

Intro to Stats Questions and Answers:

What is the difference between a single- and a double-blind experiment?

A single blind experiment only the participant does not know whether they are part of the treatment or control group, whereas in a double-blind experiment both the participant and the experimenter are kept in the dark as to who is in the treatment and who is in the control group.

What is a placebo?

A placebo is a “control” that mocks the real treatment, but lacks any active ingredients. It is important to use a placebo in an experiment to avoid the placebo effect – when someone thinks that they’re getting better just because they are receiving treatment.

Where can I use statistics in everyday life?

The main purpose of statistics is to make future predictions and educated decisions based on past data or a current sample. Here are **some** uses of statistics that may apply to your life:

- Figuring out your current course grade or figuring out what you need to get on a certain assignment in order to achieve the grade you want
- Deciding where to live based on crime rates
- Choosing the appropriate college based on average cost, employment rate after graduation, etc.
- Figuring out odds in order to decide on purchasing something (such as buying a warranty or life insurance)
- Betting on sports or playing cards
- And many more!

How do you know you are 95% positive of anything? Is there a mathematical formula?

There is a formula for the 95% confidence interval that deals with finding the actual margin of error based on the sample statistic. We will look at this in chapter 8.

What is a self-selected sample? Is it a part of one of the 5 sampling methods or is it its own sampling method?

A self-selected sample is a sample in which people choose to participate. This will be a direct result of a convenience sample. Self-selected samples are prone to participation bias since someone who chooses to be a part of a survey most likely feels strongly about that topic.

Does the word strata come from stratified or does it have a different origin?

Strata is plural for stratum. It refers to laying, leveling, or ordering. So the subgroups in stratified sampling would resemble the layers or levels of the population.

What are the different types of observational studies?

A study can just be observational in general, or it can be a subset of an observational study which includes retrospective and prospective.

What is retrospective and prospective?

A retrospective study is an observational study in which you look at past data. Typically used when you are studying something that is unethical (such as drinking during pregnancy). A prospective study is an observational study in which you observe over a significant period of time. This is used when you want to study long term effects.

What is the difference between an experiment and meta-analysis?

An experiment is a type of study in which the subjects are given a treatment (something that alters the subject in one way or another). A meta-analysis is a study of previous studies (which could have been experimental or observational). So I guess you could say that if you are conducting an experiment, you are conducting a study in “real time” and if you are conducting a meta-analysis, you are compiling studies that have already taken place on the same topic and you are looking for new trends.

What is the difference between an observational study and an experiment?

In an observational study you are not giving the subjects any type of treatment, you are just recording what you observe. In an experiment, you are giving the subjects a treatment and observing the effects of that treatment.

Why is it important to have a treatment and control group in an experiment?

Every experiment must have a treatment and control group because in order to determine if the treatment works, you have to have something to compare the results to. The control group is typically given a placebo and the treatment group is given the treatment and then the results are compared.

What is the easiest way to tell between cluster and stratified sampling?

Both cluster and stratified deal with breaking the population into subgroups and choosing from those subgroups. Cluster randomly selects subgroups from the population and surveys all subjects in those selected subgroups, whereas stratified randomly selects subjects from every subgroup.

Will we ever work with another confidence interval other than 95%?

The 95% confidence interval is the most common that we will work with, but there are two other common intervals, 90% and 99%. We will work with all three by the end of the course, but it's just a matter of using different formulas.

How do we know that the sampling will give us the correct statistics?

You will not know for sure that your sample will provide the correct statistics to represent the population, but in conducting the study you will take many precautions to avoid bias and you can make educated decisions with a certain level of confidence. The only way to know for sure is to conduct a census, but it is typically not feasible to do so.

What is the least convenient sample to use?

I think it all depends on what you are studying. It is probably least convenient to do a random sample since you would have to assign each subject an ID of some sort and then randomly generate a sample. Although it may be the least convenient, it's probably the most representative in many cases.

Can bias occur in a census?

Yes. Bias could occur in any type of study. In this case, it would most likely be due to the wording of the survey and subjects giving dishonest answers.

Are placebos used outside the medical field?

A placebo is basically a control. Even though they are most commonly used in experiments that are testing the effects of drugs, they could also be used to test a product such as a multi-surface cleaner or a lawn fertilizer.

Is a census a form of sampling or a totally different category?

A sample is when you take from part of the population. Since a census includes the entire population it wouldn't be a form of sampling, it would be a type of study.

What jobs use statistics the most?

Here are a few jobs that use statistics:

- Marketing and communication fields
- Insurance brokers
- Medical researchers
- Math teachers
- Meteorologists
- Human resources
- Company purchasers (people who choose what to sell in stores)

What's the difference between explanatory and response variables?

In an experiment there is typically a “cause” and “effect” relationship from the treatment given and the reaction to the treatment. In essence, the explanatory variable is the treatment and the response variable is what happens as a result of the treatment.

What are the 5 sampling methods?

1. Random – every member of the population has an equally likely chance of being chosen
2. Systematic – there is a system to choosing the sample such as every 20th member
3. Convenience – Using a group that is convenient such as the first 25 people that walked into the room
4. Cluster – choosing random subgroups from the population and choosing everyone in those subgroups
5. Stratified – choosing random members out of every subgroup in the population

What are subjects?

The subjects in a statistical study are the members (whether they are people or objects) that are participating in the study.

What are variables of interest?

The variables of interest are what you are studying. They are variables because they can take on different values. Suppose you were trying to find the average weight of high school girls. The variable of interest would be average weight.

Can you have two treatment groups and no control group? Can you have two control groups and no treatment group?

No, you cannot have two treatments and no control. Without a control you have nothing to compare your treatment group to. If you had two control groups you wouldn't be studying the variable of interest so it would never make sense to have two control groups and no treatment group.

Is a census 100% correct all of the time?

No. There is a lot of potential for error when conducting a census. It could be a recording error or an error in the way the survey was worded.