




The University of Auckland
DEPARTMENT OF STATISTICS

Supported by
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Intro to Inference Lecture 1

Statistics Department
University of Auckland
New Zealand

C7, S1




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compared with 83% of Wellington folk. And, of course, darlings, Aucklanders prefer coffee to tea to kick-start the day.
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C7, S2




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Aucklanders lack in sustenance but sure make up for it in style *NZ Herald 25/8/98*
Auckland women spend six minutes applying makeup, two minutes longer than women in Wellington and Dunedin. But Christchurch women take the make-up cake, at eight minutes. Aucklanders are less likely to have breakfast – only 61% do so, compared with 83% of Wellington folk. And, of course, darlings, Aucklanders prefer coffee to tea to kick-start the day.
The survey launches a new liquid Sanitarium breakfast, which the company says has the same nutritional value as two Weet-Bix and milk – so busy commuters can drink on the run.

The vanity jibes from people south of the Bombays have been borne out in a Sanitarium Health Food survey of 100 people in Auckland, Wellington, Dunedin and Christchurch.

C7, S3



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US waistlines lowering ships' waterlines

On American passenger ships, expanding waistlines are lowering hull lines, forcing the authorities into action.

The United States Coast Guard has raised its average passenger weight from 72.5kg to 84kg. It is the first time it has done so since the 1960s.

Ashes on the Sea, a California based company that conducts ocean burials, is concerned the new rules will force them to raise prices. Anticipating less usable space on many of the 50 boats he charts in five states, Ken Shortridge said the change could add several hundred dollars to the cost of each service.

He said overloaded boats are more likely to capsize.

People have just got heavier," said Coast Guard spokeswoman Lisa Novak.

The Coast Guard has followed the lead of other transport administration bodies. The Federal Transit Administration, with responsibility for the nation's buses, still tests vehicles as if the average rider weighs 68kg. It has just proposed a jump to 79kg. Prompted by a 2003 plane crash in North Carolina, the Federal Aviation Administration has raised its average weight estimate from 77kg to near 86kg.

NZ Herald 29/4/11

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NZ Herald 29/4/11

... it is a blow to many commercial boat operators, who will be forced to reduce capacity.

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That the average American is a touch portlier than 50 years ago may not come as a huge surprise but it is a blow to many commercial boat operators, who with limited space could add several hundred dollars to the cost of each service.

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NZ Herald 29/4/11

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NZ Herald 29/4/11


Weights of male students

Actual weight (kg)	62	68	Ideal weight (kg)
	M	110	
Gender			Fastest speed driven (km/h)

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Weights of male students

Population distribution (predicted)



Weight (kg)

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Weights of male students

- What is the average weight of this population of 521 male Stage 1 University of Auckland Statistics students?

C7, S14

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Weights of male students

- What is the **median** weight of this population of 521 male Stage 1 University of Auckland Statistics students?

C7, S15

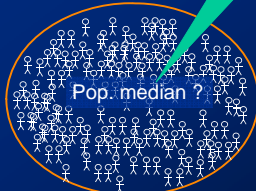
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Weights of male students

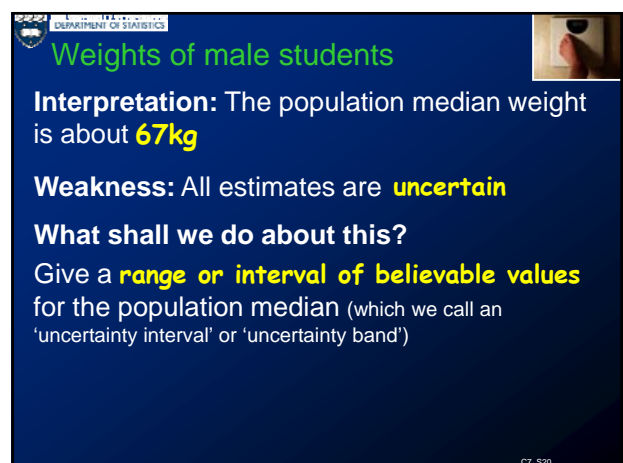
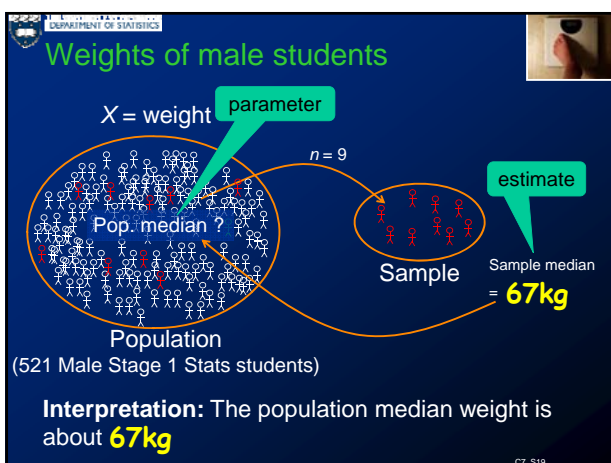
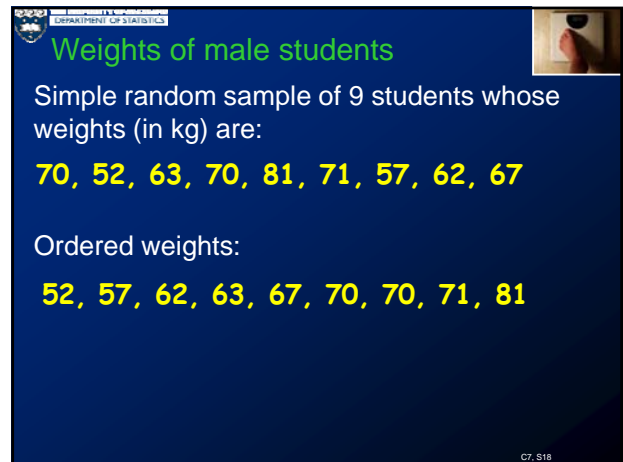
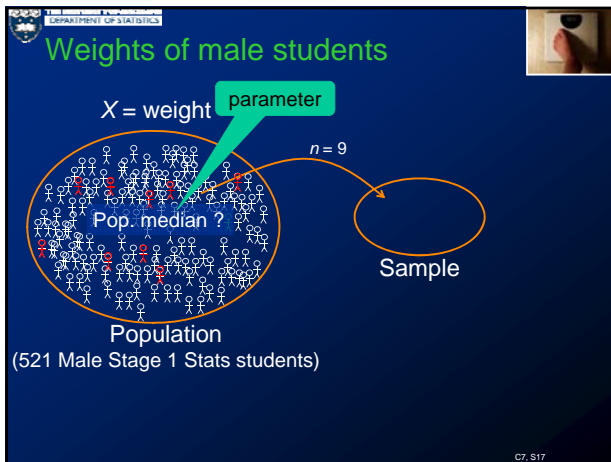
$X = \text{weight}$ parameter

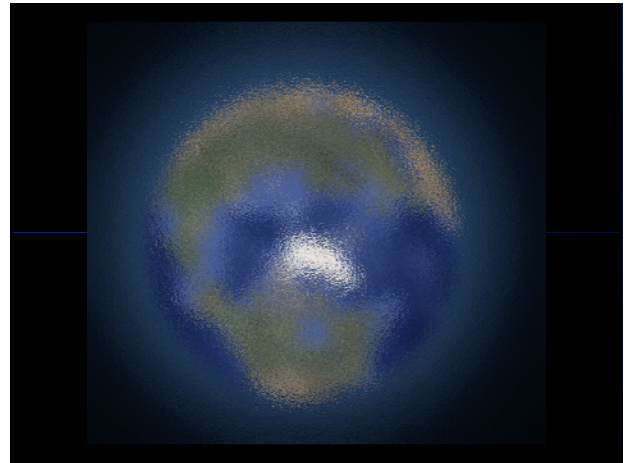
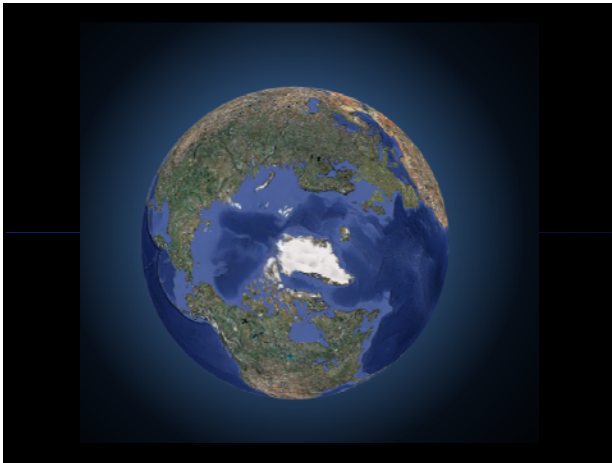
Pop. median ?

Population
(521 Male Stage 1 Stats students)



C7, S16





Weights of male students

Interpretation: The population median weight is about **67kg**

Weakness: All estimates are **uncertain**

What shall we do about this?
 Give a **range or interval of believable values**
 ('uncertainty interval' or 'uncertainty band')

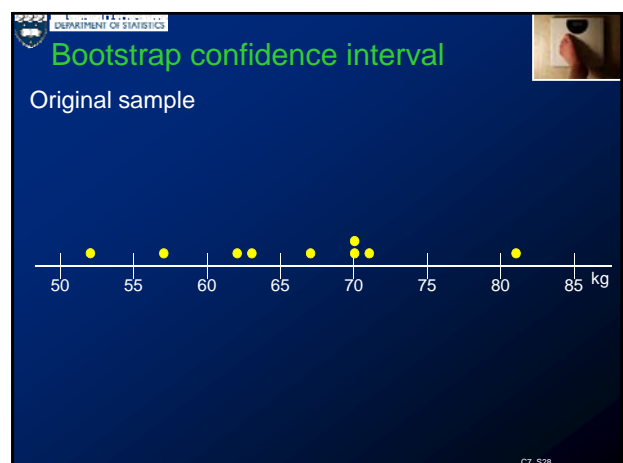
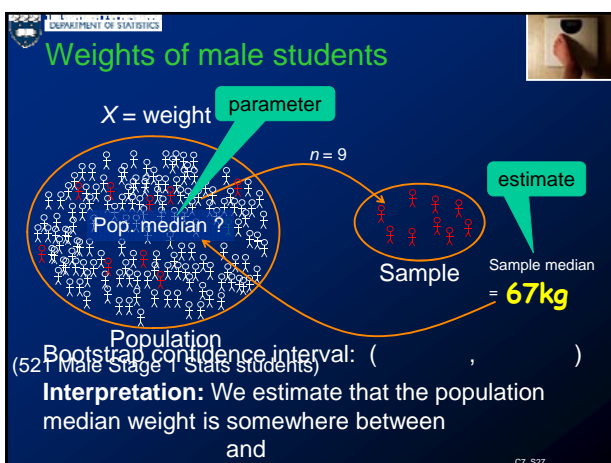
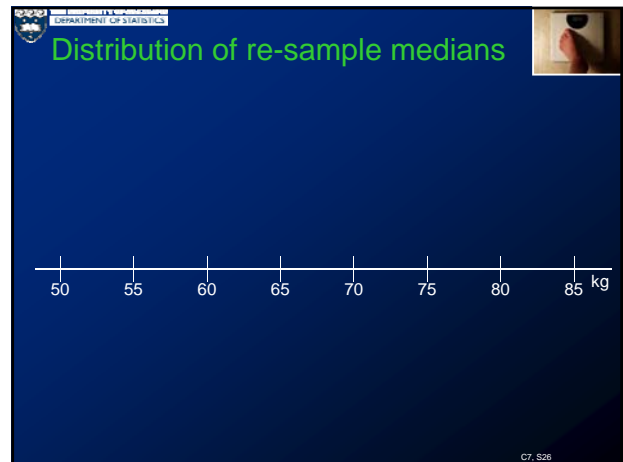
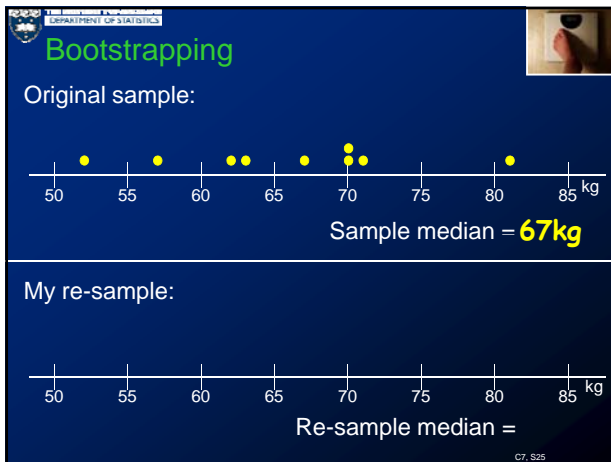
How shall we do this?
 Treat the sample as if it were the population
 Re-sample from the sample, with replacement
 We call this **bootstrapping**

C7, S23

Bootstrapping

- From the original sample, randomly sample (with replacement) until the re-sample size equals the original sample size
- Calculate the median of the re-sample (bootstrap sample)
- Do many re-samples
- Use the medians of the re-samples to calculate an interval that has a good chance of containing the population median

C7, S24



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That the average American is a touch portlier than his European counterpart may not come as a huge surprise, but it is a blow to the shipping industry.

Ashes on the Sea, a California based company that conducts ocean burials, is concerned the new rules will force them to raise prices. Anticipating less usable space on many of the 50 boats he has, the company is planning to build more.

It has just proposed a jump to 79kg. Prompted by a 2003 plane crash in North Carolina, the Federal Aviation Administration has raised its average weight estimate from 77kg to near 86kg.

9/4/11

C7, S29

The United States Coast Guard has raised its **average passenger weight** from **72.5kg** to **84kg**. It is the first time it has done so since the 1960s.

Why does this method work so well?

[Link to pdf](#)

C7, S30

Aucklanders spend an average of five minutes doing their hair in the morning compared with three minutes for people in the other cities. They also spend six minutes getting dressed, two minutes longer than people in Christchurch and Dunedin.

Aucklanders brush their hair for the most part, while people in the other cities at least try to do it. The survey of 100 people in Auckland, Wellington, Christchurch and Dunedin found that Aucklanders spend an average of five minutes doing their hair in the morning compared with three minutes for people in the other cities. They also spend six minutes getting dressed, two minutes longer than people in Christchurch.

compared with 83% of Wellington folk. And, of course, darlings, Aucklanders prefer coffee to tea to kick-start the day.

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C7, S31

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Time to do hair (Aucklanders)

$X = \text{time}$ parameter

$n = 100$

Pop. average ?

Population (Aucklanders)

Sample

Estimate = 5 mins

C7, S32

