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EU Quality Report

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1 Introduction

Lifelong learning is defined as "all the learning activities undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and employment-related perspective"¹. It is a key element in developing and promoting a skilled, trained and adaptable workforce, therefore lifelong learning holds a high profile in the defining of strategies for a sustainable economy.

A European survey was set up in the past years in order to measure the adult's participation in lifelong learning, the **Adult Education Survey (AES)**. Its main aim is to collect information on education and training for individuals aged 25-64. All kinds of learning activities are tackled in the survey (formal, non-formal and informal – see definitions in **Section 2**). The survey takes place every five years and its results are published on Eurostat's website.

The first wave of the survey, 2007 AES (also called 'pilot survey') was carried out under a Gentlemen's agreement between 2005 and 2008 in 29 countries, either Member States of the European Union, candidate countries or countries of the European Free Trade Area (EFTA). This pilot exercise was set up within a common EU framework including a standard questionnaire, tools and quality reporting yet, without any legal framework. 2007 AES has been a first step allowing for international comparisons for participation in lifelong learning.

After the first pilot exercise, the Adult Education Survey is run under a legal basis: Framework Regulation (EC) 452/2008, which makes it a compulsory European survey. The second AES data collection, 2011 AES, took place in 2011 and 2012. It was the first to be run under a Framework Regulation and it was implemented by the Commission Regulation (EC) 823/2010 (see Annex I for more information on the legal basis).

Significant changes have been made in the questionnaire and content between the two waves: improvements, new variables included, others excluded, new categories added for some already existing variables and questions rephrased for instance.

On the whole, all EU Member States (except for Croatia which had not yet joined the Union) took part in the survey. Norway, Switzerland, Serbia also implemented the 2011 AES. Iceland and Liechtenstein did not take part in the data collection.

The following report is the EU Quality Report of the 2011 Adult Education Survey. It is largely based on the standard national quality reports received by Eurostat from participating country. Metadata collected by Eurostat have also been used when possible as well as other documents on the AES project and updates reported by AES national coordinators. Quality reports give an overview of the adults' participation in all types of learning activities (formal, non-formal and informal), on characteristics of the learning activities such as the duration of the learning for example, as well as reasons for and obstacles to participation.

¹ Council Resolution of 27 June 2002 on lifelong learning (OJ C 163, 9.7.2002, p.1).

The structure of this report follows that of the chapter on statistical outputs of the European Statistics Code of Practice of the European Statistical System². All dimensions of quality for statistical outputs are included: relevance, accuracy, timeliness and punctuality, accessibility and clarity, comparability and coherence. Many dimensions have sub-components which are explained at the beginning of each section.

2 Learning activities – definition and classification

2.1 Definition

Learning activities are defined as "any activities of an individual organized with the intention to improve his/her knowledge, skills and competences"³. There are two fundamental criteria to distinguish a learning activity from a non-learning activity:

- 1) the activity must be intentional, i.e. a deliberate search for knowledge, skills, competences or attitudes of lasting value
- 2) the activity must be organized, i.e. planned in a pattern or sequence with explicit or implicit aims.

2.2 Classification

To ensure comparability of the results across all countries, three types of learning activities have been defined. They are explained in a proper dedicated classification: the Classification of Learning Activities (CLA).

- Formal education and training
- Non-formal education and training
- Informal learning

Formal education and training (FED) is defined as "education provided in the system of schools, colleges, universities and other formal educational institutions that normally constitutes a continuous "ladder" of full-time education for children and young people, generally beginning at age of five to seven and continuing up to 20 or 25 years old⁴.

Formal activities can either be classifiable in ISCED, not classifiable in ISCED and out of scope of ISCED. The AES needs to include these three types in the data collection to ensure a full coverage of the formal education and training and comparability across countries.

Nb. At the release of the current report, the CLA was under possible revision in order to improve harmonisation with the ISCED⁵ classification (eg. recognition criteria and duration criterion for defining the formal education and training activities).

² http://epp.eurostat.ec.europa.eu/portal/page/portal/quality/code_of_practice

³ Classification of Learning Activities Manual, European Commission; 2006

⁴ ISCED 97 glossary, p. 41.

⁵ **The International Standard Classification of Education (ISCED)** is a statistical framework for organizing information on education maintained by the United Nations Educational, Scientific and Cultural Organization (UNESCO). It is a member of the international family of economic and social

Non-formal education and training (NFE) refers to institutionalised learning activities, which are not considered as formal education. It includes structured programmes that cannot be positioned in the ISCED usually because of the provider and/or awarding organisation, the content or duration. The activities that should be considered as non-formal education and training are:

- Private lessons or courses (classroom instruction, lecture or a theoretical and practical course). A course is defined as a planned series of single learning activities in a particular range of subject-matters offered by a provider. They are typically subject oriented and they are taught by one or more persons specialised in the field(s) of education and training.
- Courses conducted through open and distance education: It covers courses which are similar to face-to-face courses (registration, tutoring, tests) but take place via postal correspondence or electronic media, linking instructors/tutors or students who are not together in classroom. Mutual interaction is mostly with a delay.
- Seminars or workshops: Sessions combining theoretical instruction with "hands-on" training provided during a conference or congress.
- Guided-on-the-job training: planned periods of training, instruction or practical experience, using normal tools of work, either in the immediate place of work or in the work-situation with the presence of a tutor. It is usually organised by the employer to facilitate adaptation of (new) staff, including transferred, rehired and seasonal staff in their new or current jobs. It may include general training about the company as well as specific job related instructions (safety and health hazards, working practices).

Informal learning (INF) is intentional, but less organized and less structured learning activity. It does not fall within the scope of ISCED and may include for example learning events (activities) that occur in the family, in the work place, and in the daily life of every person, on a self-directed, family-directed or socially directed basis. The key point of informal learning is it is *not institutionalised* and can take place almost anywhere – within the family, with friends, at work. That is the main parameter that differentiates informal learning from formal and non-formal. On the other hand, it must be separated from random learning, which is not an activity intentionally planned in advance. Random learning can be considered as a natural learning mechanism.

The following activities should be considered as informal learning:

- Learning from a family member, friend or colleague, i.e. lessons provided by household members or other individuals, such as relatives or neighbours.
- Using printed materials (books, professional magazines etc.), that is, studying subject using books, magazines etc.
- Using computers (online or offline), e.g. using teaching material from the internet.
- Through television/radio/video, e.g. watching a documentary on TV or listening a foreign language audio tape in the car.

classifications of the United Nations. The AES 2011 was carried out under ISCED 1997. The next version (ISCED 2011) was adopted by UNESCO's 36th General Conference in November 2011 and will replace ISCED 1997 in international data collections in the near future.

3 Overview of designs and methods used for the AES 2011

3.1 Coverage

This survey has been implemented in thirty countries in total: among which the 27 Member States of the European Union of that time, two EFTA countries (Norway and Switzerland) and one candidate country (Serbia). Luxembourg and Serbia both implemented the survey for the first time. All the territories of participating countries are covered, except:

- 1) Cyprus – which only covers the areas under the control of the government of the Republic of Cyprus,
- 2) France – which excluded the overseas departments ("Départements d'outre-mer"),
- 3) Norway - which did not include Svalbard,
- 4) Serbia – which did not cover Kosovo⁶ and enumeration districts with 19 and less households (cut off about 1 %).

The 2011 AES sample is composed of people living in private households. Still, several countries cover the members of collective households as well. All the preparation, training, fieldwork and processing had been carried out by National Statistical Authorities (NSAs) – being either National Statistical Institutes or Ministries for Education – with permanent cooperation with and recommendations made by Eurostat.

3.2 Compulsory participation

The participation of selected respondents was made compulsory at national level in nine participating countries (France, Italy, Cyprus, Latvia, Lithuania, Malta, Romania, Spain and Germany) and was on a voluntary basis in the other countries. Belgium, which is, along with UK and Ireland⁷, is the only country in which the AES 2011 was fully embedded in another survey (LFS) (same sample, extension of the survey questionnaire in a paper version). AES itself was run on a voluntary basis, but linked to the Labour Force Survey (LFS) which is a compulsory survey at national level.

3.3 Reference period

The reference period for the participation in learning activities in all countries was the twelve months prior to the interview: it was a very important norm to be fulfilled while collecting the data. It means the covered period was the previous 12 months from the moment when the respondent was replying to the interview. Having established that this reference period was not suitable for a few variables, some countries allowed for more flexible time period, in order to obtain more accurate information: it concerned

⁶ Since 1999, it is an UN-governed entity under [UNSCR 1244](#)

⁷ UK's data for AES 2011 were derived from their existing national survey, the National Adult Learning Survey (NALS). Irish questions were designed to measure the level of educational attainment and they are included in the Quarterly National Household Survey (QNHS) on an ongoing basis.

the questions about parental education and occupation, number of hours and amount of money paid for learning activities).

3.4 Sampling design and sampling frames

A majority of National Statistics Authorities (NSAs) used a stratified random sample design. A *Stratified sample* is a sample made of several layers or 'strata'. It is needed when it is important to take into account specificities of sub-groups within the sample assumed to be homogenous regarding the observed characteristics. Regions (NUTS 2, NUTS 3) or nationally defined areas, as well as the classification 'urban' versus 'rural' area are common stratification variables. Random selection is performed in each stratum and sampling rates may differ from stratum to stratum.

In a multi-stage sampling, sampling units are selected in several stages. The sampling units of the highest order are selected first according to a specific criterion and then a sub-sample of a second order is drawn from this first layer according to another criterion.

Table 1. *Sampling methods by country*

Stratified random sampling	Austria, Cyprus, Denmark, Finland, Malta, Norway, Sweden, Switzerland
Two-stage stratified sampling	Belgium, Bulgaria, Greece, Ireland, Latvia, Netherlands, Poland, Slovenia, Spain
Three-stage stratified sampling	Czech Republic, Germany, Serbia, Slovakia
Stratified systematic sampling	Estonia
Two-stage stratified cluster design	Portugal

Source: AES 2011 Standard National Quality Reports

Italy⁸, Hungary⁹ and Romania¹⁰ used the stratification method only partially. Some other stratification variables can be, for example, the settlement and household size/type

⁸ Two different sampling schemes have been applied. Municipalities are divided into two sub-groups on the basis of the resident population: 1) the group of Self-Representative municipalities (AR municipalities) made up of larger demographic size of municipalities 2) the group of Non Self Representative municipalities (or NAR) made up of the remaining municipalities. In the group of AR municipalities, each municipality is considered as an independent stratum and a cluster selection scheme is used. The primary sampling units are the households registered in the Public Registry, selected systematically from the Public Register of the municipality itself. Within the group of NAR municipalities a two stage sampling design is adopted with stratification of the primary units.

⁹ The Hungarian AES sample is a partly one-stage, partly two-stage stratified sample of dwellings:

(Slovenia, Spain). United Kingdom used a three-stage equal probability design. Almost all countries usually selected municipalities, census-linked areas or administrative districts in the first stage. Portugal used geographical areas and UK postcode sectors.

The other sampling designs were Simple Random Sampling (France and Lithuania), while Luxembourg based the sampling on a web panel¹¹. As their sampling design, Belgium and Greece used a sub-sample of the Labour Force Survey for AES 2011, thus following the same sampling scheme as for the LFS.

The final sampling unit can be the dwelling (defined by the address), the household or the individual depending of the design chosen by the country.

As a sampling unit, dwellings have been used by seven countries: France, Greece, Hungary, Poland, Portugal, Romania and United Kingdom. In most of the cases, all people eligible for the survey (in terms of age limit) living at a given address are interviewed. Two countries (France and UK) interviewed only one person per household. France decided to interview the first person born on 1 July or later in order to ensure the random selection of one person in the dwelling.

Households, as a sampling unit, have been used by six countries: Belgium, Bulgaria, Czech Republic, Italy, Ireland and Serbia, while all other countries used individuals.

The sources the most commonly used for the sampling frame were Population Registers or databases, the latest Population Census and Register of Dwellings/Households (depending on national practices). Twelve countries used Population Register, eight countries (Bulgaria, France, Greece, Cyprus, Malta, Portugal, Romania and Serbia) used the Census, while five countries (Czech Republic, Italy, Ireland, Latvia and Hungary) used the Register of Dwellings as the sampling frame. Other sources included e.g. Postcode Address File (United Kingdom), List of municipalities (Slovakia), Domestic Territorial Division Register (Poland) or Sampling register for persons' and households' surveys (Switzerland). Several countries complemented their main sampling frame with other registers or Census information (Ireland), as well as enumeration areas (Slovenia).

(1) A one-stage selection was made in larger towns, where each locality is a stratum of its own (a self-representative locality) and in each town a sample of dwellings was selected;

(2) In smaller towns/municipalities a stratified two-stage selection was made, where municipalities are the principal statistical units and dwellings are the secondary sampling units.

¹⁰ AES sampling design is founded on a two-stage sampling technique. In the first stage, a stratified random sample of 780 areas, Primary Sampling Units (PSU's), was designed after the 2002 Census. The primary sampling unit, corresponding to the selection of the master sample, is a group of census sections. In the second stage, the dwellings are systematically selected: 13 dwellings from each PSU. The secondary (ultimate) sampling unit, corresponding to the selection of the survey sample, has been the dwelling. Stratification concerns only the first stage sampling.

¹¹ Sampling has been done systematically using the following procedure: 1) random mix of the panellists; 2) the sampling interval $K = 6$ (one individual is to be chosen out of 6); 3) random choice of a number between 1 and 6, being the origin (O); 4) 1st monthly sample defined by the Kth number after the origin O 2nd monthly sample defined by the Kth number after the origin O+1 etc. until the 5th monthly sample.

The Regulation (EC) 452/2008 states that '*sample size shall be established on the basis of precision requirements that shall not require effective national sample sizes to be larger than 5000 individuals, calculated on the assumption of simple random sampling. Within these limits specific subpopulations shall require particular sampling considerations*'.

In order to calculate the minimum sample size, precision requirements were also set out (see **Section 5** below).

Table 2. *Net sample size (25-64 years old)*

Country	Net sample size
BE	5526
BG	5447
CZ	7969
DK	3660
DE	7099
EE	3324
IE	12582
EL	5420
ES	15777
FR	12514
IT	8703
CY	2404
LV	5048
LT	5388
LU	3310
HU	7367
MT	2882
NL	3036
AT	5059
PL	22522
PT	11968
RO	12255
SI	4013
SK	4255
FI	3605
SE	3096
UK	3082

NO	2666
CH	9660
RS	4534

Source: AES 2011 Standard National Quality Reports

The net sample size varies across countries. Many countries decided to substantially increase the size beyond the EU requirements. Poland, Spain, France, Romania and Portugal for instance have the largest net sample size with slightly more than 10 000 units.

3.5 Weighting factors

Weighting is a mathematical procedure used when performing a mathematical operation to give more influence to some elements on the result than other elements in the same set. In surveys, a weight is assigned to each record in the dataset (a record being a respondent) so that when a sum or average or ratio is calculated based on the sample, the result will be representative of the whole population.

Annex 2 of this report gives a description of the weighting procedures used in each country to gross up the results in the net sample to the target population including different steps taken or factors applied to the weighting design.

3.6 Methods of data collection

In AES 2011, the following survey types were used for obtaining data from the respondents:

- Paper-Assisted Personal Interview (PAPI)
- Computer-Assisted Personal Interview (CAPI)
- Computer-Assisted Telephone Interview (CATI)
- Other (Computer-Assisted Web Interview (CAWI), Self-administered questionnaire)
- Combination of the previous techniques.

A combination of various methods was used by eleven countries: Denmark, Estonia, Greece, Italy, Lithuania, Norway, Slovenia, Serbia, Sweden, Finland and Belgium. The most common combination was CAPI/CATI (seven countries), while Denmark, Greece and Lithuania respectively resorted to CATI/CAWI, PAPI/Telephone interview and PAPI/CAPI.

Belgium used CAWI/Postal mixed method, which alongside the fact that AES 2011 was a drop-off questionnaire linked to the LFS, may have led to a higher non-response (although it is improved a lot compared with the Pilot AES). It did not, however, affect the quality of the survey because necessary measures have been taken to obtain satisfactory results (high non-response was expected and therefore compensated by a very large initial sample size).

Face-to-face personal interviews (PAPI or CAPI) are the most representative data collection method for AES 2011. Bulgaria, Hungary, Malta, Poland, Romania and

Slovakia use PAPI as their main method, while CAPI was used by Austria, Czech Republic, France, Ireland, Cyprus, Latvia, Germany, Portugal, Spain and UK. Like already mentioned, Lithuania is the only one which use combination of these two. Netherlands and Switzerland use CATI only.

Luxembourg is the only country which only used CAWI. This data collection method in combination with a unique sampling method (web-panel provided by a contractor), may have also affected the response rate.

3.7 Duration of the interview and length of the questionnaire

A number of countries commented on the length of interviews or on the complexity of the questionnaire which could affect the interview process. Many countries noted that the questionnaire was rather long and that it had a certain impact on respondents' concentration, particularly when reaching the end of the interview. In a few cases, respondents were deliberately giving negative answers to skip any further questions on particular topic, but it did not hamper the quality of the data on the whole. The average duration of an interview was rarely below 25-30 minutes, depending on the structure of the questionnaire (e.g. optional variables included or not).

A total of 48 *optional variables* were proposed in the AES Commission Regulation. Each country was free to choose which of them would be included in the national survey. Cyprus was the only country which included all optional variables. Almost all have been included by Austria, Estonia and Romania, while Denmark, the Netherlands, and Switzerland included very few of them. Norway excluded all optional variables.

4 Relevance

Relevance is the degree to which statistics meet current and potential user needs. It shows whether all statistics that are needed are produced and the extent to which concepts used (definitions, classifications etc.) reflect user needs.

Most EU statistics are compiled according to Regulations containing defined lists of variables to be collected which are meant to reflect in particular the most relevant institutional users' needs.

As a relatively new survey and a unique one about adult education at the European level, the usefulness of AES is continuously increasing.

The AES results are in demand when it comes to describing the participation in the learning from the participants' perspective. The source is the only source at European level which can give details on adults' participation in lifelong learning and the characteristics of the corresponding learning activities.

Moreover, the microdata¹² can be accessed for research purposes and many requests have been sent to Eurostat since the source was made available to the research community.

Within their quality reports, countries have given their evaluation of the relevance of the main AES statistics at national level featuring policy makers, social actors, the media, researchers and students and enterprises (Table 3). The relevance for policy makers and researchers and students is high in almost all countries. (n.b. Malta and Serbia did not fill in this table).

Table 3. *High relevance of the main AES statistics by countries*

Main AES statistics <i>(high relevance)</i>	For policy makers	For social actors	For the media	For researchers and students	For enterprises
<i>Participation in formal, non-formal and informal education (FED, NFE, INF)</i>	AT, BE, BG, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, HU, NO, PL, PT, RO, SK, SI, ES, CH, SE, UK, FI	AT, BE, BG, CZ, DK, EE, FR, EL, NL, IT, IE, LV, LU, HU, NO, PT, RO, SI, ES, CH, SE, UK, FI	AT, BE, BG, CZ, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, HU, NO, PT, RO, SI, ES, CH, SE, FI	AT, BE, BG, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, HU, NO, PL, PT, RO, SK, SI, ES, CH, SE, UK, FI	AT, BE, BG, DK, EE, FR, IT, IE, CY, LT, HU, NO, PL, PT, RO, SK, CH, SE, FI
<i>Non-participation and obstacles to participation in training</i>	AT, BE, BG, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, HU, NO, PL, PT, RO, ES, CH, SE, UK, FI	AT, BE, BG, DK, EE, FR, EL, NL, IT, IE, LV, LT, LU, HU, NO, PT, RO, SK, ES, CH, SE, UK, FI	AT, BE, BG, CZ, DK, EE, FR, EL, NL, IE, CY, LV, LT, HU, NO, PT, RO, SI, ES, CH, SE	AT, BE, BG, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, HU, NO, PT, RO, SI, ES, CH, SE, UK, FI	AT, BE, BG, DK, EE, FR, IT, IE, CY, LT, NO, PT, CH, SE
<i>Participation in FED, NFE and INF activities by field of education/training</i>	AT, BE, BG, CZ, DE, DK, EE, FR, NL, IT, IE, CY, LV, LT, LU, HU, PL, PT, RO, ES, CH, SE, UK, FI	AT, BE, EE, FR, NL, IT, IE, LV, LU, HU, PT, RO, ES, CH, UK, FI	BE, BG, EE, FR, NL, IE, CY, LV, LU, PT, RO, CH, FI	AT, BE, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, HU, NO, PL, PT, RO, SK, SI, ES, CH,	AT, BE, DK, FR, IT, IE, CY, PL, PT, RO, SK, CH, FI

¹² The data are available in the form of an anonymised dataset. The link to Eurostat's website on this topic is the following:
http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/adult_education_survey

				SE,UK, FI	
<i>Share of the job related NFE</i>	AT, BE, BG, CZ, DE, DK, EE, FR, NL, IT, IE, CY, LV, LT, LU, HU, NO, PL, PT, RO, SK, ES, CH, SE, UK, FI	AT, BE, BG, CZ, EE, FR, NL, IT, IE, LV, LT, LU, HU, PT, RO, SK, ES, CH, SE, UK, FI	AT, BE, BG, EE, FR, NL, IE, CY, LT, PT, RO, ES, CH, SE, FI	AT, BE, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, NO, PL, PT, RO, SI, ES, CH, SE, UK, FI	AT, BE, BG, DE, DK, EE, FR, EL, IT, IE, CY, LT, HU, NO, PT, RO, SK, ES, CH, SE, FI
<i>Volume of instruction hours in FED and NFE</i>	AT, BE, BG, DK, EE, FR, NL, IE, CY, LT, LU, PL, PT, RO, ES, CH, SE, UK, FI	AT, BE, EE, FR, NL, IT, IE, LU, PT, RO, ES, CH, SE, UK, FI	BE, BG, EE, FR, NL, IE, CY, PT, RO, CH, SE, FI	AT, BE, DK, EE, FR, EL, NL, IE, CY, LV, HU, NO, PT, RO, SI, ES, CH, SE, UK, FI	AT, BE, DE, DK, EE, FR, IT, IE, LT, HU, NO, PT, RO, SK, ES, CH, SE, FI
<i>Employer financing and costs of learning in FED and NFE</i>	AT, BE, BG, CZ, DK, EE, FR, EL, NL, IT, IE, CY, LV, LT, LU, NO, PL, PT, RO, SI, ES, CH, SE, UK, FI	AT, BE, BG, CZ, EE, FR, EL, NL, IT, IE, LT, LU, NO, PT, RO, ES, CH, SE, UK, FI	AT, BE, BG, CZ, EE, FR, NL, IE, CY, LT, NO, PT, RO, ES, CH, SE, FI	AT, BE, CZ, DE, DK, EE, FR, EL, NL, IT, IE, CY, LV, HU, NO, PT, RO, SK, SI, ES, CH, SE, UK, FI	AT, BE, BG, DE, DK, EE, FR, EL, IT, IE, CY, LT, HU, NO, PL, PT, RO, SK, ES, CH, SE, FI
<i>Module on language and ICT skills of the population</i>	AT, BE, BG, DK, EE, IT, CY, LT, LU, HU, NO, PL, PT, RO, SK, SI, ES, SE, FI	BE, BG, EE, IT, LT, LU, HU, NO, PT, RO, SK, SI, ES, SE, FI	BE, BG, CZ, EE, EL, IT, CY, LT, LU, HU, NO, PT, RO, SI, ES, SE	AT, BE, BG, CZ, DK, EE, EL, NL, IT, CY, LT, HU, NO, PL, PT, RO, SK, SI, ES, SE, FI	BE, BG, EL, IT, CY, LT, HU, PL, PT, RO, SK, ES, SE, FI
<i>Module of social and cultural participation of the population</i>	AT, BG, EE, LT, LU, HU, PL, PT, SI, FI	BE, BG, EE, LV, LT, LU, HU, PT, SI, FI	BE, BG, CZ, EE, EL, IT, CY, LT, LU, HU, PT, SI, FI	AT, BE, BG, CZ, EE, EL, NL, IT, CY, LT, HU, PL, PT, RO, SI, FI	BG, CY, PT

Source: AES 2011 Standard National Quality Reports

5 Accuracy

The accuracy of statistical outputs is the degree of closeness of estimates to the true values. Estimates are not equal to the true values because of *variability* (statistics change due to random effects) and *bias* (the average of the possible values of the statistics is not equal to the true value due to systematic effects).

There are several types of errors that can occur at several stages of a survey process. A certain typology of errors is widely adopted in statistics. **Sampling errors** apply only to sample surveys: they are due to the fact that only a subset of the population is selected, usually randomly. **Non-sampling errors** apply to all statistical processes and encompass: coverage errors, measurement errors, processing errors and non-sampling errors.

5.1 Sampling errors

Sampling errors only affect sample surveys and arise from the fact that not all units of the frame population are surveyed. AES 2011 use probability sampling, for which sampling theory provides techniques for the estimation of the expected value and variance of specific indicators over all possible samples. The variability of an estimator around its expected value may be expressed by its variance, standard error, coefficient of variation or confidence interval. The indicator displayed in the AES quality report is the latter.

Confidence interval is the interval that covers the true value with a certain probability and is used to indicate the reliability of an estimate. It is an observed interval (calculated from the observations), in principle different from sample to sample, that frequently includes the parameter of interest if the experiment is repeated. In AES 2011 (and in most of applied practice), confidence intervals are stated at the 95% confidence level.

The confidence interval is the simplest way of showing the variability of a sample. Table 5 shows the estimates and 95 % confidence intervals for participation rate in non-formal education by sex, and Table 6 by the age groups.

The length of confidence intervals means, if we look, for example, at the data provided by France in Table 5, that with the certainty of 95 % we can say that the overall participation rate in non-formal education is between 47.8 % and 50.3 %.

Table 5. *Estimates and 95 % confidence intervals, participation rate in non-formal education for people aged 25-64, by sex*

	Number of respondents (All)	All Estimated proportion (%)	All 95% confidence interval	Women Estimated proportion (%)	Women 95% confidence interval	Man Estimated proportion (%)	Man 95% confidence interval
BE	1 879	33.1	31.9-34.4	34.1	32.2-36.0	32.2	30.4-34.0
BG	1 284	24.4	22.8-26.1	23.2	21.2-25.3	25.7	23.6-27.7
CZ	2 719	34.9	33.5-36.3	34.9	33.1-36.7	35.0	33.3-36.6
DK	2 004	52.7	51.1-54.3	55.0	52.7-57.3	50.4	48.1-52.7
DE	2 994	48.5	47.3-49.7	46.2	44.4-48.0	50.7	50.6-50.8
EE	1 561	48.0	46.1-49.9	44.0	41.2-46.8	56.0	53.2-58.8
IE	2 299	18.7	-	-	-	-	-
EL	398	9.6	8.2-11.1	11.2	9.2-13.5	8.0	6.9-9.2
ES*	6 177	34.8	33.7-35.9	34.1	32.7-35.5	35.5	34-37

FR	5 986	49.1	47.8-50.3	49.2	47.5-50.8	49.0	47.2-50.8
IT	3 277	34.3	33.4-35.2	32.5	31.8-34.4	36.1	34.1-36.8
CY	972	40.9	39.0-42.8	40.2	37.5-42.8	41.7	38.8-44.5
LV	1 474	29.9	28.5-31.4	35.3	33.2-37.4	24.2	22.2-26.2
LT*	1 228	22.8	20.3-25.2	26.2	23.7-28.6	18.3	15.9-20.7
LU	2 263	67.8	66.3-69.6	66.6	64.1-69.0	69.3	61.2-71.5
HU	2 884	37.6	36,4-38,8	35.5	34.3-36.8	39.7	38.3-41.2
MT	981	34.1	32.6-35.6	35.5	33.3-37.7	32.6	30.5-34.7
NL	1 729	56.9	56.1-57.8	53.5	52.2-54.8	60.9	59.6-62.1
AT*	2 675	45.2	43.8-46.5	45.5	43.5-47.3	44.8	42.9-46.7
PL*	4 730	21.0	20.1-21.9	21.4	20.5-22.2	20.6	19.4-21.7
PT	4 112	39.7	38.2-41.2	40.2	38.5-42.0	39.2	37.3-41.0
RO	719	5.6	4.8-6.4	5.8	4.8-6.7	5.5	4.6-6.4
SI	1 529	34.7	33.1-36.3	36.3	34.0-38.6	33.3	31.0-35.6
SK	1 622	38.3	36.9-39.7	49.4	47.6-51.3	50.6	48.7-52.4
FI	1 884	51.3	49.7-52.9	58.1	55.7-60.5	44.7	42.3-47.1
SE	2 063	67.0	65.4-68.6	68.7	66.5-70.9	65.3	62.8-67.8
UK	788	24.3	21.3-27.3	25.7	21.9-29.5	22.9	18.1-27.7
NO	1 586	56.9	55.0-58.8	56.6	54.0-59.2	57.2	54.6-59.8
CH	5 904	63.1	61.9-64.3	64.0	62.4-65.6	62.2	60.4-64.0
RS	569	13.6	12.2-14.9	13.9	12.3-15.5	13.2	11.1-15.3

* including individuals aged 18-64 or 65+

Source: AES 2011 Standard National Quality Reports

Table 6. Estimates and 95 % confidence intervals, *participation rate in non-formal education for people aged 25-64, by age groups*

	25-34 years old (%)		35-49 years old (%)		50-64 years old (%)	
	estimated proportion	95% confidence interval	estimated proportion	95% confidence interval	estimated proportion	95% confidence interval
BE	41.3	38.0-44.6	37.7	35.5-39.8	23.0	21.1-24.8
BG	25.8	23.0-28.6	29.1	26.6-31.6	19.3	17.3-21.3
CZ	38.8	36.3-41.4	40.7	38.7-42.8	25.4	23.6-27.3
DK	52.3	49.7-54.9	57.4	54.6-60.2	47.7	44.9-50.5
DE	51.4	48.8-54	52.5	50.6-54.4	42.2	40.2-44.2
EE	33.0	30.3-35.7	39.0	36.3-41.7	27.0	24.6-29.4
IE	19.4	-	-	-	-	-
EL	13.7	11.9-15.8	11.6	9.5-13.9	4.4	3.4-5.7
ES	40.3	38.1-42.6	36.0	34.5-37.6	26.2	24.8-27.7
FR	57.5	54.8-60.3	54.8	52.8-56.8	37.8	35.9-39.6
IT	38.2	36.1-40.4	38.1	36.6-39.6	27.2	25.7-28.7

CY	46.3	42.5-50.2	43.9	40.9-46.9	32.3	29.1-35.6
LV	33.1	30.4-35.8	33.9	31.3-36.5	23.2	21.1-25.2
LT	24.2	21.9-26.4	36.8	34.3-39.3	24.5	22.3-26.7
LU	75.7	72.5-78.9	72.4	70.1-74.7	56.1	53.1-59.1
HU	44.3	42.3-46.3	42.5	40.9-44.2	27.6	26.0-29.2
MT	40.4	37.6-43.2	41.2	38.8-43.6	23.5	21.0-26.0
NL	64.8	62.6-67.1	63.8	62.4-65.2	48.6	47.3-49.9
AT	49.2	46.1-52.3	49.0	46.8-51.2	38.9	36.6-41.2
PL	28.1	26.3-29.9	24.3	23.2-25.4	12.4	11.5-13.2
PT	52.9	50.0-55.8	44.5	42.4-46.6	24.9	23.2-26.6
RO	8.5	6.6-10.4	6.3	5.3-7.3	2.8	2.1-3.4
SI	38.6	35.2-42.0	40.3	37.6-43.0	26.2	23.9-28.5
SK	32.5	30.8-34.2	42.5	40.7-44.3	25.0	23.3-26.6
FI	54.7	51.2-58.2	59.9	57.2-62.6	41.7	39.3-44.1
SE	67.0	64.0-70.0	72.8	70.0-75.6	60.5	57.6-63.4
UK	23.9	17.4-30.4	24.8	20.2-29.4	24.8	19.7-29.9
NO	65.4	61.3-69.5	61.6	58.8-64.4	46.0	43.0-49.0
CH	65.7	63.1-68.3	65.9	64.1-67.7	58.0	56.0-60.0
RS	18.7	15.2-22.1	16.7	14.4-19.1	7.6	6.2-8.9

Source: AES 2011 Standard National Quality Reports

5.2 Non-sampling errors

Non-response means a failure to obtain a measurement on one or more study variables for one or more sample units. It occurs when the survey fails to get a response to some or all of the questions. Non-response causes both an increase in variance, due to the decrease in the effective sample size and/or due to the use of imputation and may cause bias as the non-respondents and respondents generally differ with respect to the characteristics of interest.

5.2.1 Coverage errors

Coverage errors (or frame errors) are due to divergences between the frame population and the target population. The *frame population* is the set of population units which can be accessed through the frame and the survey data really refer to this population. The *target population* is the population for which inferences are made. Main types of coverage errors are under-coverage (target population units that are not accessible via the frame e.g., persons without a phone will not be listed in a telephone catalogue) and over-coverage (units accessible via the frame which do not belong to the target population e.g., deceased persons still listed in a telephone catalogue). Multiple listings or misclassification are also sorts of frame deficiency.

Under- and over-coverage are rarely reported as problematic in AES 2011. Corresponding comments regarding as well as the shortcomings of the sampling frame¹³ are shown in the table below:

Table 7. Frame shortcomings (e.g. time lag) and comments on coverage errors

Belgium	Households drawn from the Population Register version September 2011 (start of fieldwork: October 2011). No geographical restrictions.
Bulgaria	Although the population frame was updated with the latest results, there still were some shortcomings based on the time lag between Census date and the moment of the interview
Estonia	Time-lag between sample selection and start of survey is 2 months. Frame includes persons who have moved abroad.
Greece	<p>The sampling frame is based on the 2001 census results. The main issues pertaining to the frame quality are:</p> <p>a) The more the time interval elapsed since the census, the less accurately the probabilities of selection reflect the “real size” of the selected primary sampling units.</p> <p>b) Sample size can be different, and even significantly different from the expected size, due to considerable changes in the “size” (that is, the number of household dwellings) of a PSU.</p> <p>c) It is difficult to control the way listings are updated. Over-coverage and under-coverage can be both present.</p> <p>d) The sampling frame includes only private households residing in "normal" dwellings. Population living in collective households (conscripts, persons living in hospitals, hotels, asylums, homes for the elderly, orphanages, etc.) is not covered by the sampling frame.</p>
Spain	Last update of the sampling was 30 of June 2011. The geographical coverage is over the whole country.
France	Two years lag between information on households (number of people, age) in the sampling frame and the moment of the interview.
Italy	Time lag between last update of the sampling frame and the moment of the actual sampling = 18 months; geographical coverage = national; coverage of different subpopulation = NO
Lithuania	The actual sampling frame was derived on 20 November 2011, Last update of the sampling frame – on 20 December 2011. Because of inadequate quality of the sample, if respondent was not accessible, using a rule of the nearest birthday in the household in such cases: an accommodation of the selected respondent was sold and another household was living there, or the selected respondent didn't live at the address at least one year.
Luxembourg	The proportion of some subpopulations is smaller in the sampling frame than in the population: e.g. foreign citizens, low skilled professionals...
Malta	<p>The sampling frame may have some under coverage due to the fact that newly created households since 2005 are not always being included in the updated version. In addition, the inclusion of new immigrants into the population is sometimes not being captured in the population frame. As a result this implies under coverage of this category.</p> <p>Moreover, some of the selected addresses were not traceable since there might have</p>

¹³ Sampling frames used by countries are given in section 3.5 'Sampling designs and sampling frames', p.9.

	been demolitions to selected dwellings, re-numbering of doors and changes in street names.
Austria	Shortcomings could be: delayed registrations or deregistration of the main residence done by persons, who removed; undone deregistration of persons, who settled down abroad.
Poland	The time interval between sampling frame updating and sample selection is the reason that the sample comprises dwellings that are outside survey frame, e.g. liquidated, pulled down, etc. Moreover, we do not have information about the current status of all dwellings, e.g. temporarily inhabited, and converted into non-housing premises. We do not learn about some of such cases until the survey. In addition to this, we do not know the number of households and persons in sampling frame. We know only the number of PSUs and dwellings.
Portugal	Since the AES sample is based on data from 2001 Census, the time lag between the date of Census and the moment of the AES 2011 necessarily implies a certain mismatch, so certain dwelling units might not fulfil the conditions to answer the questionnaire. That is the reason why, when samples are defined, a reinforcement of around 20% is given in the sample dimension.
Sweden	Births and deaths cause very small under- and overcoverage problems. Immigration causes some undercoverage because of the time lag between entry to Sweden and population registration. This undercoverage refers to immigrants with a non-Nordic citizenship. Emigration causes overcoverage because the population register is not always informed about departures.
United Kingdom	The frame of addresses is updated quarterly by the Royal Mail. The extent of undercoverage of the PAF is estimated by our Office for National Statistics at below 2% for the total UK population. Buildings which contain internal flats or businesses but only have one external front door will only have those internal elements recorded in PAF if they are clearly labelled on the outside, at the external front door or letterbox.
Serbia	The frame for the first stage of sampling selection was the list of all enumeration areas (EA) with 20 or more households. About 1.1% of households were excluded using this constraint.

Source: AES 2011 Standard National Quality Reports

5.2.2 Measurement errors

Measurement errors are errors that occur during data collection and cause the recorded values of variables to be different from the true ones. The causes are commonly categorized as:

- *Survey instrument*: the form, questionnaire or measuring device used for data collection may lead to the recording of wrong values.
- *Respondent*: respondents may, consciously or unconsciously, give erroneous information.
- *Interviewer*: interviewers may influence the answers given by respondents.

Measurement errors can be systematic or random and may cause both bias and extra variability of statistical outputs. Their evaluation depends on the type of data at hand. Some concerns about the reliability of the obtained responses exist due to several reasons: the difficulty of respondents in distinguishing between formal and non-formal

education on the one hand, and between non-formal and informal on the other; clear distinction between informal and random or accidental learning; the long reference period (especially in recalling activities (existence and characteristics) which took place long before the interview). The use of proxy interviews is also one of the potential risks. Table 8 shows the percentage of proxy interviews (compared to the total number of interviews) and the existence of pilot tests for the AES 2011 questionnaire before starting the proper data collection itself. Eight countries allowed for proxy interviewing (in Slovenia, proxies were only allowed for paper questionnaire but the share of proxy interviews remains unknown).

Table 8. *Share of proxy interviews and existence of testing for the questionnaire*

	% of proxy interviews	Pilot test questionnaire for AES 2011 (Y\N)	
		<i>partial</i>	<i>full</i>
BE	-		Y
BG	-		Y
CZ	33.0		Y
DK	-		Y
DE	-	N	N
EE	-		Y
IE	-	N	N
EL	40,6	N	N
ES	0,3	N	N
FR	-		Y
IT	19,5		Y
CY	-		Y
LV	-	Y	
LT	-	Y	
LU	-	N	N
HU	48.0	Y	Y*
MT	-		Y
NL	-	N	N
AT	-	Y	
PL	-		Y
PT	-	N	N
RO	16,4		Y
SI	Unknown (only for paper questionnaires)		Y
SK	-		Y

FI	-	Y	
SE	-	N	N
UK	-		Y
NO	-	Y	
CH	2.0		Y
RS	-		Y

*only cognitive test

Source: AES 2011 Standard National Quality Reports

Among the measures taken to minimize wrong answers, the use of a computer-assisted data collection (CAPI) can help making the interview more consistent by warning messages popping-up onto the screen of the interviewer. Moreover, questions are tested in advance and additional explanations and clarifications can also be displayed on the screen. To reduce measurement errors caused by the interviewers, emphasis on specific training for interviewers and supervision is given. These consist of controlling and monitoring of interviewer calls, provision of annual training and full instructions etc. As for measurement errors attributed to the questionnaire, attention is given in continuous checking of its design by improving the questions, incorporating explanatory text, codification and testing.

Seven countries had not conducted any pilot testing of the questionnaire. The majority which had, mostly had done it fully.

5.2.3 Processing errors

Between data collection and the beginning of statistical analysis for the production of statistics, data must undergo a certain processing: data entry, data editing, coding, etc. Errors introduced at these stages are called *processing errors*. Just as measurement errors, they affect individual observations causing bias and variation in the resulting statistics.

For data entry and coding control, countries which used CAPI method usually had a system of checks and warnings directly embedded in the applied program. Most of the countries that used PAPI had collected all the questionnaires first and then data entry was carried out in the Central/Regional Offices. Data checking was done both electronically and manually by hiring experienced and well-trained statisticians. Some of the errors detected in the post data collection are due to mixing up between formal, non-formal and informal education, duration and payment of activities, languages etc.

5.2.4 Non-response errors

Non-response is the failure of a sample survey to collect data for all data items, from all the population units designated for data collection. The difference between the statistics computed from the collected data and those that would be computed if there were no missing values is the *non-response error*. There are two types of non-response:

- *unit non-response* which occurs when no data are collected about a population unit designated for data collection,
- *item non-response* which occurs when data only on some but not all the survey variables are collected about a designated population unit.

One of the key elements for a successful data collection is a low non-response rate (especially the unit non-response). Making sure that all the respondents that are part of the sample do accept to be interviewed and provide the required information is a very important issue for the sake of the quality of the data.

It is common practice to use techniques to get the lowest non-response rate as possible, by example by sending a notice letter well in advance and sending a second one when the interview could not take place when it was planned by the interviewer.

Table 9. Total and reason-specific non-response rates (%)

	Non-response rate	Non-contact	Refusal	Other reasons*
BE	57.6	49.1	4.4	4.1
BG	12.1	6.1	5.2	0.8
CZ	31.2	13.6	16.4	1.2
DK	37.3	25.3	9.4	2.7
DE	50.3	23.8	14.8	11.7
EE	36.6	20.4	14.8	1.4
IE	-	-	-	-
EL	35.9	15.6	17.9	2.5
ES	13.1	5.2	6.9	0.9
FR	22.4	10.3	7.2	5.0
IT	54.6	27.3	19.7	7.6
CY	8.8	3.0	4.1	1.7
LV	44.0	21.0	9.0	14.0
LT	23.0	12.0	10.0	1.0
LU	58.3	-	-	58.3
HU	26.5	11.0	15.1	0.4
MT	7.4	5.7	1.7	-
NL	44.1	18.5	19.0	6.8
AT	56.6	24.6	27.8	4.2
PL	13.3	9.4	3.9	
PT	5.5	-	3.7	1.8
RO	13.0	4.0	3.5	5.6
SI	41.0	13.2	25.1	2.8
SK	33.0	5.0	14.3	13.7

FI	32.0	10.0	18.0	4.0
SE	34.1	12.9	19.7	1.6
UK	43.0	6.0	31.0	6.0
NO	43.6	22.4	17.4	3.5
CH	47.0	35.0	8.0	4.0
RS	17.8	12.4	4.9	0.5

* including rejected interviews, inability to respond and other non-specified reasons

Source: AES 2011 Standard National Quality Reports

Sixteen countries calculated the non-response at individual (respondent) level, ten on household level, while three countries (Poland, Portugal, Serbia) reported both. Table 9 shows the overall non-response rate and its classification by categories.

Luxembourg, Belgium and Austria¹⁴ have the highest overall non-response. On the other hand Portugal, Malta and Cyprus stand out as countries with the lowest one. Specification by reasons shows that non-contacts are more often the case for non-response than others. Some exceptions are Slovenia and the UK, where the refusals are dominant and Luxembourg due to the specific sampling method and survey type (web-based survey).

Item non-response is also at stake for a good quality of the data. The following table show the major items which were subject to high non-response rates (10% or above) by country.

Table 10. Questions or items with item non-response 10 % or above, by countries

Country	Item non-response	
	Item	NR rate
BE	HATFATHER	16
	HATMOTHER	14
	ISCOMOTHER	19
	FEDTHEODUR	10
	FEDNBHOURS	21
	FEDNBWEEKS	73
	FEDDURPERWEEK	71
	NFEMETHOD1	28
	NFENBHOURS1	14
	NFENBWEEKS1	94
	NFEDURPERWEEK1	95
	NFEPIDVAL1	22
	NFEMETHOD2	29
	NFENBHOURS2	15
	NFENBWEEKS2	96
NFEDURPERWEEK2	95	

¹⁴ In the Table 9 overall non response for Austria (56.6 %) includes 18-24 age group as well. If we exclude it and look only 25-64 age group, overall non-response rate would be 56.7 %.

	NFEPAIDVAL2	31
	NFEMETHOD3	36
	NFENBHOURS3	14
	NFENBWEEKS3	96
	NFEDURPERWEEK3	95
	NFEPAIDVAL3	32
	DIFFMAIN	38
BG	FEDPAIDVAL	11
	NFEPAIDVAL1	15
CZ	-	-
DK	JOBTIME	100
DE	HHINCOME	12
	SEEKSOURCE	15
	FEDPAIDVAL	12
	NFEPAIDVAL2	10
EE	HATFATHER	24
	HATMOTHER	14
IE	-	-
EL	ISCOMOTHER	14
	FEDNBHOURS	22
	FEDNBWEEKS	15
	FEDDURPERWEEK	22
	FEDPAIDVAL	55
	FEDUSE	11
	FEDOUTCOME	5
	NFEREASON2	19
	NFEPAIDVAL2	19
	DIFFICULTY	12
	OTHERLANG	100
	HHINCOME	21
ES	HHTYPE	17
	HHINCOME	35
	ICTCOMPUTER	25
	ICTINTERNET	26
FR	HATFATHER	16
	HATMOTHER	11
IT	-	-
CY	-	-
LV	-	-
LT	HATFATHER	13
	ISCOFATHER	17
	ISCOMOTHER	12
	FEDNBHOURS	37
	FEDNBWEEKS	43
	FEDDURPERWEEK	43

	FEDPAIDVAL	31
	NFEPADVAL1	12
LU	HHINCOME	32
	ISCOMOTHER	21
	LOCNACE	18
	DIFFICULTY	17
	HATYEAR	13
	HATMOTHER	12
HU	-	-
MT	FEDDURPERWEEK	14
	FEDPAIDVAL	13
	NFEPADVAL2	13
NL	-	-
AT	HHINCOME	24
PL	FEDPAIDVAL	11
PT	-	-
RO	HHINCOME	87
	LANGUSED	60
	DIFFICULTY_3_4	11
	JOBSTAT	45
SI	HHINCOME	14
SK	-	-
FI	JOBTIME	14
	FEDNBHOURS	15
SE	HATFATHER	31
	HATMOTHER	23
	FEDVOC	13
	NFEPADBY1	69
	NFEPADBY2	68
	NFEPADBY3	62
	NFEPADVAL1	10
	NFEPADVAL2	17
NFEPADVAL3	19	
UK	-	-
NO	HATFATHER	20
	HATFIELD	18
	HATMOTHER	17
	NFEPUR1	16
CH	FEDHOURS	10
	HHINCOME	21
RS	-	-

Source: AES 2011 Standard National Quality Reports

Sensitivity of some variables might have led to a higher item non-response (depending from country to country). The one that stands out the most is the variable *household*

income, which has been highlighted by many countries as difficult to properly collect (sensitivity and complexity issues).

Table 4. Non-response rate on the variable Household Income (HHINCOME)

Country	Non-response (%)
Austria	24,2
Greece	21,5
Luxembourg	31,8
Germany	12
Romania	86,5
Slovenia	14,1
Spain	34,8
Switzerland	21,2

Source: AES 2011 Standard National Quality Reports

6 Timeliness and Punctuality

The *timeliness* of statistical outputs is the time lag between the event or phenomenon they describe and their availability.

Punctuality is the time lag between the release date of data and the target date on which they were scheduled for release as announced in an official release calendar, laid down by Regulations or previously agreed among partners.

Commission Regulation (EU) No 823/2010 states that Member States shall implement the survey between 1 July 2011 and 30 June 2012 (only Finland had a derogation to implement the Finnish AES after this period) and transmit to the Commission (Eurostat) micro-data files within six months after the end of the national data collection period and the quality report within three months after the delivery of the micro-data files. Table 11 shows the fieldwork period for AES 2011 survey for each country and display the dates for delivery of the data to Eurostat.

Table 11. Fieldwork period and transmission of data to Eurostat

	Fieldwork		Transmission of data to Eurostat	
	Start date	End date	1 st version	Last version
BE	Oct 2011	Mar 2012	Dec 2012	May 2013
BG	Nov 2011	Jan 2012	July 2012	July 2012
CZ	July 2011	Dec 2011	June 2012	Aug 2012
DK	Aug 2011	Oct 2011	Feb 2012	May 2012
DE	Mar 2012	June 2012	Dec 2012	Apr 2013
EE	Oct 2011	Jan 2012	Aug 2012	Aug 2012
IE	July 2011	Sep 2011	Feb 2013	Nov 2013

EL	June 2012	Sep 2012	Jan 2013	Jan 2013
ES	Oct 2011	Mar 2012	Aug 2012	Oct 2012
FR	Apr 2012	June 2012	Dec 2012	July 2013
IT	Sep 2012	Dec 2012	Dec 2012	Mar 2013
CY	Apr 2012	May 2012	Sep 2012	Oct 2012
LV	Sep 2011	Dec 2011	May 2012	Aug 2012
LT	Jan 2012	Mar 2012	Sep 2012	Sep 2012
LU	Feb 2012	June 2012	Nov 2012	Nov 2012
HU	Jan 2012	Mar 2012	Sep 2012	Jan 2013
MT	May 2012	July 2012	Feb 2013	Mar 2013.
NL	Jan 2012	Mar 2012	Nov 2012	Dec 2012
AT	Oct 2011	May 2012	Oct 2012	Dec 2012
PL	Jan 2012	Feb 2012	Aug 2012	Aug 2012
PT	Oct 2011	Feb 2012	Oct 2012	Dec 2012
RO	Aug 2011	Aug 2011	Jan 2012	Nov 2012
SI	Sep 2011	Dec 2011	Aug 2012	Sep 2012
SK	Oct 2011	Nov 2011	May 2012	Aug 2012
FI*	Aug 2012	Dec 2012	May 2013	June 2013
SE	Mar 2012	Nov 2012	Jan 2013.	Mar 2013.
UK	Jan 2010	Aug 2010	Feb 2013	Apr 2013
NO	Mar 2012	Jun 2012	Jan 2013	Jan 2013
CH	Mar 2011	Dec 2011	Dec 2012	June 2013
RS	Aug 2011	Dec 2011	July 2012	July 2012

*by derogation

Source: E-DAMIS, the tool for data transmission (as of 25 November 2013).

Half of the participating countries delivered their full data with minor delay. For example, Spain had identified a huge non-response in three regions and decided to repeat the survey in those in order of gaining more reliable data. Extra validation of some variables (Portugal, Czech Republic), extended or delayed data collection period (Sweden, Greece) and limited resources in the context of an overlap with other surveys (Netherlands, Belgium) are some of the further reasons for extended data delivery.

Belgium, Czech Republic, Malta, Germany and Sweden have given some suggestions concerning the ways for improving punctuality. Those are generally oriented to shortening of data collection period, more time for detailed analysis/processing of the data and engagement of more people for various post-survey phases.

7 Accessibility and clarity

Accessibility and clarity refer to the simplicity and ease with which users can access statistics, with the appropriate user information and assistance: a global context which finally enables them to make optimum use of the statistics.

Eurostat published on its website (in the special folder on Adult Education Survey on the Eurostat's database¹⁵) data coming from both 2007 and 2011 AES waves. They include results on participation in education and training, characteristics of education and training activities and obstacles and access to information. The data are supplemented by meta-data in Euro SDMX Metadata Structure (ESMS) format, giving background information on the survey and summarizing methodological aspects.

Countries also published the main results of their national AES on their official website. In several countries, the data can be found in statistical papers and press releases.

Access to microdata usually requires an official request from interested party or it has been regulated by legislation. Scientific institutions and researchers can request such an access provided that they have a specific project proposal to submit to Eurostat.

8 Comparability and coherence

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 – classifications, definitions and target populations as well as harmonised methods. Coherent statistical outputs have the potential to be validly combined and used jointly. In order to achieve coherence between several surveys, there is in particular a need for covering the same population, referring to the same period in time and same localisation (like regions for instance).

Comparability is a special case of coherence when it comes to compare two or more waves of the same survey (comparability over time) or when it comes to compare a given wave across countries or regions (spatial comparability).

The reasons for lack of comparability or coherence can be summarised under two aspects: differences in concepts and differences in methods. To ensure comparability of data similar definitions should be used by countries. Table 12 depicts the deviations from the methodological recommendations for the AES 2011 while implementing at national level.

The highest number of deviations is observed for the survey type, followed by data collection period, use of proxy and sampling.

¹⁵ The database is accessible on the following link:
http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

Table 12. *Deviations from the methodological recommendations for the AES 2011*

Methodological recommendations	Target	Deviations
<i>Deviation from the AES questionnaire</i>		CZ, DE, EE, LV, SE, CH
<i>National data collection period</i>	07/2011-06/2012	EL, IT, IE, MT, FI, SE, UK, CH
<i>Survey vehicle</i>	Standalone survey	BE, IE, UK
<i>Age¹⁶</i>	All individuals aged 25-64	
	Coverage of the optional age group 18-24	AT, BG, FR, EL, IT, CZ, CY, NL, IE, SE, NO, PL, PT, RO, SK, ES
	Coverage of other age groups (younger or older)	EE (20-64), IT (65-75), LT, SI (18-69), NO, PL, PT, RO, CZ (65-69), CH (15-74), UK (16-24/25+)
<i>Statistical unit</i>	Individuals learning activities	
<i>Sampling frame</i>	Population register or census	CZ, LU, HU, SK, UK
<i>Survey method</i>	Simple random, stratified simple random, multistage stratified sampling	LU
<i>Sampling</i>	Two non-formal learning activities are sampled and described in detail for each individual (three activities on an optional basis)	DE*, EL, ES, IT, LV, MT, PT, SI *: Four instead of three non-formal learning activities are sampled in DE
<i>Survey type</i>	Face-to-face interview (CAPI)	BE, BG, DK, EL, EE, IT, LU, HU, NL, PL, FI, SE, NO, CH, SI, RS

¹⁶ The target population for the 2011 AES was adults aged 25-64. It was also possible to collect data on younger (18-24) and older people (65-69 or 74) on an optional basis. Some countries also collected data on younger people aged 15 years old.

<i>Proxy</i>	Not allowed	CZ, EL, IT, HU, CH, RO, ES, SI
<i>Precision</i>	95 % confidence interval	SE, IE
<i>Non-response</i>	Weighting by age and gender	BE, CZ, LV, NL, PL, PT, CH
<i>Data processing</i>	Checking is applied during the interviews or at the data editing process and when the data is delivered to Eurostat	

Source: AES 2011 Standard National Quality Reports

8.1 Comparability over time

Comparability over time is an important aspect for all statistical outputs published in series. The 2011 AES being the first survey run under regulation n°823/2010 it can only partially be compared to the data from the pilot 2007 AES. As mentioned in previous sections, some methodology aspects and questionnaire items have been altered. However it is still possible to compare the results of the two waves for the main indicators on participation in lifelong learning. It does not apply to informal learning though, because it is a module which has undergone heavy changes and nearly all participating countries have mentioned a major break in series as a consequence. Table 13 and Table 14 compare results computed through both waves.

Table 13. Key indicators for 2011 AES and pilot AES (2007)

	Participation in FED (%)		Participation in NFE (%)		Number of formal training activities (%)		Number of non-formal training activities (%)	
	AES 2011	AES 2007	AES 2011	AES 2007	AES 2011	AES 2007	AES 2011	AES 2007
BE	7.4	12.5	33.1	33.5	1.3	1.4	2.4	2.2
BG	2.4	2.7	24.4	35.2	n/a	n/a	n/a	n/a
CZ	3.7	3.9	34.9	35.4	n/a	n/a	1.6	1.6
DK	12.6	10.1	52.7	37.6	1.09	1.07	2.4	2.3
DE	3.8	5.2	48.5	43.1	n/a	n/a	n/a	n/a
EE	6.6	5.0	48.0	40.2	1.1	1.0	2.3	1.6
IE	6.7	-	18.8	-	-	-	-	-
EL	2.6	2.3	9.6	12.7	1.02	1.01	1.2	1.3
ES	7.0	5.9	34.1	27.2	1.1	1.11	1.5	1.6

FR	3.5	5.1	49.1	32.0	0.04	0.06	1.2	0.8
IT	2.9	4.4	34.3	20.2	1.0	1.0	2.0	3.4
CY	3.7	2.9	40.9	39.5	1.9	2.0	1.04	1.02
LV	4.3	5.4	30.0	30.7	1.05	1.01	2.3	1.6
LT	4.0	6.3	25.9	30.9	1.03	1.01	1.7	2.1
LU*	9.9	n/a	68.0	n/a	n/a	n/a	n/a	n/a
HU	6.5	2.5	37.6	6.8	1.1	1.0	2.3	1.2
MT	4.2	5.2	34.1	31.3	1.17	1.0	2.2	1.4
NL	12.3	6.8	54.8	42.1	1.0	1.0	3.0	2.1
AT	5.9	4.2	45.5	39.8	1.2	1.0	2.0	1.9
PL	5.4	5.5	21.0	18.6	1.1	1.1	1.8	1.5
PT	10.4	6.5	39.6	22.5	1.4	1.0	2.0	1.0
RO	1.4	3.3	6.9	4.7	1.01	1.05	1.1	1.1
SI	2.3	8.7	34.7	36.1	1.0	1.0	1.4	1.3
SK	5.8	6.1	38.3	41.2	n/a	n/a	2.0	1.8
FI	12.0	10.2	51.3	51.2	0.13	0.11	1.07	1.13
SE	13.5	12.7	67.0	69.4	1.3	1.2	3.1	3.1
UK	14.8	15.1	24.3	40.3	1.2	1.2	1.6	1.6
NO	7.6	9.9	56.9	50.6	1.0	1.2	2.3	2.7
CH	9.0	4.9	63.1	46.9	1.0	n/a	2.6	1.7
RS*	4.0	n/a	13.6	n/a	n/a	n/a	n/a	n/a

* did not participate in pilot AES

Source: AES 2011 Standard National Quality Reports

Table 14. Relative difference between AES 2011 and pilot AES (2007)

$$DIFF = (\text{pilot AES}/\text{AES 2011}) * 100$$

	Participation in FED (%)	Participation in NFE (%)	Number of formal training activities (%)	Number of non- formal training activities (%)
BE	168.0	101.0	105.0	93.0
BG	120.4	149.9	120.3	156.1
CZ	105.0	101.0	n/a	100.0
DK	80.0	71.0	98.0	96.0
DE	136.0	89.0	n/a	n/a
EE	75.8	83.8	91.0	70.0
IE	-	-	-	-
EL	88.5	132.3	99.0	108.3

ES	85.0	79.7	100.9	105.9
FR	145.7	65.2	150.0*	65.5*
IT	151.7	58.9	100.0	170.0
CY	78.4	96.6	98.1	105.3
LV	125.6	102.3	96.2	69.6
LT	157.5	119.3	98.1	81.0
LU**	n/a	n/a	n/a	n/a
HU	38.4	18.1	90.9	52.2
MT	123.8	91.8	85.5	62.5
NL	55.3	76.8	100.0	70.0
AT	71.2	87.4	85.4	95.0
PL	101.9	88.6	100.0	83.3
PT	63.0	57.0	71.0	50.0
RO	235.7	68.1	104.0	100.0
SI	384.3	104.0	100.0	97.3
SK	105.0	108.0	n/a	90.0
FI	85.0	100.0	85.0	106.0
SE	94.1	103.6	92.3	100.0
UK	102.0	166.0	100.0	100.0
NO	130.0	89.0	120.0	117.0
CH	54.4	74.3	66.5	n/a
RS**	n/a	n/a	n/a	n/a

* Indicator calculated from all people in file (not only participants)

** did not participate in pilot AES

Source: AES 2011 Standard National Quality Reports

8.2 Coherence of 2011 AES items with other surveys

Some main indicators from AES 2011 can be compared with indicators from LFS, but only to a certain extent, due to definitions, methodological divergences and different reference period (four weeks before the interview for LFS instead of 12 months before the interview in the AES). Many countries mentioned this comparison, and concluded that it was difficult to properly compare LFS and AES because of changes in the questionnaire and modifications in the respective data collection processes.

Apart from that, Bulgaria compared the results from national survey with the UOE data collection for participants in formal education and did partial comparison of some variables with ICT survey and EU-SILC. Netherlands and Lithuania compared the number of people employed in enterprises who participated in courses or private lessons with participation of employees in CVTS courses. Hungary compared participation data in formal education with statistical databases on public education and universities.

Annex I: Legal basis

AES 2011 finds its legal basis in the following Regulations:

- *Regulation No 452/2008/EC of the European Parliament and of the Council of 23 April 2008 concerning the production and development of statistics on education and lifelong learning, OJ L 145, 4.6.2008.*

- *Commission Regulation (EU) No 823/2010 of 17 September 2010 implementing Regulation (EC) No 452/2008 of the European Parliament and of the Council concerning the production and development of statistics on education and lifelong learning, as regards statistics on the participation of adults in lifelong learning. (1) OJ L 246, 18.9.2010, p. 33–72.*

- *Commission Decision No 2010/786/EU of 17 December 2010 granting derogations for implementing Regulation (EC) No 452/2008 of the European Parliament and of the Council concerning the production and development of statistics on education and lifelong learning with regard to Belgium, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Hungary, Malta, Poland, Portugal, Finland and the United Kingdom. (1) OJ L 335, 18.12.2010, p. 66-72.*

In addition to these European regulations, a number of participating countries have their own national legislations which often define extra needs or topics to be collected and specific criteria on top of the EU requirements.

Annex II: Description of weighting procedures used to gross up the results in the net sample to the target population and adjustment for unit non-response

	Weighting/grossing up procedures	Unit non-response adjustment via weights
BE	<p>Correction for unit non-response and adjustment to (estimated) population figures are done in one single step by the raking ratio method, which is a well-known calibration method. CALMAR is used for this purpose. The adjustment of the sampling weights is based on the following marginal population distributions of individuals, as estimated from LFS (2011 - 4th quarter - individuals in age class 25-64):</p> <ul style="list-style-type: none"> - distribution by REGION (3 NUTS-1 areas) x AGE (3 groups: 25-34, 35-39, 50-64) x GENDER - distribution by EMPLOYMENT STATUS (3 classes: employed, unemployed, inactive) - distribution by EDUCATION LEVEL (3 ISCED classes: low (ISCED 0/1/2), medium (ISCED3/4), high (ISCED5/6)) - distribution by nationality (2 classes: Belgian and non-Belgian) - distribution by household size (3 classes: 1 person in household, 2-4 persons, more than 6 persons). <p>Nationality and household size are important explanatory variables for non-response.</p> <p>Population totals are based on the calibrated LFS 2011 (4th quarter - individuals aged 25-64). Since LFS itself is calibrated on the Population Register, using a post-stratification method for individuals, where post-strata are determined by REGION, AGE and GENDER, AES is to some extent indirectly calibrated on the Population Register as well.</p>	<p>Calibration by Region, Age, Gender, Employment status, Education level, Nationality and Household size</p>
BG	<p>The current demographic data as of 31 December 2011 for the total population is used for weighting and adjustment of the results (the survey was conducted in November 2011 - January 2012, thus the population at the end of the year was more accurate than the average annual population).</p> <p>The data obtained by the survey is post-</p>	<p>Post-stratification; NUTS2; place of residence (urban/rural areas); sex; age groups (18-24, 25-34, 35-54, 55-64)</p>

stratified by:

- 6 geographical area (NUTS2),
- 2 type of residence (urban/rural areas),
- 2 genders (male/female)
- 4 age groups (18-24, 25-34, 35-54 and 55-64).

The total number of post-strata was 94. All units (individuals) in each post-stratum had the same weight (variable RESPWEIGHT). The weight is calculated by dividing the population in each post-stratum by the number of the interviewed persons in the same post-stratum.

The weight for the activities (variable NFEACTWEIGHT) had been estimated following the Eurostat requirements - respondents' weights were divided by the number of represented non-formal activities.

CZ

The original sample was designed as a self-weighting probability sample. Due to the limited information on non-respondents restricted only to the geographical information obtainable from the sampling frame, the possibilities for modelling using propensity to response models were quite limited. Therefore, united calibration for all the waves was used as the method for correcting non-response. The source for calibration totals was preliminary results of the 2011 Population and Housing Census. The following calibration variables were used: Age groups (18-24, 25-34, 35-44, 45-54, 55+), Gender, NUTS3 population totals, Education levels. The calculations were implemented using the CALMAR software.

Not applied.

DK

CLAN applied (*CLAN is a program developed at Statistics Sweden and designed to compute point- and standard error estimates in sample surveys. All parameters that can be written as arbitrary rational functions of population (domain) totals can be handled. For example simple ratios, ratios between ratios, differences between different domain totals, etc. CLAN computes an estimate of the parameter and its standard error using a Taylor linearization approach.*)

CLAN - Age, Sex, Family type, Ethnicity, Available income, Educational level.

DE

Weighting Procedure in three steps in order to neutralize design effects and to adapt the structure as regards regional and socio-demographic criteria. *The first step - non-response weighting (household level):* due to the sampling design every household has the same chance of being selected. But, as non-response occurs, the structure of the

Third step – non-response weighting: person's level: The last step corrects differences between the demographic structure of the sample and the universe. The following characteristics were used in rim-weighting:

households in the sample can deviate from the structure of private households in the universe. Therefore, in the first step, the structure of the realized sample is compared to the structure of the universe using the 291 strata. The weighting factors developed in this step correct difference between the structure of the sample and the universe; *Second step - design weighting*: in stage 3 of the sample selection process every person eligible in the household has the same chance of selection. This implies that the selection probability of a target person differs according to the size of the household she or he lives in. This result has to be corrected by a mathematical procedure using the inverse of the size of the household as a factor to multiply with the factor of step 1. By this step the household sample is changed to a sample of persons.

- age
- sex
- education
- region (Federal States (Bundesländer))
- employed/self-employed vs. not employed/self-employed
- nationality (German vs. not German).

EE

Grossing-up procedure includes 3 steps:

- 1) Calculation design weights. Design weight depends on the different inclusion probability due to stratification. Design weight is inverse of the inclusion probability.
- 2) Non-response correction. Design weights are corrected according to different response probabilities. Individuals are divided into 7 response homogeneity group according to place of residence (county and urban/rural). Correction factors are calculated for each RHG as the weighted sum of all eligible individuals divided by weighted sum of responded individuals.
- 3) Calibration of non-response corrected weights according to demographic data. Variables for calibration are sex and 5-year age group, place of residence. Software package Bascula is used for calibration.

Sex, 5-years age groups, urban/rural area, county

1. For non-response adjustment the weighting groups of reasonably uniform size of sampled households are formed on the basis of the place of residence of the household (county, city/countryside) according to the non-response rate in the region. Within each group the weight of an individual is inversely proportional to the overall response rate in the corresponding group.
2. Calibration by sex and 5-years age groups and the place of residence (county) using a linear consistent weighting method. It is based on the distribution of the Estonian population by sex, age, urban/rural area and county as of 1st January of the year 2011.

IE

The survey results are weighted to agree with population estimates broken down by age, sex and region and are also calibrated to nationality control totals. The grossing procedure aligns the distribution of persons covered in the survey with independently determined population estimates at the level of sex, five-year age group and region. The AES household survey is part of the QNHS (LFS) quarterly survey. Wave 2,3 and 4 were used in the survey. Grossing factors were calculated as part of the CORE LFS methodology are adjusted to allow the reduced waves used in the AES to gross up to population estimates of household dwellings.

-

EL	<p>Persons in the sample were weighted by the design weights (inverse of the estimated probabilities of selection for each household). Using these weights, estimates for certain combinations of gender and age and NUTS2 areas are computed, and a post-stratification factor is computed to ensure that the estimated - form AES - totals for the particular combinations of gender, age and NUTS2 areas are equal to the estimated "true" values for each combination.</p>	<p>NUTS 2 Areas, Gender, Age;</p> <p>Design weights are adjusted using post stratification correction factors that are computed for each individual so that estimations from AES are consistent with estimated population totals for post - stratification cells that are defined by 13 NUTS 2 areas x 8 age groups x gender.</p>
ES	<p><i>First step:</i> calculation of design weights that are the inverse of the probability of selection. <i>Second step:</i> Non-response correction within strata. <i>Third step:</i> Ratio estimator with auxiliary variable the population at reference time (obtained from demographic forecasts). <i>Fourth step:</i> Calibration: benchmark to sex and group of ages, nationality and population of NUTS3 (within NUTS2).</p>	<p>Not applied.</p>
FR	<p>The weighting procedure used to gross up the results in the net sample to the population was made in two stages :</p> <p>1) Correction of non-response by calculating households response probabilities with a logit model</p> <p>2) Calibration of the individual responses on the Labour Force Survey data</p> <p>1) Correction of non-response by the calculation of response probabilities of households, with a logit model</p> <p>The response probabilities of households were calculated from characteristics of dwelling and main person in household in the 2010 population census survey.</p> <p>Variables used in the logit model come from the 2010 population census survey and concern either dwelling or main person in household.</p> <p>Variables concerning dwelling: administrative region, average income in municipality (3 items), dwelling type (individual house, apartment, other), number of rooms in the dwelling, occupation status of the dwelling.</p> <p>Variables concerning main person in household: couple life, immigrant, employment classification</p> <p>2) Calibration of the individual responses on the Labour Force Survey data</p> <p>We calibrate on the Labour Force Survey</p>	<p>1) Variables used for the correction of households' non response</p> <p>Variables used come from the 2010 population census survey and concern either dwelling or main person in household.</p> <p>Variables concerning dwelling:</p> <p>administrative region,</p> <p>average income in municipality (3 items)</p> <p>dwelling type (individual house, apartment, other)</p> <p>Number of rooms in the dwelling</p> <p>Occupation status of the dwelling</p> <p>Variables concerning main person in household:</p> <p>couple life</p> <p>immigrant</p> <p>employment classification</p> <p>2) Variables used for calibration</p> <p>sex*quinquennial age</p> <p>citizenship (french, european, other)</p> <p>socio-professional group (6 items)</p> <p>highest level of completed education (16 items)</p> <p>administrative region</p>

data the weights after correction of non-response.

First, to get an individual weight from household weight we multiply household weight by the number of persons in household in the AES scope of coverage. Then we calibrate individual weights on the Labour Force Survey data between 4th trimester 2011 and 3rd trimester 2012. Variables used for calibration: sex*quinquennial age, citizenship (french, european, other), socio-professional group (6 items), highest level of completed education (16 items), admin. region, sensitive urban area.

sensitive urban area;

1) We correct non-response by the calculation of response probabilities of households, with a logit model.

The response probabilities of households are calculated from characteristics of dwelling and main person in household in the 2010 population census survey.

2) To get an individual weight from household weight, we multiply household weight after the correction of non-response by the number of persons in household in the AES scope of coverage.

3) We calibrate individual weights on the Labour Force Survey data between 4th trimester 2011 and 3rd trimester 2012.

The calibration estimator is used to obtain AES estimates. Grossing weights are determined as follows:

1. Firstly, design weights are obtained as the inverse of the inclusion probabilities of any household in the sample.

2. Then, correction factors for households' non-response are worked out as the reciprocal of the response ratios (computed for territorial domains and municipality size). Intermediate weights corrected for non-response are then computed multiplying initial weights by these correction factors.

3. Finally, final weights are obtained solving a minimization problem under constraints. The function to be minimised is a distance between final and intermediate weights; the constraints regard the estimates of some auxiliary variables that have to be equal to the totals in the reference population derived by external sources (Population Census, LFS): main constraints are population by NUTS 1, gender and age groups; population by NUTS 1, gender and self-reported employment status; population by NUTS 1, gender and educational degree; Population by NUTS 1, gender and demographic size of the municipality. The sample reproduces the same distribution of the population according to the chosen auxiliary variables.

Population by NUTS 1, gender and age groups; population by NUTS 1, gender and self-reported employment status; population by NUTS 1, gender and educational degree; Population by NUTS 1, gender and demographic size of the municipality

IT

	<p>The design weight of the household W_i is corrected for non-response using P_i, the estimated response probability of the household within each stratum ($i=1$ to 9 strata). Then, the corrected design weight of the household W_i is adjusted for all persons in household (D_{ij}, in stratum i and household j) and finally it is calibrated using age and gender to end up with the Final Weight of the Respondent, R_{it} (in stratum i, respondent t).</p> <p>Steps followed:</p> <ol style="list-style-type: none"> <i>1. Design Weight</i> <p>The Design Weight of the household is the inverse of its inclusion probability.</p> <ol style="list-style-type: none"> <i>2. Correction of the Design Weight W_i for Non-Response</i> <p>The Design Weight of the household W_i was corrected for Non-Response by multiplying it with the inverse of the Response Rate. The Response Rate P_i, was calculated by dividing the eligible sample of households that responded to the survey by the total number of eligible households in the sample.</p> <p>(The Response Rate within each stratum provides an estimate of the response probability for all the households of the stratum.)</p> <ol style="list-style-type: none"> <i>3. Design weight of the respondent, adjusted for all persons in household</i> <p>The design weight of the respondent is calculated by multiplying the corrected Design Weight of the household with the number of persons aged 25-64 within each selected household.</p> <ol style="list-style-type: none"> <i>4. Calibration procedure</i> <p>The Final Respondent Weight was calculated by calibrating the Design Weight of the respondent. This was done in order to improve the accuracy of the estimated respondent weights using external known information. The calibration variables used were the distribution of the population by age group (25-29, 30-34, 35-39,...,60-64) and gender.</p>	<p>The design weight was corrected for non-response. (The inverse of the response rate was multiplied with the design weight).</p>
<p>CY</p>		
<p>LV</p>	<p>Design weights were corrected by nonresponse and for final weights we use calibration by number of population.</p>	<p>By age groups, sex, urbanisation; Adjustment done by using nonresponse reweighting and calibration.</p>

LT

Assumption: non-respondents constitute the simple random sample from the population; therefore number of respondents is used to construct the design weights instead of the sample size. Calibration is used to adjust the design weights to the demographic data. The following calibration groups are used: cross-classification of population by sex, urban/rural living place and 5 age groups e. g. 20 groups and 7 territory groups. SAS macro program CLAN of Statistics Sweden has been used for calculation of the calibrated weights and estimates of the variances of the estimators.

Not applied.

LU

Regarding the weighting procedure, we used the SAS Macro "Calmar" available on the INSEE website.

Not applied.

This macro can correct a sample, by weighting of individuals using auxiliary information available on a number of variables, called calibration variables.

- Step 1: We analysed the distribution of non-respondents by age and sex. Distributions are almost identical to the study sample. Therefore, we concluded that the probability of response depends neither on age nor on sex.

- Step 2: We selected three variables for this study. These variables are "SEX", "HATLEVEL" and the age calculated from variables "BIRTHMONTH", "BIRTHYEAR", "REFMONTH" and "REFYEAR". For population figures, we used tables "demo_pjan" and "demo_pjangroup" (for age and sex) in Eurobase and the table "lfsa_pgaed" (for variable HATLEVEL).

Margins of the sample are initially very different from those of the population. That is why, we decided to adjust the weights (initially equal to 1), multiplying them by N/n (N =Population 25-64 years old in Luxembourg and n = sample).

According to the tables "demo_pjan" and "demo_pjangroup" available on Eurobase, $N = 289657$ and $n = 3310$.

$N/n = 87, 51$.

- Step 3: We launched our macro CALMAR, with our data in input. CALMAR macro allows to calculate the weights with four different methods: M=1: Linear Method, M=2: Raking Ratio Method, M=3: Logit Method, M=4: Truncated Linear Method.

- Step 4: Finally, the last step is to select the right method with the associated results. For

	<p>this, we relied on two criteria: The lowest dispersion and the lowest range.</p> <p>We calculated different descriptive statistics, and based on these, we decided to keep the results of the third method (M=3 Logit Method).</p>	
<p>HU</p>	<p>Design weight is defined by the sample design.</p> <p>At the first step of weighting is the adjustment for non-response. At locality level we multiplied the design weight with a factor (nr of occupied dwellings)/(nr of respondent dwellings).</p> <p>Next we applied integrative, household-level calibration with the following constraints:</p> <ul style="list-style-type: none"> - population counts by region*gender*age group (0-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-74, 75-xx) - population counts by region*degree of urbanization - household numbers by region*size of household (with members 1, 2, 3, 4-xx) 	<p>At the final step we made some light correction for within-household non-response.</p>
<p>MT</p>	<p>Two sets of weights were constructed in order to be used in AES to correct for any biases in the final sample due to sample design and differential response. The first set of weights - RESPWEIGHT; aligns and grosses sample estimates with population distribution in terms of individuals' gender, age and district. The scope of the second set of weight - NFEACTWEIGHT; is to cater for the random selection of the two non-formal activities. Calibration was then used in order to correct the estimates and to match them to demographic data.</p>	<p>By age groups, sex and district of respondent; In order to correct for unit non-response, weights were worked out using post stratification by age group, sex and district of residence of respondent. Calibration was then used in order to correct the estimates so that they matched demographic data.</p>
<p>NL</p>	<p>The final sample weights of the LFS are used as the starting points of the design weights for the AES. The starting weight is the same for each person in the sample as each person has the same inclusion probability.</p> <p>Using a linear weighing method, a correction factor is calculated. This calibration process adjusted the starting weights so that the estimated totals in the gender-age group (2x4), the education level (6), degree of urbanisation (5), origin-gender group (3x2), household type (3) and the work status (5), fitted the corresponding population values.</p> <p>The final AES weight is equal to the starting weight times the correction factor.</p>	<p>Not applied.</p>

<p>AT</p>	<p>Weighting was performed in three steps.</p> <p>First in the 5 strata (=5 age groups <25, <35, <45, <55, <65) the design weight was assigned according to marginal distributions of the Austrian Population forecasts, which serve also as key figures for the Austrian Labour Force Survey.</p> <p>The final step was done by calibrating the basic weights (originating from the two previous steps).</p> <p>This final calibration was done according to 3 dimensions:</p> <ol style="list-style-type: none"> 1. Nuts (9 federal provinces) x Sex x Age (5 age groups) 2. Sex x Educational level (8 levels) 3. Labour force status (9 levels) <p>Technically the calibration was performed with an iterative proportional fitting SAS program</p>	<p>Non response factors – also within the 5 basic strata were used to inflate the design weights (as described in the final step of the weighting procedure).</p>
<p>PL</p>	<p>The applied weighting procedure included the following elements:</p> <ol style="list-style-type: none"> 1. probability of dwelling selection, 2. level of completeness of the interviews in households, 3. level of completeness of individual interviews. <p>The above factors comprised general level of completeness on the level NUTS 2 and were used for preliminary correction of weights.</p> <p>Then, weights were calibrated separately for each voivodship (NUTS 2) with the use of data from current demographic estimates concerning sex, age (18-24 group and nine 5-year age groups), and place of residence (urban or rural areas).</p> <p>Weights for 10 larger voivodships were calibrated according to distribution covering simultaneously three variables, i.e. sex x age groups x urban/rural areas. For 6 smaller voivodships were created three marginal distributions in the following form:</p> <ul style="list-style-type: none"> - sex x age groups, - urban/rural areas x age groups, - urban/rural areas x sex. <p>Calibrated weights were calculated with the use of the specially created program in the SAS system. The applied calibration procedure was analogous to the one applied in the EU-SILC.</p>	<p>Design weights for households were corrected for unit non-response using completeness indicators according to voivodships (NUTS2) and class of locality; these weights were then corrected for individual interview non-response in groups defined as intersections of: urban/rural areas, sex, and age groups. At the end the individual weights were calibrated using demographic data.</p>

PT	<p>The weight is calculated in three steps:</p> <p>1st step: determination of the design weight, which incorporates the survey design information and is given by the inverse probability of selection of each statistical unit;</p> <p>2nd step: application of a correction factor for non-response to the weight calculated in the first step;</p> <p>3rd step: the final weight is derived as the product of the weight obtained in 2 and a factor that calibrates the sample to the results of the 2011 Census (using a posteriori stratification method by NUTS 2, sex and age groups).</p>	Not applied.
RO	<p>The weights are calculated in three steps. The first step assigns the inverse of the selection probabilities to each sampled dwelling unit. The second step adjusts for non-response, categorising the responding dwelling units by the following characteristics: county (NUTS 3 level) and urban/rural residency. The third and final steps consists of calibrating the secondary weights to the best latest available population totals by region / urban-rural residency, gender, 4 age groups and the households totals by region(NUTS 2 level), using the SAS macro Calmar.</p> <p>In the calculation of weighting factors the totals known at population level from current demographic statistics, recalculated on 2002 Census population, available at 1st of January 2011 are used. The current demographic statistics used to calibrate the AES weights include the institutional population, too.</p>	<p>By area of residence and county; Unit non-responses are adjusted in the weighting procedure by:</p> <ul style="list-style-type: none"> • re-weighting with the inverse of the response rate on response homogeneous groups. These groups were built by the combination of the following variables: county and residence area of the household (stratum). • re-weighting by calibration of the weights.
SI	<p>Sampling weights</p> <p>We would select n persons among N persons in the sampling frame and therefore the probability of selection would be n/N, or the sample weight for the selected person would be N/n. Since we had to consider also oversampling of certain strata, the sampling weight for the person belonging to stratum h, $h=1, 2, \dots, 6$, is calculated in the following way:</p> <p>N_h/n_h * correction due to oversampling in stratum h</p> <p>- Weights due to non-response</p> <p>Non-response is different in different statistical regions and is also larger in urban than in rural settlements. Weights due to</p>	Not applied.

non-response were calculated according to strata. The weight due to non-response is inversely proportional to the response rate within the stratum. Correction due to non-response is equal to the product of the sampling weight and the non-response weight.

Adjustments to external data

We applied calibration of weights of the persons with the help of external sources: we want to achieve accurate estimates, which mean that weighted estimates should equal known population values. In Slovenia we have the possibility to use registers and also some aggregates for certain variables in the database are available. Therefore the weights are calibrated to these values. For the calibration of weights we used SAS Macro Calmar. For the calibration, the sampling weight due to unequal probabilities of selection and non-response was used. For the calibration we used:

1. distribution of the population in Slovenia on 1st October 2011 by 12 regions
2. sex and age distribution of the population in Slovenia on 1st October 2011 in predefined classes (age classes: 18-24, 25-29, 30-34, 35-39, 40-44, etc.),
3. education by 3 ISCED levels from the Census 2011
4. employment status from the Census 2011

Thus each respondent in the sample represents a certain number of persons in the population. The sum of final weights is equal to the size of the population of persons aged 18 to 69 years in Slovenia.

SK

The design weighting took into account the (post)stratification for unit non-response.

Not applied.

FI

The sampling frame of four age strata (18-24, 25-34, 35-64, 65-69) was taken into account in the design weights. These design weights were first corrected with the inverse of the response probability within these groups and then calibrated in order to correct the non-response and to improve the accuracy. In groups 25-34 and 35-64 the calibration classes were "education level*age group" (3*4) and "gender*region" (2*18). In groups 18-24 and 65-69 only post stratification "gender*greater region" (2*3) was conducted.

Not applied.

SE	Weights were calculated by a calibration estimator. The estimator used the design weights given by the sampling design as starting weights. To adjust for non-response and improve accuracy the design weights were calibrated against known population totals. The variables used in the calibration were sex, age, level of education, region, country of birth, legal marital status, employment status, income and degree of urbanization.	UNA
UK	Firstly, design weights adjusted for varying selection probabilities (where more than one address is identified at a selected/printed address and where an address contains more than one eligible person). Secondly, non-response weights corrected for any non-response bias. Final weights were calculated by multiplying these two weights together.	Used, but details are not available.
NO	For the purpose of estimation some simplifying assumptions were made with regards to the sampling design. The estimator used is a regression estimator, where auxiliary information has been used to reduce bias from sampling errors and non-response errors (detailed overview in Norwegian Quality Report).	Not applied.
CH	The weighting was made so that our final sampling corresponds to the Swiss population of the same age. This weighting was calibrated on the sex, age, civil state, nationality and cantons. The stratification is based on the cantons.	Not applied.
RS	Adjusting for the households and persons non-response and post-stratification according to the population values from vital statistics, according to the five year groups and gender at the national level.	By number of interviewed households, number of persons collected with questionnaires, aged 25-64, and final post-stratification; Multiplying the initial weight with households and individuals adjustment for nonresponse and post-stratification.

Source: AES 2011 Standard National Quality Reports

Annex III: Countries abbreviations

BE	Belgium
BG	Bulgaria
CZ	Czech Republic
DK	Denmark
DE	Germany
EE	Estonia
IE	Ireland
EL	Greece
ES	Spain
FR	France
HR	Croatia
IT	Italy
CY	Cyprus
LV	Latvia
LT	Lithuania
LU	Luxembourg
HU	Hungary
MT	Malta
NL	Netherlands
AT	Austria
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovakia
FI	Finland
SE	Sweden
UK	United Kingdom
NO	Norway
CH	Switzerland
RS	Serbia