

Embargoed until 10:45am – 20 April 2009

## Household Labour Force Survey Population Rebase: December 2008 quarter

(Includes the introduction of Māori benchmarks)

### Highlights

- Seasonally adjusted employment increased by 21,000 to 2,212,000.
- The seasonally adjusted unemployment rate increased to 4.7 percent.
- The seasonally adjusted labour force participation rate decreased to 69.2 percent.
- Seasonally adjusted total actual hours worked per week increased by 1.1 percent.

Seasonally adjusted	Originally published December 2008 quarter	Revised December 2008 quarter	Change
Unemployment rate	4.6%	4.7%	+0.1
Unemployed	105,000	108,000	+3.2%
Employed	2,191,000	2,212,000	+0.9%
Not in the labour force	1,015,000	1,032,000	+1.6%
Labour force participation rate	69.3%	69.2%	-0.1

Geoff Bascand  
Government Statistician

20 April 2009  
ISSN 1178-0487

## Commentary

The Household Labour Force Survey (HLFS) estimates are updated periodically to account for the latest population estimates following each population census. As part of the rebase, historical HLFS results are revised using the updated weighting regime. This revision preserves the integrity of the HLFS statistical time series, ensuring consistency in past and contemporary trends and movements.

This release reports on the results of the latest update, using population estimates based on the 2006 Census of Population and Dwellings and introducing the Māori benchmarks into the updated weights. Series from the HLFS have been revised back to the start of the survey, the March 1986 quarter, due to the inclusion of Māori benchmarks, in addition to incorporating the revised population estimates from 2001 onwards.

The movements in the key HLFS series from the March 1986 quarter to the December 2000 quarter are attributable to the introduction of Māori benchmarks in the weights. Movements starting from the March 2001 quarter are due to both the introduction of Māori benchmarks and revisions to population estimates based on the 2006 Census.

### Impact of introducing Māori benchmarks

The inclusion of population benchmarks for the Māori ethnic group was aimed at improving the quality and time series consistency of labour force estimates for Māori. Other surveys, such as the Household Economic Survey and the Survey of Dynamics and Motivations for Migration in New Zealand, also use ethnic benchmarks in their estimates.

In this rebase, ethnic benchmarks for Māori have been introduced in the updated weights. As a result, the average proportion of Māori only in the total working-age population (WAP) for the period December 2007 quarter to the December 2008 quarter increased to 6.8 percent, up 1.3 percentage points based on the single/combination method of output. The upward revision to the number of Māori WAP is 46,800. During the same period, the average proportion of European/Māori in the total WAP also increased, up 0.9 percentage points to 5.2 percent. On the other hand, the average proportion of European only, Pacific peoples only, Asian only, Middle Eastern/Latin American/African (MELAA) only, and 'other' ethnicity only in the total WAP decreased as a result of introducing the Māori benchmarks.

Historical time series patterns have been preserved in this revision to the HLFS. The revisions resulted in some expected movements in the main labour force aggregate series (ie employment, unemployment, and not in the labour force) and shifts in the level of the unemployment rates and labour force participation rates.

### Future releases

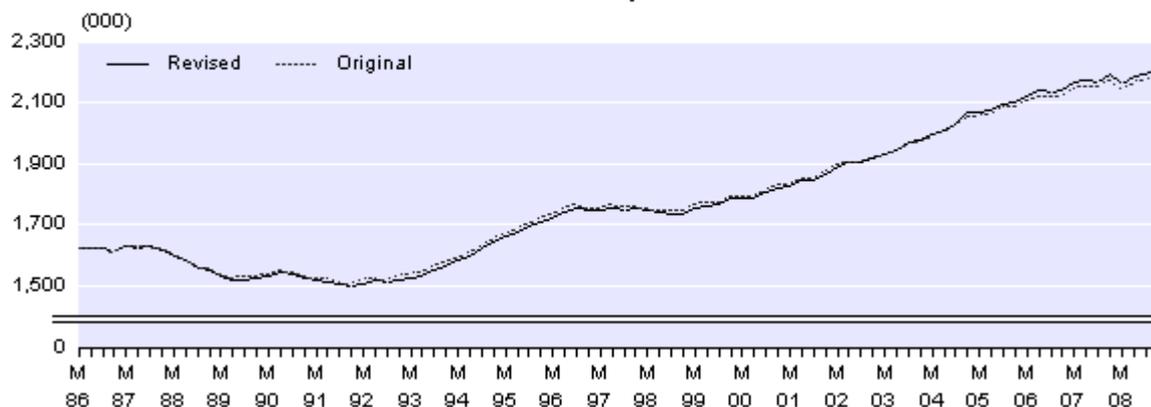
Following this rebase, HLFS results for the March 2009 quarter (release date 7 May 2009) and onwards will continue to use population estimates based on the 2006 Census.



The HLFS level estimates for the other key series are affected by increases in the total WAP and by the inclusion of Māori benchmarks (see graphs for the employed, unemployed, and the not in the labour force (NILF)). The effect of the rebase and the introduction of Māori benchmarks differ for each series, though the quarter-on-quarter movements are largely unchanged.

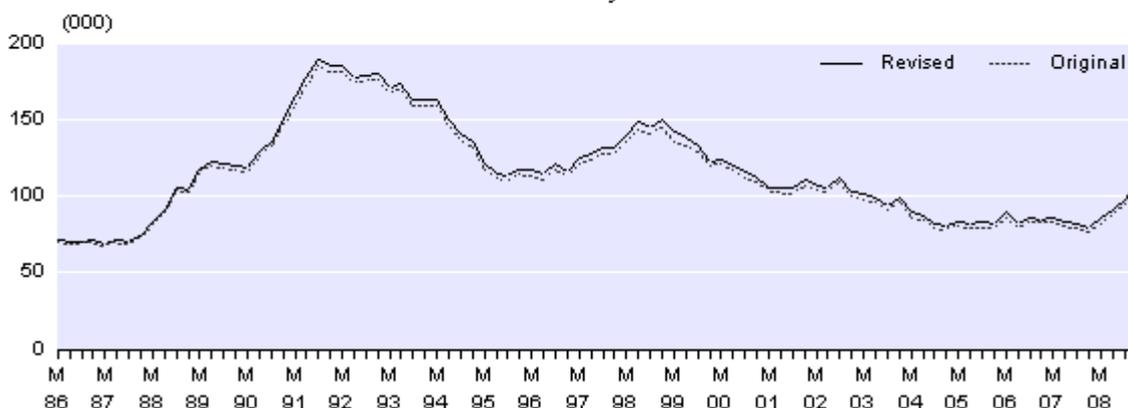
The introduction of Māori benchmarks resulted in a general downward shift of the overall level of employment, while the population rebase had an upward effect. As a result, the overall employment series is revised downwards until the December 2002 quarter, but upwards from the March 2003 quarter. From that point, the upward effect of the rebase is larger than the downward effect caused by the introduction of the Māori benchmarks, resulting in a net upward revision.

**Employed – Seasonally Adjusted**  
*Quarterly*

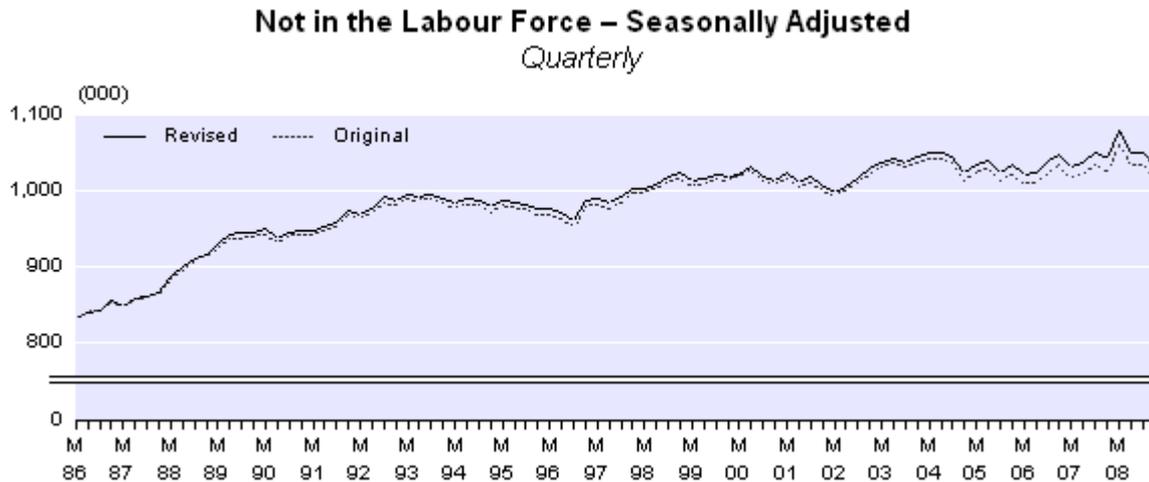


The unemployment series had a general upward revision. A relatively small component of this change is due to the population rebase from March 2001 onwards, while the change is otherwise attributable to the introduction of Māori benchmarks.

**Unemployed – Seasonally Adjusted**  
*Quarterly*



Historically, Māori have had relatively low levels of participation compared to the total WAP. The introduction of Māori benchmarks resulted in an increase in the total number of NILF. However, this difference has decreased over time so that the upward effect on NILF decreases in later quarters. The population rebase also resulted in an upward shift of NILF, and this is the dominant effect from December 2005.



The labour force participation rate pattern shows a downward level shift, with revisions being larger in the earlier to the middle part of the series. Similar to shifts in the unemployment rate, most of the revision is due to the introduction of Māori benchmarks.



### Impact on estimates from the New Zealand Income Survey

The population rebase and the introduction of Māori benchmarks will also have an impact on estimates from the New Zealand Income Survey (NZIS). The NZIS is a regular supplement to the HLFs and has been conducted every June quarter since 1997. The NZIS collects data on wages and salaries, self-employment, government transfers, investment income, and other transfer income.

The NZIS will be released separately, on a date to be announced later.

For technical information contact:

Lourdes Vivo or Mariana Gledhill  
Wellington 04 931 4600

**Email:** [info@stats.govt.nz](mailto:info@stats.govt.nz)

**Next release ...**

*Household Labour Force Survey: March 2009 quarter will be released on  
7 May 2009.*

# Technical notes

## Background to the survey

The Household Labour Force Survey (HLFS) commenced in October 1985, and the first results published were for the March 1986 quarter. The survey provides a regular, timely and comprehensive portrayal of New Zealand's labour force. Each quarter, a range of statistics relating to employment, unemployment, and people not in the labour force is published.

## In this release

This release contains revised seasonally adjusted and survey statistics as a result of the population rebase and the introduction of Māori population benchmarks. These statistics are averages for the three-month period and do not apply to any specific point in time.

Figures presented in this release are rounded. Because each table contains rounded figures, there may be some small inconsistencies between the totals and individual cells. Unrounded figures have been used in the calculation of unemployment rates and labour force participation rates.

Cells with estimates of less than 1,000 have been suppressed and appear as 'S' in the tables. These estimates are subject to sampling errors too great for most practical purposes.

Throughout these technical notes, the term 'reweighting' refers to both the population rebase and introduction of Māori population benchmarks, unless otherwise stated.

## Notes for the rebase

### Household Labour Force Survey rebase

The HLFS population rebase is a cyclical event where population estimates are revised to account for the latest census results.

Population benchmarks are used in combination with HLFS statistics to produce labour force estimates. Census-based 'working-age population' benchmarks are used to weight the survey-based labour force results. These census-based estimates provide reliable benchmarks for the survey outputs.

The HLFS rebase involves revising the statistical series back to the previous census (2001), to reflect revisions to population estimates and new exclusion ratios derived from the 2006 Census. Population benchmarks for the Māori ethnic group have also been introduced in the 2009 rebase, to improve the quality of Māori estimates. The incorporation of a Māori benchmark has resulted in revisions to both Māori and non-Māori labour force estimates back to the March 1986 quarter.

Revisions from the last HLFS population rebase were released in July 2004. Working-age population benchmarks incorporated results from the 2001 Census, and a number of technical improvements were made to enhance time series consistency, which meant the series was revised back to the March 1986 quarter. These improvements were:

- including residents temporarily overseas in the population benchmarks
- using ratios to account for military and non-military exclusions from the population benchmarks
- excluding non-private dwellings from the sample for quarters prior to June 1995
- the implementation of integrated weighting to quarters prior to June 1995.

## **Household Labour Force Survey working-age population benchmarks**

HLFS working-age population benchmarks are derived by applying exclusion ratios to the estimated resident population at a given date. The exclusion ratio takes account of individuals that are excluded from the estimated resident population, in order to match the benchmarks as closely as possible to the HLFS target population. Examples of excluded individuals are those living in residential care facilities, in public or private hospitals, or in prison or penal institutions. Military personnel are also excluded from the benchmarks. Census data is used in conjunction with administrative data to calculate the exclusion ratios. The estimated resident population is based on the census usually resident population count, updated for residents missed or counted more than once by the census (net census undercount); residents temporarily overseas on census night; and births, deaths and net migration between census night and the date of the estimate. Estimates of the HLFS working-age population are used to benchmark the HLFS estimates, by weighting the HLFS sample to match the estimate of the total population.

## **Māori population benchmarks**

Population benchmarks for the Māori ethnic group have been introduced in this rebase, to improve the quality and time series consistency of labour force estimates for this ethnic group. The method used for deriving Māori benchmarks is comparable with the method used for the total population. Census data is used in conjunction with administrative data to calculate exclusion ratios which account for individuals that fall outside the HLFS target population, and these ratios are then applied to the estimated resident population of Māori, to produce Māori working age population benchmarks. Benchmarks for other ethnic groups have not been introduced, as intercensal population estimates are unavailable for other ethnic groups.

Since Māori have different labour force characteristics, there are changes to both national and subnational estimates of labour force status.

With the introduction of Māori benchmarks, the average weight for Māori increases while the average weight for non-Māori experiences a smaller concomitant decrease. In addition, because the weights are integrated with respect to households, a non-Māori co-located with Māori would experience an increase in weight. A relatively large number of non-Māori experience a small decrease in weights and a relatively small number of Māori experience a larger increase in weight.

## **Analysis of impact from the 2009 rebase on HLFS estimates and introduction of Māori population benchmarks – unadjusted**

In the 2009 rebase, there are no differences between the original and revised working age population at the national level for the period March 1986 quarter to December 2000 quarter because the working-age population had been up-to-date based on past censuses.

Based on total response ethnicity output, for the period December 2007 quarter to December 2008 quarter, there were average upward revisions in the working-age population (WAP) for European (0.1 percent) and Māori (24.8 percent). The increase in WAP for Māori is estimated at an average of 82,700 people. The WAP for Pacific peoples, Asian, Middle Eastern/Latin American/African (MELAA) and 'other' ethnicity experienced average downward revisions.

There are shifts in the levels of the numbers of employed, unemployed and not in the labour force (NILF) as a result of reweighting. The differences before March 2001 are entirely due to the introduction of Māori population benchmarks. From March 2001 onwards, effects are generally due to both the population rebase and the introduction of Māori benchmarks. The relative contribution from each of the changes can differ between series.

The original employment estimates were higher than the revised employment estimates from the March 1986 quarter until the December 2002 quarter. By the March 2003 quarter, the revised estimates have become higher than the original estimates. This is the result of the movements in the number of employed by ethnic group, that is, the decrease in the number of non-Māori and an increasing number of Māori.

From the December 2007 quarter to the December 2008 quarter, the number of employed for Māori only and European/Māori have had average upward revisions, using the single/combination method of output for ethnic groups. Ethnic groups such as European only, Pacific peoples only, Asian only, MELAA, and 'other' ethnicity only experienced downward revisions for the number of employed. The following table summarises the average movements between the revised and original series by ethnic group for the main HLFS estimates.

<b>Average Percentage Change Between Originally Published and Revised Key Labour Market Indicators</b>			
<b>By ethnic group (based on single/combination output method)</b>			
<b>December 2007 quarter–December 2008 quarter</b>			
	Employed	Unemployed	NILF
European only	-1.4	-2.6	-0.8
Māori only	26.0	29.9	25.9
Pacific peoples only	-2.0	-2.3	-2.5
Asian only	-3.0	-3.9	-2.7
MELAA only	-2.9	-3.4	-3.0
Other ethnicity only	-1.2	S	-0.5
European/Māori only	22.4	27.3	23.6
Two or more groups not elsewhere included	5.8	8.2	7.2

**Note:** MELAA = Middle Eastern/Latin American/African  
S - suppressed

Using the total response ethnicity output method, the number of people employed for Māori and Pacific peoples had average upward revisions for the December 2007 quarter to the December 2008 quarter as a result of the reweighting. The reweighting had a negligible effect on the number of European employed. On the other hand, the number of employed for Asian, MELAA, and 'other' ethnicity experienced average downward revisions. The following table shows the average movements for the other main HLFS estimates.

<b>Average Percentage Change Between Originally Published and Revised Key Labour Market Indicators</b>			
<b>By ethnic group (based on total response output method)</b>			
<b>December 2007–December 2008 quarters</b>			
	Employed	Unemployed	NILF
European	0.0	1.0	0.5
Māori	24.4	28.7	25.1
Pacific peoples	0.3	0.3	-0.7
Asian	-2.8	-3.8	-2.5
MELAA	-2.6	-2.9	-2.7
Other	-1.0	S	-0.5

**Note:** MELAA = Middle Eastern/Latin American/African  
S - suppressed

It is important to note that estimates based on small sample sizes have a greater potential to be affected by the revisions.

## Seasonal adjustment

Seasonal adjustment aims to eliminate the impact of regular seasonal events on the time series. In the case of labour market, there are cyclical events that occur at around the same time each year that affect labour supply and demand. For example, in summertime there is a large pool of student labour that is both available for and actively seeking work. There is also an increased demand for labour in the retail sector and in many primary production industries.

Seasonal adjustment makes data for adjacent quarters more comparable by smoothing out the effect on the times series of any regular seasonal events. This ensures that the underlying movements in the time series are more visible. Each quarter, the seasonal adjustment process is applied to the latest and all previous quarters. This means that seasonally adjusted estimates for any of the previously published quarters may change slightly.

Each series is adjusted separately. For this reason, the sum of the seasonally adjusted estimates for employment, unemployment and people not in the labour force will usually not add up to the working-age population estimates.

All seasonally adjusted and trend series are produced using the X-12-ARIMA Version 0.2.10 package developed by the US Bureau of the Census.

## Trend series

For any series, the survey estimate can be broken down into three components: trend, seasonal and irregular. Trend series have had both the seasonal and irregular components removed, and reveal the underlying direction of movement in a series. Revisions to the trend series can be particularly large, especially if any estimates were considered to be outliers, but turn out to be part of the underlying trend. Typically, only the last two or three estimates will be subject to substantial revisions.

## Survey scope

The target population for the HLFS is the civilian, usually resident, non-institutionalised population aged 15 years and over. This means that the statistics in this release do not cover long-term residents of homes for older people, hospitals and psychiatric institutions; inmates of penal institutions; members of the permanent armed forces; members of the non-New Zealand armed forces; overseas diplomats; overseas visitors who expect to be resident in New Zealand for less than 12 months; and those aged under 15 years.

## Reliability of survey estimates

The HLFS sample contains about 15,000 private households and about 30,000 individuals each quarter. Households are sampled on a statistically representative basis from rural and urban areas throughout New Zealand, and information is obtained for each member of the household.

Each quarter, one-eighth of the households in the sample are rotated out and replaced by a new set of households. Therefore, the overlap between two adjacent quarters can be as high as seven-eighths. This overlap improves the reliability of quarterly estimates of change.

Two types of error are possible in estimates based on a sample survey: sampling error and non-sampling error.

Sampling error can be measured, and quantifies the variability that occurs by chance because a sample rather than an entire population is surveyed. A non-sampling error is very difficult to measure, and if present can lead to biased estimates. Statistics New Zealand endeavours to minimise the impact of these errors through the application of best survey practices and monitoring of known indicators (eg non-response).

Sampling errors are calculated for each cell in the published tables and for estimates of change between adjacent quarters. For example, the estimated total number of people employed in the December 2008 quarter is 2,227,900 before seasonal adjustment. This estimate is subject to a sampling error of plus or minus 21,900, or 1.0 percent (measured at the 95 percent confidence level). This means that there is a 95 percent chance that the true number of employed people lies between 2,206,000 and 2,249,800.

Smaller estimates, such as the number of people unemployed, are subject to larger relative sampling errors than larger estimates. For example, the estimated total number of people unemployed in the December 2008 quarter is 102,800 before seasonal adjustment. This estimate is subject to a sampling error of plus or minus 7,700, or 7.5 percent (measured at the 95 percent confidence level). This means that there is a 95 percent chance that the true number of unemployed people lies between 95,100 and 110,500.

Estimates of change are also subject to sampling error. For example, the survey estimate of change in total employment from the September 2008 quarter to the December 2008 quarter is an increase of 44,300. This estimate is subject to a sampling error of plus or minus 18,700 (at the 95 percent confidence level). Therefore, the true value of the change in surveyed employment from the September 2008 quarter to the December 2008 quarter has a 95 percent chance of lying between 25,600 and 63,000.

A change in an estimate, either from one adjacent quarter to the next, or between quarters a year apart, is said to be statistically significant if it is larger than the associated sampling error. Therefore, the example quoted above represents a significant movement.

In general, the sampling errors associated with sub-national estimates (eg breakdowns by regional council or ethnic group) are larger than those associated with national estimates.

## Response rates

The target response rate for the HLFS is 90 percent. The response rate is calculated by determining the number of eligible households who responded to the survey, as a proportion of the estimated number of total eligible households in the sample. The following table shows the HLFS response rates for the last five quarters. The response rate this quarter is lower than the target but still within acceptable bounds.

HLFS Response Rates	
Quarter	Response rate (%)
Dec 2007	87.8
Mar 2008	85.5
Jun 2008	85.8
Sep 2008	89.0
Dec 2008	88.4

## Definitions of labour force category

The labour force category to which a person is assigned depends on their actual activity during a survey reference week. The following definitions, which conform closely to the international standard definitions specified by the International Labour Organization, are used for the HLFS:

**Working-age population:** The usually resident, non-institutionalised, civilian population of New Zealand aged 15 years and over.

**Labour force:** Members of the working-age population who during their survey reference week were classified as 'employed' or 'unemployed'.

**Employed:** All persons in the working-age population who during the reference week worked for one hour or more for pay or profit in the context of an employee/employer relationship or self-employment; or worked without pay for one hour or more in work which contributed directly to the operation of a farm, business or professional practice owned or operated by a relative; or had a job but were not at work due to: own illness or injury, personal or family responsibilities, bad weather or mechanical breakdown, direct involvement in an industrial dispute, or leave or holiday.

**Unemployed:** All persons in the working-age population who during the reference week were without a paid job, available for work and had either actively sought work in the past four weeks ending with the reference week, or had a new job to start within the next four weeks.

**Not in the labour force:** Any person in the working-age population who is neither employed nor unemployed. For example, this residual category includes persons who:

- are retired
- have personal or family responsibilities such as unpaid housework and childcare
- attend educational institutions
- are permanently unable to work due to physical or mental disabilities
- were temporarily unavailable for work in the survey reference week
- are not actively seeking work.

**Unemployment rate:** The number of unemployed persons expressed as a percentage of the labour force.

**Labour force participation rate:** The total labour force expressed as a percentage of the working-age population.

This definition of labour force participation includes all those aged 15 years and over in the numerator (the total labour force) and the denominator (the working-age population). This definition is the most appropriate for the New Zealand labour market, as New Zealand does not have a compulsory retirement age, and many workers stay in the labour force beyond the age of 65. Using this definition also means that the measure will reflect changes in labour market demographics, in particular the increasing number of employees working beyond 65 years.

Several alternative definitions of labour force participation rate are in use by other organisations; they differ in regard to age of the working-age population and the inclusion of military personnel. A common definition is to restrict the labour force and working-age population to the 15- to 64-year age group, particularly in countries with a compulsory retirement age. Generally, this definition leads to a higher figure. Using this definition for the New Zealand HLFS in the December 2008 quarter gives a surveyed figure of 79.0 percent.

## **Ethnic statistics**

In the old series, the Māori working-age population was not benchmarked to population estimates. This, along with other sample design restrictions, caused a high degree of volatility in Māori statistics of the HLFS. Movements in the working-age population estimates of certain ethnic groups such as Māori may be a reflection of this volatility, rather than a real change in the estimated ethnic demographic.

Including Māori benchmarks in the working-age population mitigates the known undercount of the Māori working-age population in the HLFS and also results in smoother time series for Māori. It should be noted that introducing the Māori population benchmarks does not necessarily translate to improved estimates for non-Māori ethnic groups.

In the September 2008 quarter, the HLFS started publishing ethnicity data using the single/combination output method. This created a complete break in the ethnicity series, as the prioritisation of ethnic groups was no longer produced. Using the single/combination ethnicity output, people are counted just once according to the ethnic group or combination of ethnic groups they have reported. This means that the total number of responses equals the total number of people who stated an ethnicity.

In the December 2007 quarter, the HLFS began collecting ethnicity data using the 2005 New Zealand standard classification of ethnicity. The new single/combination ethnicity tables contain five quarters worth of data using the 2005 classification. The 2005 classification of ethnicity enables the HLFS to collect and output more detailed ethnicity data, especially for the Asian ethnic group, which was not previously collected.

Using the total response ethnicity output, people who reported more than one ethnic group are counted once in each group reported. This means that the total number of responses for all ethnic groups can be greater than the total number of people who stated their ethnicities. The table below shows total response for the September 2008 and December 2008 quarters of the Household Labour Force Survey.

<b>Total Response HLFS Ethnicity Data for Working-age Population<sup>(1)</sup></b>		
<b>Ethnic group</b>	<b>September 2008 quarter</b>	<b>December 2008 quarter</b>
European	2,574,200	2,582,200
Māori	417,900	419,500
Pacific peoples	179,900	179,300
Asian	321,100	324,100
MELAA <sup>(2)</sup>	35,200	27,500
Other	34,800	40,600

(1) The sum of ethnic groups will not add up to the total working-age population as the total response method of grouping ethnicity data counts each response given by an individual.

(2) MELAA = Middle Eastern/Latin American/African.

To read about the 2005 New Zealand standard classification of ethnicity please go to the Statistics NZ website, [www.stats.govt.nz](http://www.stats.govt.nz).

## **Household statistics**

A household's labour force status is derived by looking at the labour force status of members in the household aged between 18 and 64 years. For example, if a couple is living by themselves and one is aged 64 and the other is aged 65, this couple will be assigned to the 'All employed' or 'None employed' category, depending on the labour force status of the 64-year-old.

Households that have no members between the ages of 18 and 64 years have been excluded from this analysis.

The household categories incorporate the concept of dependent children rather than just children. A child is a person of any age who usually resides with at least one parent (natural, step, adopted, or foster) and who does not usually reside with a partner or child(ren) of his or her own. Statistics NZ defines a dependent child as a child aged under 18 years and not in full-time employment.

## **More information**

For more information, follow the [link](#) from the technical notes of this release on the Statistics NZ website.

## **Copyright**

Information obtained from Statistics NZ may be freely used, reproduced, or quoted unless otherwise specified. In all cases Statistics NZ must be acknowledged as the source.

## **Liability**

While care has been used in processing, analysing and extracting information, Statistics NZ gives no warranty that the information supplied is free from error. Statistics NZ shall not be liable for any loss suffered through the use, directly or indirectly, of any information, product or service.

## **Timing**

Timed statistical releases are delivered using postal and electronic services provided by third parties. Delivery of these releases may be delayed by circumstances outside the control of Statistics NZ. Statistics NZ accepts no responsibility for any such delays.

## Tables

The following tables are printed with this Hot Off The Press and can also be downloaded from the Statistics New Zealand website in Excel format. If you do not have access to Excel, you may use the [Excel file viewer](#) to view, print and export the contents of the file.

1. Working-age population estimates by age group and sex
2. Percentage change between originally published and revised key labour market indicators
3. People employed, unemployed and not in labour force
4. Total actual hours worked