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British Raj and Smallpox in Assam: A Study on Healthcare, Policies, Practices and Societal Implications

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Abstract: *Western healthcare system and medicine began to gain prominence in India with the arrival of British. British physicians and medical practitioners introduced modern medical practices and established hospitals and medical schools. The British administration faced a significant challenge with epidemic diseases like cholera, kala-azar, smallpox, leprosy and malaria. The colonial government introduced policies to control and prevent the spread of these diseases. Efforts were made to improve sanitation and public health infrastructure, such as the construction of sewage systems and the development of public health regulations to address various issues of sanitation, quarantine and disease control. This paper made an attempt to study the various measures taken by the colonial government to eradicate the smallpox from Assam.*

Keywords: Public Health, Diseases, Smallpox, Policies, Challenges and Peoples Response.

The introduction of western medicine in India can be traced back to the year 1600 AD when the first medical officers arrived with the fleet of the British East India Company as ship's surgeons.[1] However, it was only in 1764, a medical department was established in Bengal to provide healthcare to the company's soldiers and employees. Subsequently, in 1785, medical departments were set up in three presidencies, namely Bengal, Madras, and Bombay, encompassing both military and civil medical services.[2] Nevertheless, these services primarily catered to the company's personnel. The Revolt of 1857 exposed the British troops in India to severe epidemics, weakening their fighting capacity. In response, a special commission was formed in 1859 to investigate the sanitary conditions of British troops in India. The report of the commission revealed that 69 out

of every 1,000 British troops in India died annually due to various diseases. This led to the establishment of a sanitary commission to oversee conditions in and around military cantonments and improved military hygiene and the enactment of the Military Cantonments Act of 1864. It also introduced a system of sanitary policy and death registration within military stations.[3] In 1869, the government of India appointed a Public Health Commissioner and a Statistical Officer to further advance public health. With the abolition of the presidential system in 1896, the three separate presidential medical departments in Bengal, Bombay and Madras were merged to create the Indian Medical Services (IMS).[4] This marked a significant step in the development of medical and public health services in India. Territorial expansion in India triggered various medical challenges that not only threatened the company's profits but also the lives of both the colonizers and the colonized. Warfare and population movements within India created a conducive environment for the spread of epidemic diseases like cholera and smallpox, leading to severe outbreaks in the early and mid-nineteenth centuries.[5] Furthermore, the construction of colonial infrastructure, such as roads, railways, and labor transportation systems, played a pivotal role in disseminating diseases throughout the country. Unclean living conditions in coolie lines, where British capitalists housed workers in plantations, mines, and industries, also facilitated the spread of diseases. The expansion of irrigation canals and the development of railways created favorable breeding grounds for malaria-carrying mosquitoes in India.[6]

Assam's interaction with the Western medical system can be traced back to the late 18th century when doctors and surgeons accompanied soldiers and made visits to the region. The British presence in Assam gained momentum following the Treaty of Yandabo in 1826, which marked the conclusion of the first Anglo-Burmese war (1824-1826).[7] Since then, one of its top priorities was the health and well-being of both its employees and the local population.[8] The arrival of the British in Assam brought about significant changes in health and medical policies. The challenging climate and environmental conditions in Assam posed various health risks for the British and their soldiers. They encountered a range of health issues and diseases, including cholera, kala-azar, malaria, leprosy, smallpox, etc. In response to these challenges and in order to safeguard the lives of both Europeans and natives, the colonial rulers implemented numerous health and medical policies during the 19th century. These policies marked a pivotal development in the history of healthcare in the region.

History of Smallpox

Sanskrit medical manuscripts from ancient India, dating back to approximately 400 CE, contain some of the earliest documented mentions of smallpox, with descriptions tracing as far back as 1500 BCE.[9] In these ancient texts, the disease known as 'Masurika' has been discussed for around 2,000 years. The term 'Masurika' is derived from 'Masura,' which refers to the hard, lenticular orange

pulses that are still a dietary staple in South Asia today.[10] In medical science smallpox is identified as a highly contagious viral infectious disease caused by the variola virus.[11] Variola belongs to the Orthopoxvirus family and is one of the largest viruses known.[12] There were two viruses within the Orthopoxvirus genus responsible for human smallpox. One was the variola minor poxvirus, causing a less severe form of the disease known as alastrim, which had a low fatality rate.[13] The other was the variola major poxvirus, associated with an extremely high fatality rate,[14] often referred to as 'hemorrhagic' or 'flat' smallpox. Smallpox spread from one person to another through respiratory transmission, and contact with infected individuals or their belongings could also transmit the virus.[15] Infected individuals experienced high fever and developed red spots on their face, mouth, and throat, leading to severe pain and difficulty in eating and swallowing. While survivors gained immunity against future attacks, they often bore lifelong facial and skin damage, and in some cases, they suffered blindness for the rest of their lives.[16] Smallpox, in its endemic and epidemic forms, claimed the lives of countless millions of people around the world and left many others disfigured during its devastating history.[17]

Smallpox in Assam and Colonial Response

Shortly after their arrival in Assam, the British encountered a devastating smallpox epidemic in the Nowgong district in 1832, which had a significant impact on the local population, resulting in a considerable number of fatalities.[18] According to W.W. Hunter, the climate in Nowgong was exceptionally unhealthy, primarily due to the presence of numerous swamps and the absence of proper hygiene practices among the local residents. The quality of water used for drinking and cooking was extremely poor, indicating that the lack of attention to hygiene and unsanitary habits likely contributed to the prevalence of smallpox in the region.[19] The Nowgong district reported the highest death rates in various years, including 1898, 1904, 1909, and 1910.[20] The Civil Surgeon attributed the disease's origin to Nonoi, a place in the Nowgong district where there was strong resistance to anti-smallpox vaccination. The local population not only doubted the effectiveness of vaccination as a preventive measure but also believed that it could actually cause smallpox. Smallpox was also widespread in other districts of Assam, including Sibsagar, Darrang, Kamrup, and Lakhimpur.[21] The prevalence of smallpox in the region was notably influenced by local climate and weather conditions. According to reports submitted by the Civil Surgeon of the Kamrup district, smallpox cases tended to increase in the early months of hot weather.[22] Smallpox epidemics were more common in areas with lower rainfall, while regions with high rainfall experienced a decrease in the prevalence of smallpox. Provinces like Bengal and Assam, which received consistent high rainfall and had high humidity, showed lower epidemic rates. Interestingly, in the wetter regions of lower Bengal and Assam, there was no clear correlation between smallpox and either the monthly

temperature or relative humidity.[23] The Annual Public Health Report for the Province of Assam in 1928 recorded the highest number of smallpox-related deaths in the month of April and the lowest death rates in November.[24] This observation suggests that smallpox death rates were highest during hot weather with low rainfall and humidity, while they were lowest during the months of high rainfall and the winter season. However, it's essential to note that these observations appear somewhat speculative because local climate and weather alone may not offer a straightforward explanation for the outbreak of smallpox. Smallpox incidence is influenced by a complex interplay of factors, including vaccination rates, population density, and other public health practices, making it difficult to attribute outbreaks solely to climate and weather conditions.

In Assam, a distinctive healthcare system prevailed, where people turned to Ganaks (individuals with expertise in astrology and Vedic rituals), for medical treatment believing that smallpox was caused by a religious curse.[25] People widely practiced the inoculation in the region with the help of *Ganaks*. However, it's essential to clarify that the term 'inoculation' in this context did not mean what it does in modern medicine. Instead, it referred to a practice called variolation, which involved deliberately exposing individuals to smallpox or related diseases.[26] This variolation practice raised several controversial issues. Firstly, variolation was believed to impede the development of safer and more effective vaccination methods. Secondly, it often led to severe illness or even death among those subjected to it. Lastly, variolation could unintentionally spread natural smallpox and trigger epidemics.[27] Some Tikadars, the individuals responsible for administering variolation or 'mark-making,' reportedly acknowledged causing one fatality for every 200 inoculations they performed.[28] Consequently, a decision was made to ban the practice of inoculation in Assam. Nevertheless, resistance to vaccination persisted in different districts, with some individuals fearing that vaccinating children would anger the goddess of smallpox.[29] The *Mahapurushias*, who followed Sankardev's faith in Barpeta town, also opposed vaccination on religious grounds.[30] The absence of a comprehensive vaccination campaign further worsened the smallpox outbreak during the colonial period. Importantly, there was a marked contrast in vaccination coverage among various provinces. Some areas had robust immunization programs, while others, particularly in the northeastern region, had limited coverage, leading to frequent resurgences of smallpox cases.[31] This divergence in vaccination practices played a pivotal role in shaping the smallpox landscape in the region. This highlights the challenges and resistance faced by the British authorities in combating smallpox due to local beliefs, hygiene practices, and misconceptions about vaccination.

Edward Jenner introduced the first smallpox vaccination in 1798, and however, its implementation in India began in 1802. By 1804, certain Indian provinces had already prohibited smallpox inoculation.[32] However, in Assam the practice of inoculation continued unabated which significantly contributed

to the high smallpox fatality rate in the region. In the 19th and 20th centuries, Assam witnessed introduction of various medical policies to combat and ultimately eliminate smallpox. In 1850, the Smallpox Commission drew a compelling comparison between variolation, which deliberately infected people with smallpox for immunity, and deeply ingrained Indian customs like *Sati* and female infanticide. This led to the 1870s and 1880s Vaccination Act, a pivotal step in banning variolation and enforcing mandatory vaccination.[33] Smallpox had its most devastating impact on malnourished or under-three children, warranting exceptional care.[34] To address this, the Vaccination Act of 1880, No. 13 of 1880, was passed, granting authorities the power to prohibit variolation and mandate child vaccination in specific areas, starting with Assam where variolation was officially outlawed.[35] In 1916, the jurisdiction of Bengal Vaccination Act of 1880, designated as Act No. V of 1880,[36] was extended its scope to Assam, including Nazira and Mangaldai, intensifying vaccination campaigns.[37] Concurrently, the Epidemic Disease Act of 1897 emerged as a vital legislative instrument to combat smallpox, extending its influence not just within the Assam but nationwide. This Act primarily aimed to curb the transmission of infectious epidemic diseases, granting extraordinary powers to authorities for enforcement. It empowered state governments to bestow authority for necessary measures and temporary regulations in response to imminent epidemic threats, with breaches incurring legal penalties. In Assam, it facilitated mandatory vaccination, targeting regions reporting smallpox outbreaks or hosting anti-vaccination sentiments. District medical officers found it invaluable for executing vaccination and revaccination initiatives.[38] In summary, from the 1850 Smallpox Commission to the 1897 Epidemic Disease Act, a series of measures signified a progressive endeavor to combat smallpox, particularly hazardous for children, and enforce mandatory vaccination, ultimately advancing public health in India.

In October 1915, compulsory vaccination of the Imperial Act XIII of 1880 was made effective.[39] To facilitate these efforts, an Epidemic Unit was established and deployed systematically in severely affected areas, such as the Sibsagar subdivision resulting in a significant number of vaccinations administration.[40] Despite resistance from the general public, vaccination and revaccination were carried out with great determination. A concerted effort was made to combat the smallpox epidemic through the active involvement of key administrative bodies, including the Civil Surgeons, Local Board, and Municipal Board. These organizations were granted increased authority to appoint specialized immunizers in rural areas, ensuring the strict enforcement of vaccination laws. The Civil Surgeons, who were part of the official Indian Medical Services, played a pivotal role in popularizing smallpox vaccination throughout the region.[41] While compulsory vaccination was lacking, every possible measure was taken to combat the disease effectively. The Civil Surgeon emphasized the need to make vaccination mandatory in rural regions,[42] advocating for the deployment of vaccination inspection staff to conduct house-to-house inquiries and prevent

the resurgence of smallpox.[43] To address the shortage of vaccination inspection staff, T.D. Murison, in his 1926 public health report, urged the addition of ten workers to accommodate two sub-inspectors in larger and more densely populated subdivisions. It was recognized that the district personnel had to be sufficient to meet the district's needs, as vaccination and revaccination were the primary tools in managing smallpox epidemics. Despite opposition from some local communities rooted in superstitions and unfounded objections to vaccination, efforts to combat smallpox continued in the face of ongoing challenges. The persistence of infection in one area even as it disappeared in another highlighted the difficulty of completely eradicating the disease.[44] Plans were also made to involve all immunizers in sub-divisions to immunize and revaccinate the population at the thana level, identifying refractory villages as smallpox-infected and requiring vaccination during the subsequent season in the hope of achieving better outcomes.[45]

In urban areas, Municipal Boards were responsible for disease prevention, but most municipal towns in Assam had inadequate smallpox treatment and control facilities.[46] Isolation facilities or specialized hospitals for smallpox treatment were severely lacking, with only a few available in towns like Shillong, Gauhati, Dhubri, and Tezpur. In other towns, smallpox cases were isolated and treated in makeshift sheds attached to charitable dispensaries. In some areas, there were no isolation facilities at all, and patients received treatment alongside others in general hospitals or even at home.[47] Despite the establishment of a separate sanitary department, there was little improvement in the general decline of smallpox mortality.[48] The oversight of vaccinators across the province suffered due to a shortage of inspection personnel. The inconsistent performance of vaccinators, often acting recklessly, led to increased smallpox fatality rates during various years, particularly from 1912 to 1927. Between 1919 and 1927, the death rate steadily rose, reaching alarming levels in 1925 to 1927, indicating unsatisfactory immunization levels among the population. It became evident that the number of immunizers in most districts was inadequate to conduct annual visits to each village by the circle immunizer.[49] Insufficient vaccination efforts resulted in a surge in smallpox fatalities in specific areas like Mangaldai subdivision and Golaghat. The Assistant Director of Public Health identified deficiencies in the immunization program in this subdivision and urged the Civil Surgeon and Local Board to address these issues.[50] To protect individuals in regions heavily affected by smallpox, district magistrates were granted legal authority to enforce vaccination. However, this provision was not consistently enforced, as demonstrated by the differing situations in Gauripur and North Lakhimpur, where the mandatory vaccination act was extended in the former but not the latter.[51] In the Goalpara district, the Civil Surgeon was given the authority to select suitable candidates for local board appointments. The 1929 Public Health Report for the Province of Assam recommended the appointment of rural sanitary inspectors in police circles as they significantly reduced the

occurrence of diseases.[52] The inspection team was substantially reinforced, and the number of immunizers employed by Local Boards was significantly increased.[53]

In 1927, an expansion of the number of vaccinators for local areas took place to meet the growing demand. Additional Sub-inspectors of vaccination were appointed and assigned to districts as required. A recommendation was made to the government, proposing that vaccination inspection staff undergo training in basic hygiene and sanitation at the Provincial Medical School. This training would equip them with the skills necessary to perform the tasks of Rural Sanitary Inspectors, such as ensuring proper vaccine administration and verifying vital statistics in rural areas. These personnel played a crucial role in addressing village sanitary issues, particularly during epidemic outbreaks, as they could respond quickly in the absence of district employees from the epidemic unit.[54] The Civil Surgeon emphasized the importance of having immunizers under his authority to effectively control smallpox epidemics and ensure proper vaccination.[55] Successful and mandatory vaccination campaigns in affected areas led to a reduction in smallpox fatality rates in subsequent years. However, when local immunizers carried out poor immunization with inadequate supervision, fatality rates spiked. It's worth noting that there were no regulations mandating immunization or booster shots in rural areas, resulting in limited vaccine work during non-epidemic periods. Furthermore, the absence of separate consulting rooms and facilities for female patients in dispensaries contributed to a decline in the number of women seeking medical care. Women's reluctance to visit hospitals or dispensaries due to a lack of privacy exacerbated the smallpox mortality problem.[56] Additionally, the collection of vaccination fees from the public deterred many from receiving vaccinations.[57]

Conclusion

Throughout the 19th century, smallpox loomed as a terrifying scourge in Assam, significantly raising mortality rates. The colonial government took proactive steps to eliminate smallpox from the region, introducing various acts and preventive measures. They enacted the Compulsory Vaccination Act and prohibited the dangerous practices of inoculation. Special isolation hospitals were established in municipal towns for the treatment of smallpox patients. Deputy Commissioners, civil surgeons, and various organizations, including municipal and local boards in Assam, were authorized to oversee and implement preventive measures against smallpox epidemics. They had the authority to appoint numerous vaccinators and other official staff according to the needs of affected areas. Health workers were directed to conduct door-to-door visits to monitor smallpox incidence, especially in rural regions. Initially, many people dismissed the significance of vaccination due to religious beliefs associated with smallpox. However, as the mortality rate declined, they began to recognize the

benefits of smallpox vaccination. The colonial-era medical interventions in the Brahmaputra valley brought substantial benefits, curbing various epidemic diseases, including smallpox. During post-independence period the process of vaccination and revaccination was continued until the complete eradication of smallpox and in 1977 India was declared smallpox free nation by the World Health Organization.

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