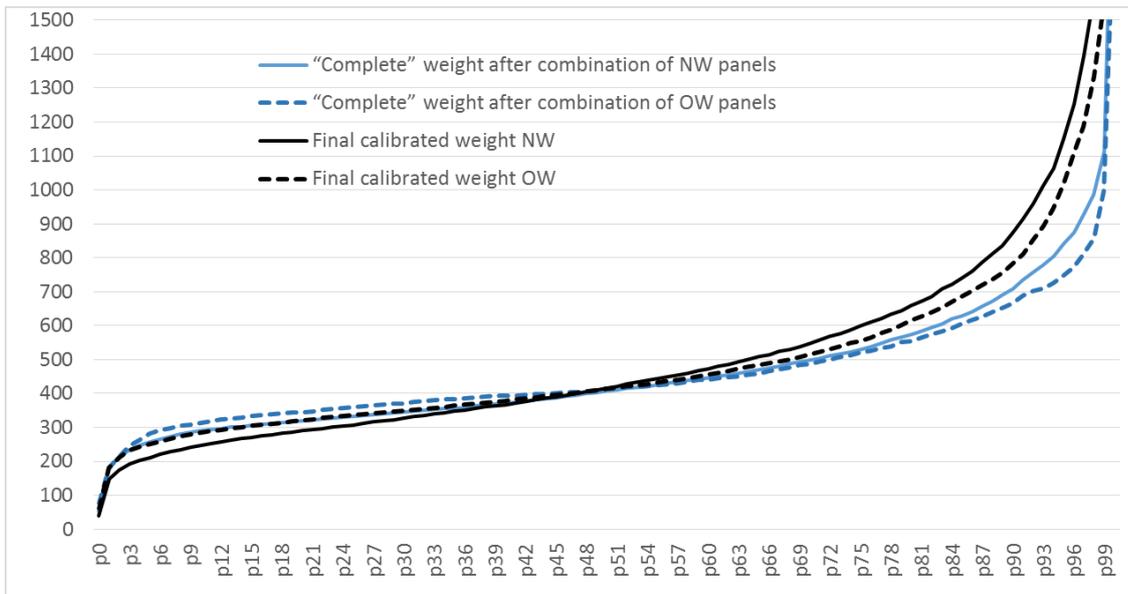
[2] Children are all persons under the age of 18 as well as persons aged 18 to 24 who are not in employment and who live with their father and/or mother.

### 7.1.2. Distribution of weights

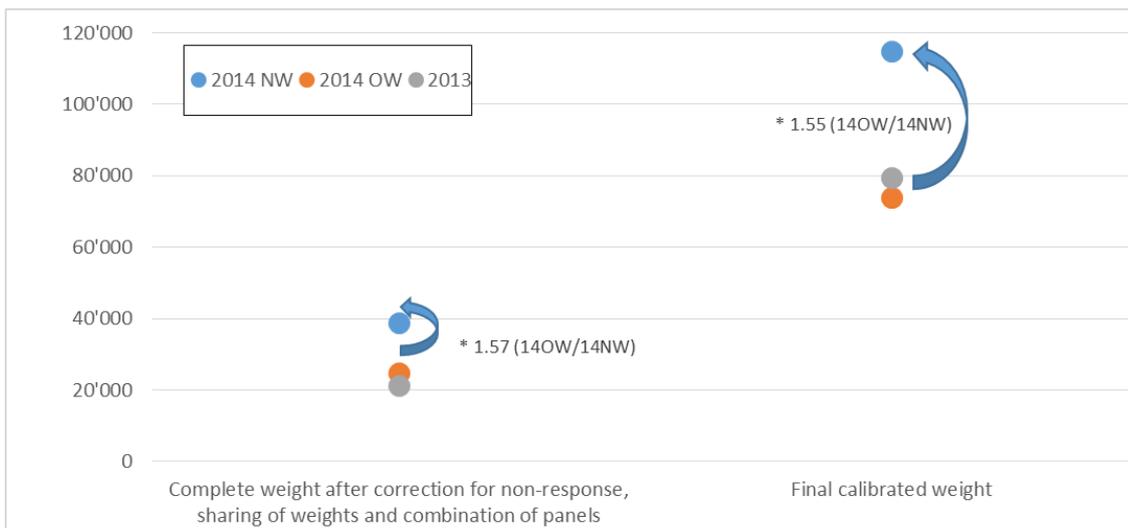
The new weighting had an effect on the distribution of weights, causing them to be more dispersed (Figure 13 and Figure 14). The dispersion of weights is greater with the new weighting once non-response has been corrected and is maintained after calibration. This can be explained by the fact that:

- The auxiliary variables available are more substantial than previously and allow more effective correction of non-response bias.
- The ALTELS can now be selected. As they are difficult to contact, their response rate is lower than for CASTEMs. The response probabilities in wave 1 are therefore more dispersed than previously, and as a result so are the weightings adjusted for non-response in wave 1, especially as the correction for non-response is carried out separately for ALTELS and CASTEMs.

**Figure 13 Distribution of new method weights (NW) and old method weights (OW) at the intermediate stage after panel combination and the final calibration.**



**Figure 14 Total variability of weights before/after calibration, weights 2013, 2014 old method (OW), 2014 new method (NW).**

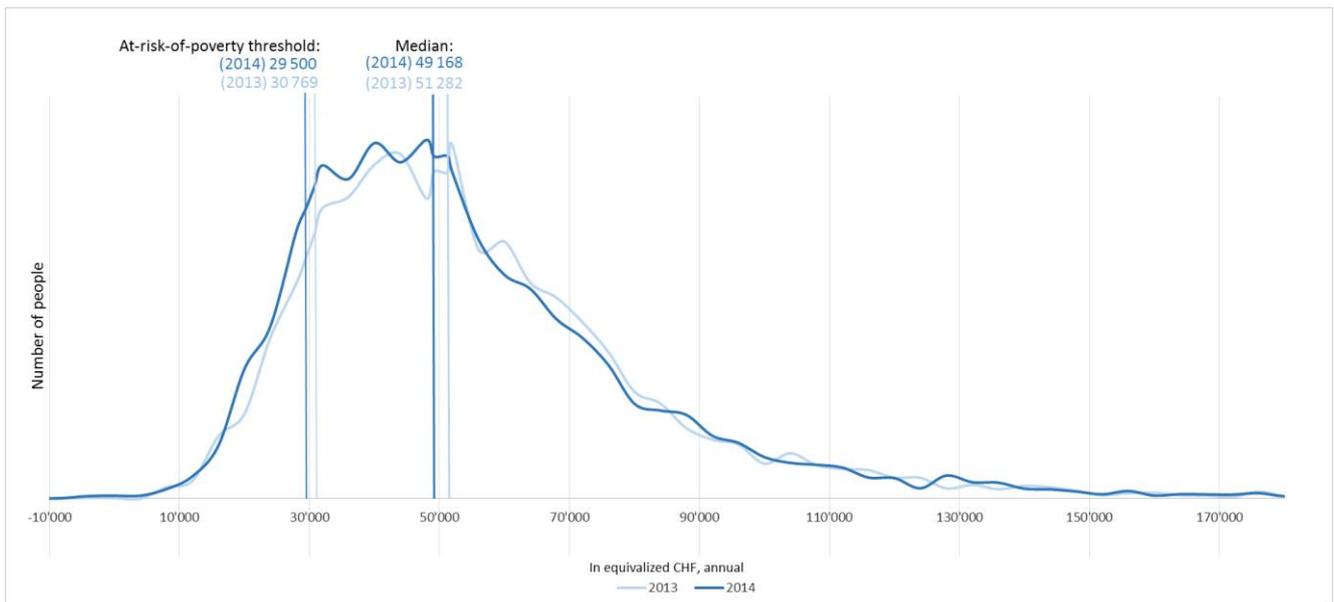


### 7.1.3. Impact on the core indicators

One relatively major effect is the significant decline in the average income from employment (PY010G *Employee cash or near cash income*, see chapter 7.3). The median equivalised disposable income fell significantly, partly due to a fall in income from employment. This fall is significant for a large proportion of the socio-demographic categories shown in Table 18. The lowering of the median equivalised disposable income is accompanied by a significant decrease in the first quartile. The impact of the new weighting is therefore a downward shift in the bottom part of the distribution curve without any significant change to the top part (see Figure 15 below). The income quintile share ratio S80/S20 did not change for the population overall, but increased for some categories (Table 18)

The lowering of the median results in a lowering of the at-risk-of-poverty threshold, from CHF 30,769 in 2013 to CHF 29,500. However, this has not impacted the at-risk-of-poverty rates due to the downward shift in income distribution.

**Figure 15 Distribution curve of annual equivalised disposable income, in CHF, for 2013 and 2014, rounded to the nearest CHF 4 000.** The upper extremities are not shown.



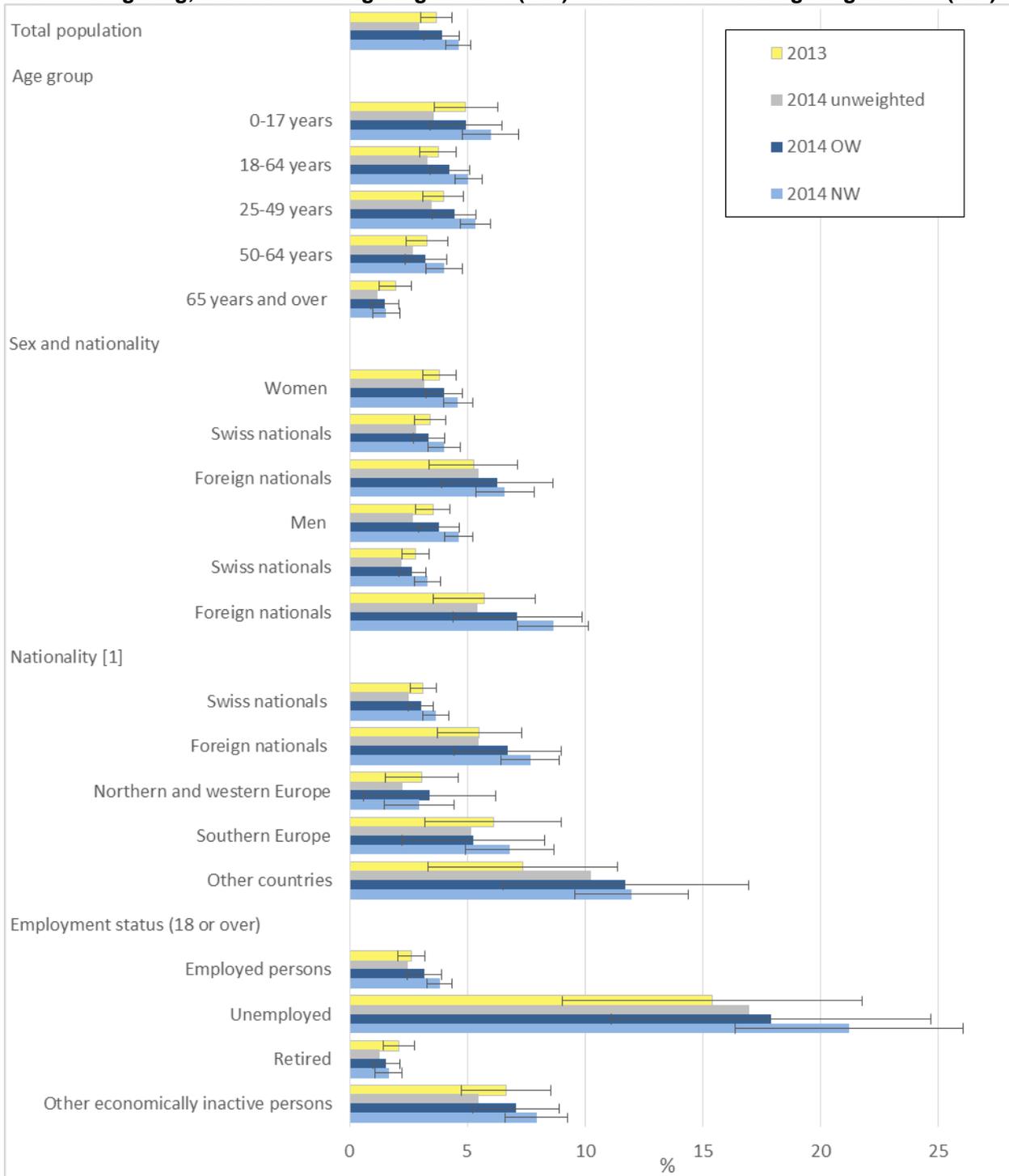
The material deprivation rate (see Table 17) in the population increased slightly due to the effects of the change in the survey framework, the introduction of the ALTELS and real annual trends. However, this difference is not significant for the population as a whole. The severe material deprivation rate increased significantly for the population as a whole and for many categories (see also Table 18).

**Table 17 Results of the at-risk-of-poverty rate, material deprivation rate and severe material deprivation rate, in 2013 and 2014, based on the two weighting methods**

	2013	2014 OW	2014 NW
ARPR (60%, with imputed rent)	13.3	12.7	13.5
Material deprivation rate	3.7	4.7	4.6
Severe material deprivation rate	0.7	1.1	1.3

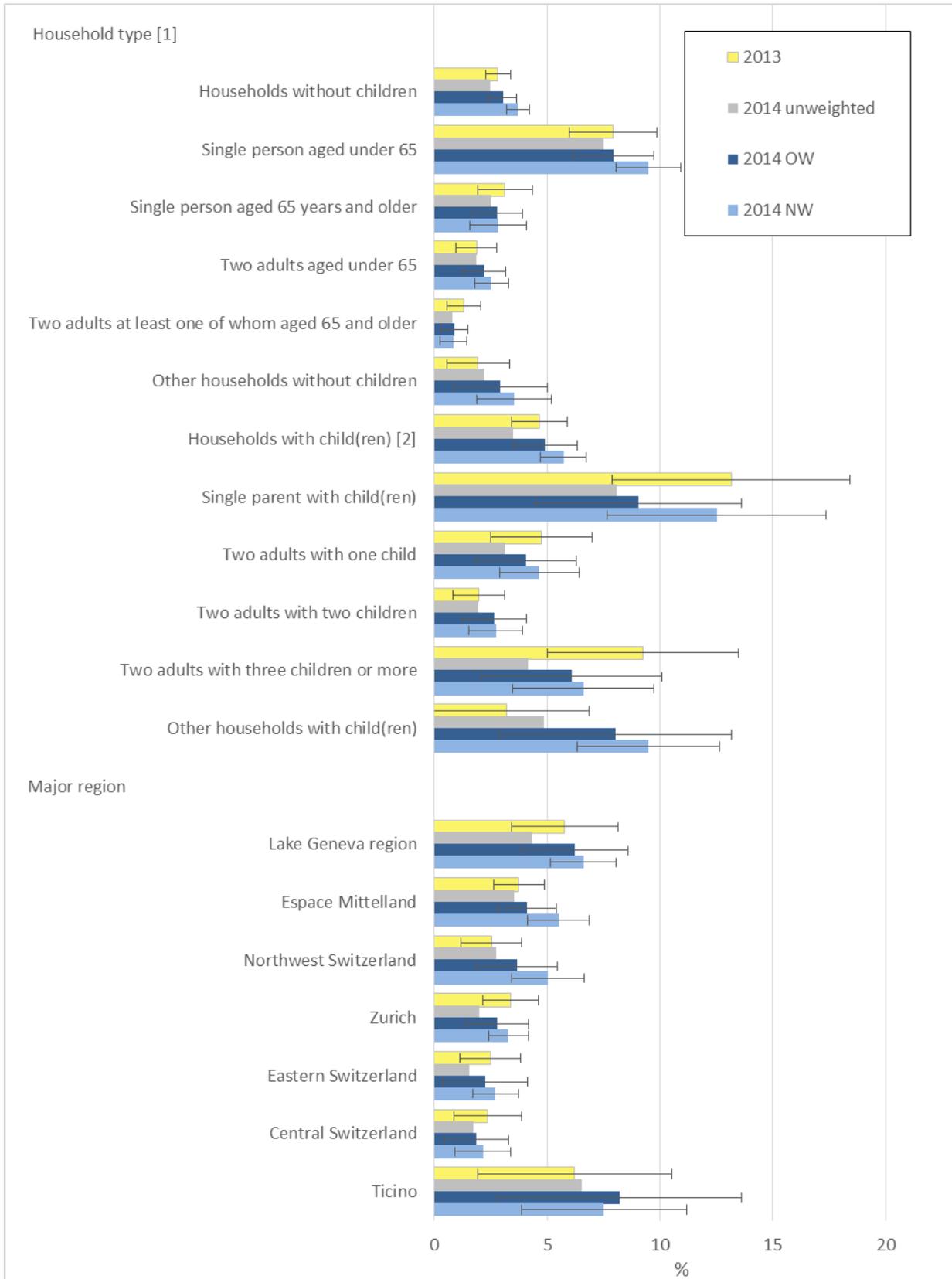
In terms of the other indicators, no significant changes were observed concerning overall life satisfaction. As mentioned above, the results of several indicators suggest a deterioration of the financial situation for a part of the population or the population as a whole (fall in median equivalised disposable income, increase in material deprivation rate, significant rise in severe material deprivation rate, increase in the percentage of the population with at least one financial difficulty), although paradoxically respondents' perceptions of their financial situation are stable (satisfaction with financial situation, percentage of individuals having difficulty making ends meet) or has improved (percentage of individuals finding it easy to make ends meet).

**Figure 16 Material deprivation rates for some socio-demographic categories, in 2013 and in 2014, without weighting, with the old weighting method (OW) and with the new weighting method (NW)**



[1] Northern and western Europe: Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Iceland, Liechtenstein, Luxembourg, Monaco, Norway, Netherlands, United Kingdom and Sweden; Southern Europe: Andorra, Vatican City, Spain, Greece, Italy, Portugal and San Marino.

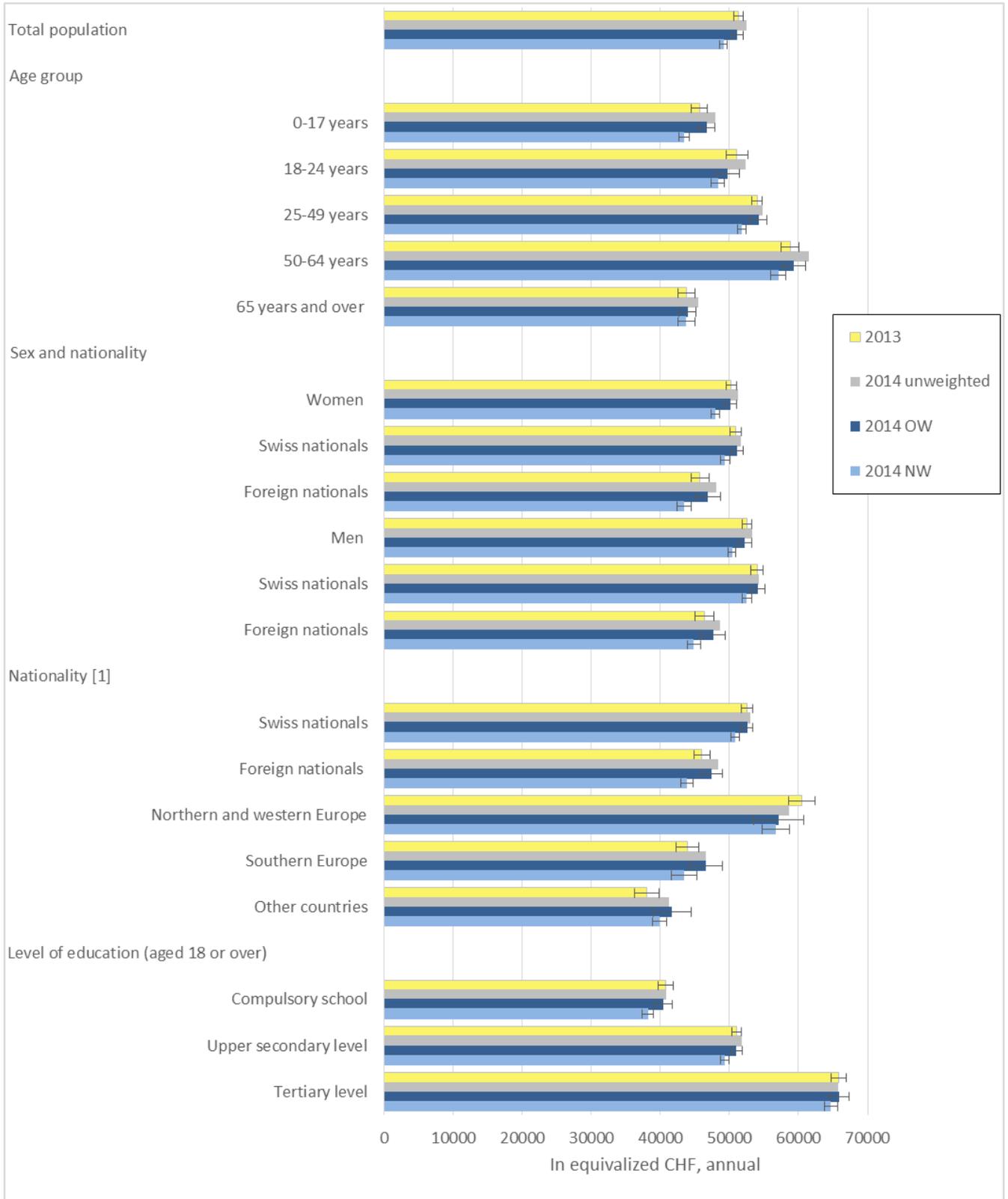
**Figure 17 Material deprivation rates for some socio-demographic categories, in 2013 and in 2014, without weighting, with the old weighting method (OW) and with the new weighting method (NW)**



[1] Persons living in a household with these characteristics.

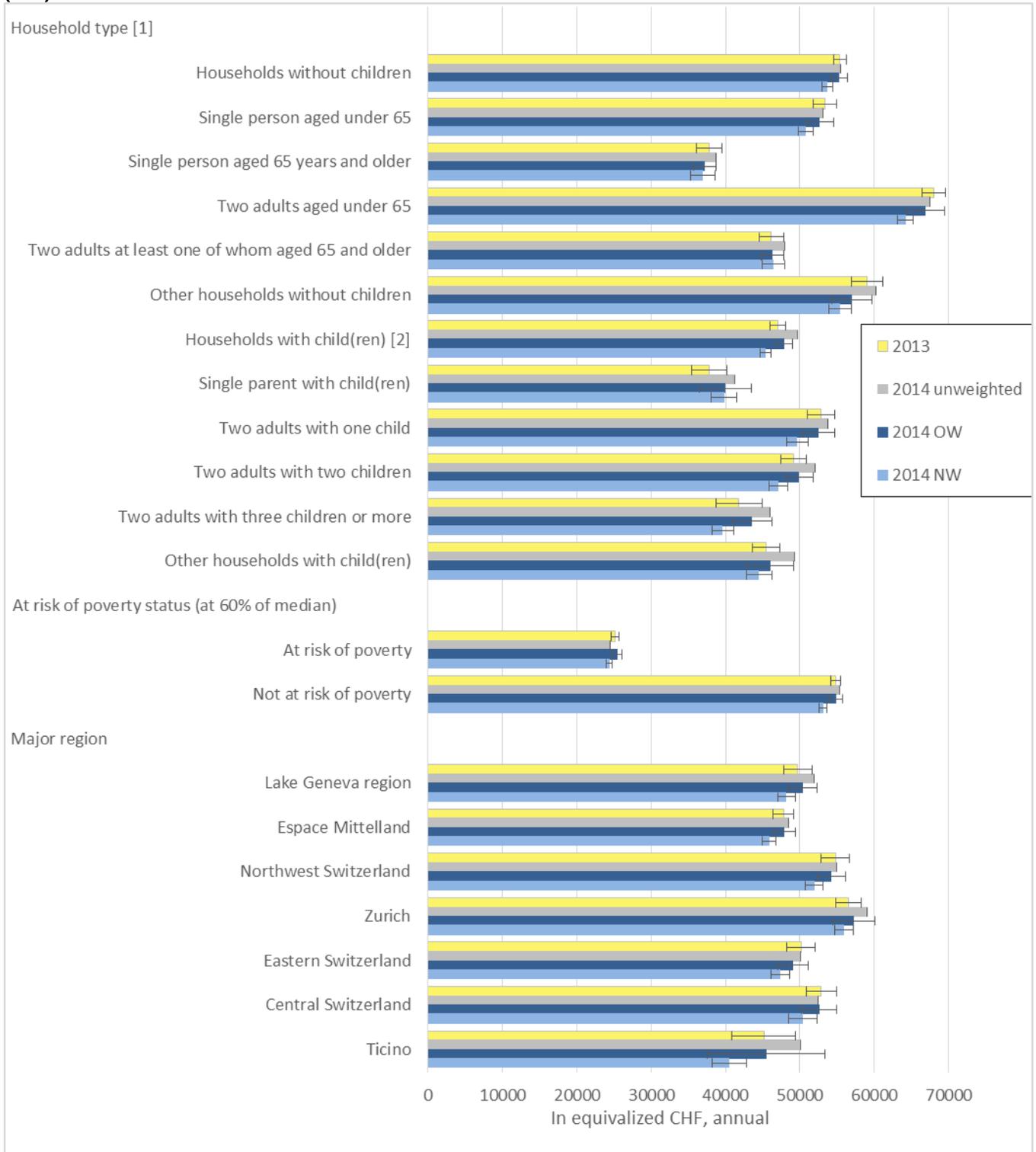
[2] Children are all persons under the age of 18 as well as persons aged 18 to 24 who are not in employment and who live with their father and/or mother.

**Figure 18 Median equivalised disposable income for some socio-demographic categories, in 2013 and in 2014 without weighting, with the old weighting method (OW) and with the new weighting method (NW).**



[1] North and Western Europe: Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Iceland, Liechtenstein, Luxembourg, Monaco, Norway, Netherlands, United Kingdom and Sweden; Southern Europe: Andorra, Vatican City, Spain, Greece, Italy, Portugal and San Marino.

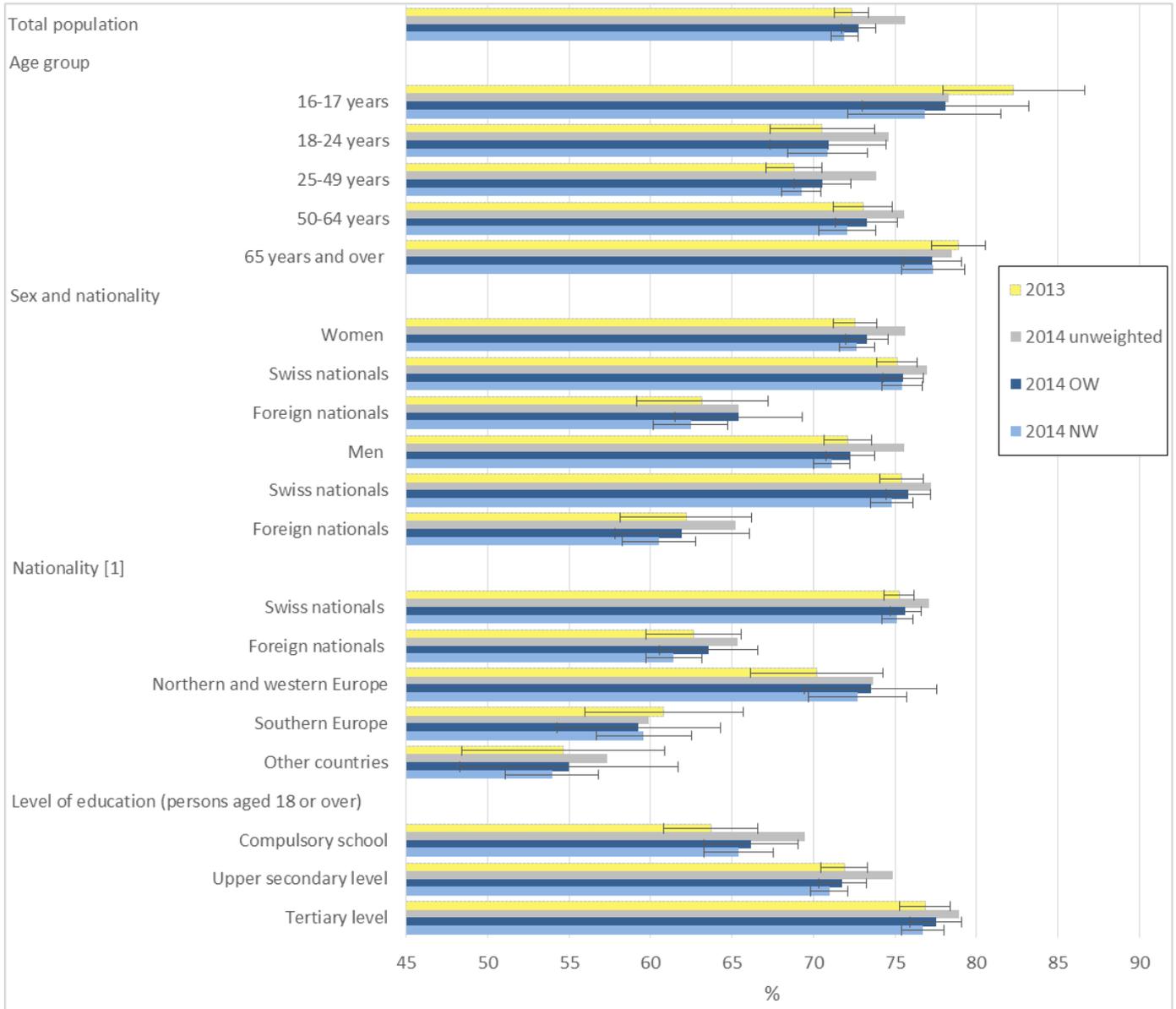
**Figure 19 Median equivalised disposable income for some socio-demographic categories, in 2013 and in 2014 without weighting, with the old weighting method (OW) and with the new weighting method (NW).**



[1] Persons living in a household with these characteristics.

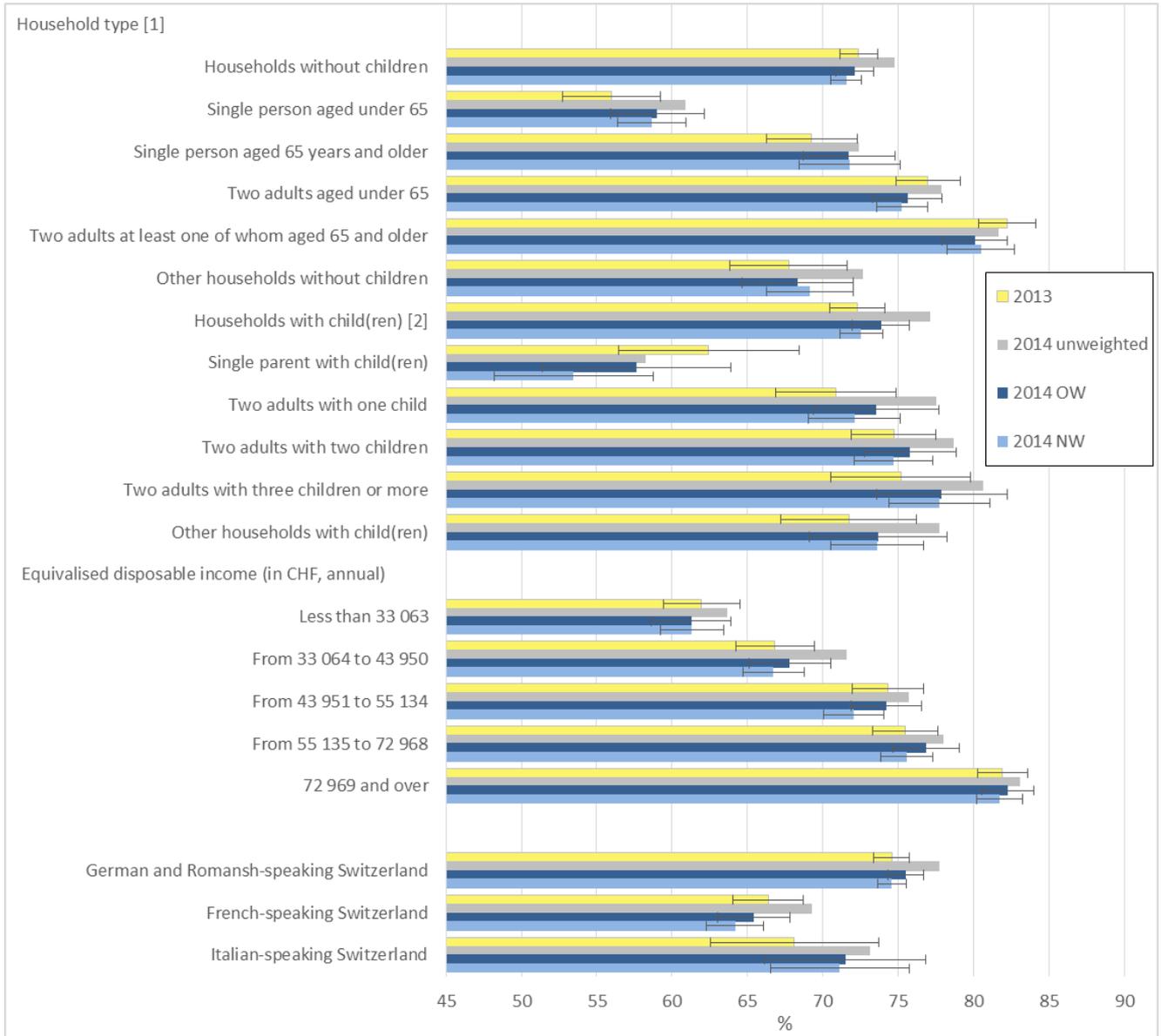
[2] Children are all persons under the age of 18 as well as persons aged 18 to 24 who are not in employment and who live with their father and/or mother.

**Figure 20 Proportion of persons very satisfied with their current life, for some socio-demographic categories, in 2013, in 2014 without weighting, with the old weighting method (OW) and with the new method (NW)**



[1] North and Western Europe: Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Iceland, Liechtenstein, Luxembourg, Monaco, Norway, Netherlands, United Kingdom and Sweden; Southern Europe: Andorra, Vatican City, Spain, Greece, Italy, Portugal and San Marino.

**Figure 21 Proportion of persons very satisfied with their current life, for some socio-demographic categories, in 2013, in 2014 without weighting, with the old weighting method (OW) and with the new method (NW)**



[1] Persons living in a household who have these characteristics.

[2] Children are all persons younger than 18 as well as all persons aged 18 to 24 who are economically inactive and who live with their father and/or mother.

**Table 18 Summary of change in core SILC indicators between 2013 and 2014 for some socio-demographic categories.** Only the significant changes are shown (decrease in red, increase in green).

	1st decil	1 <sup>st</sup> quartile	Median	3rd quartile	9e décile	S80/S20	ARPR 60%	Material deprivation rate	Severe material deprivation rate	Percentage of the population living in a household that has at least one economic difficulty	cannot afford to buy at least one consumer durable	cannot make ends meet [5]	can easily make ends meet [6]	has a high level of Satisfaction towards financial situation of household [4]
Total population														
<b>Age group</b>														
0-17 years														
18-64 years														
18-24 years														
25-49 years														
50-64 years														
65 years and more														
<b>Sex and nationality</b>														
Women														
Swiss nationals														
Foreign nationals														
Men														
Swiss nationals														
Foreign nationals														
<b>Nationality [3]</b>														
Swiss														
Foreign														
Northern and western Europe														
Southern Europe														
Other countries														
<b>Level of education (persons aged 18 or over)</b>														
Compulsory school														
Upper secondary level														
Tertiary level														
<b>Employment status (persons aged 18 or over)</b>														
Employed persons														
Unemployed														
Retired														
Other economically inactive persons :														
<b>Household type [1]</b>														
Households without children														
Single person aged under 65														
Single person aged 65 years or older														
2 adults aged under 65														
2 adults at least 1 of whom aged 65 or older														
Other households without children														
Households with child(ren) [2]														
Single parent with child(ren)														
2 adults with 1 child														
2 adults with 2 children														
2 adults with 3 children or more														
Other households with child(ren)														
<b>Occupancy status of dwelling [1]</b>														
Owners														
Tenants														
<b>Equivalised disposable income (in CHF equivalents, annual)</b>														
Less than 29,542														
From 29,542 to 39,326														
From 39,327 to 50,009														
From 50,010 to 66,219														
66,220 or more														
<b>At risk of poverty status (at 60% of median)</b>														
At risk of poverty														
Not at risk of poverty														
<b>Material deprivation (3 out of 9 items)</b>														
Materially deprived														
Not materially deprived														
<b>Language region</b>														
German and Romansh-speaking Switzerland														
French-speaking Switzerland														
Italian-speaking Switzerland														
<b>Degree of urbanisation</b>														
Densely populated zone														
Intermediate zone														
Sparsely populated zone														
<b>Major region</b>														
Lake Geneva region														
Espace Mittelland														
Northwest Switzerland														
Zurich														
Eastern Switzerland														
Central Switzerland														
Ticino														

[1] Persons living in a household with these characteristics.

[2] Children are all persons under the age of 18 as well as persons aged 18 to 24 who are not in employment and who live with their father and/or mother.

[3] Northern and western Europe: Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Iceland, Monaco, Norway, Netherlands, United Kingdom and Sweden; Southern Europe: Andorra, Vatican City, Spain, Greece.

[4] Value of 8, 9 or 10 on a scale of 0 (not at all) to 10 (absolutely).

[5] Values 1 (very difficult) or 2 (difficult) on a scale of 1 to 6.

[6] Values 5 (easy) or 6 (very easy) on a scale of 1 to 6.

## 7.2. Comparisons with external sources

In-depth coherence analysis was carried out between the SILC survey and the Household Budget Survey (HBS\*), or the structural survey (SS\*), also conducted by the FSO\*.

This analysis covers the percentage of households receiving the various components, the distribution of amounts above 0 and at-risk-of-poverty rates by individual profile. As the reference year for income in the 2014 SILC survey was 2013, comparison was made with HBS\* data from 2013. In contrast to SILC, the HSB sample was still drawn from CASTEM in 2013. A small part of the difference between the results can be explained by the non-coverage of ALTELS in the HBS13 sample and the difference in the reference population for the calibrations (Statpop\* for HBS13, SRPH for SILC14).

The Household Budget Survey is conducted annually and seeks to collect detailed information on households' income and expenditure. The survey samples 3 000 households, primarily through the use of written questionnaires. The response burden of the HBS is high, explaining why unadjusted response rates are relatively low at less than 40%. Unlike the SILC survey, no register information is reconciled with information gathered during fieldwork. However, in the event of inconsistencies arising during HBS\* quality controls, householders are contacted again to clear up issues and correct information where appropriate.

### 7.2.1. Population structure

The population structure was calculated according to different comparable socio-demographic characteristics for persons aged 15 or over, in SILC and the Structural Survey (SS). In the large majority of cases, the rates estimated with the new SILC14 weighting are very close to those from the structural survey (Table 19). Only the distribution of sizes and types of household differs significantly. The estimates that differ the most concern:

- single persons aged under 65
- two adults aged under 65
- two adults with 1, 2 and 3 or more children

In addition, in most cases (28 of 34), the new weighting gives rise to estimates that are closer or equal to the structural survey, which points in the right direction and suggests that the new weighting will deliver the hoped-for improvements in quality.

**Table 19 Comparison of SILC and SS population structures.** Values that differ significantly compared with the 2014 results with the new weighting are shown in red. These values were calculated on the basis of the population of persons aged 15 and over.

Variable		SS2013 15+			SILC14 OW 15+			SILC14 NW 15+		
		weighted %	CI (95%) min max		weighted %	CI (95%) min max		weighted %	CI (95%) min max	
Sex	Men	<b>49.24</b>	49.05	49.43	<b>49.27</b>	48.29	50.24	<b>49.21</b>	48.19	50.22
	Women	<b>50.76</b>	50.57	50.95	<b>50.73</b>	49.76	51.71	<b>50.79</b>	49.78	51.81
	Swiss	<b>76.94</b>	76.78	77.10	<b>76.30</b>	75.30	77.29	<b>76.88</b>	75.85	77.91
	Foreign	<b>23.06</b>	22.90	23.22	<b>23.70</b>	22.71	24.70	<b>23.12</b>	22.09	24.15
Sex-nationality	Swiss men	<b>36.93</b>	36.75	37.12	<b>36.68</b>	35.78	37.58	<b>37.07</b>	36.13	38.01
	Foreign men	<b>12.31</b>	12.18	12.44	<b>12.59</b>	11.78	13.41	<b>12.14</b>	11.30	12.97
	Swiss women	<b>40.01</b>	39.82	40.19	<b>39.62</b>	38.70	40.53	<b>39.81</b>	38.85	40.76
	Foreign women	<b>10.75</b>	10.63	10.87	<b>11.11</b>	10.35	11.87	<b>10.98</b>	10.20	11.77
Nationality	Swiss	<b>76.94</b>	76.78	77.10	<b>76.30</b>	75.30	77.29	<b>76.88</b>	75.85	77.91
	Northern and western Europe	<b>6.65</b>	6.55	6.75	<b>7.68</b>	7.09	8.28	<b>6.59</b>	6.06	7.11
	Southern Europe	<b>7.92</b>	7.82	8.02	<b>8.35</b>	7.68	9.01	<b>7.92</b>	7.25	8.60
	Turkey, Western Balkans	<b>4.34</b>	4.26	4.43	<b>4.47</b>	3.85	5.08	<b>4.99</b>	4.32	5.65
	Other countries	<b>4.15</b>	4.07	4.23	<b>3.21</b>	2.78	3.64	<b>3.63</b>	3.12	4.14
Civil status	Single	<b>33.30</b>	33.12	33.48	<b>32.40</b>	31.46	33.35	<b>33.22</b>	32.24	34.20
	Married/ registered partnership	<b>51.92</b>	51.73	52.12	<b>52.95</b>	<b>51.97</b>	<b>53.93</b>	<b>50.87</b>	<b>49.85</b>	<b>51.88</b>
	Separated	NA	NA	NA	<b>0.91</b>	0.73	1.10	<b>0.96</b>	0.75	1.18
	Widow (er)	<b>5.49</b>	5.40	5.58	<b>5.26</b>	4.86	5.66	<b>5.52</b>	5.11	<b>5.94</b>
	Divorced/ dissolved registered partnership	<b>9.29</b>	9.17	9.40	<b>8.47</b>	7.94	9.01	<b>9.42</b>	8.82	<b>10.03</b>
Household type	Single person aged below 65	<b>11.84</b>	11.71	11.97	<b>10.16</b>	<b>9.55</b>	<b>10.76</b>	<b>12.33</b>	<b>11.60</b>	<b>13.06</b>
	Single person aged 65 or over	<b>6.54</b>	6.44	6.64	<b>6.41</b>	5.98	6.83	<b>6.71</b>	6.26	7.15
	Two adults aged under 65	<b>18.76</b>	<b>18.60</b>	<b>18.93</b>	<b>20.39</b>	19.60	21.19	<b>20.14</b>	<b>19.33</b>	<b>20.95</b>
	Two adults at least one of whom is 65 or over	<b>13.84</b>	13.70	13.98	<b>13.78</b>	13.21	14.35	<b>13.82</b>	13.24	14.41
	Other households without children	<b>17.96</b>	<b>17.77</b>	<b>18.14</b>	<b>11.87</b>	11.20	12.54	<b>10.92</b>	<b>10.26</b>	<b>11.59</b>
	Single parent with child(ren)	<b>2.75</b>	2.68	2.82	<b>2.16</b>	1.91	2.40	<b>2.65</b>	2.32	2.98
	Two adults with one child	<b>6.03</b>	<b>5.93</b>	<b>6.12</b>	<b>8.98</b>	8.41	9.55	<b>8.64</b>	<b>8.05</b>	<b>9.23</b>
	Two adults with two children	<b>8.59</b>	<b>8.48</b>	<b>8.70</b>	<b>12.50</b>	11.88	13.11	<b>11.96</b>	<b>11.30</b>	<b>12.62</b>
	Two adults with three children or more	<b>3.81</b>	<b>3.72</b>	<b>3.90</b>	<b>4.36</b>	4.02	4.71	<b>4.39</b>	<b>4.00</b>	<b>4.79</b>
Other households with children	<b>9.88</b>	<b>9.73</b>	<b>10.03</b>	<b>9.39</b>	8.70	10.09	<b>8.43</b>	<b>7.81</b>	<b>9.05</b>	
Size of household	1 person	<b>18.38</b>	18.22	18.54	<b>16.57</b>	<b>15.86</b>	<b>17.28</b>	<b>19.05</b>	<b>18.23</b>	<b>19.86</b>
	2 persons	<b>33.57</b>	<b>33.37</b>	<b>33.78</b>	<b>35.28</b>	34.37	36.18	<b>35.44</b>	<b>34.50</b>	<b>36.38</b>
	3 persons	<b>17.43</b>	17.26	17.60	<b>17.50</b>	16.76	18.25	<b>17.02</b>	16.22	17.81
	4 persons	<b>18.99</b>	18.82	19.16	<b>19.69</b>	18.92	20.46	<b>18.48</b>	17.70	19.27
	5+ persons	<b>11.62</b>	<b>11.45</b>	<b>11.79</b>	<b>10.95</b>	10.24	11.67	<b>10.01</b>	<b>9.35</b>	<b>10.67</b>
Housing occupancy status	Owner	<b>43.77</b>	<b>43.64</b>	<b>43.90</b>	<b>44.75</b>	43.81	45.68	<b>45.13</b>	<b>44.15</b>	<b>46.10</b>
	Tenant	<b>53.81</b>	53.65	53.98	<b>55.26</b>	54.32	56.19	<b>54.88</b>	53.90	55.85
	Other	<b>4.88</b>	4.82	4.94						

### 7.2.2. Comparison of SILC14-HBS13 income components

Compared income components are those whose Eurostat definitions are relatively similar in the two surveys. However, HBS goes into more detail about various items of income that may at times be problematic for comparisons. Although the linking of these items to Eurostat components was subject to a coordinated assessment between the SILC survey and the HBS, definition mistakes or discrepancies may still arise.

Table 20 shows the average of core income components for all households (N non-weighted 6875 for the SILC and 2917 for the HBS), while Table 21 indicates the proportion of households with a positive amount in relation to an income component, along with the average of values above 0. All results have been calculated with weightings, in the case of SILC with both the old and new methods.

Findings from Table 20 indicate that, of the 15 income components that were compared, the majority (10) had a similar average (with statistical significance of 95%) in both surveys.

The average amount per household is significantly higher in the SILC for the components *Survivor benefits* (PY110G), *Disability benefits* (PY130G), *Pension from individual private plans* (PY080G) and *Family/Children-related allowances* (HY050G) whereas the component *Regular inter-household cash transfer received* (HY080G) is significantly higher in the HBS. Of these, none represents a significant part in the calculation of disposable income.

The differences concerning these latter components can be seen in Table 21 which this time only shows the average for households receiving the sub-component.

For all households, with or without income from employment, the average annual income from employment PY010G is not significantly different to that in the HBS, with either the new or the old weighting method. The SILC estimate of the average annual income from employment per household is significantly lower with the new weighting method than the old one. This means that the new weighting method attributes greater weight to low incomes than the old method. It is worth remembering here that a number of auxiliary variables directly linked to income distribution in registers were used in the new weighting (see Chapter 4 Weightings).

**Table 20 Comparison SILC14-HBS13.** Average, confidence interval of income sub-components for all households (with or without income) with weightings, in CHF per year. Components for which averages with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

	HBS13			SILC14 OW			SILC14 NW			
	Average	Confidence interval (95%)		Average	Confidence interval (95%)		Average	Confidence interval (95%)		
		min	max		min	max		min	max	
<b>Employment income</b>										
PY010G	Employee cash or near-cash income (Gross)	84 551	80 447	88 656	88 882	86 524	91 240	82 228	79 617	84 839
PY050G	Cash benefits or losses from self-employment	6 718	5 384	8 052	7 161	6 431	7 892	7 951	7 038	8 865
<b>Investment and property income</b>										
HY040G	Income from rental of a property or land	1 978	1 539	2 416	2 230	1 949	2 510	2 348	2 021	2 676
HY090G	Interest, dividends, profit from capital investments in unincorporated business	2 467	1 646	3 287	2 497	2 166	2 829	2 485	2 175	2 794
<b>Transfer income</b>										
PY100G	Old-age benefits	16 750	15 570	17 931	15 892	15 198	16 587	15 388	14 706	16 070
PY110G	Survivor benefits	447	300	594	856	717	995	834	701	966
PY130G	Disability benefits	1 397	1 036	1 759	1 964	1 690	2 237	2 135	1 859	2 411
PY120G	Sickness benefits	NC	NC	NC	NC	NC	NC	NC	NC	NC
PY080G	Pension from individual private plans	188	105	271	768	627	910	775	624	926
PY140G	Education- related allow ances	119	14	223	90	63	118	115	72	159
HY050G	Family/Children-related allow ances	1 355	1 255	1 455	2 000	1 903	2 096	1 929	1 826	2 031
HY060G	Social exclusion not elsew here classified	1 445	1 207	1 683	1 109	951	1 268	1 409	1 170	1 648
HY070G	Housing allow ances	70	32	109	42	26	58	50	29	71
HY080G	Regular inter-household cash transfer received	1 666	1 362	1 970	973	856	1 090	1 091	919	1 262
<b>Mandatory deductions</b>										
HY130G	Regular inter-household cash transfer paid	2 094	1 692	2 497	1 857	1 678	2 036	1 869	1 667	2 071
HY140G	Tax on income and social contributions	32 972	30 843	35 100	35 255	34 486	36 025	33 458	32 566	34 349

For households that receive income from employment, there is a significant difference between the SILC and the HBS, both in terms of the percentage of households concerned and the average annual income. This also applies to income from self-employment. However, in 2014, the estimated average income from employment in the old SILC weighting is not significantly different to that in the HBS. In terms of the differences in the percentage of households with income from employment, it should be noted that In the SILC, the activity statuses (employed or self-employed) according to the CCO\* register are prioritised. In the HBS, priority is given to the option chosen by the respondent. It is thus possible that a proportion of the respondents classify themselves as self-employed even though they are considered to be employed in the CCO\* register (for example, employees of their own business) and are thus classified as such for the SILC.

As is the case for the employment income addressed above, the differences between the SILC14 and the HBS13 for other sub-components have already been observed in previous years

For several income sub-components, the percentage of households receiving an amount greater than zero is higher in the SILC than in the HBS, as shown in Table 21. This concerns the sub-components *Survivor's benefits* (PY100G), *Disability benefits* (PY130G), *Pension from individual private plans* (PY080G), *Family/Children related allowances* (HY050G) and *Social exclusion not elsewhere classified* (HY060G). This can largely be explained by differences in the reference period: the whole of 2009 for the SILC / month of reference for the HBS. Furthermore, the latter sub-component has a rather vague definition in both the SILC and the HBS, encouraging us to treat findings cautiously.

With regard to income from wealth (HY090G, the rate of households receiving an income (>0) is higher in the HBS. This is undoubtedly due to the different survey methods and the fact that in CATI, households with a small income from interest and dividends state these less frequently than in PAPI.

The percentage of households with transfers paid to other households (HY130G) or received from other households (HY080G *Regular inter-household cash transfer received*) is far higher in the HBS, even though the average of the positive amounts, both the transfers received and paid, is significantly higher in the SILC than in the HBS. However, the average of all households is ultimately higher for the HBS. This can largely be explained by the fact that the irregular transfers between households are integrated into this component for the HBS, whereas in the SILC only the regular transfers are considered.

Summing up, in spite of the differences highlighted above, results for each component in the SILC survey and the HBS\* are generally very similar. Differences generally stem from data-collection type (CATI\*, PAPI\*, register), the level of detail during the survey and definitions used.

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**Table 21 SILC14-HBS13** Proportion (%) of households with income sub-component (>0) and average (in CHF, per year) thereof where this is non-zero. Sub-components for which averages or ratio with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

		HBS13					SILC14 OW					SILC14 NW										
		% of households w ith income > 0			Average	Confidence interval			% of households w ith income > 0			Average	Confidence interval			% of households w ith income > 0			Average	Confidence interval		
		Confidence interval (95%)				Confidence interval (95%)			Confidence interval (95%)				Confidence interval (95%)			Confidence interval (95%)						
		%	min	max		min	max	%	min	max		min	max	%	min	max		min	max			
<b>Employment income</b>																						
PY010G	Employee cash or near-cash income	70.1%	68.1%	72.0%	120 690	115 870	125 511	75.2%	74.1%	76.2%	118 230	115 584	120 876	74.7%	73.6%	75.8%	110 059	106 893	113 226			
PY050G	Cash benefits or losses from self-employment	19.8%	18.0%	21.5%	33 940	28 225	39 655	13.2%	12.3%	14.1%	54 206	49 806	58 605	14.1%	13.2%	15.1%	56 214	51 008	61 419			
<b>Investment and property income</b>																						
HY040G	Income from rental of a property or land	9.3%	8.2%	10.5%	21 209	17 121	25 298	8.5%	7.9%	9.2%	26 155	23 457	28 853	8.6%	7.9%	9.3%	27 207	24 141	30 272			
HY090G	Interest, dividends, profit from capital investments in unincorporated business	91.8%	90.6%	93.0%	2 687	1 793	3 580	89.1%	88.3%	90.0%	2 801	2 430	3 173	88.3%	87.3%	89.3%	2 814	2 465	3 164			
<b>Transfer income</b>																						
PY100G	Old-age benefits	29.2%	27.3%	31.0%	57 376	55 191	59 561	30.7%	29.5%	31.8%	51 799	50 495	53 103	30.6%	29.4%	31.7%	50 369	49 076	51 662			
PY110G	Survivor benefits	1.7%	1.2%	2.2%	26 219	21 351	31 087	3.5%	3.0%	3.9%	24 774	22 267	27 281	3.4%	3.0%	3.9%	24 319	21 967	26 671			
PY130G	Disability benefits	4.2%	3.4%	5.1%	32 937	28 403	37 470	6.2%	5.5%	6.8%	31 864	29 293	34 436	7.1%	6.3%	7.8%	30 195	28 020	32 369			
PY120G	Sickness benefits	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC			
PY080G	Pension from individual private plans	1.7%	1.1%	2.2%	11 317	7 342	15 293	3.2%	2.8%	3.6%	23 916	20 581	27 251	3.2%	2.8%	3.6%	23 976	20 337	27 616			
PY140G	Education- related allow ances	0.9%	0.5%	1.3%	13 568	4 552	22 585	1.2%	0.9%	1.5%	7 484	5 817	9 150	1.4%	1.0%	1.8%	8 022	5 796	10 247			
HY050G	Family/Children-related allow ances	25.8%	24.0%	27.6%	5 250	5 056	5 444	32.8%	31.5%	34.1%	6 098	5 910	6 286	31.2%	29.9%	32.5%	6 176	5 972	6 380			
HY060G	Social exclusion not elsew here classified	17.7%	16.1%	19.3%	8 168	7 032	9 303	19.8%	18.7%	20.9%	5 601	4 878	6 325	22.0%	20.7%	23.2%	6 416	5 427	7 404			
HY070G	Housing allow ances	0.8%	0.4%	1.1%	9 312	6 451	12 173	0.7%	0.5%	1.0%	5 798	4 570	7 025	0.8%	0.5%	1.1%	6 005	4 669	7 340			
HY080G	Regular inter-household cash transfer received	20.3%	18.6%	21.9%	8 226	6 878	9 575	8.1%	7.3%	8.8%	12 074	10 989	13 159	8.5%	7.7%	9.3%	12 888	11 281	14 495			
<b>Mandatory deductions</b>																						
HY130G	Regular inter-household cash transfer paid	31.5%	29.6%	33.4%	6 648	5 446	7 849	17.0%	16.0%	18.0%	10 909	10 045	11 774	16.8%	15.7%	17.9%	11 112	10 128	12 095			
HY140G	Tax on income and social contributions	100.0%	100.0%	100.0%	32 972	30 843	35 100	100.0%	100.0%	100.0%	35 255	34 486	36 025	100.0%	100.0%	100.0%	33 458	32 566	34 349			

### 7.2.3. Comparison of at-risk-of-poverty rates SILC14-HBS13

Table 22 sets out estimated at-risk-of-poverty rates (60% of median) in regard to SILC 2014 and HBS 2013 for some socio-demographic sub-groups. The findings shown in the table substantiate the high degree of consistency between the two sources. At-risk-of-poverty rates are situated within confidence intervals at 95%. In the absence of consistent categorisation between the two surveys, the poverty rates of households with children cannot be compared and are thus not presented here.

We observe that the at-risk-of-poverty rate only differs significantly between SILC14 new weights and HBS13 for people aged 50 to 64. This difference was even more marked with the old weighting. In most cases (25 out of 29), the results from the new weighting are closer to those of the HBS than to those of the old weighting. This means that the new weighting tends to improve consistency between the two surveys with regard to the at-risk-of-poverty rate.

**Table 22 SILC14-HBS13 Comparison of at-risk-of-poverty rates by socio-demographic category.** Sub-components for which ratios with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

Variable		HBS13				SILC14 OW				SILC14 NW			
		n	At-risk-of-poverty rate (%)	CI (95%)		n	At-risk-of-poverty rate (%)	CI (95%)		n	At-risk-of-poverty rate (%)	CI (95%)	
			min	max		min	max		min	max		min	max
Total population		6 799	<b>15.5</b>	13.9	17.2	15 850	<b>13.5</b>	12.4	14.6	15 651	<b>13.8</b>	12.6	15.0
Age	0-17 years	1 476	<b>19.5</b>	15.8	23.2	3 102	<b>14.2</b>	12.0	16.5	3 064	<b>14.8</b>	12.2	17.5
	18-64 years	4 161	<b>12.3</b>	10.7	13.9	9 615	<b>9.6</b>	8.5	10.6	9 492	<b>10.5</b>	9.2	11.7
	18-24 years	440	<b>14.6</b>	9.4	19.9	1 255	<b>12.5</b>	9.6	15.5	1 233	<b>13.0</b>	9.9	16.1
	25-49 years	2 236	<b>10.3</b>	8.5	12.1	4 962	<b>8.9</b>	7.8	10.1	4 903	<b>10.0</b>	8.6	11.4
	50-64 years	1 485	<b>15.1</b>	12.4	17.8	3 398	<b>9.4</b>	8.0	10.8	3 356	<b>10.2</b>	8.4	11.9
	65 years and over	1 162	<b>23.1</b>	19.6	26.7	3 133	<b>27.7</b>	25.5	29.9	3 095	<b>25.7</b>	23.5	27.9
Sex	Men	3 327	<b>14.8</b>	12.9	16.7	7 654	<b>12.2</b>	11.1	13.4	7 560	<b>12.5</b>	11.2	13.8
	Swiss	2 933	<b>13.1</b>	11.3	14.9	6 505	<b>10.9</b>	9.9	12.0	6 440	<b>11.1</b>	9.9	12.2
	Foreign	394	<b>20.5</b>	14.6	26.5	1 149	<b>16.0</b>	12.7	19.3	1 120	<b>16.7</b>	13.0	20.5
	Women	3 472	<b>16.3</b>	14.4	18.1	8 196	<b>14.7</b>	13.5	15.9	8 091	<b>15.1</b>	13.8	16.5
	Swiss	3 042	<b>15.0</b>	13.1	16.9	7 109	<b>14.0</b>	12.9	15.1	7 034	<b>14.3</b>	13.0	15.7
	Foreign	430	<b>21.0</b>	15.2	26.9	1 087	<b>17.1</b>	13.7	20.6	1 057	<b>17.9</b>	14.0	21.8
Type of household	Households without children	4 044	<b>13.8</b>	12.1	15.6	8 316	<b>14.3</b>	13.2	15.5	8 220	<b>14.2</b>	12.9	15.5
	Single person aged below 65	537	<b>12.5</b>	9.3	15.8	1 146	<b>14.3</b>	12.0	16.6	1 135	<b>14.8</b>	12.3	17.4
	Single person aged 65 or over	269	<b>31.1</b>	24.9	37.4	937	<b>36.2</b>	32.7	39.7	921	<b>34.1</b>	30.6	37.6
	Two adults aged below 65	1 214	<b>8.2</b>	5.6	10.8	2 534	<b>4.1</b>	2.9	5.3	2 510	<b>4.2</b>	2.8	5.7
	Two adults of which at least one is 65 or over	994	<b>20.2</b>	16.0	24.3	2 330	<b>23.4</b>	20.7	26.1	2 308	<b>21.0</b>	18.4	23.7
	Other households without children	1 030	<b>10.8</b>	6.1	15.4	1 369	<b>9.6</b>	5.6	13.6	1 346	<b>11.0</b>	6.1	15.9
	Households with children	933	<b>16.1</b>	10.5	21.7	7 534	<b>12.5</b>	10.6	14.4	7 431	<b>13.4</b>	11.2	15.6
Housing occupancy status	Owner	3 813	<b>13.7</b>	11.5	15.9	8 595	<b>9.9</b>	8.8	11.1	8 507	<b>10.4</b>	9.0	11.8
	Tenant	2 986	<b>17.1</b>	14.5	19.8	7 096	<b>15.7</b>	13.9	17.4	6 990	<b>15.9</b>	14.0	17.8
Region	Lake Geneva region	1 098	<b>17.1</b>	13.0	21.1	2 779	<b>14.4</b>	11.8	17.0	2 739	<b>13.2</b>	10.6	15.9
	Espace Mittelland	1 556	<b>19.4</b>	15.0	23.8	3 821	<b>15.7</b>	13.4	17.9	3 786	<b>17.4</b>	14.7	20.2
	Northwest Switzerland	861	<b>13.9</b>	8.5	19.4	2 272	<b>13.2</b>	10.0	16.3	2 254	<b>14.1</b>	10.2	18.1
	Zurich	1 103	<b>8.0</b>	5.2	10.9	2 762	<b>8.8</b>	6.5	11.0	2 734	<b>8.1</b>	6.1	10.1
	Eastern Switzerland	920	<b>17.6</b>	12.5	22.6	2 165	<b>13.0</b>	10.2	15.9	2 128	<b>14.3</b>	11.1	17.5
	Central Switzerland	647	<b>13.3</b>	6.9	19.7	1 489	<b>11.7</b>	8.6	14.7	1 460	<b>10.4</b>	7.2	13.7
	Ticino	614	<b>23.3</b>	15.6	30.9	562	<b>23.8</b>	16.0	31.5	550	<b>26.3</b>	17.0	35.6

### 7.3. Comparison SILC13 - SILC14

One relatively important effect is the significant decrease in the average employment income (PY010G *Employee cash or near cash income*, see Table 23 below), from CHF 119,492 in 2013 to CHF 110,059 with the new weighting, although the percentage of individuals receiving this sub-component is stable. This decline is mainly due to the new weighting since the difference is most marked between the 2014 results with the old and new weighting. This decrease goes hand-in-hand with a fall in income tax (HY140G).

Concerning income from means-tested social assistance and other social benefits (*HY060G: Social exclusion not elsewhere classified*), the percentage of households receiving benefits is significantly lower in 2014 with the old weighting and in 2013. This difference can be explained either by the integration of the ALTELS in 2014, or by a real decline. It is offset by the new weighting in 2014. In contrast, for the households receiving means-tested social benefits (table 33), there was an insignificant increase in the average amount between 2013 and 2014 with the old weighting, and a further insignificant increase with the new weighting, resulting in a significant difference between 2013 and 2014 with the new weighting (4637 +/- 506 versus 6416 +/- 988). This difference is therefore partly due to the new weighting method and partly to a difference between 2013 and 2014, whether due to a real change in the data or the introduction of the ALTELS (see ch. 1.2).

With the exception of the few elements mentioned above, the comparison of the SILC14 and SILC13 shows a high level of coherence between the two years. The results are very similar between 2014 and 2013, both for the average for all households (Table 23) and for the percentage and average for households receiving this sub-component (Table 24).

**Table 23 Comparison SILC13-SILC14.** Average, confidence interval of income sub-components for all households (with or without income), weighted, in CHF per year. Components for which averages with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

	SILC13			SILC14 OW			SILC14 NW		
	Confidence interval (95%)			Confidence interval (95%)			Confidence interval (95%)		
	Average	min	max	Average	min	max	Average	min	max
<b>Employment income</b>									
PY010G Employee cash or near-cash income (Gross)	88 886	86 268	91 505	88 882	86 524	91 240	82 228	79 617	84 839
PY050G Cash benefits or losses from self-employment	7 910	7 118	8 702	7 161	6 431	7 892	7 951	7 038	8 865
<b>Investment and property income</b>									
HY040G Income from rental of a property or land	2 154	1 840	2 468	2 230	1 949	2 510	2 348	2 021	2 676
HY090G Interest, dividends, profit from capital investments in unincorporated business	2 667	2 303	3 031	2 497	2 166	2 829	2 485	2 175	2 794
<b>Transfer income</b>									
PY100G Old-age benefits	15 524	14 859	16 188	15 892	15 198	16 587	15 388	14 706	16 070
PY110G Survivor benefits	754	644	865	856	717	995	834	701	966
PY130G Disability benefits	2 023	1 701	2 345	1 964	1 690	2 237	2 135	1 859	2 411
PY120G Sickness benefits	14	2	26	14	4	23	12	4	20
PY090G Unemployment benefits	1 079	910	1 248	1 073	909	1 236	1 114	937	1 291
PY080G Pension from individual private plans	550	435	665	768	627	910	775	624	926
PY140G Education-related allowances	118	60	175	90	63	118	115	72	159
HY050G Family/Children-related allowances	1 964	1 876	2 053	2 000	1 903	2 096	1 929	1 826	2 031
HY060G Social exclusion not elsewhere classified	1 097	962	1 231	1 109	951	1 268	1 409	1 170	1 648
HY070G Housing allowances	74	45	103	42	26	58	50	29	71
HY080G Regular inter-household cash transfer received	973	847	1 099	973	856	1 090	1 091	919	1 262
<b>Mandatory deductions</b>									
HY130G Regular inter-household cash transfer paid	1 739	1 549	1 928	1 857	1 678	2 036	1 869	1 667	2 071
HY140G Tax on income and social contributions	34 805	33 950	35 659	35 255	34 486	36 025	33 458	32 566	34 349

**Table 24 Comparison SILC13-SILC14** Proportion (%) of households with income sub-component (>0) and average (in CHF, per year) thereof where this is non-zero. Sub-components for which ratios or averages with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

		SILC13						SILC14 OW						SILC14 NW					
		% of households with income > 0			% of households with income > 0			% of households with income > 0			% of households with income > 0			% of households with income > 0					
		Confidence interval (95%)			Confidence interval (95%)			Confidence interval (95%)			Confidence interval (95%)			Confidence interval (95%)					
		%	min	max	Average	min	max	%	min	max	Average	min	max	%	min	max	Average	min	max
<b>Employment income</b>																			
PY010G	Employee cash or near-cash income	74.4%	73.3%	75.4%	119 492	116 446	122 538	75.2%	74.1%	76.2%	118 230	115 584	120 876	74.7%	73.6%	75.8%	110 059	106 893	113 226
PY050G	Cash benefits or losses from self-employment	13.4%	12.6%	14.3%	58 932	54 261	63 603	13.2%	12.3%	14.1%	54 206	49 806	58 605	14.1%	13.2%	15.1%	56 214	51 008	61 419
<b>Investment and property income</b>																			
HY040G	Income from rental of a property or land	9.1%	8.5%	9.8%	23 575	20 522	26 627	8.5%	7.9%	9.2%	26 155	23 457	28 853	8.6%	7.9%	9.3%	27 207	24 141	30 272
HY090G	Interest, dividends, profit from capital investments in unincorporated business	87.6%	86.7%	88.5%	3 043	2 629	3 457	89.1%	88.3%	90.0%	2 801	2 430	3 173	88.3%	87.3%	89.3%	2 814	2 465	3 164
<b>Transfer income</b>																			
PY100G	Old-age benefits	30.1%	29.0%	31.2%	51 644	50 400	52 889	30.7%	29.5%	31.8%	51 799	50 495	53 103	30.6%	29.4%	31.7%	50 369	49 076	51 662
PY110G	Survivor benefits	3.2%	2.7%	3.6%	23 839	21 901	25 778	3.5%	3.0%	3.9%	24 774	22 267	27 281	3.4%	3.0%	3.9%	24 319	21 967	26 671
PY130G	Disability benefits	6.1%	5.4%	6.7%	33 303	29 833	36 774	6.2%	5.5%	6.8%	31 864	29 293	34 436	7.1%	6.3%	7.8%	30 195	28 020	32 369
PY120G	Sickness benefits	0.2%	0.1%	0.3%	6 441	1 652	11 230	0.2%	0.1%	0.4%	5 637	3 157	8 117	0.2%	0.1%	0.3%	6 062	3 289	8 835
PY090G	Unemployment benefits	7.0%	6.1%	7.8%	15 525	13 908	17 141	7.1%	6.3%	7.9%	15 187	13 556	16 819	7.3%	6.5%	8.2%	15 185	13 437	16 932
PY080G	Pension from individual private plans	2.8%	2.4%	3.2%	19 633	16 508	22 758	3.2%	2.8%	3.6%	23 916	20 581	27 251	3.2%	2.8%	3.6%	23 976	20 337	27 616
PY140G	Education- related allowances	1.5%	1.1%	1.8%	8 100	4 752	11 449	1.2%	0.9%	1.5%	7 484	5 817	9 150	1.4%	1.0%	1.8%	8 022	5 796	10 247
HY050G	Family/Children-related allowances	33.2%	31.9%	34.4%	5 924	5 768	6 081	32.8%	31.5%	34.1%	6 098	5 910	6 286	31.2%	29.9%	32.5%	6 176	5 972	6 380
HY060G	Social exclusion not elsewhere classified	23.7%	22.5%	24.8%	4 637	4 131	5 143	19.8%	18.7%	20.9%	5 601	4 878	6 325	22.0%	20.7%	23.2%	6 416	5 427	7 404
HY070G	Housing allowances	1.1%	0.8%	1.4%	6 732	5 223	8 241	0.7%	0.5%	1.0%	5 798	4 570	7 025	0.8%	0.5%	1.1%	6 005	4 669	7 340
HY080G	Regular inter-household cash transfer received	7.4%	6.7%	8.0%	13 222	11 818	14 626	8.1%	7.3%	8.8%	12 074	10 989	13 159	8.5%	7.7%	9.3%	12 888	11 281	14 495
<b>Mandatory deductions</b>																			
HY130G	Regular inter-household cash transfer paid	15.7%	14.8%	16.7%	11 063	10 027	12 098	17.0%	16.0%	18.0%	10 909	10 045	11 774	16.8%	15.7%	17.9%	11 112	10 128	12 095
HY140G	Tax on income and social contributions	100.0%	100.0%	100.0%	34 805	33 950	35 659	100.0%	100.0%	100.0%	35 255	34 486	36 025	100.0%	100.0%	100.0%	33 458	32 566	34 349

## 7.4. Comparison of ALTELS and CASTEMs

In 2014, wave 1 was drawn from the new survey framework SRPH for the first time in the SILC survey. It therefore also contains the ALTELS households, which had not been sampled in previous surveys. This population represents 300 adults in the net sample for wave 1, while the rest (referred to in contrast as "CASTEMs") comprises 1,634 individuals. The ALTELS adults therefore represent 15.5% of the net survey in wave 1, and 4.4% of the 2014 survey (all waves). The socio-demographic characteristics of the ALTELS are presented in chapter 1.2. The results for the various income sub-components were also evaluated independently for these two populations in order to determine the effects of introducing the ALTELS on income sub-components. The old weighting method was used for these analyses as the new method uses the ALTEL/CASTEM variables as explanatory variables, which would have distorted the comparisons.

Table 25 shows that a portion of the income sub-components are significantly different between ALTELS and CASTEMs. ALTELS are less likely to receive old-age or survivor benefits or pensions from individual private plans (PY100G, PY110G and PY080G). This can easily be explained by the fact that the ALTELS population contains few older people, who are the most concerned by these sub-components.

ALTELS are younger, live in households more frequently made up of one to two people and are more at risk of poverty than CASTEMs. They are more likely to receive employment income, but it is lower on average, whether they are employed or self-employed. They also receive less income from wealth and investments. Naturally, they also pay less income tax and receive more housing benefit. This is consistent with the profile of the ALTELS population.

As shown by the comparison of the SILC13 - SILC14 results, introducing the ALTELS had no significant effect on the results as no sub-component is significantly different between the 2013 results and the 2014 results obtained with the old weighting method. As mentioned above, the ALTELS only account for 4.4% of the 2014 net sample. However, the proportion of ALTELS will increase over the next three survey years until the whole sample is taken from the SRPH, and could reach 15-20% of the 2017 sample. This move towards a progressively younger sample could result in a fall in income by 2017.

**Table 25 Comparison of ALTEL-CASTEM for the main income sub-components.** Percentage, average, confidence interval of income sub-components for all households (with or without income), as well as average and confidence interval for households that receive the sub-component, with the old weighting, in CHF per year. Components for which averages with confidence intervals of 95% differ significantly compared with the 2014 results with the new weighting are outlined in red.

	All households						Households receiving the sub-component											
	ALTELS V1			CASTEM V1			ALTELS V1						CASTEM V1					
	CI (95%)			CI (95%)			CI (95%)			CI (95%)			CI (95%)			CI (95%)		
	Average	min	max	Average	min	max	%	min	max	Average	min	max	%	min	max	Average	min	max
<b>Employment income</b>																		
PY010G Employee cash or near-cash income	83 887	72 545	95 228	84 016	79 734	88 297	89.8%	85.9%	93.7%	93 373	81 261	105 486	75.5%	73.2%	77.7%	111 345	106 552	116 137
PY050G Cash benefits or losses from self-employment	3 743	1 669	5 817	8 129	6 065	10 194	12.1%	7.4%	16.7%	30 987	19 791	42 183	14.4%	12.4%	16.4%	56 512	45 367	67 657
<b>Investment and property income</b>																		
HY040G Income from rental of a property or land	675	278	1 073	2 163	1 471	2 855	4.2%	2.0%	6.5%	15 983	10 875	21 092	7.5%	6.2%	8.8%	28 713	21 105	36 321
HY090G Interest, dividends, profit from capital investments in unincorporated business	1 668	0	3 469	2 688	1 991	3 385	79.5%	73.5%	85.4%	2 100	0	4 362	89.4%	87.6%	91.3%	3 005	2 227	3 783
<b>Transfer income</b>																		
PY100G Old-age benefits	4 003	2 487	5 520	14 745	13 386	16 105	8.9%	5.8%	12.0%	44 862	35 739	53 985	29.9%	27.6%	32.3%	49 289	46 524	52 054
PY110G Survivor benefits	107	0	295	843	554	1 133	0.5%	0.0%	1.3%	20 381	0	41 048	3.4%	2.5%	4.4%	24 546	19 027	30 066
PY130G Disability benefits	2 682	1 324	4 040	2 194	1 585	2 804	8.1%	4.4%	11.8%	33 069	23 808	42 331	7.2%	5.6%	8.8%	30 543	25 770	35 317
PY090G Unemployment benefits	1 779	928	2 629	1 360	925	1 795	12.5%	8.0%	17.1%	14 179	9 808	18 549	8.5%	6.6%	10.3%	16 020	12 152	19 888
PY080G Pension from individual private plans	88	0	209	625	383	867	0.7%	0.0%	1.4%	13 461	8 005	18 917	2.9%	2.1%	3.6%	21 863	15 333	28 393
PY140G Education- related allow ances	217	0	494	149	41	257	2.9%	0.3%	5.5%	7 465	0	15 295	1.7%	0.9%	2.6%	8 537	5 006	12 068
HY050G Family/Children-related allow ances	1 606	1 195	2 018	1 934	1 749	2 118	29.2%	23.0%	35.4%	5 507	4 672	6 342	34.0%	31.3%	36.7%	5 688	5 361	6 014
HY060G Social exclusion not elsew here classified	1 500	727	2 273	1 656	1 125	2 188	29.5%	23.1%	36.0%	5 078	2 728	7 428	21.3%	18.8%	23.7%	7 777	5 566	9 988
HY070G Housing allow ances	74	0	218	66	18	113	0.6%	0.0%	1.7%	13 188	13 188	13 188	1.0%	0.4%	1.6%	6 641	4 358	8 923
HY080G Regular inter-household cash transfer received	1 128	603	1 653	973	717	1 230	13.8%	8.9%	18.8%	8 150	5 875	10 425	7.6%	6.2%	9.0%	12 812	10 523	15 101
<b>Mandatory deductions</b>																		
HY130G Regular inter-household cash transfer paid	1 808	854	2 762	1 766	1 405	2 128	17.5%	12.0%	23.0%	10 324	6 449	14 198	17.6%	15.4%	19.7%	10 059	8 307	11 810
HY140G Tax on income and social contributions	28 947	25 472	32 422	33 921	32 565	35 278	100.0%	100.0%	100.0%	28 947	25 472	32 422	100.0%	100.0%	100.0%	33 921	32 565	35 278

## 8. References

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## 9. Appendices

### 9.1. Glossary

**CALMAR2:** CALMAR2 (CALage sur MARGes), a macro published by SAS\*, is used to adjust samples by reweighting individuals with the help of available auxiliary information, on the basis of variables known as "calibration variables".

**CAPI:** Computer assisted personal interviewing.

**CASTEM:** CAdre de Sondage pour le Tirage d'Echantillons de Ménages, Survey framework used by the FSO\* for telephone polling of households up to and including 2013. This framework is based on directories of fixed-line telephone numbers representing all operators in Switzerland, supplemented by ex-directory numbers. No mobile telephone numbers are listed.

**CATI:** Computer assisted telephone interviewing.

**CCO:** The Central Compensation Office CCO is a public-service institution operating in the realm of first-pillar (state) social insurance, which covers old-age and survivor benefits (in French, AVS), disability benefits (AI) and loss of earnings (APG). It is also tasked with applying international conventions on social security. [www.zas.admin.ch](http://www.zas.admin.ch)

**Co-resident:** A co-resident is an individual who, as of wave 2, joins a longitudinal household that was sampled in wave 1. An initially present co-resident was part of the reference population picked up through household selections but was not surveyed. An initially absent co-resident was not part of this reference population (e.g. a foreign person that took up residence in the household after surveying took place).

**ESS:** L'Enquête suisse sur la Structure des Salaires, or Swiss Earnings Structure Survey, was conducted for the first time by the FSO\* in 1994. Every two years it provides detailed information about the level, structure and components of wages in Switzerland. [www.ess.bfs.admin.ch](http://www.ess.bfs.admin.ch)

**HBS:** Household Budget Survey. The purpose of this survey is to provide a detailed breakdown of the budgets of private households situated in Switzerland. The survey has been conducted on a continual basis since 1 January 2000. Some 250 households take part every month, selected randomly from the register of residential telephone numbers in Switzerland. Participation is not mandatory. For a whole month, participating households note down all their expenditure and income on specially provided survey forms. They receive telephone assistance by a skilled advisor. [www.ebm.bfs.admin.ch](http://www.ebm.bfs.admin.ch)

**INSEE:** Institut National de la Statistique et des Etudes Economiques, France's national statistics office. [www.insee.fr](http://www.insee.fr)

**IVEWare:** Imputation and Variance Estimation Software, developed by the Researchers at the Survey Methodology Program, Survey Research Center, Institute for Social Research, University of Michigan

**MIS Trend:** A social and economic research firm, with offices in Lausanne and Bern. It conducts CATI and CAPI\* for the SILC survey. [www.mistrend.ch](http://www.mistrend.ch)

**NOGA:** Nomenclature Générale des Activités économiques (General Classification of Economic Activities). This fundamental research tool, which is produced by the FSO\*, is used to structure, analyse and present statistical data. It is used to classify businesses and institutions into statistical units by business sector and then group them into consistent clusters.

**NUTS:** Nomenclature d'Unités Territoriales Statistiques, or Nomenclature of territorial units for statistics, defined by the EU. This subdivides European countries into structured statistical units based on three levels, by number of inhabitants: NUTS1 (3-7 million), NUTS2 (800 000 to 3 million) and NUTS3 (150 000-800 000).

**PAPI:** Pen And Paper Interviewing.

**Proxy:** Response mode whereby a person answers the questionnaire on behalf of the designated person.

**SAS:** *Statistical Analysis System*, statistical analysis software developed by SAS Institute Inc.

**SDMX** Statistical Data and Metadata eXchange is an international initiative that aims at standardising and modernising ("industrialising") the mechanisms and processes for the exchange of statistical data and metadata among international organisations and their member countries.

**SHS** : Swiss Social Assistance Statistics. Register of households that receive social assistance from the state. This register has been used since SILC13.

**SRPH:** FSO survey framework that has been used since 2014 for the SILC survey and is based on population registers.

**Structural survey:** this survey has been conducted annually since 2010 as part of the new population census. It currently covers around 200,000 persons aged 15 or over and collects data on socio-economic and socio-cultural variables by means of a written or online questionnaire.

**Statpop:** The Population and Households Statistics are part of the surveys conducted within the framework of the new annual population census system, which started in 2010. They comprise statistics on the size and the composition of the resident population and households on 31 December of each year and of the changes registered during the given year.

## 9.2. Non-response modelling for the grid questionnaire in wave 4. Example of segmentation tree for construction of a HRG.

Umzug1: moved house between wave 1 and 2013  
 IntPol1: Interested in politics  
 FamtypK900: Type of family "other"  
 Famtyp300: Family with at least one child  
 Com28: Agrarian-mixed communes  
 Proprio: Owner of main dwelling  
 Rev54: Total equivalent income class in 4th quintile [JP60-P80]  
 Rtrav2: Two incomes from employment in household  
 HHsize5: 5 persons or more in household  
 Atype0: Type of nationality within household: only Swiss  
 areasNA: dwelling surface missing  
 maritalst2: married

Split 1	Split 2	Split 3	Split 4	Split 5	Split 6	Split 7	Split 8	Split 9	RHG		
umzug1=0 4161 73.80%	IntPol1=0 192800.00% 78.79%	com28=0 1752 80.31%	rev54=0 1377 78.29%	Atype0=0 (224) 68.30%	Rtrav1=0 893 82.42%	areasNA=0 731 84.54%	FamtypK900=0 (291) 89.35%	maritalst2=0 (154) 74.03%	maritalst2=1 (286) 85.31%	1	
				Atype0=1 1153 80.23%			2				
				3							
				4							
				Rtrav1=1 (260) 72.69%			5				
				6							
				7							
				8							
				9							
				10							
				11							
				12							
				13							
				14							
				15							
				16							
				17							
				18							
umzug1=1 862 53.02%	IntPol1=1 2233 69.50%	PROPRIO=0 1086 64.18%	Rtrav2=0 682 58.94%	Iwi2=0 (427) 53.86%	Rtrav2=1 (404) 73.02%	Taillecom6=0 380 65.26%	Rtrav0=0 (229) 59.83%	Rtrav0=1 (151) 73.51%		19	
				Iwi2=1 (255) 67.45%			20				
				21							
				22							
				HHsize5=0 947 72.12%			rev54=0 777 70.66%			rev55=0 566 68.20%	Taillecom6=1 (186) 74.19%
				PROPRIO=1 1147 74.54%			rev54=1 (170) 78.82%			rev55=1 (211) 77.25%	
HHsize5=1 (200) 86.00%											
umzug1=1 862 53.02%	FamtypK900=1 553 47.02%	IntPol1=1 361 41.83%	Rtrav2=0 (192) 35.94%	Rtrav2=1 (169) 48.52%					19		
			20								
			21								
	FamtypK900=0 (309) 63.75%	IntPol1=0 (192) 56.77%							22		

### 9.3. Estimating imputed rent (log): results of linear regression

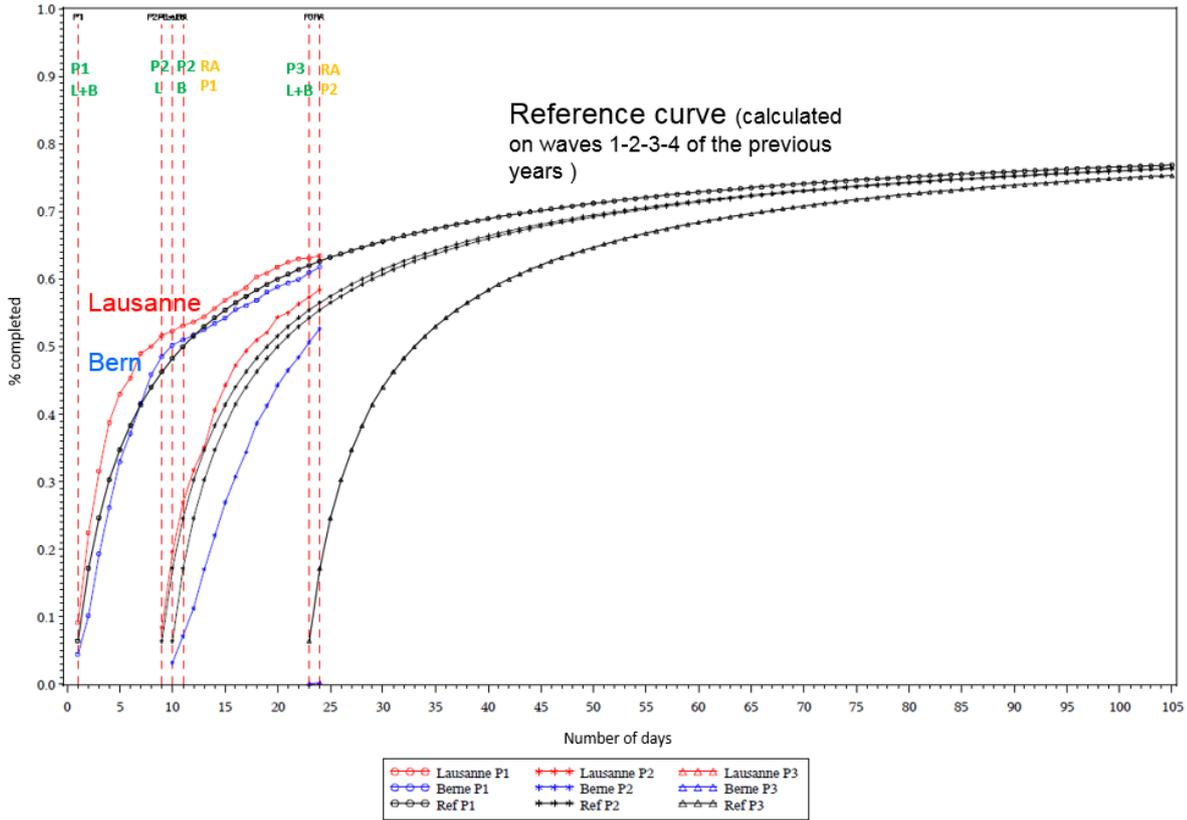
Parameter	Label	Estimate	StdErr	P-val.
Intercept		-1.945	0.957	0.095
AGE14	Age	-0.016	0.002	0.000
NATIO2_1	Nationality: Swiss	-0.426	0.069	0.000
COM3_14_1	Commune type: core cities, larger urban zones, agglomerations, tourist area or rural	0.164	0.092	0.076
COM3_14_2	Commune type: rich	0.030	0.142	0.833
COM3_14_3	Commune type: industrial and tertiary sector	0.002	0.113	0.989
EDUCAT14_REC_1	Level of education recoded: 3-4 years	0.004	0.050	0.937
EDUCAT14_REC_2	Level of education recoded: less than 3 years	0.192	0.065	0.003
TENURE_KAT_1	Number of years since arrival 6 years or less	0.421	0.067	0.000
TENURE_KAT_2	Number of years since arrival 7 to 11 years	0.152	0.070	0.030
TENURE_KAT_3	Number of years since arrival 12 to 20 years	0.050	0.062	0.421
H14H15_1	Dwelling type: in a building with several apartments	0.633	0.108	0.000
H14H15_2	Dwelling type: in a detached or semi-detached house	-0.583	0.112	0.000
H14H20	Dwelling: number of rooms	-0.234	0.022	0.000
H14H25_1	Financial means to heat dwelling sufficiently: yes	-0.269	0.124	0.030
H14H26_1	Dwelling: outside surroundings noisy: yes	0.145	0.058	0.012
H14H30_2_1	Public housing assistance, housing grant: yes	-0.886	0.200	0.000
H14H12_1	Car for personal use: yes	-0.254	0.058	0.000
H14I26_1	Computer at home: yes	3.942	0.915	0.010
IMR	Heckmann correction of selection bias (inverse Mills ratio)			

#### 9.4. Time distribution of interviews by rotational group (valid households)

Rotational group	R1		R2		R3		R4		Total	
Wave	3		2		1		4			
Joined panel	2012		2013		2014		2011			
	N	%	N	%	N	%	N	%	N	%
<b>Grid interviews</b>										
March	368	22.9%	393	23.5%	481	24.9%	395	23.8%	1 637	<b>23.8%</b>
April	697	43.3%	762	45.5%	850	44.0%	728	43.9%	3 037	<b>44.2%</b>
May	367	22.8%	379	22.6%	477	24.7%	385	23.2%	1 608	<b>23.4%</b>
June	170	10.6%	134	8.0%	118	6.1%	143	8.6%	565	<b>8.2%</b>
July	6	0.4%	6	0.4%	8	0.4%	8	0.5%	28	<b>0.4%</b>
<b>Total, grid</b>	<b>1 608</b>	<b>100.0%</b>	<b>1 674</b>	<b>100.0%</b>	<b>1 934</b>	<b>100.0%</b>	<b>1 659</b>	<b>100.0%</b>	<b>6 875</b>	<b>100.0%</b>
<b>Household interviews</b>										
March	333	20.7%	354	21.1%	426	22.0%	352	21.2%	1 465	<b>21.3%</b>
April	655	40.7%	719	43.0%	768	39.7%	694	41.8%	2 836	<b>41.3%</b>
May	410	25.5%	425	25.4%	556	28.7%	433	26.1%	1 824	<b>26.5%</b>
June	198	12.3%	169	10.1%	171	8.8%	169	10.2%	707	<b>10.3%</b>
July	12	0.7%	7	0.4%	13	0.7%	11	0.7%	43	<b>0.6%</b>
<b>Total, household</b>	<b>1 608</b>	<b>100.0%</b>	<b>1 674</b>	<b>100.0%</b>	<b>1 934</b>	<b>100.0%</b>	<b>1 659</b>	<b>100.0%</b>	<b>6 875</b>	<b>100.0%</b>
<b>Individual interviews</b>										
March	456	17.4%	471	16.8%	573	18.0%	501	18.0%	2 001	<b>17.6%</b>
April	998	38.1%	1 069	38.1%	1 128	35.4%	1 071	38.6%	4 266	<b>37.5%</b>
May	718	27.4%	868	30.9%	1 052	33.0%	840	30.2%	3 478	<b>30.6%</b>
June	410	15.7%	371	13.2%	395	12.4%	337	12.1%	1 513	<b>13.3%</b>
July	35	1.3%	26	0.9%	36	1.1%	29	1.0%	126	<b>1.1%</b>
<b>Total, individual</b>	<b>2 617</b>	<b>100.0%</b>	<b>2 805</b>	<b>100.0%</b>	<b>3 184</b>	<b>100.0%</b>	<b>2 778</b>	<b>100.0%</b>	<b>11 384</b>	<b>100.0%</b>

### 9.5. Monitoring the fieldwork. Time distribution of interviews by rotational group (valid households)

The graph shows the progress in the rate of grids completed by researchers for all waves by the number of days worked in the survey institute after 23 days of field work. We can see for example the delay of the Bern office (in blue) compared with Lausanne (in red), or the negative effect on progress of batch 1 (P1) of the introduction of the 2<sup>nd</sup> batch (P2, vertical red lines).



### 9.6. Household contact procedure during survey

