

# Cholera an epidemiological review health essay

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For over centuries, mankind has put countless efforts to fight the outbreak and spread of diseases and it has always been an entity of devastation and a matter of concern for mankind. Masses of people lose their lives and millions of resources have been used up on the treatment of diseases. Out of much morbidity, human race has dealt with several infectious diseases throughout the historical record, affecting populations around the globe. Due to increased probability of transmission, infectious diseases have always been a matter of concern for people all over the world. Cholera is one of the most devastating infections and is the second leading cause of mortality worldwide among children younger than 5 years (Mandal, Mandal & Pal, 2011). The reason for selection of cholera out of other infections is that it is endemic in more than 50 countries around the globe and also causes large epidemics since 1817 (Baqir, Sobani & Bhamani et al., 2012). Therefore, it is quite significant to highlight its outbreak, causes and management from epidemiological perspective. Furthermore, cholera mainly affects Africa, Pakistan, India, Haiti and other developing countries (Zuckerman, Rombo & Fisch 2007). Hence, it is important to highlight the reason and management of cholera epidemics in third world regions including our country. Another reason for the selection of this topic is that cholera is an infection concerned not only with the personal hygiene but also with the water and sanitation management on country level. Hence, this is an interesting topic that can enable one to figure out possible steps that can be taken at national level to reduce incidents of cholera (Harris, Larocque & <https://assignbuster.com/cholera-an-epidemiological-review-health-essay/>

Qadri et al., 2012). Moreover, cholera has been the center of discussion in the Dominican Republic since November 2010. We must highlight a topic that is of a common interest for medicine, public health, government and general population. According to Gordis (2009) the chronological background of cholera goes back in the era of John Snow. Cholera was a disease that was a chief problem in England in the mid of 19th century. In the first week of September 1854, about 600 people living within a few blocks of the Broad Street pump in London died of cholera. At that point in time the registrar general was William Farr. Snow and Farr had a major discrepancy about the cause of cholera. Farr stick to what was called the miasmatic theory of disease. According to this theory, disease was transmitted by a miasma, or cloud, that clung low on the surface of the earth. If this were so, this could be expected that people who lived at lower altitudes would be at greater risk of contracting a disease transmitted by this cloud than those living at higher elevations. Snow did not agree he believed that cholera was transmitted through contaminated water. He incorporated with one of the water supply company to experiment his hypothesis. He carried out " Shoe-leather epidemiology" approach i. e. going from house to house, counting all deaths from cholera in each house, and determining which company supplied water to each house. The death rate was 315 deaths per 10, 000 houses that were getting its water from polluted part of the Thames River. The fascinating history of cholera invited researchers to do further researches concerning the natural history of the disease. It was found that Cholera is caused by *Vibrio Cholerae*- a gram negative and comma shaped bacteria with a short incubation period of few hours to 5 days which is a necessary cause for this disease. After the ingestion of *V Cholerae* from contaminated water, most of

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the bacteria are killed by gastric acid. Surviving organisms colonize the small intestine and elaborate cholera toxin. Cholera toxin is a protein exotoxin which acts enzymatically to activate adenylate cyclase and lift intracellular cyclic AMP. This leads to chloride secretion through secretory diarrhea (Harris, Larocque & Qadri et al., 2012). Once the pathophysiology of the disease flashed on the screen, researchers focused on the causes and host susceptibility of cholera. The infection is acquired by ingestion of water or food contaminated with faeces. *V cholerae* can grow in water of low salinity when it is warm and contains sufficient organic nutrients. Cholera is most frequently transmitted through fecal-oral route and has been linked to drinking contaminated water from shallow wells, rivers or streams without boiling. Raw or undercooked seafood has also been linked to acquisition of infection (Njoh, 2010). The epidemiological perspective suggests that it should be noted that these causes can be associated to the epidemics, as cholera mainly affects developing countries like Africa and Pakistan where water and waste management is a prominent issue at country level (Zuckerman et al., 2007). Furthermore, the causes can be related to the epidemics in a way that socio-economic status of a region plays a significant role in the acquisition and transmission of cholera for the reason that recent evidences suggest that cholera spread is greater in areas where the living conditions are crowded and where there is no proper disposal of faeces. Considering Pakistan, according to a survey of 104 developing countries by the Human Development Initiative at the University Of Oxford 2010 suggests that the percentage of poor in Pakistan is 51%. The living conditions in such areas are worth perturbing with a poor and crowded infrastructure and the waste management is also not adequate for a healthy lifestyle in majority

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areas of Pakistan. Also in developing countries, the general health status of a person is an important indication as this evidently relates the causes of cholera with its epidemic in Pakistan. Environmental factors are important in the epidemiology of cholera. Changes in surface water temperature and terrestrial nutrient discharge lead increase in V cholerae. Cholera rates also increase considerably during floods compared with non-flood periods. Natural disasters that disrupt public health facilities, also contribute to cholera epidemics (Harris, Larocque & Qadri et al., 2012). Pakistan is ranked number 9th in terms of flood affected countries. During floods the dirty water provides constructive environment for microbes to grow (Baqir, Sobani & Bhamani et al., 2012). Clinical indications of cholera include massive watery painless diarrhea, up to 1 L per hour that can lead to hypotensive shock and death within hours of the first symptom also known as cholera gravis. The characteristic rice-water stool of cholera refers to the similarity of the stool to water in which rice has been washed. Other clinical indications comprise vomiting, dehydration, electrolyte imbalances, lethargy, dry mouth and cold skin. Kussmaul breathing can occur because of acidosis from stool bicarbonate losses. Weak and thready peripheral pulse and low urine output are also incorporated in clinical manifestation of cholera. Complications can result in hypoglycemia, seizures, circulatory collapse and death (Page, 2007). World Health Organization estimates that 3.5 million cases occur per year predominantly in Asia and Africa, with periodic major epidemics including that in Haiti in 2010. The prevalence of cholera in Pakistan, according to the Aga Khan University statistics from 2011 to 2012 includes 16 males and 17 females between the age limit of 5-40 years. With such severe complications and mass epidemics of cholera, it is very important to

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ponder over its management. It is havoc especially for developing countries with low socio-economic status. Firstly, medical management of the disease will be discussed briefly. Rehydration is the cornerstone of management of patients with cholera. As all the problems i. e. (weak pulse, hypoglycemia, seizures, hypotension) are due to water and electrolyte imbalance. Oral Rehydration Therapy aims to balance sodium and glucose to maximize sodium uptake in the small intestine, and careful replacement of fluid losses. It is important to improve access to therapy and decrease time to initial rehydration. Patients with severe cholera need an average of 200 mL/kg of isotonic oral or intravenous fluids in the first 24 h of therapy. Effective antibiotics may also shorten the duration of diarrhea and reduce the volume of stool losses by up to 50%. Antibiotic therapy can be initiated after the fluid management. Nutritional interventions include the reopening of a high energy diet immediately following the initial fluid deficit is corrected to prevent malnutrition, hypokalemia and hypoglycemia. Zinc supplementation after childhood diarrhea also reduced the incidence of subsequent episodes of diarrhea for several months (Harris, Larocque & Qadri et al., 2012).

Secondly, epidemiological management of the disease will now be discussed. It is very important for the clinicians and public health nurses to educate public about the disease process and the significance of seeking medical help. Many people from low socio-economic status perceive rice-water stool (a marked clinical feature of cholera) as usual occurring diarrhea. It is thus very important to provide awareness to people about the severity of infection through radio advertisements, mobile phone messaging, messaging on billboards, community volunteers and other methods (Page, 2007). After providing awareness, the next step is working with the water and sanitation

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management department. Cholera is a threatening epidemic that can be eliminated not only by the efforts of medical department. It is a collaborative work and can be enhanced by working with different water and waste management departments at district and national level. Using disinfectants, proper disposal of waste and the bodies of those who die, and coordination of the response with community, regional, national, and international health authorities are important epidemiological steps that should be taken in order to fight the Cholera threat (Lucas & Deen et al., 2005). About 1 billion people still do not have access to safe water and remain at jeopardy of cholera around the globe (Harris, Larocque & Qadri et al., 2012). While in Pakistan, more than 175 million people still don't have access to clean water (Blyther, 2012). Hence, it is very important to ensure the accession of clean water in such areas in order to eliminate the risk of cholera. Another step that can be taken to solve the epidemic problem of cholera is the introduction of cholera vaccine, recommended officially by WHO. Even though safe and effective cholera vaccines exist, cholera vaccination is not yet part of cholera control programs in Pakistan. In Beira Africa, cholera vaccine has been introduced as mass immunization campaign (Lucas & Deen et al., 2005). In this campaign, the effectiveness of this vaccine was proved by immunizing mass number of people with cholera vaccine. This campaign proved to be effective as a lot of people were encouraged to immunize themselves by the influence of each other. This step has not yet been taken in Pakistan. The effectiveness of this campaign suggests that this step should also be taken here in Pakistan to incorporate cholera vaccine in the cholera control programs. WHO recommendations for cholera includes mass awareness programs about safe latrine use, disinfection of water with 2% chlorine solution, hand washing and <https://assignbuster.com/cholera-an-epidemiological-review-health-essay/>

proper sanitary and sewage disposal. The recommendations from WHO also suggests effective surveillance (Njoh, 2010). It is already known that surveillance is a continuous systematic collection and interpretation of data. With effective surveillance, faulty and under reporting of cholera cases would be reduced which would result in effective management. Recommendations by Njoh (2010) on individual level include focusing on freshly cooked foods, discouraging defecation near water sources and careful handling of stools. In a nutshell, cholera has had a vast consequence on human history. Therefore, many questions remain unanswered like will severe weather events such as regional flooding associated with global warming result in increased cholera? What role would surveillance, screening, vaccination, or empirical treatment have in limiting the spread of cholera into immunologically naive populations? How can safe water and improved sanitation be attained in the many parts of the world without them? Many of these questions are answered and many are not. But as advances are made in medical, environmental and public health, more and more questions would be answered and many aspects would be unfolded. With effective collaboration among public health nurses, physicians and water management at national level, successful strategies can be ruled out to prevent incidences of cholera. As it has in the past, cholera remains principally a disease of destitution, social unrest and displacement, and endures to be a disease of major public health concern. Therefore, it is important to handle it effectively. (Word Count: 2018)