Medical Apparatus and Epidemics: Mughal State's Response to Epidemics (1526-1707)

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Abstract

I propose an examination of the medical apparatus and the profound impact of epidemics in Mughal India from 1526 to 1707. I contest the persistent colonial and European-traveler historiography that depicts the indigenous medical system as static, superstitious, and unprofessional. In contrast, Mughal India possessed a dynamic and sophisticated medical culture, characterized by formalized education, a professionalized corps of physicians (*hakims*), extensive medical literature, and a state-sponsored concept of public health. The imperial court actively patronized this system, a syncretic blend of Unani, Ayurvedic, and local traditions. I analyze the Mughal state's response to major epidemics—primarily plague, cholera, and smallpox. The empire's reaction was not one of passive resignation but involved specific, context-appropriate governance strategies, including strategic mobility of the court, public sanitation initiatives, and extensive economic relief measures. I explore the devastating social, economic, and administrative impacts of these calamities, revealing both the vulnerabilities and the remarkable resilience of the Mughal state and its subjects in the face of widespread pestilence.

Keywords: Mughal India, Epidemics, Medical History, Public Health, State Governance, Unani Medicine

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The Mughal Empire (1526–1707) stands in historical imagination as an edifice of military might, architectural grandeur, and administrative sophistication. Yet, beneath this veneer of imperial glory, the empire was a living society grappling with the same universal challenges that defined the early modern world: political instability, climatic volatility, and, most profoundly, recurrent and devastating epidemic disease. European travelers and later colonial administrators, in particular, shaped the historiography of this period, frequently perpetuating a narrative of medical inadequacy. Accounts from figures like John Fryer, François Bernier, and Niccolao Manucci painted a picture of Indian medicine as a craft mired in superstition, which caste supposedly governed, and devoid of scientific professionalism (Kundra 2010). This perspective framed the Mughal state as fatalistic and indifferent, incapable of mounting an effective response to public health crises.

This deeply entrenched narrative, however, obscures the reality of a complex and intellectually vibrant medical world. Mughal India, in fact, possessed a dynamic and pluralistic medical apparatus that the state actively patronized and deeply integrated into society. Formalized medical education in *madaris*, a respected professional class of physicians (*hakims*) who were often high-ranking state officials, a vast and growing body of medical literature that engaged with global knowledge, and a network of state-sponsored and private hospitals (*Darul-Shifa*) characterized this system. This medical culture, a syncretic blend of Greco-Arabic Unani Tibb, indigenous Ayurveda, and local folk traditions, remained dynamic as a field of active inquiry and practice (Alavi 2008).

The recurrent waves of pestilence that swept the subcontinent put the efficacy of this medical system and the resilience of the Mughal administrative machinery to their greatest test. Major epidemics of plague, cholera, smallpox, and various fevers repeatedly ruptured the empire's social and economic fabric. I argue that we must document the nature of these epidemics, their devastating consequences, and the mechanisms by which the Mughal state and society responded. The state’s reaction was not one of passive resignation but involved specific governance strategies, pragmatic public health measures, and targeted economic relief. The profound administrative and demographic impacts of these calamities reveal the tangible limits of early modern state power, yet the coherent and context-specific responses demonstrate a sophisticated and rational culture of governance.

The historiography of medicine in medieval India provides a crucial foundation for this analysis. Scholars have effectively challenged the colonial discourse of a stagnant medical 'tradition'. Asoke Bagchi (1997) and Fakhar Alam (2019) have traced the development of Unani medicine during the Sultanate and Mughal periods, demonstrating its intellectual vibrancy and institutional support. This body of work establishes that the Mughal medical system was in no way 'behind' its contemporaries in Europe or the Middle East. Specific studies on the reigns of emperors like Babur, Akbar, and Jahangir have highlighted imperial interest in public health and medicine (Chattopadhyay 1995). Furthermore, scholars like Ali Nadeem Rezavi (2001) have detailed the professional status of physicians, moving them from the realm of

courtly curiosities to integral members of the urban middle class and state bureaucracy.

A parallel body of scholarship has focused on the history of disease and natural calamities. Nükhet Varlik's (2015) work on the Ottoman Empire provides a comparative framework for understanding plague as an imperial problem. Within the South Asian context, C. M. Agrawal (1983) produced a foundational study on natural calamities under the Mughals, providing a broad overview of famines, floods, and epidemics. Other researchers have focused on the specific visitations of plague and smallpox (Ansari 1994; Alam 2001). I build upon these two distinct scholarly traditions, bridging the gap between the history of the medical *apparatus* (the physicians, texts, and hospitals) and the history of the *response* to epidemic crises, arguing that the two were intrinsically linked.

I employ a contextualist historical methodology, seeking to understand Mughal-era ideas and actions within their own intellectual and material frameworks. I consciously avoid the fallacy of 'presentism' by evaluating Mughal medical theories, such as the miasmatic understanding of disease, not against modern microbiology but against the contemporary global scientific consensus (Whatmore 2015). In this, I follow the principle that Mughal actions were rational and evidence-based within their own epistemic world. Furthermore, I utilize a critical, post-colonial lens, informed by the work of Edward Said (1978), to deconstruct the inherent biases within European travelogues. I treat these sources not as objective reports but as constructed narratives, which I must cross-reference and interrogate against indigenous primary sources.

The source base for this research is twofold, balancing indigenous accounts with external observations. The primary Mughal sources include imperial memoirs, which offer direct insight into the emperors' empirical interests, such as the *Tuzak-i-Jahangiri* (Jahangir 2007). Official court chronicles like the *Ain-i-Akbari* (Fazl 1873) and later histories such as the *Maasir-i-Alamgiri* (Khan 1947) supplement these, documenting official state actions, troop movements, and the impact of calamities on the administration. The second category of sources consists of European traveler accounts (Tavernier 1925; Ovington 1929). By juxtaposing these prejudiced but minutely detailed observations with the official court perspective, a more nuanced and balanced picture of the Mughal medical world emerges.

Medical Apparatus, Epidemic Crises, and State Response

The persistent European narrative of Mughal India's medical system as primitive is a historiographical distortion. European travelers, often lacking deep cultural or linguistic understanding, frequently misinterpreted what they saw. John Fryer's (1909) assertion that professionalism was non-existent and that any person could become a physician was a gross oversimplification. Similarly, Niccolao Manucci (1907), himself a quack of dubious credentials, dismissed the extensive knowledge of Indian *tabibs* as inadequate. A burgeoning Eurocentrism colored these accounts, as did a failure to comprehend a medical system that was pluralistic and organized differently from that of Europe, yet was no less complex or intellectually rigorous in its own right (Kundra 2010).

Contrary to the myth of a purely hereditary craft, I argue that medical education in Mughal India was formal and institutionalized. During the reign of Akbar, the state incorporated medicine into the standard curriculum for higher learning (Fazl 1873). The state actively patronized medical education by granting funds for the establishment and maintenance of medical schools, or *madaris*, which functioned as centers of excellence. Father Montserrat, a Jesuit visitor to Akbar's court, noted the establishment of a medical school and hospital at Sirhind, from which the state dispatched trained doctors throughout the empire (Montserrat 2020). Famous centers of learning in cities like Lahore, Delhi, and Ahmedabad specialized in medical training, attracting students from across the region (Alam 2016).

An established apprenticeship system supplemented this formal education, where students would live and work with a master physician, assisting in the preparation of medicines and treatment of patients. This instructor-based model, which combined theoretical knowledge with clinical practice, remained common globally. The homes of renowned physicians, such as Hakim Shamas Uddin Gilani in Akbar's time, became famous as private schools of medicine, attracting students from distant lands (Chand Puri 1960). This dual system of institutional and apprentice-based learning ensured the steady transmission and development of medical knowledge, blending textual scholarship with hands-on practice.

The physicians, or *hakims*, who emerged from this training were highly respected members of Mughal society. The term *hakim* itself, derived from *hikmah* (wisdom), signified that these individuals were not just medical practitioners but polymaths, often trained in philosophy, logic, astronomy, and literature (Qadeer 2001). The imperial court selected its physicians with extreme care, often subjecting them to rigorous tests of diagnostic skill. In a famous account, Akbar tested the expertise of Hakim Ali Gilani by asking him to identify the urine of various humans (sick and healthy) and animals from sealed bottles. Only after Gilani's complete success did Akbar admit him into imperial service (Rezavi 2012).

This professional class was integral to the Mughal state and was not, as Tavernier (1925) suggested, dependent solely on royal patronage. While *hakims* certainly received immense rewards from the court, the state also wove them into the fabric of its administration. Hakim Abu-Fatah Gilani, a physician, was one of Akbar's closest advisors and received appointments to high administrative posts (Chattopadhyay 2000). Jahangir similarly entrusted his famous surgeon, Muqarab Khan, with the governorship of provinces. This prestige reflected the vital importance of medicine to the state. Beyond the court, a distinct and growing class of "bazar physicians" flourished, operating private clinics that served the burgeoning urban middle classes of cities like Agra, Lahore, and Delhi (Baliyan 2016).

A vast and dynamic body of medical literature supported the intellectual life of these physicians. European claims of non-existent or inadequate medical books were patently false. A survey of manuscripts from the period reveals that scholars wrote, compiled, or translated hundreds of medical texts in Persian, Arabic, and Sanskrit (Rahman et al. 1982). Mughal patrons commissioned translations of major Sanskrit works on Ayurveda into Persian, fostering a syncretic medical knowledge. Physicians

compiled medical encyclopedias, and frequently dedicated new works to emperors or princes, such as the *Tibb-i-Yusufi* dedicated to Babur. This literature was not insular but actively engaged with global knowledge, with references to Greek, Roman, and Islamic physicians being commonplace (Dehghan 2021).

This body of knowledge demonstrates a clear awareness of and engagement with international medical developments. For instance, we find William Harvey's revolutionary work on the circulation of blood, published in 1628, referenced and discussed in Mughal medical treatises from the period (Alam 2019). This intellectual curiosity extended to European physicians at court, whom Mughal patrons sometimes asked to translate recent European medical discoveries into Persian. This scholarly activity also responded directly to public health crises. When a devastating plague struck, physicians like Nurul Haq Sarhindi wrote specialized treatises on the disease, attempting to understand its causes and remedies based on empirical observation.

The Mughal state also demonstrated a clear concept of public health through the establishment and maintenance of hospitals, known as *Darul-Shifa* (House of Healing). This was a continuation of a practice from the Sultanate period, but the Mughals expanded it significantly. Soon after his ascension, Emperor Jahangir issued a famous decree ordering the establishment of hospitals in all great cities of the empire, funded from the crown lands (*khalisa*), and appointing physicians for the treatment of the sick (Jahangir 2007). This represents a clear articulation of state responsibility for public welfare.

Emperor Shah Jahan was equally enthusiastic about public health, and during his reign, he equipped the empire with numerous hospitals. The author of the *Badshahnam* records that Shah Jahan established a large and well-endowed hospital on the south side of the Jamia Masjid in Delhi, where the staff distributed medicines free of charge to all, without religious distinction (Verma 1970). Extensive private philanthropy supplemented these state-sponsored institutions. Nobles and wealthy merchants, such as Wazir Khan in Chiniot and Nawab Khayr Andish in Etawah, established hospitals for the poor and needy, viewing it as both a pious and a civic duty (Askari 1957). A professional staff, including a chief physician, clerks (*mutasaddis*), and attendants, managed these hospitals with clear systems of accountability.

Epidemics, Cures, and State Response

Waves of epidemic disease repeatedly tested this sophisticated medical and administrative apparatus. Among the most feared was the bubonic plague. While some scholars have debated its presence in medieval India (Sussman 2011), Mughal sources are unequivocal. I find records of major outbreaks in 1556, 1575 in Gujarat, and a particularly virulent epidemic from 1616 to 1619 that swept across the Punjab, Agra, and Delhi. A devastating plague also struck the Deccan in 1688 following its conquest by Aurangzeb. The Mughal observers of these events were astute empiricists. Emperor Jahangir, in his memoir, provides a remarkable account of the 1616 plague, noting its winter seasonality and, most critically, its connection to rodents.

Jahangir (2007) and his court historian Mutamid Khan both record that mice "rushing out from their holes... like they gone mad" preceded the plague's appearance. They noted that if a cat bit one

of these mice, the cat would sicken, and if a person in the house touched the mouse, they would develop buboes and die (Khan, 75). This clear, empirical connection of the plague to rats, while not a full understanding of the flea vector, is a significant scientific observation. It contrasts sharply with the purely miasmatic or supernatural explanations that dominated contemporary European discussions of the Black Death. It demonstrates a culture of close observation and a desire to find a physical cause for the disease.

The primary state response to plague was administrative, not medical, as no one knew an effective cure anywhere in the world. This response was strategic mobility. Colonial historians often misinterpreted the emperor's and the court's departure from a plague-stricken city like Agra as an act of abandonment. This is a fundamental misunderstanding of Mughal governance. The imperial camp was not a simple retreat; it was a "movable city" or "moving capital," a fully functioning administrative center with all its departments, archives, and staff (Guha 2020). By moving the court to a healthier location, the emperor was not fleeing; he was protecting the administrative core of the empire and ensuring the continuity of governance. This mobility was a deliberate, performative act of rule and the most effective public health measure available (Chida-Razvi 2021).

In contrast to plague, I argue that Mughals understood cholera as a different kind of threat, and they tailored the state response accordingly. Cholera was prevalent in India long before it reached Europe, and Mughal observers clearly linked its outbreak to specific conditions, particularly the mass gatherings at pilgrimage sites like Hardwar and Puri (Hari et al. 2019). This connection suggests an implicit understanding of its transmission through contaminated water or food. The Portuguese chronicler Gaspar Correia provides a harrowing account of a cholera epidemic in Goa in 1543, where patients died within hours (Zupanov 2002).

The Mughal state's primary response to a disease like cholera was sanitation, not mobility. The imperial administration included a department under the *kotwal* (city prefect) who was personally responsible for the maintenance of public hygiene. The *kotwal* managed a corps of scavengers and sweepers who cleaned the city streets and houses daily (Sarkar 1935). While this system served primarily civic order, it functioned as a pragmatic public health measure against filth-related diseases. Extensive medical literature on hygiene, which the state patronized to create public awareness, supplemented this. This focus on sanitation represented a targeted response to a disease that they understood as linked to the urban environment.

Furthermore, during combined cholera and famine events, such as the devastating Deccan famine of 1630-31, the state deployed economic relief. Emperor Shah Jahan ordered the remission of one-third of the land revenue, amounting to seventy lakhs of rupees, and established public kitchens to distribute free food to the indigent (Khafi Khan 1985). This policy directly contradicts the colonial narrative, forwarded by historians like V. A. Smith (1919), that the Mughal state did nothing for public relief. While the logistics of early modern relief proved fraught with difficulty, the existence of a clear policy of tax remission and food distribution demonstrates a recognized state responsibility for its subjects during calamities.

In the realm of cures, observers often saw indigenous treatments for cholera as superior to European ones. European physicians in India, such as Garcia d'Orta, openly admitted that "experience has shown that European medicine are of no use here" for cholera (Agre 1966). In contrast, multiple European travelers, including Thevenot and Manucci, recorded the Indian remedy of cauterizing the middle of the heel with a red-hot iron. They noted with surprise that this painful but effective counter-irritant "allayed the pain, and discharge and vomiting stops" almost immediately (Manucci 1907, 169). This demonstrates the efficacy of indigenous medical practices, which rested on centuries of empirical observation.

Smallpox was another recurrent scourge, so common that its pockmarks were a default descriptor in official records; registers from Mathura show that nearly 40 percent of people bore the marks of the disease (Alam 2001). While people often viewed it through a religious lens and associated it with the goddess Sitala Mai, this did not preclude medical intervention. In a remarkable example of indigenous medical experimentation, the 17th-century physician Akbar Arzani recorded his development of a new treatment. In his book *Mufrih-ul-Qulub*, he described treating his own son's malignant smallpox by pricking the vesicles with a gold needle to drain the discharge. He noted that the patient felt immediate relief and that he subsequently used this technique successfully in numerous cases (Bagchi 1997). This act of innovative, recorded, and repeatable clinical intervention is the antithesis of a static, superstitious medical tradition.

Malaria and other fevers were endemic, particularly in monsoon-heavy regions like Bengal. The globally prevalent miasmatic theory dominated the understanding of these diseases: people believed "bad air" (*hawa-i-fasid*) rising from swamps or other corrupting sources caused them. This was the same theory of disease prevalent in Europe at the time. Consequently, the treatments were also standard for the period. Bloodletting was a common therapy to rebalance the 'humors', and physicians applied it to all levels of society. When Emperor Aurangzeb fell severely ill with fever in 1661, his physicians resorted to bleeding him as a last measure, after which he recovered (Khan 1947, 25).

Socio-Economic and Administrative Ramifications

The impact of these recurrent epidemics was profound, shaking the Mughal state to its foundations. The most immediate social consequence was catastrophic mortality. The plague of 1575 in Gujarat was so severe that people reportedly took over one hundred cartloads of the dead for burial each day from the capital alone (Agrawal 1983, 135). The 1688 plague in Bijapur reportedly swept away half its population, with a death toll estimated at 100,000 (Khan 1988, 13). This level of mortality led to a complete breakdown of social customs. Mass graves replaced individual burials, and court historians recorded that during the 1616 plague, people left houses locked with dead bodies inside, as "because of fear... nobody dared to touch them" (Khan, 75).

When epidemics coincided with famine, the social disintegration was absolute. The year Akbar ascended the throne, a severe epidemic and famine led to widespread cannibalism, which Abul Fazl (1873) recorded unflinchingly, noting that "men took eating one another." This recurred

during the 1630-31 famine, where Salih Kamboh (2004) described people eating dead bodies from graves. The most common social response to pestilence was mass migration. The plague of 1616 caused a "great dispersion among the masses" (Fazl 1873, 111). The continuous epidemics of the 1680s depopulated entire regions, including the prosperous cities of Golkonda, Hyderabad, and Bijapur (Sharma 1971).

The economic consequences were equally severe. Epidemics brought production to a grinding halt. The smallpox outbreak in Calicut from 1670–1677 fatally undermined the shipbuilding industry as carpenters and laborers fled in terror (Fawcett 1936). Similarly, plagues in Sindh decimated the ranks of cotton and silk manufacturers, causing a collapse in the lucrative textile trade (Paliwal 2010). This loss of production, combined with the depopulation of agricultural land, led to a sharp decline in royal revenue, straining the imperial treasury. The loss of livestock during these events further crippled the agrarian economy, creating a vicious cycle of disease, scarcity, and famine.

Administratively, epidemics posed a direct threat to the functioning of the state. The loss of experienced officers and administrators to disease created power vacuums and disrupted the chain of command. The 1575 malaria outbreak in Bengal, for instance, claimed the lives of a significant number of high-ranking *amirs* (Fazl 1873, 375). The military, the bedrock of Mughal power, felt this administrative disruption most acutely. Epidemics repeatedly crippled or destroyed entire armies. A virulent pestilence, likely malaria, brought the 1662 campaign in Assam to a halt, leaving only one-third of the cavalry alive (Sarkar 1928, 170).

This military vulnerability was a recurring theme. I attribute the failure of the Mughal campaign against the Marathas in 1684 directly to an epidemic that perished vast numbers of men, camels, and horses, making it impossible to proceed (Majumdar 1974, 282). The sudden death of Humayun, followed by a plague, created a power vacuum that invited rebellions across the empire. Conversely, epidemics could also be politically decisive in the Mughals' favor. During the siege of Asirgarh in 1599, a pestilence broke out *inside* the fortress, devastating the garrison and paving the way for a Mughal victory (Chandra 2007, 195).

Alongside these empirical and administrative responses, supernatural and religious explanations for epidemics were pervasive. This co-existence of the rational and the divine was not a contradiction in the early modern mind but a complete worldview. The miasmatic theory of "bad air" was the dominant 'scientific' explanation. At the same time, people widely perceived epidemics as manifestations of divine anger. Khafi Khan (1985) wrote that calamities occur when human misdeeds go beyond extent, as a warning from God. People also turned to astrology, believing the appearance of comets heralded pestilence. This led to widespread religious responses, from special prayers to the appeasement of specific deities, most notably the worship of Sitala Mai to ward off smallpox (Nicholas 1981).

Conclusion

I argue that the persistent historical narrative of a medically inept and fatalistic Mughal India is a colonial distortion. A critical analysis of indigenous and European sources reveals that the empire from 1526 to 1707 possessed a structured, sophisticated,

and pluralistic medical system. Formalized education, a professionalized and respected corps of physicians who were integral to the state, a rich and dynamic body of scientific literature, and a network of public hospitals characterized this apparatus. This system was not static but demonstrated a capacity for empirical observation, as seen in the linking of plague to rats, and for clinical innovation, as seen in new treatments for smallpox.

The Mughal state's response to the recurrent crises of plague, cholera, and smallpox was neither passive nor indifferent. I propose it was a rational and multi-faceted strategy of governance, tailored to the specific threat. The state deployed strategic mobility to protect the administrative core from plague, public sanitation measures to combat cholera, and extensive economic relief to mitigate the conjoined devastation of famine and disease. The profound socio-economic and administrative ruptures caused by these epidemics demonstrate the immense challenge they posed to any early modern state. Yet, the coherence of the Mughal response reveals a resilient and sophisticated administrative culture, fully engaged with the profound challenges of public health.

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