

How do researchers use your data?

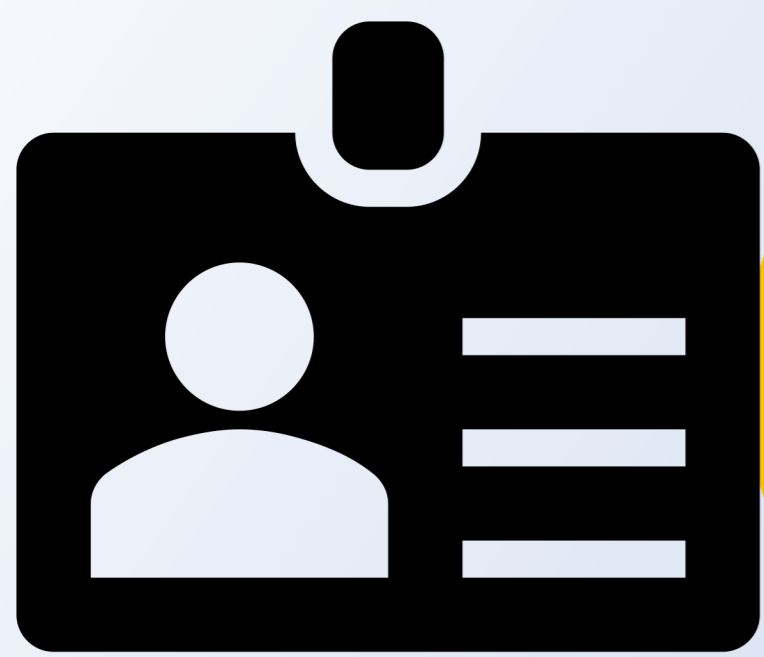
Data is everywhere! It can help us deal with infections better. Here are five steps that researchers follow to answer big questions about infections safely and wisely



Ask the right question

Before a researcher starts looking at any data, they need to work out what they want to learn. Here are three types of questions they might ask:

- Descriptive questions: These are like asking, "Tell me about this." For example, we might want to know if the number of people getting sick with measles has been going up in recent years. We're basically trying to describe what's been happening.
- Predictive questions: These questions are all about guessing what might happen in the future. It's like trying to predict the weather. For example, can we figure out which patients are likely to get really sick and need intensive care in a hospital?
- Explanatory questions: These questions are like trying to understand why something happens. For instance, does having COVID-19 antibodies in your body protect you from getting COVID-19 again? We're trying to explain the reasons behind things.



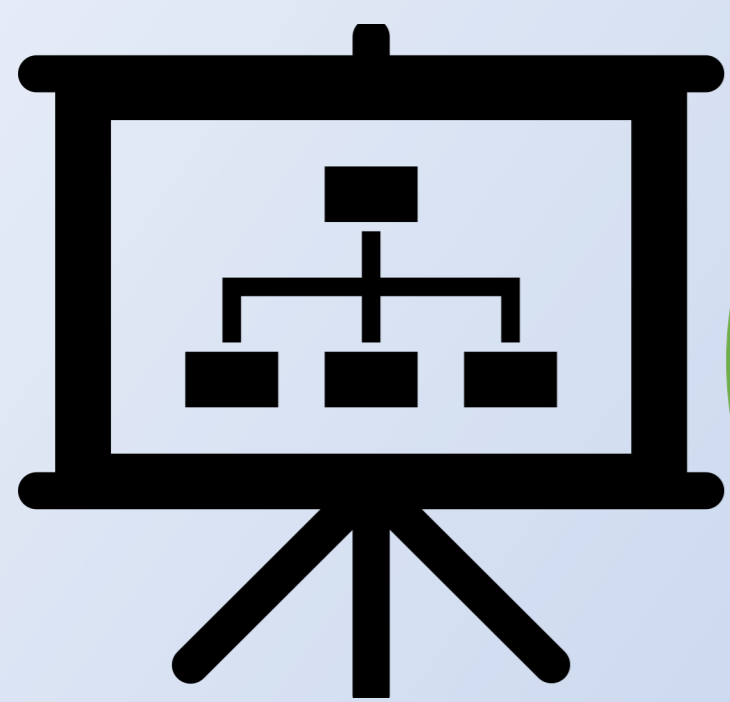
Get agreement

Once a researcher has decided on their question, they make a project plan. This plan goes to a group of people who check if the researcher is from a trustworthy organization, their question is important, their plan makes sense, and they are asking only for the data they need.

To make sure researchers are careful with the information they have:

- The researcher only gets the data they really need to answer the question.
- The researcher works with the data they need in a safe place.

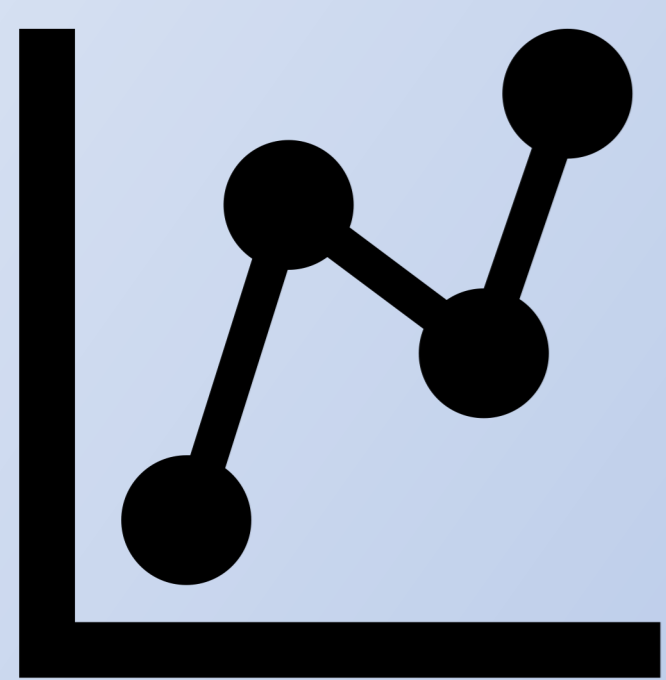
Only non-business groups can submit plans, like charities, non-governmental organizations, and universities.



Sort and organise

When researchers first get the data, they need to make sure it is tidy and ready to help answer their questions. They need to do three things:

1. Check the data: For example, if a hospital starts using a new machine for a blood test, the numbers that show the test results might change. They need to make sure all the numbers make sense.
2. Clean the data: Sometimes, there might be mistakes in the data, like saying someone is over 150 years old. Researchers have to fix these mistakes.
3. Rearrange the data: They might want to organize the data in a better way. For example, they could group people's ages into categories or put together data from different sources to make it easier to understand, like working out when in a hospital stay patients got different types of antibiotics.



Look for patterns

Now, they are at the exciting part – the analysis stage! They work out how to use the data based on the questions they want to answer. There are different kinds of things they could do:

- Descriptive analysis: This is like drawing pictures and making summaries to talk about the data. For example, we might make graphs to show how many cases of a stomach infection called "C diff" there have been over the last 10 years.
- Statistical analysis: We use fancy math called statistics to see what we can work out from the data. For instance, we might wonder if some types of doctors are more likely to give antibiotics than others, so we use statistics to help us find the answer.
- Machine learning or artificial intelligence: We also use computer programs to help us. It's like teaching a computer to predict things or find patterns. For example, we might try to predict if someone's chest infection will get worse and turn into a very serious type of infection called pneumonia.



Share what we find

When they've got their answers, the last thing they do is share them with others. There are lots of ways they can do this:

- Writing papers in science magazines
- Talking at meetings
- Sharing with people working in the Oxford hospitals
- Using the IORD website
- Social media like Twitter