

A panoramic review article on “F- Diagram”: Paths of Disease Transmission

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ABSTRACT

The faecal–oral route (also called the oral–faecal route or orofecal route) describes a particular route of transmission of a disease wherein pathogens in faecal particles pass from one person to the mouth of another person. Over 90% of the cause of diarrheal deaths is unsafe drinking-water, poor sanitation, and insufficient hygiene. Human and animal faeces are the main source of diarrheal pathogens. Faecal–oral transmission is primarily considered as an indirect contact route through contaminated food or water. However, it can also operate through direct contact with faeces or contaminated body parts, such as through anal sex. They are set up in a way that faecal–oral transmission pathways are shown to take place via water, hands, arthropods, and soil. To make it easier to remember, words starting with the letter "F" are used for each of these pathways, namely fluids, fingers, flies, food, fields, fomites (objects and household surfaces). Rather than only concentrating on human faeces, animal faeces should also be included in the F-diagram. One approach to changing people's behaviours and stopping open defecation is the community-led total sanitation approach. In this process "live demonstrations" of flies moving from food to fresh human faeces and back are used.

***Key words:** Faecal–oral route, “F- Diagram.”*

INTRODUCTION:

The faecal–oral route (also called the oral–faecal route or orofecal route) describes a particular route of transmission of a disease wherein pathogens in faecal particles pass from one person to the mouth of another

person. Main causes of faecal–oral disease transmission include lack of adequate sanitation (leading to open defecation), and poor hygiene practices. If soil or water bodies are polluted with faecal material, humans can be infected with waterborne diseases or soil-transmitted diseases. Faecal contamination of food is another form of faecal-oral transmission. Washing hands properly after changing a baby's diaper or after performing anal hygiene can prevent food borne illness from spreading.

The common factors in the faecal-oral route can be summarized as five Fs: fingers, flies, fields, fluids, and food. Diseases caused by faecal-oral transmission include typhoid, cholera, polio, hepatitis, and many other infections, especially ones that cause diarrhoea. Over 90% of the cause of diarrheal deaths is unsafe drinking-water, poor sanitation, and insufficient hygiene. Human and animal feces are the main source of diarrheal pathogens. These bugs enter the environment when people and animals defecate, and are then spread to other humans by fingers, flies, in fluids (mostly water), and via surfaces, such as fields.¹

Although faecal–oral transmission is usually discussed as a route of transmission, it is a specification of the entry and exit portals of the pathogen, and can operate across several of the other routes of transmission.² Faecal–oral transmission is primarily considered as an indirect contact route through contaminated food or water. However, it can also operate through direct contact with faeces or contaminated body parts, such as through anal sex.^{3,4} It can also operate through droplet or airborne transmission through the toilet plume from contaminated toilets.^{5,6}

F-DIAGRAM:

The foundations for the "F-diagram" being used today were laid down in a publication by the World Health Organization (WHO) in 1958.⁷

Modifications have been made over the course of history to derive modern-looking F-diagrams. These diagrams are used in many sanitation publications. They are set up in a way that faecal–oral transmission pathways are shown to take place via water, hands, arthropods, and soil. To make it easier to remember, words starting with the letter "F" are used for each of these pathways, namely fluids, fingers, flies, food, fields, fomites (objects and household surfaces). Rather than only concentrating on human faeces, animal faeces should also be included in the F-diagram.⁸

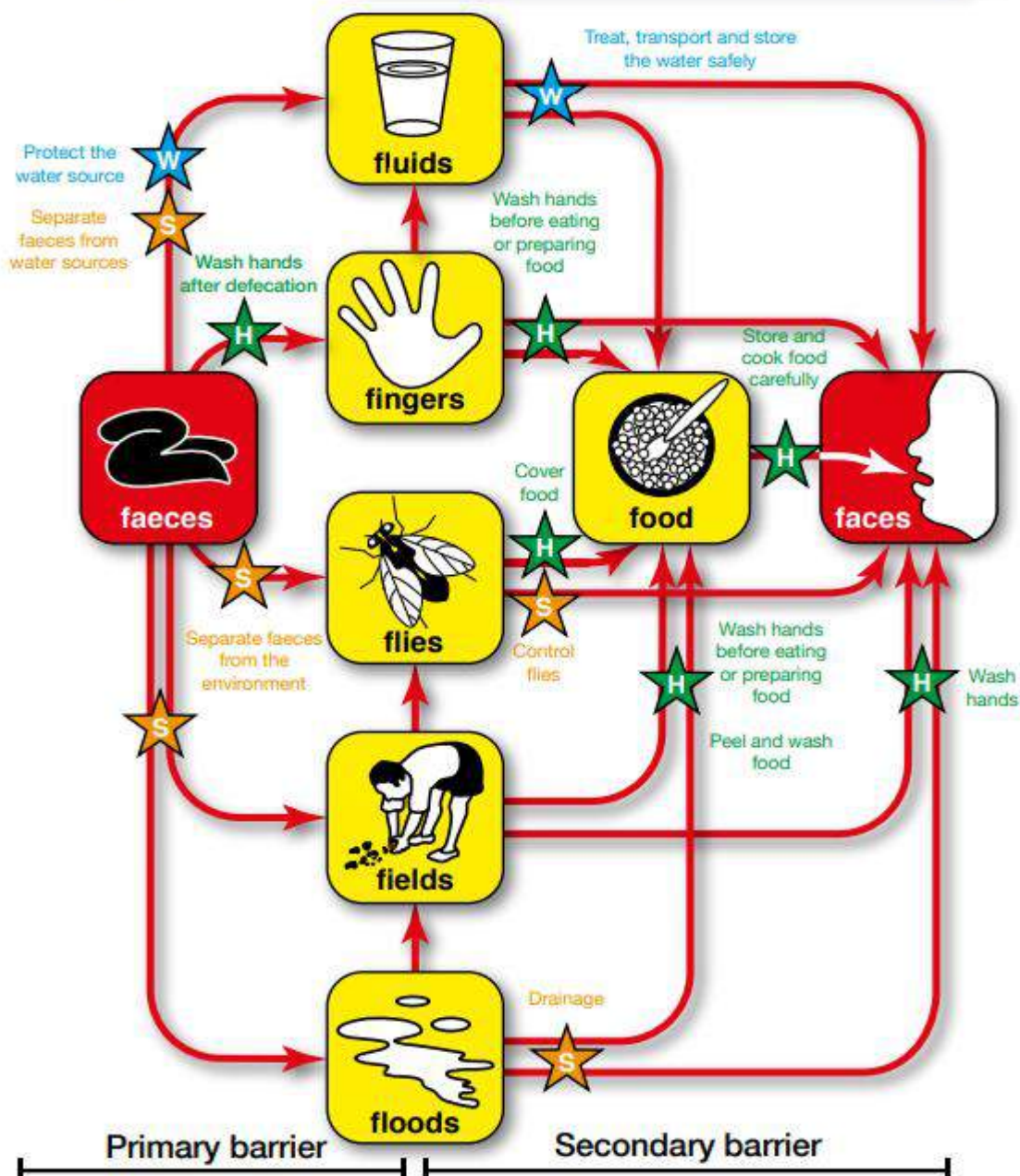
PATHS OF DISEASE TRANSMISSION:

The movement of pathogens from the faeces of a sick person to where they are ingested by somebody else can take many pathways, some direct and some indirect. This diagram illustrates the main pathways.

The 'f' diagram

WATER
SANITATION
HYGIENE

Barriers can stop the transmission of disease; these can be primary (preventing the initial contact with the faeces) or secondary (preventing it being ingested by a new person). They can be controlled by water, sanitation and hygiene interventions.



Poor hygiene practices, lack of adequate sanitation and unsafe or limited water supplies can contribute to the spread of preventable diseases, Such as cholera or typhoid. Understanding how pathogens (organisms that cause disease) are transmitted allows engineers and public health workers to intervene in appropriate ways to break the transmission cycle, saving lives and reducing unnecessary suffering.

Infectious faecal-oral diseases are spread when a susceptible person (or in some cases, an animal) ingests a pathogen that gives them the disease. The pathogen multiplies inside them and is subsequently found in their faeces. They are easily memorized as they all begin with the letter 'f': fluids (drinking water) food, flies, fields (crops and soil), floors, fingers, and floods (and surface water generally). Excreta-related water-borne diseases can be transmitted by any route which allows faecal matter to enter the mouth; the faecal-oral route. In 1958, Wagner and Lanoix identified the major means of transmission and produced what is now known as the 'f' diagram.⁹

PREVENTION:

One approach to changing people's behaviours and stopping open defecation is the community-led total sanitation approach. In this process "live demonstrations" of flies moving from food to fresh human faeces and back are used. This can "trigger" villagers into action.¹⁰

CONCLUSION:

Eating healthy foods, getting enough exercise, and refraining from tobacco and excessive alcohol use confer numerous health benefits—including possibly preventing the onset of chronic diseases.

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