



John Hooper  
Medal for Statistics

# John Hooper Statistical Poster Competition

The **John Hooper Medal for Statistics** is awarded to the winner of this national poster competition. The goal of the competition is to improve students' abilities to describe their environment with the help of statistics and to use statistics as a tool for making sense of daily life.

## Who can take part?

Teams of 2 to 3 students, born in 2003 and younger, from any part of the island of Ireland. Teachers must register the teams.

## How to take part:

1. Find a question
2. Collect or use existing data
3. Review data quality
4. Analyse the data
5. Make the poster

The poster can be about any topic; however, it should reflect or illustrate usage, analysis, interpretation and communication of statistics or statistical information.

## Important Dates

- **Registration now open**  
[www.cso.ie/ interactivezone](http://www.cso.ie/interactivezone)
- **4 March 2022 (5pm)**  
Poster to be submitted via <http://www.cso.ie/interactivezone>
- **1 April 2022**  
Results will be announced on our website

## Why should you get involved?

Taking part will encourage you to:

- work as a team
- investigate real questions using data
- use your analytical and graphical skills
- interpret statistical results
- develop skills in written communication

Winners are eligible to represent Ireland in the European Statistics Competition.

## Prizes



**€1,600** – €1,000 awarded to the school; €600 awarded to the team and the CSO John Hooper Medal for Statistics.



**€1,000** – €650 awarded to the school and €350 awarded to the team.



**€600** – €400 awarded to the school and €200 awarded to the team.

## John Hooper Poster Competition Guidelines

These guidelines are based on our experience of the hundreds of entries we have received over the years for this competition. We are providing some advice about things to consider at the planning, data collection, analysis and presentation phases of your project. We hope they will help to make developing your poster an enjoyable and interesting experience.

### Plan

The starting point for any statistical poster is deciding on your research question. What is it exactly that you want to study/analyse and present to your audience? This checklist might help you to answer this question

- Can the research question be answered with data? – that is the essence of statistical research.
- Am I really interested in this topic? - You are going to be working on this topic for weeks/months while you research, analyse and present your findings, so choose something that will hold your interest and that you can get excited about. Your attitude towards your research will come across in your writing and presentation! Maybe organise a brainstorming session with some of your classmates to come up with some ideas.
- Is the topic that I have selected manageable? How will I access data to support my research?- It's much better to pick a simple topic and present your findings clearly rather than to pick a complex topic which is difficult to explain. Past winners of the competition have been across a broad range of themes, from sport, social media, environment etc. The common denominator was that the students had picked an interesting topic and presented their findings in a clear and engaging manner. Once you have settled on your research topic, do some background reading around it to familiarise yourself with the subject matter. This will help you with the next stages of the process.
- Who or what is my target population is for the research project? How will I access my target population? - If your target population is your class, then you can access them quite easily, but if your target population is broader than that, then you will probably need to select a sample from the population. These are all issues that you should consider at the planning stage of your study.

### Collect

In the majority of statistical research projects, the next step involves some element of data collection. We want to use this data to inform our decisions regarding the theory or hypothesis that we're investigating. Consider the method that you will use to collect the data and decide if this will work for

your particular target population. If you have decided to select a sample for your study, consider how the sample will be selected so that it will be representative of the population.

Data can be collected through numerous methods;

- You can collect data through observation where you observe and record behaviour and characteristics of people, objects, or phenomena;
- You can conduct interviews with your study participants;
- You can design and issue questionnaires to your sample.
- Can you use secondary data for your study? - Secondary data is data that has already been collected and is made available to researchers. The CSO website provides links to a vast selection of databases and data sources covering many topics (<https://www.cso.ie/en/databases/>)

Try to choose a collection method that will yield the most relevant and accurate data possible.

Studies that use statistics to answer questions require you to collect data in the form of variables that you'll analyse. Consequently, you must define the variables that you will measure and decide how you'll measure them. If you do not collect the correct data or if you measure it inaccurately, you might not be able to answer your research question. Take your time determining which variables you'll need to measure to answer your research question.

## Analyse

Once you have collected the data, you must find a way of turning it into information. Raw data on its own isn't particularly useful. You need to organise, structure and analyse the data in a way that will allow you to answer the questions posed in your original research question.

The first step should always be to clean your data, i.e. make sure that there aren't any mistakes such as typos, duplicates etc. If you have collected some data as text strings, you might want to consider developing a coding system to convert the text into numeric codes to make it easier to analyse.

It's always a good idea to start out with some exploratory data analysis in order to develop an understanding of your data and to summarise the main characteristics. Start exploring it by creating some graphs. When you're dealing with large volumes of data, visualisation is the best way to explore and communicate your findings. How you visualise the distribution of a variable will depend on whether the variable is categorical or continuous. A variable is categorical if it can only take one of a small set of values (e.g. eye colour) and a variable is continuous if it can take any of an infinite set of ordered values (e.g. height). Bar charts are a useful way of examining categorical variables and histograms are good for looking at continuous variables. You can use these graphs to ask yourself questions like:

- Which values are the most common? Why?
- Which values are rare? Why? Does that match your expectations?
- Can you see any unusual patterns? What might explain them?

As well as helping you to understand your data better, these questions will also allow you to identify possible errors or inconsistencies in your data.

You should also try to summarise your data numerically. When you want to summarise data, it's always good to look at the following four aspects:

- Centrality – the middle value or average
- Dispersion – how spread out the values are from the average
- Size – how large your sample is
- Shape – the data distribution, which relates to how “evenly” the values are spread either side of the average

There are different measures of centrality and dispersion, so you need to choose the ones that are best suited to your particular data.

If the purpose of your study is to draw conclusions beyond the data that you have analysed, or to reach conclusions about some hypotheses, then you will need to do more than just describe and summarise your data. You will have to carry out some statistical tests to inform your decisions. In choosing the type of analysis to perform, you need to understand the types of data that you have (i.e. categorical or continuous, whether it is normally distributed or not etc.) There are lots of online resources that will point you to the correct test for your circumstances.

## Present your findings

When you have completed the analysis stage of your project, it's time to pull all of the information together and present it to your audience. The challenge with a statistical poster competition is to be able to showcase your project in a clear, engaging, and visually attractive way that will hold the reader's attention. No mean feat! When you're putting your poster together, try to put yourself in the position of a reader that has no knowledge of the subject matter. This will help you to make sure that you have presented all of the information that is required to understand both the background to your study, and the conclusions that you have drawn.

You will have to be concise in your presentation style as there are limits to the size of your poster. This means that you will have to strike a balance between giving enough information to get your points across and not overfilling the space on the poster making it look cramped. We all know the saying that “a picture paints a thousand words” so using graphs in your presentation will help you to convey your message concisely.

It's important to consider the graph/graphic you are using in your presentation. For example, if you're collecting data over time, a line graph might be the best option but if you're showing how the results

of a survey are distributed then a histogram might be the way to go. It's always worth doing a bit of research into the best way to represent your data and results.

Infographics are another valuable tool for visual communication and this makes them ideal for use in statistical posters. Infographics are visual representations of information or data. A good infographic will instantly grab your attention and help us understand a concept. There are lots of online resources where you can download ready-made infographics, and some where you can design your own.

As well as using visual aids, you will need to discuss and interpret your findings in the context of your original research question. Give your interpretation of how the data answers your original questions. What conclusions can be drawn, and will those conclusions extend to the entire population? Analyse the strengths and weaknesses of your study. Are there things that you learned along the way that would lead you to carry out the study in a different way if you were to do it again?

We hope that working on this poster will help to show you the ways in which good data and statistics can keep people informed and help them with decisions and choices. We also hope you enjoy the experience of working on this project. Best of luck to all!