

## INTRODUCTION

The Ministry of Womens Affairs says that the gender pay gap still exists, and the causes are a variety of social and political issues. The below table shows how the pay gap between men and women in NZ still exist.

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gender pay gap (%)	12.44	12.67	14.19	12.47	11.79	13.00	11.25	10.60	9.60	9.30	10.1

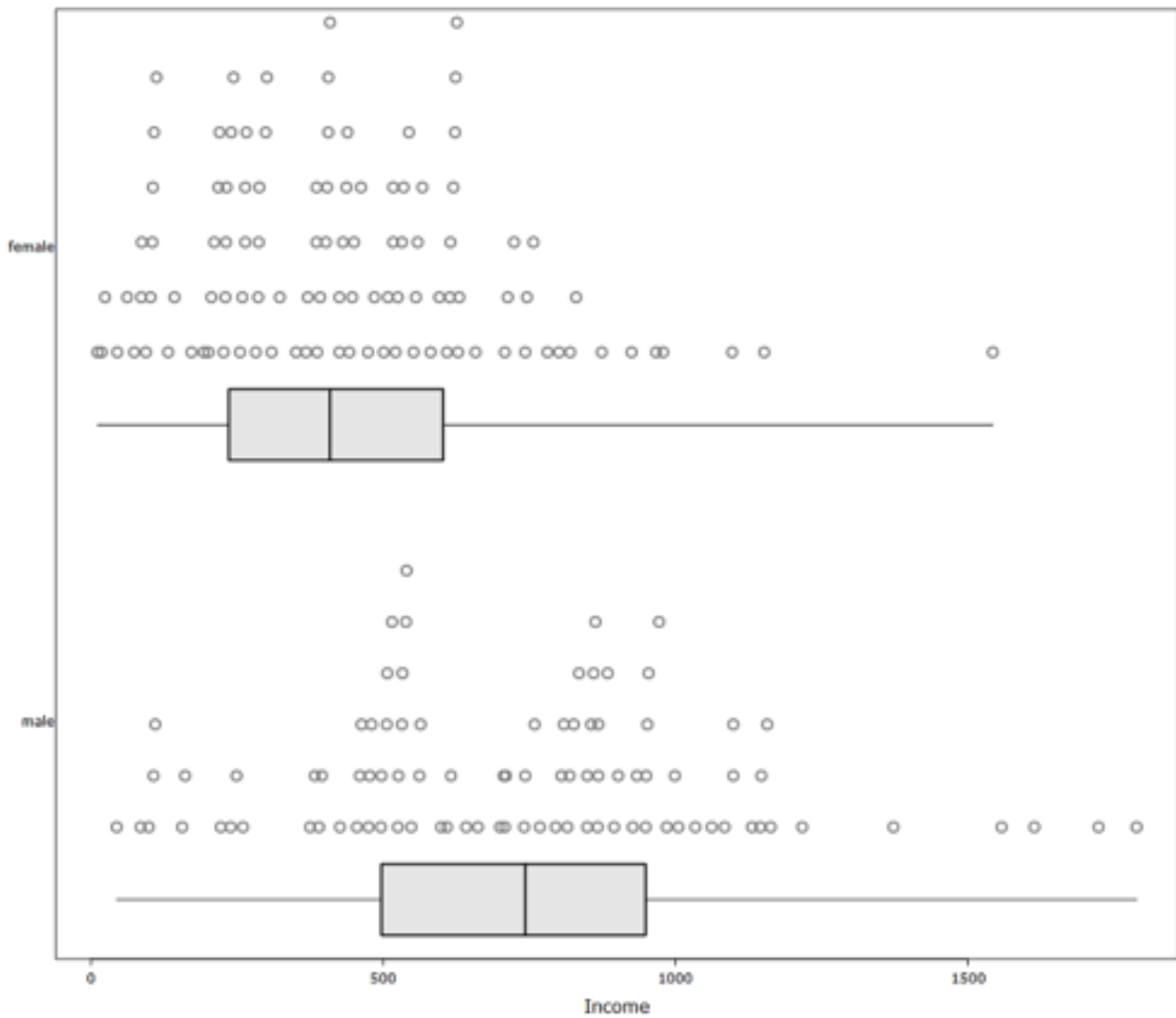
Source: Statistics New Zealand: New Zealand Income Survey

<http://mwa.govt.nz/gender-pay-gap-0>

I will investigate the difference between the male median weekly income (in \$) compared with the female median weekly income (in \$), amongst the New Zealand population between the ages of 25 and 64 who participate in paid work.

I expect to find that male weekly income (\$) is higher than female weekly income (\$).

Gender versus Income



5 POINT SUMMARY	Male (\$)	Female (\$)
Minimum	\$44	\$11
Lower Quartile (LQ)	\$497	\$236
Median	\$743	\$409
Upper Quartile (UQ)	\$949	\$602.50
Maximum	\$1789	\$1543
Interquartile range (UQ - LQ)	\$452	\$366.50
Sample size	93	107

## **ANALYSIS: Technical notes**

### Centre

[S,N,C] I notice that the sample median female income is \$409 per week compared with the sample median male income of \$743 per week. The sample median income for males is \$334 per week larger than the sample median income for females.

[P] This suggests that there is, on average, a difference between male and female median weekly income in the New Zealand population. Males, on average, seem to earn more than females per week.

**OR**

[S,N,C] I notice that the sample distribution of female weekly income appears to be right skewed compared with the sample distribution of male weekly income which appears to be normally distributed.

[P] This suggests that there is, on average, a difference between male and female median weekly income in the New Zealand population. Males, on average, seem to earn more than females per week.

### Spread

[S,N,C] I notice that the sample middle 50% of female weekly income is between \$236 per week, and \$602.50 per week, compared with the sample middle 50% of male weekly income which is between \$497 per week and \$949 per week. The males have a larger middle 50% (IQR = \$452) than the females middle 50% (IQR = \$366.50).

[P] This suggests that some males in the New Zealand population earn the same median weekly income as females in the New Zealand population

**OR**

[S,N,C] I notice that the sample middle 50% of male weekly income is shifted further up the scale compared with the sample middle 50% of female weekly income.

[P] This suggests that most males in the New Zealand population earn a higher median weekly income compared with females.

### Unusual Features

There is an outlier in the female weekly income sample data at \$1543. The reason this is unusual, is that the nearest point is at \$1152 per week. It is possible that this female is a highly paid CEO or other top level manager.

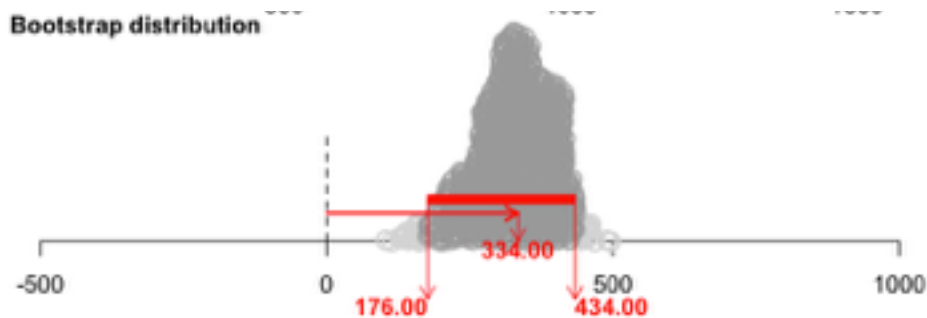
There are no outliers in the male weekly income.

	Evidence of difference	Evidence of NO difference
Centre: median	Yes	
Centre: sample distribution	Yes	
Spread: middle 50%		Yes
Spread: shift	Yes	Yes
Spread: overlap	N/A	N/A

## CONCLUSION: Executive summary

All of the features analysed in the sample data tell me that there is could well be a difference in the median weekly income of male and females in New Zealand.

Different samples of a similar sample size from the New Zealand population between the ages of 25 and 64 who participate in paid work will produce sample medians that will vary, and therefore different results to mine. I will test my result by taking 1000 re-samples of the sample.



The bootstrapped confidence interval tells me that it is a fairly safe bet that the median income of males from the New Zealand population between the ages of 25 and 64 who participate in paid work, is *higher* than the median income of females from the New Zealand population between the ages of 25 and 64 who participate in paid work, by between \$176 per week and \$434 per week.

There **is** a difference between median male weekly income (in \$) compared with median female weekly income (in \$), amongst the New Zealand population between the ages of 25 and 64 who participate in paid work because the bootstrapped confidence interval does not contain zero. I can be fairly sure that median male weekly income is higher than median female weekly income.

## References

Te Ara Encyclopedia of New Zealand. (2013). Women's Labour Organisations. Retrieved <http://www.teara.govt.nz>

Catalyst Inc. (2013). Women's Earnings and Income. Retrieved from <http://www.catalyst.org>