

SURVEY COVERAGE AND METHODOLOGY

Introduction

- 1 The 2016 Comprehensive Labour Force Survey is the thirty-ninth in the series of mid-year labour force surveys conducted in Singapore by the Manpower Research and Statistics Department of the Ministry of Manpower. The objective of the survey is to collect data on the economic activities of the population, including detailed information on employment and unemployment as well as characteristics of persons in and outside the labour force.
- 2 The survey is conducted under the Statistics Act (Chapter 317) which empowers the Director of the Manpower Research and Statistics Department to collect information from survey respondents. The Act also guarantees the confidentiality of individual information obtained from the survey.

Coverage

- 3 The survey covers private households in Singapore. It excludes workers living in construction worksites, dormitories and workers' quarters at the workplace and persons commuting from abroad to work in Singapore. Estimates of the total labour force are derived by combining data on residents obtained from the survey with foreign employment data compiled from administrative records.

Data Collected

- 4 The survey questionnaire was designed to collect data on the personal characteristics of the population and detailed information on the economic characteristics of the labour force. The items collected in the questionnaire included:

For Persons Aged 15 Years and Over

Sex
Age
Highest qualification attained
Labour force status

For Residents Aged 15 Years and Over

Marital status
Field of study

For Employed Residents Aged 15 Years and Over

Occupation
Industry
Gross monthly income from work
Employment status
Whether working full-time or part-time
Willingness and availability of part-timers to work additional hours
Whether employed on permanent or term contract basis
Usual hours worked
Years in current job

For Unemployed Residents Aged 15 Years and Over

Duration of unemployment
Action taken to look for work
Working experience
Previous occupation
Previous industry
Main reason for leaving previous job

For Residents Outside the Labour Force Aged 15 Years and Over

Main reason for not working and not looking for a job
Working experience
Whether persons intend to look for work in future
Preference for full-time or part-time work

Concepts and Definitions

- 5 The concepts and definitions used in the survey conform to international guidelines recommended by the International Labour Organisation. The terms and definitions used are as follows:

Reference Period	This refers to the week preceding the date of the survey interview.
Household	A household is made up of persons who share common accommodation and food arrangements. A household may consist of only one person or many persons.
Residents	Residents (also known as locals) refer to Singapore citizens and Permanent Residents.
Labour Force Status	Labour Force <ul style="list-style-type: none">▶ This refers to persons aged 15 years and over who are either employed (i.e. working) or unemployed (i.e. actively looking for a job and available for work) during the reference period. Outside the Labour Force <ul style="list-style-type: none">▶ This refers to persons aged 15 years and over who are neither employed nor unemployed during the reference period.
Employed Persons	This refers to persons aged 15 years and over who, during the reference period: <ul style="list-style-type: none">(i) work for one hour or more either for pay, profit or family gains; or(ii) have a job or business to return to but are temporarily absent because of illness, injury, breakdown of machinery at workplace, labour management dispute or other reasons. Members of the Singapore Armed Forces including full-time National Servicemen are included in the persons employed, unless otherwise specified.

Unemployed Persons	This refers to persons aged 15 years and over who are not working but are actively looking for a job and available for work during the reference period. They include persons who are not working but are taking steps to start their own business or taking up a new job after the reference period.
Labour Force Participation Rate	This is defined as the percentage of the labour force to the population.
Employment Rate	This is defined as the percentage of employed persons to the population.
Unemployment Rate	This is defined as the percentage of unemployed persons to the labour force.
Time-Related Underemployed Persons	This refers to persons aged 15 years and over who normally work less than 35 hours a week but are willing and available to engage in additional work.
Time-Related Underemployment Rate	This is defined as the percentage of time-related underemployed persons to employed persons.
Duration of Unemployment	This refers to the number of complete weeks between the date when action was first taken to look for a job and the date of the survey interview.
Long-Term Unemployed Persons	This refers to persons aged 15 years and over who have been unemployed for 25 weeks or more.
Long-Term Unemployment Rate	This is defined as the percentage of long-term unemployed persons to the labour force.
Discouraged Workers	This refers to persons outside the labour force who are not actively looking for a job because they believe their job search would not yield results. Reasons cited for being discouraged include believes that there is no suitable work available, employers' discrimination and lack of necessary qualifications, training, skills or experience.

**Highest
Qualification
Attained**

This refers to the highest level or standard which a person has passed or attained either through attendance at an institution of learning or through correspondence or self-study. The classification of highest qualification attained is based on the Singapore Standard Educational Classification (SSEC) 2015.

A person is classified into one of the following categories according to the highest qualification attained:

No Formal Qualification / Pre-Primary / Lower Primary

- ▶ This refers to those who have never attended school, have pre-primary/ kindergarten education, or have primary education but without Primary School Leaving Examination (PSLE) certificate or their equivalent, or have Certificate in Basic Education for Skills Training (BEST) 1-3.

Primary

- ▶ This refers to those who have PSLE or other certificate of equivalent standard, or have Certificate in BEST 4 or at least 3 Workforce Skills Qualifications (WSQ) Statements of Attainment in Workplace Literacy and Numeracy (WPLN) at Level 1 or 2 (e.g. under Employability Skills System (ESS) or Employability Skills (ES)).

Lower Secondary

- ▶ This refers to those who have secondary education without a General Certificate of Education (GCE) Normal ('N')/Ordinary ('O') Level pass or equivalent, or have Certificate in Worker Improvement through Secondary Education (WISE) 1-3, or basic vocational certificates (including Institute of Technical Education (ITE) Basic Vocational Training), or at least 3 WSQ Statements of Attainment in WPLN at Level 3 or 4 (e.g. under ESS, ES).

Secondary

- ▶ This refers to those who have at least 1 GCE 'N'/'O' Level pass, or have National ITE Certificate (Intermediate) or equivalent (e.g. National Technical Certificate Grade 3, Certificate of Vocational Training, Building and Construction Authority (BCA) Builder Certificate), or have ITE Skills Certificate (ISC) or equivalent (e.g. Certificate of Competency, Certificate in Service Skills) or at least 3 WSQ Statements of Attainment in WPLN at Level 5 and above (e.g. under ESS, ES), or other certificates/ qualifications of equivalent standard.
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Post-Secondary (Non-Tertiary)

- ▶ This refers to those who have at least 1 GCE Advanced ('A')/Higher 2 ('H2') Level pass or other certificates/qualifications of equivalent standard. It also includes those who have National ITE Certificate (NITEC) (e.g. Post NITEC Certificate, Specialist NITEC, Certificate in Office Skills, National Technical Certificate Grade 2, National Certificate in Nursing, Advanced Builder Certificate), or have Higher NITEC (including Certificate in Business Skills, Industrial Technician Certificate and other polytechnic certificates), or Master NITEC or equivalent (e.g. National Technical Certificate Grade 1). This group also includes WSQ Certificate/Higher Certificate/Advanced Certificate or equivalent, International Baccalaureate/High school diploma or other advanced certificates (e.g. Singapore Institute of Management (SIM) certificates).

Polytechnic Diploma

- ▶ This refers to those who have Polytechnic diploma, or Polytechnic advanced diploma (including Polytechnic advanced/post/specialist/management/graduate diploma).

Professional Qualification and Other Diploma

- ▶ This refers to those who have qualifications awarded by professional bodies, or National Institute of Education (NIE) diploma, ITE diploma and other diploma qualifications (e.g. SIM diploma, LaSalle-SIA diploma, Nanyang Academy of Fine Arts (NAFA) diploma, WSQ diploma and WSQ specialist diploma).

Degree

- ▶ This refers to those who have Bachelor's Degree, or Postgraduate Diploma (including NIE postgraduate diploma), WSQ graduate certificate, WSQ graduate diploma, Master's, or Doctorate.

Field of Study

This refers to the principal discipline, branch or subject matter of study that leads to the award of the highest qualification attained at degree, diploma & professional qualification levels.

Training Participation Rate

The training participation rate (also known as training incidence rate) is defined as the proportion of residents aged 15 to 64 in the labour force who had engaged in some form of work-related structured training or education activities over the 12-month period ending June. Work-related structured training or education refers to training that is related to a current or future job. It includes classroom training, private lessons, correspondence courses, workshops, seminars, structured on-the-job training (OJT), e-learning (systematic training programmes via e-platforms e.g. e-courses), WDA's Traineeship Programmes, apprenticeship training and mandatory courses. However, it excludes informal on-the-job training such as watching a video on management skills, observing others perform a task at work, time spent at work learning new tasks and keeping up to date with work-related developments by reading journals/newspapers and informal discussions.

Training Intensity

Training intensity is defined as the average duration of work-related structured training per adult. It is derived by multiplying the training participation rate by average (mean) training days per trainee.

Occupation	This refers to the type of work performed by a person, which may not necessarily be related to his training, skill or professional qualification. In the case of a person who performs two or more kinds of work, his occupation would refer to the one in which he usually works the longest hours during the reference period. The classification of occupations is based on the Singapore Standard Occupational Classification (SSOC) 2015, unless otherwise specified.
Industry	This refers to the major kind of activity undertaken by the establishment, enterprise, firm or organisation in which the person worked during the reference period. It is related to the principal class of goods produced or services rendered by the organisation. The classification of industries is based on the Singapore Standard Industrial Classification (SSIC) 2015, unless otherwise specified.
Gross Monthly Income from Work	This refers to income earned from employment. For employees, it refers to the gross monthly wages or salaries before deduction of employee CPF contributions and personal income tax. It comprises basic wages, overtime pay, commissions, tips, other allowances and one-twelfth of annual bonuses. For self-employed persons, gross monthly income refers to the average monthly profits from their business, trade or profession (i.e. total receipts less business expenses incurred) before deduction of income tax.
Employment Status	<p>This refers to the position or status of an employed person in relation to other persons within the organisation he works in. Employed persons are divided into the following four categories:</p> <p>Employers</p> <ul style="list-style-type: none"> ▶ These are persons who employ at least one paid worker in their business or trade. <p>Employees</p> <ul style="list-style-type: none"> ▶ These are persons who work for employers in return for regular wages or salaries. <p>Own Account Workers</p> <ul style="list-style-type: none"> ▶ These are persons who operate their own business without employing any paid workers in the conduct of their business or trade. <p>Contributing Family Workers</p> <ul style="list-style-type: none"> ▶ These are persons who assist in the operation of family business without receiving regular wages or salaries.

Type of Employment

Employed persons can be categorised into those working on full-time or part-time basis.

Full-time

- ▶ This refers to employment where the normal hours of work is at least 35 hours a week.

Part-time

- ▶ This refers to employment where the normal hours of work is less than 35 hours a week.

Before 2009, full-time refers to employment where the normal hours of work is at least 30 hours a week while part-time refers to employment where the normal hours of work is less than 30 hours a week. From 2009 onwards, the threshold between full-time and part-time was revised from 30 hours to 35 hours to align with the revised definition in the Employment Act.

Employees can be categorised into those employed on term contract or permanent basis.

Term Contract

- ▶ Employees on term contracts refer to those on fixed-term contract of employment that will terminate on the expiry of a specific term unless it is renewed, as well as those on casual/on-call employment (i.e. where persons are employed on ad hoc basis, as and when the company requires additional manpower).

Permanent

- ▶ Permanent employees refer to those employed for an unspecified duration, i.e. they are not on term contracts.
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Years in Current Job

This refers to the number of years of uninterrupted work the person has with a particular employer, either in the same job or in different positions within the same organisation. Jobs are therefore employer-based, not position-based. If the person has left a job and subsequently returned to work with the same employer, the years in current job should be that of his most recent period of work i.e. the duration will not include his previous years in the job.

Usual Hours Worked

This refers to the number of hours that a person usually works in a typical week, regardless of whether he is paid or not. The concept of usual hours of work differs from that of normal hours of work referred to in contractual arrangements. For a person who has just started work during the reference period, usual hours of work refers to the number of hours per week he is expected to work in that job. For a multiple jobholder, it should be aggregated from the hours spent in all the jobs.

Sampling Design

- 6 The sample for the 2016 survey was selected based on a stratified design with proportional allocation. The sample selection was undertaken by Singapore Department of Statistics, Ministry of Trade and Industry, which maintains a sampling frame of residential dwellings in Singapore. The selection is done in accordance with the specified sampling criteria.
- 7 Dwelling units in the sampling frame were divided into different groups (or strata). The groups are defined based on the planning areas demarcated by the Urban Redevelopment Authority and broad dwelling type groups. A random sample was then selected proportionally from the different groups by systematic sampling with a random start. The samples selected from each group were combined to form the required sample of 33,000 dwelling units.
- 8 This sample design yields an overall equal probability and self-weighting sample.

Planning, Organisation, Fieldwork and Data Verification

- 9 The Manpower Research and Statistics Department undertook the planning and operation of the survey. These included the preparation of the questionnaire and related documents, survey design, recruitment and training of staff, supervision and control of field work, editing and checking on the completed cases, data verification and compilation.
- 10 The field operation for the 2016 survey was carried out mainly from 23 May 2016 to 31 July 2016. Around 140 temporary interviewers and 20 permanent staff were involved in the survey operations. Comprehensive training sessions comprising classroom training and role-play were conducted for the interviewers.
- 11 The majority of the households completed the survey through telephone or internet. Households that did not respond through these options were enumerated through face-to-face interviews. All the information captured were keyed into the secured Integrated Manpower Survey System (iMSS). The use of automatic routing in iMSS ensured that all relevant questions were answered. The system also has an auto-error checking function to prompt interviewers of missing, invalid or inconsistent entries so that clarifications could be conducted. The information collected was subjected to further editing checks by supervisors and verification officers.
- 12 The work of the interviewers was closely monitored to ensure the quality of the data collected. Supervisors conducted checks by calling up selected households to verify the information collected. The data were subjected to consistency and verification checks before tabulation.

Reliability of Data

- 13 The results of the survey were grossed up to the resident population in June 2016 (compiled by the Singapore Department of Statistics) using multiple estimation factors. Being a sample survey, the results were inevitably subjected to sampling and non-sampling errors.

Sampling Errors

- 14 In a sample survey, inferences about the target population are drawn from the data collected from the sample. Errors due to extension of the conclusions based on one sample to the entire population are known as sampling errors. The sampling error of an estimate is the extent of variation between the estimated value obtained from a sample and the true value from the population. Factors influencing the sampling error include the sample size, the sample design, method of estimation, the variability of the population and the characteristics studied.

- 15 A common measure of the sampling error of an estimate is its standard error, which is a measure of the variation among the estimates derived from all possible samples. An alternative measure is the relative standard error of an estimate which indicates the standard error relative to the magnitude of the estimate. As a general rule, the smaller the group whose size is estimated or from which an estimate is being derived, the less precise that estimate is.
- 16 A sample estimate and an estimate of its standard error can be used to construct an interval that will, at specified levels of confidence, include the true value. By statistical convention, the confidence level has been set at 95 per cent.
- 17 For the 2016 survey, the estimated sampling errors of the main resident labour force estimates were as follows:

	Estimate	Standard Error	Relative Standard Error	95% Confidence Interval	
				Lower	Upper
Resident Labour Force	2,257,600	6,900	0.3%	2,244,100	2,271,100
Employed Residents	2,165,300	6,900	0.3%	2,151,800	2,178,900
Unemployed Residents	92,300	2,100	2.3%	88,200	96,400
Residents Outside the Labour Force	1,060,800	6,200	0.6%	1,048,700	1,072,900
Resident Labour Force Participation Rate	68.0%	0.18%-pt	0.3%	67.6%	68.4%
Resident Employment Rate of Population Aged 25 to 64	80.3%	0.19%-pt	0.2%	79.9%	80.7%
Resident Unemployment Rate	4.1%	0.09%-pt	2.3%	3.9%	4.3%

Note: Data are non-seasonally adjusted. They pertain to those aged 15 & over, unless otherwise stated.

- 18 As many sample estimates can be computed from the survey, it would be impractical to estimate the sampling errors for all estimates. A generalised table of sampling errors for the Comprehensive Labour Force Survey based on a simple random sample is presented as follows:

Size of Estimate	Proportion of Total Resident Population	Standard Error	Relative Standard Error	95% Confidence Interval	
				Lower	Upper
2,000,000	50.84%	7,000	0.35%	1,986,400	2,013,600
1,000,000	25.42%	6,100	0.61%	988,100	1,011,900
500,000	12.71%	4,600	0.93%	490,900	509,100
200,000	5.08%	3,100	1.53%	194,000	206,000
100,000	2.54%	2,200	2.19%	95,700	104,300
50,000	1.27%	1,600	3.12%	46,900	53,100
20,000	0.51%	1,000	4.95%	18,100	21,900
10,000	0.25%	700	7.00%	8,600	11,400
5,000	0.13%	500	9.91%	4,000	6,000
2,000	0.05%	300	15.68%	1,400	2,600
1,000	0.03%	200	22.17%	600	1,400
500	0.01%	200	31.36%	200	800
200	0.01%	100	49.58%	-	400

- 19 Data users are advised to take cognisance of the sampling error of the estimate and exercise judgement on whether the estimate is reliable for their intended purpose. Specifically, caution is to be exercised in interpreting results of detailed cross-tabulations for small sub-groups as these could have large sampling errors.

Non-Sampling Errors

- 20 Non-sampling errors could result from the varying interpretation of questions by respondents and interviewers, inability or unwillingness of respondents to provide correct information, mistakes in recording, coding and processing. These errors have been minimised by careful design of the questionnaire, intensive training and supervision of interviewers, as well as strict data processing controls.

Response

- 21 Of the 33,000 housing units selected in the initial sample, 1,552 households were excluded from the survey as they were unoccupied, non-residential or demolished. A total of 27,780 households responded to the survey, achieving an overall response rate of 88.3%.

Impact of Population Revision on Labour Force Data

- 22 Being a sample survey, data obtained from the Comprehensive Labour Force Survey are grossed up using population estimates from Singapore Department of Statistics (DOS). DOS has refined the resident population estimates for June 2008 onwards to exclude Singapore residents who have been away from Singapore for a continuous period of 12 months or longer. Before June 2008, the labour force data are grossed up using DOS's original resident population estimates which comprise all persons whose usual residence is in Singapore. Hence, the resident labour force data for 2008 onwards are not strictly comparable with those published in earlier years.
- 23 To facilitate comparison with data for 2008 onwards, adjusted labour force estimates for 2007 based on the revised population estimates are published, alongside the original estimates in the key time series tabulations. The adjustment assumes that the proportion of persons overseas for at least 12 months in the 2007 Comprehensive Labour Force Survey was the same as that in the 2008 survey. Adjusted data for 2007 are denoted by the symbol ^a. The impact of the population revision is more significant for level data of large estimates such as the resident labour force or employed residents and less so for rates and proportions derived from level data of the same year as shown below.

	June 2007 (a)	June 2007 (Adjusted) (b)	Difference (b) - (a)
Resident Labour Force	1,918,100	1,878,000	-40,100
Employed Residents	1,842,100	1,803,200	-38,900
Unemployed Residents	76,100	74,800	-1,300
Residents Outside the Labour Force	1,026,500	1,009,200	-17,300
Resident Labour Force Participation Rate	65.1%	65.0%	-0.1%-pt
Resident Unemployment Rate	4.0%	4.0%	-
Resident Employment Rate of Population Aged 25-64	76.5%	76.5%	-

Note: Data are non-seasonally adjusted. They pertain to those aged 15 & over, unless otherwise stated.

- 24 A suggested method to compute the annualised growth in the size of labour force over a period which spans 2007 is illustrated in the worked example below.

Example:

Suppose we want to compute the annualised growth in the number of persons in the labour force from 2006 to 2016. With the break in series in 2007, we can estimate the change as follows:

Year	Labour Force
2006	2,594,100
2007 (Original)	2,750,500
2007 (Adjusted)	2,710,300
2016	3,672,800

The annualised growth from 2006 to 2016 can be computed based on two sub-periods, 2006 to 2007 (based on old definition of population estimates) and 2007 to 2016 (based on new definition)

Annualised growth from 2006 to 2007, based on original 2007 figures:

$$\left[\left(\frac{2,750,500}{2,594,100} \right)^{\frac{1}{1}} - 1 \right] \times 100 = 6.0\% \text{ p.a.}$$

Annualised growth from 2007 to 2016, based on adjusted 2007 figures:

$$\left[\left(\frac{3,672,800}{2,710,300} \right)^{\frac{1}{9}} - 1 \right] \times 100 = 3.4\% \text{ p.a.}$$

Therefore, the annualised growth in number of persons in the labour force from 2006 to 2016

$$= \left\{ \left[\left(1 + \frac{\text{Annualised growth from 2006 to 2007}}{100} \right)^1 \left(1 + \frac{\text{Annualised growth from 2007 to 2016}}{100} \right)^9 \right]^{\frac{1}{10}} - 1 \right\} \times 100$$

which reduces to:

$$= \left\{ \left[\frac{\text{Labour force level in 2007 (Original)}}{\text{Labour force level in 2006}} \times \frac{\text{Labour force level in 2016}}{\text{Labour force level in 2007 (Adjusted)}} \right]^{\frac{1}{10}} - 1 \right\} \times 100$$

$$= \left[\left(\frac{2,750,500}{2,594,100} \times \frac{3,672,800}{2,710,300} \right)^{\frac{1}{10}} - 1 \right] \times 100 = 3.7\% \text{ p.a.}$$

Labour Force Survey Supplement on Training, 2016

- 25 A Labour Force Survey Supplement on Training, 2016 was conducted from 31 August 2016 to 3 October 2016 following the closure of the Comprehensive Labour Force Survey. The survey aimed to capture information on participation in work-related structured training by the resident labour force during the 12-month period ending June 2016. It also sought to ascertain the duration of training and training outcomes. 3,916 residents in the labour force aged 15 to 64 years (excluding full-time National Servicemen) were surveyed, of whom 3,496 or 89.3% responded.