A STATISTICAL STUDY ON THE IMPACT OF COVID-19 ON HEALTH IN INDIA

Keya Mondal, Xeviers Koner, Arnab Biswas
The University of Burdwan, West Bengal, India

The first reported case, casualty and the initial reaction to COVID-19

The first official cases of COVID-19 were recorded on 31st of December, 2019, when the World Health Organization (WHO) was informed of cases of pneumonia in Wuhan, China, with unknown cause. It was then on 7th January, 2020, the Chinese authorities identified a novel coronavirus, temporally named 2019-nCoV, as the primary cause of these cases. Weeks later, on 30th of January 2020, the WHO declared the rapidly spreading COVID-19 outbreak as a Public Health Emergency of International Concern. It wasn't until the following month, however, on the 11th of February that the novel coronavirus got its official name - COVID-19. Nine days later, the US Centers for Disease Control and Prevention (CDC) confirmed the first person to die of COVID-19 in the country. The first case of COVID-19 infection in India was reported in Kerala, India. On January 27, 2020, a 20 yr old female was shifted to the Emergency Department in General Hospital, Thrissur, Kerala, with a one-day history of dry cough and sore throat with a feeling of a mild sore throat and dry cough. The victim confirmed her travel history to China. The first casualty in the country came in the form of a 76 -year-old man, who succumbed to COVID-19 on March, 10, 2020. The patient complained of respiratory distress along with co-morbidities like asthma, hypertension and diabetes. The following figures 1-3 provide a clear picture of cases in India (source = https://www.worldometers.info/coronavirus/country/india/).

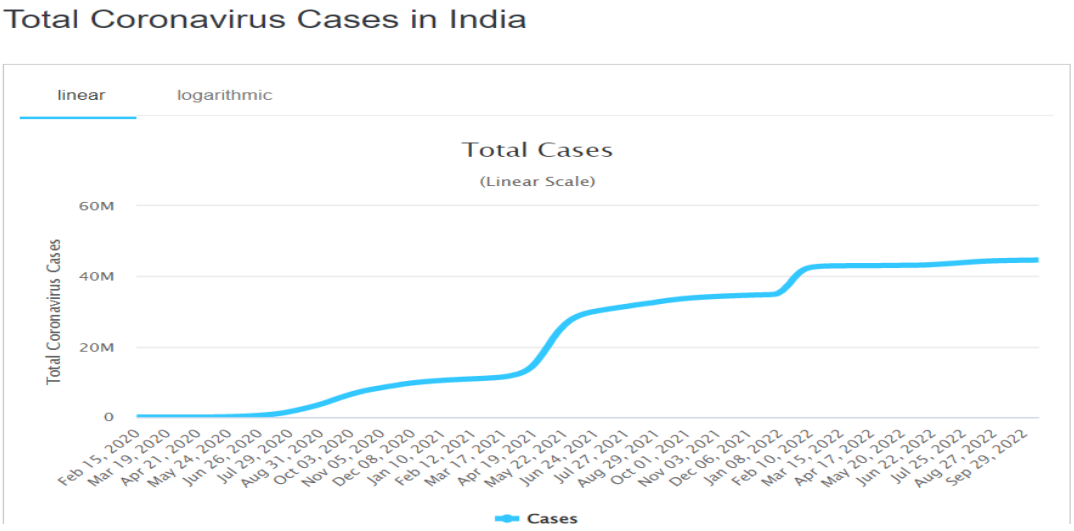

Fig 1: Total coronavirus cases in India

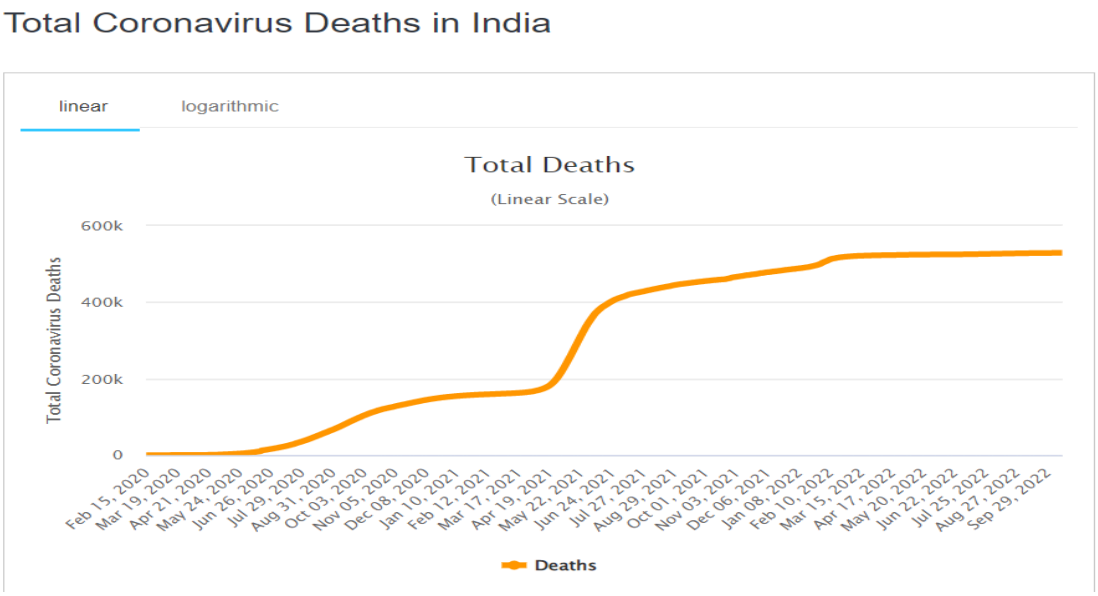

Fig 2: Total coronavirus deaths in India

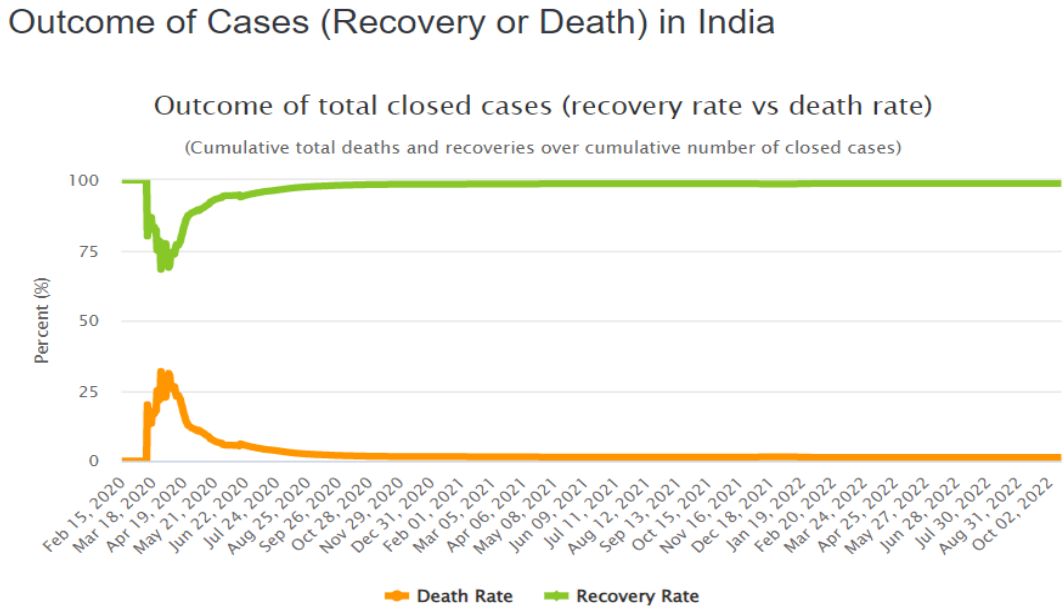

Fig 3: Outcomes of cases (recovery or death) in India

Spread of COVID 19 in India :

First wave: Nation-wide

The Epidemic Diseases Act, 1897 and Disaster Management Act, 2005 was invoked in mid-March 2020. All commercial domestic and international flights were suspended imposing a complete lockdown. The increase in the number of cases in the first wave has been more gradual. While the first wave of COVID-19 touched approx. 1 lakh cases in India, it was a more gradual increase, than the upcoming second one. The focus in the first wave, was majorly on arresting the import of virus, by monitoring the inflow of passengers from the affected countries. The arrival of an unfamiliar virus with its rising death toll led to an increase in fear in the country, leading to the announcement of lockdown. This gave time to revamp and scale-up the health infrastructure to match the rising spread of the pandemic.

Second wave: State-wide and localized

In comparison to the first wave, the rise has been sharper in the Second wave. In the Mid-February,2020, India was recording approx. 10,000 cases per day. However, by the end first week of May, the daily tally had touched an average of 4 lakh cases. On 4 April, 2020, Maharashtra imposed a weekend lockdown and night curfew including other restrictions. By early to mid-May, 35 of 36 of India's states and union territories had some form of state-wide and localized restriction. The second wave of the pandemic in India has seen no nationwide lockdown. Phased unlocking was announced starting June in Delhi, Tamil Nadu, Maharashtra, Uttar Pradesh and a number of other states. The second wave has been characterized by a false sense of normalcy. The elections in multiple states, including assembly as well as Panchayat elections have led to large gatherings. Also, Public places were opened and there were large religious gatherings leading to crowded places and spread of virus. Apart from that, the focus has now shifted from stopping the import of the disease to stopping the community transmission between the already infected and the rest of the population

Impact of COVID-19 pandemic on health system

Front line health workers facing stress, anxiety and burnout

As the country experiences waves of COVID-19, the focus shifts to how normal life can be resumed. The crippling impact the pandemic has left on the nation’s health system is starker than ever. Two years of fighting SARS-CoV-2 has been catastrophic not just for the India’s health system, which expended all its energy on futile exercises to tie down the virus and lay claim to exceptionalism, but also the healthcare workers, most of whom are exhausted and suffering burnout. The stigma surrounding COVID, anxiety over personal safety and that of families back home, physical rigours of operating donning a suffocating PPE kit and helplessness of having to watch people die every day were humbling and distressing, said doctors.

Oxygen shortage

In May 2021, India found itself at the global epicenter of the COVID-19 pandemic. As the second wave struck, the demand for medical oxygen soared ten-fold and tragic scenes unfolded as people struggled to access the life-saving commodity.

Corona virus: 'India's healthcare system failed my family'

People are waiting for up to 12 hours to get a cylinder filled

In the following Figure 4, a picture is provided clearly depicting the severity ofoxygen shortage deaths during covid 19 second wave in India.

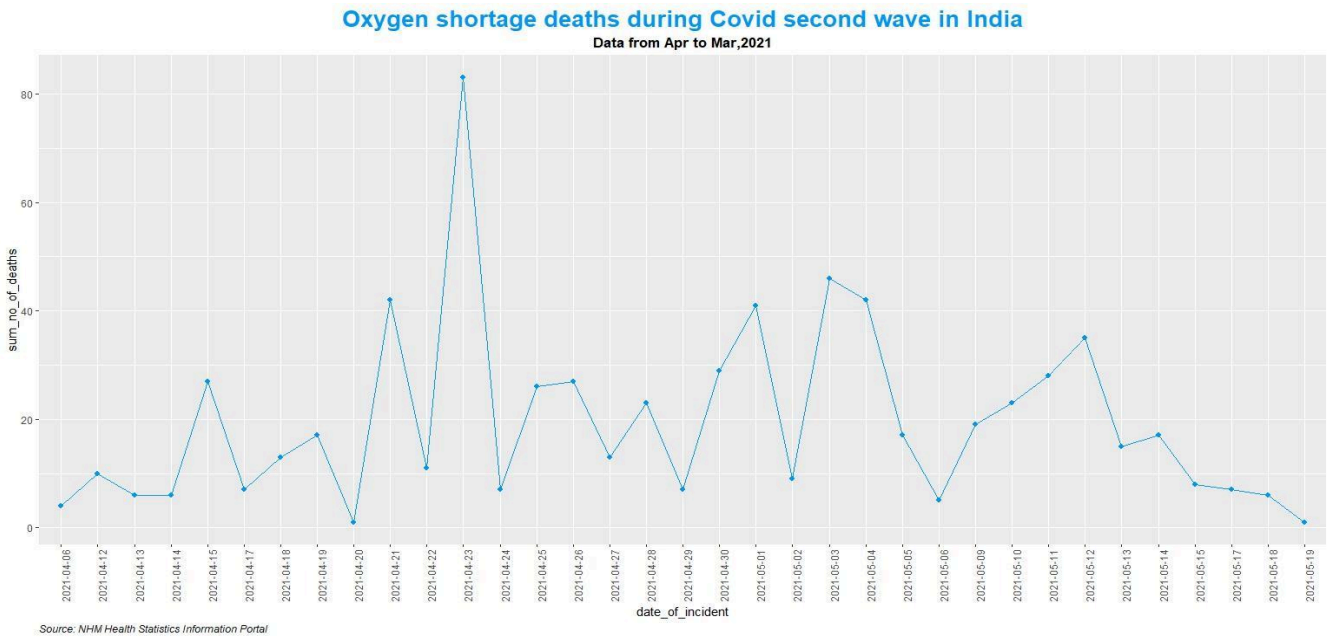

Fig 4: Oxygen shortage death during covid 19 second wave in India

COVID-19 has resulted in setting up numerous pressure swing adsorption (PSA) oxygen plants throughout the country. In a significant development, two medical oxygen plants funded by

PMCARES have been installed at AIIMS, New Delhi and RML Hospital. To try to get supplies to where they are needed, the government has now started an "oxygen express", with trains carrying tankers to wherever there is demand. In order to effectively address the high surge of Covid-19 cases in the country, PMCARES has allocated funds for the installation of 500 Medical Oxygen Plants across the country. In addition, hospitals in over 550 cities and districts were geo-mapped and an online system established to track the real time movement of the commodity.

Fig 5: Medical oxygen plant at AIIMS New Delhi

How has COVID 19 impacted healthcare companies in India?

While public policy measures have been implemented to contain the spread of COVID-19, the measures have resulted in significant operational disruption for many companies including those in the Indian healthcare industry. Staff quarantine, supply-chain failures, and sudden reductions in customer demand have generated serious complications for companies across a wider range of sectors than initially anticipated. For most, the revenue lost in this period represents a permanent loss and has put sudden, unanticipated pressure on working capital lines and liquidity.

Despite the current crisis being a healthcare issue, the private healthcare system in the country continues to reel under the negative impact of COVID-19. There has been a significant drop in both in-patient and out-patient footfall for private hospital chains—be it a single speciality, multi-speciality, tertiary-care hospitals or even diagnostics businesses, during this lockdown. This sudden decline in business has had an immediate effect on hospitals' ability to sustain fixed costs. The inability of new centres/hospitals to start generating cash, debt repayment obligations, decreased levels of medical tourism, and increased scheme revenues (which represents credit revenue) are some of the many factors impacting cash flow.

Rise of Digital Healthcare : Development of Best Healthcare Apps in India

CoWIN app: India sets a new world record by administering over 12.7 billion Covid vaccine doses in the fight against corona as of October 2022. Thanks to the CoWIN app, the indigenous healthcare app in India that protects from the precarious effects of coronavirus. The app allows us to follow a 3-step easy process viz.,booking an appointment, getting the vaccine as per slot allotted, and finally, downloading the COVID certificate, your licensed health certificate. The pandemic has accelerated digital adoption in healthcare, and people are increasingly resorting to

web & mobile app-based home healthcare services, telemedicine. All these triggers digital health leading to quality personalized healthcare services across geographical boundaries. Be it healthcare providers, hospitals, clinics, businesses, or patients, healthcare apps are dominating the healthcare sector in India. Let's find out a few of the best healthcare apps in India!

Google Playstore – Free & Paid Apps:

1. PharmEasy – Online Medicine **Ordering App (**Online Rating **– 4.5)**

PharmEasy app is one of the most popular healthcare apps in India specializing in online pharmacy. It allows to buy healthcare products, medical equipment, and products online. One can even book online diagnostic tests and other preventive health checkups from the comfort zone of your home.

2. Practo- Online Doctor Appointments & Consultation (Online Rating **– 4.5/5.0)**

Practo app allows one to access a wide network of multiple clinics, doctors who provide online consultations to patients across the country. The app has more than 5 million installs by now across India. Patients can have a direct chat and calls with the doctors. The app uses Google Map to identify doctors who are available in the locations near to patients.

3. mFine (Online Rating **– 4.5/5.0)**

mFine has 2 million app downloads. It offers 24*7 AI-enabled telemedicine services The very app connects more than thirty specializations for consultancy services. A patient has to pay for booking an appointment over the app but needs not to pay again during follow-ups. The app arranges for personalized digital prescriptions as well as home-diagnostic tests.

4. Pedi -STAT (Online Rating **– 4.5/5.0)**

A significant healthcare app for pediatric patients in the emergency and critical care wards. Pedi-STAT app works for a timely and rapid reference for paramedics, RNs, physicians, and pediatricians.

5. Critical – Medical Guide (Online Rating **– 4.0/5.0)**

A marvelous app that takes care of the entire critical care needs and a comprehensive guide for that regard.A complete critical care reference app for RNs, physicians, and other healthcare professionals.

iOS Appstore – Free & Paid Apps:

1. Apollo 247 (Online Rating **– 4.0/5.0)**

Apollo 24|7 app provides outstanding app- services like a personalized level of health experience in all, priority access, and valued Prices. Absolutely a complete healthcare buddy that is available 24*7 anywhere in India.

2. Netmeds (Online Rating **– 4.5/5.0)**

Netmeds app makes your medicine delivery an easy process. The Netmeds healthcare app in India also allows you to consult doctors online, book lab tests, and obviously, home delivers your medicines.

3. Hompath FireFly (Online Rating **– 3.0/5.0)**

It is a popular homeopathy app based in AppStore. Hompath FireFly app refers to 10 repertories directly from Kent, Boericke, Kent, Boenninghausen, and many more, while effectively managing patients' cases over virtual mode anytime, anywhere.

Fig 6: Purposes of Apps Related to COVID-19

Precipitated by the rising demand for effective treatment, we observed a surge in digital technologies within the ambit of healthcare, leading to the evolution of an array of solutions comprising e-pharmacies, teleconsultation, e-diagnostics, among others. This is clearly reflected in the tremendous growth of the digital healthcare market. Valued at INR116.6 billion in 2018, it is expected to reach INR485.4 billion by 2024, at a CAGR of ~27.4 per cent during the 2019-2024 period. While the decrease in physical interactions and mobility has enabled patients to get online services, increasing internet penetration together with the adoption of e-commerce has further accentuated the demand for digital healthcare. Unquestionably, tools facilitating affordable consultations and an easy interface connecting everyone across health systems are likely to be the new normal. This imperative transformation is gradually helping seep healthcare access to smaller towns and rural areas.

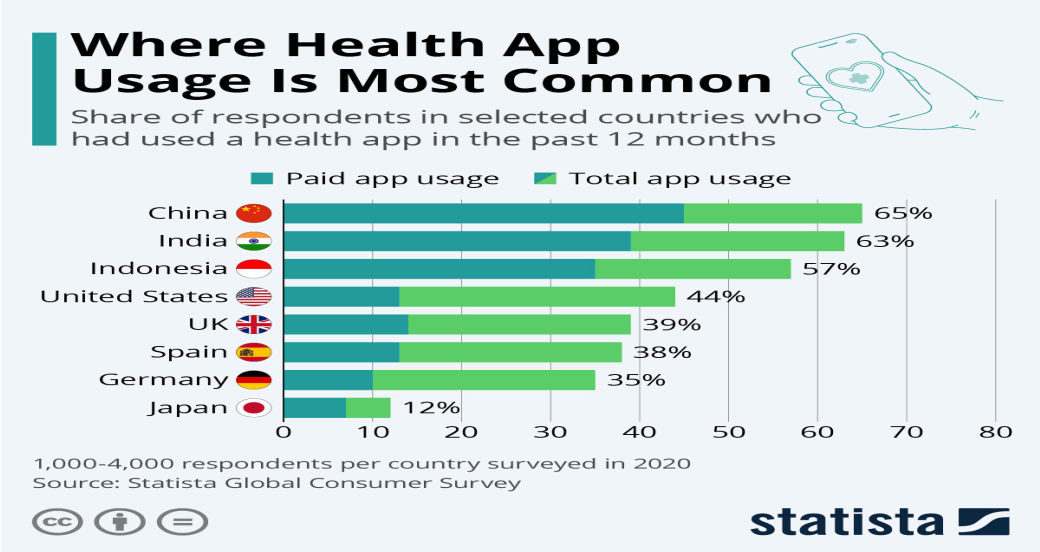

Fig 7: Comparison of usage of health apps for India with other countries

Effect on mental health and surge in suicidal cases:

Suicide rates in India increased during the first year of the COVID-19 pandemic, and although the increase in suicide rates, especially among males, predates the pandemic, the increase in suicide rates was highest in 2020, compared to increases in previous years. It was observed that the increase in suicide rates was substantially greater among males compared to females. The traditional role of males as the—"breadwinners"—of the family in India and the pressures of providing for the family have been highlighted as a potential reason for male suicides in India. The social disruptions caused by the COVID-19 pandemic might have, in part, contributed towards this increase above what would otherwise have been expected. While untested, it is possible that the economic consequences of the pandemic (e.g., loss of job/income) and the associated role strain and shame might have been experienced more severely, on average, among males. Crude suicide rates from 2010 to 2020 were calculated for the three specific groups of Indian states categories based on their Sociodemographic Index (SDI); low SDI, middle SDI and

high SDI, with the low SDI states being the most underdeveloped in terms of per capita income and literacy and fertility rates In India, the higher increase in male suicide rates in low SDI states, compared to middle and high SDI states, might be reflective of the severity of the negative social and economic impacts of the pandemic among already disadvantaged households. However, further research is required to measure potential impact of COVID-19 on suicide rates in India. Ongoing monitoring and consideration of specific sub-populations (e.g., age-groups, religion, and caste) remains paramount in order to determine any ongoing impacts of the COVID-19 pandemic on suicide rates in India.

Mental health services in India have undergone a period of scaling up over the past decade, and new initiatives were commenced during the COVID-19 pandemic. Yet, as in many middle-income countries, critical shortages remain in mental health personnel and other health system infrastructure in several parts of the country. It is possible that the mental health system in less developed parts of India was less able to be as responsive to the increased mental health burden in the community during the COVID-19 pandemic compared to settings with more resourced mental health systems. Moreover, mental health issues are highly stigmatized in India, contributing further to gaps in help-seeking and service provision. Primary reasons gleaned from both primary and secondary data include long working hours, increased workload, and fear being infected and/or infecting family members. Mental health workers (MHWs) engaged in direct management of COVID-19 in ambulatory services, ICU, and isolation facilities have been most affected. Additionally, primary data highlighted dealing with difficult patients and family members, change in roles and responsibilities and resource constraints as reasons.

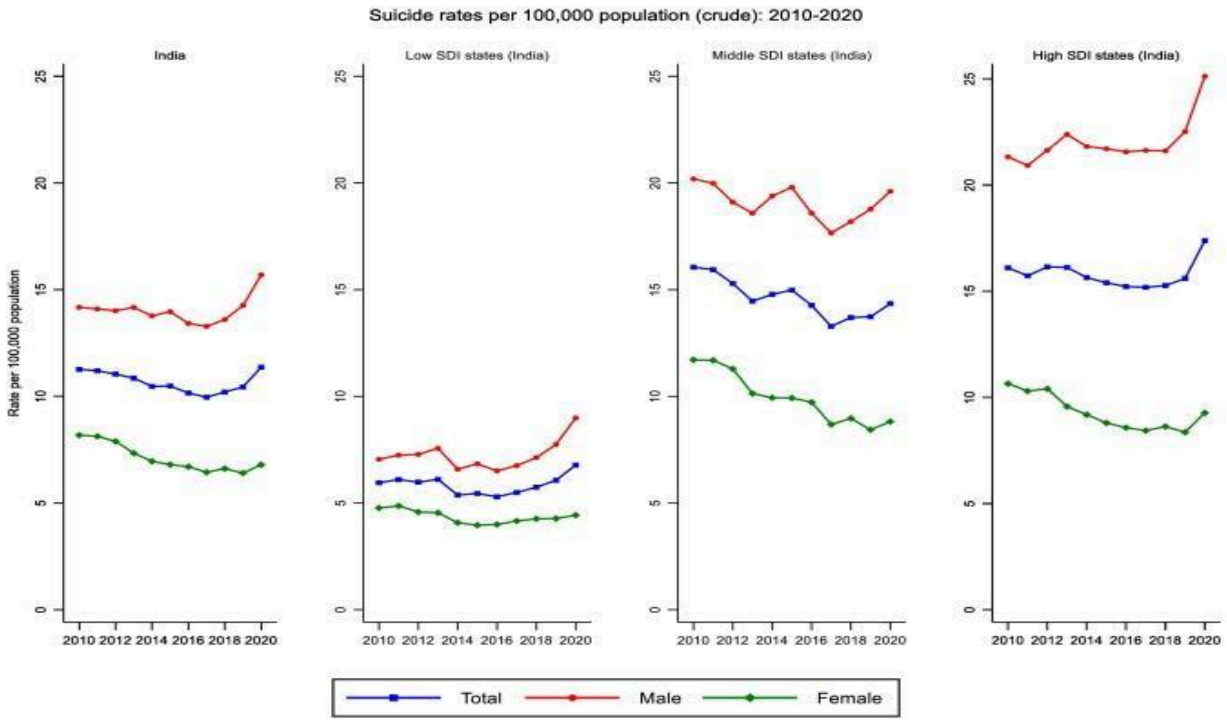

Fig8: Suicide rates (crude): India and by Socio-Demographic Index (SDI) state categories (2010–2020).

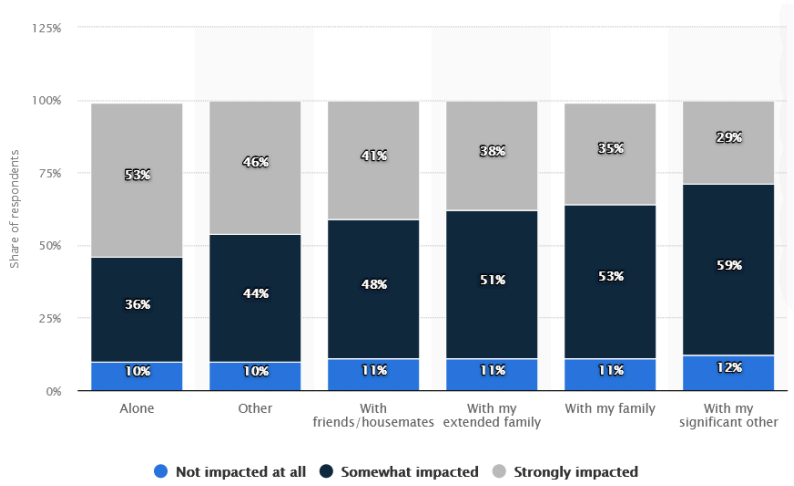

Fig 9: Impact on mental health during the corona virus (COVID-19) lockdown in India as of April 2020, by companion.
Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8983610/#bb0050

Fig 10: Stress and anxiety on mental health workers

Conclusion

As we enter the COVID-19 recovery phase, it will be critical to reflect on the role of health systems - in fostering resilient societies. The global health crisis and the lockdown that followed have brought to the fore professions that have often been taken granted, renewing our awareness of their value to society. This helped restore a sense of esteem for those workers who have worked relentlessly during this time to keep economies afloat.The frontline healthcare workers are at risk of physical and mental consequences directly as the result of providing care to patients with COVID-19. Even though there are few intervention studies, early data suggest implementation strategies to reduce the chances of infections, shorter shift lengths, and mechanisms for mental health support could reduce the morbidity and mortality amongst HCWs.The most commonly reported adverse events with COVID-19 vaccines are expected vaccine side effects, such as headache, fatigue, muscle and joint pain, fever and chills and pain at the site of injection. The occurrence of these adverse events is consistent with what is already known about the vaccines from clinical trials.The impact of COVID-19 pandemic and lockdown on health and healthcare was negative. The exaggeration of income inequality during lockdown can be expected to extend the negative impacts beyond the lockdown.Although we have not yet recovered from the pandemic effects completely, situations are improving a lot in India owing to public awareness.

References

- https://www.thehindu.com/news/national/kerala/crippling-impact-of-pandemic-on-health-system/article38350258.ece
- https://www.bbc.com/news/world-asia-india-57911638
- https://www.news-medical.net/health/History-of-COVID-19.aspx
- https://www.jica.go.jp/india/english/office/others/c8h0vm0000fdjmnd-att/study_02.pdf
- https://www.thehindu.com/news/national/kerala/crippling-impact-of-pandemic-on-health-system/article38350258.ece
- https://www.bbc.com/news/av/business-55355587
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8983610/#bb0050
- https://www.statista.com/statistics/1170404/india-impact-on-mental-health-covid-19-lockdown-by-companion/