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01 Population

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New census system Quality survey

In 2010, the population census was replaced by a system based on information from existing administrative registers. At the beginning of 2013, the Federal Statistical Office (FSO) carried out a quality survey to evaluate the coverage of registers of persons and of the Federal Register of Buildings and Dwellings (RBD). The survey shows that the information in the registers is of high quality. Thus the statistics based on this information are extremely reliable.

This publication presents the general principles of the coverage, as well as the concept, procedure and results of the survey.

The data obtained from the registers enable two important basic statistics to be produced, the Population and Households Statistics (STATPOP) and the Buildings and Dwellings Statistics (BDS). Even though the survey and the processing of the data are subject to strict quality standards, it is possible that both may contain errors, including so-called coverage errors. On the one hand, these can be attributed to omissions (undercoverage), and on the other hand to double counting or units mistakenly included in the reference sample (overcoverage). The overcoverage and undercoverage shares are offset against each other to provide an estimate of the net undercoverage. The net undercoverage results from the balance of these two types of error which can cancel each other out.

To verify the level of coverage of both statistics and the quality of the results produced for 2012, the FSO carried out a survey of persons, residential buildings and dwellings at the start of 2013. This coverage survey (EC2013) or quality survey – which is independent of the registers – compares the data from the registers with the local reality.

Survey sample plan

In order to create the sample, Switzerland was divided into squares measuring 100, 200, 400 or 800 metres on each side. This division was carried out based on the housing density (number of persons, number of residential buildings per square). To make the on-site work easier, only squares with a maximum of 250 people or 85 residential buildings were considered (according to information from the available registers). The gross sample was around 57,000 people.

488 squares with a total of 12,000 residential buildings and 30,000 dwellings were evaluated.

In some squares there were no residential buildings in the RBD. Ten of these empty squares measuring 800 metres per side were selected using a simple random sample and processed in the survey (in addition to the 488 base squares).

Survey procedure

The survey was carried out in three phases. First, specially trained interviewers went to the concerned buildings and dwellings in the selected zones. On the basis of on-site observations, they checked, completed and corrected the lists that the FSO had created based on RBD data.

Evaluating coverage errors

The evaluation of coverage errors is often based on "capture-recapture methods" the mechanics of which are explained here in simplified form. The number of individuals that according to the population census occur in the defined population P are designated with C, the population census being considered the first capture within P. Lastly in the quality survey, the number of individuals from P within a selection of geographical squares is recounted. This second count corresponds to the recapture and must be conducted independently of the population census. The share of individuals who are not counted in the population census, among those appearing in the quality survey, provides an estimate of the undercoverage rate of the population census. Due to the fact that the first and second surveys are carried out independently the method remains valid although the second survey may not be perfect, in the sense that individuals may be forgotten. The survey procedure among persons guarantees the hypothesis of independence. As the interviewers had access to the Buildings and Dwellings list prepared by the FSO, the assumption of independence between the two surveys in the area of buildings and dwellings is satisfied to a slightly lesser extent. This is, however, counterbalanced by the fact that it is highly unlikely that an on-site interviewer with a large number of resources would forget to include a building or dwelling.

If a person from the household was present, they were asked about the date of birth, civil status and nationality of each household member (face to face).

The households from the selected zones could answer the questions in three ways: face to face on-site with the interviewer, by internet or by telephone. The second phase of the survey consisted of telephone interviews with the households which had not yet answered.

In a third phase, the interviewers tried to conduct on-site interviews with the households they had so far been unable to reach or to clarify any uncertainties regarding housing data.

The survey lasted from 2 May to 6 July 2013. During this period more than 100 interviewers were present on-site. They were equipped with a PC tablet, which enabled them to localise the selected zones and to situate themselves spatially (GPS), to check or complete the lists of buildings and dwellings and if necessary to correct them, as well as to conduct interviews.

All households from the selected zones as well as the communes and the local police stations were informed beforehand in writing that the survey would take place.

More than 21,000 households were interviewed (37% by online questionnaire, 31.5% by telephone and 31.5% face to face).

A high quality population statistic

A coverage survey was already conducted in 2000. This took place after the last population census that was carried out as a comprehensive survey with paper questionnaires. The nationwide net undercoverage rate among individuals was 1.4% at that time. The results of the EC2013 show a clear improvement, the undercoverage rate decreased to 0.5%. This low rate proves that the STATPOP statistics based on administrative data are of high quality.

T1 Estimation of coverage of persons

Classification	Category	Undercov. % (SD-Standard deviation)	Overcoverage %	Net under-coverage % (SD)	Confidence interval (of 95%) net undercov. (%)
Total		0.47 (0.04)	0.02	0.45 (0.04)	[0.37; 0.53]
Nationality	Swiss	0.26 (0.03)	0.01	0.25 (0.03)	[0.19; 0.31]
	Foreigner	1.19 (0.14)	0.08	1.11 (0.14)	[0.84; 1.38]
Sex	Men	0.48 (0.05)	0.03	0.46 (0.05)	[0.36; 0.56]
	Women	0.46 (0.04)	0.02	0.44 (0.04)	[0.36; 0.52]
Civil status	Single	0.65 (0.07)	0.03	0.62 (0.07)	[0.48; 0.76]
	Married	0.36 (0.04)	0.02	0.34 (0.04)	[0.26; 0.42]
	Widowed	0.27 (0.06)	0.02	0.25 (0.06)	[0.13; 0.37]
	Divorced	0.28 (0.03)	0.02	0.26 (0.03)	[0.20; 0.32]
Age class	0–14	0.57 (0.09)	0.02	0.55 (0.09)	[0.37; 0.73]
	15–29	0.84 (0.10)	0.04	0.80 (0.10)	[0.60; 1.00]
	30–44	0.59 (0.07)	0.03	0.55 (0.07)	[0.41; 0.69]
	45–59	0.21 (0.03)	0.02	0.20 (0.03)	[0.14; 0.26]
	60–74	0.25 (0.05)	0.01	0.24 (0.05)	[0.14; 0.34]
	>= 75	0.25 (0.06)	0.02	0.23 (0.06)	[0.11; 0.35]

Note: no standard deviation for overcoverage, because the controls refer to all register data (no sample survey errors)

Source: FSO – EC2013

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Detailed estimates show particularities in certain population groups. The rates remain low, however, and the differences are relatively small. For example, the net undercoverage rate for foreign nationals is 1.1%, whereas that of Swiss citizens is 0.3%. With a rate of 0.6%, single persons also stand out from the rest of the population (0.3%).

Young adults between 15 and 29 years of age show a higher rate (0.8%) than persons from the age of 45 (0.2%).

From a regional perspective, the Lake Geneva region (GE, VD, VS) with a rate of 0.9%, differs slightly from the other regions which all show a rate of 0.5% or less.

Both omission errors (undercoverage) as well as double counting (overcoverage) can mainly be attributed to the lapse between the time of an event (moving home, birth, etc.) and its being recorded in the population register.

The survey does not enable differences in the size of communes to be distinguished.

Good coverage of building and housing stock

For residential buildings, the EC2013 shows a slight overcoverage (Buildings which are superfluous in the RBD). Analyses show that this has mainly to do with buildings which have been wrongly entered in the RBD as residential, or buildings with a faulty status (as completed, when the building has actually been demolished or is still under construction). Overall, however, at -0.5% , the undercoverage rate is low.¹

T2 Estimate of coverage of residential buildings

Classification	Category	Undercov. % (SD- Standard deviation)	Over- coverage % (SD)	Net under- coverage % (SD)	Confidence interval (of 95%) net undercov. (%)
Total		0.18 (0.05)	0.71 (0.11)	-0.53 (0.12)	[-0.76;-0.30]
Building category	Exclusively residential	0.18 (0.05)	0.44 (0.09)	-0.26 (0.10)	[-0.47;-0.06]
	With sub- sidiary use	0.18 (0.13)	2.04 (0.40)	-1.90 (0.45)	[-2.77;-1.02]
Major regions	1 – GE, VD, VS	0.19 (0.12)	0.90 (0.23)	-0.72 (0.27)	[-1.24;-0.20]
	2 – BE, FR, JU, NE, SO	0.06 (0.05)	0.45 (0.14)	-0.40 (0.16)	[-0.71;-0.09]
	3 – AG, BL, BS	0.23 (0.12)	0.30 (0.16)	-0.08 (0.21)	[-0.49;0.33]
	4 – ZH	0.06 (0.06)	0.44 (0.25)	-0.38 (0.26)	[-0.89;0.12]
	5 – AI, AR, GL, GR, SG, SH, TG	0.18 (0.12)	0.71 (0.24)	-0.53 (0.23)	[-0.98;-0.09]
	6 – LU, NW, OW, SZ, UR, ZG	0.08 (0.08)	0.93 (0.33)	-0.86 (0.33)	[-1.51;-0.21]
	7 – TI	0.89 (0.45)	2.07 (1.08)	-1.21 (1.32)	[-3.79;1.38]

Source: FSO – EC2013

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On the basis of the sample size, comparisons between major regions are only possible to a limited extent.² Three major regions (Northwestern Switzerland, Zurich, Eastern Switzerland) show a confidence interval (CI) that does not allow an undercoverage of buildings (lower threshold of positive CI) or overcoverage (upper threshold of negative CI) to be identified.

Of the ten zones for which there is no entry in the RBD (i. e. without residential buildings), six had no buildings of this category. In four zones, 23 buildings with 20 dwellings were recorded on-site (in all of the other 488 zones of the sample together, 10 additional buildings were found). No persons could be linked to the additionally found dwellings (no main place of residence). Due to the small sample size of the empty zones, however, no reliable estimates can be made and therefore no clear conclusions drawn. This could be due to a problem in the BDR or a measuring error owing to the small sample sizes.

The results on buildings and dwellings published here do not take the empty zones into account.

Overcoverage for buildings leads to overcoverage of dwellings.

The undercoverage of dwellings is, however, more marked than that of buildings, in particular for buildings with subsidiary use³ (1.8%). Overall, the net undercoverage is very low here too, with a negative rate of 0.36%.

Similarly to the buildings, the confidence intervals for the dwellings in certain major regions do not have a confidence interval which allows one to determine whether under or overcoverage exists.

¹ A negative net undercoverage rate means that the overcoverage is greater than the undercoverage.

² Switzerland's seven major regions correspond to the Eurostat NUTS-2-Regions

³ Buildings that are not used exclusively for residential purposes.

T3 Estimate of coverage of dwellings

Classification	Category	Undercov. % (SD- Standard deviation)	Over- coverage % (SD)	Net under- coverage % (SD)	Confidence interval (of 95%) net undercov. (%)
Total		0.90 (0.13)	1.25 (0.12)	-0.36 (0.18)	[-0.70;-0.01]
Building category	Exclusively residential	0.66 (0.08)	0.93 (0.10)	-0.27 (0.13)	[-0.52;-0.01]
	With sub- sidiary use	1.75 (0.51)	2.42 (0.35)	-0.68 (0.65)	[-1.95;0.59]
Major regions	1 – GE, VD, VS	1.71 (0.57)	1.34 (0.32)	0.37 (0.68)	[-0.95;1.70]
	2 – BE, FR, JU, NE, SO	0.87 (0.18)	1.43 (0.21)	-0.57 (0.31)	[-1.17;0.03]
	3 – AG, BL, BS	0.94 (0.22)	0.66 (0.17)	0.29 (0.28)	[-0.27;0.84]
	4 – ZH	0.44 (0.13)	1.13 (0.30)	-0.69 (0.35)	[-1.37;-0.02]
	5 – AI, AR, GL, GR, SG, SH, TG	0.62 (0.17)	1.05 (0.19)	-0.44 (0.29)	[-1.01;0.14]
	6 – LU, NW, OW, SZ, UR, ZG	0.63 (0.19)	1.54 (0.42)	-0.92 (0.50)	[-1.90;0.06]
	7 – TI	0.47 (0.20)	2.01 (0.84)	-1.57 (0.97)	[-3.44;0.31]

Source: FSO – EC2013

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The use of administrative data is very satisfactory

The FSO and the communal and cantonal agencies responsible for keeping the registers were faced with the major challenge of creating a basis so that important statistics could be produced by using administrative data.

The 2013 Quality Survey shows that the registers are generally of a high standard and that the STATPOP and BDR statistics that are produced from them are extremely reliable. This also means that the cantonal and communal agencies responsible use efficient procedures in their register keeping. Their registers are exhaustive and are constantly updated. The necessary processes are established and consolidated in the cantons and communes.

At the present time, the conduct of regular quality surveys is not envisaged.

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