Chapter: 3

Disease and Death in Calcutta and the Major Health Policies

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3.1 Introduction

The growth of the city of Calcutta since late seventeenth century, led to the occurrence of various diseases that were associated with bad environmental conditions. The rapid spread of these diseases among the inhabitants led to concern about the condition in the city by the rulers as they also infected them. In this chapter we attempt to analyze the health condition of the indigenous and the European population along with the population of Calcutta during the colonial rule. An attempt has also been made to illustrate the health condition in Britain mainly in London during the same period and to compare the measures taken to secure good and healthy living condition in the metropolitan cities. The policies adopted and the measures taken by the colonial government in Calcutta to combat disease and death have also been studied.

‘Health’ is a relative concept. According to the W.H.O., ‘health’ has been defined as a “state of complete physical, mental, and social well-being and not merely an absence of diseases or infirmity”1. Perkins defined ‘health’ as “a state of relative equilibrium of body form and functions, which results from its dynamic adjustment to force, tending to disturb it. It is not passive interplay between body substances and force working towards adjustment”2. Encyclopedia of Britannica defines ‘health’ as “a condition of physical soundness or well being in which an organism discharges its functions efficiently, also in a transferred sense, a state of normal or intellectual well-being”3. Health, therefore, refers to both physical and mental state of health4.

“Public Health”, as the concept is used in Great Britain, refers to the principles and measures that aim at promoting and safeguarding the health of the community5. It is the science and art of: preventing diseases; prolonging life; and, promoting health and efficiency6.

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3 Encyclopedia of Britannica; Vol. 11; Chicago: Encyclopedia Britannica Ltd; p.295.
5 Op.cit; footnote 3; Vol.18; p.738.
The main diseases associated with bad environmental condition are: cholera, diarrhea and dysentery, enteric fever- typhoid and paratyphoid fevers -, poliomyelitis, infective hepatitis, tetanus, malaria, smallpox, plague and many other fevers like influenza, tuberculosis.

There are various indicators to measure health condition but in this study only mortality data has been taken into consideration, as other data pertaining to morbidity etc were not recorded for the period under study.

### 3.2 Mortality amongst the English in Calcutta

It is difficult to get accurate statistics regarding the mortality of Europeans in Calcutta. Hamilton stated that "in 1700, there were about 1,200 English in Calcutta, but in the following January 460 were buried, higher than any year up to 1800, excepting 1760 when 305 died."\(^8\)

The statistics of the Calcutta Hospital in 1757–58, as furnished by Ives, shows the extreme unhealthy condition of the town. It stated that:

"Between February 8\(^{th}\) and August 8\(^{th}\) of 1757, 1140 patients recovered; of those, 54 were for scurvy, 302 for bilious fevers, and 56 bilious colic; 52 men buried. Between 7\(^{th}\) August and 7\(^{th}\) November, 717 fresh patients were taken in; of those 147 were in putrid fevers, and 155 in putrid fluxes; 101 were buried."\(^9\) Fevers were also very common mainly among the ship crews, chiefly owing to their exposure to night fogs, and to the punch-houses. Scurvy was almost universal.

It has also been stated "much of the disease in Calcutta and in other parts of India has been owing to the English not conforming their mode of living, dress and others, to the climate. The Anglo-Saxon in every part of the world has wished to carry his home system on with him as in London."\(^10\)

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\(^9\) *Ibid*; p.65.

\(^10\) *Ibid*; p.66.
The British Army in Bengal as well as in other parts of the country was in constant terror due to the tropical diseases. It was the major hindrance to the efficiency of the British infantry. Every year a large number of European soldiers either died or were sent off due to chronic diseases. Most severe were attacks of fever or malaria, dysentery, smallpox, and cholera. In a single attack of cholera in 1817, 704 soldiers of the British army had died. In the contemporary reports of the East India Company, it was reported that hundreds of soldiers died each day and each week, and the wave of attacks continued till 1821. From the report on the statistics of the British army in India and the native army and jails of Bengal to the end of 1876, we find that out of 1890 cholera deaths, in the native army, 1402 occurred on the north-western frontier, eastern frontier and in Bengal proper. However, every year about 6000 men of the native army had to be sent home at the beginning of hot weather, either on unpaid leave or sick leave. Between 1867 and 1876, out of 5467 men who went to their homes, 2282 died. In the European Army, deaths were mainly due to blood dysentery, cholera and fever. In the European army of Bengal, 1107 fever deaths occurred between 1867 and 1876, and during the same period, 1120 fever deaths occurred in the native army.

<table>
<thead>
<tr>
<th>Presidency</th>
<th>Strength</th>
<th>Ratio per 1000 average strength</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Admission</td>
</tr>
<tr>
<td>Bengal</td>
<td>36179</td>
<td>1251</td>
</tr>
<tr>
<td>Madras</td>
<td>10890</td>
<td>1171</td>
</tr>
<tr>
<td>Bombay</td>
<td>10092</td>
<td>1365</td>
</tr>
</tbody>
</table>


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Table 3.1 shows the health condition of the European Army stationed in the three Presidencies of India for the year 1877. The total loss of human resource by the army during the year 1877, as shown in the table reveals a great loss mainly in the Madras Presidency followed by Bombay and Bengal Presidencies.

The results of death registration during the six years between 1871 and 76, as tabulated by Dr. Bryden in the last issue of his statistical history of the European Army in India, is given in Table: 3.2.

**Table: 3.2**

| Causes Of Mortality In The European Army |
| (Bengal, Madras, and Bombay Presidencies) |
| 1871 – 76 |
| (Omitting cholera, smallpox, and violence) |

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Bengal</th>
<th>Bombay</th>
<th>Madras</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis</td>
<td>15</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>Dysentery</td>
<td>9</td>
<td>9</td>
<td>17</td>
</tr>
<tr>
<td>Enteric Fever</td>
<td>13</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Other Fevers</td>
<td>11</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Heat Apoplexy</td>
<td>11</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Heart Diseases</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Phthisis</td>
<td>9</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Respiratory Diseases</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Delirium Tremens</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>


The British Troops in Calcutta were stationed mainly in the cantonments located at Fort William, Alipur, Dum Dum, and Barrackpore areas. Figure. 3.1 show the health condition of the Army during the late nineteenth century. It is clear from the figure that ‘fever, cholera, dysentery and diarrhea; were the main cause of death among the Army stationed in Bengal, particularly in Calcutta.
Apart from the Europeans in the European Army, the health status of the English in the Port area was also in a sad state. In the Annual Report of the Sanitary Commissioner of Bengal – 1897, it is observed that ‘cholera’ had been a predominant disease among the Europeans in the Port Area. Table 3.3 show the death rates due to ‘Cholera’ among the European population in the Port of Calcutta prior to 1897. Apart from cholera, 211 European seamen were admitted to hospital for fever in 1896 as compared to 278 in 1895; with 1 death in 1896 and 3 in 1895. Number of persons
admitted to hospital for dysentery and diarrhea in 1896 was 61 as compared to 104 in 1895 with no deaths in 1896 and 4 deaths in 1895. Although 'smallpox' was prevalent in the city, there were no deaths among the European seamen in the Port of Calcutta. One case of smallpox was admitted into hospital during 1896 against 9 in 1895 with 1 death.

Table: 3.3  
Deaths from Cholera Among the European Population  
In the Port Area of Calcutta—1887-1896

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Strength of European Seamen in Port of Calcutta</th>
<th>Ratio of Deaths Per 1000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1896</td>
<td>1124</td>
<td>16.01</td>
</tr>
<tr>
<td>1895</td>
<td>1431</td>
<td>6.28</td>
</tr>
<tr>
<td>1894</td>
<td>1481</td>
<td>5.40</td>
</tr>
<tr>
<td>1893</td>
<td>2081</td>
<td>5.28</td>
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<td>1892</td>
<td>2133</td>
<td>3.28</td>
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<tr>
<td>1891</td>
<td>1426</td>
<td>7.01</td>
</tr>
<tr>
<td>1890</td>
<td>1679</td>
<td>8.33</td>
</tr>
<tr>
<td>1889</td>
<td>1626</td>
<td>11.07</td>
</tr>
<tr>
<td>1888</td>
<td>1510</td>
<td>10.59</td>
</tr>
<tr>
<td>1885</td>
<td>1893</td>
<td>10.03</td>
</tr>
</tbody>
</table>

Source: Compiled from the Annual Report of the Sanitary Commissioner Of Bengal, 1897

Figure: 3.2

Deaths Among European Seamen in Calcutta Port

Source: Annual Report of the Sanitary Commissioner of Bengal, 1897-1910
Figure 3.2 shows the ratio of deaths among the European Seamen in the Port of Calcutta. Although the death rate declined over years, yet the number dying were substantial and not a sign of good health conditions in the city.

**Figure: 3.3**

![Graph showing deaths among native floating population in Calcutta Port](image)

Source: Annual Report of the Sanitary Commissioner of Bengal, 1897-1910

Figure 3.3 gives the number of deaths among the local floating population in the port of Calcutta during the late nineteenth and early twentieth century. It is clear that during the early twentieth century the death rate among the European Seamen stationed at Calcutta Port was higher than the local floating population and declined over time. Whereas, the death rate among the local Seamen remained constant.

The major diseases reported for causing deaths among the European seamen in the Port of Calcutta, were cholera, smallpox, fever, dysentery or diarrhea. Figure 3.4 shows the disease specific death rate in the port of Calcutta. Similarly, figure 3.5 shows the disease specific death rate among the native or the local floating population in the Port of Calcutta. It is evident from both the figures that 'cholera, diarrhea / dysentery, and fever' were the main cause of death among the people living in the Port area of Calcutta.
3.3 Public Health in Calcutta

It is necessary to analyze the health condition of the indigenous population of city. This has been done with the help of mortality rates. The temporal trend of 'crude death rate' in Calcutta (including town proper, added areas and fort, port areas) as shown in figure 3.6, reveal a decline over the years. The sex wise death in the city in
comparison to its total population shows that crude death rate among the female population was higher than their male counter part.

**Figure: 3.6**

![Graph showing Temporal Pattern of Crude Death Rate in Calcutta Sex Wise](Image)

**Figure: 3.7**

![Graph showing Temporal Pattern of Crude Death Rate in Calcutta Religion Wise](Image)

The death rate among different religious groups in the city as shown in Figure 3.7 reveals that among the Hindu population it was higher than in the other religious groups. The crude death rate among the Christian population in the city was also high in 1870, 1876, 1881, 1941-42 and in 1946-47 as compared to their total population which was lower than the Hindu population. Death rate among the Muslim population
was comparatively less than that of the Hindus during the period under study. The
death rate among ‘other religious groups’ in the city was comparatively low.

It is necessary to analyze the major diseases that were prevalent in the city during the
period under study and were fatal in character.

It is evident from Figure 3.8 that from mid nineteenth century to mid twentieth
century, the major diseases that proved fatal in the city were ‘fever, cholera,
dysentery/diarrhea, malaria, plague, smallpox, typhoid etc.

**Figure: 3.8**

![Proportion of Deaths Due to Reported Diseases in Calcutta](image)

The analysis shows that during the late nineteenth and early twentieth century, deaths
reported due to ‘bad environmental condition’ were dominant in the city of Calcutta
(See Figure 3.9). It is clear from the figure that since the last decade of the nineteenth
century, deaths due to ‘bad environmental conditions’ remained constant while deaths
due to ‘other reasons’ increased sharply.
Similarly, the major diseases that were most fatal in London between mid seventeenth century and mid eighteenth century were smallpox and fever. The other diseases that were of major concern were plague and cholera and dysentery (see figure 3.10).
3.3.1 Spatial and Temporal Analysis of Death Rate in Calcutta

For the spatial analysis of the death rates in the city, the ward wise data was collected for the Census years between 1876 and 1931 and for the year 1946-47. The causes of death in different wards of the city during the years under review were also identified.

3.3.1.1 Crude Death Rate

The ward wise analysis of crude death rate in the city reveals that between 1876 and 1881 Waterloo Street, Park Street and Fort William areas recorded low crude death rates (less than 15 deaths per 1000 population). Hastings recorded a high crude death rate during this period (more than 45 deaths per 1000 population). Rest of the wards recorded a medium crude death rate i.e. between 20 – 40 deaths per 1000 population. In 1901 crude death rate was highest in Hastings and Jorabagan areas followed by Koomartooly, Burra Bazaar and Entally. Death rates were lowest in Waterloo Street, Baman Bustee and Fort Williams, though higher than the previous years.

By 1921 the crude death rate in most of the wards of the city ranged between 12 and 40 per 1000 population except in Fort Williams where the crude death rate was 2.90 per 1000 population. Entally and Beniapukur recorded the highest crude death rate and were followed by Ekbalpur-Garden Reach ward. By 1931 the crude death rate in most of the town area had comparatively declined. Fort William, Waterloo Street, Park Street, Collinga, Baman Bustee and Alipore recorded the lowest death rate. By 1946-47 crude death rates in the city ranged between 10 to 47 in most wards except in Fort Williams, Burra Bazaar, Bow Bazaar and Fenwick Bazaar where, the crude death rate was less than 10 per 1000 population.

The overall analysis of crude death rate for specific years reveal that death rates were higher in the wards dominated by the indigenous population and where the density of population was high. These were the areas where most of the houses were kutcha houses. Crude death rate was also high in the added areas of the city lying to the east and south of the main town, as these were reclaimed marshy and swampy areas of the city. The wards where most of the Europeans resided recorded comparatively low crude death rate, as these were the areas where the density of population was comparatively low with pucca houses built on large open spaces.
Map: 3.1

Crude Death Rate in Calcutta – Ward Wise

<table>
<thead>
<tr>
<th>Index</th>
<th>Crude Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>CJ 1-9.99</td>
<td></td>
</tr>
<tr>
<td>CJ 10-19.99</td>
<td></td>
</tr>
<tr>
<td>CJ 20-29.99</td>
<td></td>
</tr>
<tr>
<td>CJ 30-39.99</td>
<td></td>
</tr>
<tr>
<td>CJ 40-49.99</td>
<td></td>
</tr>
<tr>
<td>CJ 50-60</td>
<td></td>
</tr>
<tr>
<td>Data Not Available</td>
<td></td>
</tr>
</tbody>
</table>

Maps Not to Scale
3.3.1.2 *Sex Specific Death Rate*

The spatial and temporal analysis of sex specific death rates for Calcutta shows that deaths were higher among the female population as compared to their male counterpart. The main reason probably could be the social inhibitions espoused by women that prevented them to approach hospitals and doctors for treatment.

Map: 3.2

**Sex Specific Death Rate in Calcutta – Ward Wise**
3.3.1.3 Disease Specific Death Rate

Due to restricted classification of the prevailing diseases, we cannot analyze the causes of death in the city during colonial rule. Yet, based on the limited data available, an attempt has been made to identify the major causes of high mortality in the city.

Map: 3.3

Disease Specific Death Rate in Calcutta – Ward wise
Disease Specific Death Rate in Calcutta – Ward Wise

Maps Not to Scale
Disease Specific Death Rate in Calcutta – Ward Wise
The major diseases reported as the main cause of death in the city before 1901 were cholera, fever, and smallpox. Between 1876 and 1881 'fever' was the most important cause of death in all the wards of the city followed by 'cholera' and 'smallpox'. Fever was the most dominant and fatal disease in Hastings, Taltolla, Burtolla, Burra Bazar, Collootola and Bow Bazar. Cholera claimed life and persisted mostly in Hastings, Koomartooly, and Port area, Jorabagan, Burra Bazaar, Burtolla and Collinga. Smallpox was rampant at Taltolla, Collinga, Fenwick Bazar, Collootola, Bow Bazaar and Burra Bazaar areas.

In 1901, deaths due to 'plague' and 'fever' were most prominent in all the wards of the city followed by cholera, dysentery/diarrhea and smallpox. Deaths due to plague were the highest in Jorabagan, Burra Bazaar, Koomartooly and Fenwick Bazaar. Fever claimed highest number of deaths in Hastings, Entally, Beniapukur and Collinga. Deaths due to dysentery/diarrhea were high at Hastings, Koomartooly, Ballygunge-Tollygunge areas, and Entally. Smallpox claimed highest number of lives in Burtolla, Collootola, Entally, and Bow Bazaar. Cholera was intense in Koomartooly, Shampooker and Jorabagan areas.

By 1921, the prevalence of 'plague' had diminished in the city and deaths due to 'smallpox' were a small proportion of the total deaths in the city. 'Fevers' were now specified in the data and it was 'influenza' that claimed most of the lives in the city mainly in the southern parts of the city in Hastings, Watgunge, Ekbalpur, Alipore, Bhowanipore and Ballygunge and Tollygunge areas. Other unspecified forms of fevers claimed a large number of lives in Fort Williams, Hastings, Ballygunge/Tollygunge, Ekbalpur, Entally, Burra Bazaar and other areas. 'Malaria' was comparatively high in Beniapukur, Entally, Collinga, Taltolla, Puddopooker, Moocheepara, Sukea's Street and Shampooker wards. The other disease that was on a rampage in the city was 'tuberculosis'. Its incidence was high in Collootola, Beniapukur, Entally, Sukea’s Street and other wards. Apart from the above-mentioned diseases, cholera, diarrhea, and dysentery were common in all the wards of the city.
In 1931, only 24.75 percent of the total deaths in the city were due to diseases associated with bad environmental / sanitary condition. Among the prevailing diseases in the city, the highest number of deaths was due to ‘dysentery/diarrhea’, followed by ‘cholera’, ‘smallpox’, ‘enteric fever’, ‘malaria’, ‘influenza’, ‘kalazar’ and ‘measles’.

The ward wise analysis, reveal that a comparatively high death rate from ‘diarrhea/ dysentery’ was observed in Jorasanko, Tollygunge, Park Street, Puddopooker, and Ballygunge areas. Most of the deaths in Fort William and Port and Canal area of the city were due to ‘cholera’. The disease also claimed a large number of lives in Tollygunge, Alipore, Watgunge – Hastings and Jorabagan. ‘Smallpox’ that was at a low ebb in 1921 but claimed a number of lives in 1931. It was fatal in Tollygunge, Ballygunge, Beniapukur and Bhowanipore wards. Almost no ‘plague’ cases were reported in this year. ‘Malaria’ claimed a large number of lives in Beniapukur, Shampooker, Tangra and Ekbalpur- Khidderpore wards. The other diseases that prevailed in the city were ‘enteric fever’, ‘kalazar’ and ‘influenza’.

In 1946-47, nearly 86.87 percent of the total deaths in the city were due to “other reasons” i.e. unclassified reasons. Deaths due to ‘cholera’, ‘smallpox’, ‘plague’, ‘enteric fever’, ‘kalazar’, ‘influenza’ and ‘malaria’ persisted in different parts of the city but the numbers were small. This fall in the number of deaths could be because of improved environmental or sanitary condition or due to political instability and underreporting.

3.3.2 Epidemics and Famines in Calcutta

From initial days, Calcutta has been repeatedly affected by various calamities that led to massive destructions including life of the people. It is stated that on 11th October 1737 a furious hurricane at the mouth of the Ganges along with a violent earthquake brought massive destruction of ‘Golgotha / Kolkata’\textsuperscript{12}. The year 1770 is memorable for the famine and the pestilence that afflicted not only Calcutta, but also the whole of Bengal. Between 15\textsuperscript{th} July and 10\textsuperscript{th} September, according to Mr. Hickey, 26,000

persons died in the very streets of Calcutta. Apart from these natural calamities, ‘fires’ have been frequent in Calcutta mainly among the native settlements. It is stated that the main settlement around the bazaar area was burnt in 1638. In March 1780 a fire occurred in Calcutta, in which 15,000 straw houses were consumed and 190 people were burned and suffocated. Similarly, in April 1780 nearly 700 straw houses were burnt in Bow Bazaar. Another fire in the same month in Cooley Bazaar, Machooa Bazaar and in Dhurumtolah claimed 20 human lives and a great number of cattle. Calcutta, along with other parts of the country experienced ‘Smallpox Epidemics’ in the 1850s; ‘Plague Epidemics’ between 1898 and 1907; ‘Influenza Epidemics’ in 1918; and the ‘Great Bengal Famine’ of 1943.

3.3.2.1 Smallpox Epidemics in Calcutta

The prevalence of the disease in India is age-old. It is stated that although ‘smallpox inoculation’ was widely practiced in India, the disease claimed an enormous toll of deaths and deformity every year. The disease attacked the rich and poor alike. Holwell in 1767 stated: “Every seventh year with scarcely any exception, the smallpox rages epidemically in these provinces (Bengal) during the months of March, April and May, until the annual returning of rains about the middle of June put a stop of its fury... the disease proves universally the most malignant confluent kind, from which few either of the Indians or the Europeans escaped... commonly dying on the first, second, or third day of eruption.”

In England too Smallpox had been a common disease in the sixteenth and seventeenth centuries. It reached its peak in the eighteenth century. The disease kept on reoccurring after relatively short breaks in the major industrial towns, and after longer intervals in the market towns and in the villages. Peak years in London were 1723, 1725, 1736, 1746, 1752, 1757, 1763, 1768, 1772, 1781, and 1796. In London, the yearly death rate from smallpox during the eighteenth century was, on an average 4,000 per million populations.

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15 Jaggi, O. P. (1979): Western Medicine in India: Epidemics and Other Tropical Diseases; Vol. 12; Delhi: Atma Ram and Sons; p.123
Edinburgh lost over 2700 of its 40000 inhabitants in the course of the two years 1740-42, more than half the deaths being of children under the age of 5 years. During the last quarter of the eighteenth century, nearly 19 percent of all the deaths in Glasgow were due to smallpox. The disease began to recede as an important cause of death and disfigurement in Britain since 1796\textsuperscript{16}.

During the eighteenth century, smallpox was widely prevalent in India, and killed more people here than in other countries. In Calcutta it was much more. In 1844, Stewart had stated that at the Park Street Dispensary in Calcutta, out of 280 patients attending daily, 12 were suffering from smallpox. Blindness and disability resulting from the disease were very common\textsuperscript{17}.

During the first half on the nineteenth century, smallpox appears to have visited Calcutta in an epidemic form not less than 4 times, each epidemic lasting for about 12 or 16 months; while during the intervening period the complaint seems to have almost entirely disappeared. The epidemic in Calcutta during 1850s was the most devastating claiming 47 percent of the total deaths in the city\textsuperscript{18}. The epidemic may be said to date from the occurrence of 8 fatal cases in November 1848. During the first three months of 1850, the number of deaths amounted to 3,329 among a ‘native population’ estimated at 387,398\textsuperscript{19} i.e. a death rate of 8.59 per 1000 population.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
Year & Number of Deaths & Duration of Epidemic \\
\hline
1832-33 & 2814 & 16 months \\
1837-38 & 1548 & 16 months \\
1843-44 & 2949 & 16 months \\
1849-50 & 6100 & 16 months \\
\hline
\end{tabular}
\caption{Smallpox Epidemics in Calcutta - Early Nineteenth Century}
\label{tab:smallpox_calcutta}
\end{table}

\textsuperscript{16} Howe, G. M.(1972): \textit{Man, Environment, and Disease in Britain: A Medical Geography of Britain Through Ages}; Barnes and Noble Books; p.143.
\textsuperscript{17} \textit{Ibid}; p.124.
\textsuperscript{18} \textit{Ibid}; p.124.
\textsuperscript{19} \textit{Smallpox Commissioners Report} (1850); Calcutta: Military Orphan Press; p.2.
The general character of the disease during the 16 months between January 1849 and March 1850 did not differ from that of the previous epidemics. Majority of the cases among the Europeans were "modified" by previous vaccination, but, among the local patients, unprotected either by inoculation or vaccination, the disease often assumed its most malignant type\(^{20}\). Of the 57 cases treated in the Smallpox Hospital in the city, 40 died, 11 were cured and discharged and 6 remained under treatment. It was observed that only 1 patient was vaccinated and another inoculated. The religion wise breakups of the patients' reveal that 20 were Muslims, 31 were Hindus, and 6 were native Christians. The sex wise classification shows that 42 were males and 15 were females. Only 1 was a boy aged 7 years and the rest were adults. All the patients belonged to the poorest and most miserable class, and had been 8–10 days ill before they were found and carried by the police to the hospital.

The cases treated in the General Hospital, were all Europeans, chiefly seamen from incoming ships recruits or invalid soldiers from the barracks, and few townsmen\(^{21}\). The number admitted from December 1849 to 1\(^{st}\) May 1850 was 76, whereof 20 died and 56 recovered. Dr. McPherson divides the cases into 46 mild or modified, and 30 severe or confluent. Of these latter cases 12 are stated to have been vaccinated and exhibited good cicatrices; 13 had been vaccinated but the cicatrices were not well marked; 5 had not been vaccinated. The age and sex wise classification shows that there were 8 children of less than 5 years of age of whom 1 died; and all were male patients. Out of the 8 children 2 were not vaccinated.

During this epidemic year (1849-1850) the total strength of Regiment quartered in Fort William, was 1168 (including women and children), and only 5 cases of smallpox were reported and these were of 'modified character' and only one death occurred.

The main reason behind the non existent of smallpox epidemics in the garrison of Fort William, and low death rate in other European areas of the town at a time when the city and suburbs have been ravaged by this formidable, loathsome, and highly


contagious disease, may be ascribed to: 1) vaccination; 2) partial isolation of the inhabitants of the garrison; 3) immediate removal of the sick; and, 4) great cleanliness and thorough drainage of the Fort. The disease claimed maximum life in Bow Bazaar and Moocheepara wards followed by Colootola, Sukea’s Street and Shampooker wards that were inhabited by the indigenous population living in kutch houses in close proximities.

Map: 3.4

3.3.2.2 Plague Epidemics in Calcutta

There are references in Indian history to pestilences that raged from time to time. These could have been plague epidemics. A very devastating plague like pestilence raged in Gaur, the medieval capital of Bengal in 1573. The first case of plague in Calcutta occurred in 1895. It came with the Shropshire Regiment that arrived in Calcutta from Hong Kong. Many of the soldiers suffered from fever with ‘buboes’, but no mortality was recorded. Authorities, however, were unwilling to admit them as cases of plague as the disease adopted a mild form.

Britain was ravaged by 'Bubonic Plague' during the fourteenth and fifteenth centuries. It was primarily and principally a disease of the poor who lived in over crowded houses. Stone-built houses of the well to do were not so affected. There were at least 12 outbreaks in the whole country, of which 8 outbreaks were confined to London.

'Plague' had re-occurred in Britain during the seventeenth century and was epidemic in London from March 1603 to January 1604. It claimed one-eighth of its quarter million population. The disease flourished among the ill-fed, ill clothed and poorly housed, living in rat-ridden tenements and insanitary alleys. Rarely a plague victim belonged to a wealthy family. There was another disastrous visitation in 1625, claiming 41,313 lives and in 1636, when it claimed 10,400 out of the total of 23,359 deaths. It was the 'Great Plague of 1665' which was the worst, and last, of a century-long series of outbreaks in Britain. The disease broke out in London in the winter of 1664-65, but by early summer it was well established. There were 68,596 deaths from plague in 1665, 2000 in 1666, 35 in 1667 and 14 in 1668. Several provincial towns in Britain were also affected24.

Though plague had been controlled in England after the epidemic of 1665, it continued to rage in India. The first officially recognized case of plague in Calcutta occurred in April 189825. This probably was importation by sea rather than by railway communication. Death of many rats was noticed in the middle of April 1898 in a printing house on the riverside in ward 7 and in the course of 3 or 4 days other localities in the neighborhood also became infected. On 17th April, the police on Kapalitola Lane discovered a corpse; on post-mortem, the death was identified to be caused by plague.

Within a week several cases were reported not only from the neighborhood of Kapalitola Lane, but also from wards situated at a distance from it, viz. Shampooker, Koomartooly, Burra Bazaar, Fenwick Bazaar and Beniapukur. Calcutta city was officially declared infected by plague on 30th April 1898. This announcement is said

to have created such a panic that people rushed out of Calcutta, in streams and a number of lives were lost at the railway station due to stampede.

The progress of the epidemic could be traced from the usual plague centers in the city namely the godowns of pulses and grain in Jorabagan, to ward number 5; then to Chitpur-Ahiritola bustees of ward number 2, to the grain godowns in their neighborhood, and finally to the wards in the southeastern districts of the city and the added areas\(^{26}\). As in the previous years there was a widespread epidemic amongst rats that reached its peak in the beginning of January, and declined before the epidemic amongst the humans broke out. Based on the ‘Plague Report’ 1898 – 1908\(^{27}\), it is observed that only 6.4 per cent of the total population of Calcutta (1901 Census) was affected by the disease. But the death rate was high i.e. 94 per cent of the total attacked succumbed to the disease.

The ward wise analysis of the epidemic as reported by the “Plague Report”, reveals that the highest number of cases were recorded in Jorabagan and Burra Bazaar wards of the city that were the main market areas with many godowns within the congested houses and high density area. Koomartooly, Colootola and Jorasanko had the next highest number of cases. A very small number of cases were reported from Baman Bustee, Port/Fort/Canal areas, Alipore, Park Street, and Ballygunge–Tollygunge wards where the density of population was not only low, the housing conditions were also because most of these areas were inhabited by Europeans. Over all, the number of plague cases reported during the period was lower in the outer wards of the main town.

The death rate from the disease was quite high i.e. more than 90 per cent of the total people attacked died. From Map 3.5 it is clear that in most of the wards, apart from Fort William, Waterloo Street, Koomartooly, Park Street, and Fenwick Bazaar (the European quarter of the town), about 88 per cent of the total population attacked died during the epidemic period. The death rate was higher in the outskirts of the city i.e.

\(^{26}\) Report on the Municipal Administration of Calcutta – 1902-03.

in the added areas where more than 94 percent of the total attacked died. This may be due to the lack of implementation of sanitary and other prophylactic measures in these areas.

Map: 3.5

3.3.2.3 Influenza Epidemic in Calcutta

The epidemic of Influenza is said to have occurred in India in 1850 though not much information is available about it. In the spring of 1889, a catarrhal fever, which had been prevalent in Asiatic Russia suddenly assumed pandemic proportions and spread to India, and appeared in Bombay in February 1890\textsuperscript{28}. It later spread all over the country. In Bombay it was known as the ‘naya sardi bukhar’ and in Calcutta it was known as the ‘Bombay fever’.

Influenza epidemics had occurred in Britain throughout the sixteenth century particularly in 1510 and 1557-58. There were occasional outbreaks in the first half of the century but Creighton makes particular mention of influenza epidemics in 1657-59, 1661-64, 1675, 1678-79, 1688, and 1693. The disease was present in the seventeenth century, though it was not known by that name until the eighteenth

\textsuperscript{28} Op.cit; footnote 15, p.106.
century when the major outbreaks occurred in 1712, 1727-29, 1733, 1737, 1743, 1762, 1767, 1775, 1782 and 1788. Influenza reappeared in severe epidemic form in Britain during the nineteenth century (1803, 1831, 1833, and 1837, 1847-48). It was pandemic in 1894, with recurrences in 1895, 1900 and 1908, until it culminated once again in the great pandemic of 1918-1929.

Map: 3.6

In June 1918, influenza appeared in Calcutta three times in epidemic form. The first attack was in June 1918, and lasted till the end of July. The cases ran a rapid course. The second attack followed in October 1918, and persisted till January 1919 and was of fulminating type. The third invasion in May 1919 was a mild one, pursued a chronic course. In Calcutta out of 710 cases admitted in the hospital, 214 died. In England too the pandemics of 1889-92 and 1918-1919 are milestone in the history of Influenza in Britain.

The mortality data from the Reports of Calcutta Municipal Corporation for the year 1918, shows that Influenza claimed the maximum lives in Beniapukur ward and

\[ ^{29} \text{Op. cit; footnote 16; p.150.} \]
Khidderpore – Ekbalpur wards on the outskirts of the main town of Calcutta. The second highest death rate was recorded in Watgunge and Entally wards followed by Alipore, Bhowanipore, Ballygunge – Tollygunge, Taltola and Collinga. The lowest number of deaths was recorded in Fort William and Hastings ward.

3.3.2.4 Post Famine Public Health in Calcutta

Soon after the various epidemic years, the city faced the ravage of famine, generally referred to as ‘Bengal Famine’, which occurred in 1943 and affected the Province of Bengal. There was a widespread immigration of population from various districts of Bengal Province mainly from the East Bengal province into the city of Calcutta. The famine stricken population as well as the resident population of the city faced acute health problems during the post famine period. Map 3.7 based on the mortality data available from the Municipal Corporation of Calcutta for the period 1944-45, shows that the crude death rate was highest in Manicktola ward. The lowest death rate was observed in Fort William, Park Street and Burra Bazaar wards of the Town that were relatively the more prosperous areas of the city and where the famine stricken migrants did not find a footing.

Map: 3.7

Post Famine Death and Disease
The major diseases in the post famine period Calcutta besides the ones we have discussed were cholera, dysentery / diarrhea, malaria, kalazar, and enteric fever. 'Smallpox' was the most rampant disease in the city and claimed the highest number of lives followed by dysentery / diarrhea, malaria, cholera and enteric fever. The ward wise distribution of mortality rate due the above mentioned disease during the period under study has been shown in Map 3.7. The death rate from smallpox was high in almost all the wards of the city, the maximum number occurring in Koomartooly, Jorabagan, Shampooker, and Belgachia. Deaths due to malaria were also high in most of the wards.

3.4 Policies and Measures Taken to Prevent Disease

All the plans and programs of public health in Colonial India were initiated because of the health problems in the army and the question of military health became a major concern of the British administration. The measures initiated to fight these diseases in India depended upon the medical advancement in England. The Indigenous medical system of India was totally neglected by the British authorities and its use declined because the western system of medicine was considered efficient.

3.4.1 Public Health Administration In British India

The early efforts of health administration were directed towards the alleviation of suffering and to the rehabilitation of the sick. The idea of prevention came much later. Till the middle of the nineteenth century, the British Government in India did not accept any major responsibility for public health. It was only after the experience of the Crimea War, when Florence Nightingale had forced the British Government to make an enquiry into the sanitary state of the army, it was decided to carry out a similar investigation in India.30.

The history of Public Health Administration in British India identifies four major landmarks31. These are:

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1. The appointment of a Royal Commission to enquire into the health of the army in India in 1859;
2. The Report of the Plague Commission in 1904 following the outbreak of Plague in 1896;
3. The Reforms introduced by the Government of India Act of 1919; and,

The Royal Commission of 1859 submitted its report in 1864. It pointed out the necessity of establishing a ‘Commission of Public Health’ in each Presidency, to maintain the health of the army and that of the general population by preventing epidemics, construction of drainage system and provision of water supplies. According to its recommendations, ‘Sanitary Commissions’ were established in each of the three Presidencies of Bengal, Madras and Bombay. These Commissions recommended the employment of trained public health staffs in towns and districts. But, these were not carried out. However, certain administrative posts were created at the Center and in the Provinces. A Sanitary Commissioner and a Statistical Officer was also appointed in other Provinces of British India. The main function of these officers was to advise the governments and local bodies regarding sanitary matters. They were also entrusted with the control of vaccination against smallpox in their respective areas. The medical administrators, however, did not give preventive medicine its proper place.

In 1872 Lord Mayo’s policy of decentralization, gave an increased responsibility and power to the Local Governments. It was followed by some increase of activity in medical and sanitary matters. The Provincial Governments took these matters into their own hand. In 1882, Lord Ripon’s scheme of ‘Local-Self-Government’ was further elaborated. Municipalities and local self-bodies were entrusted with the power of collecting and spending money for local purposes, such as medical relief and sanitation. But the priority attached to sanitation varied enormously from one municipality to another.

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32 Anonymous (1893): “Sanitary Administration in India”; Indian Medical Gazette; Vol. 28; p. 348.
Between 1886 and 1888, the ‘Medical Act’ was passed. The post of Sanitary Commissioner was merged with that of the Director General, Indian Medical Services. From 1888, the local bodies were responsible for the promotion of environmental sanitation in the rural areas.

The outbreak of plague epidemic in India in 1896, led to the appointment of the ‘Plague Commission’ to investigate the causes of this outbreak. It revealed an utter inadequacy and defects of the then existing health organization and the services available to the people. Following it, in 1897, the Epidemic Disease Act was passed. The Act declared the disease as an epidemic form and, empowered the health authorities the right of enter any premise and remove the patient to a hospital and take necessary measures to control epidemic. The report of the ‘Plague Commission’ was submitted in 1904. It recommended the strengthening of the public health services and the establishment of laboratories for research and for the preparation of vaccine and sera. The action taken to implement these recommendation included the creation of a Medical Research Department under the Central Government, the establishment of the Indian Research Fund Association for promoting research into medical problems and annual grants from the Central Funds to the Provinces to assist in the execution of public health works, such as drainage and water supply, and in the strengthening of public health personnel by additions to the existing posts of Deputy Sanitary Commissioners under local bodies. Attention however, was mainly directed towards the urban areas and very few measures, if at all, were considered for the rural areas.

In 1907, the ‘Morley-Minto Reforms’ entrusted Indians into the management of the Indian Government and in 1912, each Province was authorized to select their own ‘Sanitary Commissions’. 33

The first real step for reaching the health services to the people was taken in 1919, after the ‘Montague-Chelmsford Reform Act’ was passed. The act provided the retention of control of research, under the General Government, but, recommended decentralization of health administration by transferring them to the Provincial

Governments. Medical administration including hospitals and dispensaries, medical education, public health, sanitation, vital statistics, with certain reservations in respect of legislation by the Indian legislature, were transferred to the Province.

Between 1919 and 1921, the ‘City and District Municipalities Act’ and the ‘Local Board Act’, containing the legal provisions for the advancement of Public Health under the local authorities in several Provinces, were passed\(^{34}\). In 1922, the Indian Red Cross Society came into existence and took up voluntary actions in different parts of the country in health services\(^{35}\).

The Influenza epidemic of 1918-1919, led to the establishment of ‘Kalazar Commission’ in 1926 to study the problem and its treatment and control. In the same year, ‘Rural Health Circles’ were created in Bengal, under the charge of a qualified sanitary inspector for each police station. By 1929 –1930, these rural health circles, spread in many States of India, and, was the only rural health organization for carrying out public health programmes.

In 1930, the ‘Royal Commission on Labor’ in India, known as the ‘Whitley Commission’, was appointed to advise on the measures for the improvement of health and living conditions of workers. The Government of India also appointed a ‘Drug Inquiry Committee’ under Col. Ram Nath Chopra to inquire about the sale of substandard drugs in the market and, recommended ways and means to control this menace to public health.

In 1932, Rockefeller Foundation started health work in India and created the first series of seven ‘health units’ in India. These health units gave birth to the concept of ‘health centers’. The Government of India Act, 1935, made a distribution of health functions between the Center and the States, and, at the same time provided a large measure of autonomy to the Provinces\(^{36}\). All the health activities were grouped under

\(^{34}\) Raja, K.C.K.E.(1937): “A Plea for a Forward Policy in India”; Indian Medical Gazette; Vol.72; p. 428.


\(^{36}\) Chopra, R.N. (1941): “Organization of Public Health and Medical Administration in India”; Indian Medical Gazette; Vol.76; p.54.
three lists – Federal, Concurrent, and Provincial - under the control of Central, Central and Provincial, and Provincial Governments, respectively.

In 1937, Central Health Organization with a member in charge of health, in Viceroy's Executive council, was created. It consisted of a Secretary, the Chief Executive Officer, with two Advisors – viz. the Director General of Indian Medical Service (for all medical services), and the Public Health Commissioner with Government of India (for public health services). The first Public Health Act of India was passed in 1939 in the Presidency of Madras.

In spite of these measures towards public health in India, the great 'Bengal Famine' of 1943, exposed the inadequacy of the public health set-up of the country. A countrywide epidemic of major communicable diseases broke out and thousands of people died. Therefore, the Government of India appointed a Committee called the 'Health Survey and Development Committee' under Sir Joseph Bhore as the Chairman. The Report, known as the 'Bhore Committee Report', was published in 1946.

The Report revealed the existence of low standard of public health services in the country, leading to high morbidity and mortality rates; inadequacy of preventive and curative services; concentration of hospital services mainly in the district towns which served only a small proportion of population; and, confinement of the main activities in public health to the control of epidemics\(^{37}\).

Other Public Health Acts passed during the Colonial Era were:

- **The Indian Railways Act (1890)**: provided for the control of communicable diseases and which empowered the railway authorities to refuse to carry persons suffering from infections or contagious diseases.

- **Indian Lepers Act (1898)**: The act provided for:
  - Segregation of pauper lepers;

- Control of lepers following certain occupations or doing certain acts as preparation and sale of food, drink, drugs, etc., taking drinking water or bathing and washing clothes in public wells and tanks;
- Prohibition on the utilization of public vehicles.

Measures for the improvement of hygiene in industrial areas began to be taken after 1911 through a number of acts. Mentions can be made of:
- The Indian Factories Act (1911);
- Indian Mines Act (1923);
- Workmen's Compensation Act (1923);
- Bombay Maternity Benefit Act (1920), etc.

### 3.4.2 Prophylactic Measures Adopted for Some Important Diseases in Calcutta

Apart from the above-mentioned Acts passed by the colonial rulers to combat disease and death in the India, some immediate measures were also taken up by the Calcutta Municipality and the Bengal Government to check the spread of diseases.

#### 3.4.2.1 Plague

The outbreak of 'plague' in Calcutta promulgated the Municipal Act of 1888 that entrusted upon the health officers the power to disinfect dwellings, destroy suspected goods, and to remove persons suffering from the disease to hospital. Under the Plague Regulations, where disinfections could not be efficiently carried out, adequate compensation was paid to the owners. The demolitions were undertaken in most cases by hut-owners themselves. But adequate action was not under taken as the plague scares brought forward hostility and distrust between the Bengali Commissioners and the executive. The measure of segregation of the patients also led to hostility among the local population of the city. With the reoccurrence of the disease in Calcutta in 1898, nearly 150,000 people fled from the city. The quarantine measures were hence gradually relaxed.

This delay in adopting precautionary measures in Calcutta, led countries like Italy, France, and Germany place a blanket ban on raw hides from India (as well as certain
other materials thought susceptible to infection with plague), which were one of India’s chief exports to the west. Of all Indian ports, Calcutta was hardest hit by this ban, being the country’s chief exporter of hides and skins.

Apart from the above mentioned measures undertaken during the outbreak of ‘plague’ epidemic in Calcutta, the practice of inoculating anti-plague vaccine among the people of the city was very rare. Social taboos prevented its spread among the local population of the city. There were only 9 applications for inoculation with Haffkine’s serum in 1902 – 1903. It was only in 1907 that the situation changed. The intensity of the epidemic gradually diminished and the disease virtually disappeared from the city in 1925\(^{38}\). However, no specific treatment for plague was in practice till 1946 and the physicians were mainly directed towards giving relief from pain and provide encouragement to the patient in his fight against the disease.

Plague prevention measures also included the process of growth of rat population in the city. Sulphapiridin and sulphathiazole were also found to be useful in the treatment of plague\(^{39}\).

The plague scare however, prompted an atmosphere favorable to sanitary reform, and for the first time there was general agreement over the need to institute a new drainage scheme, and for a Building Commission to monitor the construction of new houses in the city. But the sanitary state of Calcutta still left much to be desired.

3.4.2.2 Cholera

Cholera was the major disease that affected the population of Calcutta during the period under study. The disease was endemic and took epidemic form very often resulting high death rate in the city. Several government circulars were passed for preventing cholera in the city.

In 1865, it was ordered to disinfect the cots, beddings and *punkah* fringes used by cholera or smallpox patients by washing them in boiling water and to fumigate the

place where the patient resided. In 1869, the medical department of Calcutta called for isolating cholera patients from others.\textsuperscript{40} In accordance to another order passed in 1870, cholera infected patients were forbidden to travel in the railways. It also preferred that people traveled during daytime rather than at night.

Apart from the above measures, special attention was given towards army barracks and hospitals in the city. The \textbf{General Order of the Governor}\textsuperscript{41}, circulated in August 1870, recommended that:

- Every army station should be prepared to combat the spread of cholera by undertaking all precautionary measures beforehand. Moreover, the personal cleanliness of the men was given major importance as a preventive measure.
- Especial care must be taken in crowded barracks and hospitals. During the hot season, inmates of these barracks and hospitals must be permitted to sleep in the outer verandahs, or in tents pitched for the purpose in the vicinity of the barracks.
- Good sites should be selected with proper supply of good water for new camping purposes away from the local settlements, as, the existing encamping grounds, used by troops were situated along the lines of communication and thus the troops were easily infected by cholera.
- Special attention should be paid for the improvement of the general health of the men and every effort should be made to relieve them from duties which caused needless exposure and fatigue, ensure good and wholesome food and appropriate clothing, and to promote every means of healthy amusement and occupation.
- During the prevalence of cholera, funeral parties should be discontinued either of officers or men.
- The local medical authorities must authorize and take special measures to appoint the natives who attended the European soldiers in hospitals suffering from cholera.

\textsuperscript{40} Jaggi, O.P. (1979): \textit{Western Medicine in India: Public Health and its Administration}; Vol. 14; Delhi: Atma Ram and Sons; p.133.

\textsuperscript{41} \textit{Sixth Annual Report of the Sanitary Commissioner} (1869); Appendix C; Rules regarding the measures to be adopted on the outbreak of Cholera or appearance of Smallpox.
The appointment of European soldiers as orderlies in hospitals during the prevalence of cholera, if considered unavoidable, must be selected from among the volunteers, as the medical authorities deemed necessary. It also recommended a maximum of 24 hours duty only to healthy soldiers.

For attending women and children suffering from cholera, appointment of native female nurses was recommended.

There was no material advance in the treatment of cholera until the middle of the nineteenth century. In 1882, Dr. Koch\textsuperscript{42}, discovered the Cholera Vibro “comma bacillus” and in 1892 W.M Haffkine, discovered the vaccination against cholera as a prophylactic measure. In spite of severe criticism, Haffkine’s anti-cholera vaccination given from 1893 showed positive result in Calcutta but there was no appreciable fall in the rate of mortality. This was essentially due to the fact that public sanitation remained poor and the spread of infection from one region to another was more rapid and more widespread due to the rapid communication facilities\textsuperscript{43}. The only medicine or measure that was in use to prevent cholera rampage in India as well as in Calcutta was the use of providing ‘water or saline solutions’\textsuperscript{44} to cholera patients.

3.4.2.3 Malaria

Malaria was another important disease that affected the city of Calcutta. Even after the discovery of the causal factor of the fever, no preventive measure was undertaken either in India or abroad\textsuperscript{45}. In fact initially people passed amusing remarks about killing mosquitoes or preventing the growth of their population. It was only in 1909, when the Imperial Malaria Conference was convened at Simla, that a resolution was passed urging for the creation of local provincial organization to work in consultation with a central committee to be appointed by the Government of India to control malaria. Subsequently, a provincial malaria committee was actually formed in each

\textsuperscript{42} Op.cit; footnote 15; p. 69.
\textsuperscript{43} Op.cit; footnote 40; pp. 139-140
\textsuperscript{44} The credit of discovering the most beneficial line of treatment of cholera goes to an I.M.S. officer, Dr. Leonard Rogers. He was not the first to think of giving water or saline solutions to cholera patients. He was preceded in this mode of treatment by Dr. Twining in India, and by Dr. Latta and Dr. Craige in Edinburgh in 1832.
\textsuperscript{45} Op. cit; footnote 40; p.150.
province, but no measures were taken to control the disease. Quinine was the only drug widely used in the country.

3.4.2.4 Smallpox
The local government immediately segregated patients suffering from smallpox in Calcutta. This led to a mass evacuation from the city as well as non-reporting of the cases. Apart from this, smallpox vaccination was introduced to combat the spread of the disease. The invention and spread of smallpox vaccination in India and Calcutta has been discussed separately in chapter 5.

3.4.2.5 Kala-azar
Kala-azar, another form of fever was prevalent and fatal during the early part of the nineteenth century in Calcutta. The introduction of aromatic diamidines in the treatment of Kala-azar formed an important landmark in chemotherapy. Evins synthesized Stilbamidino 4-4-diaminostibene in 1939 and it was in 1940-1941, that this drug was used to treat Indian Kala-azar and obtained a cure rate of 98 per cent.

3.4.2.6 Influenza
During the Influenza epidemic in Calcutta (1918-1919), the municipality took up the matter seriously\(^{46}\). Relief centers were opened to distribute medicines both curative and prophylactic, free to people; traveling dispensaries were requisitioned, and qualified medical men with their medicine chests traveled about in ‘gharries’ through the lanes and alleys of the city to distribute medicine to the poor people. The Health Department tried hard to minimize the spread of the disease, and thousands of people resorted to the district officers to have the prophylactic nasal douche; but all measures failed to prevent dissemination and the dispensaries had to be kept going throughout

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the year. The disease was no respecter of age, sex or nationality. Climate had no
influence on it.\textsuperscript{47}

\subsection{3.4.3 Measures for the British Army in Cantonments and Barracks}

Apart from the major policies and measures undertaken by the colonial government of
combat disease and death in Colonial India and Calcutta, special measures were taken
to protect the army. The \textit{Military Cantonment Act XXII of 1864} aimed at the
protection of the British soldiers on land.\textsuperscript{48} Thus, by 1904 cantonments were formed
to save the army. These cantonments received complete protection and large amounts
were spent for smooth functioning of health measures. To ensure healthier
environment, it was advised to carry out health measures not only in the barracks and
bungalows but also in the immediate vicinity. Anti-malarial spraying campaign was
systematically carried out not only in the barracks and the bungalows within the limits
of the cantonments but also in the surrounding villages, with special attention paid to
the married quarters, bazaars and servant's quarters, as they were the major sources of
malarial infection. It was also decided to establish an inner zone of complete anti
mosquito control by undertaking drainage, canalization and oiling; and an outer­
malarial zone controlled only by Paris green.\textsuperscript{49} To prevent the occurrence of
dysentery and remittent fever among soldiers, especially in the rainy season, raised
pathways were constructed between the various barracks and their houses.\textsuperscript{50}

The barracks in which the soldiers were housed attracted the attention of the medical
authorities from time to time. It was suggested that the ground floor of the army
barracks should house the library, common rooms, storerooms, kitchen, etc., and the
first floor to be provided for sleeping purposes with verandahs on all sides, pitched
roofs, ventilated throughout, and double ceiling, to prevent excessive heating during
the hot winds. It was also recommended that the whole area should have one great

\textsuperscript{47} Bose, K.C.(1920): "Epidemic Influenza in and around the city of Calcutta"; \textit{Indian Medical Gazette};
Vol. 55; p.169.


\textsuperscript{49} It is a toxic double salt of copper arsenate and copper acetate. It's a shade of green tinged with
yellow and is property of being green; resembling the color of growing grass.


\textsuperscript{51} It had been generally observed that living in the first floor of the barracks caused lesser diseases than
living on the ground floor. Malarial fevers were known to be common in people living on the
The barracks were provided with bar and flap ‘punkhas’ to have the benefit of air movement. These ‘punkhas’ were removed and burned after the occurrence of cholera or smallpox in these barracks. The barracks were also fumigated with either chlorine gas, or nitrous acid gas and sulphurous acid gas, after a case of cholera or smallpox was detected in them in accordance to an army circular of 1874.

Most of the doctors during the late eighteenth century recommended to shift the families of the European soldiers to different hill stations in India where the climatic conditions were more akin to those prevailing at ‘home’, or to send them back to Europe. Hence a series of hill stations along the Himalayas was developed and all the facilities were provided there for the stay of British soldiers and their families. It is not that diseases were non-existent among the European residents there, but they occurred less often and in less severe form. Particularly, their stay at hill stations was found to be very favorable for the health of the troops after active service in the plains. They were found to recover sooner from the effect of fatigue and toil.

These hill stations began to be occupied by the British troops after the first quarter of the nineteenth century. The Royal Commission to Enquire into the Health of the Army in India recommended sending of the troops to those hill stations. It also observed better health conditions of the native civilian population living there compared to those living in the plains.

### 3.5 Conclusions

The following conclusions can be drawn from the analysis in this chapter.

- Various diseases that were associated with bad environmental conditions engulfed Calcutta. The most persisting and devastating diseases of the period
were cholera, diarrhea/dysentery, fevers — influenza, malaria, typhoid, kala-azar —, smallpox, plague, measles, and tuberculosis. Throughout the period under study, these diseases were epidemic in the city at various points of time viz. — smallpox in the 1850s, plague in the late nineteenth and early twentieth centuries, and influenza in 1918-1919. Apart from the epidemics that claimed quite a large part of the population of the city, ‘famines’ caused malnutrition and affected the health of the city population by making it vulnerable to disease.

• The standing army, consisting of both European and the Indian soldiers stationed in various cantonment areas in Calcutta were attacked by cholera, dysentery and diarrhea, smallpox and various fevers. These diseases proved very fatal for the soldiers as well as for the seamen who landed in the port of Calcutta during the period under study.

• The death rates for the city of Calcutta show a decline between 1876 and 1946-47 probably because the colonial authorities became conscious of the danger of poor health of the population and took preventive and curative measures to combat disease and death in the city. Female death rate was higher in the city during the period under study. Among the different religious communities in the city, death rate was highest among the Christian population mainly among the Europeans because of their inability to adjust to tropical climate and their unwillingness to change their living habits to suit local conditions. The death rates amongst the native population were highest among the Hindus, followed by the Muslims and ‘other religious’ communities.

• The ward wise analysis of crude death rates show that they had been lower in Waterloo Street, Park Street, Fort William and to some extent in Bow bazaar and other areas where the European and Eurasians resided. Death rates were higher in the new areas except in 1901 when plague attacked the population residing in the main town area. The most affected wards during the period
under study were Hastings, Burra Bazaar, Watgunge-Ekbalpur, Koomartooly, Entally, Beniapukur, Ballygunge-Tollygunge, Bhowanipore and Port area. These wards were either located along the River Hooghly or Tolly Nulluh or occupied the reclaimed marshy areas of Salt lakes in the eastern side.

- The disease specific death rate in the different wards of the city shows some consistency over time. Cholera, dysentery, diarrhea, fevers and malaria constantly inflicted the city.

- Most of the policies adopted by the British authorities for colonial India and mainly for Calcutta were focused on the health of the Europeans and Eurasians residing there. The policies adopted for better health care facilities also favored the army cantonments and were discriminatory against the native town. Although measures were taken to protect the public health in the city, local finances inhibited the execution of these measures.

52 Refer Chapter 2 for the distribution of population community wise.