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ARTICLE

Mountains of corpses: the deadliest attack of the 1918–19 influenza pandemic in the city of Calcutta

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Abstract
The 100th anniversary of the 1918–19 influenza pandemic provides us an opportunity to study the properties, spread and impact of pandemics and devise new strategies to mitigate their effect. The present discussion is an untold story about a noxious influenza pandemic that strechted its deadly scratches in the city of Calcutta in 1918–19 with an unexpected toll. It is not known whether Calcutta became infected by ship or by rail. Calcutta appeared to be the main disseminating centre for the disease in Bengal and its spread was undoubtedly because of the relatively excellent railway communication. Against such a backdrop, the present attempt sets out to explore (i) the spreading pattern of the pandemic (ii) preventive measures taken by the people and by the government (iii) how the government handled this challenge (iv) the general attitude regarding the pandemic, and (v) the role of the native press in reporting and handling this pandemic. This research effort has utilized archival documents, microfilms, census reports, books, memoirs, and gazetteers to divulge people's experience of the colonial bureaucracy, an ineffective public health care system, and its negligence. The study tries to set an example to understand the post-pandemic strategies so that prevention and control programmes can be tailored to corresponding changes in epidemiological response.

Keywords Colonial · Calcutta · Historical · Influenza · Pandemic · Society

1 Introduction

> ... so vast was the catastrophe and so ubiquitous its prevalence that our minds, surfeited with the horrors of war, refused to realize it. It came and went, a hurricane across the green fields of life, sweeping away our youth in hundreds of thousands and leaving a toll of sickness and infirmity which will not be reckoned in this generation (Tomkins, 1989, p. 291).

The word pandemic derives from the Latin word '*pandemus'*, which itself comes from the Greek word '*pan demos*, the first meaning all, every, and the second meaning the people (Honigsbaum, 2009). It commonly refers to a widespread epidemic of contagious disease throughout the whole of a country or one or more continents at the same time. The internationally accepted notion is that a "pandemic is an epidemic that has spread over several countries or continents, usually affecting many people" (Kessler, 2020). The word influenza is a term of Italian origin first documented at the dawn of the sixteenth century to describe a malady provoked and influenced by the alignment of the stars. '*Italian Flu*' was a term used for any disease outbreak thought to be influenced by the stars. In 1743, what the Italians called *influenza di catarro* (the catarrhal epidemic) spread across Europe, and the disease came to be called simply "influenza" in English (Breedlove, 2006).

The Spanish Flu[1] arrived on the Indian subcontinent in early June 1918 and the eastern coast was affected probably

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[1] The "Spanish Flu" or the Great influenza was the deadliest pandemic in human history. Initially it was believed that the disease originated from Spain. However, the real story was that Spain was one of the few major European countries that remained neutral during the First World War. Unlike the Allied and Central powers, where the freedom of the press was low as compared to the Spanish press where the freedom of the press was relatively high. Spanish media first reported about the pandemic and therefore it was known as 'Spanish Influenza'.

through the sea route.[2] Bengal experienced this catastrophe slightly. When readers of *The Hindoo Patriot* opened their newspapers in Calcutta on June 29, 1918, they saw the headline "Influenza-War Fever" on its first page. An unknown fever, in common parlance, uttered as '*ojana jvara'*, had begun in every province of India, but at the time of this publication, nobody knew that a terrible catastrophe was about to come. Having a closer look, one may ask why was the heading written as 'War Fever'. The easiest explanation would be that the pandemic resulted from the Great War,[3] which spread it across the globe with its continental variations. The war had an enormous impact on India, facilitating the pandemic that rushed after it.

A report in *The Amrita Bazar Patrika* (13th July 1918, p. 5), titled "The New Fever–Report of Health Officer of Calcutta" mentioned that:

> On the 12th, the health officer of Calcutta reported on the current fever outbreak to the General Committee of the Calcutta Corporation. The following preliminary statement represents the views of the Board, but it should be clearly understood that they are formulated on incomplete data and may require revision later on. ...the following simple rules should be observed during the epidemic–1 avoid necessary exposure and fatigue, (2) do not travel in overcrowded tram cars, (3) do not visit overcrowded places of public resort, (4) do not neglect trifling symptoms of ill health, (5) if attacked go to bed and stay there till your doctor allows you to get up and (6) the first case in a house should be isolated, the sputum (if any) disinfected handkerchiefs, etc. boiled.
>
> H.M. Crake
> Health Officer to the Calcutta Corporation

Besides the *Amrita Bazar Patrika*, several other local newspapers reported the rapid spread of the Spanish Flu in Calcutta and specifically the areas near waterways and railways. Then the flu spread to the rural areas of Bengal.[4] The neighbourhood areas became a serious concern not only for the public but also for the prominent businesses of Calcutta which were threatened unprecedentedly. In this context, a report of *The Amrita Bazar Patrika* (13th July 1918, p. 5) is noteworthy.

> As a consequence of this state of affairs, public business was also affected considerably. The Bar Library was comparatively empty, and this malaise was the main topic of consideration. In innumerable cases, adjournments were granted owing to the parties being ill and unable to attend court.

Inquiries showed that nearly every home and household was affected by this malady. People expected that its duration will be short, thus undermining the general health of the public. All hospitals, besides public and private dispensaries, were busy attending patients from sunrise to sunset. The demands for private medical practitioners also exceeded all expectations.[5] This is how the contagion took its toll in the city of Calcutta.

Today, none of us remember or show any interest in knowing about this historical horror of human history. Mridula Rammana in her paper 'Coping with the Influenza Pandemic: The Bombay Experience' (2003) makes us aware, but it would not have drawn more attention if we would not be affected by the deadly COVID-19 pandemic. This disaster of humankind sparked our interest to remember the deadly memories of the Spanish Flu, which devastated the entire world 104 years ago. In this regard, the present paper delves into the untold story of the Spanish Flu which affected the city of Calcutta.

2 Researching Spanish flu in India

Most articles on the Spanish Flu examined the consequences of the United States or Europe, while only a few mentioned Africa. The flu broke out initially in the Kansas City, then spreading across the United States and Europe. A few historians and economists have studied this devastating pandemic on the Indian subcontinent. These works served as background to this paper.

Mills (1986) in his paper 'The 1918–1919 Influenza Pandemic—The Indian Experience' provided a detailed analysis of the impact of the 1918–1919 influenza pandemic on India. The author described the spread of the disease in different regions of India and its impact on public health, economy, and social life. The paper 'Coping with the Influenza Pandemic: The Bombay experience' by Mridula Ramana in, Howard Phillips and David Killingray (2003) edited *The Spanish Influenza Epidemic of 1918–19: New Perspectives*, provided a detailed account of how Bombay (now Mumbai), India, coped with the influenza pandemic of 1918–1919. Ramana examined the various measures taken by the city's colonial administration to control the spread of the disease,

[2] Resolution of the Calcutta Corporation, 1918.

[3] The First World War was nick named as 'the Great War' (1914–1918) in the history of humankind. It was fought between the two factions, namely the Allied and the Central Powers. The Allied powers included the Great Britain and the Commonwealth countries, USA, Italy, France and the Russian Empire, whereas the Central powers were made up of the German Empire and its colonies, the Austro-Hungarian Empire, the Tsardom of Bulgaria and the Ottoman Empire.

[4] Municipal Department, Sanitation Branch, File No. S.2D–8, Proceedings Nos. A 1–20, 1919.

[5] Finance Department, Medical Branch, File No. 2A–2, Proceedings Nos. B110 -111, 1918.

including quarantine, isolation, and public health campaigns. The author also highlighted the tensions between the colonial authorities and the Indian nationalists and how the pandemic both reinforced and challenged the existing power structures.

The paper 'The Evolution of Pandemic Influenza: Evidence From India, 1918–19' by Siddharth Chandra and Eva Kassens-Noor (2014) explored the evolution of the 1918–1919 influenza pandemic in India. The authors analyzed the spread of the disease across different regions of India and examined the impact of public health policies and social norms on the course of the pandemic. It highlighted the impact of colonial policies on the spread of the disease, and the role of traditional healing practices and social customs in shaping the response to the pandemic. Chhun (2015) in her unpublished doctoral dissertation *'Death and disorder: The 1918–1919 influenza pandemic in British India'*, meticulously investigated the devastating impact of the influenza pandemic in British India with special reference to Bombay. She tried to provide an in-depth analysis of the colonial government's responses to the pandemic and highlighted how the pandemic exposed the limitations and failures of British colonial policies and institutions. Arnold (2019) in his article 'Death and the Modern Empire: The 1918–19 Influenza Epidemic in India' provided a compelling analysis of the devastating impact of the influenza epidemic on India during the early twentieth century. The author explored how the epidemic was not only a public health crisis but also a political and social one, revealing the complex interplay between colonial power, local responses, and global health governance.

Tumbe (2020) in his book '*The age of pandemics (1817–1920): How they shaped India and the World*', offered a comprehensive overview of the history of pandemics. The author traced the origins and spread of past pandemics, including cholera, the bubonic plague, influenza, and COVID-19, and explored how they had impacted human societies throughout history. He also provided a nuanced analysis of the political, economic, and social factors that contributed to the spread of pandemics and of how societies responded to them. The main highlighting feature of this book was the author's emphasis on the role of global interconnectedness in the spread of pandemics.

In brief, the above research works either focused on India in general or Bombay in specific. Bombay's place was important because the Spanish Flu arrived first there and then spread slowly across the country. No one can deny the fact that the Bombay Presidency did not tell the whole story. In addition, several Indian newspapers both in English and also in local vernaculars, like, *the Amrita Bazar Patrika*, *The Bengalee*, *Hindoo Patriot*, *The Indian Daily News*, *The Statesman*, *The Englishman*, *Times of India,* etc. reported the incidences of the death tolls, colonial bureaucracy and common people's response about this unimaginable public health crisis. No systematic attempt was made to cover the situation in Bengal and specifically Calcutta. Against this backdrop, the present paper hopes to investigate how a communicable disease like influenza spread throughout the city of Calcutta, analyze the death tolls, the responses of the common people, and the reactions of colonial rulers, officials, and the preventive strategies implemented by them. Thus, the present paper attempts to explore (i) how the influenza pandemic began and spread in colonial Calcutta (within 25 municipal wards). (ii) which were the most affected wards of Calcutta? (iii) what kind of preventive measures were taken by the people and the government? (iv) how the Government handled this challenge? (v) what was the attitude of the native populace and the media regarding the pandemic?

Data and information have been collected both from primary (archival) and secondary (published materials) sources available at different institutions in Kolkata. The published materials comprised books, reports, census reports, ethnography, memoirs, and gazetteers. Unpublished archival documents referred to include files from different departments like Sanitation, Home, Public Health Branch, Medical and Secretariat papers on the Medical, Sanitary, and General Departments. In brief, an attempt has been made to investigate in detail the relationship between pandemics, history, and imperialism, both in the material sphere and in the thoughts and feelings of rulers and the ruled.

3 Pathological perspectives of the disease

The Spanish Flu pandemic of 1918–19 was a global health crisis that affected millions of people and caused millions of deaths. The pandemic ravaged the entire world, which probably began in the mid-western United States of Kansas City in March 1918, and then rapidly spread to Europe, Asia, North Africa, and Australia before reaching India (Kupperberg, 2006). World War I did not cause the flu, but the close troop quarters and their massive movements triggered the pandemic. A big factor in the worldwide occurrence and spread of this flu was the increased travel of soldiers, sailors, and civilians (Johnson and Muller, 2002). From a pathological perspective, the pandemic was caused by the H1N1 influenza virus,[6] which had unique characteristics that contributed to its severity. "A minuscule virus spreading from person to person in droplets from coughs,

[6] H1N1 influenza, a subtype of influenza A virus, is a highly contagious virus that causes upper and sometimes lower respiratory tract infections in the host. The name "H1N1" refers to the unique properties that tell the immune system to recognize the virus and allow it to bind and multiply. "H" (hemagglutinin) and "N" (neuraminidase) are two proteins found in the coat or envelope.

this was an unprecedented and gloriously unique opportunity–influenza took it" (Oxford, 2003, p. xvii). One of the most notable features of the Spanish Flu virus was its ability to cause a cytokine storm. This was a severe immune system response that could cause inflammation and damage to the body's tissues and organs. In the case of the Spanish Flu, the cytokine storm[7] led to severe respiratory distress, as the immune system attacked the lungs, causing damage and making breathing difficult. The virus also had a unique ability to infect healthy young adults, which was unusual for an influenza virus. Typically, influenza viruses affect the elderly and young children more severely, but the Spanish Flu virus seemed to target young adults. This might have been because the virus triggered a more vigorous immune response in healthy individuals, leading to a more severe cytokine storm.

Another contributing factor to the severity of the pandemic was the high incidence of secondary bacterial infections. The virus weakened the immune system, making it easier for bacteria to invade the body and cause additional damage. Pneumonia was a common complication of the Spanish Flu, and it was often caused by secondary bacterial infections. The pathological effects of the Spanish Flu virus could be seen throughout the body. Besides, the damage caused to the lungs, the virus could also affect the heart, leading to myocarditis and heart failure. It could also cause damage to the brain, leading to encephalitis and other neurological complications. In short, these factors contributed to the severity of the pandemic, making it one of the deadliest pandemics in human history. However, it was not even certain whether the disease was caused by any germs at all. A report entitled 'Influenza Epidemic: Measures Against Possible Recrudescence Official Memorandum–Organized Relief and Prevention', dated 23rd, April 1919 in *The Englishman* illustrates that:

> Memorandum of the Govt. of India states that during 1918 a peculiar and exceptionally widespread epidemic of influenza appeared which affected the inhabitants of practically every continent... The organism responsible for the epidemic of influenza has not been definitely identified. The weight of evidence still points, however, to the Bacillus called the *Bacillus of Pfeiffer*[8] being the cause.

No one knew that the disease was caused by a virus because the electron microscope was yet to be invented, which would happen only in 1931. No readymade medicine was available to prevent that infectious disease because of the absence of the prophylactic effect of the medicine. As the disease was caused by a virus that was completely unknown to the medical authorities, no remedial medicine could be applied. The Spanish flu hit different age groups, displaying a so-called '*W-trend'*,[9] with infections typically peaking in children and the elderly, with an intermediate spike in healthy young adults. With young adults, lack of pre-existing virus-specific and/or cross-reactive antibodies and cellular immunity probably contributed to the high attack rate and rapid spread of the 1918–19 H1N1 virus.

4 Horrifying pandemic in the city of Calcutta

It is important to highlight the jurisdiction of the Calcutta Municipal Corporation (CMC) in 1918 to understand the occurrence of the influenza pandemic in different wards. At that time Calcutta city was divided into 25 Wards, namely, I-Shampooker, II-Coomertooly, III- Burtollah, IV-Sookea's Street, V- Jorabagan, VI-Jorasanko, VII -Bara Bazar, VIII-Colootollah, IX-Moochipara, X-Bowbazar, XI- Poddopukur, XII-Waterloo Street, XIII- Fenwick Bazar, XIV-Taltollah, XV-Collingah, XVI-Park Street, XVII- Baman Bustee, XVIII-Hastings, XIX-Entally, XX-Beniapukur, XXI-Ballygunge and Tollygunge, XXII- Bhowanipur, XXIII-Alipur, XXIV-Kidderpur and Ekbalpur, XXV-Watgunge and Garden Reach.[10]

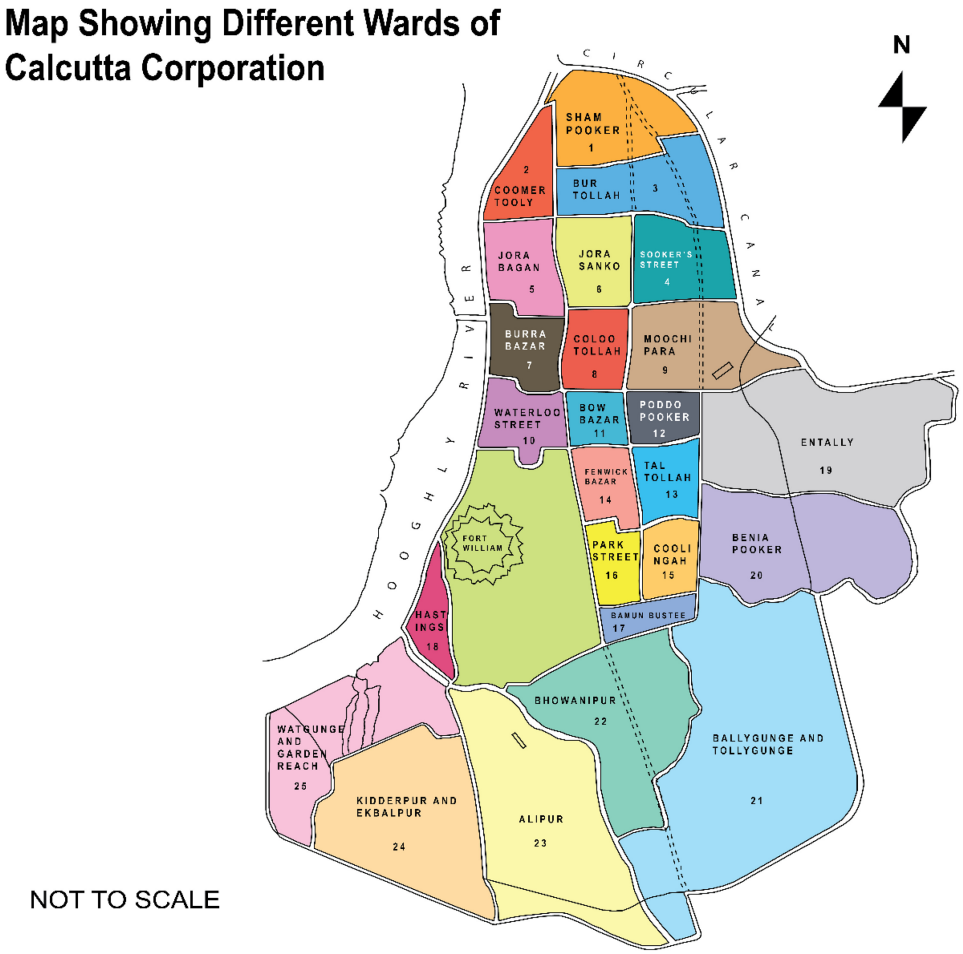
The year 1918 was an abnormal year from a public health point of view. In the early months of the year, there was a considerable influx of panic-stricken immigrants from Rajputana and other badly infected centres by the plague. Those who brought infection with them intensified overcrowding in Bara Bazar and other congested places and helped swell the mortality, particularly from smallpox and plague. In the middle of June, Spanish Flu broke out in epidemic form and although it subsided after a few weeks, there was a severe recrudescence in October which lasted throughout the year and also in the next year.

[7] Cytokine storm is a condition that occurs when your immune system reacts to a serious infection. The immune system is so aggressive that the body releases many cytokines into the bloodstream very quickly. Cytokines play an important role in normal immunity, but releasing too many cytokines in the body at once can be dangerous.

[8] Pfeiffer's bacillus, also known as *Haemophilus influenzae* type b (Hib), is a gram-negative bacterium that can cause severe infections, such as meningitis, pneumonia, and sepsis. It was first identified by German physician Richard Pfeiffer in 1892, hence the name.

[9] 'W' trend is the occurrence pattern and trends of morbidity among patients. Mortality rates due to influenza pandemic were higher among those under 5 years old, 20–40 years old, and 65 years and older. A feature of this epidemic is the high mortality rate of healthy people, including people in the 20–40 age group. The pattern is child, young and older which reflects the pattern 'W'.

[10] Minutes of the Calcutta Corporation, November 1918.



5 Onset, course, and distribution

Sporadic cases of the Flu pandemic occurred in the middle of June 1918. Nothing definite was known as to the distribution of these cases. Towards the end of June, a few groups of cases of 'Fever' of short duration almost like Dengue in character occurred. One such group occurred in Ward XIX (Entally) and another in Ward V (Jorabagan). It was also clear from the returns of the Kidderpore dispensary that Spanish Flu was present towards the end of June. These early cases were mild and attracted very little attention. During the first week of July, the disease assumed epidemic form, but until July 13, the disease did not spread in epidemic form. According to the returns from dispensaries and hospitals, the largest number of attendances for fever and influenza occurred on July 11th. The number of deaths recorded because of influenza rose from 16 during the week ending July 13th to 107 during the week ending July 20th and reached a maximum of 179 during the week ending July 27th. Table 1 depicts the general mortality by week in the 25 Wards of the city of Calcutta.

It was interesting to note that except for Ward No. XVI (Park Street area) where higher class people lived, every ward of the city was affected. Due to deadly influence of the Spanish Flu, resulting in increased mortality in all areas of the city, a detailed analysis of the local variations in the death rates of the different wards was hardly called for. For the first time in many years, not a single ward in the city had a death rate of 10 per mile or less. The impact of the Spanish Flu's severity and spread on the city's vital statistics was clear. In 20 of the city's 25 wards, the death rate exceeded 30 per mile. The average death rate for the whole city was 35.0 per mile. A revised standard was adopted for creating a 'Black List' of wards with high mortality rates. The following table highlights the wards with death rates of 40 per mile or over, with a brief note as to the principal causes of death.

Table 2 shows that Kidderpore and adjoining areas (Ekbalpur, Watgunge, and Garden Reach) were the worst affected, followed by Jorabagan, Beniapukur, Ballygunge, and Hastings. The first signs of the recrudescence were observed in the Kidderpore section of the city in the middle of September 1918. The fact that this ward was the first to be

Table 1 Deaths from 'Spanish Flu' by weeks in the city of Calcutta from 1st july to 10th august 1918

Wards	Population	Deaths	Rate per 1000 population
I	53,036	41	0.77
II	33,073	27	0.81
III	54,610	30	0.54
IV	48,112	24	0.49
V	52,114	25	0.47
VI	59,541	38	0.63
District I	3,00,486	185	0.61
VII	30,495	18	0.59
VIII	57,094	11	0.19
IX	63,362	25	0.39
X	25,014	9	0.35
XI	29,966	13	0.43
XII	6284	3	0.47
District II	2,12,215	79	0.37
XIII	28,436	4	0.14
XIV	32,112	7	0.21
XV	11,385	2	0.17
XVI	5294	–	–
XVII	3125	1	0.32
XIX	45,072	19	0.42
XX	37,881	15	0.39
District III	1,63,305	48	0.48
XVIII	5550	1	0.18
XXI	39,952	24	0.60
XXII	54,569	32	0.58
XXIII	19,749	7	0.35
XXIV	21,869	23	1.0
XXV	43,806	17	0.38
District IV	185,495	104	0.56

Source (Proceedings of the Govt. of Bengal, Municipal Department, Sanitation Branch, File No. S.2D – 8 (5))

infected and had suffered more severely than any other part of the city shows that the infection was seaborne.[11]

In the Kidderpore area, the *purdah* system was adopted in the slums and gullies of a congested city, which led to a high mortality rate among females. The major reason appeared to be the large coolie population employed in the docks, many of whom were poverty stricken and living under the most insanitary condition in damp, dark, and dirty huts. They were a different kind of people to deal with, not only for their nature of habitation but they often refused the advice and treatments. Because of their ignorance and superstitions, the infection spread rapidly. Similar factors were important in other wards as well, specifically in the Bara Bazar area.

6 Sex differences in death rates

The number of deaths recorded because of influenza from 1st September to 31st December 1918 was 3,673. In 1918, the death rates for males were 30.6 per mile, and for females 44.1 per mile. In Table 3, sex-wise death rates in the most affected wards have been highlighted.

The female mortality rate was highest in the entire city of Calcutta. The data revealed that in the above wards, appalling mortality was found among the females. Owing to the *purdah* system and consequently being deprived of fresh air and a healthy living environment, women were constantly exposed to unsanitary conditions. The other major reason was sex-specific negligence by the menfolk. Due to patriarchal dominance, female folk were busy with their domestic chores and caring duties. They were neglected and unnoticed by their husbands and other family members. They had to depend on God's mercy, which caused a very high mortality rate among females. In the case of the community-specific death rate, the death rate was high for both Hindus and Muslims. Outbreaks of infectious Spanish Flu were difficult to deal with as the common mass was very ignorant and superstitious. The death toll in the Christian area was lower because of their health consciousness.[12] The death rate among males of all ages was 30.6 per mile. Table 4 shows the population, number of deaths, and death rate per mile for each of the principal age groups.

Table 2 Death rate (per mile) in most affected wards of the Calcutta city in 1918

Ward and area	Year 1918	Principal causes of death
Kidderpore (XXIV)	64.0	Influenza and respiratory disease
Entally (XIX)	44.7	Influenza and diarrhoea
Jorabagan (V)	43.9	Influenza and small pox
Beniapukur (XX)	40.3	Influenza, respiratory disease, diarrhoea, malaria
Ballygunge (XXI)	40.2	Influenza, respiratory disease, cholera
Hastings (XVIII)	40.7	Influenza, respiratory disease

Source (Minutes of the Proceedings of the Calcutta Corporation, December 1918)

[11] Minutes of the Proceedings of the Calcutta Corporation, October 1918.

[12] Minutes of the Meeting of Calcutta Corporation, September 1918.

Table 3 Sex and death rates in most affected wards in Calcutta city in 1918

Ward	Death rates per mile	
	Male	Female
XXIV (Kidderpore)	63.6	65.7
V (Jorabagan)	37.7	57.9
VII (Bara Bazar)	28.9	55.0
XX (Beniapukur)	34.0	50.3
XIX (Entally)	31.7	51.4
XXI (Ballygunge)	33.5	53.6
IX (Moocheepara)	29.7	52.8
XIV (Taltollah)	28.6	50.6

Source (Minutes of the Proceedings of the Calcutta Corporation, November 1918**)**

Table 4 Age groups and death rates of the males in all the wards of Calcutta city 1918

Age group	Population	No. of deaths	Death rate per mile
1–5	24,617	1507	61.2
5–10	35,400	622	17.5
10–15	43,478	508	11.7
15–20	56,316	888	15.7
20–30	174,951	2951	16.9
30–40	133,664	3067	22.9
40–50	75,109	2248	29.9
50–60	33,879	1454	42.9
60 and over	22,602	2595	114.8

Source (Annual Report of the Health Department, Section – I: Meteorology and Vital Statistics, 1918**)**

Table 5 Age groups and death rates of the females in all the wards of Calcutta city 1918

Age group	Population	No. of deaths	The death rate per mile
1–5	23,191	1446	62.3
5–10	31,909	709	22.2
10–15	24,285	387	15.9
15–20	26,325	703	26.7
20–30	59,983	1654	27.5
30–40	45,085	1337	29.6
40–50	31,789	877	27.5
50–60	20,065	794	39.5
60 and over	18,719	2528	135.0

Source (Annual Report of the Health Department, Section – I: Meteorology and Vital Statistics, 1918)

There had been a steep rise in death rates in every age group. This was most marked among children of 5–10 years. At all ages between 5 and 20 years and between 30 and 50 years, the death rates were more than doubled. Among the old people, 60 years and above, the mortality was highest.

The death rate among females of all age groups was 44.1 per mile (Table 5). This exceptionally high rate of mortality among females, particularly among women of childbearing age, was a standing disgrace to the city. Poverty, overcrowding, unsanitary conditions, child marriage, untrained midwife, and the purdah system were identified as the additional causes of higher mortality among females.

Like elderly men, elderly women had the highest mortality rate compared to other age groups.

The circumstances of the children's death were horrific. The infant mortality rate for the city was 357.8 per thousand registered births. This was the highest rate recorded in 1902. The highest infantile death rates were observed in Ward No. V (Jorabagan 581),VII (Bara Bazar 473), XIV (Taltollah 285), XXIV (Kidderpore 351), IX (Muchipara 345) and XIII (Fenwick Bazar 325). Jorabagan and Bara Bazar showed a high rate of infant mortality due to intensely congested and overcrowded buildings, intersected by narrow gullies, of course, intensified by the severe Spanish Flu epidemic.[13]

In such a terrible situation, a special Health Committee meeting was held on 17th July at 5 p.m. at the Central Municipal Office under the Presidentship of Sri Kailash Ch. Bose. Other members present were Dr Haridhan Dutt, C L'E Colthurst, Dr Suresh Chander Sircar, A. C. Banerjee, W.H. Phelps, J.A. Jones, and the Hon'ble Mr W H Arden Wood. Health Officer's report was:

> ...The extremely rapid diffusion shows the very contagious nature of the disease. The mode of spread appears to be by contact. An infected person coughing, sneezing, or talking, particularly in crowded and ill-ventilated rooms, can infect those in his vicinity. The danger from the use of common drinking cups, spoons etc., and from handkerchiefs and towels are obvious while the distinguishing practice of spitting all over the place, which is so prevalent in the whole city of Calcutta will undoubtedly lead to the spread of the disease.[14]

The measures advised to follow included avoiding unnecessary exposure and fatigue, no travel in overcrowded trams or buses, no visit to overcrowded places or public resorts, not neglecting trifling symptoms of ill health during fever and bed rest was necessary, infected cases should be isolated and must use boiled handkerchiefs and towels. The Health Officer Dr. Crake also made some valuable suggestions to ward off an attack, namely the application of nasal douche, the exercise of due care in using spoons, soiled linen, etc., and the prevention

[13] Proceedings of the Govt. of Bengal, File No.S.2-D-8(12).

[14] Proceedings of the Govt. of Bengal, File No.S.2D–8 (1).

Table 6 Death rate (per mile) in most affected wards of Calcutta city in 1919

Ward and area	Year 1919	Principal causes of death Influenza and respiratory disease
Kidderpore (XXIV)	81.1	Influenza, respiratory disease and malaria
Entally (XIX)	51.3	Influenza, cholera and small pox
Jorabagan (V)	47.4	Influenza, respiratory disease and diarrhoea
Ballygunge (XXI)	46.9	Influenza, respiratory disease and diarrhoea, malaria
Hastings (XVIII)	44.5	Influenza, respiratory disease and cholera
Beniapukur (XX)	44.4	Influenza, respiratory disease

Source (Minutes of the Proceedings of the Calcutta Corporation, January 1919)

of expectoration. He also recommended using Eucalyptus, a great prophylactic of Spanish Flu, and advised that the public should use it liberally. Besides, he thought that the saturated solution of Thymol was a good one.[15]

Coming to the context of 'the second wave of the 'Spanish Flu', it started on October 1918 and reached its peak in January 1919. It persisted for many months, though a few weeks after the initiation, it had disappeared. Thereafter, a severe recrudescence of the Flu epidemic occurred throughout the year. Infection was widespread and the number of deaths was innumerable. A considerable proportion of deaths from influenza were registered under respiratory diseases and fever. Under both these headings, a large increase in the number of deaths occurred. The deaths from respiratory diseases rose from 6914 in 1918 to 8236 in 1919. Similarly, deaths from fevers rose from 2085 in 1918 to 2392 in 1919. Due to the reoccurrence of the Spanish Flu within a very short period resulted in a lowering of the vitality and the power of resistance for the entire community. The result was a high rate of death not only from the Flu pandemic but from every disease prevalent in the locality (Table 6).

A death rate of 36.7 per thousand was recorded among males, resulting in 22,339 deaths. 15,500 deaths were recorded among registered females, resulting in a death rate of 53.7 per thousand. The death rate among females was nearly 50 percent higher than their male counterparts. The death rates of males and females in Kidderpore areas were nearly equal. This was because of the large coolie population where both genders lived and worked in pitiful conditions. In the other wards also, female death rates were higher than males. In Bara Bazar, for instance, the mortality among females was more than double that of the males (Table 7).

However, the second outbreak of influenza began at the end of October 1918 and reached its peak in December, and the increase was incremental up to January 1919. It took a long time for the peak to slow down. The intensity slowly diminished month by month. This noxious flu ended after June but

Table 7 Sex and death rates in most affected wards in Calcutta city in 1919

Ward	Death rates per mile	
	Male	Female
XXIV (Kidderpore)	80.5	82.0
V (Jorabagan)	40.6	62.7
VII (Bara Bazar)	28.2	63.2
IX (Moochepara)	32.7	55.7
XVII (Baman Bustee)	18.1	62.5
XIX (Entally)	47.8	58.7

Source (Minutes of the Proceedings of the Calcutta Corporation, January 1919)

was not eliminated even at the end of the year. Although the death rate was reduced, it did not stop suddenly. The third recrudescence in 1920 was sporadic, and the attack was mild.

During this gruesome death toll, the question of hospital accommodation became the most important issue. After consulting the various hospital authorities, it was constructed temporary sheds at Cambell and Sambhu Nath Pandit hospitals. To begin with, one shed with 20 beds was provided at Campbell Hospital. Later on, a second shed was constructed at Shambhu Nath Pandit Hospital. As the second ward at Shambhu Nath Pandit Hospital rapidly filled up, two temporary hospitals with 20 beds each were opened, one at Kalighat Rest House and the other in a rented house at Mominpur Road. All the hospitals were severely unhygienic and lacked proper medical professionals. The hospitals were choked, and it was impossible to move the dead bodies. Burning ghats and crematoriums were swamped with corpses. Nearly every household was lamenting a death, and every ward of the city was alarmed by the voice of death. British medical assistance was crowded with misunderstanding, ill-advised intervention, and bureaucratic imposition of British policies with little or no cooperation with the common mass. As a result, the common mass viewed Indian Medical Service (IMS) with something between wary skepticism and outright suspicion.[16]

[15] Proceedings of the Govt. of Bengal, Municipal Department, Sanitation Branch, File No. S.2D – 8 (5).

[16] Minutes of the Proceedings of the Calcutta Corporation, January1919.

In such a devastating situation, undoubtedly the most important development was the establishment of relief centres. These centres were initially started in District III (shown in Table 1) by Dr Soorya Goodeve Chuckerbutty, District Health Officer, whose zeal and enthusiasm deserved special recognition. Relief centres manned by volunteers sprang up all over the city, and at any time, over 100 centres were at work. Here, volunteers, both lay and medically trained, treated mild cases, distributed thymol solution to the affected people, received calls, and most important of all, visited the bustees in the neighbourhood and reported all serious cases requiring special attention. With 50 mobile dispensaries and over 100 relief centres, a fairly complete organization was established, resulting in a very large proportion receiving advice and treatment for the disease.[17] Some of the relief centres in different corners of the city were (i) Ananda Chatterjee Lane–In charge Babu C N Banerjee, (ii) 8/1 Bagbazar Street–In charge Babu B D Mullick, (iii) 23/1 Beniatola Street–In charge Dr T K Ghosh, (iv) 83 Raja Dinendra Street–In charge Me Eleazar Ekka, and (v) 24 Girish Vidyaratna Lane–In charge Dr S C Mitra.

But the mountain of the corpses was witnessed by the burning ghats and burial grounds. Hindu dead bodies were gathered at the principal, burning ghats like Nimtolla, Kasi Mitter, and Shahnagore. On the other hand, Mohamedan dead bodies were piled up at Gobra, Ekbalpur burial grounds, and Christian dead bodies were dumped at the Lower Circular Road cemetery. Many dead bodies were floating in the river Ganges, as there was no one to burn or cremate them. Thus, Calcutta, once the capital city of the British rulers, witnessed the horrors of death during the dreaded Spanish Flu epidemic.[18]

7 Disease, public health, and the colonial bureaucracy

The 1918 influenza pandemic affected nearly every continent of the world and left in its wake a confounding death toll. More deadly than the First World War, the 1918 influenza pandemic lasted 2 years and left long shadows. Within a year, the 1918 influenza pandemic took away 50–100 million lives worldwide, 12–13 million of them from India alone.[19] However, the 1918–19 influenza pandemic in India has largely been downgraded to mere appendices. Unfocussed by the contemporaneous 1918 famine[20] and the end of World War I, the British Indian government did little to respond to the pandemic, even as famine-induced price barbs caused extensive malnutrition and sharp demographic disparities in mortality (Srivastava, 1968). While the Indian people noted the link between famine and influenza mortality, as did the British medical community, the Indian government itself paid little attention. No one will ever know the exact death toll in India, with an estimate ranging from 7 million to an upper limit of 18.5 million. Sanitary Commissioner F. Norman White reported 7,089,694 official deaths in the Annual Sanitary Report for 1918, though it was stated in the report that these figures were given "without any claim to accuracy".[21]

What measures the government had taken, or rather failed to prove, had been frequently asked in the local newspapers repeatedly. Due to a lack of preparedness, tremendous criticism was raised against the government for its poor response to providing medical help to the masses as the second wave of the pandemic hit even harder than the first. In such a public health catastrophe, most of the highly paid health experts, instead of providing health care help to the common mass went to a hill station to save their lives from this deadly attack (Ramana, 2003, pp. 87–98). The common people were completely unaware of the service they would receive from the government.

The local newspaper, *The Bengalee,* 22nd April 1919, published a report entitled "Influenza Epidemic: Sanitary Commissioner's Memorandum Circulated to Local Government, Simla", where the Sanitary Commissioner strongly recommended taking various precautions to avoid the influenza epidemic as mentioned below.

> ...the Govt. of India in a circular letter to local Govt. and administrations forwarded a memorandum prepared by the Sanitary Commissioner dealing with the case and treatment of Influenza. In view of the possibility of recrudescence of Influenza in India and with the object of meeting the emergency of the Govt. of India consider it desirable that medical officers should arrange for the translation of the memorandum into suitable vernaculars and distribute it as widely as possible...

During the first wave of the outbreak, people were not at all aware of the intensity and virulence of the disease. But at the second outbreak, certain preventive measures were adopted. It was realized that no legislative measures could be adopted

[17] Minutes of the Proceedings of the Calcutta Corporation, February 1919.

[18] Minutes of the Proceedings of the Calcutta Corporation, January 1919.

[19] Annual Report of the Sanitary Commissioner,1920.

[20] In 1918, when India was still facing the effects of the First World War, suddenly the southwest monsoon stopped raining in many parts of India, including Bengal. This event led to famine throughout India. Although famine affected many Provinces in India, but the British Government did not declare famine except the Central and United States. Other places are maintenance only. The effect of this famine was fatal, but combined with influenza, its effect became more formidable.

[21] Annual Report of the Sanitary Commissioner, 1920.

in most communities. The limitation of an epidemic of this nature depended more on individuals than upon legal enactments. Under instructions from the Health Department, the Director of Public Instruction closed all Government schools and colleges. The general recommendations made for schools, colleges, and the public were (i) to avoid coughing, sneezing, spitting, and hawking in public places; (ii) to wear warm clothes; (iii) to avoid crowded gatherings; (iv) to use separate rooms for those infected; (v) to use a handkerchief when coughing; (vi) to return to work after the temperature become normal; (vii) to sleep in the well-ventilated room; (viii) to wear a face mask; (ix) closure of meeting places, schools, colleges, cinema halls, dancing halls, skating rinks, churches, holy places, markets, etc.; isolation; (x) sprays and gargles; (xi) disinfection and (xii) necessary quarantine. In addition, the Health Department of Calcutta Corporation provided medicines and lotions (Quinine, Sodium Benzos, Thymol, Eucalyptus oil, Cinnamon, etc.) for the prevention and treatment of influenza. Allopathic doctors of Western medicine prescribed a variety of remedies to combat influenza namely, belladonna, laudanum, camphor, creosote, and a mixture of iodine and chloroform.[22]

The government warned the public and intimated that an infected person coughing, sneezing or talking, particularly in crowded and ill-ventilated rooms, could infect those in his vicinity. An infected person in a house should not, therefore, cough, sneeze, or talk. Other suggestions were also made, like common drinking cups, spoons, etc. should be broken and common handkerchiefs and towels should be torn into pieces and each man must purchase new ones for his use. No one should spit, because it spreads the maximum germs.

The Press provided publicity to such measures which were recommended for adoption. A well-written Bengali pamphlet entitled 'Epidemic Disease and their Prevention' covered all the aspects of influenza. People were told in very simple language how the disease attacked the human body and how it could be combated. The pamphlets were distributed free of cost to all the residents through door-to-door visits by the Ward Health Association.[23]

The Sanitary Commissioner Bengal announced that influenza was one of those diseases that had little concern about public health and very little could be done to prevent its spread. He recommended prompt isolation of the infected, opening up of ill-ventilated dwellings, encouraging people to sleep in the open, and disinfecting the clothing of influenza patients. The Surgeon General, R.W.S. Lyons, in his instructions, recommended gargling with diluted potassium permanganate and aspirin and warned against the use of quinine as a prophylactic or a curative medicine, and suggested immediate medical attention when fever appeared. Hospitalization was advised for those who developed pneumonia. Lyons also ordered that all hospitals and dispensaries should expand their accommodation and well-ventilated schoolrooms should be used. However, despite the Surgeon General's claim that the health officers had done their best to combat the epidemic, the local press did not seem to agree. This situation is exemplified in the following report:

> Statements referred to in the answers by the Hon'ble Mr. O'Malley to the questions asked by the Legislative Council Member Hon'ble Babu Brojendra Kishore Roy Chowdhury at the Council Meeting of the 21st January 1919 are:
> The reply given to the Hon'ble Mr. Brojendra Kishore Roy Chowdhury's question at the Bengal Council on Tuesday about influenza in the mofussil must be regarded as a confession of defeat by the Government. Mr. Rai Chaudhuri's question was to the following effect–
> (a) Are the Government in a position to state, district by district, the approximate number of deaths from influenza during the last 2 months? (b) Is it a fact that, as compared with the number of attacks, the mortality has been heavier in rural areas than in town? (c) What arrangements have been made (i) by Government and (ii) by the District Boards for medical relief in rural areas affected by influenza?
> Mr. O'Malley, on behalf of the Government, replied as follows–
> (a) Government regret that they are not in a position to give the information asked for owing to the fact that the agency employed for the reporting of vital occurrence are unable to diagnose properly the different causes of mortality, (b) Sufficient data are not available to enable a comparison of this nature to be made.[24]

The government loaned 66 temporary Sub-Assistant Surgeons to help the District Boards. The press reported that health officials sought refuge in the hills for their safety. The Government agency responsible for reporting vital occurrences was ineffective. The only help the Government could offer during an emergency was to lend 66 temporary Sub-Assistant Surgeons to the District Boards, leaving them to fend for themselves.

Along with the Western medical practitioners, the practitioners of the indigenous system of medicine like *kavirajas*, *vaidyas,* and *hakims* tried their level best to provide relief to the patients. Every day they visited the house of

[22] (Proceedings of the Govt. of Bengal in the Municipal Department (Sanitation) for April 1919, File No. S.2D–80.

[23] Proceedings of the Govt. of Bengal, April 1919.

[24] Proceedings of the Govt. of Bengal, January 1919, Municipal Dept. Sanitation Branch, File No: S Q-5 and S Q -2.

Pic. 1 Influenza patients coming for treatment at Bengal Health Association Treatment Centre

Pic. 2 Influenza patients meet at Goddesses *śītala* temple for *Charanamitro* (Holy water)

the infected person and guided about does and don'ts. They specifically instructed that infected persons should be separated and kept in separate rooms. They provided masks to the villagers and training to use them and how to wash their hands frequently with neem water, make gargle with hot salty water and always keep the surroundings of the house clean.

In such turmoil, indigenous medical practitioners repeatedly raised their voices in the media for their system of treatment and also emphasized the use of Indian indigenous medicines as a remedy. They demanded cooperation from the government, but all efforts failed because of the indifference of the colonial government. Sir Alexander Cardew and Surgeon General Col. Gifford from the Government not only refused to show the least sympathy for the indigenous systems but considered them outdated and pitied against those who practiced the Indigenous system of medicine. This was the reality created by the colonial government, which effectually stifled the indigenous system of medicine and its practitioners (*Amrita Bazar Patrika,* 20th August, 1918, p. 4).

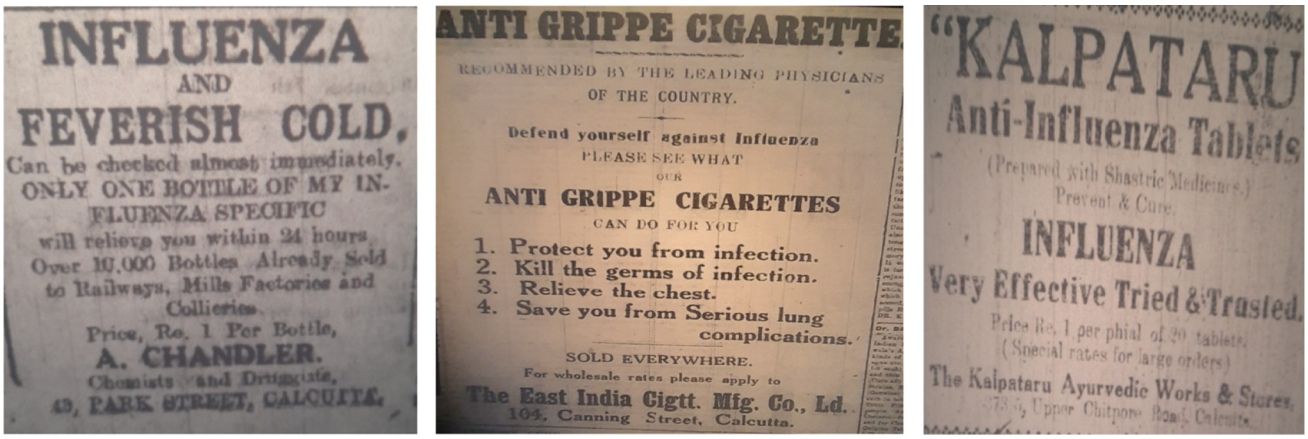
Despite the terrible effects of the flu, the government did not know how to respond to this catastrophe because of the severe shortage of doctors, as many were serving in the military. The local newspapers and magazines played an important role in venting public anger against the colonial government, shaping public opinion, and criticizing the bureaucratic bungling of the "colonial government" (Kalpagam, 2001, p. 421). Public protest rose from different sections of society that what the government had done, or rather, failed to do, criticizing the government for its unsatisfactory response to the ongoing crisis. Besides the lack of preparedness, the government also showed a marked indifference toward providing medical assistance to the masses, as the second wave of flu hit even harder than the first one. The authorities did not take any substantial measures to deal with the situation caused by influenza and famine.

8 The common peoples' perception of the influenza pandemic

In the terrible prevalence of the influenza pandemic from September to December 1918, nearly 5,000 lives were needlessly sacrificed to this entirely unknown disease, paralyzing the life of the whole city. Ignorance, superstition, and stigma acted so rapidly that hygiene education became a failure. Small, overshadowed inhabitants of bustees living in ill-lighted and ill-ventilated rooms were in frequent physical contact with each other and became the catalytic agents for the rapid spread of the disease. All kinds of awareness programme became futile because every day they assembled in the local temple of *śītala* (originally the goddesses of the smallpox epidemic and repurposed to influenza) to get the *Charanamitro*[25] of Thakur because the priest of the temple used to say that everyone would be healed by taking his *Charanamitro.* The situation became more horrific when the common mass came for treatment without knowing that they were already affected (Pics. 1 and 2). This created an intense virulent infection and tragic instances of the death of many young people.[26]

[25] Charanamrita (cha-ra-NAM-rita) means "holy water from the feet of the immortal God." The priests of the temple bathe the deity every day with milk, ghee, honey, sweet curd and holy water. This water, called charanamrita, is usually given to all disciples at the temple.

[26] Proceedings of the Calcutta Corporation, February 1919.



Pic. 3 Medical advertisements during the influenza pandemic in Calcutta

9 Medical advertisements during influenza pandemic: an attempt to commercializing public health

During the 1918–19 flu pandemic, the public was bombarded with conflicting advice from official and unofficial sources on how to stay safe. Medicine companies used the pandemic as an advantage to relaunch their products under a new advertising campaign focused on providing a lucrative flu prevention opportunity. This section tried to examine how medical advertisements responded to the 1918–1919 influenza pandemic in Calcutta. It looks particularly at how the marketing strategies changed and how these strategies were implemented by making lexical and semiotic choices (e.g., language, image, colour, typography, texture, materiality, composition, and layout) of advertisements (O'Hagan, 2021, pp. 161–187). Different local newspapers like *The Amrita Bazar Patrika, The Times of India, The Hindoo Patriot, The Statesman, and The Englishman* published different medical advertisements related to the influenza pandemic like (i) Influenza and Feverish Cold (Tonic), (ii) Anti Grippe Cigarette (defense against influenza), (iii) Influenza–Scott's Trench Fever Cure, (iv) Kalpataru–Anti Influenza Tablets (Ayurvedic), (v) Influenza–Veno's Lightning Cough Cure, and (vi) B K Paul & Co.'s Influenza Tablets (sure remedy), etc. (Pic. 3).

Each brand transformed its marketing strategy for selling its medicines in response to the pandemic, using such techniques as testimonials, hyperbole, scaremongering, and pseudoscientific claims to persuade consumers that their products offered the best protection. While these strategies may appear manipulative, they also had the function of fostering reassurance and sympathy amongst the public in a moment of turmoil, showing the important role of brands in building consumer trust and promoting a sense of authority in early twentieth-century Bengal. Originality/value–exploring how advertisers responded to the 1918–1919 influenza pandemic reminds us of the challenges of distinguishing legitimate and illegitimate medical advice in a fast-moving pandemic situation and highlights the need to cast a critical eye on the public health information, particularly when it comes from unofficial sources with vested interests.

The medical authorities passed sweeping bans on public gatherings, but the public could not live in total isolation. Due to the necessity of working and eating, most of the bustee dwellers had to venture out of their homes into the germ-ridden realm of public spaces. Hence, health authorities needed to remind individuals about the rules of safe coughing, sneezing, and spitting and to encourage business establishments to do their part to minimize the spread of infection. Despite the prevalence of the disease in the city of Calcutta, the government, private sector, and voluntary organizations like the Red Cross Society, the Hindu Satkar Samity[27], and the Ramakrishna Mission tried their level best to provide relief to the infected persons in various ways. The matter became more complicated because of the forceful stoppage of the service provided by the indigenous practitioners.[28]

10 Conclusion

The Influenza pandemic was the deadliest in human history. In Calcutta, the noxious flu stretched its deadly scratches first in mid-July 1918. It peaked in September but subsided. Again, the second wave started at the end of October and continued until almost the end of 1919. The pandemic was marked by colonial bureaucracy, an ineffective public health care system,

[27] Hindu Satkar Samity is a Kolkata-based Hindu charity that burns derelict Hindu corpses. Hindu Satkar Samity is the only institution where Hindus are allowed to transport their dead bodies in hearses and cremate them. Shri Indubhushan Bid initially started these activities during Spanish influenza in 1918 and finally got its organizational form in the year 1932.

[28] Minutes of the Proceedings of the Calcutta Corporation, March 1919.

and negligence. The colossal death toll terrified the British government, but the preventive measures taken instead were inadequate to handle the situation. The common people developed a deep-seated distrust towards the government's role during the pandemic because of a combination of organizational insufficiencies and interconnected issues of supremacy, discrimination, and colonial intervention. The colonial government's initiatives were palpably ineffective in stemming the staggering death tolls. The situation was made more horrifying by famine. This pandemic created a mountain of corpses that destroyed common public life. The British government failed to address the triple threat of war, epidemic, and famine. The country made various plans to combat COVID-19, but the lessons from the 1918–19 Influenza pandemic were not fully used. The history of public health cannot give proper attention to the 1918–19 Influenza outbreak, even today.

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References

Arnold, D. (2019). *Death and the modern empire: The influenza epidemic in India*. Cambridge University Press.

Breedlove, B. (2006). Title of subordinate document In Etymologia: Influenza. *Emerging Infectious Diseases, 12*(1), 179. https://doi.org/10.3201/eid1201.et1201.Accessedon04.04.2023

Chandra, S., & Kassens-Noor, E. (2014). The evolution of pandemic influenza: Evidence from India 1918–19. *Bio Med Central Infectious Diseases, 510*, 1–10.

Chhun, M. (2015). *Death and disorder: The 1918–1919 influenza pandemic in British India.* Unpublished PhD Dissertation, History Department, University of Colorado

Honigsbaum, M. (2009). Historical keyword pandemic. *The Lancet, 373*, 1939.

Johnson, P. A. S. N., & Mueller, J. (2002). Updating the accounts: Global mortality of the 1918–1920 "Spanish" influenza pandemic. *Bulletin of the History of Medicine, 76*, 105–115.

Kalpagam, U. (2001). Colonial governmentality and the public sphere in India. *Journal of Historical Sociology, 14*, 418–440.

Kessler, M. (2020). *Strengthening health systems during a pandemic: The role of development finance*. Centre for Global Health US Centres for Disease Control and Prevention.

Kupperberg, P. (2006). *The influenza pandemic of 1918–1919: Great historic disasters*. Chelsea House Publishers.

Mills, I. D. (1986). The 1918–1919 influenza pandemic-The Indian experience. *The Indian Economic and Social History Review, 23*, 1–40.

O'Hagan, L. A. (2021). *Commercialising public health during the 1918–1919: Spanish flu pandemic in Britain*. Emerald Group Publishing Limited.

Oxford, J. S. (2003). A virologist's foreword. In P. Howard & K. David (Eds.), *The Spanish influenza pandemic of* (pp. 1918–1919). Routledge.

Ramana, M. (2003). Coping with the influenza pandemic: the Bombay experience. In P. Howard & K. David (Eds.), *The Spanish influenza pandemic of* (pp. 1918–1919). Routledge.

Srivastava, H. S. (1968). *The history of Indian famines and development of famine policy 1858–1918*. Sri Ram Mehra.

Tomkins, S. M., (1989) Britain and the influenza pandemic of 1918–19 (Unpublished PhD Dissertation) University of Cambridge

Tumbe, C. (2020). *The age of pandemics 1817–1929: How they shaped India and the world*. Harper Collins.