A. GENERAL

The data on income presented in this publication are part of the Household Expenditure Survey, and include data on the current expenditures and income of individuals and households in Israel. The main questions on income in the survey relate to income of persons aged 15 and over from employee work and self-employment and income from other sources at the individual level.

The publication includes data on money income only before tax is deducted (i.e., gross income).

From 1997 to 2011, the Central Bureau of Statistics (CBS) examined household income in two separate surveys. The first was the Household Expenditure Survey (the survey sample included an average of about 6,000 households, annually). The second one was the Income Survey, which was conducted in combination with the quarterly ongoing Labour Force Survey, in which a fourth of the households were asked about their income (the survey sample was an average of about 8,500 households, annually). Data from the two surveys were combined into one system and presented as integrated results. The Integrated Income Survey sample included an average of 14,500 households, annually.

As of 2012, due to the change in the frequency with which the Labour Force Survey was conducted, from quarterly to monthly, the Income Survey was removed from the Labour Force Survey, and instead the Household Expenditure Survey sample was expanded by 3,000 households. In 2020, the sample included 13,604 households.

As of 2012, in addition to the expansion of the survey's sample, changes were made in the survey population, questionnaires, and estimates, as follows:

1. The sample population of the survey was expanded, and now includes collective moshavim and renewed kibbutzim that have engaged in a process of privatization (as opposed to collective kibbutzim). As of 2016, it includes the Bedouin population in permanent localities once again (from 2012 to 2015 this population was not surveyed due to difficulties in carrying out interviews). As a result, the population coverage increased from about 95% to about 97%.

2. Definition of soldiers in compulsory military service as employees. Until 2012, the income of soldiers in compulsory military service was included in "other income from work". However, in accordance with the International Labour Organization's (ILO) Conventions and Recommendations, the CBS decided, similar to the policy in most of the developed countries, to measure the entire

labour force instead of only the civilian labour force. This was done by adding soldiers in compulsory military service to the labour force in Israel. Following this decision, as of 2012, the income per employee and income from employed work also include the income of soldiers in compulsory military service.

3. Augmenting the sample among the Arab population of northern localities. The sample was augmented to provide more reliable estimates of the Arab population.

4. Changing the estimation method. The estimation method is intended to reduce sampling errors as well as biases that can occur due to differences between the characteristics of the households that did not respond to the questionnaire and those that responded. As of 2012, estimation of the population in the Household Expenditure Survey was adjusted to the new structure of the monthly Labour Force Survey. **Therefore, in 2012, there was a break in the series, as compared with the data published in previous years.**

Changes in the Household Expenditure Survey 2019

In 2019, the Household Expenditure Survey became a computer-assisted field survey. As a result, all processes of the survey were changed and there were many changes in the methods of data imputation. The following are the changes in the data collection methods and the survey methodology:

1. **A change in the method of data collection:** Until 2018, the Household Expenditure Survey was conducted as a paper survey. As of 2019, the survey has become computerized.
2. **A change in the method of population estimation:** In 2019, due to a decline in survey response rates, the estimation method was changed. The change in the method of calculating the weights was intended to reduce both the sampling errors and the biases that might have resulted from the fact that households that did not respond to the survey might differ in their characteristics from those who responded. The change made in the estimation method mainly affects the income of households and individuals. Therefore, **in 2019, there was a break in the series, compared to the data published in the previous years.** In order to test the stability of the method over time, and to create a basis for comparing estimates between years, weights were calculated using this method retroactively for the 2018 sample as well.

3. **The population sampled in the survey has been expanded and also includes boarding school students.** Until 2019, boarding school students were not included in the households where their parents lived. On the recommendation of international organizations, and for the purpose of uniformity between the surveys, starting in 2019, boarding school students have been included in the survey population.
4. **A change in the definition of head of household in cases where a caregiver lives in the household:** The head of a household is defined as the member of the household who normally works the greatest number of hours per week. Therefore, until 2019, in households in which a caregiver resided, he/she was considered the head of the household. As of 2019, in these households the caregiver is no longer considered the economic head of the household.

The Household Expenditure Survey 2020 in Light of the Coronavirus Crisis

The year 2020 was particularly challenging due to the Coronavirus (COVID-19) crisis, during which the country experienced closures and restrictions that made it very difficult for the CBS interviewers to carry out their survey of Israeli households. As a result of the crisis and the ongoing shortage of interviewers, the survey suffered from an exceptionally high incidence of non-response and the overall response rate was only 44.4%. Due to the closures and the economic crisis, there was a change in individual income.

New income items for 2020:

1. A Grant for Each Citizen was added to income from the National Insurance Institute allowances – these are the grants from the National Insurance Institute given to all citizens in April and August, due to the COVID-19 crisis.

2. Income From a Grant / Compensation From the Tax Authority to Self-Employed Persons was added to income from other institutions.

B. MAIN FINDINGS

The findings are based on a sample of 5,593 households and 13,117 individuals aged 15 and over in 249 urban and rural localities. The sample represents 2,765,561 households in the population, and approximately 6,430,007 individuals aged 15 and over. Of those individuals, approximately 3,162,400 were employees, approximately 420,800 were self-employed, and approximately 2,846,700 were not working.

Income of Individuals Aged 15 and Over, by Income Sources and Work Status (Summary Table)

Analysis of the sources of income of individuals aged 15 and over revealed that income from work constituted 75.4% of the total income of individuals aged 15 and over, whereas 24.6% of this income was not from work (income from the National Insurance Institute, from pension and provident funds, subsidies from government institutions, and support from other individuals in Israel and abroad).

Distribution of Income Not from Work: Of the total amount of income, 14.5% was from the National Insurance Institute; 6.7% from pension and provident funds, 2.3% from subsidies provided by governmental institutions; and 1.1% from subsidies provided by other individuals in Israel and abroad.

Income of employees: 92.0% of employees' income was from work and 8.0% from other sources.

Income of self-employed persons: 87.7% of self-employed persons' income derived from work and 12.3% was from other income sources.

Income of persons who are not working: 1.1% of their income derived from other work (temporary or informal work) and 98.9% from sources other than work. The main sources of income for individuals aged 15 and over who are not working were the National Insurance Institute (56.7%) and pension and provident funds (31.3%).

Individuals who are not working comprised 44.3% of the entire population, and were divided into two main age groups. The first comprised individuals of working age, aged 15–66, who do not work regularly, and the second comprised individuals not of working age, aged 67 and over. The average monthly income of the latter was NIS 5,965, 2.9 times higher than the income of younger persons who are not working, which was NIS 2,047. 44.9% of the income of persons aged 67 and over was from pension and provident funds, and 47.4% from the National Insurance Institute, as compared with 14.9% and 67.8%, respectively, in the younger group of the persons who are not working.

See Table A: Tables From the Introduction.

Income of Employees

The average gross monthly income of employees from work as an employee in 2020 was NIS 10,412, and the median income – the amount below which half of the employees earn and above which the other half earn – was NIS 7,750.

The number of work hours per week was 40.5, and the average income per work hour was NIS 65.0.

Average Gross Income per Employee, by Occupation, Extent of Job Position, and Sex (Table 2)

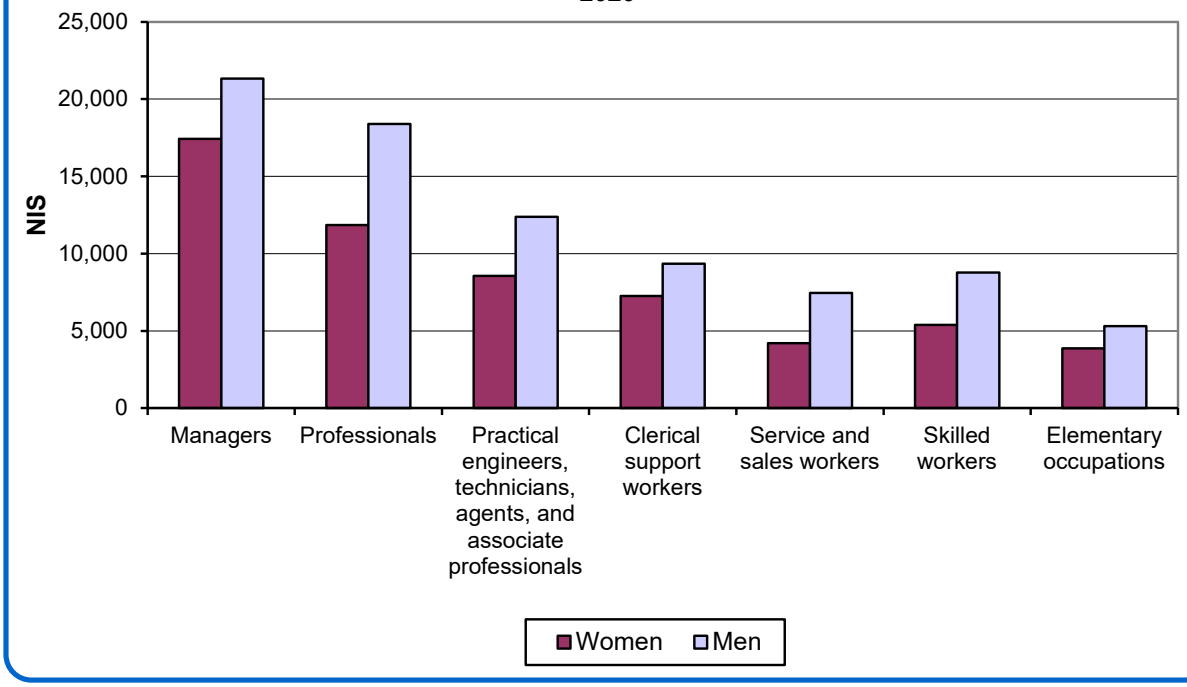
In ranking the major groups of occupations by amount of gross income, it was found that the highest income was of Managers – NIS 20,161 per month. This income was 1.9 times higher than the average monthly income of all employees (NIS 10,412). The lowest income was in Elementary Occupations – NIS 4,659 per month. This income was 2.2 times lower than the average monthly income of all employees (NIS 10,412).

The average monthly income among men is higher than that of women in all occupations.

Among Professionals there was a wide gender gap – 35.6% (NIS 18,398 per month among men versus NIS 11,853 among women), and the percentage of male professional employees was lower than the corresponding percentage among female employees (45.5% versus 54.5%, respectively).

See Table D/2: Tables From the Introduction.

DIAGRAM 1. GROSS MONTHLY INCOME PER EMPLOYEE, BY OCCUPATION AND SEX 2020



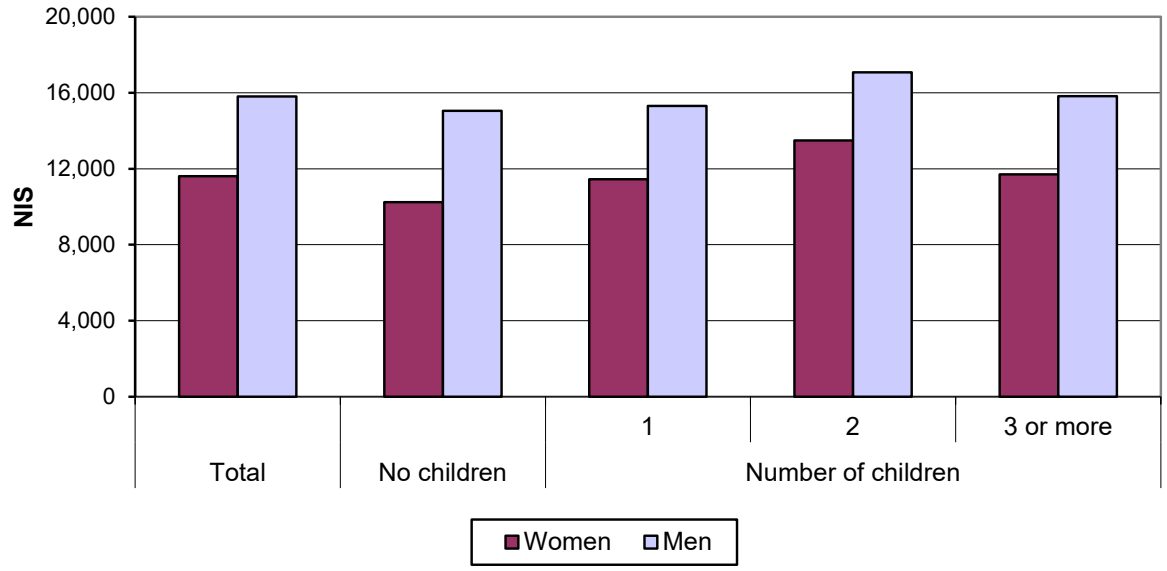
Average Gross Income per Married Employee, by Number of Children in Household, Extent of Job Position, and Sex (Table 3)

Married persons constituted 64.0% of all employees in the population. Their average gross monthly income was NIS 12,079 – 16.0% higher than the average income of all employees in the population (NIS 10,412).

A breakdown by number of children reveals that married employees with 2 children had the highest monthly income (NIS 13,873) and married employees with no children had the lowest monthly income (NIS 10,745).

Among married employees who were employed full-time, the highest incomes were those of both men and women with 2 children (NIS 17,085 and 13,498 per month, respectively).

DIAGRAM 2. GROSS MONTHLY INCOME PER MARRIED EMPLOYEE ENGAGED IN A FULL-TIME JOB, BY NUMBER OF CHILDREN IN HOUSEHOLD AND SEX 2020

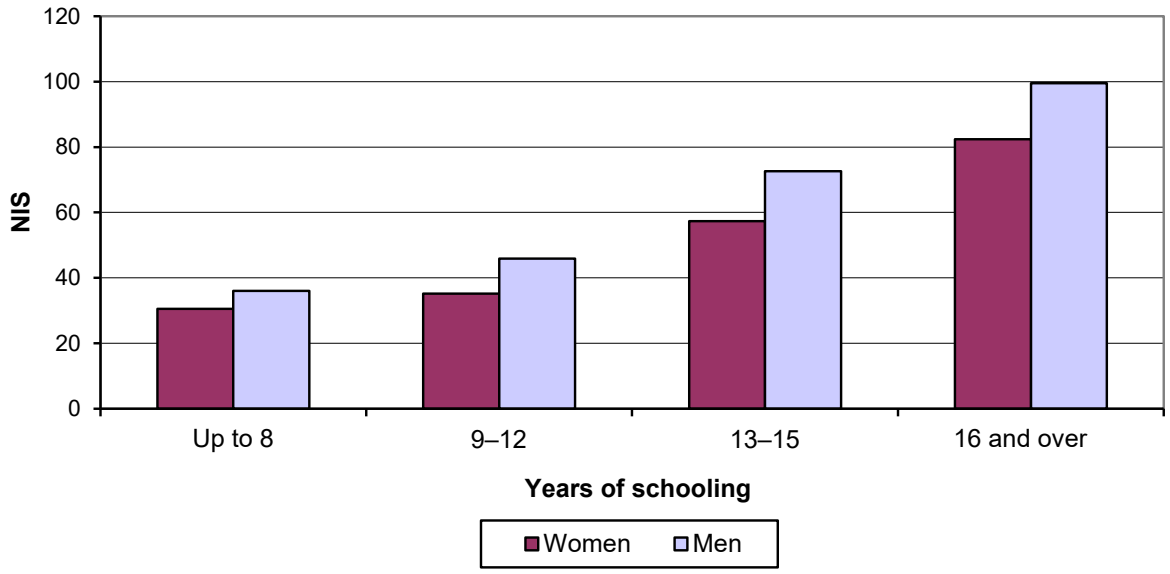


Average Gross Income per Employee, by Occupation, Number of Years of Schooling, and Sex (Table 5)

The average gross hourly income of an employee with 16 years or more of schooling (NIS 91.4) was 1.4 times higher than that of employees in general (NIS 65.0) and 2.7 times higher than that of employees with less than 9 years of schooling (NIS 34.3).

The average hourly income among men was higher than that of women at all levels of education. The widest gap, 23.3%, was found among employees with 9–12 years of schooling (NIS 45.9 per hour for men, versus NIS 35.2 for women). The narrowest gap, 15.3%, was found among employees with 0–8 years of schooling (NIS 36.0 per hour for men, versus NIS 30.5 for women).

DIAGRAM 3. GROSS INCOME PER EMPLOYEE PER WORK HOUR, BY NUMBER OF YEARS OF SCHOOLING AND SEX 2020



See Table G: Tables From the Introduction.

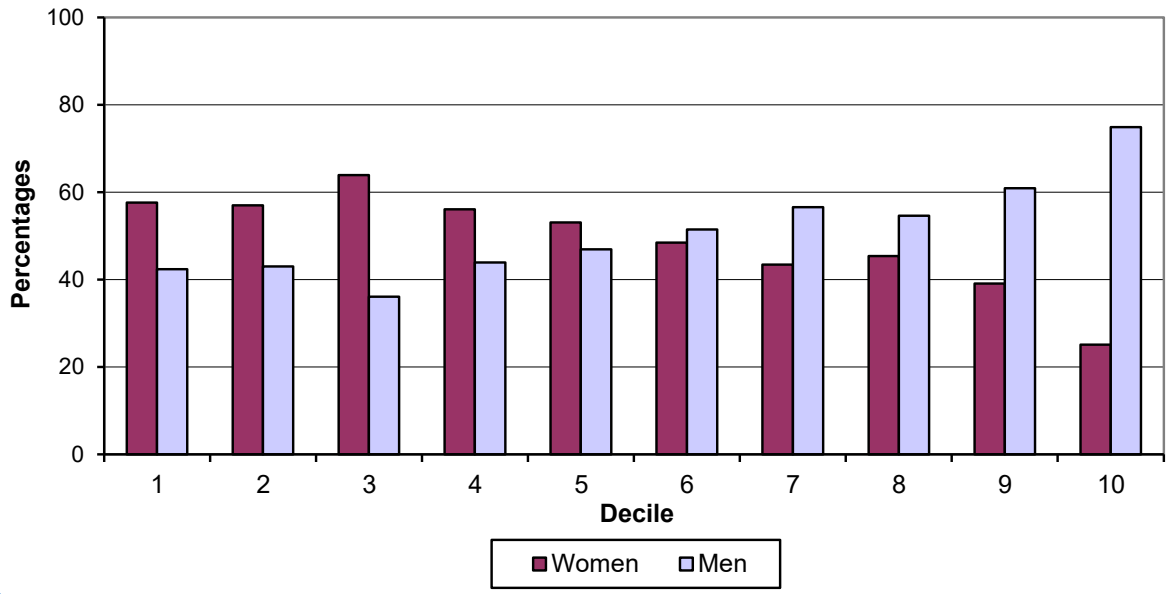
Average Gross Income per Employee, by Gross Money Income Decile and Sex (Table 7)

The average gross income per employee in the top decile was NIS 33,190 per month – 34.6 times higher than the average income in the bottom decile (NIS 959). It should be noted that some of the low incomes in the bottom decile are those of soldiers in compulsory military service, who are included in the category of employees (see Chapter A: "General", above).

Women made up more than 50% of each of the five lowest income deciles. The ratio reverses from the sixth to the tenth deciles, with men making up more than 50% of each decile.

Women made up less than 26% of the top decile (236,900 men as compared with 79,600 women), and their income was 8.8% lower than the income of male employees (NIS 30,947 versus NIS 33,944, respectively).

DIAGRAM 4. EMPLOYEE DISTRIBUTION, BY DECILE OF GROSS MONTHLY INCOME AND SEX 2020

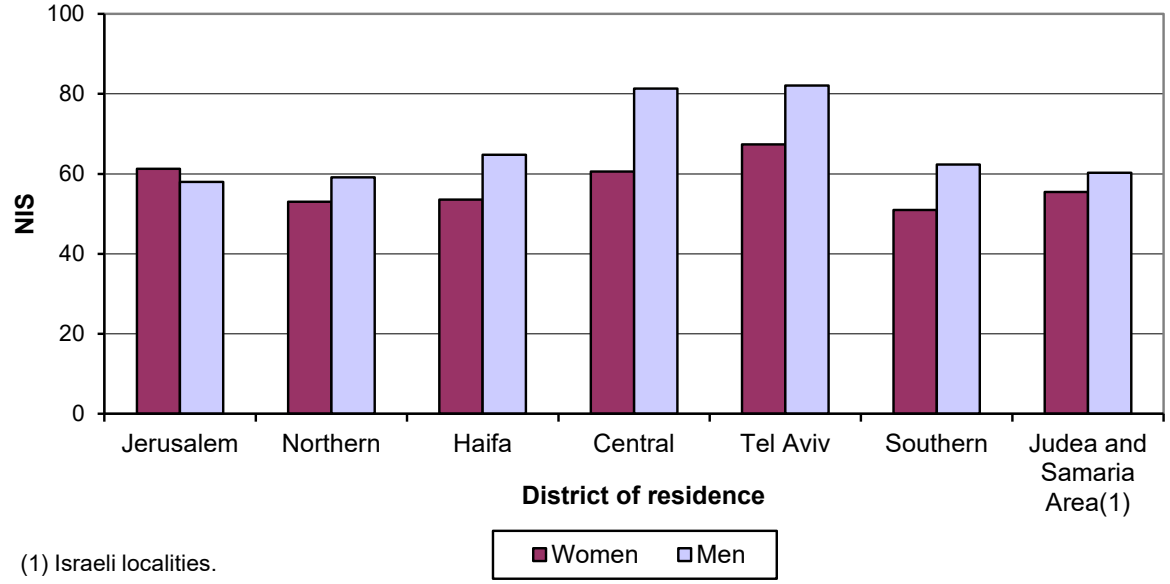


Average Gross Income per Employee, by District of Residence and Sex (Table 8)

The highest average monthly income (NIS 11,965) was in the Central District, and the lowest was in the Judea and Samaria Area (NIS 8,476).

The average hourly income of men was higher than that of women in all districts except the Jerusalem District, where the average hourly income of women was higher than that of men (NIS 61.3 versus NIS 58.0, respectively).

DIAGRAM 5. GROSS INCOME PER EMPLOYEE PER WORK HOUR, BY DISTRICT OF RESIDENCE AND SEX 2020



(1) Israeli localities.

Average Gross Income per Employee, by Industry, Level of Education, and Sex (Table 9)

An examination of the gross monthly income by industry shows that the highest incomes were in "Information and Communications" (NIS 19,966) and "Electricity and Water Supply, Sewerage and Waste Management" (NIS 15,996) – 1.9 and 1.5 times, respectively, the average income of the total number of employees (NIS 10,412). The lowest monthly income – NIS 5,045 (less than half the average income of all employees) – was in "Households as Employers".

See Table E/2: Tables From the Introduction.

C. TERMS, DEFINITIONS, AND EXPLANATIONS

Individuals aged 15 and over: The survey sample was drawn from persons over the age of 15, for whom employment data were filled out. In accordance with the international definition and the International Labour Organization, working age is 15 and over.

Employee: Any person interviewed in the survey who had some income from wages or salaries during the three months preceding the interviewer's visit.

Self-employed: Persons working in their own business or farm, including employers, who reported in the survey on annual or monthly income of their business/farm before tax is deducted.

A person who is not working: A person who did not work for even one day over the three months preceding the visit of the interviewer.

The survey population: The survey population covered all households in Jewish, Arab, and mixed localities, except for collective moshavim, kibbutzim, and Bedouins living outside localities.

The data for 2000–2001 did not include the population of East Jerusalem due to enumeration difficulties. However, in other years this population was included in the survey.

Full-time job: Over 35 hours of work per week as reported in the survey.

Part-time job: Less than 35 hours of work per week as reported in the survey.

Religion and population group: The classification by religion is Jews, Arabs, and Others. The group "Jews and Others" includes Jews, non-Arab Christians, and those not classified by religion, and the group "Arabs" includes Moslems, Arab-Christians, and Druze.

Average gross income per employee: The income derived from the division by 3 of the quarterly gross income investigated in the survey. The quarterly gross income is the gross income (i.e., before compulsory payments and taxes) from all places of work where the participant in the survey was employed for wages or salary in the three months preceding the interviewer's visit. This income includes all additions, such as overtime, vacation pay, clothing allowance, and premium payments. This division also applies to employees who worked only one or two out of the three months about which they are being questioned. Therefore, the average monthly

income calculated in these cases is usually lower than their actual wages for the months they did work.

Average gross income per self-employed person: Income from annual net profit of owned business (divided by 12), as well as current monthly income that the person receives from the business before deductions and tax payments.

Median income: A measurement of the statistical middle. Half the persons earn more than the median and half earn less.

Average gross income per work hour: The income derived from dividing the quarterly gross income (see above) by the total work hours for those three months.

Weekly work hours: Work hours as the employee / self-employed person reported in the survey. It was difficult to find out the number of work hours in the field and therefore it is subject to high sampling errors.

Income from selected sources (Summary Table): Includes income from work, income support benefits from the National Insurance Institute and from other government offices, income from pension funds in Israel and abroad, study funds, provident funds, and assistance from individuals in Israel and abroad.

Income index: A number that describes the relationship or differences in surveyed income between various groups in the population. Usually, the average income in the population is regarded as 100%, and corresponding incomes in various groups are compared with it.

For example*:* in Table D/2, the index of the monthly income for an employee = 100; by comparison, the index for monthly income for an employee working in an academic occupation = 41=141-100. That is, in 2020, the average monthly income of employees working in academic occupations was nearly 41% higher than the average monthly income per employee.

Deciles: A decile is a group composed of 10% of the surveyed population. Deciles are arranged by income level (the "classifying income"), from the individual with the lowest income in the lowest decile to the one with the highest income in the uppermost decile.

The income by which the households are classified can be gross or net, as well as income per household, per capita or per standard person. In this publication, the classification is by gross money income per person.

Quintile: A group comprised of 20% of the population (two deciles) according to a classifying variable.

District and Sub-District: The districts and sub-districts are defined according to the official administrative division of the State of Israel, which includes 6 districts and 15 sub-districts. In 1972, the Judea and Samaria and Gaza Areas were added to these, to characterize the Israeli localities and their population, which are located in these areas. As of August 2005, these are registered as the Judea and Samaria Area.

Classifications of Occupations and Industries

In 2013, there was a change in these classifications. Up to and including 2012, occupations were classified in the Household Expenditure Survey according to the 1994 Classification, and as of 2013, the 2011 Classification is used. There are almost no changes in the names of the major groups in the 1994 and 2011 Classifications. However, the order in which the major groups appear has been adjusted to the International Standard Classification of Occupations ISCO-08. The main differences between the 1994 and 2011 Classifications are presented in the tables from the introduction.

See Table K: Tables From the Introduction.

In the process of adopting the International Standard Classification of Occupations, Armed Forces Occupations was added as a specific major group. However, it should be emphasized that the CBS does not code Armed Forces Occupations separately. With regard to industries, the 1993 Standard Industrial Classification was used in the Household Expenditure Survey up to and including 2012. As of 2013, the 2011 Classification is used. The main differences in the classifications are presented in the tables below.

See Table L: Tables From the Introduction.

D. METHOD OF INVESTIGATION

Collecting the survey data: Data were collected from each household in an integrated manner, as follows:

1. A questionnaire on the structure of the household, which was filled out by the interviewer. The questionnaire included basic demographic and economic data on each member of the household (e.g., age, sex, country of birth, year of immigration, work status, and so on).

2. A bi-weekly diary, in which the household recorded each member's daily expenditures over a period of two weeks.

3. A questionnaire that examined large or exceptional expenditures and income. The questionnaire was filled out by the interviewer on the basis of reports from the household relating to the 3- or 12-month period preceding the date of the interview (depending on the rarity of expenditures for the items investigated).

Survey period: The data were collected in the field over a period of approximately 15 months, beginning in January of the survey year and ending in March of the subsequent year. Investigation of the sample was spread across the entire survey period, so that all weeks in the investigation period would be represented.

Estimates of expenditures obtained from the diary are approximations of expenditures made during the survey year. The estimates obtained from the questionnaire pertain to a 17-month period (from October 2019 to February 2021), or a 24-month period (from January 2019 to December 2020), according to the purpose of expenditure.

E. RESULTS OF THE FIELD WORK

Of the 13,547 dwellings sampled, there were 991 (7.3%) that should not have been investigated, as specified below:

Dwellings that should not have been investigated	Absolute numbers	Percentages
Total	**991**	**100.0**
Vacant	485	48.9
The occupants have another permanent address in Israel	138	13.9
The occupants are households that do not belong to the survey population	72	7.3
Used as businesses, institutions, etc.	128	12.9
Demolished, abandoned, or under construction	102	10.3
Errors in sampling frames	66	6.7

The 12,556 dwellings that met the investigation criteria were occupied by 12,604 households belonging to the survey population. As expected, most of the dwellings were occupied by one household, and only 0.42% were occupied by two households or more.

Of the 12,604 households in the dwellings that met the investigation criteria, approximately 55.6% were not included in the survey estimates: 7,009 of these households were not investigated, and 2 were disqualified at the editing stage.

Thus, a total of 7,011 households were not included in the estimates, as shown below:

Households for investigation	Absolute numbers	Percentages of total	Percentages
Total	**12,604**	**100.0**	**—**
Not investigated – total	**7,009**	**55.6**	**100.0**
Refused	2,280	18.1	32.5
Not at home	638	5.0	9.1
Communication difficulties, illness, mourning, etc.	1,171	9.3	16.7
Not located and other difficulties	2,920	23.2	41.7
Investigated – total	**5,595**	**44.4**	**100.0**
Disqualified in editing	2	0.02	0.4
Included in survey estimates	5,593	44.4	99.6

Of the households that were not investigated, some refused to participate in the survey, some provided only limited information on household characteristics in Questionnaire A, and a few began to fill out a diary but did not complete it.

Households not investigated	Absolute numbers	Percentages
Total	**7,009**	**100.0**
Did not respond at all	5,829	83.2
Responded at least to Questionnaire A	1,180	16.8

F. DATA PROCESSING

Editing and coding: Questionnaires submitted by households underwent initial editing at the district offices of the Central Bureau of Statistics. Afterwards, the questionnaires were sent to the subject unit at the main office for data entry, which included keying in, editing, checking for logic and quality, and coding of goods.

Price adjustment: All income data were presented at a standardized price level, i.e., at the average price level of the survey year (223.5 points in 2020 according to base 1993 = 100.0).

In addition, based on information from the National Insurance Institute, a further revision was made for real changes in salary data of employees by industry. This additional revision partially diminishes the distribution of data due to structural changes in the employment market. In that way the various average estimates are corrected, even if the sample is not distributed equally over the survey year.

Imputation of missing incomes: Some respondents did not give full information about the investigated variables. Therefore, different calculations are made at the individual level, such as: imputing income for individuals aged 15 and over who worked a few days and did not report a salary; imputing salaries for months for which no data were reported, in accordance with reports for other months; calculation of gross income for those cases where the net or the paid sum were reported.

G. METHOD OF ESTIMATION

The method of estimation aimed to minimize potential sampling errors and biases deriving from the fact that non-responding households may have characteristics that differ from those of the participating households.

In order to obtain estimates for the entire survey population, a weight was determined for each household investigated, with all members of a given household having the same weight. A household's weight reflects the number of households and persons in the survey population represented by that household.

In order to reduce the potential for bias stemming from non-response, a preliminary stage was performed before the stage of creating the weights. In this preliminary stage, all households that responded were assigned an initial weight as compensation for non-responding households. The initial weight is calculated as the inverse of the product of multiplying the sampling probability by the response probability, where the response probability is the outcome of a logistic regression model that uses the following explanatory variables: socio-economic index, size of household, total hours worked in the household, and income from work (data for which are obtained from administrative sources from the previous year).

Until 2018, in the method of calculating the weights, the initial weight was defined as the product of multiplying the inverse of the sampling probability by a correction factor for non-response. This correction factor was calculated in strata of geographical groups and within them, a division into socio-economic levels.

The weighting system was determined in a multi-step process using the raking method, by which the distribution of the sample given the initial weights is adjusted to a number of external distributions, according to selected distribution variables. The adjustment was made both according to the characteristics of the households and according to the characteristics of the persons, separately (and not in combination), for each of the distributions.

For households, the adjustment was made for two groups:

1. The population of Jewish and mixed localities.
2. The population of non-Jewish localities.

For these distributions, the division differs according to household characteristics:

- Groups by type of households, defined according to household size and age composition of household members (elderly persons living alone, young couples, households with children, etc.).
- Groups of households defined on the basis of the time they were investigated. These groups were intended to balance the weighted sample over the survey year, and to prevent biases that might result from the fact that the survey sample was not distributed over the months of the year in a uniform manner due to fieldwork constraints.
- Groups according to the lifestyle of the household, of the population in the Jewish and mixed localities (ultra-Orthodox / all the rest). Adjustment by lifestyle was added in the new method. Adjustment for homogeneous groups of households in terms of expenditures was removed.

The distributions by characteristics of households, to which the survey data were adjusted, were obtained from estimates of the Labour Force Survey, which is based on a large sample.

With regard to persons in households, the weights for the various groups of households were determined in a way that would also assure full correspondence between the estimates and the distribution of the survey population by:

- Division into groups according to percentile of income from work. Data on income from work was obtained from administrative sources[1] updated to the year prior to the survey year. For the population in the Jewish and mixed localities, groups of income deciles were defined; and for the population in the non-Jewish localities, groups of income quintiles. The percentile

[1] For a comprehensive explanation regarding income from administrative sources, see Furman, O. (2007). *Statistics of Income from Administrative Sources*. CBS. (Hebrew only).

boundaries were calculated from data for the general population, separately for men and women. The addition of the adjustment of the survey distributions according to income percentiles began with the estimate for the 2019 survey year and was made because it was found that the income from work has a high correlation with the dependent variables estimated from the survey, and it effectively minimizes the bias due to non-response.

- Integration of the characteristics of sex and age groups by geographical cross-sections, according to the current demographic data of the Central Bureau of Statistics

H. RELIABILITY OF THE ESTIMATES

The estimates presented in this publication are based on a sample survey, and may therefore be subject to errors of two main types:

1. **Sampling errors** arise from the fact that the survey investigated only one sample of households and their individual members, and did not cover all the households and individuals in the population.

2. **Non-sampling errors** result from other factors that may be present, even when a full census of the entire population is conducted.

1. Sampling Errors

The sample on which this survey is based is one of very many possible samples of the same size that could have been drawn from the same population by the same method.

Estimate X' is the estimated value, based on the specific sample of this survey, for the corresponding value X that would have been obtained if a full census had been conducted.

The sampling error of the estimate, $\sigma(X')$, is the mean difference between all estimates that could have been obtained from all possible samples of the same size and the same method, and the value that would have been obtained if a full census had been conducted under the same data-collection conditions.

In some cases, it is convenient to estimate the accuracy of the estimates on the basis of the **relative sampling error**, which is defined as the sampling error of the estimate divided by the estimated value.

The confidence interval for the estimate contains the census value X at a given predetermined level of confidence. The estimate X', based on the sample, and the estimate of its sampling error, $\sigma'(X')$, make it possible to construct a confidence interval at a predetermined confidence level, so that the interval contains the census value X at the stipulated confidence level.

The confidence interval is usually presented at a confidence level of 95%. Therefore, the boundaries of this confidence level are calculated as $X' \pm 2\sigma'(X')$. For every table

of subgroups in this publication, the sign "±" and the values of the two sampling errors for this estimate are presented beneath the estimate (in small characters).

Example: According to the Summary Table, the estimated average gross monthly income from work per individual in 2020 was NIS 5,995. The 95% confidence interval for this estimate would be NIS 5,995±156.1. That is, it can be claimed with 95% confidence that the average gross monthly income from work per individual ranges from NIS 6,151.1 to 5,838.9.

The confidence level is usually set at 95%, but it can be set higher or lower, and the confidence interval can be computed in the following way:

α	67%	80%	90%	95%	99.5%
$K(\alpha)$	1.0	1.3	1.7	2.0	2.8

where $K(\alpha)$ (the number of sampling errors in either direction) is determined in accordance with the requisite confidence level, α.

Continuing with the previous example: If a higher confidence level of 99.5% (near certainty) is desired, the value of the sampling errors that appear in Table 1 is divided by 2, and the result is multiplied by 2.8 = $K(\alpha)$. In this example, one sampling error of NIS 156.1 is obtained, and therefore a 99.5% level of confidence will be:

5,995± 2.8 * 78.1

That is: 5,995 ± 218.7

It can therefore be argued with almost total confidence (99.5%) that the average monthly income of households in the above-mentioned group ranges from NIS 5,776 to 6,214.

Notes

(a) The confidence intervals are usually symmetric around the estimate, but they are asymmetric for estimates based on a small number of cases in the sample (less than 40). In these cases, both the estimate itself and the estimate of its sampling error are subject to a high error.

(b) In order to warn the reader against the use of estimates that are subject to high errors, estimates with relative sampling errors between 15% and 30% are shown in parentheses ( ). Estimates with relative sampling errors of over 30% are not presented in this publication; the character ~ appears in their place.

Comparisons of Estimates Related to Mutually Exclusive Groups

Sampling errors can be used to compare estimates related to mutually exclusive population groups (e.g., men and women) and to determine whether the difference between the two groups is statistically significant.

If the estimates for Group 1 and Group 2 are $X'(1)$ and $X'(2)$, respectively, the estimated difference between the groups is

$$D' = X'(1) - X'(2)$$

In order to determine whether $X'(1)$ is different from $X'(2)$ in the population itself, it is necessary to determine the sampling error of the estimated difference, D':

$$\sigma'(D') = \sqrt{\sigma'\big(X'(1)\big)^2 + \sigma'\big(X'(2)\big)^2}$$

where one sampling error of the estimates is obtained by dividing the values shown in the tables by 2.

If $\sigma'(D')$ is given, it is possible to determine a confidence interval for the difference at a confidence level α:

$$D' \pm K(\alpha)\sigma'(D')$$

If the confidence interval contains the value 0, the difference D' is not statistically significant. In other words, on the basis of the specific sample in the survey at the stipulated confidence level, it cannot be argued that $X'(1)$ is different from $X'(2)$ in the population itself (even though the two values are different in the sample).

If the confidence interval does not contain the value 0, there is a statistically significant difference between the two groups, and at the stipulated confidence level the difference will be between $D' - K(\alpha)\sigma'(D')$ and $D' + K(\alpha)\sigma'(D')$.

For the reader's convenience, a chart is attached at the end of the introduction and can be used to obtain 95% confidence intervals for the difference between mutually exclusive groups. The chart should be used in the following way:

For the estimates and sampling errors presented in this publication, the tables show the sampling error for the two estimates – $X'(1)$ and $X'(2)$. These values are marked in the two columns at either end of the chart. If a line is drawn between them, the value $2\sigma'(D')$ will be found in the middle column in the figure. (To facilitate use of the chart, the scale of the limits can be adjusted.) If, for example, for two estimates, the values of two sampling errors are 60 and 75, the line connecting 60 and 75 in the extreme columns intersects the middle column at the value of 96. Therefore, the value of the two sampling errors of the difference is 192=2*96.

If the difference D' is smaller than $2\sigma'(D')$ in absolute terms, the difference is not statistically significant. I.e., according to the specific sample in the survey, at the set confidence level, it is impossible to state that $X'(1)$ is indeed different than $X'(2)$ in the population itself (although in the sample they are different).

If the difference D' is larger than $2\sigma'(D')$ in absolute terms, the difference is statistically significant and lies within the range $D' \pm 2\sigma'(D')$.

Example: Based on the Summary Table, the average gross monthly income from work of employees versus self-employed individuals will be compared at a 95% confidence level. The average gross monthly income from work was:

NIS 10,554 $\pm$ 248.8 per employee;

NIS 12,047 $\pm$ 1,115.8 per self-employed person.

The question is whether the difference between these groups is statistically significant. Based on these estimates alone, there would appear to be a difference in the average gross monthly income of individuals in the two groups above. This difference is estimated as:

$$D' = 12{,}047 - 10{,}554 = 1{,}493$$

To examine whether the difference is significant, the confidence interval needs to be computed:

$$\mathrm{D}' \pm 2\sigma'(\mathrm{D}')$$

A more accurate computation of the two sampling errors of the difference is based on the following formula:

$$2\sigma'(D') = 2 * \sqrt{\left(\frac{1{,}115.8}{2}\right)^2 + \left(\frac{248.8}{2}\right)^2} = 2 * 572 = 1{,}144$$

One may calculate a 95% confidence margin for the estimate of the difference:

$$\mathrm{D}' \pm 2\sigma'(\mathrm{D}') = 1{,}493 \pm 1{,}144$$

This interval does not include the negative values or the value "zero" (the amount ranges from 349 to 2,637); hence the difference is significant. Therefore, at a 95% level of confidence it can be argued that there is a difference in the average gross monthly income from work of employees versus self-employed individuals.

Ratio of Estimates Among Mutually Exclusive Groups

The ratio R' of $\mathrm{X}'(1)$ to $\mathrm{X}'(2)$ for two mutually exclusive groups, 1 and 2, is estimated as follows:

$$\mathrm{R}' = {}^{\mathrm{X}'(1)}\Big/_{\mathrm{X}'(2)}$$

And the estimate for the sampling error of the ratio estimate $\sigma'(\mathrm{R}')$ will be:

$$\sigma'(\mathrm{R}') = \mathrm{R}' * \sqrt{\left(\frac{\sigma' X(1)}{X'(1)}\right)^2 + \left(\frac{\sigma' X(2)}{X'(2)}\right)^2}$$

Therefore, a 95% level of confidence for R' will be $\mathrm{R}' \pm 2\sigma'(R')$.

If the confidence interval includes the value "1", the ratio is not significantly different from 1.

If the confidence interval excludes the value "1", the ratio is significantly different from 1 and falls within the aforementioned confidence interval.

2. Non-Sampling Errors

The obtained estimate and its sampling error make it possible to deduce the census value. However, this value may be different from the real value for the population because it may be affected by non-sampling errors. The non-sampling errors can be estimated only with great difficulty, or not at all.

In this survey, these errors fall into the following categories:

(a) **Biases due to non-response or partial response:** Out of all the households that were supposed to have been in the survey sample population 55.6% did not participate in the survey for various reasons (see Chapter E: "Results of the Field Work", above). The group that did not participate in the survey – i.e., the non-response cases – might have different characteristics than the households that participated, and this can bias the estimates of the survey. The method of estimation used in the survey ("weighting") substantially reduces errors of this type, but does not eliminate all of them.

In addition, missing data on the variables examined in the survey can cause errors. The missing information was supplemented by imputing income on the basis of regression models, according to the reported income of each investigation unit. For work hours per week, different types of imputation methods were used. In that way, some of the bias errors that can derive from partial responses were reduced. However, not all of those errors could be reduced, because there is obviously no way of imputing the real value of all missing data.

(b) **Response errors:** The survey estimates were based on the responses of interviewees to the items in the questionnaire, and only some of them were based on documents such as salary slips. Hence, there might be some inaccuracies in the responses – particularly with regard to income – in cases where the interviewees did not have a salary slip and provided information based on their memory. There may also be inaccuracies in the responses regarding other variables examined in the survey, such as "weekly work hours".

Another potential source of response errors lies in the survey method itself, where one family member can report on another member (investigation through a proxy). This method can lead to inaccurate reports for the family member who

was away from home at the time of the interview, because the family member who was present at the interview might not have had all of the requested information.

The interviewers requested that the families refer to documentation, and attempts were made to correct data that seemed unreliable by returning to the households. In addition, logical checks were conducted during the data processing stage. Despite all this, there was still concern that inaccuracies in the responses might lead to biases in the survey estimates.

(c) **Coding errors:** Some of the data collected in the survey, such as data on industries and occupations, were based on the interviewees' verbal descriptions and then recorded as numeric codes. Hence there might have been errors in the codes assigned due to inaccuracies in the descriptions provided by the interviewees.

(d) **Other processing errors:** The various stages of processing, such as data entry, coding of products, and logical checks, have the potential for errors. All such errors can affect the reliability of the estimates.

It is usually very difficult, even impossible, to estimate the effect of non-sampling errors on the survey estimates. Nevertheless, it should be noted that the biases caused by these errors are sometimes in opposite directions and may therefore partially offset each other.