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Epidemics and Pandemics outbreak in India from 19th to 21th Century

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Abstract: *India has witnessed a widespread of illness and viral outbreak throughout century. The diseases may spread from human to human contact, animal to human transmission. Diseases may epidemic, endemic and pandemic in nature. India is great prone to these epidemic and pandemic diseases due to large population and favorable tropical climate of the country. India also has a large disasters prone area which may cause large spreading of many epidemics after post disaster. Pandemics on the other hand, refer to the worldwide spread of diseases. Some of which causes death of million. Millions of people displaced from their home and become homeless. Epidemics or pandemics cause a great loss to Indian society.*

Keywords*: Epidemic; Endemic; Pandemic; Tropical climate.*

I. Introduction

India is the second largest populated country of the world after China. It lies in the tropical region which also favors the large number of epidemic and pandemic disease to spread faster than other countries. India supports large number of diverse habitats which favors a large number of bacteria, viruses and fungus to survive and grow. Some are also zoonotic in nature, as these diseases and infections, which are naturally transmitted between vertebrate animals and man, and infections that are shared between vertebrates and man. Diseases never had meanings that are purely bodily. In fact, dominant ideologies and religious beliefs, across time, have always had a major impact in shaping the meanings of diseases, and the manner in which they originate and circulate [1]. Some examples of pandemic disease are cholera which was first detected in Calcutta (now Kolkata) in India (1817), Leprosy in 11 century in Europe, Plague in 541 AD from Egypt and Spanish flu in 20 century etc. There have been seven time cholera pandemics and three plague pandemics is recorded history. The third plague pandemic which last for a century, and killed 1.2 crore up to the year 1960, including an estimated 1 core people only in India. India being a developing country with a large number of people living below poverty line, poor sanitation, open drainage system and living condition in India which favors a large number of local outbreaks in India like Odisha jaundice and Bombay plague etc.

Cholera Outbreak (1817-1899)

During 19th centuries, during British colonial era a large number of disasters climates like floods, landslides etc occurs in India which favors the Cholera pandemic multiple times, in 1817, 1829, 1852, 1863, 1881, and 1899[2]. First outbreak Cholera was reported in 23rd August 1817. Second in 1829 in Bengal, been a land of many river and Gangetic plain favored these bacteria to grow more rapidly and very soon it spread to the northern part along the river. And with in a weak it kills a 1000 of people in northern India. *Vibro cholera*, is the causative agent of the cholera pandemic, is a type of bacterium[3]. People living condition was very poor and large number of slums was there which favors a deadly disease to spread in India more frequently. Cholera outbreak in Orissa after post floods in 2001 affected 34,111 people including 33 deaths[4]. There are an estimated 50,000–100, 000 deaths because of cholera annually[5].

Bombay Plague Epidemic (1896-1897)

Bombay plague is also known as Bubonic plague or Black Death. The Bombay plague is caused by *Yesinia Pestis.* It gripped the Bombay and Calcutta (1895-1897) cities which have sea ports and it was believed that it is entry point of the infection from other country. Bombay was the industrial city and has large number of migrated laborers from different part of the country. As this epidemic occurs in Bombay the large numbers of workers migrate to their native places and carry this disease with them to other parts of the country and continued till 1918. It leads to the death of 1900 within a weak. In the span of ten years between 1898 and 1908, around 5 lakh people succumbed to the infection. Plague pandemic leads to the death of 75-200 million throughout the world[6].

Spanish Flu Pandemic (1918-1920)

In 20th century, the world witnessed deadly pandemic called Spanish Flu. It is a viral infection and is a stain of *Avian Influenza* (H1N1)[7]. It was started in the end of World War I (March 1918) and continues to spreading all over the world due to mass mobilization of the tropes. In India, the second wave began in Bombay in India and spread to north India and Sri Lanka, and then across the world. Spanish Flu pandemic leads to the death of 10-20 million in India only. It was said that the Indian soldiers returned from World War I carry this virus with them. The estimated global mortality ranges from 20 to 50 million.

Encephalitis Lethargic Outbreak (1915-1926)

Encephalitis Lethargica was a mysterious and devastating epidemic in early 20th century and also known as Lethergic Encehallitis. It spread around the world in 1915-1926. It is also known as Economo's Encephalitis. The disease was characterized by increasing drowsiness and lethargy[8]. In 1919 it spread in India, China, Central America and different part of the world. This virus spread from one person to other. The virus attacks on the Grey matter (CNS) of the human nervous system[9, 10]. This pandemic leads to the death of around 500,000 million though out the world.

Polio Hyper Endemic (1970-1990)

In the early 20th century, Polio was one of the most feared diseases in developing country, like India. India was the worst affected developing country until the late 1990. In 1990 India was hyper endemic for polio. Approximate 500 in 1000 children paralysis daily in India. India accounted 40% of the polio cases globally. Oral vaccine was first introduced in the 1960 but the epidemic continuous till 1990. In 2011 India declare polio free status[11]. It affects both rural and urban states.

Smallpox Epidemic (1974-1980)

Smallpox epidemic broke out in India in 1974 in West Bengal, Bihar, and Orissa. Nearly 85% of the cases reported globally were from India. Around 15,000 people lost their lives to the worst smallpox epidemic of the 20th century. Thousands of survivors suffered from blindness and disfigurement. *Virula Major* or *Virule Minor* is the causative virus of smallpox[12]. Although the origin of the disease is not known, it appears to have existed in 3rd century BCE. Due to the tropical climatic nature of the country it favors the virus to grow more rapidly in the counties like India, Africa etc[13]. Smallpox also spread to Europe, Arabia for centuries and its kill's approx three out of ten people. India declared free from smallpox in 1977 March.

Plague Outbreak (Surat) Gujarat (1994) and (Shimla) Himachal Pradesh (2002)

In India plague outbreak is also seen in different years from 1994 to 2004. In 1994, plague broke out in (Surat) Gujarat that lasted for only a little over two weeks. 1000 cases were reported including 53 deaths. Fear of quarantine and panic resulted in population exodus and internal migration. People flee in large numbers due to rumors and misinformation which leads to people hoarding essential supplies and widespread panic. This mass migration contributes to the spreading of disease in different part of the country. Within in the weak report emerged of at least 1000 cases of patients affected with the disease and 50 deaths[14, 15]. In 2002 Pneumonic plague hits Shimla (Himachal Pradesh). Out of 16 cases and 4 deaths were reported. Thus, it was evident that the fatality rate is high even though only a small number of cases were reported[16].

Severe Acute Respiratory Syndrome (SARS) Pandemic (2003)

Severe Acute Respiratory Syndrome, popularly known as SARS, caused by SARS-CoV virus (to which virus causing COVID-19 is related) is considered the first severe infectious disease that broke out in the current century. In April 2003, India witnesses its first case of SARS (Severe Acute Respiratory Syndrome). The epidemic

emerged from the Guangdong province of China[17, 18]. The infection spread to other countries and over 8000 cases were reported with 774 deaths. Use of facial masks, disinfecting surfaces, and washing hands frequently were the precautions taken, like in the case of current corona virus infection.

Chikungunya and Dengue Epidemic (2006)

Several states in India reported simultaneous outbreaks of Dengue and Chikangunya virus in 2006. Around 15 lakh cases of Chikungunya were reported across the country including the Andaman and Nicobar islands. Majority of the cases were reported from southern states, Madhya Pradesh, Maharashtra, and Gujarat. In the same year Dengue outbreak was also witnessed in the same year with 10,344 cases and 162 deaths. Both are mosquito borne tropical diseases and stagnation of water provides breeding ground for these mosquitoes that impact local communities[19, 20]. Aedes mosquitoes were found to be the vectors of the disease[21]. Dengue not only epidemic to India but also effects more than 100 countries in southeast Asia, the Americas, the Western Pacific, Africa and the Eastern Mediterranean regions[22].

Encephalitis Outbreak (2005)

It is locally known as "Chamki Bukhar". Specifically Japanese Encephalitis (JE) and Acute Encephalitis Syndrome (AES) caused primarily due to mosquito bite. Gorakhpur in Uttar Pradesh had history of being effected by Encephalitis from 2005. It is witnessed the increase in number of children death every year. It is a viral infection disease that cause inflammation of the brain leaving long term physical disabilities and even leads to the death. It mainly affects the brain causing swelling. It was the longest and most severe epidemic in 3 decades; 5,737 persons were affected in 7 districts of eastern Uttar Pradesh, and 1,344 persons died. Japanese encephalitis virus (JEV) is the most common cause of childhood viral encephalitis in the world; it causes an estimated 50,000 cases and 10,000 deaths annually[23].In 2005, Uttar Pradesh reported 1145 cases from 14 districts and Bihar reported 90 cases. Around 296 persons affected lost their lives one-fourth of the total affected. The cases of encephalitis continue to occur annually predominantly in the northern part of India.

Gujarat Hepatitis Outbreak (2009)

In February-March 2009, reports emerged that approximately 125 people in Modasa town of Sabarkantha, district in Gujarat[24]. An infected disease caused by hepatitis B virus that affects the liver. The disease is caused due to transmission of the infectious blood and other body fluids. The local doctors were suspected to use of recycled and unsterilized syringes and injection needles as the means of transmission of the infection[25].

Odisha Jaundice Outbreak (2014-2015)

Several towns in Odisha witnessed an outbreak of Jaundice in November 16, 2014 and January 1, 2015. Due to water contamination in around 3966 cases where reported in Odisha within a year. The first case has been reported from the town of Sambalpur[26]. Within the three month 12 people has dies and 670 cases of jaundice has been reported in the town.

Swine Flu Outbreak (2014-2015)

It is an Influenza virus last for a few months in India (2014). It is a one type of influenza virus which spread in the states like Gujarat, Delhi, Maharashtra, Rajasthan and Telangana. Worth effected state are Gujarat and Rajasthan[27]. By March 2015, according to India's health ministry, approximately 33000 cases had been reported across the country and 2000 deaths. In 2010, H1N1 Flu, also known as Swine Flu, resulted in the death of around 18,500 people worldwide[28]. Around 27,000 confirmed cases including 981 deaths were witnessed in India. The flu re-emerged in 2015 with 30,000 cases across the country and 1,731 deaths. Rajasthan, Maharashtra, and Gujarat were the worst affected.

Zika Virus Outbreak (2018)

Zika is a mosquito born Flu virus that originates in Uganda in 1947 in monkeys[29]. It is later identified in 1952 in human. Zika virus is primarily transmitted by Aedes mosquitoes which mostly bite in the day. Symptoms of this disease are shown after 2-7 day. Zika virus infection during pregnancy can cause infection to brain with microcephaly which is commonly known as Zika syndrome. Outbreak in Jaipur, Rajasthan and some part of Madhya Pradesh are reported in October 2018[30]. In India 100-200 cases were reported. Zika is also transmitted from mother to fetus during pregnancy, through sexual contract, transfusion of blood and blood products and organ transplantation is also responsible of Zika virus transmits from human to human.

Nipah Virus Outbreak (2018)

The spread of the outbreak remained largely in the Kerala, India. It spread in the May and June 2018. Reported 19 cases of Nipah virus out of at least 17 people died. The disease shows extremely high mortality rate. Nipah virus is an emerging bat-borne pathogen which is spread by the fruit eating bat[31]. By June the outbreak declared to have been completely contained. Nipah virus is a highly pathogenic *Paramyxo virus* that first emerged in Malaysia and Singapore in 1999[32]. All India outbreaks have seen person-to-person transmission.

COVID-19 (2019- Till date)

The Corona virus out break comes to light on December 31, 2019. China informed World Health Organization (WHO) of a cluster of cases of Pneumonia of unknown causes in Wuhan city in Hubei province. On January 9, 2020 WHO issued a statement saying Chinese researcher have made preliminary determination of the virus as a Novel Corona virus. Since then thousand of cases of novel corona virus reported from all the province of China. The novel Corona virus has acquired the ability to spread among the humans. With the case of human to human transmission have being reported in first Vietnam and Germany then this deadly pandemic is spreading all over world till today. Globally there have been 12,964,809 confirmed cases of COVID-19 including 570,288 deaths, reported by WHO till 14 July. In India, from 30 January till 14 July there have been 906,752 confirmed cases of COVID-19 with 23,727 deaths[33].

II. Conclusion

India been such a huge population have always stand strongly against these type of pandemic from past. Good researcher, scientist and medical faculties help to overcome these pandemic in India. Some of the epidemics like polio, measles are completely eradicated and some are controlled within the span of time. Large variable habitats, climatic conditions and lack of post disasters management favor the outbreaks in India. And also lack of sufficient data and experimental approach some of pandemic lead to the death of the peoples in the country. This research paper may show the young researchers and people, that COVID-19 is not only the pandemic we are facing a lot of pandemic, epidemic and outbreak are there in the past century.

References

[1]. Cleetus, B. (2020). Tropics of disease: Epidemics in colonial India. *Economic and Political Weekly*, *55*(21).
[2]. Arnold, D. (1986). Cholera and colonialism in British India. *Past and Present*, *113*(1), 118–151. https://doi.org/10.1093/past/113.1.118.
[3]. Charles, R. C., & Ryan, E. T. (2011). Cholera in the 21st century. *Current Opinion in Infectious Diseases*, *24*(5), 472–477. https://doi.org/10.1097/QCO.0b013e32834a88af.
[4]. WHO, https://www.who.int/csr/don/2001_08_14/en/
[5]. Weil, A. A., & Ryan, E. T. (2018). Cholera: Recent updates. *Current Opinion in Infectious Diseases*, *31*(5), 455–461. https://doi.org/10.1097/QCO.0000000000000474
[6]. Echenberg.j, Myron (2007). *Plague ports: the global urban impact of bubonic plague, 1894-1901*. New York: New York University Press. ISBN 978-0814722329. OCLC 70292105
[7]. Akins, P. T., Belko, J., Uyeki, T. M., Axelrod, Y., Lee, K. K., & Silverthorn, J. (2010). H1N1 encephalitis with malignant edema and review of neurologic complications from influenza. *Neurocritical Care*, *13*(3), 396–406. https://doi.org/10.1007/s12028-010-9436-0
[8]. Fominykh, V. V., Frei, E. A., Brylev, L. V., & Gulyaeva, N. V. (2018). Autoimmune Encephalitis: A Disease of the 21st Century at the Crossroads of Neurology and Psychiatry.*Neurochemical Journal*, *12*(4), 311–323. https://doi.org/10.1134/s1819712418040037
[9]. McCall, S., Vilensky, J. A., Gilman, S., & Taubenberger, J. K. (2008). The relationship between encephalitis lethargica and influenza: A critical analysis. *Journal of NeuroVirology*, *14*(3), 177–185. https://doi.org/10.1080/13550280801995445
[10]. Lo, K. C., Geddes, J. F., Daniels, R. S., & Oxford, J. S. (2003). Lack of detection of influenza genes in archived formalin-fixed, paraffin wax-embedded brain samples of encephalitis lethargica patients from 1916 to 1920. *Virchows Archiv*, *442*(6), 591–596. https://doi.org/10.1007/s00428-003-0795-1
[11]. Bhattacharya, S. (n.d.). Smallpox and polio eradication in India : comparative histories and lessons for contemporary policy Erradicação da varíola e da pólio na Índia : histórias comparativas e lições para políticas contemporâneas. 433–444.
[12]. Lane, J. M. (2011). *Remaining Questions about Clinical Variola Major*. *17*(4). https://doi.org/10.3201/eid1704.101960
[13]. Shafa, E. (1973). *Present State of Global Smallpox Eradication 1*. *9*, 5–9.
[14]. Mcnamee, D. (1996). *plague by*. 1626.
[15]. Ramalingaswami, G. V. (2001). *Psychosocial Effects of the 1994 Plague Outbreak in Surat , India*. (August), 1994–1995.
[16]. Giordano, A., & Luppi, A. (2007). *Pneumonic Plague , Northern India ,*. *13*(4).
[17]. Cherry, J. D. (2020). *The chronology of the 2002 – 2003 SARS mini pandemic*. (January). https://doi.org/10.1016/j.prrv.2004.07.009
[18]. Zhong, N. S., Zheng, B. J., Li, Y. M., Poon, L. L. M., Xie, Z. H., Chan, K. H., Guan, Y. (2003). *Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong , People ' s Republic of China , in February , 2003*. *362*, 1353–1358.
[19]. Khetarpal, N., & Khanna, I. (2016). Dengue Fever: Causes, Complications, and Vaccine Strategies.*Journal of Immunology Research*, *2016*(3). https://doi.org/10.1155/2016/6803098
[20]. Mutheneni, S. R., Morse, A. P., Caminade, C., & Upadhyayula, S. M. (2017). 20Dengue burden in India : recent trends and importance of

climatic parameters. *Nature Publishing Group*, (June). https://doi.org/10.1038/emi.2017.57
[21]. Dapurkar, D., & Telang, M. (2019). A patent perspective on chikungunya. *Acta Tropica*, *199*(August), 105131. https://doi.org/10.1016/j.actatropica.2019.105131
[22]. Mascarenhas, M., Garasia, S., Berthiaume, P., Corrin, T., Greig, J., Ng, V., … Waddell, L. (2018). A scoping review of published literature on chikungunya virus. In *PLoS ONE* (Vol. 13). https://doi.org/10.1371/journal.pone.0207554
[23]. Verma, S. K., & Rao, P. V. L. (2006). *Japanese Encephalitis Outbreak, India, 2005*. *12*(9), 1427–1430.
[24]. Patel, D. A., Gupta, P. A., Kinariwala, D. M., Shah, H. S., Trivedi, G. R., & Vegad, M. M. (2012). An investigation of an outbreak of viral hepatitis B in Modasa town, Gujarat, India. *Journal of Global Infectious Diseases*, *4*(1), 55–59. https://doi.org/10.4103/0974-777X.9376
[25]. Seetharam, S. (2009). Hepatitis B outbreak in Gujarat: a wake-up call. *Indian Journal of Medical Ethics*, *6*(3), 120–121. https://doi.org/10.20529/ijme.2009.042
[26]. Paul, S., Mahajan, P., Bhatia, V., Sahoo, J., & Hembram, D. (2015). Investigation of jaundice outbreak in a rural area of Odisha, India: Lessons learned and the way forward. *Community Acquired Infection*, *2*(4), 131. https://doi.org/10.4103/2225-6482.172650
[27]. Kirti, Mann, P., & Gupta, R. (2014). swine flu a clear and present danger that rocked india in 2014-15;Journal of international academic research for multidisciplinary.*2*(4), 234–240.
[28]. Arbat, S., Dave, M., Niranjane, V., Rahman, I., & Arbat, A. (2017). Analyzing the clinical profile of swine flu/influenza A H1N1 infection in central India: a retrospective study. *VirusDisease*, *28*(1), 33–38. https://doi.org/10.1007/s13337-017-0363-y
[29]. Agumadu, V. C., & Ramphul, K. (2018). Zika Virus: A Review of Literature. *Cureus*, *10*(7), 1–5. https://doi.org/10.7759/cureus.3025
[30]. Biswas, A., Kodan, P., Gupta, N., Soneja, M., Baruah, K., Sharma, K. K., & Meena, S. (2020). Zika outbreak in India in 2018. *Journal of Travel Medicine*, (February). https://doi.org/10.1093/jtm/taaa001
[31]. Aditi, & Shariff, M. (2019). Nipah virus infection: A review. *Epidemiology and Infection*, *147*, 1–6. https://doi.org/10.1017/S0950268819000086
[32]. Lo, M. K., & Rota, P. A. (2008). The emergence of Nipah virus, a highly pathogenic paramyxovirus. *Journal of Clinical Virology*, *43*(4), 396–400. https://doi.org/10.1016/j.jcv.2008.08.007
[33]. WHO,Coronavirus disease(COVID-19) https://covid19.who.int/region/searo/country/in