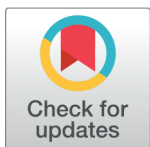


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The Struggle of India in COVID-19 Combat

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Abstract

Objectives: To find the underlying reasons for the exponential increase in mortality rate in India due to (coronavirus disease-2019) COVID-19. **Methods:** The Indian scenario was analysed after the first declaration of the COVID-19 outbreak. Despite the meticulous efforts of the Indian government, the number of deaths rose gradually. Subsequently, an exponential increase was observed, and the trend was analysed cautiously to assess the shortcomings. **Findings:** The cause of death in the reproductive age group and change in the pattern of death in the first and second waves were analysed. A rapid increase in death might be due to not identifying individuals with comorbidity early. Due to the lack of a centralised government database, a higher death rate is recorded. **Novelty:** Identifying and communicating with individuals with comorbidities at the right time is essential during the pandemic. Hence, the present study emphasised a centralised database and connected the medical records nationwide to provide early warning signals for such people. In the future, it could be linked with the Geographical Information System (GIS).

Keywords: pandemic; comorbidity; unique ID card; vulnerable; lockdown

1 Introduction

The coronavirus epidemic that started in China in late December 2019 (COVID-19) has become the deadliest pandemic of the century and devastated the human community in just a few months. COVID-19 outbreaks were officially announced as pandemic on 11 March 2020 by World Health Organization (WHO) because it started affecting a large geographical area, affecting many people and spreading rapidly in the community. Also, visual exponential growth was observed worldwide⁽¹⁾. By the time COVID-19 was declared a pandemic, a 13-fold increase was recorded in China and had spread to more than 114 countries. Although there may be a further increase in the mortality rate, currently, the number is 31,73,576 globally. The underlying reasons might include not maintaining social distancing, ignorance of severity, virus attack consequences and inaccurate medical records to identify individuals with comorbidities. Although the 20th century has witnessed many pandemics, including the Spanish Flu, Asian Flu, Hong Kong Flu, HIV/AIDS, SARS, Swine flu, Ebola, MERS and now the newly added COVID-19, all those listed in [Figure 1](#) have a crucial role in disrupting the human community during the specific period.



Fig 1. 21st century pandemics

2 Methods

2.1 COVID -19

The origin of COVID-19 infection, its transmission from bats to humans, symptoms, incubation period, testing and treatment methods were reviewed^(2,3), and the significance of the research was highlighted. Based on the severity of symptoms and conditions, COVID -19 patients are categorised into mild, moderate, severe and critical. Factors, such as asymptomatic individuals, act as the carriers of infection⁽⁴⁾, also, a faecal-oral transmission has been speculated. However, whether a decrease in temperature⁽⁵⁾ would change the transmission rate is yet controversial. Several precautionary steps, such as social distancing, frequent hand washing and usage of masks, have been advised globally to prevent transmission.

2.2 Strategies of India in COVID -19

The first outbreak of COVID -19 in India was on 30 January 2020, and the number of confirmed cases is 30,134,445 and the number of deaths is 3,93,310 as of 21st June 2021⁽⁶⁾. WHO appreciated the efforts taken by the Indian government to curtail the spread of the disease⁽⁷⁾. The government's steps and exemplary actions until March 2020⁽⁸⁾ are showcased in Figure 2. From March 2020, several restrictions and facilities have been implemented and provided by the government, respectively, to control the transmission among the population.

Restrictions implemented were as follows:

- Travel and entry restrictions from other countries
- Lockdowns announced in a phased manner
- Zonal classification of areas is based on colours, such as green, orange and red
- No get-together or parties
- Closed all the malls except essential services
- Postponed all the sports events
- Cancelled all the international flights
- Restricted local transportation within the country

Facilities provided:

- Increased screening of all international passengers
- Increased the number of labs and testing facilities

- Evacuated many Indian nationals and certain foreign nationals from the virus-affected areas
- Launched a smartphone application called ‘Aarogya Setu’ to help in contact tracing and containing the spread of the COVID-19 pandemic
- Increased health care departments
- Special efforts for contact tracing
- Encouraged self-quarantine and increased the frequency of house visits by healthcare workers
- A sum of ₹3,100 crores was announced as the first allocation from the Prime Minister care fund on 13 May 2020 to provide relief to the affected people

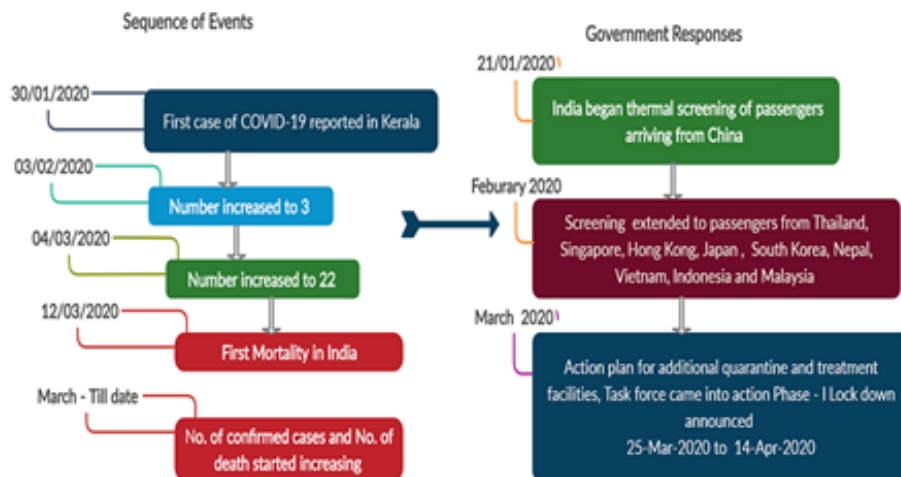


Fig 2. Sequence of events: Responses

Despite meticulous efforts taken by the government, the number of deaths is increasing day by day (Figure 3). The severity of the second wave compared to the first wave is indicated in the graph.

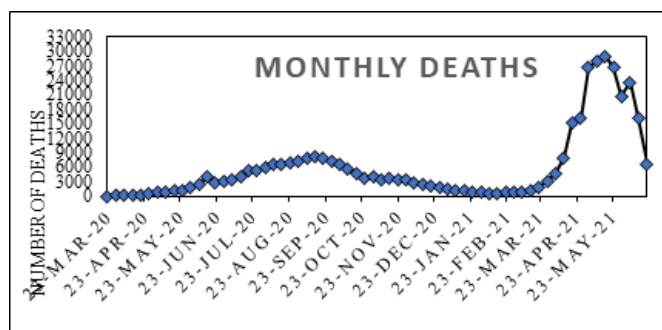


Fig 3. COVID-19 Mortality rate in India

2.3 Discussion on the strategies of COVID- 19 in India

Few striking features of COVID-19 were observed in other countries, and the Indian scenario differed slightly in the first wave based on some unique factors, especially the mortality rate of the age group⁽⁹⁾ and gender variation in affected people⁽¹⁰⁻¹²⁾. However, the cause for the above said specific features are yet to be identified. The statistical data of the demographic age structure of India revealed that⁽¹³⁾ 66.77% fall in the age group of 15–64 years, and 6.18% belongs to the greater than 65 year age group. Thus, the working-age group is large and constitute interstate migrants searching for a job in the country. During the lockdown that was implemented in a phased manner, this age group travelled to their native places. The travel relaxation

during the fourth lockdown period for the interstate migrants played a significant role in increasing the number of cases⁽¹⁴⁾. According to the mortality rate, many deaths were reported only during the fifth lockdown period, which could be attributed to travel permits provided during the fourth phase lockdown serving as an added factor for the spread of infection. Thus, the working-age group was affected markedly. Another projected reason for more deaths in this age group was comorbidity^(15,16).

Several studies emphasised that individuals with cardiac ailments are easily affected by the virus⁽¹⁷⁾. Several unprecedented changes were observed in their cardiorespiratory fitness, daily routine-like behaviour and eating habits, and increased mental stress and anxieties. Another study indicated that death rate and risk factors were higher⁽¹⁸⁾ in individuals with hypertension, diabetes and cardiovascular diseases, who were above the average age. Thus, these were additional complications in people with comorbidities. Also, pre-existing cardiovascular disease and/or development of acute cardiac injury is associated with COVID-19⁽¹⁹⁾. Hence, additional studies are required for the optimal management of people with cardiovascular disease and COVID-19. These groups have been categorised as vulnerable⁽²⁰⁾. Despite substantial efforts of the government exerting several precautions, what could be the reasons for the increasing death rate? Whether comorbid patients have been identified at the right time and were signal or warnings were identified for specified groups are some factors to be considered. Nonetheless, this vulnerable group requires extra shielding from the infection.

The Indian government took enormous steps in linking all the data, such as voter’s identity, permanent account number (PAN) issued by the income tax department, bank details, mobile number, ration card and gas cylinder supply details, of an individual with a unique identity (ID) number, the Aadhar card⁽²¹⁾. This card provided hassle-free transparent information on the service delivery mechanism and the benefits and subsidies of the government⁽²²⁾. However, linking this ID with the medical history (Figure 4) is not yet effectuated. If this was successful, identifying comorbid and vulnerable categories would be feasible, and driving them to take precautions would be easy. Interestingly, linking the unique IDs with medical records is a tedious and time-consuming process in such a populous country; but if it is successful, the curve would have flattened early. This, in turn, would reduce the death rate of extremely vulnerable categories.

Another prominent feature is that women are most affected than men, although the socialising gender in India is men⁽²³⁾. This finding could be attributed to the general health care and nutrition status of women. According to recent statistical data⁽²⁴⁾, only 37% of women receive proper health care.

If these aspects are encountered effectively, the number of deaths in the future and flattening the curve would not be a mirage in a hugely populated and developing country like India.

Similarly, the availability of lifesaving medicines and equipment could be input into the central database. Currently, these steps have been taken by good Samaritans. They have launched portals and apps comprising various resources, including available beds, ventilators and oxygen cylinders.

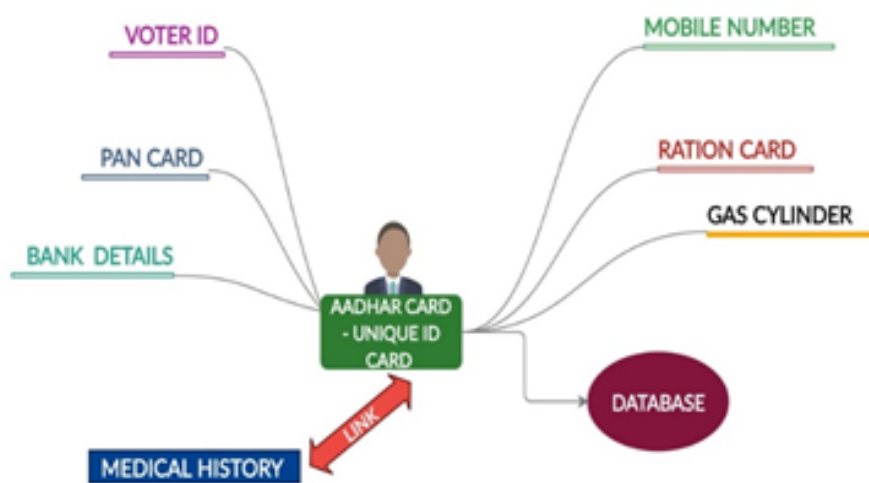


Fig 4. Pictorial representation of linking of Medical History with Aadhar card

3 Conclusion

Although the government has taken the most appropriate and prudent steps in advance from January 2020, India is still combating to safeguard the citizens. The present study emphasizes spreading awareness through media to protect the vulnerable, elderly, women and individuals with comorbid conditions. Thus, linking the medical records of all individuals with a shared database would help identify sensitive categories. This strategy might help us in future pandemic calamities. Owing to the technology and the policymakers' efforts, the global health crisis that humankind may experience in the future could be minimised with proper shielding for the vulnerable category. This study appreciates the measures taken by the government to reduce the spread with contact tracing; nonetheless, the death rate is increasing day by day. Hence, we suggested a centralised database and Geographical Information System (GIS) to locate individuals with comorbidities and contain them at the early stage, thereby reducing the fatalities.

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