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Research Article

Epidemiological History of Disease Outbreaks in Telangana and the Lessons Ahead

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ABSTRACT

Background: Telangana, a state in south central India, has faced numerous infectious disease outbreaks throughout history, from medieval epidemics to modern pandemics. This article provides a historical overview of major disease outbreaks in the Telangana region, examining their epidemiological characteristics and impact on society and public health measures.
Methods: A historical epidemiological review was conducted using archival records, published literature, and public health data to document significant outbreaks in Telangana from 14th century to the present.
Results: Outbreaks include a 14th-century epidemic during the Delhi Sultanate's campaign (possibly plague or cholera), recurrent cholera epidemics in the 19th and early 20th centuries, the devastating 1918 influenza pandemic, and various post-1947 outbreaks such as cholera, dengue, H1N1 influenza, and COVID-19. These events prompted varied responses from traditional remedies and colonial sanitary reforms to modern surveillance and vaccination campaigns.
Conclusion: The history of disease outbreaks in Telangana underlines the region's vulnerability to pandemics and the evolving public health responses. Lessons from past outbreaks, including the importance of sanitation, community engagement, and preparedness, remain crucial for current and future epidemic management.

1. Introduction

Pandemics and epidemics have periodically ravaged the Indian subcontinent, leaving profound impacts on its demography and public health systems. In the 19th and early 20th centuries, India was the epicentre of several major pandemics it was the origin of the first cholera pandemic of 1817 and suffered heavily during the third plague pandemic starting in 1896 (Arnold D 2020). The 1918 influenza (Spanish flu) pandemic alone killed an estimated 12–17 million Indians, roughly 5% of the population (Arnold D 2020). As part of this broader historical context, the region of Telangana (in south-central India) has experienced numerous infectious disease outbreaks from medieval to modern times. Telangana's unique historical position. formerly the core of the princely state of Hyderabad and now a standalone state provides a valuable case study of how epidemics were recorded and managed in different eras.

Understanding the outbreak history of Telangana is important for several reasons. First, historical outbreaks have shaped local infrastructure and health policies; for instance, early 20th-century epidemics in Hyderabad city led to urban planning interventions in water supply and sanitation. (TOI 2020). Second, cultural responses to disease in this region (such as traditional beliefs and resistance to colonial medical measures) offer insight into the social dynamics of epidemics (Arnold D 2020). Finally, a historical perspective provides context for contemporary public health challenges highlighting patterns of disease emergence and the long-term benefits of improved hygiene, vaccination, and surveillance systems.

This article aims to rewrite and synthesize a historical manuscript on Telangana's disease outbreaks into a structured scientific format. We present a chronological overview of major outbreaks, analyze their causes and consequences, and discuss the evolution of outbreak responses. By doing so, we seek to identify recurring themes and lessons applicable to current epidemic preparedness in Telangana and similar contexts

2. Materials and Methods

2.1. Study Design

We conducted a historical review using both qualitative and quantitative approaches. Archival documents, historical chronicles, demographic records, and scientific publications were examined to identify significant disease outbreaks in the Telangana region across different time periods. The study period ranges from the 14th century to the 21st century, covering pre colonial, colonial, and post-independence eras.

2.2. Data Sources:

Key sources included: (1) Historical texts and travelogues for medieval outbreaks, we consulted translations of chronicles such as Ibn Baṭṭūṭa's *Riḥla* and contemporaneous Indo Persian records (Baranī's chronicle) that mention epidemics in Telangana. (Tresso CM 2023). (2) Colonial and administrative reports for 19th–20th century outbreaks, British India and Hyderabad State records (e.g., Imperial Gazetteer, public health reports) were reviewed for statistics on morbidity, mortality and measures taken (Tresso CM 2023). Scientific literature and epidemiological studies modern outbreaks were documented using peer-reviewed articles, outbreak investigations and official health bulletins. We utilized databases like PubMed and local government archives to gather data on outbreaks of cholera, influenza, plague, etc., in Telangana. (4) News archives and media reports in the absence of academic reports for certain recent incidents, reputable news sources were used to capture outbreak details (2009 cholera outbreak in Hyderabad). All data sources and references were cross verified where possible to ensure accuracy.

Inclusion Criteria: An outbreak was defined as an event in which an infectious disease caused a sharp increase in cases or deaths in Telangana (or the erstwhile Hyderabad State) compared to baseline. We included large-scale epidemics as well as notable localized outbreaks that had significant health impact or led to public health action. Both laboratories confirmed outbreaks (in the modern era) and historically reported epidemics (inferred from narrative descriptions) were included. Non-communicable events (e.g., famine without a specific disease) were excluded unless associated with secondary disease outbreaks.

2.3. Data Extraction and Analysis:

For each identified outbreak, information was extracted on the time period, location (district or city), disease etiology (if known), scale of impact (cases and deaths, when available), and the response measures taken. Historical narrative data were analyzed to discern socio-cultural reactions and government interventions. Quantitative data (e.g., mortality figures from census records, attack rates from outbreak investigations) were tabulated and compared across outbreaks. We synthesized the information into a timeline and thematically analyzed how responses (sanitation, quarantine, vaccination, etc.) evolved over time. The Results and Discussion are presented together to contextualize findings historically

3. Results and Discussion

3.1. Medieval and Early Modern Epidemics (14th–18th Centuries)

The earliest recorded epidemic in the Telangana region dates back to the mid-14th century. According to the Moroccan traveler Ibn Baṭṭūṭa's account, an epidemic broke out in 1334–1335 during Sultan Muḥammad bin Tughluq's military expedition to *Tiling* (Telangana) (Tresso CM 2023). The disease, described as a **"pestilence"** (Arabic: *wabāʾ*), devastated the Sultan's camp at the fortress of Warangal. Contemporary chronicles report that the epidemic killed a large portion of the army the greater part of them perished and even struck down high-ranking nobles, though the Sultan survived after falling gravely ill While Ibn Baṭṭūṭa and Indian historians of that era did not specify the symptoms, later scholars have debated the nature of this outbreak. Some interpret it as an occurrence of **plague** reaching India prior to the Black Death, whereas others suggest **cholera**, partly due to translation ambiguities (the term *wabāʾ* could denote any epidemic) (Tresso CM 2023). The consensus remains inconclusive, but this **1330s Telangana epidemic** stands as a significant event possibly the first documented instance of a fast spreading lethal outbreak in the region's history (Arnold D 2020).

Following this medieval episode, there are scant records of major epidemics in Telangana for the next few centuries, which could be due to under documentation rather than an absence of outbreaks. However, by the 17th–18th centuries (pre-colonial era), Telangana as part of Hyderabad State likely experienced the same diseases endemic to India, such as smallpox and periodic **cholera** occurrences. Smallpox was a feared scourge across India in the 18th century, and the practice of variolation (inoculation) was known in the region prior to the introduction of the vaccine in the early 19th century. Cholera, which would later ravage the subcontinent, probably struck local populations during regional epidemics, although specific Telangana records before 1800 are lacking. Traditional beliefs often shaped responses: for example, in rural Telangana communities, sudden outbreaks of cholera were attributed to the wrath of a deity (locally called "**Gattara**"), leading villagers to perform rituals and animal sacrifices to appease the goddess. Such interpretations sometimes impeded acceptance of biomedical interventions. It was only with colonial documentation in the 19th century that clearer evidence of recurrent outbreaks in this region emerged.

3.2. Cholera Pandemics and Colonial Era Outbreaks (19th Century)

The 19th century saw cholera become the first disease of pandemic proportions to emanate from India, repeatedly sweeping through the subcontinent and beyond. (Mehta RD 1950). Telangana (then part of the Hyderabad State under Nizam's rule) lay along the routes of cholera's spread. British and Hyderabadi health records indicate that the region was frequently invaded by cholera during the pan-Indian epidemic waves. One major transmission pathway was via pilgrimage sites: for instance, the annual Maha Shivaratri fair at Srisailam (just south of Telangana) Fig-1, was notorious for sparking cholera outbreaks. Pilgrims returning from Srisailam brought infection into districts like Mahbubnagar, Nalgonda, Karimnagar, and Medak, often triggering localized epidemics in the months of March–May, Another route was the Pandharpur pilgrimage in neighboring Bombay Presidency; cholera contracted there would travel with devotees through Aurangabad and Gulbarga into northern parts of Hyderabad State (Mehta RD 1950) Colonial epidemiologists noted these routes and timings or example, cholera incidence in Telangana tended to rise after these fairs, especially during the monsoon (July–October) when water contamination was rife (Mehta RD 1950).

The impact of cholera in 19th-century Telangana was severe. While exact mortality figures in the region are not fully

available, it is recorded that tens of thousands perished in Hyderabad State during each cholera wave. British physician who served in the region documented persistent cholera endemicity in the Deccan. Outbreaks were often exacerbated by poor sanitation and contaminated water sources. The Nizam's dominions had limited modern sanitation at that time open wells and lack of sewage disposal in Hyderabad's old city contributed to waterborne disease spread. In response, towards the late 1800s the Hyderabad administration began some public health measures, such as establishment of a **vaccination department** for smallpox and attempts to improve urban cleanliness. However, cholera control remained challenging due to the vast rural landscape and deeply rooted practices (e.g. pilgrimage gatherings continued despite the risks). By the end of the 19th century, cholera had become a grim but regular feature of life, flaring up especially during droughts or famines when population displacement and water scarcity facilitated contamination.

Another disease of note in late 19th-century India was bubonic plague, which arrived in 1896 via Bombay and spread across the country. Initially, Hyderabad State was geographically insulated, but by the early 1900s plague made inroads. The first cases in Hyderabad city were reported in the opening years of the 20th century. The Imperial Gazetteer of India (1909) notes that when plague invaded Hyderabad State, the Nizam's government employed measures such as evacuating infected houses/villages, disinfecting dwellings, and setting up quarantine camps at railway stations on the state's borders. (Hymavathi M 2021). Travel restrictions and inspections were imposed to prevent importation of plague from British Indian provinces. These efforts could not entirely keep plague out, and intermittent outbreaks occurred in the state. Notably, plague and cholera often struck in tandem historical records indicate that while cholera was already endemic, plague introduced an additional epidemic threat. For example, Hyderabad city suffered plague outbreaks in the 1910s, around the same time as cholera and other diseases, compounding public health woes (Sudhir U 2009).

According to the 1909 edition of the *Imperial Gazetteer of India*, fever was reported as the most prevalent ailment in Hyderabad State, accounting for approximately 50% of all recorded deaths in the region during the 1800–1900 period. The term *fever* in 19th-century colonial medical parlance often encompassed a wide spectrum of diseases, including malarial fevers, typhoid fever, enteric fever, and possibly undiagnosed viral infections such as dengue or influenza. These diseases were poorly differentiated due to the absence of bacteriological diagnostics prior to the late 19th century. Following fevers, diarrhoea, dysentery, and other bowel complaints were highlighted as major causes of mortality. These conditions reflect the widespread waterborne and fecal-oral disease transmission, often linked to poor sanitation, contaminated water sources, and overcrowded urban conditions in cities like Hyderabad, Warangal. This is consistent with other reports from the colonial administration across the Indian subcontinent during the same period, where enteric diseases were leading killers, especially during the monsoon season.

Another significant contributor to mortality in Hyderabad State during this period was **smallpox**, an acute viral disease that caused numerous epidemic outbreaks throughout the Indian subcontinent before the widespread implementation of vaccination programs. The British authorities undertook variolation and later introduced the **Jennerian cowpox vaccine** in the latter half of the 19th century, but vaccine resistance and inadequate infrastructure limited its early success in princely states.

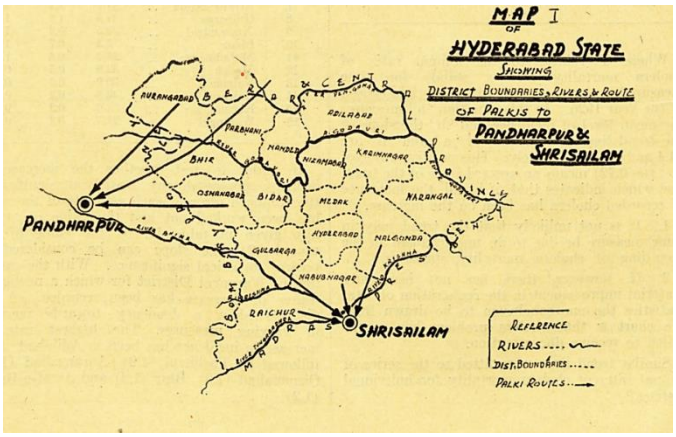

Fig 1. Cholera In Hyderabad State

Source: R. D. MEHTA, l.M.&S. (Hyd.), D.Ph. &Hy. (Cal.)
Reproduced form Medical Statistician, Bureau of Epidemiology, Public Health Department, Hyderabad-Dn. THE INDIAN MEDICAL GAZETTE [Dec.,1950)

These mortality patterns reflect not only the **ecological and climatic vulnerability** of the Deccan region to vector- and waterborne diseases but also the **limited reach of colonial medical interventions** in semi-autonomous princely territories such as Hyderabad [IGI-Hyderabad state 1909)

3.3. Early 20th Century: Plague, Influenza, and Urban Reforms

The decade of 1911–1921 was one of unprecedented mortality in Telangana (Hyderabad State), due to multiple epidemics. Plague continued to claim lives annually, and then the catastrophic influenza pandemic of 1918 struck. According to historical demography data, this was the only decade on record where Hyderabad's population saw a net decline, reflecting the heavy toll of disease. A Census report later documented that during 1911–1921, plague killed about 194,325 people and cholera about 42,246 people in Hyderabad State (Akbar S 2020) These figures, though immense, were overshadowed by influenza the 1918–20 Spanish flu pandemic swept through Hyderabad in three waves, peaking towards late 1918. Contemporary accounts describe how influenza started with sporadic cases in mid-1918, then escalated to an alarming height by October 1918 (Akbar S 2020). The daily death rate in Hyderabad city reached a staggering 46.5 per thousand population at the end of September 1918 during the flu's peak Families were decimated one oral history recalls entire households perishing, with survivors like a young pregnant woman in Mahbubnagar left as the only remaining family member after the flu swept through (Akbar S 2020).

The conjuncture of plague and influenza in 1918 was particularly devastating. Many who avoided plague succumbed to flu, and vice versa. It is estimated that hundreds of thousands died in the Telangana region in those years, contributing significantly to the ~12 million Indian deaths of the global influenza pandemic. The twin epidemics spurred major public health responses by the Nizam's administration. Under the reign of Mir Osman Ali Khan (Nizam VII), Hyderabad implemented one of India's more proactive epidemic responses for its time. Isolation hospitals and camps were established on the outskirts of cities (e.g., camps at Sitaphalmandi and Errum Manzil in Hyderabad) to house the sick or quarantine contacts.

Movement of people was monitored, and some **social distancing** measures were effectively practiced for instance, the Nizam encouraged development of new suburban areas (such as *Banjara Hills* and *Jubilee Hills*) to decongest the old city, implicitly as a form of urban social distancing after the plague and flu outbreaks. This led to a significant reshaping of Hyderabad's urban morphology; as one researcher noted, it often takes a crisis for people to act, and indeed the post 1911 epidemics catalyzed the modernization of the city.

Infrastructure improvements were a cornerstone of the response. Following a devastating 1908 flood of the Musi river that had already highlighted sanitary shortcomings, the Nizam's government (with engineer Sir M. Visvesvaraya's input) constructed dams (Osman Sagar and Himayat Sagar) and a modern drainage system to secure clean water supply and prevent waterborne diseases (Akbar S 2020). In 1912, a City Improvement Board was founded, which oversaw slum clearance, building of model houses, new roads, and better ventilation in urban design. The administration also carried out regular house inspections before monsoons to eliminate water stagnation (a breeding ground for mosquitoes and germs) **Vaccination drives** were intensified: although a vaccine for influenza did not exist, inoculations for smallpox and plague (the Haffkine plague vaccine) were made available and publicized. Mobile medical units were dispatched, particularly after rural tribal rebellions (e.g. the 1940s revolt of Komaram Bheem) underscored the need for extending healthcare to remote communities. (PTI 2015) The Nizam's public health approach was notable for combining modern medicine with traditional systems alongside the allopathic Osmania General Hospital established in 1920s, a Unani hospital was also set up to cater to those preferring indigenous medicine

It is important to recognize the **cultural dimensions** during these outbreaks. Public compliance with health measures was mixed. For example, during the plague years, many Hyderabad residents initially resisted hospitalization and preferred home care due to fear of isolation policies. The administration sometimes used forceful measures (enabled by the Epidemic Diseases Act of 1897, which was also applied in Hyderabad) to enforce quarantines, which led to public apprehension. In rural Telangana, as mentioned, outbreaks like cholera were often met with ritual responses. Over time, however, outreach efforts (distribution of educational booklets in local languages, involvement of community leaders) helped improve acceptance of vaccines and treatments (Akbar S 2020) The shared trauma of the 1918 flu, which affected all sections of society, somewhat unified people in acknowledging the need for collective action such as improved hygiene and cooperation with health workers.

By the mid 20th century, these historical epidemics had left a legacy a stronger health infrastructure in Hyderabad, a cadre of trained medical professionals, and a populace that had directly witnessed the value of public health interventions. This legacy would influence how post-independence outbreaks were tackled.

3.4. Post-Independence Disease Outbreaks (1947–2000)

After India's independence in 1947 and the subsequent incorporation of Hyderabad State into the Indian Union (1948), Telangana continued to face infectious disease challenges, albeit with gradually improving control. **Smallpox** remained endemic until the 1960s; Telangana participated in India's national smallpox eradication campaign through the 1960s–70s, and by 1975 India was declared smallpox-free. The region's last smallpox outbreaks occurred in early 1970s, controlled by mass vaccination and surveillance (therefore, not discussed in detail here as they were part of the nationwide effort).

Cholera persisted as a public health issue in the 20th century. The sixth cholera pandemic (1899–1923) and the seventh pandemic (1961 onward) affected India broadly, and Telangana saw outbreaks especially in rural areas with poor water sanitation. For instance, during the 1950s–60s, several acute diarrheal disease outbreaks in Telangana's villages were reported, often identified as cholera or a mix of enteric pathogens. Public health reports from the 1950s show that improved access to clean water was still lacking in many districts. (R.D. Mehta 1950) noted that cholera in Hyderabad State followed seasonal patterns linked to pilgrimages and monsoons, consistent with earlier colonial observations. Over time, investments in bore-well installation and protected water schemes began to reduce cholera incidence, but as late as the 1990s, pockets of Telangana continued to register cholera cases during the annual hot months.

Malaria was another concern in mid-20th century Telangana, with the region's tropical climate and extensive rivers (like Godavari and Krishna basins) supporting mosquito breeding. Malaria control under the National Malaria Eradication Programme saw some success by the 1970s, and malaria outbreaks became less frequent than in the early 1900s, though not fully eliminated. Polio outbreaks also occurred periodically until the Polio Eradication Programme achieved success in the 1990s–2000s; Hyderabad city reported paralytic polio cases in the 1980s, which declined to zero by 2004 after aggressive immunization days.

One notable epidemic in independent India was the plague outbreak of 1994 while its epicenter was Surat in Gujarat, it caused nationwide panic. In Telangana (then part of Andhra Pradesh state), no confirmed plague cases were reported in 1994, but the scare led to preventive measures. Hyderabad's health authorities activated surveillance for any patients with fever and cough (pneumonic plague symptoms) and enforced rodent control and sanitation drives as a precaution. This episode tested the preparedness of regions like Telangana for re-emerging infections, and fortunately, the state remained plague-free.

5. Conclusion

Telangana's history of disease outbreaks illustrates a microcosm of India's broader epidemic story one of adversity, adaptation, and gradual progress in public health. From the medieval wabā that struck a Sultan's army to the COVID-19 crisis in the 21st century, the region has repeatedly been challenged by infectious diseases. Infrastructure and Sanitation Matter: Epidemics of cholera and plague in the 19th–20th centuries prompted Hyderabad to invest in water supply, sewerage, and urban planning. These measures led to long-term reductions in water and vector borne diseases. Continued vigilance is needed, as shown by the 2009 cholera outbreak which occurred when infrastructure lagged behind population growth.

Historical Responses Inform Present Strategies: The Nizam era response to plague and influenza including isolation camps, travel screening, and public education has parallels in modern outbreak management (e.g., quarantine centers and awareness campaigns for COVID-19). The efficacy of these

measures in the past, when implemented earnestly, provided a template for contemporary responses.

Community Engagement is Crucial: Overcoming cultural resistance was necessary in past vaccination drives and remains so today. The example of tribal communities initially resisting intervention in 2017, and later collaborating, highlights that respect for local beliefs and involving community leaders can improve outbreak outcomes. Public trust, once earned (as in the acceptance of vaccines over time), becomes a formidable asset in epidemic control.

Epidemiological Capacity Evolves: Telangana's ability to detect and respond to outbreaks has improved dramatically. Where once only symptomatic descriptions were available (14th-century chronicle of plague-like illness), today laboratory confirmation and detailed epidemiological studies are routinely done. This has enabled targeted interventions for example, identifying specific dengue serotypes or pinpointing a contaminated water source thereby making responses more effective.

Going forward, the lessons of history argue for a sustained commitment to public health infrastructure in Telangana. Strengthening disease surveillance (especially at community and primary healthcare levels), ensuring universal access to clean water and sanitation, and maintaining preparedness for pandemic threats should remain policy priorities. The historical record also encourages humility new diseases will continue to emerge, and old diseases can resurface if complacency sets in. By remembering the stories of past outbreaks the lives lost, and how society eventually overcame them public health authorities and communities in Telangana can be better prepared to face the epidemiological challenges of the future. In essence, the chronicle of disease outbreaks in Telangana is not only a testament of trials endured but also a guidebook of hard-earned wisdom for safeguarding health in the years to come

Conflicting Interests

The authors have declared that no conflicting interests exist.

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