



## Causes of Lower Mortality of COVID 19 Pandemic in India: A Case Study

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### ABSTRACT

COVID 19 is an infectious disease caused by corona virus. The virus takes its birth in the Wuhan city in China during December 2019 and thereafter it outbreaks almost in all over the world within a short span of time. People of all categories may be affected by this virus but one who are older and/or who have comorbidities are more susceptible to COVID 19 disease. The world's average mortality (CFR) of COVID 19 is 2.29 (08.12.20). But India in spite of its large population base and developing economy, it has the CFR which is only 1.45 which is the lowest among 15 worst affected countries of the world. The study shows that, age category of the people, nature of climate, nature of virus (mutated), inherited nature of immunity of the people, racial characteristics of the people, nature of decision taken by the government regarding the management of the pandemic etc are the major determinants concerning lower mortality of COVID 19 disease. The present paper is an attempt to analyse these factors relating to COVID 19 CFR of India which may be cited as examples to cope up the worst affected disease ever occur over the globe.

**Key Words:** Corona virus, COVID 19, CFR, Comorbidities, Mortality, Outbreak

### Introduction

COVID 19<sup>1</sup> is an infectious disease having severe acute respiratory syndrome (SARS). It is caused by the respiratory pathogen: corona virus. It is transmitted between humans and animals and so the virus is zoonotic in nature<sup>2</sup>. The virus as well as the disease is first identified in **Wuhan city** in Hubei province in **China** in December **2019**. During that time it was known as corona virus or Wuhan corona virus<sup>3, 4</sup>. World Health Organization (WHO) first learned the disease from this city on 31<sup>st</sup> December 2019 and is officially named as COVID-19 on 11<sup>th</sup> February 2020<sup>5</sup>. Thereafter it spreads rapidly throughout the world within a short span of time and so the **WHO** has declared the COVID 19 a Global **pandemic**<sup>6</sup> on March 11, 2020. At present 220 countries all over the world are suffering from this disease<sup>7</sup>. On May 14, 2020, the WHO director uttered that the virus may never go away and could become a disease that the world has to learn to live with<sup>7</sup>.

The disease spreads through the droplets of saliva or discharge from the nose of an infected person<sup>8,9</sup>. Anyone can also be affected by COVID 19 indirectly by touching a contaminated surface or object<sup>10</sup>. People of all category irrespective of their age, sex, caste and category may be infected by this disease, although the fatality rate is not equal in all cases. It varies from man to man, from region to region and from country to country. Mainly two groups of people are at higher risk of getting severe COVID 19 disease: **older people** having 70 years of age and **people who already are at risk** for severe disease like high blood pressure, cardiovascular disease, diabetes, chronic respiratory disease, chronic liver disease, hypertension, cancer and so on<sup>11</sup>.

**India** recorded its first confirmed case of COVID 19 on **30<sup>th</sup> January, 2020** at Trissure district in **Kerala**. But the country recorded its first death on 06.02.20, when the number of positive cases was 07. The present day COVID 19 mortality in the world as a whole is **2.29**<sup>7</sup>. India, in spite of its large population base and diverse community, has the mortality which is only 1.45 as on 08.12.20<sup>7</sup>. Age, comorbidity, obesity and racial character of the people, nature of the environment etc are the principal determinants of COVID 19 **CFR**<sup>12, 13, 14, 15</sup>. The present paper is an attempt to analyse such factors in controlling COVID 19 CFR in India.

### Data base and Methodology

The data utilized for this study, are collected from the World Health Organization (WHO) COVID 19 data base, a regular exercise that aims to compile information on every known disease including COVID 19 of all the countries over the world. Other sources from which relevant data has been collected are Ministry of Health and Family Welfare, Government of India and West Bengal State Health Department. These sectors collect reported data for all diseases. Here the enumerators collect household-level data regarding the disease and individual-level characteristics.

The methodology used for this study is quantitative as well as qualitative. The method of analysis applied here includes a combination of thematic mapping followed by statistical analysis. To explore whether there is low mortality rate in India, the variation in case of fatality rate (CFR) has been looked at. CFR is the number of deaths from COVID 19 by the number of confirmed cases of COVID 19 and is expressed as percentage<sup>16</sup> i.e. **CFR (%)**

=Number of deaths from COVID 19/Number of confirmed case of COVID 19 x 100.

Diagram 1, made on the basis of collected and compiled data shows the comparative CFR of India is least among 15 worst affected countries of the world. From diagram 2 the cumulative fatality of India is set up with respect to the same of the world where as diagram 3 illustrates the inter-state variation of CFR within India.

### COVID 19 CFR in India: The Determinants

India is the second most populous country with about 1.4 billion population. Its high population density, closely spaced houses, prevalence of slums, large family sizes in non species rooms, difficulties in maintaining social and physical distancing, lack of access of basic sanitation needs, frequent use of crowded public transport system etc are ideal for viral outbreak. In spite of these it has the COVID 19 CFR which is very low. According to the record of Ministry of Health and Family welfare Department, India and WHO COVID 19 data base, the mortality CFR in India is only **1.45%**, whereas the same is 9.30% in Mexico, 4.8 in Iran 3.48 in Italy and so on (08.12.20)<sup>17</sup>.

Total number of infected patient in this country as on 08.12.20 is **9703770** where is the number of death is only **140958**. On the same date, cumulative confirmed cases and death in the world was **67210778** and **1540777**.

As per WHO records, still now no **community transmission** takes place in this country like many developed countries and the outbreak takes place here as **cluster of cases**<sup>7</sup>. In terms of total population the number of COVID 19 death per 100000 population is only **9.6** as compared to 126 in Belgium, 109 in Peru, 87 in Spain, 64.74 in USA and so on<sup>18</sup>. In respect of the total population of the country, the infection rate (**IR**) ie number of cumulative infection x 100/total population is only **0.62%** whereas the same is 3.05% in USA, 3.03% in Spain, 2.9 in Peru and 2.70 in Brazil<sup>18</sup>.

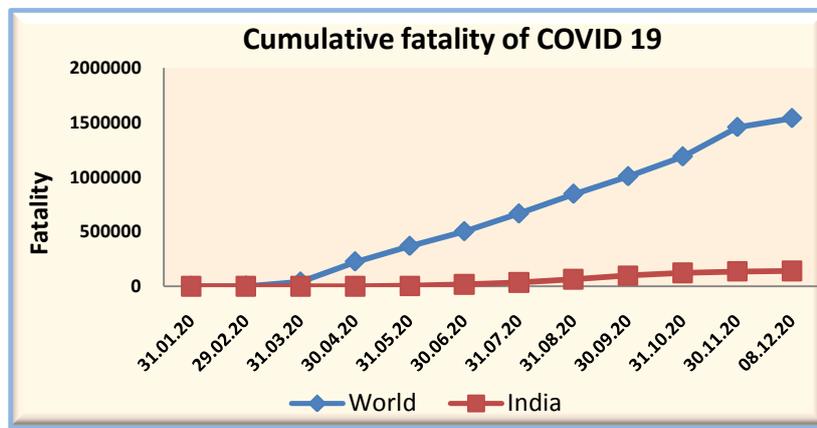


Fig-1: Comparative growth of COVID 19 fatality in India and in the world (Source- WHO COVID 19 Data, retrieved on 08.12.20)

But the CFR in India is not uniform through the country rather a large variations is noticed in –

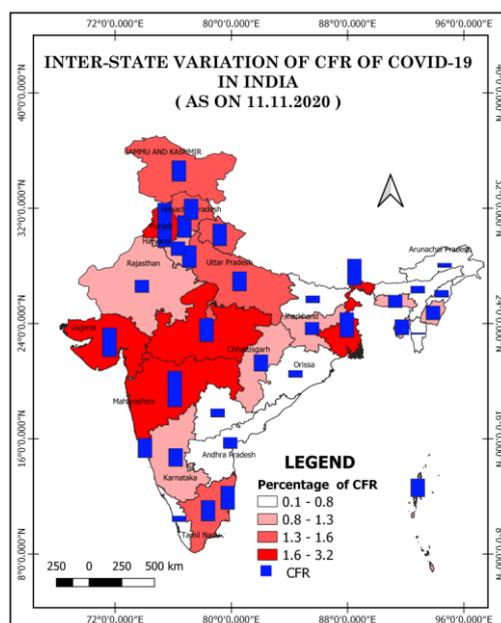


Fig-2: Inter-state variation of COVID 19 CFR in India (Source- MoHFW, GOI, Data 11.11.20)

terms of affected people and CFR due to the variations of the physical, economic, social, racial and demographic factors in different parts of the country. Within the country highest CFR (**3.2%**) is recorded in Punjab, where as it is lowest (**0.1%**) in Mizoram. But in respect of the total recorded COVID 19 death Maharashtra ranks first (**45435**) whereas the same is lowest (**02**) in Mizoram. (**Fig-3**)

The possible reasons and parameters for such a type of COVID 19 mortality (CFR) in India have been identified and investigated and thereafter these are analysed in details as follows.

#### Age of the people

The age of the people play a vital role in determining the number of COVID 19 infection and the death. A study conducted by the US based National Beauro of Economics Research clearly shows that, death rate (CFR) due to COVID 19 is very low in younger age group while it is high enough in the older ones<sup>12</sup>. It is because of the fact that, the older has a weakened immune system and is likely to have problems like diabetes, hypertension, cardiovascular diseases etc which is more vulnerable to infection. Investigation shows that the patients with age below 50 years have the risk of death is 0.5% while it is 8% in case of those patients who are older than 70 years old<sup>19</sup>. According to a CDC analysis in USA it is found that the risk of death among the COVID 19 patients is 0.003%, 0.02%, 0.5% and 5.4% for the age groups 0-19 years, 20-49 years, 50-69 years and 70 years or over respectively<sup>20</sup>. A report published in LANCET on 25 June 2020, shows that, about only 8% of admitted children desired intensive care. Among the 582 children observed only 4 were died. It is only about 1% under 10 years and about 4% in between 10-20 years<sup>21</sup>.

The average age of Indian population is only **26.8** years as compared to 38.5 years in USA, 45.5 years in Italy and so on<sup>22</sup>. That means India is a **younger country**. It has 41% of population below 19 years of age and about two third is below 39 years of age. Whereas the percentage shares of old age (above 60 years) is only 8.6%<sup>23</sup>. According to the World population record, India is a country with 28.4% of median age group population. The younger population of India having upto 39 years of age has only 10% of all deaths due to COVID 19. On the other hand the 60+ years of age group having the population share of only 8.6% has 53% of all death.<sup>24</sup> Also the availability of universal health care, prevalence of joint family, the culture of family, ties and protection of the elderly people in India brings down the CFR of COVID 19.<sup>25</sup>

#### Timely lockdown

Indian Government declared a nationwide **four phase** long run lock down during the early onset of COVID 19 in this country to have a break in its chain. First lockdown here is called for a period of 21 days from 24<sup>th</sup> March to 13<sup>th</sup> April when the number of infected patients and deaths are only 519 and 09 respectively<sup>7</sup>. It was planned after a 14-hour voluntary public curfew on 22 March. The lockdown is extended for a period of 14 days with a conditional relaxation from 20<sup>th</sup> April for the areas having minimum infection and death from 14<sup>th</sup> April to 3<sup>rd</sup> May.<sup>26</sup> Further the Government extends the duration of lock down for two weeks upto 17<sup>th</sup> May. The entire country is then divided into three zones namely- **red zone**, **orange zone** and **green zone** depending on the number of active cases<sup>27</sup>. Again the lock down is extended up to 31<sup>st</sup> May by the National Disaster Management Authority.

This 69 days nonstop lockdown helps to prepare the COVID 19 fighters including doctors, nurses, security staff, cleaners etc for the pandemic. The country's health care authorities including the doctors also had the opportunity of sharing the experience of other affected countries. The medical journal LANCET has rightly concluded that lock down in India get desired effect of flattening the epidemic curve. After the first detected case in India on 30<sup>th</sup> January 2020 it takes a long span of time to reach only 2000 mark in April 3<sup>rd</sup><sup>27</sup>. Opposite picture is noticed in many other countries where lockdown is not declared timely and maintained properly. After the lock down, unlock phases (phase-I upto 30<sup>th</sup> June) are implement over the country except the regions having containment zones<sup>28</sup>.

#### Universal vaccination

Study confirms that, the countries where the children are required to get different vaccines have a lower tendency of COVID 19 infection as well as death from the disease<sup>29</sup>. Under Universal Immunization Programme (UIP), the Ministry of Health and family Welfare, India introduced vaccination programme (with a significant support from International community) from 1985. This programme provides different vaccines like tuberculosis vaccine, BCG vaccine, DPT vaccine, oral polio vaccine, measles vaccine, Hepatitis B vaccine, TT vaccine, JE vaccine, Hib containing Pentavalent vaccine etc to protect the children from different diseases<sup>30</sup>. This makes Indian to have a strong base of immune system than the people of many other countries. This may help to protect them from the infection of COVID 19 and so the less CFR. Also, Indians have past experiences of suffering from pandemics like cholera, dengue fever etc. It is possible that, antibody protection was already may present among many Indians before the outbreak of this disease. BCG vaccine is being trialed also in many countries to reduce the severity of corona virus<sup>31</sup>.

#### Tough life, Food habits and inborn immunity

India is a developing country with huge population base. Per capita income of Indian is low enough. Large number of people still lives in villages and they are directly involved in different primary activities mainly in agriculture or other laborious works in the open sun. Most of the villagers in India are to work hard regularly to earn their lively hood. The tough life of people, unhygienic conditions, poor community hygiene, food habits and most of all their close affinity with the nature may produce a natural immune system<sup>32</sup>. This can help to protect them from different diseases including COVID 19.

The food habits of Indian to some extent help them from corona virus infection by boosting up of immunity system. Different types of herbs and spices like turmeric, cloves, ginger, mustard, saffron, cardamom, garlic etc are essential ingredients of Indian kitchen. All the spices are rich in bioactive compounds and phytochemicals which possess medical properties.<sup>33</sup>

Also, the immune response genes (human leukocyte antigen/HLA) of Indian population are diverse and much more extensive than Caucasian<sup>34</sup>. Moreover, the Indians possess higher percentage of nature killer (NK) cells<sup>35</sup>. This protects them from corona virus infection.

## Conclusion

COVID 19 disease is the worst affected disease ever occurs over the globe. Almost all the countries of the globe are now under its threat. The virus most horribly affected the lives, the economy and the society of human civilization throughout the world. Millions of people have lost their lives directly and or indirectly from this pandemic. But the rate of lost of live by COVID 19 or its impact on the social and economic life is not uniform throughout the Globe. In some countries the mortality of COVID 19 is very high whereas the same is very low elsewhere. Among the worst affected 15 countries, the mortality (CFR) is lowest in India. Here in spite of huge population base, developing economy, lack of awareness about the disease, infrastructural shortcomings in fighting against the disease etc the CFR is only 1.45 as compared to 2.48 of worlds average. Age structure of the people, environmental conditions, experience from the prevalence of previous viral diseases, inherited immune system, system of universal vaccination etc factors protect Indians from the pandemic. Although it ranks second in terms of the total positive cases and death but infection rate is very very low here. It's a great success of Indian Government. Other countries may share these experiences of India to tackle their COVID 19 pandemic.

## References

1. Public Health England. COVID-19: epidemiology, virology and clinical features. Available from: <https://www.gov.uk/government/publications/wuhan-novel-coronavirus-background-information/wuhan-novel-coronavirus-epidemiology-virology-and-clinical-features>
2. Chan JF, Lau SK, To KK, Cheng VC, Woo PC, Yuen KY. Middle East respiratory syndrome corona virus: another zoonotic beta corona virus causing SARS-like disease. *Clinical microbiology reviews*. 2015 Apr 1;28(2):465-522.
3. McNeil Jr DG (2 February 2020). "Wuhan Corona virus Looks Increasingly Like a Pandemic, Experts Say". *The New York Times*. ISSN 0362-4331. Retrieved 4 April 2020.
4. Griffiths J. "Wuhan corona virus deaths spike again as outbreak shows no signs of slowing". *CNN*. Retrieved 4 April 2020.
5. "Naming the corona virus disease (COVID-19) and the virus that causes it". *World Health Organization (WHO)*. Archived from the original on 28 February 2020.
6. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. (February 2020). "Epidemiological and clinical characteristics of 99 cases of 2019 novel corona virus pneumonia in Wuhan, China: a descriptive study". *Lancet*. 395 (10223): 507–513. doi:10.1016/S0140-6736(20)30211-7. PMC 7135076. PMID 32007143.
7. World Health organization Corona Virus outbreak (COVID 19) data base, Archived from the original on 11.11.2020
8. "Q&A: How is COVID-19 transmitted? (How is the virus that causes COVID-19 most commonly transmitted between people?)". *www.who.int*. 9 July 2020.
9. "Transmission of COVID-19". *www.ecdc.europa.eu*. 7 September 2020.
10. "Transmission of SARS-CoV-2: implications for infection prevention precautions" (PDF). *www.who.int*. World Health Organization. 9 July 2020. Archived from the original on 9 July 2020.
11. Merriam Webster Dictionary. Pandemic. Available from: <https://www.merriam-webster.com/dictionary/pandemic>
12. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu J, et al. (April 2020). "SARS-CoV-2 Infection in Children". *The New England Journal of Medicine*. Massachusetts Medical Society. 382(17):1663–1665. doi:10.1056/nejmc2005073. PMC 7121177. PMID 32187458.
13. Silvia Comunian, Dario Dongo, Chiara Milani, and Paola Palestini, (2020) "Air Pollution and COVID-19: The Role of Particulate Matter in the Spread and Increase of COVID-19's Morbidity and Mortality" *International journal of Environmental Research and Public Health*, Published online 2020 Jun 22. doi: 10.3390/ijerph17124487
14. Tamara A, Tahapary DL (1 July 2020). "Obesity as a predictor for a poor prognosis of COVID-19: A systematic review". *Diabetes & Metabolic Syndrome*. 14 (4): 655–659. doi:10.1016/j.dsx.2020.05.020. PMC 7217103. PMID 32438328.
15. Garg S, Kim L, Whitaker M, O'Halloran A, Cummings C, Holstein R, et al. (April 2020). "Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Corona virus Disease 2019 – COVID-NET, 14 States, 1–30 March 2020". *MMWR. Morbidity and Mortality Weekly Report*. 69 (15)
16. Porta M. *A Dictionary of Epidemiology*, 5<sup>th</sup> edition, Oxford University Press, Oxford, 2008
17. World Health organization COVID 19 data base, Archived from the original on 15.11.2020
18. World Health organization COVID 19 data base, Archived from the original on 16.11.2020
19. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, Tong S (June 2020). "Epidemiology of COVID-19 Among Children in China" (PDF). *Pediatrics*. 145 (6): e20200702. doi:10.1542/peds.2020-702. PMID32179660. S2CID 219118986. Archived(PDF) from the original on 17 March
20. CDC (11 February 2020). "Coronavirus Disease 2019 (COVID-19)". *Centers for Disease Control and Prevention*. Retrieved 10 October 2020.
21. John Parkinson (25 June 2020). "Study: Majority of Children with COVID-19 Have Mild Disease, Mortality is Rare". *ContagionLive*.
22. "World Population Prospects". *esa.un.org. Population Division – United Nations*. Archived from the original on 19 September 2016. Retrieved 15 September 2016.
23. Primary *Census Abstracts*, Registrar General of **India**, Ministry of Home Affairs, Government of **India**, Available at: [http://www.censusindia.gov...censusindia.gov.in/2011-prov-results/paper2/census2011\\_paper2](http://www.censusindia.gov...censusindia.gov.in/2011-prov-results/paper2/census2011_paper2).
24. **TIMES OF INDIA** Report on "Covid deaths: Over 50% above 60 yrs; 73% had other illnesses" Retrieved on May, 2020

25. Sudha S., Suchindran C., Mutran E.J., Rajan S.I., Sarma P.S. Marital status, family ties, and self-rated health among elders in South India. *J Cross Cult Gerontol.* 2006;21(3–4):103–120. doi: 10.1007/s10823-006-9027-x. [PubMed] [CrossRef] [Google Scholar]
26. "PM Modi announces extension of lockdown till 3 May". *Livemint.* 14 April 2020.
27. "2 More Weeks Of Lockdown Starting May 4". *NDTV.com.* Retrieved 1 May 2020.
28. Desk, India com Hindi News. "Unlock 6.0 Guidelines: आजसेदेशमेंशुरूहुआ 'अनलॉक 6.0', जानेक्याखुलेगाऔरक्याअबभीरहेगाबंद...". *India News, Breaking News, Entertainment News | India.com (in Hindi).* Retrieved 11 November 2020.
29. Miller A, Reandelar MJ, Fasciglione K, et al. Correlation between universal BCG vaccination policy and reduced morbidity and mortality for COVID-19: an epidemiological study. *MedRxiv* 2020.03.24.20042937 [Preprint.] 2020. doi: 10.1101/2020.03.24.20042937. <https://www.medrxiv.org/content/10.1101/2020.03.24.20042937.v1.full.pdf>
30. National Health Mission, Govt Of India, Ministry of Health and family Welfare Department, Website: <https://nhm.gov.in/index1.php?lang=1&level=2&sublinkid=824&lid=220>
31. *Clinical Trials Arena* Australian researchers to trial BCG vaccine for Covid-19. <https://www.clinicaltrialsarena.com/news/australia-bcg-vaccine-trial-covid-19>
32. VarshneyVibha. Do Indians have higher immunity to novel coronavirus? <https://www.downtoearth.org.in/news/health/covid-19-do-indians-have-higher-immunity-to-novel-coronavirus-70322.COVID-19>
33. Sengupta, A., Ghosh, S., Bhattacharjee, S., and Das, S. (2004). Indian food ingredients and cancer prevention - an experimental evaluation of anticarcinogenic effects of garlic in rat colon. *Asian Pac. J. Cancer Prev.* 5, 126–132.
34. Mehra, N. K. (2010). Defining genetic architecture of the populations in the Indian subcontinent: impact of human leukocyte antigen diversity studies. *Indian J. Hum. Genet.* 16, 105–107. doi: 10.4103/0971-6866.73394
35. Rathore, D. K., Holmes, T. H., Nadeau, K. C., Mittal, P., Batra, A., RosenbergHasson, Y., et al. (2018). Differences in multiple immune parameters between Indian and U.S. infants. *PLoS One* 13:e0207297. doi: 10.1371/journal.pone.0207297