

3. Statistical processing

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

3.1. Source data

The Total Population Register (TPR) is kept at Statistics Sweden since 1968. TPR is an extract from the population register at the Tax Authorities and all individuals residing in Sweden shall be registered at the property unit in the parish where they live. Each individual in TPR has a unique personal identity number. TPR receives daily updates on births, deaths, changes in marital status, and changes in citizenship, national migration, immigration and emigration from the Tax Authorities. Received information is checked mechanically with respect to the validity of the codes and the logical contents of the information and quality tests comprises, among other things, regional codes, connections between age and marital status, etc.

TPR is used as the sampling frame for the selection of the sample. Data refers to the third quarter of the precedent year of the survey year. Persons aged less than 16 years of age are excluded from the frame.

3.1.1. Sampling design and procedure

Type of sample design

Stratified sample with simple random sampling within strata. Allocation is proportional to the size of strata. The sampling design was changed for the 2012 process.

Stratification and sub stratification criteria

The sample is stratified by age in seven strata according to age: 16-38 years, 39-63 years, 64-68 years, 69-73 years, 74-78 years, 79-83 years, and 84 years and older.

Sample selection schemes

Random sample of individuals.

Sample distribution over time

The fieldwork period 2014 was carried out from January to December.

3.1.2. Sampling unit

The sampling unit is individuals (selected respondent).

3.1.3. Sampling rate and sampling size

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

- the actual sample size which is the number of sampling units selected in the sample

- the achieved sample size which is the number of observed sampling units (household or individual) with an accepted interview

- the effective sample size which is defined as the achieved sample size divided by the design effect with regards to the at-risk-of poverty rate indicator

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

The actual sample size was 11155 individuals (selected respondents) for the cross-sectional component in the survey year 2014.

The achieved sample size was 5800 households (selected respondents).

3.2. Frequency of data collection

Annually

3.3. Data collection

Mode of data collection

1-PAPI	2-CAPI	3-CATI	4-Self-administered	5-CAWI	6- PAPI-proxy	7-CAPI-proxy	8-CATI-proxy	9- Self-administered-proxy	10-CAWI proxy
% of total	0.1	98.2					1.7		

The mean interview duration

The mean interview duration is calculated as the avarage minutes to complete the household questionnaire (HB100). For SE HB100 is the complete interview time with the selected respondent.

Average interview duration = 19 minutes

Annexes:

[Annex - Data collection](#)

3.4. Data validation

Not requested by Reg. 28/2004

3.5. Data compilation

Not requested by Reg. 28/2004

3.5.1. Weighting procedure

See Annex - Weighting procedure

Annexes:

[Annex - Weighting procedure](#)

3.5.2. Estimation and imputation

See Annex - Estimation and Imputation

Annexes:

[Annex - Estimation and Imputation](#)

3.6. Adjustment

Not requested by Reg. 28/2004

4. Quality management

4.1. Quality assurance

Not requested by Reg. 28/2004

4.2. Quality management - assessment

Not requested by Reg. 28/2004

5. Relevance

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5.1. Relevance - User Needs
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5.2. Relevance - User Satisfaction
Not requested by Reg. 28/2004
5.3. Completeness
Not requested by Reg. 28/2004
5.3.1. Data completeness - rate
Not requested by Reg. 28/2004

6. Accuracy and reliability [Top](#)

This section describes the closeness of computations or estimates to the exact or true values that the statistics were intended to measure (accuracy) and the closeness of the initial estimated value to the subsequent value (reliability).

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

6.1. Accuracy - overall

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

The minimum effective sample size for sample of persons (5750 for Sweden) was achieved.

6.2. Sampling error

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

The main hypothesis on which the calculations are based is that the "at risk of poverty" threshold is fixed. According to the characteristics and availability of data for different countries we have used different variables to specify strata and cluster information. In particular, countries have been split into 3 groups:

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

6.2.1. Sampling error - indicators

	AROPE			At risk of poverty			Severe Material Deprivation			Very low work intensity		
	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)	Ind. value	Stand. errors	Half CI (95%)
Total	16.9	0.6	±1.1	15.1	0.5	±1.0	0.7	0.1	±0.3	6.4	0.4	±0.9
Male	15.6	0.6	±1.2	13.9	0.6	±1.2	0.8	0.2	±0.3	6.2	0.5	±0.9
Female	18.2	0.7	±1.3	16.3	0.7	±1.3	0.7	0.2	±0.3	6.5	0.6	±1.1
Age0-17	16.7	1.2	±2.3	15.1	1.1	±2.2	1.1	0.3	±0.7	5.4	0.7	±1.5
Age18-64	17.2	0.6	±1.2	14.7	0.6	±1.1	0.8	0.1	±0.3	6.7	0.4	±0.8
Age18-59												
Age 65+	16.5	0.9	±1.8	16.5	0.9	±1.8	0.2	0.1	±0.2			

Annexes:

[Annex - Sampling Errors](#)

6.3. Non-sampling error

Non-sampling errors are basically of 4 types:

- Coverage errors: errors due to divergences existing between the target population and the sampling frame.
- Measurement errors: errors that occur at the time of data collection. There are a number of sources for these errors such as the survey instrument, the information system, the interviewer and the mode of collection.
- Processing errors: errors in post-data-collection processes such as data entry, keying, editing and weighting.
- Non-response errors: errors due to an unsuccessful attempt to obtain the desired information from an eligible unit. Two main types of non-response errors are considered:
 - Unit non-response: refers to absence of information of the whole unit (households and/or persons) selected into the sample
 - Item non-response: refers to the situation where a sample unit has been successfully enumerated, but not all required information has been obtained.

6.3.1. Coverage error

Coverage errors include over-coverage, under-coverage and misclassification:

- Over-coverage: The sample is drawn several months before the field work starts and checked (matching with Total Population Register TPR) before field work start. (people who have died during this period are excluded). The people who have left Sweden but are still registered as Swedish residents are difficult to discover but the estimation error is negligible (109 individuals for 2014).
- Under-coverage: We regard the TPR as the total population of Sweden and accordingly under-coverage by definition does not exist. However people without permanent residence (including asylum seekers) or waiting for residence are not included in the population.
- Misclassification: refers to incorrect classification of units that belong to the target population.

6.3.1.1. Over-coverage - rate

Cross sectional data	Main problems	Size of error
	Over-coverage	0.98
	Under-coverage	
	Misclassification	

6.3.1.2. Common units - proportion

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6.3.2. Measurement error

Cross sectional data			
Source of measurement errors.	Building process of questionnaire	Interview training	Quality control
Some caution should be observed in the interpretation of responses to questions related to attitudes and frequency. Most	As CATI is the main method used for the Swedish SILC the questionnaire has been specially designed for this	Following a basic introductory course in survey methods, new interviewers participate	New questions are tested by the cognitive measurement unit at Statistics Sweden.

survey refers to the present for which memory errors is not a major source but there are questions about frequency during a longer reference period that are more complicated. Indirect interviews can be a	type of survey. The SILC part of questionnaire follows the rules and suggestions made by Eurostat.	in an additional one day course that includes six hours of training for the EU-SILC and the Swedish living conditions survey (LCS).	Indirect interviews can be a source of errors.
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<p>6.3.3. Non-response error</p> <p>Non-response errors are errors due to an unsuccessful attempt to obtain the desired information from an eligible unit. Two main types of non-response errors are considered:</p> <p>1) Unit non-response which refers to the absence of information of the whole units (households/selected respondents) selected into the sample. According the Commission Regulation 28/2004</p> <ul style="list-style-type: none"> • Household non-response rates (NRh) is computed as follows: $NRh = (1 - (Ra * Rh)) * 100$ Where Ra is the address contact rate defined as: $Ra = \frac{\text{Number of address successfully contacted}}{\text{Number of valid addresses selected}}$ and Rh is the proportion of complete household interviews accepted for the database defined as: $Rh = \frac{\text{Number of household interviews completed and accepted for database}}{\text{Number of eligible households at contacted addresses}}$ Individual non-response rates (NRp) will be computed as follows: $NRp = (1 - (Rp)) * 100$ Where Rp is the proportion of complete personal interviews within the households accepted for the database defined as: $Rp = \frac{\text{Number of personal interview completed}}{\text{Number of eligible individuals in the households whose interviews were completed and accepted for the database}}$ • Overall individual non-response rates (*NRp) will be computed as follows: $*NRp = (1 - (Ra * Rh * Rp)) * 100$ As a sample of persons is selected, the individual non-response rates is calculated for the selected respondent. <p>2) Item non-response which refers to the situation where a sample unit has been successfully enumerated, but not all the required information has been obtained.</p>
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6.3.3.1. Unit non-response - rate													
Cross sectional data													
Address contact rate		Complete household interviews		Complete personal interviews		Household Non-response rate		Individual non-response rate		Overall individual non-response rate			
(Ra)*		(Rh)*		(Rp)*		(NRh)*		(NRp)*		(NRp)*			
A*	B*	A*	B*	A*	B*	A*	B*	A*	B*	A*	B*	A*	B*
76.1	75.6	69.0	67.2	100	100	47.5	49.2	0	0	47.5	49.2		
6.3.3.2. Item non-response - rate													
The computation of item non-response is essential to fulfill the precision requirements concerning publication as stated in the Commission Regulation No 1982/2003. Item nonresponse rate is provided for the main income variables both at household and personal level.													
6.3.3.2.1. Item non-response rate by indicator													
See Annex - Item non-response													
Annexes:													
Annex - Item non-response													
6.3.4. Processing error													
Data entry and coding		Editing controls											
Data are checked interactively (value, syntax, logic) as an integrated part of the data entry process.													
6.3.4.1. Imputation - rate													
Not requested by Reg. 28/2004													
6.3.5. Model assumption error													
Not requested by Reg. 28/2004													
6.4. Seasonal adjustment													
Not requested by Reg. 28/2004													
6.5. Data revision - policy													
Not requested by Reg. 28/2004													
6.6. Data revision - practice													
Not requested by Reg. 28/2004													
6.6.1. Data revision - average size													
Not requested by Reg. 28/2004													

7. Timeliness and punctuality	Top
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7.1. Timeliness	
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7.1.1. Time lag - first result	
Not requested by Reg. 28/2004	
7.1.2. Time lag - final result	
Not requested by Reg. 28/2004	
7.2. Punctuality	
Not requested by Reg. 28/2004	
7.2.1. Punctuality - delivery and publication	
Not requested by Reg. 28/2004	

8. Coherence and comparability	Top
<p>The coherence of two or more statistical outputs refers to the degree to which the statistical processes, by which they were generated, used the same concepts and harmonised methods. A comparison with external sources for all income target variables and the number of persons who receive income from each 'income component' will be provided, where the Member States concerned consider such external data to be sufficiently reliable.</p> <p>According to the Regulation (EC) No 1177/2003 of the European Parliament and of the Council concerning EU-SILC: "Comparability of data between Member States shall be a fundamental objective and shall be pursued through the development of methodological studies from the outset of EU-SILC data collection, carried out in close collaboration between the Member States and Eurostat".</p> <p>Although the best way for keeping the comparability of data is to apply the same methods and definitions of variables, small departures of the definitions given by Eurostat are allowed in EU-SILC. In this way, the mentioned Regulation in its article 16th says: "Small departures from common definitions, such as those relating to private household definition and income reference period, shall be allowed, provided they affect comparability only marginally. The impact of comparability shall be reported in the quality reports."</p>	

8.1. Comparability - geographical			
Not requested by Reg. 28/2004			
8.1.1. Asymmetry for mirror flow statistics - coefficient			
Not requested by Reg. 28/2004			
8.1.2. Reference population			
Reference population	Private household definition Household membership		
The reference population is the whole Swedish population except short term migrants. People who stay in Sweden for no longer than 3-12 months are not covered.	The household definition is in line with the EU-SILC regulation.	The EU-SILC regulation definition is applied.	
8.1.3. Reference Period			
Period for taxes on income and social insurance contributions	Income reference periods used	Reference period for taxes on wealth	Lag between the income ref period and current variables
2013 (year N-1)	2013 (year N-1)	NA	1 year
8.2. Comparability - over time			
Not available			
8.2.1. Length of comparable time series			
Not requested by Reg. 28/2004			
8.3. Coherence - cross domain			
Not available			
8.4. Coherence - sub annual and annual statistics			
Not requested by Reg. 28/2004			
8.5. Coherence - National Accounts			
Not available			
8.6. Coherence - internal			
Not requested by Reg. 28/2004			

9. Accessibility and clarity	Top
Not requested by Reg. 28/2004	
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Not requested by Reg. 28/2004	
9.2. Dissemination format - Publications	
Not requested by Reg. 28/2004	
9.3. Dissemination format - online database	
Not requested by Reg. 28/2004	
9.3.1. Data tables - consultations	
Not requested by Reg. 28/2004	
9.4. Dissemination format - microdata access	
Not requested by Reg. 28/2004	
9.5. Dissemination format - other	
Not requested by Reg. 28/2004	
9.6. Documentation on methodology	
Not requested by Reg. 28/2004	
9.7. Quality management - documentation	
Not requested by Reg. 28/2004	
9.7.1. Metadata completeness - rate	
Not requested by Reg. 28/2004	
9.7.2. Metadata - consultations	
Not requested by Reg. 28/2004	

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Not requested by Reg. 28/2004	
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Not requested by Reg. 28/2004	

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