**Spanish Flu 1918 and COVID-19 in India: A Comparative Study of Correlation between Density of Population and Mortality Rate**

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***Abstract***

*The historians have not paid adequate attention in recording mortality rate from epidemics, however, it killed more people than wars. Spanish flu, one of the greatest epidemics in human history is the best example of it. India registered the largest death rate in the Spanish flu broke out 1918. Many villages were depopulated and the Central Province and Berar was worst hit. Around six percent of the population died in this province alone. The previous studies on the cause of large number of deaths in India found that high density of population was one of the reasons. But the present study found that death rate was less in densely populated areas but**higher in sparsely populated areas based on the analysis of the Census reports and the reports of the sanitary commissioners. Similarly, it was found that there was no co-relation between the density population and mortality from COVID-19 in India where the largest number of infections and high death rate were reported from low density areas.*

**Keywords***:* India, Flu, Spanish, Density, COVID-19

**Introduction**

The deadliest coronavirus broke out in China in December 2019 at the elapse of one hundred years after the Spanish flu hit the world in 1918. From China it radiated to the entire world crossing international boundaries by land, air or water affecting people belonging to all walks of life. This flu was a global disaster as a consequence of transactional and novel nature of the First World War. It was the most deadly epidemic in history. The mortality effect of the 1918 influenza epidemic was higher in India than anywhere else on the planet. The epidemic swept across India in a matter of three months, and that the impact varied widely, being worst in Central Provinces and Berar and having very little impact in Bengal. The previous studies pointed to the high density of population as one of the reasons behind the high death rate. In this background, a comparative analysis of whether the density of population caused high mortality due to the Spanish influenza and coronavirus based on the hitherto untapped census reports and the reports of the sanitary commissioners attempted here

**Spanish Flu: Density of Population and Mortality**

Spain was not special in terms of the severity or date of onset of the disease but, because of its neutral status in World War 1, did have freer press than most other countries. The greater attention in news reports explained why the flu was called “Spanish” in terms of mortality rates and total persons killed, it would be more appropriate to label the epidemic as the India flu[[1]](#footnote-1). The influenza pandemic of 1918-1919 was called “the greatest medical holocaust in history”[[2]](#footnote-2) and mother of all pandemics[[3]](#footnote-3). The previous studies showed that global mortality during the pandemic exceeded 21.5 million[[4]](#footnote-4). The more recent estimates varied widely, suggested that between 15 and 100 million people died in a short span of about in a year[[5]](#footnote-5).

The historians have no unanimous opinion about the place of origin of the so-called Spanish flu. Jordan observes that it was brought to Europe by the Chinese Labour Corps, raised by the French and British in Northern China for service on the Western front[[6]](#footnote-6). But James Joseph argues that there is no evidence to support theories that the spring wave began in China and was brought to North America and then to France by Chinese labourers on their way to the Western Front[[7]](#footnote-7). But W.I.B. Beveridge observes that all reports state that it started in China in autumn spreading to European countries, India and North America[[8]](#footnote-8). While I.D. Mills argues that time and place of the first appearance of the new virus cannot be pinpointed, the earliest recorded outbreak seems to have been among army recruits at Camp Funston, Kansas where an epidemic began on 5 March 1918[[9]](#footnote-9). While David Killingray observes that the flu of 1918-19 originated in France[[10]](#footnote-10).

In recent years the Chinese origin theory has gained new support from researchers such as Christopher Langford, Dorothy A, Pettit and Janice Bailie, who have uncovered evidence of a severe form of respiratory illness, initially diagnosed as pneumonic plague, circulating in the interior of China during the winter of 1917-18[[11]](#footnote-11). Langford Pettit and Bailie have used evidence mainly drawn from public health reports, newspapers, colonial office records, and Canadian and British sources from China, North America and Europe to support Chinese origin of 1918 pandemic. This evidence is further supported by a close reading of the military sources lead credence to construct an unbroken epidemiological chain from the interior of China to the battle fields of Europe. However the flu originated in China the mortality rate was very low compared to other countries. Christopher Langford proposes that it was because many people in China had some previous exposure to the virus responsible for the outbreak or one closely related to it and so had a degree of immunity to the disease and it proved that the influenza virus responsible for the 1918-19 pandemic originated in China. Mark Osborne Humphries expresses that while there are several theories explaining the origins of the 1918 influenza pandemic, the Chinese hypothesis makes the most convincing case and is supported by the strongest epidemiological and historical evidence[[12]](#footnote-12).

There is no unanimity among the scholars concerning the mortality rate from the Spanish flu too. Andrew Balfour and Henry H Scott claims that influenza swept like pestilence from country to country, sparing no race, indifferent to climate[[13]](#footnote-13). The first major historical work providing the number of deaths on the influenza pandemic is Edwin Oakes Jorden’s Epidemic Influenza: A Survey from 1927, in which he claims that the influenza pandemic caused the deaths of 21.6 million people worldwide[[14]](#footnote-14). Over time other researchers have determined that this estimate was inaccurate, and probably much too low. In 1977, W.I.B Beveridge estimates the total morality at between 15-25 million[[15]](#footnote-15). The most active compiler of data on the influenza in recent years has been K. David Patterson, who in 1991 estimated the total number of deaths worldwide at “a conservative total of roughly 30 million victims[[16]](#footnote-16). When the pandemic lashed, the Great powers were involved in world war. Hence, the medical and scientific professions were totally unprepared and ill-equipped to deal with the disease and could offer no effective way of combating or curing it. Niall PAS Johnson and Juergen Mueller find that it killed 30 million people or more worldwide, considerably more than the total casualties of the First World War[[17]](#footnote-17).This flu was a global disaster as a consequence of transactional and novel nature of the First World War. India faced the greatest devastation in terms of human mortality from influenza.

The Spanish flu battered the Indian subcontinent heavily in 1918-1919[[18]](#footnote-18). In the second wave in September 1918, the Spanish flu reached coastal cities of British India[[19]](#footnote-19). It killed sixty lakh people all over India in a few months[[20]](#footnote-20). In Bombay alone, nearly 13500 people died within four weeks of spread of influenza[[21]](#footnote-21). Communications played an important role in the spread of influenza. The movement of soldiers during the First World War, trade and commerce through ships and inland movement through postal network and human mobility channelized the disease from one area to the other[[22]](#footnote-22). In most of the places, the first instance of disease was reported with the movement of soldiers.

K. Davis in his ‘The Population in India and Pakistan’ (1951) estimated that the mortality due to influenza of 1918-19 was around two crore in the Indian subcontinent, four times the official estimate[[23]](#footnote-23). The largest number of deaths in India were reported from the United Provinces, which was also the home to the largest number of population in British India. More than ten lakhs people died in the United Provinces forming around two percent of the total population of the province. The second largest number of deaths was reported from Bombay province where five percent of the population lost lives in six months. The highest mortality percentage recorded in the Central Provinces and Berar where around six percent of the total population died due to the pandemic[[24]](#footnote-24). The other prominent provinces were North West Frontier Province and Delhi losing four and six percent of its populations respectively. Its effect was comparatively less in eastern and south-eastern parts of the British India. Madras province lost 1.2 percent of its population. The eastern province of Bengal lost only around 0.4 percent which was lowest in British India. The provinces of Bihar and Orissa, Assam, and Burma lost on an average around one percent of their respective populations. The official estimate of mortality in India was more than five millions[[25]](#footnote-25). The revised mortality figures have been ever upward from the six million officially estimated shortly after the epidemic to 17-18 million suggested by Mills in a recent study[[26]](#footnote-26). The Colonial and Foreign Offices reacted slowly to the news of influenza epidemics in the colonies. For instance, original calculation in India put at 7,089, 694[[27]](#footnote-27). But in 1991, it was estimated between 12.5 and 20 million[[28]](#footnote-28).

Death totals for British India, which included modern Pakistan and Bangladesh, were by far the highest for any single country and provide the longest single source of uncertainly for Asian and world mortality totals. An Indian doctor who studied the pandemic put morbidity at 50-80 percent and suggested a total of 15 million deaths[[29]](#footnote-29). India had the largest case specific mortality rate of any large country, occurred roughly 40-50 percent of all deaths during the pandemic, and lost far more people than the approximately 8 million military causalities sustained by all of the belligerents in the First World War. In India, as elsewhere there was remarkable high age specific mortality rate among young adults in the age group between 20 and 40[[30]](#footnote-30). The Central Provinces and Berar were the worst sufferers from influenza in British India and it had a death rate of 57 persons per thousand which was highest in the British India. In the Central Provinces, it was reported that considerable difficulties were experienced in disposing the dead and a few places, corpses were thrown into riverbed or left in the jungle[[31]](#footnote-31). The provincial death rate in the Bombay presidency was a relatively high 54.9 people per thousand inhabitants[[32]](#footnote-32). India largely rural but intensely connected population. Of the 50 million pandemic associated deaths, 8 million were thought at the time to have occurred in British India. One in every 23 Indians died during 1918-19 and that one in every 3.5 global pandemic deaths was an Indian[[33]](#footnote-33). The young adults experienced a disproportionality high death risk during the 1918 pandemic, whereas older adults had a relative decreased risk.

**Table I: Influenza Mortality in British India, (1918) (up to 30 November)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Province** | **Population** | **Total Estimated Influenza Deaths** | **Percentage of total population** |
| United Provinces | 46,820,506 | 1,072,671 | 2.2 |
| Bombay | 19,587,383 | 900,000 | 4.5 |
| Punjab | 19,337,146 | 816,317 | 4.2 |
| Central Province and Berar | 13,916,308 | 790,820 | 5.6 |
| Madras | 40,005,735 | 509,667 | 1.2 |
| Bihar and Orissa | 34,489,846 | 359,482 | 1.0 |
| Bengal | 45,329,247 | 213,098 | 0.4 |
| North West Frontier Province | 2,041,077 | 82,000 | 4.0 |
| Assam | 6,051,507 | 69,113 | 1.1 |
| Burma | 9,856,853 | 60,000 | 0.6 |
| Delhi | 416,656 | 23,175 | 5.5 |
| Coorg | 174,976 | 3,382 | 1.9 |
| **British India** | **238,026,240** | **4,899,725** | **2.0** |

**Source**: A Preliminary Report on the Influenza Pandemic of 1918 in India, 1919, p4

However, despite the fact that influenza pandemic has few historical rivals in terms of sheer loss of human life, it has not entered into the narrative of world history, nor indeed national histories, to the same extent that major wars or natural disasters have. From the review of above studies, three distinct category of studies have emerged regarding the historiography of the influenza pandemic. The first category primarily focuses on place of origin of the Spanish flu. The second category takes the analysis a step further and attempts to determine the mortality rate out of Spanish flu. The third category concentrates on the responses of the colonial government towards the epidemic. But none of the above studies have made scholarship on the causes of the high mortality rate in Central Provinces and Berar. Hence, the present study is an earnest attempt in this direction. Scholars suggested myriad reasons behind the high mortality in India. Olive Reyas observed that high income countries reported relatively low death rates among the elderly, but this was not observed in Indian populations and suggested it was due to the fact that the elderly population might not have been exposed to the 1830s global pandemic virus or its descendants[[34]](#footnote-34). Siddharth Chandra argued that low population density districts in British India was not suffered as much as high population density districts from the influenza pandemic of 1918–19[[35]](#footnote-35). Hence the present study analysed whether high density caused high mortality. The study used census reports for the analysis and focussed on those provinces directly administered by the British in India. The princely states excluded from this study since the princely states had their own civil service systems, were often not as well equipped to carry out the census as the British directly ruled provinces.

The Indian Empire had an area of 1,805,332 square miles, calculated in the 1921 census exceeding that of 1911 census by 2675 square miles. About 3,000 square miles were added owing to the enumeration by estimate of certain tracts in Burma which had been excluded from previous censuses. The British territory covered 1,094,300 square miles forming 61 percent of the country, while the Indian states an area of 711, 032 square miles or 39 percent. The total population was 318942480. The British territory consisted of 247003293 persons or 77 percent and the Indian states 71,939, 187 persons or 23 percent, of the whole population[[36]](#footnote-36). The size and population of British provinces and Indian states varied over a wide range. Burma was the largest province and its area was larger than France. The United Province was about the same size as Italy but had a rather larger population. Bombay resembled Spain in area and had a population equal to that of Spain and Portugal together, while Assam, the smallest of the major provinces had an area rather larger than that of England and Wales and population comparable with that of Switzerland. Of the larger Indian states, Hyderabad and Kashmir had each an area nearly as large as that of Great Britain without Ireland though their combined population was not much more than one-third of that of Great Britain alone[[37]](#footnote-37). On the whole of India the average population per square mile was 177, the mean density in the British provinces being 226 and in the Indian States 101.

There was a correlation between the density of the population and the quality of the rainfall. The sharp contrast between the extremes of density in the Eastern Bengal on the one hand and the sparsely inhabited areas in the plains of the Indus valley on the other was largely due to the difference between unfailing abundance and permanent deficiency of rain[[38]](#footnote-38). In Eastern Bengal, the density of population was over 1000 per square miles. This area provided favourable factors for the growth of agricultural population like alluvial soil and abundant supply of water. On the other hand, the complete absence of rain in large portions of the Indus valley and the plains of northern Rajaputana rendered these tracts uncultivable and consequently uninhabitable, except where water was supplied by artificial irrigation. The Godavari district had a population of 578 square mile and the Malabar district of the West coast a density of 585, while in the smaller state of Cochin, where physical and economic conditions were specially favourable, the density was as high as 662 per square mile. The density of population was mainly dependent on physical conditions. But the density was lowest in Central provinces and Berar primarily due to the less favourable configuration of the surface. The undulating plateaus of Central India and the central portions of the peninsula proper are broken by ranges of mountains, sometimes bare and stony and sometimes forest. Further, the Central Province was comparatively lately opened out by railway and road and colonization was more recent than in the northern districts[[39]](#footnote-39).

The density of population was comparatively low in Central Provinces and Berar compared to East Bengal, South India and Ganga-Yamuna basins[[40]](#footnote-40). But the Central Provinces and Berar registered highest mortality rate in comparison with densely populated East Bengal and South India where Spanish flu least affected[[41]](#footnote-41). Likewise, the less populated North West Frontier Province registered high mortality rate[[42]](#footnote-42). From this, it proved that the density of population had no role in excess mortality rate as observed by Siddharth Chandra. If so, the densely populated East Bengal and South India would have been met the excess mortality rate. The factors behind the high mortality rate in Central Provinces and Berar are yet to be investigated.

**COVID-19: Density of Population and Mortality**

Coronaviruses are a large family of viruses which may cause illness in animals or humans.  In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19[[43]](#footnote-43). People can catch COVID-19 from others who have the virus. The disease spreads primarily from person to person through small droplets from the nose or mouth, which are expelled when a person with COVID-19 coughs, sneezes, or speaks. These droplets are relatively heavy, do not travel far and quickly sink to the ground[[44]](#footnote-44). People can catch COVID-19 if they breathe in these droplets from a person infected with the virus.  This is why it is important to stay at least one meter away from others. These droplets can land on objects and surfaces around the person such as tables, doorknobs and handrails.  People can become infected by touching these objects or surfaces, then touching their eyes, nose or mouth.  This is why it is important to wash your hands regularly with soap and water or clean with alcohol-based hand rub[[45]](#footnote-45)

The first human cases of COVID-19, the disease caused by the novel coronavirus causing COVID-19, subsequently named SARS-CoV-2 were first reported by officials in Wuhan City, China, in December 2019[[46]](#footnote-46). Retrospective investigations by Chinese authorities have identified human cases with onset of symptoms in early December 2019. While some of the earliest known cases had a link to a wholesale food market in Wuhan, some did not. Many of the initial patients were either stall owners, market employees, or regular visitors to this market[[47]](#footnote-47). Environmental samples taken from this market in December 2019 tested positive for SARS-CoV-2, further suggesting that the market in Wuhan City was the source of this outbreak or played a role in the initial amplification of the outbreak[[48]](#footnote-48). The market was closed on 1 January 2020. SARS-CoV-2 was identified in early January and its genetic sequence shared publicly on 11-12 January 2020. The full genetic sequence of SARS-CoV-2 from the early human cases and the sequences of many other virus isolated from human cases from China and all over the world since then show that SARS-CoV-2 has an ecological origin in bat populations[[49]](#footnote-49). All available evidence to date suggests that the virus has a natural animal origin and is not a manipulated or constructed virus. Many researchers have been able to look at the genomic features of SARS-CoV-2 and have found that evidence does not support that SARS-CoV-2 is a laboratory construct[[50]](#footnote-50). If it were a constructed virus, its genomic sequence would show a mix of known elements. This is not the case. Another coronavirus, SARS-CoV-1, the cause of the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003, was also closely related to other coronaviruses isolated from bats. These close genetic relations of SARS-CoV-1, SARSCoV-2 and other coronaviruses, suggest that they all have their ecological origin in bat populations[[51]](#footnote-51). Many of these coronaviruses can also infect several animal species. For example, SARS-CoV-1 infected civet cats and then humans, while the virus causing the Middle East Respiratory Syndrome (MERS-CoV) is found in dromedary camels, and has continued to infect humans since 2012[[52]](#footnote-52). All available evidence for COVID-19 suggests that SARS-CoV-2 has a zoonotic source. Since there is usually limited close contact between humans and bats, it is more likely that transmission of the virus to humans happened through another animal species, one that is more likely to be handled by humans[[53]](#footnote-53). This intermediate animal host or zoonotic source could be a domestic animal, a wild animal, or a domesticated wild animal and, as of yet, has not been identified. All the published genetic sequences of SARS-CoV-2 isolated from human cases are very similar. This suggests that the start of the outbreak resulted from a single point introduction in the human population around the time that the virus was first reported in humans in Wuhan, China in December 2019. A number of investigations to better understand the source of the outbreak in China are currently underway or planned, including investigations of human cases with symptom onset in and around Wuhan in late 2019, environmental sampling from markets and farms in areas where the first human cases were identified, and detailed records on the source and type of wildlife species and farmed animals sold in these markets[[54]](#footnote-54). Results from these studies are essential to preventing further zoonotic introductions of SARS-CoV-2 into the human population. WHO continues to collaborate with animal health and human health experts, Member States, and other partners to identify gaps and research priorities for the control of COVID-19, including the eventual identification of the source of the virus in China[[55]](#footnote-55).

The deadliest coronavirus as christened by the World Health Organisation as COVID-19 originated its journey in the beginning of 2020 from Wuhan in China traversed all the six continents across the globe bringing much hardships to the people on an unprecedented level without any respect to borders or rich or poor. Being one of the most populous countries, India experienced worst effects of the pandemic forcing the Union government to declare lock down throughout the country. The worst sufferers of the virus were the migrant labourers stranded in different parts of India without adequate shelter, food or water. Some of them have pedalled to home while others on foot lost precious lives due to accident en route. Most of the state government’s exchequer were drained out leading to inadequate financial support for the adoption of even health emergency measures. The salaries and pensions of the government employees were cut to meet the financial requirements of the state. Inter-state travel became a nightmare and the economy got paralysed. Around sixty lakh persons contracted the virus infection and around one lakh persons succumbed to it by the end of September 2020[[56]](#footnote-56). Most of the deaths were reported among the senior citizens of sixty and above years of age. Co-morbidities caused causalities among the younger population as well.

There is unanimous opinion among the scholars about the relationship between density of population and the infection level of the coronavirus. Soumya Swaminathan, Deputy Director-General of the World Health Organization, expressed that high density would be great challenge to India to combat the COVID-19[[57]](#footnote-57). Mohammad Arif and Soumita Sengupta argue that high density leads to high mortality rate[[58]](#footnote-58). K. Vish Viswanath has expressed the same view[[59]](#footnote-59). In this background, this study makes a comparative analysis of the number of coronavirus infections and mortality rate up to 30 September 2020 with the density of population. It showed that Maharashtra contracted highest number of corona infections and mortality rate followed by Karnataka the density of both the States were lower than the national average of 382 despite the fact that the States of Maharashtra and Karnataka had only 9.29 and 5.05 percent of total population of India respectively according to the census report of 2011[[60]](#footnote-60). While the high density States of Bihar and West Bengal contracted only 3 and 4.2 percent corona infections and 0.93 and 5.084 percent mortality rates respectively despite having 8.58[[61]](#footnote-61) and 7.55[[62]](#footnote-62) percent populations respectively. At the same time, the densely populated NCT of Delhi with 1.38 percent of Indian population reported 4.57 percent total infections and 5.52 percent mortality. India’s case fatality ratio (CFR)-the proportion of people who died among those who tested positive for the coronavirus disease dipped from 2.15% in early August to 1.72% on September 6[[63]](#footnote-63). India’s CFR is much lower than the global average of 3.2%. The United Kingdom’s (UK) CFR has been the highest at 12%, followed by Mexico (10.6%)[[64]](#footnote-64).

**Table-II: Comparison of the total number of confirmed, cured and mortality rates from the coronavirus up to 30 September 2020 with the percentage and density of population**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| States | Percentage of Total Population | Confirmed Cases | Percentage of Confirmed Cases | Number of Cured Persons | Percentage of the Cured | Number of Persons Died | Percentage of Death | Density in 2011 (per sq.km) |
| Bihar | 8.58 | 181285 | 3 | 168025 | 3.35 | 894 | 0.93 | 1,102 |
| West Bengal | 7.55 | 253768 | 4.2 | 222805 | 4.44 | 4899 | 5.084 | 1029 |
| Kerala | 2.76 | 187276 | 3.1 | 124688 | 2.48 | 719 | 0.08 | 859 |
| Uttar Pradesh | 16.49 | 394856 | 6.54 | 336981 | 6.7 | 5715 | 6.00 | 828 |
| Haryana | 2.09 | 126974 | 2.1 | 110814 | 2.21 | 1356 | 1.46 | 573 |
| Tamil Nadu | 5.96 | 591943 | 9.8 | 536209 | 10.68 | 9453 | 9.80 | 555 |
| Punjab | 2.29 | 112460 | 1.8 | 92277 | 1.83 | 3359 | 3.5 | 550 |
| Jharkhand | 2.72 | 82540 | 1.3 | 69898 | 1.39 | 700 | 0.73 | 414 |
| Assam | 2.58 | 177221 | 2.93 | 144002 | 2.87 | 680 | 0.71 | 397 |
| Goa | 0.12 | 32777 | 0.05 | 27781 | 0.55 | 419 | 0.43 | 394 |
| Maharashtra | 9.29 | 1366129 | 22.64 | 1069159 | 21.29 | 36181 | 37.54 | 365 |
| Tripura | 0.30 | 25734 | 0.43 | 19692 | 0.39 | 277 | 0.29 | 350 |
| Karnataka | 5.05 | 592911 | 9.82 | 476378 | 9.49 | 8777 | 9.10 | 319 |
| Andra Pradesh | 7.00 | 687351 | 11.3 | 622136 | 12.39 | 5780 | 6.00 | 308 |
| Gujarat | 4.99 | 135842 | 2.25 | 115727 | 2.31 | 3439 | 3.569 | 308 |
| Orissa | 3.47 | 215676 | 3.57 | 181481 | 3.61 | 828 | 0.86 | 269 |
| Madhya Pradesh | 6.00 | 126043 | 2.08 | 102445 | 2.04 | 2281 | 2.37 | 236 |
| Rajasthan | 5.67 | 133119 | 2.206 | 111272 | 2.22 | 1471 | 1.53 | 201 |
| Uttaranchal | 0.84 | 47995 | 0.79 | 38282 | 0.76 | 591 | 0.613 | 189 |
| Chhattisgarh | 2.11 | 110655 | 1.83 | 78514 | 1.56 | 916 | 0.95 | 189 |
| Meghalaya | 0.24 | 5463 | 0.09 | 3940 | 0.078 | 47 | 0.05 | 132 |
| Jammu and Kashmir  and Ladak | 1.04 | 78290 | 1.297 | 58624 | 1.17 | 1222 | 1.268 | 124 |
| Himachal Pradesh | 0.57 | 14747 | 0.24 | 10991 | 0.22 | 183 | 0.19 | 123 |
| Manipur | 0.22 | 10746 | 0.18 | 8039 | 0.16 | 65 | 0.0674 | 122 |
| Nagaland | 0.16 | 6040 | 0.1 | 4986 | 0.099 | 17 | 0.018 | 119 |
| Sikkim | 0.05 | 2937 | 0.04 | 2235 | 0.045 | 35 | 0.036 | 86 |
| Mizoram | 0.09 | 1986 | 0.03 | 1576 | 0.03 | 0 | 0 | 52 |
| Arunachal Pradesh | 0.11 | 9553 | 0.158 | 6743 | 0.13 | 16 | 0.016 | 17 |
| NCT of Delhi | 1.38 | 276325 | 4.57 | 243481 | 4.84 | 5320 | 5.52 | 11297 |
| Chandigarh | 0.09 | 11816 | 0.195 | 9598 | 0.19 | 158 | 0.16 | 9252 |
| Puducherry | 0.10 | 27066 | 0.45 | 21616 | 0.43 | 517 | 0.54 | 2598 |
| Dadra and Nagar  Haveli and  Daman and Diu | 0.05 | 3033 | 0.05 | 2910 | 0.057 | 2 | 0.002 | 1434 |
| Lakshadweep | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 2013 |
| Andaman an­d  Nicobar islands | 0.03 | 3821 | 0.06 | 3587 | 0.07 | 53 | 0.055 | 46 |
| Total | **100** | **6034378** | **100** | **5020395** | **100** | **96370** | **100** |  |

The above table is prepared based on the information provided in the Census Report of 2011 (<https://censusindia.gov.in/2011-prov-results/data_files/india/Final_PPT_2011chapter7.pdf>, last assessed on 30 September 2020) and the website of the Government of India on the COVID-19 update (<https://www.mygov.in/covid-19> , last accessed on 30 September 2020)

**Conclusion**

India reported highest death rate across the globe in the so called Spanish flu spanning between 1918 and 1919. It spread to India through the Indian troops served in Europe. There is no unanimity among the scholars regarding the number of deaths in India. Different scholars provided varied number of causalities but all of them agreed that India reported highest death rate across the globe. Among the British Provinces, the Central Provinces and Berar registered heavy toll of life. Previous studies showed that high death rate in India was due to high density of population. If so, largest number of death rate would have been occurred in densely populated East Bengal. But East Bengal registered only low death rate. Comparatively sparsely populated Central Provinces and Berar and North West Frontier Province met high mortality rate. It was found that density population had played no role in increasing death rate in the Spanish flu. Likewise, the spread of the COVID-19 had no relation with the density of population. The low density States contracted highest level of infections and mortality rate. There were other reasons behind high level of infection and mortality rate in sparsely populated States which yet to be discovered. Again, at the global level, low density countries compared to India reported high mortality rate. The low death rate in India compared to European countries and the United States America in the COVID-19 might have been due to the high resisting power of the Indians to the coronavirus either due to the previous exposure of the Indians to the similar viruses or immunisation

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