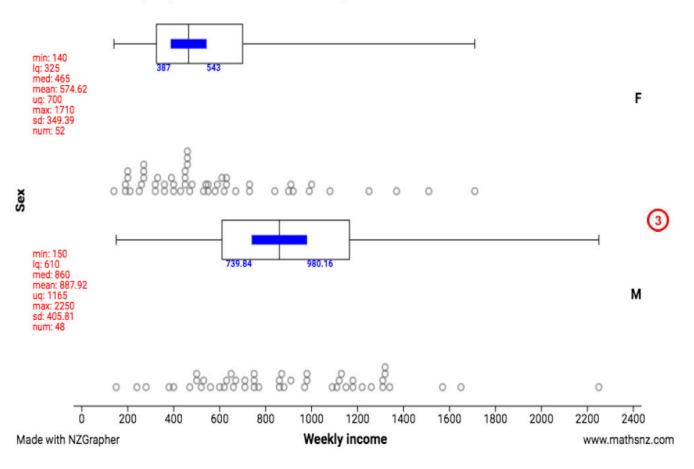**Question:**

In the statistics nz survey (SURF) is the median weekly income for a female in New Zealand less than the median weekly income for a male in New Zealand?

①

Prediction:

I predict that the median weekly income amount a male gets will be more than the median weekly income a female gets because males generally work longer hours.

Sampling:

I have chosen a sample size of 100 because it is a good amount to work with, it isn't too large or too small and I am able to see accurate results. I have chosen to go with a simple random sample because it's an easy way to collect data without being bias.

②

min: 140
lq: 325
med: 465
mean: 574.62
uq: 700
max: 1710
sd: 349.39
num: 52

387   543

F

Sex

③

min: 150
lq: 610
med: 860
mean: 887.92
uq: 1165
max: 2250
sd: 405.81
num: 48

739.84   980.16

M

0   200   400   600   800   1000   1200   1400   1600   1800   2000   2200   2400

Weekly income

Made with NZGrapher   www.mathsnz.com

Centres:

I notice that the median amount a male gets per week ($860) is more than the median amount a female gets per week ($465). There is a difference of $395. The males mean ($887.92) is also greater than the females mean ($574.62) This means for this sample there is quite a big difference between the weekly income amount of a male in NZ and the weekly income amount of a female in NZ.

Shapes:

The shape of the distribution of data for the weekly income amount that a male gets tends towards a more uniform distribution whereas the shape of the distribution of data for the weekly income amount a female gets tends towards more of a right skew.

Spread:

I notice that the IQR of the males ($555) is more than the IQR of the females ($375). The males ($2100) also have a bigger range than the females ($1570). The data for the males sits just right of the females data with the boxes slightly overlapping.

The smaller IQR for the females means that there are more values clustered around the median whereas since the males IQR is larger it means that the values are more spread out.

④

Back in the population the range would suggest that the males tend to get a bigger weekly income amount than the females do due to the fact that the ranges are so different in size.

Overlap:

50% of the males data is more than 75% of the females data. This means that quite a few males get a bigger weekly income amount than the females. Back in the population we would expect that quite a few males would get a bigger weekly income amount as the difference is quite significant.

Unusual features:

In the males data there is an outlier that sits around the $2200-$2400 weekly income amount mark. This could be due to this person having a very difficult job that pays extremely well like a surgeon, a CEO of a company or owning a building company.

Confidence intervals:

The confidence intervals don't overlap, $387 to $543 for females and $739.84 to $980.16 for males. In fact there is quite a difference between them so we can be reasonably confident that males get a bigger weekly income amount than the females.

Sampling variability:

If we took another sample we would almost certainly get different results as the sample data would be different and the confidence intervals wouldn't be the same. However we would expect the median to lie within the confidence intervals generated by the sample.

⑤

Conclusion:

In conclusion I found that in this sample my prediction was correct and the median weekly income amount a male gets tends to be more than the median weekly income amount a female gets. This could be due to a number of different things and because it's such a controversial topic it is hard to know for certain who earns more but for this specific sample of data it does show that males get a bigger weekly income amount. If I were to sample differently this could affect the outcome because if I were to take a smaller sample the data would be closer together and I am fairly confident that the confidence intervals would end up overlapping more.

⑥