



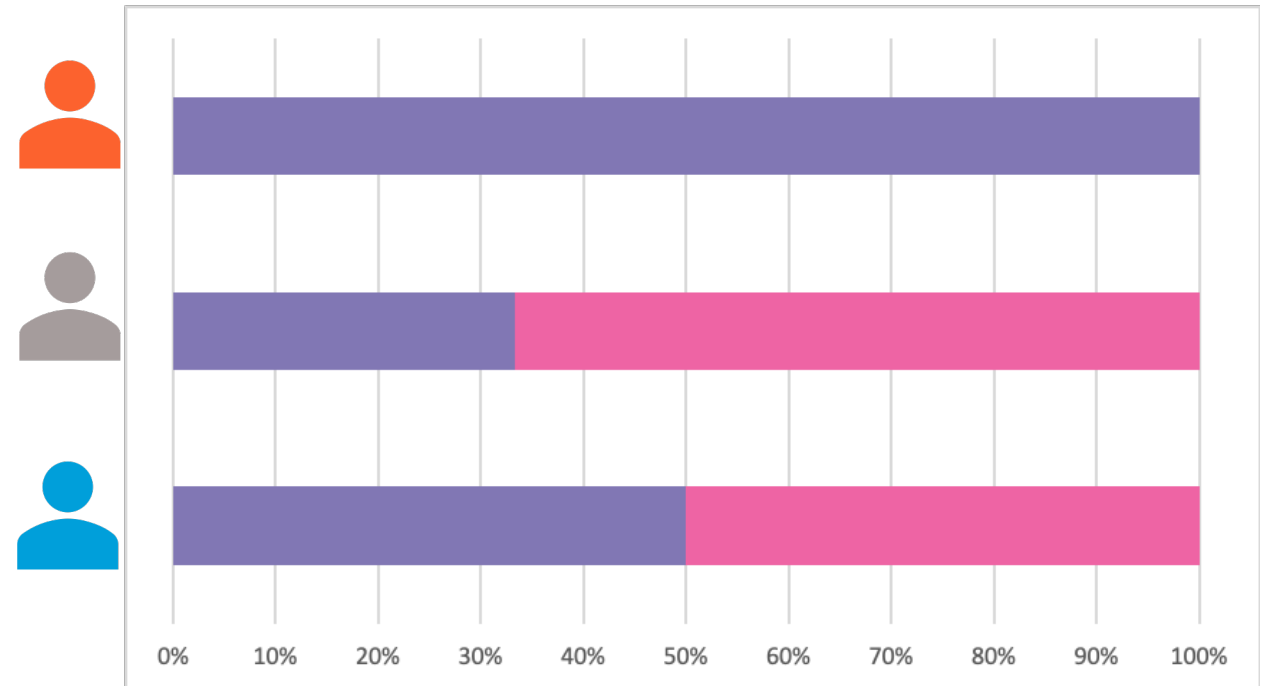
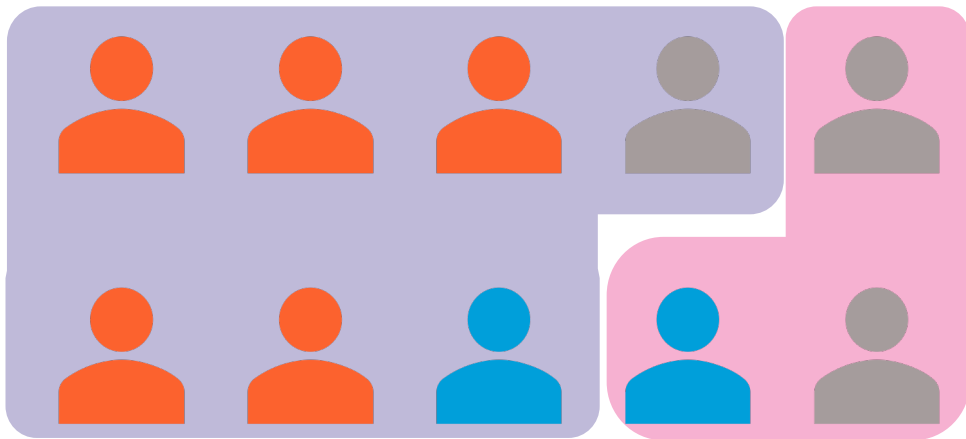
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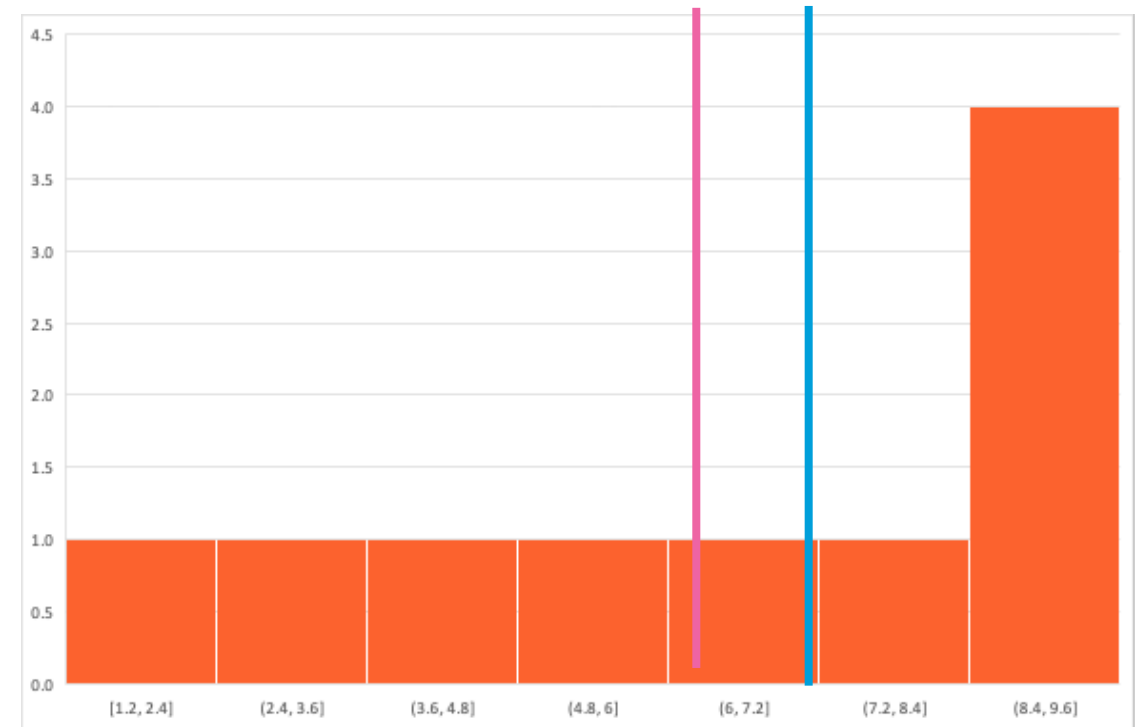
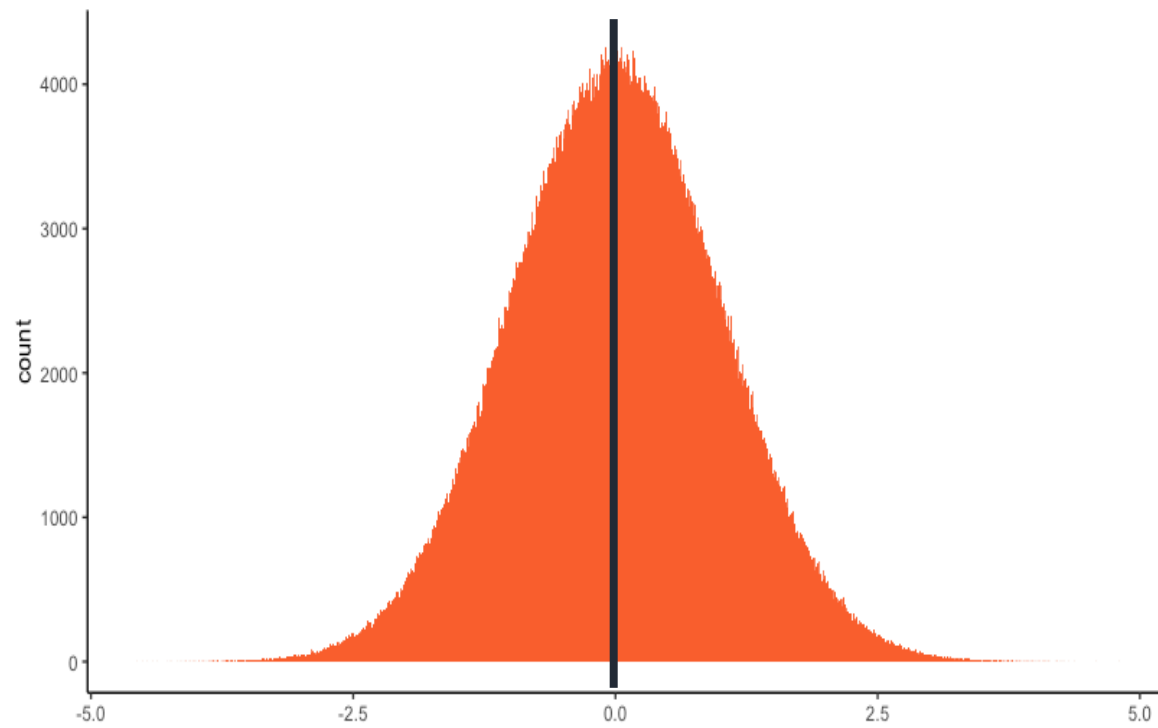
Quant Bites – What is statistical significance?

Beatriz Gallo Cordoba, PhD – Monash Centre for Youth Policy and Education Practice (CYPEP)

Contingency or count tables



Averages



Overview

1. Population and sample
2. Statistical tests
3. Sampling distribution
4. What is not statistical significance?

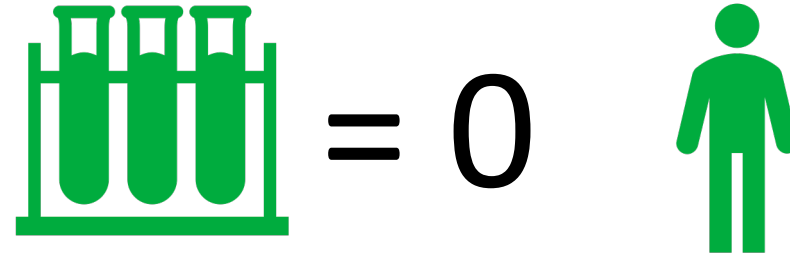
Population vs sample



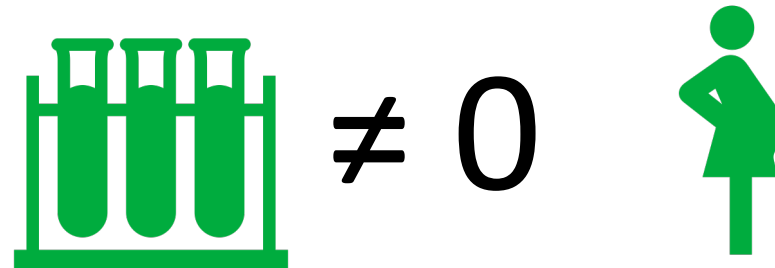
Statistical test

Hypotheses

Null Hypothesis:



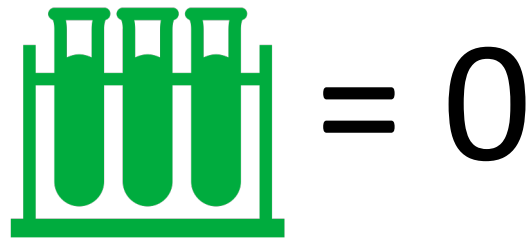
Alternative Hypothesis:



Statistical test

Decision

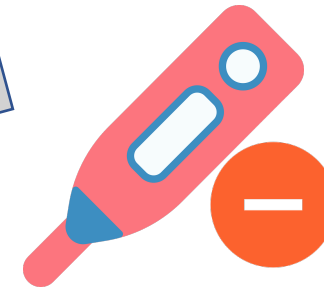
Null Hypothesis:



To reject



Not to reject





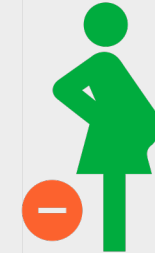



Defining significance

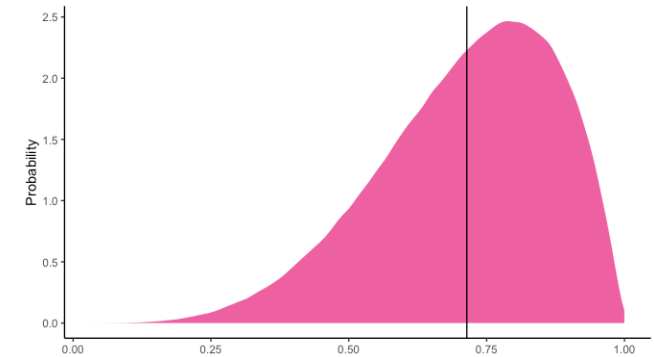
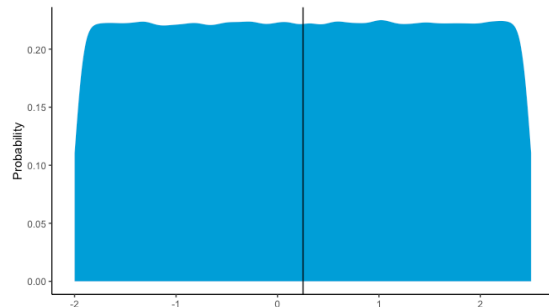
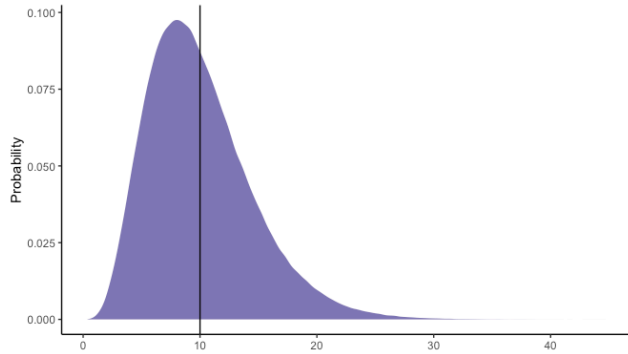
The probability of having a false positive

Is the null hypothesis...?

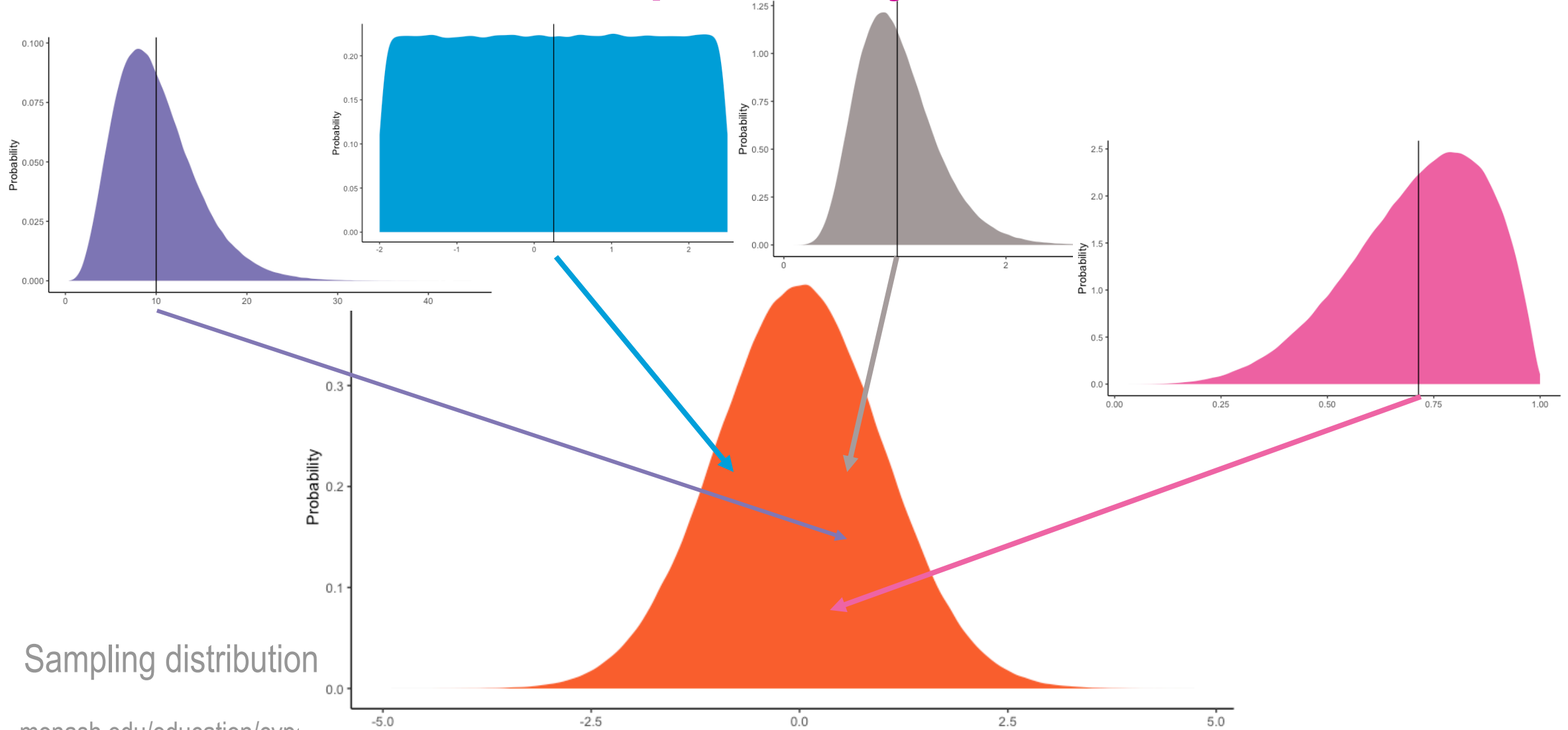
Population

		Population	
		False	True
Sample	 Rejected	 Power True positive	Type-I error False positive Significance 
	 Not rejected	 Type-II error False negative	Confidence True negative 

How do we calculate this probability?



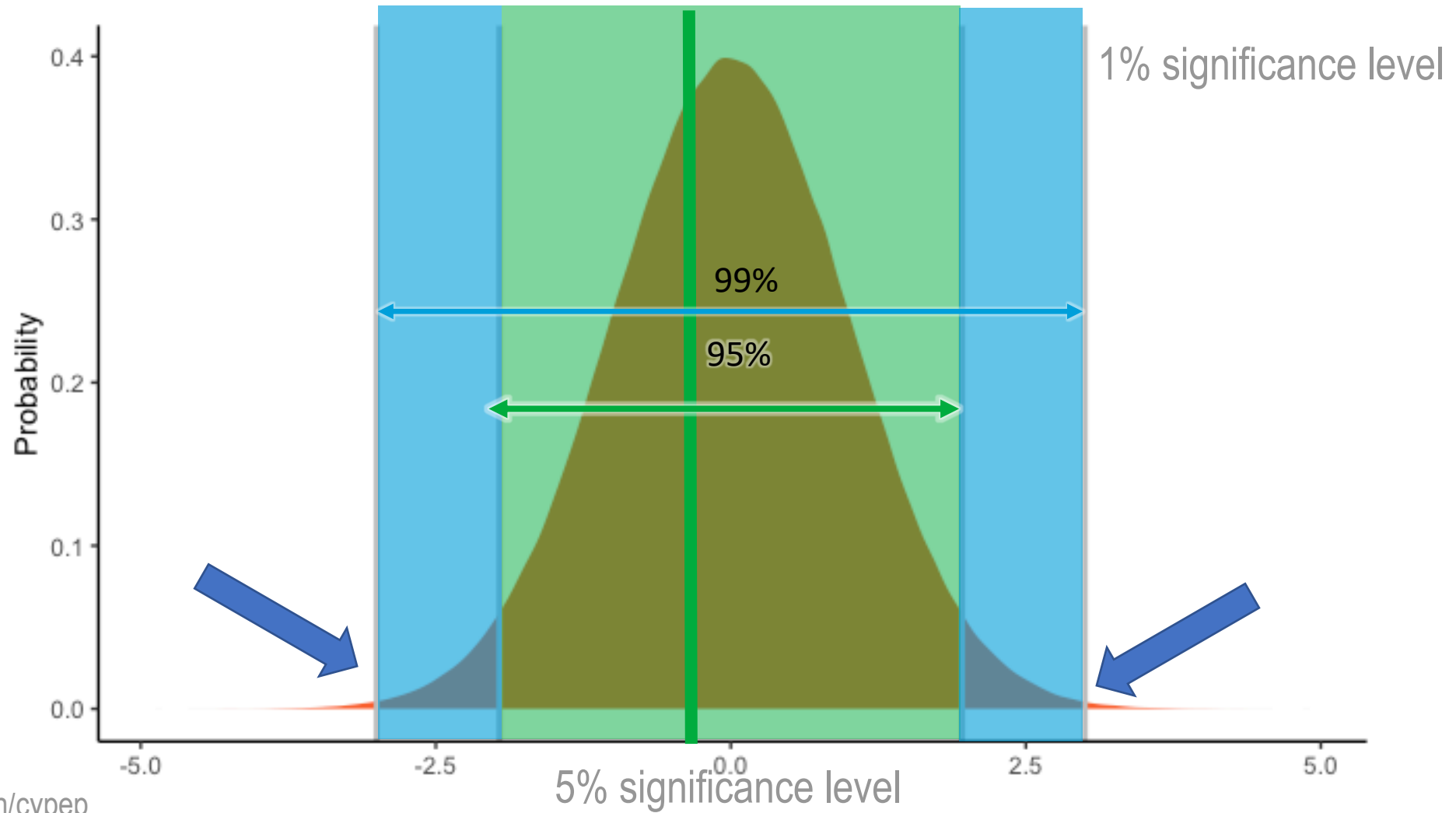
How do we calculate this probability?



Sampling distribution

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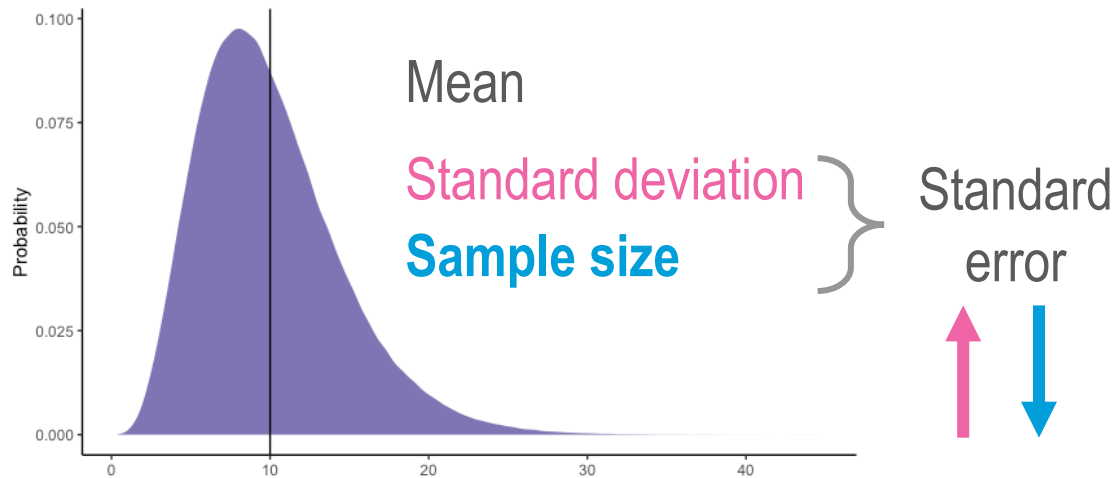
Sampling distribution – the normal distribution



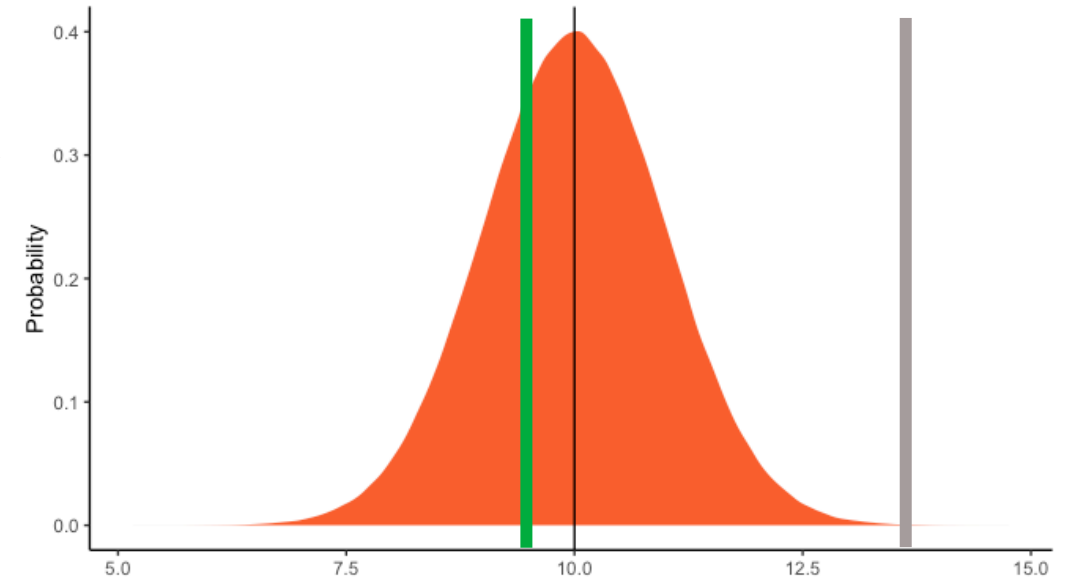
But we don't collect infinite samples

We estimate the sampling distribution

Distribution of our variable



Sampling distribution – Distribution of the mean

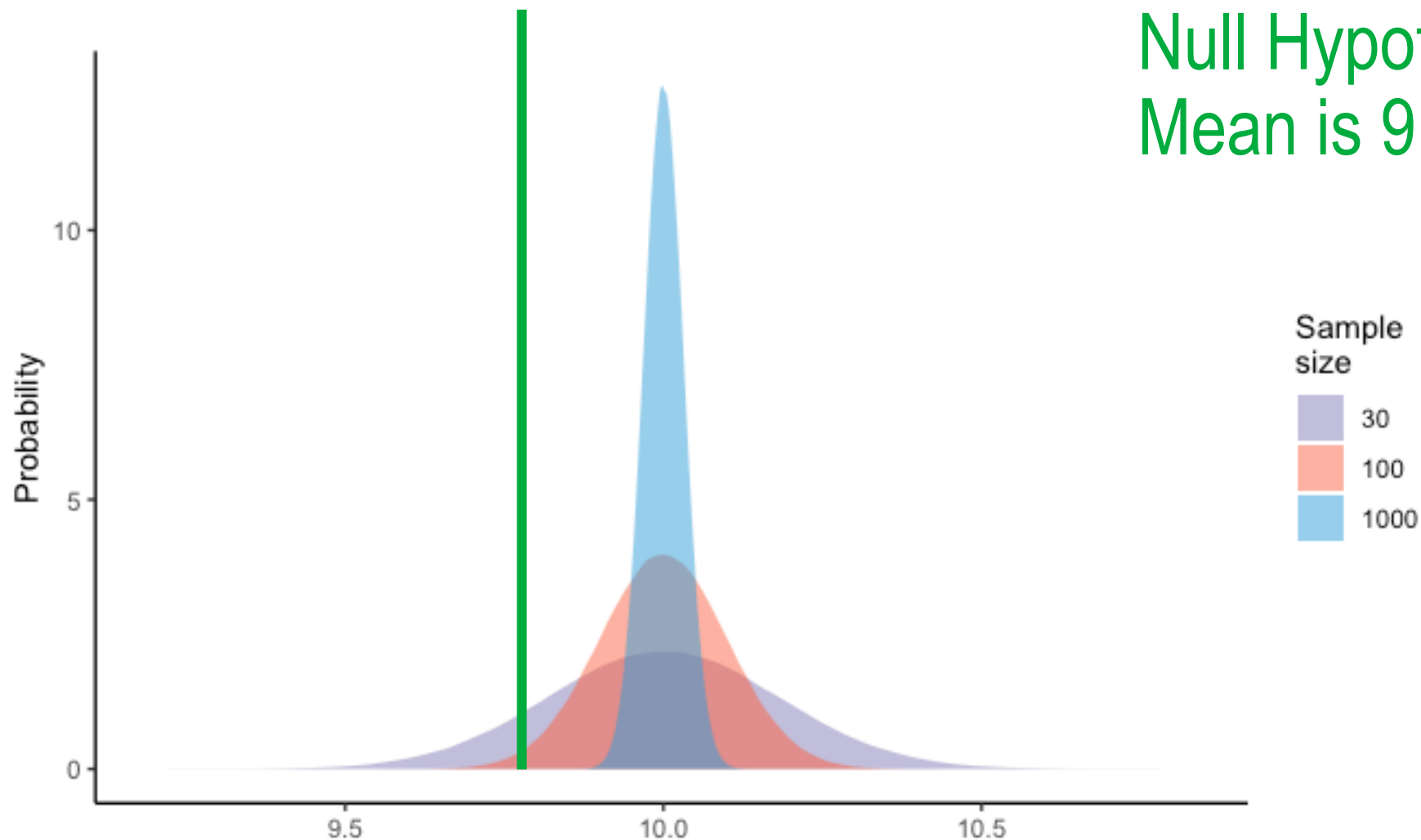


Null Hypothesis: Mean is 9.8

Null Hypothesis: Mean is 13

Decision with larger sample sizes

Null Hypothesis:
Mean is 9.8



So what is it?

An indicator of how prone to error (having false positives) our inferences are

What can be statistically significant?

- A mean?
- A proportion?
- A difference
- A correlation

What is it not?

- Importance
- Magnitude
- Meaningfulness/causality
- The only criterion to decide

Questions?

Find out more monash.edu/education/cypep

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