



Salmonellosis

Introduction to Public Health – LCHS4004

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Introduction

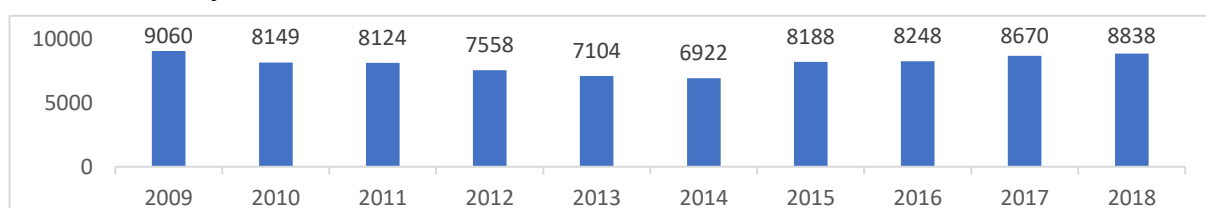
According to the UK Health Security Agency (2021) and the World Health Organization (2022), salmonella is a 'gram-negative rods genus belonging to the Enterobacteriaceae family', bacteria that naturally live in domestic and wild animal guts and there are a few thousand strains known that split into two species: bongori and enterica. These bacteria are transmitted orally, generally by ingesting it as food, present in meat, dairy, and eggs, or can be carried in vegetables or fruits that have been exposed to contaminated water, soil, or livestock, and in very particular circumstances the bacteria can be also transmitted by being in contact with a person that's has the infection active or a place where the bacteria prevails.

Discovered by the American Epidemiologist Daniel Salmon in 1884 (NCBI, 2022), these bacteria cannot be digested by humans, if this is the case, and is not being treated by the doctor's advice with particular antibiotics, its acuteness will create an infection called **salmonellosis** within less than 72 hours. The following most common symptoms presented after 12 hours of the bacteria being ingested are:

- Diarrhea
- Nausea and vomiting
- Stomach cramps
- Fever
- Dehydration

Once the person is infected, the infection generally can last from 4 to 7 days, and even though the bacteria are not attacking the body, the germs can be present in the stool for months after becoming infected, though considering that the infection prevalence can be longer and result in death in some cases if not attended.

According to Popa (NCBI, 2022), Salmonellosis incidence is one of the most common foodborne transmitted infections, having different types of causes and more than 2 billion diarrheal infections a year in the world, a third of them are transmitted by food consumption. In 2021, the UK HSA published that for the last 10 years around eight thousand cases have been reported in England annually, where children younger than the age of 9 years are the most affected by these bacteria.



Public health measures

The best environment for these bacteria to live in requires humidity and to be protected from Ultra Violet irradiation exposure, they can also live without much oxygen for long periods, therefore, having a remarkable ability to survive unconventional conditions, even after a rough disinfecting process can bloom back again if the conditions allow it. That is why it can be found not only in water, but manure, soil, plants, or inanimate objects exposed to these bacteria (Cornell Chronicle, 1997).

As they are well-hosted by domestic and wild animals, the bacteria are prevalent in food animals, such as pigs, poultry, fish, and cattle, and can also affect the whole food chain from animal feed, not only can be present in the flesh but also in products derived from contaminated stock, such as milk, eggs, some types of cheese, stocks, or fats, as well as from frozen or not well-stored products (WHO, 2022). Therefore is of much importance to health services, animal control, aquaculture, and agriculture ministers to have a close approach in policies and legislation to support and supervise all levels of producers, manufacturers, transporters, and food handlers to have consideration of the importance of education and accurate controls of procedure to systematically handle any food product before been ingested with care, that at any stage there is a possibility of exposure, as the importance to understand the how alarming repercussions can rapidly affect the food chain. It is also important to educate on a domestic level, not only about the food risks but also about animal care, in England 40% of the households count on a friendly pet that is also can be a beloved transmitter and can put families at risk (Ehuwa, 2021).

We all can easily collaborate to stop the spreading of these bacteria and as a matter of fact, help at the same time spreading so many other bacteria and viruses by stop doing some risky and unhealthy habits is highly recommended (CDC, 2022):

- Washing with soap or sanitizer our hands regularly
- Considering a safe distancing of pets and wildlife
- Avoiding eating raw food, or washing them thoroughly
- Being aware of dangers and spreading the word of its risks to others
- Paying attention to drinking public water mainly in summertime, when water is warmer.

Key determinants

The prevalence of the disease is determined by the poor hygienic quality of habits, water sanitation, poor institutional control measures, education, and region, all these can be merely eradicated by caring, and acknowledging what is done in our surroundings, or can be in a way easily changed, and what each person hygiene practices determine, and still, the risk will prevail due to the nature of any bacteria. On the other hand, important determinants such as age group, health conditions, or particular resistance to certain reactions, the world we live in, as the survival capabilities of organisms are, per se our weak spots. The size of bacteria and the size of the planet earth, compared to the access humans have over each region or animal in the wild, are completely out of proportion and reach, thus, out of our control. That is why at the very least, effective measures and controls need to be thoroughly implemented in our nearest living space, inside of the borders of our reach, and to control, as keeping a keen eye on those that trespass on them (Ngogo, 2020).

As is known, animals are great carriers of bacteria, their innocent look does not contradict the fact of being then, a great danger to our health, as they mostly are asymptomatic carriers. For example, birds are not controlled when trespassing on borders, as they often do it, usually accomplishing amazing distances, they tend to host bacteria in their intestines because their water sources are naturally unregulated, nor do they have access to sanitary habits or education.

Considering how easy is to be exposed to factors out of our control, is important to know that children younger than the age of five years have the biggest rate of danger, due to their high exposition at discovering what should and should not be going to their mouths, older people and people with medical conditions, such as diabetes, liver or kidney disease, and cancer are at a greater risk of being affected, as children, all these groups have a weakened immune system. However these factors are not exclusive only to them, every human, at any age, and the condition is at risk of getting these bacteria ingested nonetheless (CDC, 2022).

Short-term public health consequences

The propagation of the bacteria is short-term public health consequences, with the side effects being diarrhea, nausea and vomiting, stomach cramps, and fever, which can last up to a week

in a person with a strong immune system when with some people with a sort of immune deficiency these bacteria and the infection can easily escalate to the bloodstream or more difficult clinical access, making by consequence a different clinical approach in attacking these bacteria can affect as the damage obtained, by taking different electrolytes, antimicrobial medicine and even hospitalization could be required. As the CDC (2015) recommends whether the infection is installed in a healthy or a weaker person, medical attention is advised, and at least to be reported to local authorities, to be able to:

- Measure appropriately the incidence and morbidity
- Understand the risk to diagnose a solution and a treatment
- Identify possible sources and if measures need to be taken
- Stopping the spread and risks of possible outcomes
- Monitor the prevalence of the disease

As the NHS (2021) is less worried or concerned about the consequences of food poisoning or how rapidly this disease can become an escalated problem, the main health strategy is to stay home, whether the disease is in an adult or a child, avoiding going to work or school not until diarrhea or sickness has faded away for at least 2 full days, as it hardly focuses on drinking as much water as is possible, or squashes to prevent dehydration.

These little concerns in food control and supervision can be seen in what happened on Christmas 2022 when some supermarkets recalled customers that some turkeys they sell were contaminated with plastic material, becoming toxic to ingestion, published by Blazquez, for the express (2022).

Different recent cases around the world have alarming outcomes, due to market needs and poor supervision, instead of prioritizing health standards and enriching the prevalence of salmonella. For example in 2016 as Popa (2021) inquire, cucumbers exported from Mexico managed to contaminate 900 people with salmonellosis in 40 states of the United States of America. Another case gone wrong in 2018 was a Romanian fast-food vendor that managed to contaminate 134 people by using polluted mayonnaise, as, in 2017, 196 people from eight different countries developed the disease by consuming eggs from Poland.

Supervision and revision of legislation, as effective controls, should not wait until these numbers are shown or people have died as consequence, but a constant adaptation of circumstances requires to be considered to prevent the health of innocent people is counted in red numbers.

Long-term public health consequences

Safety and blind trust in our health exposure should be the long-term focus of public health services, that always someone is making sure that we all keep this principle as universal fundamental knowledge. To understand the advantages of being a community, we need to work always in partnership with each other to split responsibilities and share a less complicated lifestyle. To get from point A to point B, putting everybody in the same effort is a loss of energy and a waste of time because we do not all have the same amount and the knowledge gained can be better applied, accomplishing field away of morbidity, thus, keeping people for longer, generation after generation.

Due to the nature of salmonella, no data support the long-term consequences of these bacteria nor how can affect humans directly, our body is not a good host to salmonella and react quickly to the disease with diarrhea, nausea, fever, and complications of salmonellosis affects only those with weaker immunologic metabolism by into bloodstream or nervous system but does not prevails active for long-term, but by not doing anything about it, its prevalence in the environment, and therefore the collateral risks will keep on blooming omnipresently, as the risks to humans in ingesting the bacteria are higher, more often or in wider ways, as Ngogo mentions (2020).

Thorough care, strategies, and controls need to be designed and implemented to obtain the long-term benefits required, we have now enough experience of how wrong things can go, is up to the institutions to establish durable solutions and constant supervision.

The creation of a vaccine that effectively prevents humans from the disease and acute effects of ingesting or being in contact with these bacteria can be potentially useful, as a solution to weaken the survival capability of salmonella should be considered, so far, there are no benefits in these particular micro-organisms, it would not affect the life chain or environment if eradicate it.

As the WHO insists (2022), in an increasingly globalized world, strengthening food safety standards at all levels, from production to consumption, is essential to prevent foodborne illness, enhancing surveillance across different sectors with effective controls before consumption, instead of waiting to see where it went wrong measuring the number of ill people.

Conclusion

As salmonellosis does not represent a very high risk to the health or mortality of the human species, is still important to consider its presence and acuteness to sensitive metabolisms, and how quickly or easily it can be spread, even though are a mildly damaging bacteria, to educate people about hygiene and how to pay attention to its hosting preferences, how to reduce the risks of ingestion, as the care required in case of developing the infection is important to have it in consideration. All these are to reduce it as much as possible, not nourishing its incidence, therefore affecting the prevalence and human risks of having to deal with its effects at least, and some symptomatic animals.

Is also important to have in mind that vaccines help humans, and yet we still do not have one to prevent our bodies from adverse reactions due to the salmonella family, as other foodborne pathogens that historically damage human health and the way we get nourished.

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