

## Commentary

# A Systematic Review of Pathogenic Outbreaks

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## Description

A pathogen is an organism that causes disease. Microbes are naturally present in your body. Pathogens are different and can cause disease once they enter the body. All a pathogen requires to thrive and survive is a host. Once inside a host's body, the pathogen avoids the body's immune responses and uses the host's resources to replicate before exiting and spreading to a new host. Pathogens can be transmitted in a variety of ways, depending on the type. They can be spread through skin contact, bodily fluids, airborne particles, contact with faces, and touching a surface touched by an infected person.

Pathogens come in a variety of forms, but we'll concentrate on the four most common: viruses, bacteria, fungi, and parasites. Pathogens can cause a variety of diseases that differ in severity and mode of transmission. Let's take a look at some of the diseases caused by different types of pathogens. Viruses can cause a variety of infections, many of which are contagious. Examples of viral diseases include the common cold, flu, measles, viral gastroenteritis, hepatitis, yellow fever, dengue fever, and HIV & AIDS. Pathogens can make us sick, but when we are healthy, our bodies are able to defend against pathogens and the illnesses they cause. Many of the illnesses caused by different types of pathogens have treatments. For those who cannot be treated, such as some viral infections, there is also symptom relief.

Analysis of foodborne outbreak data is one method for estimating the proportion of human cases of specific enteric diseases attributable to a specific food item (food attribution). Although we recognize that reported outbreaks represent only a small portion of all actual outbreaks for a variety of reasons, using outbreak data for food attribution is the only methodological approach where, theoretically, there is an actual direct link between the pathogen, its source, and

each infected person. The goal of this study was to investigate the utility of foodborne outbreak data extracted from publicly available international electronic reports and publications to provide estimates of food attribution, to derive and compare these estimates across regions, and to improve understanding of the pathogen/food vehicle combination. Electronic reports and publications on foodborne outbreaks worldwide since the 1980s were systematically scanned, and data were extracted and compiled in a database.

The current study compiles a review of drinking waterborne outbreaks from 2000 to 2014, with an emphasis on the production and distribution of microbiologically safe water. The outbreaks are classified as raw water contamination, treatment deficiencies, and distribution network failure. The main sources of contamination were: intrusion of animal faeces or wastewater due to heavy rain; discharge of wastewater into the water source and increased turbidity and colour; malfunctioning disinfection equipment at treatment plants; and, for distribution systems, cross-connections, pipe breaks, and wastewater intrusion into the network. *Cryptosporidium*, norovirus, *Giardia*, *Campylobacter*, and rotavirus were the pathogens that affected the most consumers. The treatment works and distribution network were found to have the greatest diversity of pathogens. The contamination events from a surface water source had the highest number of affected consumers with gastrointestinal illness, while the distribution network had the highest number of individual events.

Avian influenza virus-infected poultry can produce a large amount of virus-contaminated droppings, which can infect susceptible birds. So far, much research has concentrated on virus spread within flocks. However, because faecal material or manure is a major constituent of airborne poultry dust, virus-contaminated particulate matter from infected flocks may be dispersed into the environment. We collected

samples of suspended particulate matter, or the inhalable dust fraction, inside, upwind, and downwind of buildings housing poultry infected with low-pathogenic avian influenza virus and tested them for the presence of endotoxins and influenza virus to characterize the potential impact of airborne influenza virus transmission during outbreaks at

commercial poultry farms.

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None

**Conflict of Interest**

None