

STAT 201

Week 4

Who am I?

- ▶ Helloooo!!! I'm really happy to meet you.
- ▶ My name is Rodolfo;
- ▶ I am from Brazil (hence the accent ☺);
- ▶ Both my undergrad and master's degrees were in Stats, and my PhD was in CS.
- ▶ I recently joined the Stats Dept @ UBC.

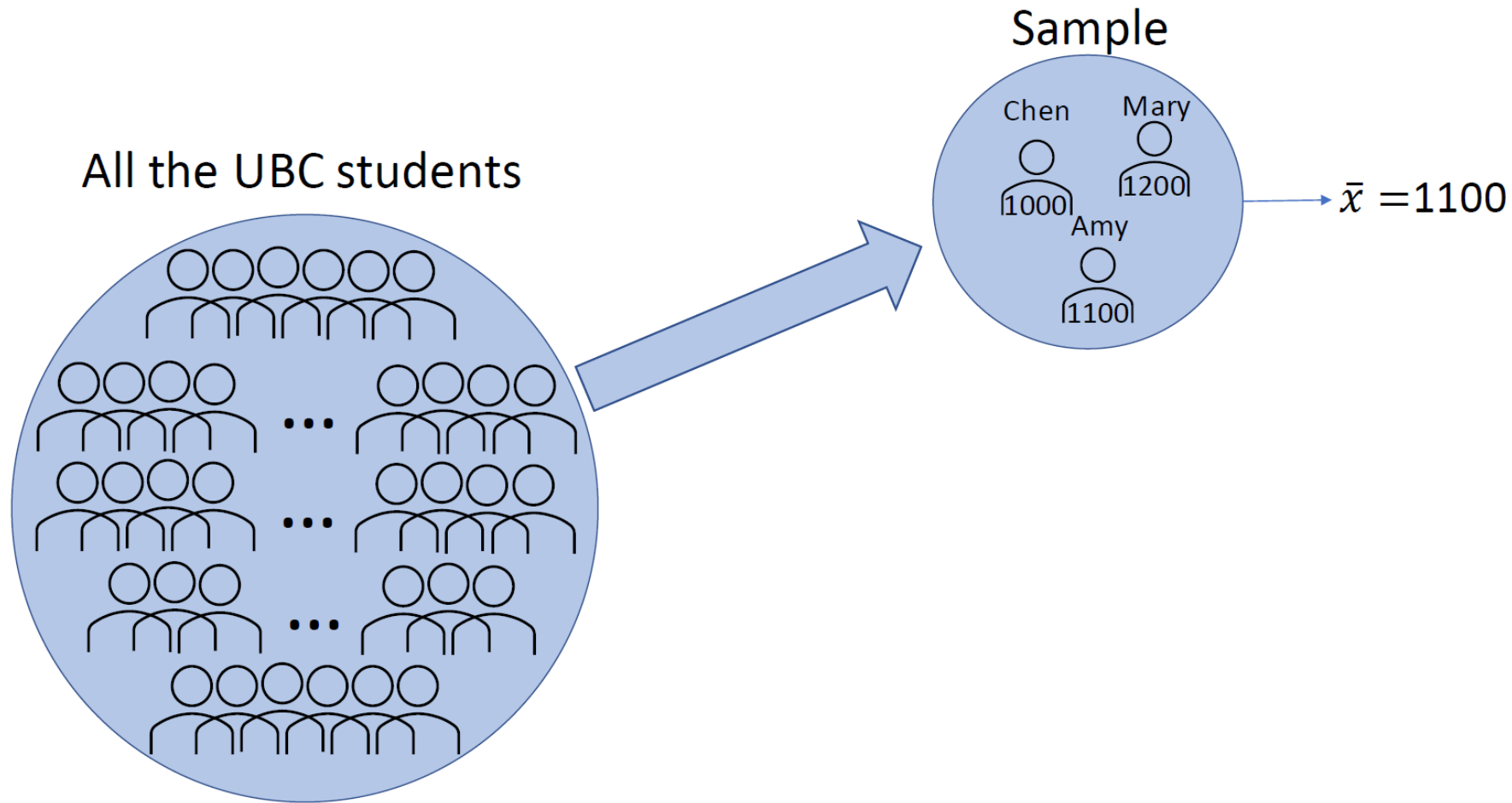
The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect.

Revisiting the big Picture

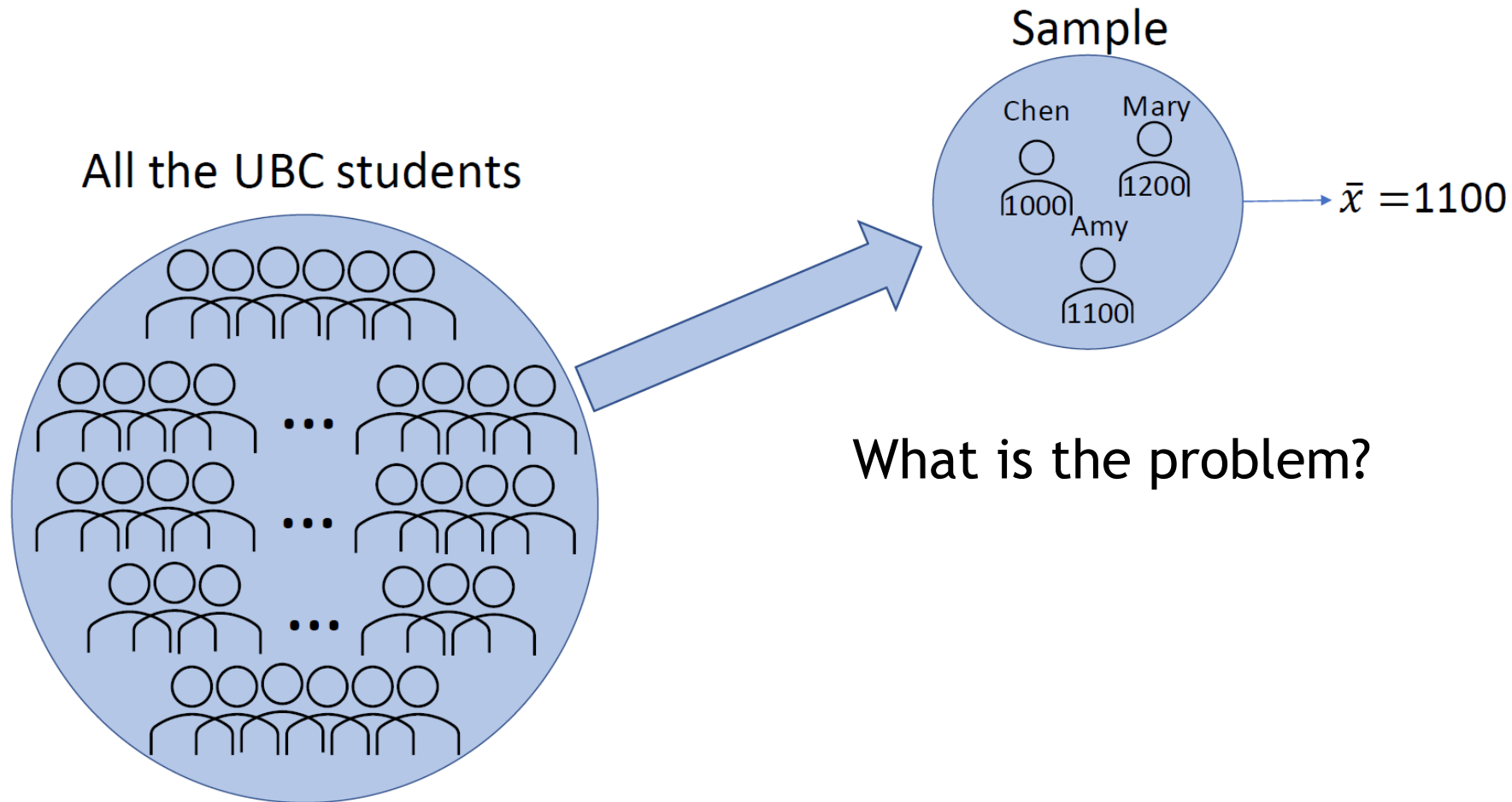
The big picture

- ▶ Suppose the President of UBC is interesting in knowing the average income of UBC students so he can create a student financial aid to help them go through the COVID-19 situation.
 - ▶ What is the population of interest?
 - ▶ What is the parameter of interest?
 - ▶ We don't know what the student's average income is, and UBC has over 65,000 students. What should we do?

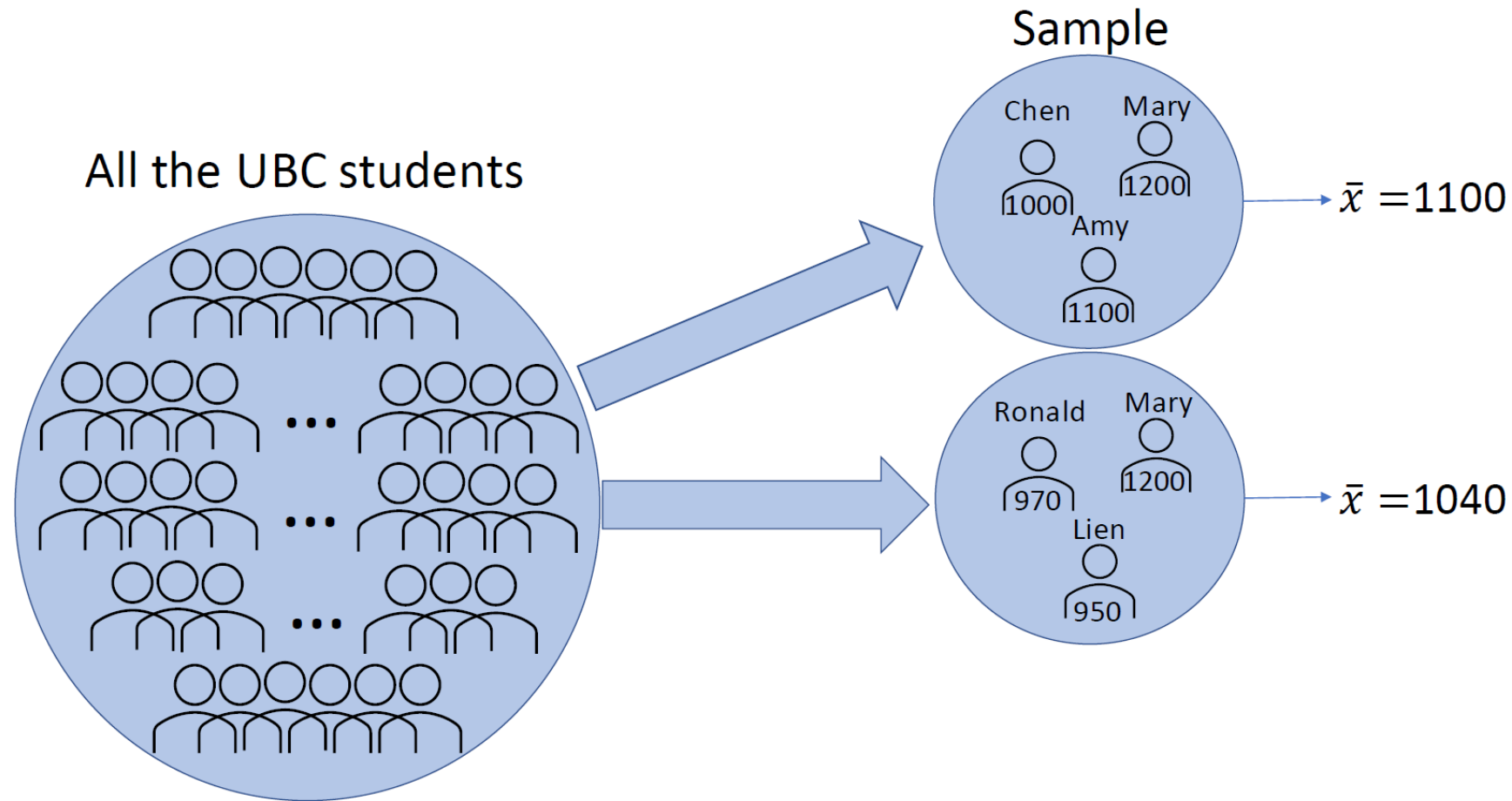
Random Sample



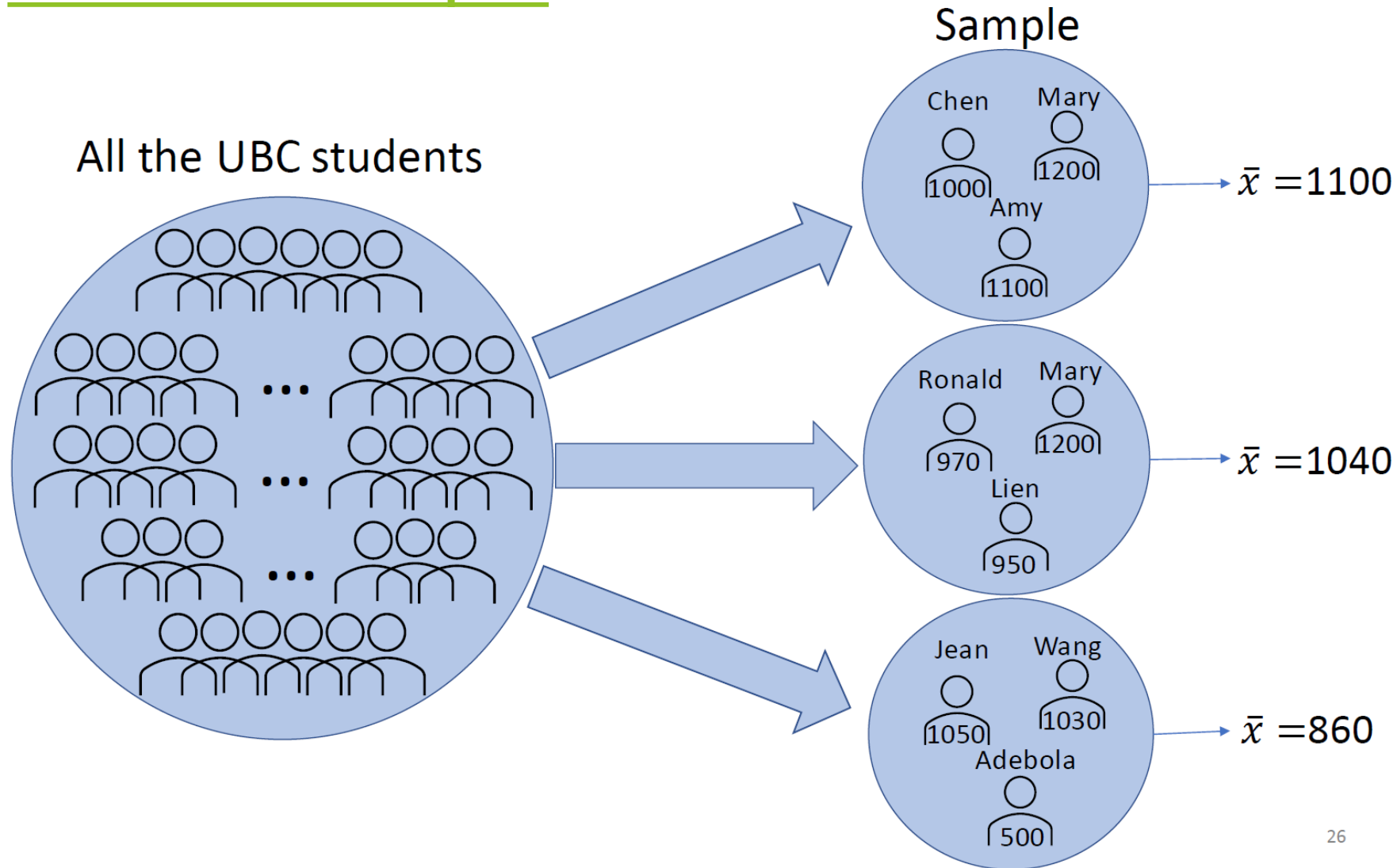
Random Sample



Random Sample



Random Sample



A few points to consider:

- ▶ A different sample might give different results
- ▶ Bad sample (not representative of the population)
- ▶ In general: how reliable is our result?

Revisiting the big picture

- ▶ What are we trying to do?
- ▶ How are we doing it?
- ▶ What is the problem?

Revisiting the big picture

- ▶ What are we trying to do?
 - ▶ We want to learn about the populational parameter, in this case, the populational mean
- ▶ How are we doing it?
 - ▶ By taking a sample and estimating the populational parameter.
- ▶ What is the problem?
 - ▶ We have no clue how good is the value we got.

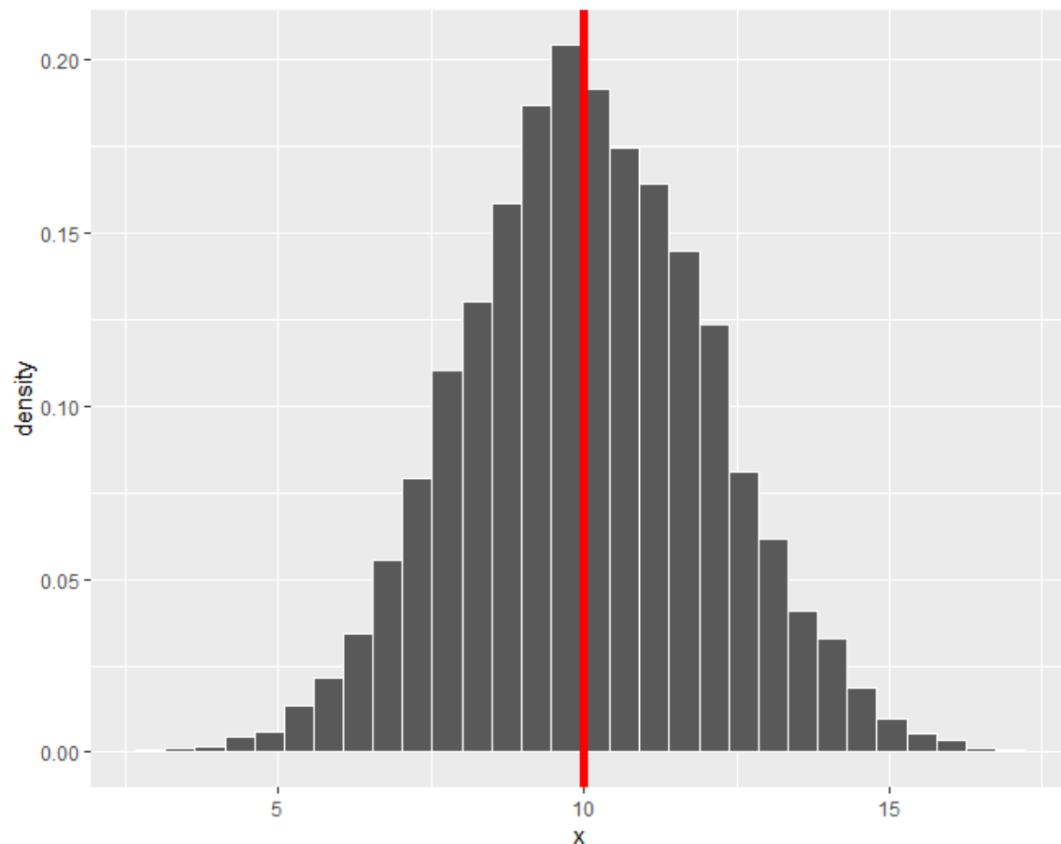
Confidence Interval

Confidence interval

- ▶ You learned about point estimate.
- ▶ Then, you study the impacts of sampling variability and modelled it using?
- ▶ However, given a point estimate, we have no idea how good (how close to the parameter it actually is).

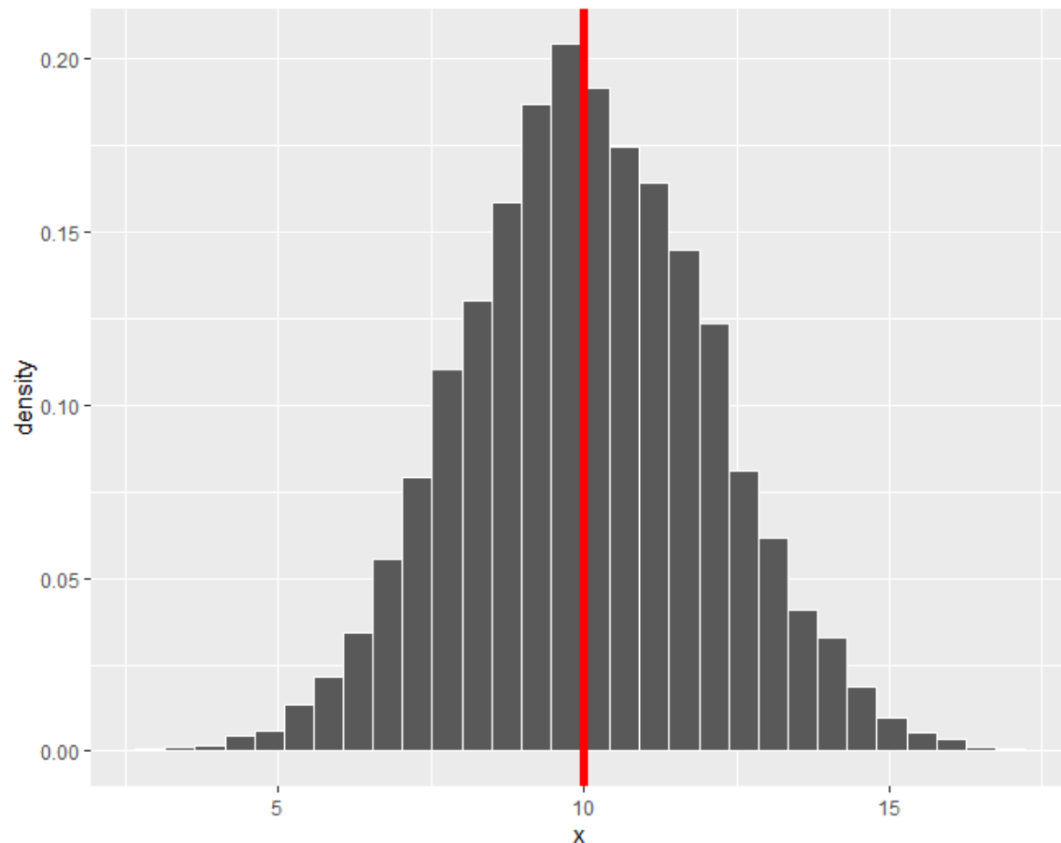
Confidence interval

- The sampling distribution gives us a general idea of how likely it is for the point estimate to be far from the parameter.



Confidence interval

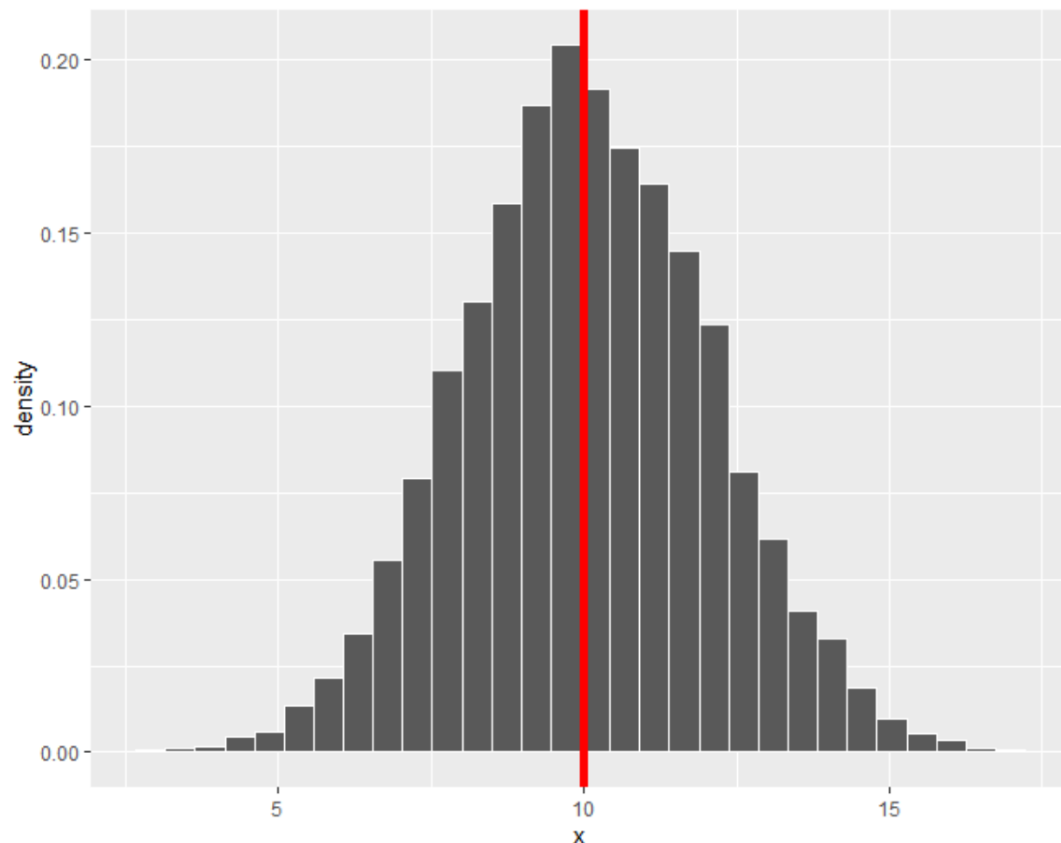
- The sampling distribution gives us a general idea of how likely it is for the point estimate to be far from the parameter.



How likely is it for us to get a point estimate that is farther than 4 units from the parameter?

Confidence interval

- The sampling distribution gives us a general idea of how likely it is for the point estimate to be far from the parameter.



Today we are going to formalize this idea.