

STEC surveillance and patient management in a culture-free era

Plain English Summary

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Bacteria are among the smallest of living things and made up of just one cell. In our stomachs, we have lots of bacteria. Some bacteria are good for you and some are bad for you. One type of bacteria that can make you poorly is called STEC (Shiga toxin-producing *E. coli*). STEC can produce toxins, which are poisonous to humans. Humans should not have STEC in their body. Having STEC in your stomach is called an infection. STEC infections can make you feel very sick, have diarrhoea, and sometimes blood in your poo. The infection can get worse because of the toxins that the bacteria produce. The toxins can make the organs in your body shut down.

There are different ways you can get an STEC infection. One way is eating uncooked food like beef. Another is touching animals you might find on a farm like sheep and cows. There are different types of STEC and some are more dangerous to humans than others.

Lots of people get infected with STEC and we want to find out what types of STEC are most infecting people most often in England. We also want to know how poorly STEC makes these people feel and how they got infected. We want to know if people got infected with STEC by eating meat or vegetables, or by touching animals or perhaps by going on holiday.

To learn more about a person who is sick with STEC, they give the doctor a poo sample. This poo sample gets sent to us. We break open the bacteria in the poo and look at DNA that is inside the bacteria. DNA is a chemical made up of a code that is specific to each type of bacteria and tells us lots of information about how dangerous it is to humans. We also collect information about the person who is sick. How old they are, where they have been recently, what they have eaten and how they feel. We look at all the information given to us about the patient and the information from the DNA of the bacteria.

From this information, we can work out which types of STEC are most dangerous to humans and how people become infected with STEC. We can help trace how they got sick, if it was from eating the same food, we can stop that food from being sold to other people. If they got sick after staying in the same hotel, we can visit the hotel and talk to the owners about how to keep the hotel clean. To make sure we have all the information needed to understand more about STEC and be able to deliver well informed results, lots of labs across the country need to collect data about the person who is sick, and send the poo sample to us to process it.

We write reports about the different types of STEC and about the patients. We share these reports with the doctors and nurses and the public by printing them in newspapers, journals, and by talking about them on the television and online. All our analysis and reports helps doctors and nurses know how to look after people when they get sick and helps the public know about how dangerous STEC is and how to not get infected and stay safe and well.

