HOW IS EPIDEMIOLOGY USED TO INVESTIGATE NATIONAL GASTROINTESTINAL ILLNESS OUTBREAKS LINKED TO CONTACT WITH ANIMALS AND ANIMAL FOODS IN CANADA?

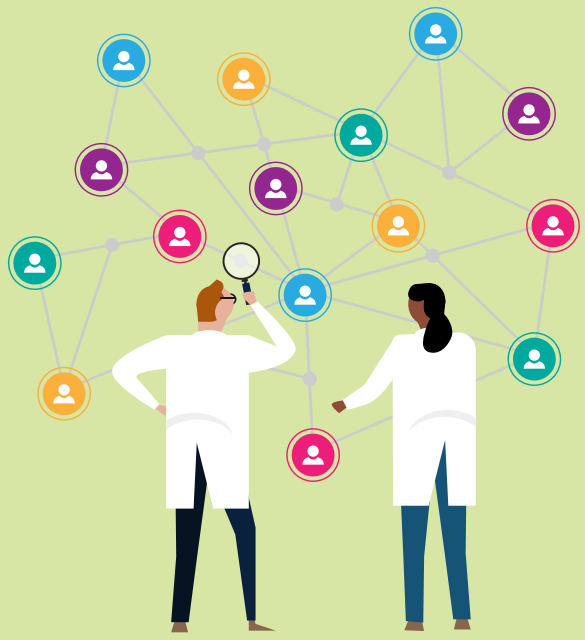
What is epidemiology?

Epidemiology is a science that studies the causes, distributions, and outcomes of health and disease in human populations and applies this knowledge to control health problems.

What is the role of the Public Health Agency of Canada?

The role of the Public Health Agency of Canada (PHAC) is to coordinate the national investigation of gastrointestinal illness outbreaks (such as salmonellosis or *E. coli* infection) linked to contact with animals and animal foods when there are individuals from more than one province or territory who are ill, or when there is an international connection. PHAC is also responsible for leading the epidemiological component of the investigation.

The investigation of and response to national gastrointestinal illness outbreaks linked to contact with animals and animal foods is guided by the Foodborne Illness Outbreak Response Protocol (FIORP). Additionally, Annex 14 of the protocol provides further guidance on the response to outbreaks linked to contact with animals or animal foods.



How does epidemiological evidence help to identify the source of a national gastrointestinal illness outbreak linked to contact with animals and animal foods?

Public health officials gather epidemiological evidence from the people who became sick (also known as cases), including: age, sex, geography, and when their symptoms began. Cases are also interviewed about a variety of exposures they may have had prior to becoming sick, such as contact with animals and animal foods (e.g. pet treats, pet food, live poultry, reptiles, feeder rodents). Loyalty card records and receipts may also be collected. Some of the considerations used to assess the epidemiological evidence include:

Plausibility

- Is the suspect animal or animal food a known vehicle of infection for the outbreak pathogen?
- Is there literature to indicate the pathogen has been previously identified in the animal or animal food?

Temporality

- Do cases report contact with the suspect animal or animal food within the exposure period (the maximum amount of time between exposure to a pathogen and the appearance of symptoms)?

Strength of the association

- Is there a higher than expected proportion of cases that report contact with the suspect animal or animal food?

Consideration of alternate explanations

- Have other suspect sources been adequately ruled out based on available evidence?

Consistency

- Is the distribution of cases in time and place consistent with the distribution of the suspect animal or animal food?
- Is the distribution of cases in time and place consistent with the shelf life of the suspect animal food?
- Is contact with the suspect animal or animal food reported consistently among cases?

What happens next?

PHAC determines the overall strength of the epidemiological evidence through an assessment of all available information and a collaborative discussion between investigators. PHAC works in collaboration with investigative partners to review epidemiological, laboratory, and animal supplier/breeder or animal safety evidence with the goal of identifying the source of an outbreak and preventing further illness. These streams of evidence can help to inform timely and appropriate public health action, such as product recalls; public communications; inspection, closure, sanitation and review of practices at implicated facilities (e.g. farms, hatcheries); and case and contact management.

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