

## VCAA Year 7 curriculum

Students identify or calculate **mean, mode, median** and range for data sets, **using digital technology for larger data sets.**

ABS Quickstats is good for

*interesting questions and real, accessible data*

*introduction to spreadsheeting skills*

Age group	Post code Population	Cumulative population
0-4 years	846	846
5-9 years	860	1706
10-14 years	1,040	2746
15-19 years	1,331	4077
etc	etc	etc
<b>25-29 years</b>	2,666	<b>8917</b>
<b>30-34 years</b>	2,320	<b>11237</b>
<b>35-39 years</b>	etc	etc
85 + years	409	<b>22326</b> <b>=2 x 11163</b>

### Median Calculations

Students download the first two spreadsheet columns and learn how to obtain the cumulative population.

For a population of 22326 people, we need the age of the 11,163<sup>rd</sup> person.

We need to interpolate between the age of the 8917<sup>th</sup> person and the age of the 11,237<sup>th</sup> person.

But what ages are these people? Some might say from 29 to 34, leading to a median of **33.84**.

More correctly 30 to just less than 35, leading to a median of **34.84**

The ABS says the median is **34**. They round down.

Age group	Mid age	Pop	Mid age x pop	<b>Mean Calculations</b>  Students decide the middle of each age group* and enter these values in a new column.  They need a new column for the mid-age x population calculations.  They sum the figures in the relevant columns.  Estimated mean $\frac{855809}{22325} = \mathbf{38.3}$ *or <b>38.8</b> if mid-ages are 2.5, 7.5 etc
0-4 years	2	846	1692	
5-9 years	7	860	6020	
10-14 years	12	1,040	12480	
etc				
Column sums		22325	855809	

### Discussion for students:

Is age a whole number – and why does the ABS say the median age is 34, rather than 34.8 or 35?

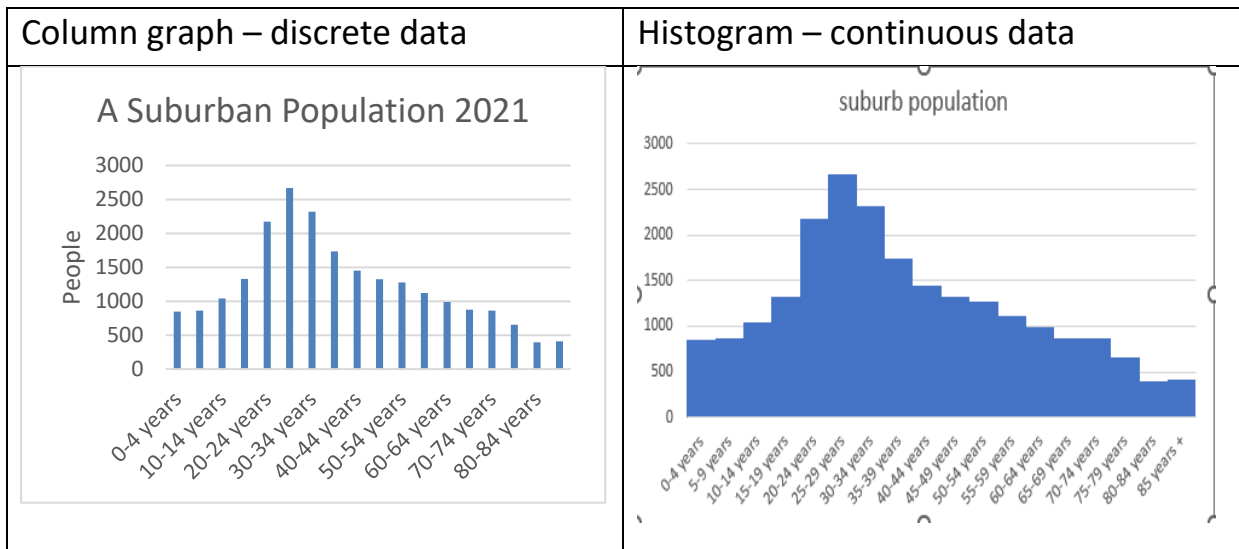
When was the ‘average’ Australian born? (Census Day was 10<sup>th</sup> September 2021.)

What makes the mean greater than the median, 38.8 cf 34.8?

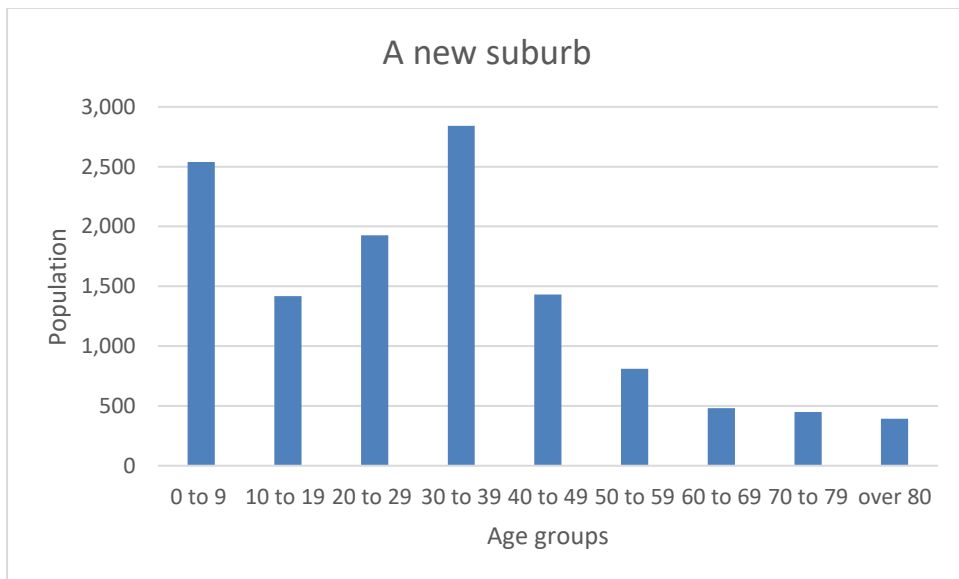
Can you think of any real distributions that should have the mean less than the median?

Make up a question for which the mean age is the more appropriate statistic than the median age.

Which graph is the right one?



For a newly populated suburb:-



The mean age might not help.

The median age would be misleading.

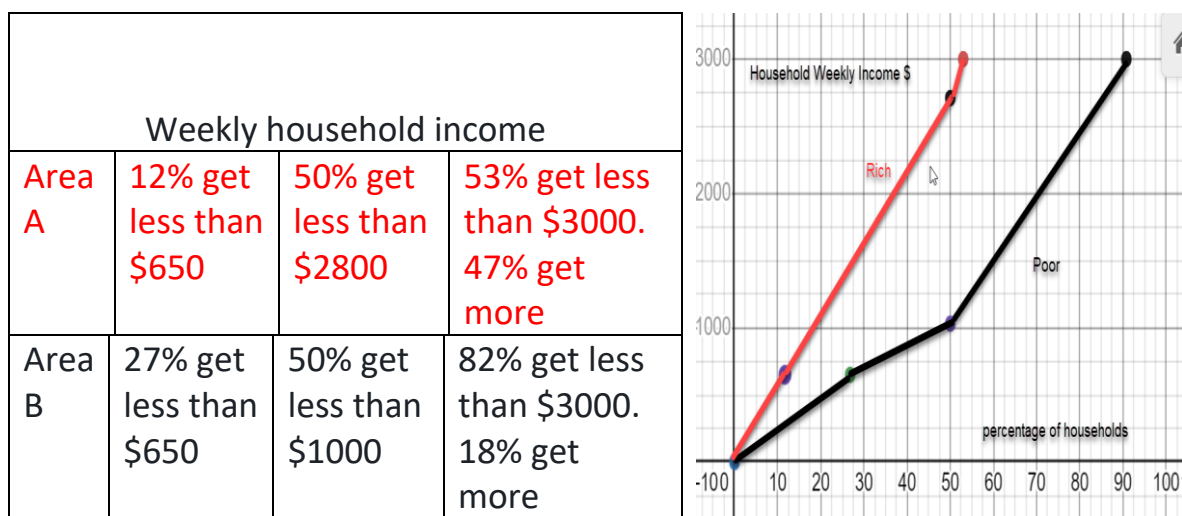
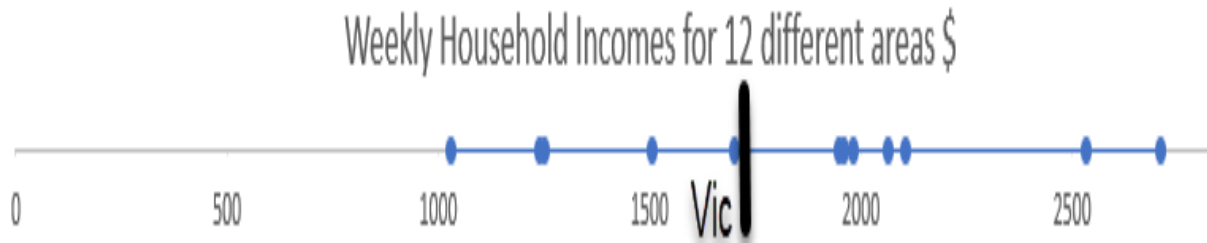
Bi-modal – kids under 10 and parents in their thirties

## Discussion

1. What are the pros and cons of real data in large data sets – and what data sets other than ABS Quickstats are suggested?
2. Which related maths skills or other learning experiences might you deal with either concurrently or as pre-requisite?
3. Are spreadsheeting skills important to your curriculum?
4. What year level would this be in your curriculum and how long would you plan for covering this unit?
5. At what stage would you give students the correct interpretation of class intervals?

## Where do the rich people live?

From ABS Quickstats



## Towards Year 11 - correlation and causation

More use of ABS Quickstats – comparing 12 suburbs

Age versus household income: rank correlation  $\approx 0$

Household income vs long term health: rank correlation = +0.48.

What causes might be involved?

See the [Mag-Net website](#) and MAV's journal [Vinculum 2023/1](#)

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