

## **Wage Subsidy Survey - Technical information**

### **Response rate**

A survey invitation was emailed to all 381,093 businesses who had received the Wage Subsidy by 9 May 2020. As all businesses were surveyed no random sampling was required.

94,725 businesses completed the survey. Some businesses on our original list of Wage Subsidy recipients reported that they were ineligible or had subsequently returned their money due to business being better than expected, which meant they didn't answer many of the questions. This left 90,134 businesses who reported receiving the Wage Subsidy.

The response rate was 25 percent, i.e. 25 percent of those who were emailed a survey invitation completed a questionnaire. For New Zealand research industry standards this is a high response rate for an online business survey. We assume that this is because of the high degree of interest in the subject and also a degree of reciprocity given respondents have already received substantial help from MSD.

For New Zealand research industry standards this is also a much larger sample than is the norm.

### **Accuracy of the data**

The population of interest for this survey is all New Zealand businesses who received the Wage Subsidy. In order to be comfortable with the accuracy of the data the responses need to be representative of this population across key business demographics. In this case we are interested in the following demographics:

- Industry
- Number of employees
- Region
- Tourism
- Businesses identifying as Māori or Pacific

Information on these demographics for businesses receiving the Wage Subsidy comes from two sources; the [MSD Wage Subsidy Dashboard](#), and Treasury analysis using the IDI.

#### *Industry*

In New Zealand a business's industry is classified using [ANZSIC06](#).

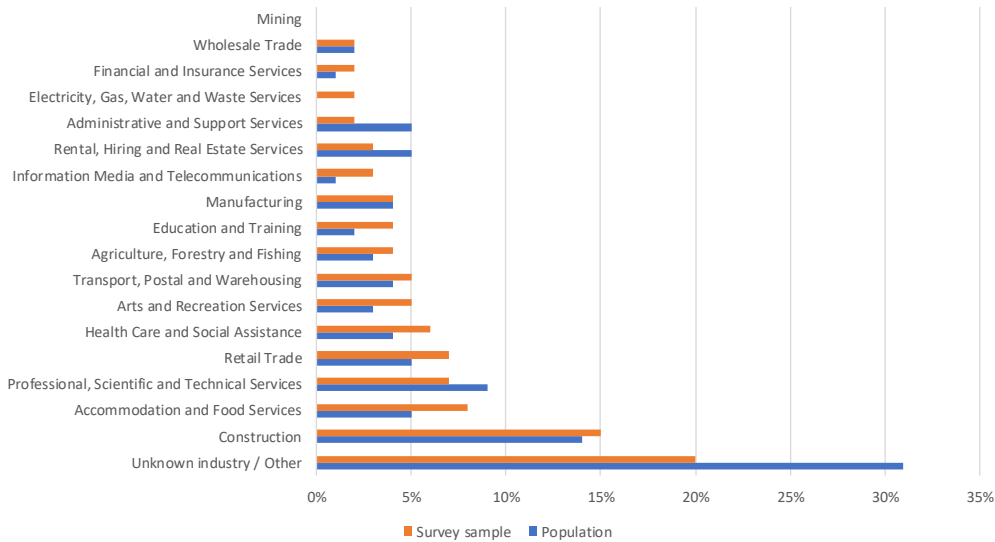
The MSD Wage Subsidy Dashboard reports the number of businesses that have received the Wage Subsidy by industry. Figure 1 shows that there is good alignment between these and the survey respondents. There is a maximum difference of three percentage points for a few industries (accommodation and food services, and administrative and support services).

However, you will note that there is a large number of unknown / other industries for both the Wage Subsidy recipients and survey respondents. Care should be taken in interpreting industry results because of these large unknown / other numbers.

A large number of businesses categorise themselves in the 'Other Services' category because there are some industries that are harder for businesses to self-identify into. For

these industries there is a lower proportion of survey respondents than we would expect from the population proportion. These industries include 'Administrative and Support Services', 'Professional, Scientific and Technical Services', and 'Rental, Hiring and Real Estate Services'.

**Figure 1: Proportion of businesses by industry for all Wage Subsidy recipients and survey respondents**



### Number of employees

The MSD Wage Subsidy Dashboard also presents information on Wage Subsidy recipients by the number of employees. This provides useful information on the target population in which to compare survey respondents against.

New Zealand businesses are largely made up of small businesses. Over half (54 percent) of all businesses that received a Wage Subsidy had no employees (sole traders) and a further 44 percent had between one and 19 employee(s). The survey respondents are representative of this demographic in that 97 percent have less than 20 employees.

As a result, overall findings from this survey are heavily influenced by small businesses and we should be careful when generalising those results to large businesses. For example, while six percent of all businesses reported intending to make staff redundant in the future, this figure was significantly higher for businesses with 100 or more employees (38 percent).

We can also check the response rate by business size to determine the accuracy of the data (table 1). There are no extremely low (or high) response rates across business size, which provides more confidence in the accuracy of the data.

**Table 1: Response rate by business size**

Business size	Response rate
No staff	25 percent
1 to 19 employees	20 percent
20 to 49 employees	30 percent

50 to 79 employees	32 percent
80 to 100 employees	34 percent
100 plus employees	36 percent

Lastly, we have compared the representativeness of the responses by industry and business size. This gives us an indication of whether there is some bias within small or big businesses. Table 2 below shows that while there is variation between the population and survey responses, there are several patterns that suggest reliability in the survey data. The largest industries in total (construction, and professional, scientific and technical services) are the same within the survey responses across small and large businesses. Secondly, where there is a large difference in industry size between businesses with no staff and those with employees, that difference largely exists in the survey respondents.

**Table 2: Proportion of businesses by industry and business size for all Wage Subsidy recipients and survey respondents**

Industry	No staff		Employees	
	Population	Survey	Population	Survey
Accommodation and Food Services	1.5%	4.8%	8.6%	12.5%
Administrative and Support Services	5.5%	2.9%	4.6%	1.0%
Agriculture, Forestry and Fishing	2.6%	3.2%	3.9%	4.7%
Arts and Recreation Services	2.9%	6.9%	2.1%	3.0%
Construction	12.6%	13.8%	16.6%	16.2%
Education and Training	1.9%	5.2%	1.7%	3.5%
Electricity, Gas, Water and Waste Services	0.1%	1.5%	0.3%	1.9%
Financial and Insurance Services	0.8%	2.1%	1.4%	1.7%
Health Care and Social Assistance	4.0%	7.3%	4.1%	4.9%
Information Media and Telecommunications	1.5%	3.5%	1.0%	2.1%
Manufacturing	2.5%	2.3%	6.6%	6.2%
Mining	0.0%	0.1%	0.1%	0.1%
Other Services	5.2%	22.4%	7.2%	17.5%
Professional, Scientific and Technical Services	8.6%	8.0%	10.1%	6.0%
Public Administration and Safety	0.2%	0.2%	0.3%	0.1%
Rental, Hiring and Real Estate Services	6.0%	4.2%	3.5%	1.9%
Retail Trade	2.9%	4.7%	8.4%	10.0%
Transport, Postal and Warehousing	4.8%	5.5%	3.1%	3.5%
Wholesale Trade	1.1%	1.3%	4.0%	3.2%
Unknown industry	35.2%		12.6%	

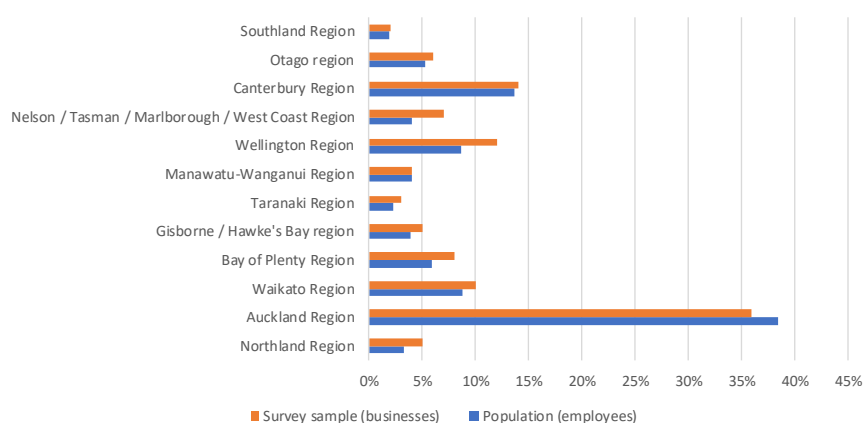
## Region

It is more difficult to compare differences by region because we do not currently have this information for businesses that received the Wage Subsidy. However, Treasury have looked at regional data that can be used as a comparison for the spread of survey respondents by region.

Figure 2 shows that the spread of survey respondents by region was fairly similar to the spread of employees covered by the Wage Subsidy, suggesting the sample is representative by region.

In the Wage Subsidy Survey, respondents were asked to identify **all** the regions that they normally have staff based in, which means businesses could identify multiple regions. Therefore, the totals in figure 2 add to more than 100 percent.

**Figure 2: Proportion of businesses and employees by region**



## Tourism

There is no comparable information on the proportion of revenue that businesses receive from tourism for all businesses that received the Wage Subsidy. However, Stats NZ ask a similar question in the Business Operations Survey (BOS), which provides estimates on all businesses. Compared to data from the BOS, Wage Subsidy survey respondents were more likely to receive revenue from tourism (30 percent from the Wage Subsidy Survey compared with around 17 percent for BOS). This is somewhat understandable given that it is likely that a very high proportion of businesses reliant on tourism would have applied for the Wage Subsidy.

## Māori and Pacific businesses

There are difficulties in finding information to compare to the proportion of respondents who identified as a Māori or Pacific business. There is no information on whether businesses that received the Wage Subsidy identify as a Māori or Pacific business. Difficulties defining Māori and Pacific businesses add further complications but a discussion on this sits outside the scope of this paper.

However, in the Wage Subsidy Survey businesses were asked to self-identify whether they were a Māori business using a question very similar to one asked in Stats NZ's BOS. The latest BOS found that around four percent of businesses self-identified as a Māori business, a similar proportion to our responses to the Wage Subsidy Survey.

### *Other response bias*

Being an opt-in survey there remains the possibility of response-bias, in which people who reflect a typical profile are more or less likely to respond than the sample as a whole. This can never be wholly mitigated.

### **Reliability of survey results**

Using surveys leads to two types of error in results; sampling error and non-sampling error. Sampling error occurs by chance because a sample rather than the entire population is surveyed. We can quantify the sampling error through the margin of error.

Non-sampling errors are all errors that are not sampling errors. These errors are not quantifiable and include unintentional mistakes by respondents. Good questionnaire and survey design attempt to minimise these errors. However, there will always be some level of non-sampling error present.

### **Margin of error**

The statistical margin of error on a survey result (P) is a function of the result itself, and the size of the survey sample (n). The margin of error we have used is set at 99% confidence, meaning that we can be confident that if we did 100 separate surveys, in the same way, the results from 99 of those would fall within the margin of error.

The formula for calculation of the margin of error at 99 percent confidence is:

$$Margin = \pm 1.99 \sqrt{\frac{(100-P)P}{n}}$$

The maximum margin of error occurs when P=50 percent, ie. when the survey result is close to the midpoint.

As the margin of error varies according to the answers given and the size of the sub-sample answering a given question, the statistical significance of every result is calculated individually.

So, in our full sample (90,134), for an answer in which 50 percent of the sample answer in a given way, we can be confident that 99% of the time the answer lies between 49.634 percent and 50.366 percent (i.e. plus or minus the margin of error of **0.366 percent**).

As the sample becomes less divided, the margin of error reduces. So, for example if we have an answer where the sample is split 75/25 (instead of 50/50) the margin of error reduces even further, to 0.325 percent.

However, if we use a smaller sub-sample for a result, say Māori businesses (3,468), the margin of error increases. We can be confident that 99 percent of the time the result lies between 47.813 percent and 52.187 percent (i.e. plus or minus the margin of error of **2.187 percent**). The smaller the sample size the less certain we are that the result is accurate.

Table 1 shows the approximate margin of errors you can expect on survey results of 50 percent when using different sized samples.

**Table 1: Approximate margin of errors on results of 50 percent, by sample size**

<b>Sample size</b>	<b>Margin of error</b>
90,134	±0.366 percent
20,000	±0.884 percent
10,000	±1.269 percent
5,000	±1.808 percent
1,000	±4.067 percent
100	±12.878 percent