

METHODS

The sampling, estimation and investigation methods used in the Labour Force Surveys have changed over the years, since 1954 when the survey first began. The methods described here are those in operation following changes, which were introduced together with the revised population estimates for 1998, based on the results of the 1995 Census of Population and Housing.

The changes in the survey methods, definitions and questionnaire which were made in 1954-2003 were gathered into a special technical publication - see Central Bureau of Statistics, *Labour Force Survey: Changes in the Methodology, Definitions and Questionnaire 1954-2003, Technical Publication No. 78*. For changes in the survey methods made after the 1995 Census see Central Bureau of Statistics, *Labour Force Surveys 2000*, Special Publication 1176, Introduction, Chapter E, and for those made after the 1983 Census, see Central Bureau of Statistics, *Labour Force Surveys 1985*, Special Publication 801, Appendix B.

Every year, four quarterly surveys are conducted, the interviewing being spread over the entire quarter. On average, in 2008, the estimates of each quarterly survey were calculated from the data of over 25,000 persons in the sample.

1. Population

The survey population includes the entire permanent population aged 15 and over as detailed in Chapter D later.

2. Panels and their mode of investigation

2.1 General

The sample drawn each year is allocated to four groups, known as panels. The panels are introduced into the survey investigation in four consecutive quarters, one panel in each quarter beginning with the last quarter of the calendar year in which the sample is drawn.

Each panel is investigated four times according to the following pattern: the first quarter of the investigation (investigation number 1), the following quarter (investigation number 2), a break of two quarters and two more investigations in the following two quarters (investigations 3 and 4, respectively) that are parallel to those of the first two investigations, a year later.

In the following diagram, the investigation is illustrated for the years 2007 and 2008.

Table B1.- Diagram showing mode of investigation of panels, by quarter and sample year

Year Sampled	First Investigated	Panel Number	Investigation quarter in 2007				Investigation quarter in 2008			
			I	II	III	IV	I	II	III	IV
			Investigation number							
2005	4/05	54	4							
	1/06	51	3	4						
	2/06	52		3	4					
	3/06	53			3	4				
2006	4/06	64	2				3	4		
	1/07	61	1	2			3	4		
	2/07	62		1	2		3	4		
	3/07	63			1	2		3	4	
2007	4/07	74				1	2			3
	1/08	71					1	2		
	2/08	72						1	2	
	3/08	73							1	2
2008	4/08	84								1

2.2 Features of the panel system and its advantages

- Each quarterly sample comprises four panels: a new panel being investigated for the first time and three established panels, two of which were investigated in the previous quarter. The panels in the first, second and third quarters are from two sampling years, and in the fourth quarter from three sampling years.
- Each two consecutive quarters include two common panels and two different panels. Thus, **efficient estimates of the difference between consecutive quarters (compared to exclusive samples of the same size)** can be obtained.
- Every two quarters, a year apart (for example, as illustrated by the shaded areas of the diagram, the second quarter of 2007 and the second quarter of 2008) include two common panels (61 and 62) and two exclusive panels (51 and 52 in 2007, 71 and 72 in 2008). Thus, **efficient estimates of difference between parallel quarters a year apart (compared to exclusive samples of the same size)** can be obtained.
- Each year contains nine different panels from three sampling years, seven of which are investigated twice.
- Each two consecutive years contain five common panels (some of which are investigated more than once during the year) and four different panels. Thus, efficient estimates of difference between consecutive years (compared to exclusive samples of the same size) can be obtained.

3. Sampling

Most of the survey population is covered by current samples generally drawn once a year. A small part of the population whose characteristics do not change over time is covered by permanent samples taken from the 1995 Census.

3.1 Current Samples

3.1.1 Sampling Fraction

The survey is planned so that in each panel a sample of about 2,700 households should be obtained. At the stage of planning the yearly sample, the sampling fraction, expressing the relationship between the planned sample size and the population size of that year, is determined. The sampling fraction is determined according to the actual size of the samples in previous quarters, in relation to the desired size and also by the rate of growth of the population. The sample obtained for 2008 is about 0.5% of the population of households.

3.1.2 The Main Sampling Method

Most of the final sampling units are dwellings, which are sampled in a two-stage method. In the first stage, localities are sampled, with probability proportional to size. In the second stage, dwellings are sampled in the sampled localities, so that the final sampling probability of the dwelling is equivalent to the sampling fraction of that year. The sampled dwellings are placed in sampling “portions” of about 10 dwellings and each portion is allocated to a panel. The sampling method is described in detail in the following section.

3.1.2.1 First stage - sampling of localities

The sample of localities in the survey is taken from a list of localities (the locality sampling frame), and the localities are placed in four main groups, according to their size (determined by the number of persons aged 15 and over).

In the first three groups all localities are included with certainty every year:

- a. The largest localities included in all four new panels of that year’s sample. Each year about 60 localities of this type are sampled.
- b. Smaller localities included in only two (non-adjacent) panels. Thus, each locality is represented in each quarter by two panels from two sampling years. Each year about 25 localities of this type are sampled.
- c. Smaller Arab localities included in only one panel. The panel in which a locality of this group is placed will be each year “even” (panel number ending with 2 or 4) or “odd” (panel number ending in 1 or 3). Thus, the locality will be represented in one panel in each quarter. Each year about 20 localities of this kind are sampled.
- d. Other localities – small urban localities and all rural localities. These localities are divided into homogeneous groups, called sampling strata, similar to the geographical groupings used for determining the weights of the survey (see Table B4 in section 5 for the detailed groupings) and according to other characteristics. The localities are arranged in each stratum according to various characteristics and a systematic random sample is drawn, the

probability of each locality to be sampled being proportional to its size (Thus these localities are known as “probability localities”). The sample in each locality is placed in one or two panels, depending on the stratum. Each year a sample of localities is taken, dependent on the previous year’s sample, to ensure that as many different localities as possible are included in the samples of two adjacent years (which can be investigated in the same quarter more than once). Altogether, each year about 130 “probability” localities are sampled out of about 1,050 localities in the frame.

3.1.2.2 Stage two – sampling within the sampled localities

In every locality that is sampled, a sample of residential dwellings is taken, although sometimes (mostly in non-urban localities) households or other units are sampled. The sampling is done as follows:

- a. **Sampling from municipal tax files** – each year, a sample of dwellings is taken from the municipal tax files in about 155 localities, usually the larger ones. In every file, on each record (property) there are means of identification (number in the locality, address and name of resident), type of property (such as the use for which the property is designated – residential or other). Records of non-residential property are deleted from the file, so that the sampling frame includes only residential dwellings. The dwellings are then arranged geographically and a systematic random sample is taken. By this method, a random sample of dwellings spread over the locality is obtained.
- b. **Sampling from lists of households** – for **most of the villages, moshavim and some of the urban localities**, the Bureau does not have a tax file. A systematic random sample is taken near to the time of investigation from a list of households or dwellings obtained from the secretariats of the localities.
- c. **Sampling from lists of persons** – it is usually difficult to obtain a list of households in **kibbutzim**. Therefore for those kibbutzim sampled in the survey, a list of persons aged 15 and over residing permanently in the kibbutz is obtained close to the time of the first interview. A systematic random sample of persons is chosen from this list. A sampled person who is a head of household (in accordance with definitions laid down in advance) is interviewed together with the other members of the family. A person who is sampled but is not a head of household is not included in the sample (unless one of the other sampled persons is the head of their household). For the third investigation a new sample is taken by the same method but independent of the first sample. This replaces the original sample and is interviewed on the third and fourth investigation of the panel. Until the third quarter of 1998 a separate sample was taken in the kibbutzim for each of the four interviews.

3.1.3 Special Samples

A small part of the current sample is not drawn by the main sampling method described above, but instead by other methods, depending on the sampling frame and various other constraints.

- a. **East Jerusalem** – the addresses on the municipal tax-file in East Jerusalem are hard to locate and so a two-stage sample is taken from an alternative frame in the following way:
 - A sample of 12 enumeration areas from the 1995 Census is taken from a frame based on the Census (their sampling probability proportional to size). The size of each area is based on the number of households in the Census, multiplied by a correction factor, which is derived from a count on the ground of households in this district or others sampled from this frame in the past. Each area that is sampled is mapped and the households are counted prior to the time of the interview.
 - Each sampled area is divided into geographical sections of about 13 households, and one of the sections is sampled randomly. The sample comprises all persons aged 15 and over in all the households in the sampled section.
- b. **Samples in student hostels and immigrant absorption centres** – neither persons nor households in student hostels and immigration absorption centres are covered by the locality sampling frames. In order to include these populations in the current Labour Force Surveys, special sampling frames of dwelling units in student hostels (in the seven large universities) and immigrant absorption centres are compiled. A one-stage sample of dwelling units is taken from these frames once a year and is allocated evenly to the four new panels of that year.
- c. **New buildings** – the investigation of the main sample of the Labour Force Surveys in urban localities may extend up to two and a half years from the time the sample was taken. Since the original sample of dwellings does not represent the population that moved into dwellings of which the construction was completed after the sampling, these dwellings have to be represented by a supplementary sample. Thus, **each quarter**, an additional sample is taken from special sampling frames of new dwellings in the urban localities for each panel whose investigation has not yet finished. In rural localities, no supplementary sample is taken since the first interview is held close to the time of taking the sample and the fourth interview is completed after about a year and a quarter after the sample was taken (in kibbutzim, about a quarter of a year).

3.1.4 Changeover or Multiple Households in the Sample Unit

It should be mentioned that because the sample unit is a dwelling, the household residing there at the time of the interview is investigated. Thus, in the case of a changeover of residents, the new household is interviewed. (The same principle applies when the sampling is from a list of households – the interviewer returns to the same address). In the case of more than one household in the sampled dwelling, all the households are interviewed.

3.2 Allocation of the current sample over time

Since one of the main goals of the Labour Force Survey is to measure changes in the characteristics of the labour force over time, a number of steps are taken to minimise the variation in the sample with respect to time.

Each year, the interviewers' portions (quotas) of the current sample are allocated to the four panels, so that balanced samples should be obtained with respect to the following:

- The number of portions in each panel.
- The number of portions according to locality groups (for example, kibbutzim, moshavim, Arab localities).
- The number of portions in localities where there are four portions a year or more.

Further, the week of interviewing is designated within the quarter for each portion, so that the sample should be evenly distributed over the weeks of the quarter.

3.3 Size of the current sample

In each quarter, about 10,000 households participate in the survey, so that over the year about 40,000 interviews of households are conducted. It should be mentioned that in a given year, the large majority of households are interviewed twice. In 2008 about 22,500 different households were interviewed, of which about 17,500 households were interviewed in two different quarters and about 5,000 were interviewed in one quarter.

In those households that participated in the survey in 2008, an average of about 21,500 persons were interviewed each quarter in the current sample. In addition, about 3,900 persons were included in the permanent sample, as detailed in the following section, so that the overall sample size in each quarter was over 25,000 persons.

In the table following, the breakdown of the sample for urban and rural localities and for the four main locality groups (defined in paragraph 3.1.2.1) for an average quarter is shown.

**Table B2.- Breakdown of sample of persons by main locality sampling groups –
for urban and rural separately**
Average per quarter in 2008

	Absolute numbers	% of sample in each of the main locality groups				
		Total	Localities with 4 panels a year	Localities with 2 panels a year	Localities with 1 panel a year	Probability localities
Total	21,500	100	77	4	4	15
Urban	19,900	100	83	5	4	8
Rural	1,600	100	--	--	--	100

3.4 “Permanent” Samples from the 1995 Census of Population and Housing

Because of the difficulty of interviewing certain sections of the survey population on a regular basis, “permanent” samples were taken from a sampling frame comprising records from the 1995 Census. These samples participate in the survey estimates, by means of data collected in the Census, and do not change in-between censuses.

The “**permanent**” samples are:

3.4.1 Institutions not investigated currently in the survey

Other institutions, besides those mentioned in paragraph. 3.1.3, such as dormitories of educational establishments, homes for the elderly, etc., are not covered by the current samples of the survey. Sampling frames are compiled from the 1995 Census and samples are drawn separately for residents and for households in institutions from sampling strata with a probability of 1:50 or, with a probability ensuring at least two units in each stratum.

The sampling strata are defined as follows:

- *Residents of institutions* – by type of institution, geographical grouping (see Table B4 in Section 5 below), sex * age group. Altogether, 2,706 residents of institutions aged 15 and over were sampled.
- *Households in institutions* – by type of institution, (sheltered housing not covered in the current sampling frame and others), geographical grouping, composition of persons in the household by sex * age group. Altogether, 288 households, comprising 380 persons aged 15 and over were sampled.

In all, 3,086 persons were included in the permanent sample of institutions.

3.4.2 Bedouin tribes in the South

A sampling frame of households of the Bedouin tribes in the South was prepared, based on the 1995 Census. The sample was taken from sampling strata defined in accordance with the composition of the households according to sex * age groups, with a probability of either 1:50 or sufficient, to ensure at least two units from each sampling stratum. Altogether, 313 households of Bedouin tribes were sampled, comprising 769 persons aged 15 and over.

3.4.3 Those living outside localities

The sample was taken from a frame of dwellings of those living outside localities, from the 1995 Census. A systematic sample was taken with a probability of 1:200 after arranging the frame by geographic grouping and locality code. A total of 14 households with 31 persons aged 15 and over were sampled.

4. The interview and questionnaire

The interviewing is conducted by about 60 trained interviewers of the Central Bureau of Statistics, under the guidance and direction of survey coordinators. The interviewers visit every dwelling in the sample. In 2008, about 87.2% of the households that were intended to be investigated (the **net** sample), were in fact interviewed. The calculated percentage of interviewees excluded cases that were not intended to be investigated, such as unoccupied dwellings, non-residential dwellings and persons not belonging to the survey population. These cases are considered “zero” cases (6.2% of the **gross** sample in 2008), (see Table B3).

In residential dwellings, the interviewers interview one of the household members from whom they receive information about all members of the household (in a dwelling where there is more than one household, each household is investigated). For households where nobody is at home on the first visit, the interviewer usually makes two subsequent visits. If still no one is at home, questionnaires are left to be filled-out and returned by post. Each time that no household member is interviewed, the interviewer indicates the reason in a “non-investigation” questionnaire.

Non-investigation may be due to absence of household members, refusal to answer, or other reasons such as difficulty of communication or inability to locate the dwelling. Households that do not fill-in the questionnaire are considered “non-response” cases (12.8% of the **net** sample in 2008).

Table B3.- Size of the Sample (Dwellings/Households) (excluding permanent samples)

Average per quarter in 2008

	Gross Sample			Net Sample				
	Total	"Zero" cases	Eligible cases	Total	Interviewed	Not interviewed ("Non-Respondent" cases)		
						Total	Thereof:	
						Absent	Refused	
Absolute numbers	11,036	697	10,460	10,460	9,119	1,335	335	337
Percent	100.0	6.3	93.7	100.0	87.2	12.8	3.2	3.2

In urban localities interviews in the second and third stages are in general conducted by telephone; in 2008, 53.6% of the interviews were by telephone (about 92% of the interviews in the second and third investigations).

In 1999, the changeover to computer based data collection in the survey began. The interview of panels in their second and third investigation is conducted by telephone using CATI (Computer Assisted Telephone Interviewing). This is done from the Data Collection Centre in the Central Bureau of Statistics' Jerusalem Office. The interviewer sits in front of a PC with the survey questions on the screen and keys the answers into the computer (see Central Bureau of Statistics, *Labour Force Surveys 2000*, Special Publication 1176, Introduction, Chapter E).

In 2008, the transition to data collection through face-to-face interviews (CAPI – Computer Assisted Personal Interviewing) was completed. In Panels A and D, data collection was performed in face-to-face interviews using the CAPI method.

In 1954-1956, the survey fieldwork was conducted during one week each year, in 1957 during two weeks and in 1958 and 1959 one week during each quarter. As of January 1960, it is carried out continuously each and every week for the entire three months of the survey. During each week, about 1/13 of the households included in the survey are interviewed. **The “determinant week” in this period always refers to the “previous week”, namely the week ending on the Saturday prior to the visit of the interviewer.** The data obtained for any period (quarter-year, year, etc.) are intended to reflect the situation of an “average” week in this period.

For each household one questionnaire is completed containing information pertaining to the entire household and to each member aged 15 and over.

In 1995, the survey questionnaire was changed. For a detailed explanation, see Central Bureau of Statistics, *Labour Force Surveys 1998*, Special Publication 1104, Introduction, Chapter E.

In 2000, questions regarding “highest diploma received”, “discouraged workers”, and “recipients of wages from employment agencies” were added to the survey questionnaire. For a detailed explanation see chapter E of the Introduction.

The questionnaire for an individual includes questions on: work in the determinant week, number of work hours usually worked and hours actually worked **in the determinant week**, number of work hours less than usual in the determinant week, number of overtime hours, reasons for part-time work, reasons for absence from work (during the entire determinant week or part of it), place of work, geographical mobility of all employed persons, industry and occupation, and status at work. In addition, information is obtained on search for work, mode and length of time of search, search for full-time or part-time work, reasons for unemployment, whether the individual ever worked in Israel and when, and the activities of unemployed persons prior to seeking work. For employed persons, the amount of time worked during the year and reasons for working only part of the year are also investigated. Those persons not in the civilian labour force but who had worked during the year preceding the interview, are asked about their last work. Those not in the civilian labour force and who did not work during the year preceding their interview, are asked why they did not work.

Apart from details about work, demographic information is also collected: age, sex, marital status, country of birth, length of time in Israel, level of education (number of years of schooling and type of last school attended).

The household questionnaire includes information on the number of persons in the household, the number of rooms in the dwelling, the number of children in the household and the number of hours of work of any paid domestic help.

Besides the regular questions about work, and household and demographic characteristics, from time to time information is gathered on other subjects, such as: housing conditions, domestic appliances in the possession of the household and various other subjects. The inclusion of these topics in the survey is intended to provide information on the relationship between work patterns of the household and other areas of behaviour. Also included occasionally in the survey are questions related to specific aspects of work, such as seniority at work, labour mobility, and so on, designed to supply further information on both household and individual behaviour in the labour sphere.

Drawing the sample and interviewing in kibbutzim

Until 1995, the interviewer visited the kibbutz, drew a sample and obtained details on the sampled persons, from the kibbutz secretariat. Starting in 1995, the interviewer draws a sample from the lists of the kibbutz secretariat, that he obtains by fax or telephone. The interviewer personally interviews the sampled persons, by telephone.

5. The Estimation Method

The data collected in the survey undergo keying, coding and checking. Because the data relate only to the sample, they have to be transformed so that estimates for the entire population can be derived. This is achieved by means of multiplying each of the survey datum by a factor known as a “weight”. Using the weights, estimates are calculated from each quarterly sample. The annual estimates presented in this publication are averages of the four quarterly estimates. In the following sections, the estimation method, by which the weights are derived, will be described.

The estimation method is intended to reduce both sampling errors and bias likely to occur as a result of the differences between responding and non-responding households.

As of 1998, a new estimation method was used in the survey, ensuring synchronization between the characteristics of persons and of households to which they belong, reducing bias in the estimates of household by size. By this method, in each household interviewed, every person has an identical weight. The weight corresponds to both **the number of households** and **the number of persons** represented by the given household.

By contrast, in the estimation method in use until 1998, persons’ weights were determined by the ratio of the number of persons in the population to the number of persons interviewed – in each weighting group - without any consideration of the households.

The set of weights is determined by an iterative process, that preserves the compatibility of weighted distributions of persons with the current demographic estimates of the Central Bureau of Statistics, based on the 1995 Census, according to weighting groups.

The division into weighting groups is by geographic groupings and also by population characteristics (sex*age), independent of religion, as seen in Table B4 following. These groups are more detailed than those used until 1998.

In 2002 a number of changes were made in the definitions of the weighting groups. The changes and the main reasons for introducing them are detailed below:

- One of the characteristics for determining the relevant weighting group is the year of immigration. In the past, a distinction was made between "new" immigrants (up to 2 years in Israel) and other immigrants from 1990 and after. In the new method, immigrants up to 4 years in the country are in a separate weighting group, while the rest of the immigrants are allocated to the relevant geographical grouping determined by their locality of residence. The change stemmed largely from the fact that immigrants 4 years and more in Israel have employment characteristics similar to those of the "veteran" population and different from those of immigrants less than 4 years in Israel.
- The city of Ashdod was taken out of the "Jerusalem and Southern District – other localities" group and now appears as a separate geographical group. The reasons for the change are the sharp rise in the number of residents in the city, and a further addition to its

population resulting from the change in definition of immigrants (those 4 years or more in Israel being allocated to their city of residence instead of to a separate weighting group of immigrants).

The following three changes were designed to avoid technical problems encountered in implementing the old system:

- Kibbutzim were no longer grouped by geographical area now - all Kibbutzim throughout the country appear as one group.
- Similarly, Moshavim were no longer grouped by geographical area now - all Moshavim throughout the country appear as one group.
- Age groups in Bene Beraq were combined.

Table B4 presents the new weighting groups. For a comparison of weighting groups according to the old weighting method and the new one, see Table B5 in this section in the *Labour Force Surveys 2002*, Special Publication 1218.

The process of determining weights is conducted in the following stages:

a. Determining a preliminary weight for each person in the sample

A preliminary weight is obtained for each person responding in the survey, according to the geographic group to which they belong. This is derived by dividing the current demographic estimate (excluding residents of institutions in the 1995 Census) in each geographical grouping by the sample size in the same group. All persons in a given group receive the same weight.

For the **permanent sample**, the preliminary weight is determined as follows:

➤ **The sample in institutions**

Preliminary weights are derived separately for residents and for persons in households. By inverting the sampling probability, a set of preliminary weights is obtained, ensuring compatibility of the weighted sample and the data as obtained in the 1995 Census according to the following groupings:

1. Type of institution * sex * age group.
2. Weighting group, namely, geographic grouping * sex * age group (see Table B4 following).

For persons in households in institutions, a special adjustment is made to ensure that all persons in the same household are given the same preliminary weight.

➤ **The remaining “permanent” sample**

For those living outside localities (Bedouin tribes and others), the preliminary weight is determined as the inverse of the sampling probability by which the permanent sample was drawn.

b. Preliminary correction factors for the current sample

Every quarter, correction factors are calculated for each geographical grouping separately for those dwellings sampled from the frame of new buildings. This is done to compensate for the lag in updating the sample of new dwellings.

Occasionally, correction factors are required for various groups in the population when specific problems arise in the interviewing, such as difficulties in conducting the survey in certain areas.

At this stage, the preliminary weight for persons in these households is obtained by multiplying the weight derived in the previous stage by the correction factor.

c. Determining the final weights for persons in institutions in the permanent sample

These weights are calculated for all weighting groups separately. For each group a correction factor is calculated, the ratio of the current demographic estimate for the present quarter to the parallel estimate obtained in the 1995 Census. The use of a correction factor is based on the assumption that the growth of the institutional population is similar to that of the general population for each of the weighting groups, in the absence of up-to-date information of the population in institutions.

The final weight for a resident in a given weighting group is obtained by multiplying the preliminary weight by the correction factor for that group.

d. Calculation of current demographic estimates excluding residents of institutions

Using the final weights of residents of institutions, the total population of institutions of each weighting group can be calculated. This number is deducted from the current demographic estimate of the quarter for the relevant group. Thus, the current demographic estimate excluding the residents of institutions can be derived.

e. Determining the final weight for persons in households

For all persons in the sample households, including those in the permanent sample, an iterative converging process is used to obtain final weights. In determining the final weights, the following constraints have to be satisfied:

- The final weights are as close as possible to the preliminary weights.
- The total of persons in the weighted sample for each weighting group, derived from the final weights, is equal to the current demographic estimate for the quarter, without residents of institutions.

It should be noted that in each of the geographical groupings children aged 0-14 constitute a separate weighting group and for them also compatibility with demographic estimate is ensured.

- All persons belonging to a given household are given the same final weight, namely a uniform household weight.