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India's COVID-19 Episode: Resilience, Response, Impact and Lessons

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Abstract

Despite the commonality of loss of lives, every pandemic has played a role in shaping the socio-economic and public health outcomes depending on the nature and the magnitude of the outbreak. In this study, we have attempted to make a preliminary assessment of COVID-19 impact on India and commented on the country's resilience, response, impact and draw the lessons for the future. Although lockdown was necessary to stop the transmission, is showing and will show a greater impact on all spheres of human life considering the country's poor resilient socio-economic institutions. Our concurrent assessment in the middle of the outbreak predicts that the socio-economic, demographic and health costs in India would be much higher than developed countries. Initiation of timely action from the very beginning (when the first case reported in Kerala) could have plummeted the potential transmission in every corner of the country to a large extent and could have avoided socio-economic crises that presently surfaced in the country. The study provides a strong message for initiating sector specific measures alongside relief packages to reduce the damage not only for now but also to build a resilient system for socioeconomically vulnerable groups, health care services, and education infrastructure to face future pandemics. Otherwise, the pandemic like this can cost more.

Introduction

India's response to the outbreak of the novel Coronavirus 2019 (COVID-19) is so far noteworthy and has been receiving mixed reactions from around the world. In particular, the World Health Organisation (WHO) is lauding the country's response to the problem with the complete lockdown of 1.38 billion populations for more than five weeks. The country also made a relatively early response by restricting the entry of flights from around the world, compared to the United States, Italy, Spain and other European countries which are now a hotbed of the problem. Such massive scale of response is expected to have mixed implications for the country, though very essential to stop the highly infectious virus spread. Thus, in this review article, we have analysed in detail what has led to the initiation of such stern measures by India, and its social, economic, demographic and health impacts that the

country is experiencing and will experience in the future. Specifically, we would like to answer four questions: (1) Are we paying heavily for the lack of resilience to catastrophes in the country? (2) Where India's strategy went wrong? (3) What are the positive and negative consequences of India's response and how they vary by economic status, age and gender? (4) What we can learn from different state government responses?

Background

Amidst the recent global crisis sparked with the outbreak of the COVID-19, biological researchers have already been unravelled its potential risks to infect humans long before [1]. Despite the substantial scientific evidences on how the animal origin of human coronavirus can cause possible disease outbreaks, it hardly received any attention in biomedical and clinical sciences, public health systems around the world to predict and prevent the emergence of pandemics or built resilience in health care, economic and social systems [2-4]. Previously, the world has experienced two critical epidemics related to two different beta-coronaviruses in last two decades: Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) transmitted from civet cats to human in 2002 with a fatality rate of 10% and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) which was transmitted from dromedary camels to human in 2012 and recorded 37% fatality rate [5-7]. The outbreak of SARS-CoV and MERS-CoV which considered to be less contagious than novel COVID-19 killed more than 800 and around 858 people respectively all over the world [8,9]. Apart from these two, the outbreak of Swine-origin Influenza A Virus (H1N1) infection also killed over 18,000 people with a fatality rate of 30% between January 2009 and August 2010 [10]. While, until 17th April, 5.00 PM, the COVID-19 has resulted into 2,169,022 confirmed cases and 146,071 deaths worldwide [11].

Why India case is important?

As of 17th April, 2020, India ranks 18th globally in terms of confirmed cases of COVID-19 while the USA reported the highest confirmed cases and number of deaths. Considering the global course of the pandemic, several research teams have projected that India may vary between 97 thousand to 250 million infected cases and 30 thousand deaths due to COVID-19 by July 2020 [12, 13]. However, doubts are arising on the reliability of those mathematical modelling and projections due to several assumptions and least baseline information that the models are using [14]. So far may be due to complete lockdown, it is apparent that the rise of cases in the country is not as per the projected numbers, although picking-up very fast from the second week of April. Nevertheless, this study does not focus on the number of cases or deaths that India will have by the lifetime of COVID-19 episode. Based on the current trends and the average of projected figures from various teams, we assume that the number will be much higher than the underprepared health care, economic and social systems of the country could manage. The country did not take the lessons from the past experiences to prepare ahead to tackle the crisis and its adverse effects on socio-economic and health dimensions during pandemics. For instance, the highly infectious Spanish flu in 1918 had killed about 10 to 20 million in British India out of 20 to 50 million worldwide estimated deaths [15]. The last contemporary epidemic of H1N1 outbreak caused 981 deaths in 2009 [10]. Moreover, the

country has experienced 4971, 1094 and 1055 deaths respectively due to H1N1, Malaria and Dengue in the last five years [16-19]. Thus, it is crucial to understand the resilience of the country to the catastrophe and its implications on various institutions and individuals of the society and how they differ for different economic groups, ages and genders.

In this study, we have assessed the impact of ongoing COVID-19 on social behaviour of the population, socio-economically vulnerable groups, education system and health care services. We have drawn several inferences based on our preliminary assessment on the lessons for building resilience and preparedness for the states and its people against future pandemics in general and to avoid, prevent and minimise the damage from COVID-19, in particular. However, the costs of the pandemic over its lifetime run will outsize our assessment.

State response

What went wrong?

Although the lockdown is an inevitable solution to control the pandemic, its implementation was abrupt, poorly conceived and underprepared, unlike other Asian countries that have already flatten the curve: China, Singapore, Hong Kong, South Korea and Taiwan. Considering the time lag between the first case reported in India and the country-wide lockdown, the preparation could have been much better. Besides, the country failed to prevent the import of the virus and break the channels to contain the spread with an early shutdown of international travel and closing of country borders.

Fig 1 explains the channels of the spread of COVID-19 in India. On one hand, the country took more than 50 days since the first confirmed case to put an international travel ban from selected countries and suggested 14 days quarantine for travellers from high-risk countries. The country also failed to check the inter-state and urban to rural mobility-related issues, safety and precautionary measures until 25th March, after the first shutdown happened on 22nd March which escalated a forced and massive mobility of an enormous number of working-age populations, temporary and seasonal migrants to shift to their hometown without any thermal screening in the railway stations and many domestic airports. This was one of the biggest mistakes the country made as it carries a high potential to spread the virus in rural and smaller towns of the country.

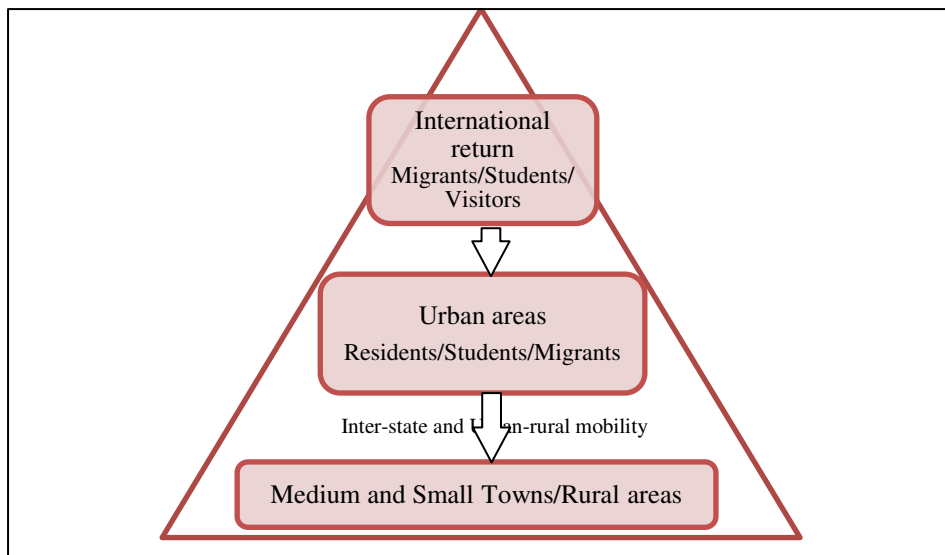


Fig 1.Channels of spread of COVID-19 in India

On the other hand, a prior strategy of dealing with urban migrants, employees in the informal sector, and livelihood options for daily wage earners, migrant workers, and students were completely missing. Sudden lockdown not only exposed millions of migrant workers and students to the virus while travelling through flight, train or local transport but it also pushed an unprecedented number of people at risk who were travelling with them and their family members, particularly elderly in their homes. The previous studies have already documented based on evidence from the countries with higher fatality rates for COVID-19, like Italy and Spain [20, 21] that the elderly population is at a high risk of COVID-19 and requires maximum care and treatment to fight the disease [22]. Therefore, intergenerational transmission within households, mainly from working age-group to older populations can worsen the fatality rate for the elderly population. Precisely due to this reason, Italy is experiencing more mortality with less number of cases than China. In the context of India where 85% of the elderly population (60 and above) co-resides with their children can increase the chance of extensive community spread [23, 24].

Considering India ranked 145 out of 195 countries in the Health care Access and Quality Index (HAQ) which is far below China (48) [25], the alarming situation requires enormous strengthening of health care infrastructure. In the beginning, the country has put conditions on testing and the rate of testing is still the lowest in the world due to its small capacity. India tested 302956 cases between 30th January and 16th April 2020. Moreover, India initiated to prepare more laboratories for testing samples and ordered nearly 7 million test kits [26]. A major scarcity has already raised in terms of stockpiles of necessary personal protective equipment (PPE) for the health workers. The country has a total of 1.6 million beds including its private sectors [27], while around 2.6 million beds may require if situation continues [28]. Until recently the country has not permitted private sector providers to pitch in due to fear of cost escalations, although it put a cap on the cost of testing.

Impact

Social behaviour and reactions

As a response to the health hazard and government interventions, the people from different sections of the country are perceiving and receiving the measures differently. In this section, we tried to look into deeper and shed light on the people's response to the state's measures.

Lack of awareness, panic-stricken or irresponsible behaviour

The fight against highly contagious COVID-19 demands and recommends the spirit of co-operation from every individual of the society and solidarity among the citizens across the socio-economic classes. However, a range of reported incidents exhibits the lack of awareness, helplessness on the one hand, but sheer negligence and irresponsible behaviour is also evident on the other hand, among different sections of the population. For instance, fleeing from quarantine, taking pills to lower temperature, and reluctance in testing among COVID-19 symptom patients are surfaced in the country. Furthermore, suicide in fear of COVID-19 is also evident in India [29].

Stigmatisation and discrimination

Due to the fear of getting exposed to the virus, people started discriminating and stigmatising others based on their appearance, occupation and travel history. A plethora of incidents of stigma and racial discrimination have been reported in different parts of the country in the name of social distancing. Mainly, north-eastern students are facing extreme xenophobic behaviour because of their Mongolian/Chinese features. Besides, doctors, healthcare workers, and flight attendants are suffering from social exclusion from their landlords, neighbours and community suspecting that they might be contacted with infection. Also, the Indians, as well as foreign nationals those who have travel history, are experiencing unkind behaviour from natives irrespective of their health situation or their test results. In fear of being ostracised, many people are even fearing to report actual health condition and not seeking proper treatment [30].

Myths and superstitions

With the outbreak of COVID-19, people from a particular religious fringe group started promoting the medicinal values and miraculous properties of cow urine, cow dung, burning gum resin and arranging cow worshipping programme. There are reports of people felt sick due to cow urine consumption to prevent COVID-19 infection [31]. However, Ministry of Health and Family Welfare and ICMR alongside WHO have initiated platforms to disseminate authentic information related to the infection, advisories and treatment procedure for the infection. Media houses have also contributed to myth-busting, although myths and superstitions are not completely out of Indian minds.

Education Disruptions

The decision to close academic institutions in the mid of the outbreak, although important to prevent the transmission, but lack of advanced planning from both the state and institutions-

side will have a long-term repercussion on ongoing academic-year and mental health outcomes of the students. The abrupt shutdown has pushed them to move to their hometowns through unsafe public transport which might have increased their chance of being infected or infecting other people during the journey and family members at the homes. Even if the lockdown is lifted, it is now uncertain when the institutions will resume. Parents are less likely to send their children unless pandemic declared over. A majority of academic institutions in a country with 320.7 million learners or students from primary to tertiary levels do not have a catastrophic resilient system, unlike its developed counterparts [32]. Considering the lack of education infrastructure, a majority of the schools, colleges and universities are not in a position to conduct virtual learning classes and distributing study materials to compensate for the academic losses. Not only from the institutional obstacles, but also a considerable number of the students are not equipped to be present online either due to poor internet connectivity in rural areas or lack of facilities at home. This might increase huge rural-urban and economic inequalities in educational outcomes in the country.

Wage loss, destitution and homelessness

About 450 million informal workers constitute 90% of India's workforce are not allowed to have paid leaves. A majority of them are migrant workers who are at the edge of the crisis during the lockdown when work from home becomes the new normal all over the globe due to the outbreak. Many among these inter-state migrants chose to walk hundreds of kilometres in the hope to reach to their hometown [33]. Among them, the fear of remaining hungry over daily wage loss is outweighing their fear of the virus.

Moreover, the Central Government relief measures were missing until 26th March, 2020. To ensure the relief packages for migrant workers, they should have been registered in their state of work and data must be available with Ministry of Social Justice and Empowerment. The early declaration that the state will be providing them with shelters and relief packages to stay back at the place of work during lockdown could have scaled down the crisis.

Compared to the countries that are spending up to 10% of the country's GDP, the recent relief packages announced by India is a minuscule for its population [34]. Lack of inclusiveness in relief packages is unfavorable to families outside the PDS system, households without a functional kitchen, and for pregnant women and mothers [35]. Though, states like Kerala, West Bengal, Karnataka, Delhi, Uttar Pradesh, Maharashtra and Telangana have allocated decent budget to mitigate the nutritional needs of the poor to a considerable extent. Also, civil society efforts can't be ignored in this regard.

India is the home for nearly 1.8 million populations for whom roadside footpaths are the only place to be self quarantined and maintaining hygiene without having basic amenities (water and soap) to continue the battle against COVID-19. In addition, 29.4% of the urban population resides in densely populated slums with semi-permanent structures [36]. They are carrying multiple burdens of fear of getting infected, community transmission and limited access to water, sanitation, hygiene and health care facilities.

The distribution of relief packages is disrupting due to interstate transport restrictions. Further, the identification proof requirements, inadequate amount and bouncing back of cash transfers, transfers into wrong accounts and transaction failures are some of the challenges to distribute relief packages to poor. A large proportion of the middle class and upper-middle-class also standing in the line for relief packages at the distribution centers raised major problems for the homeless population and migrant workers in receiving the support [37].

Gendered impact of COVID-19

Considering India's patriarchal society, the gendered division of labour has been practiced traditionally and household chores and care work has largely been considered as women's work. Thus, the closure of schools, shops and offices as a result of the complete lockdown would bring more burdens on women to arrange groceries, water, food and run the households properly. Along with, loss of livelihoods is relatively higher for women since female workforce in India largely confined in the informal sector. Thus, the gender difference in time allocation for leisure and sleep will further increase and the absence of alternative livelihood options lead to conflicts. It will ultimately affect women's both mental and physical health adversely [38]. Previous evidence also suggests the rise in gender-based violence, divorce and separation rates during pandemics [39].

Further, the female elderly in both rural and urban areas might face the toughest conditions to access basic amenities and livelihoods amid ongoing crisis. In the long-run, pandemic may have a gendered economic impact. Loss of jobs and livelihood may increase the age at marriage for males, as well as child marriages for females. More often relief packages, policies and public health initiatives often overlooked to the gendered impacts of pandemics. Until now, the responses to COVID-19 show the same.

Impact of COVID-19 on Other Health and Demographic outcomes

Globally, deaths due to COVID-19 recorded highly among co-morbid people. Therefore, considering the high multiple morbidity prevalence in India, the pandemic will have a huge impact on other health care provisions and health outcomes. In India, nearly 69 lakh people access outpatient services on daily basis from Government hospitals (30%), Private hospitals (23%), Private doctors/clinics (43%), and Other (Charitable and NGOs) health care service providers (4%). Thus, ignoring other health care services further aggravates the chance of being infected with COVID-19 to a large section of the population. Besides, transportation shutdown hit hard the poor and lower-middle-income classes who do not have their own vehicles to reach emergency health care services.

Alongside, mobility restrictions affect attendance of frontline health workers to provide basic health care like ANCs for pregnant women, delivery and new-born child care services. It is evident that the lack of access to health services usually causes nearly 3600 pregnancy-related deaths per month and 2800 under-five child deaths per day. Further, in India, 49,481 births take place per day [40,41]. Thus, lockdown-driven panic and crisis certainly affect pregnancy outcomes. In addition, postponement of child immunisation can negatively impact

on child health outcomes, though, essential services are available but the scarcity of public transportation and fear of infection may hamper the access.

The global evidence suggests that there was a high demand for contraceptives and abortion services during the outbreak of Zika virus in 2015-16. The limitation in availability and accessibility of contraceptives may persuade unintended pregnancies, abortion, sexual and reproductive tract infections, and lack of hygienic menstrual absorbents can lead to adverse health consequences for females of reproductive age-group, especially health workers [42].

Moreover, many cases of mental health emergency due to COVID-19 phobia have already been reported in India [43]. Mainly, the asymptomatic nature of the disease and social disconnectedness is fuelling the mental health issues among the older population while youths are suffering from the fear of uncertain future, academic year and job losses.

Challenges ahead and lessons

Lack of preparedness for COVID-19 resulted and will result in a huge social, economic and health consequences. Even though imperative, the sudden decision of total lockdown of the country is a result of poor resilience of the country's socio-economic and health care system to tackle the disease outbreak. The decades of neglect and under investments in health care and social welfare sectors have resulted in the worst crisis. This is the high time for India to foresee the impacts of pandemic on social, economic and health fronts and take adequate steps to minimise the damage during the ongoing pandemic and be resilient to face the future pandemics.

Cultivating the Social behaviour

Incidents of racism, discrimination, and stigmatisation are increasing at an alarming pace in India amid the outbreak and most of them are as a consequence of lack of awareness, myths, and superstitions. It puts a certain section of the population in more danger than others. Therefore, busting myths and strong awareness campaigns on health and hygiene knowledge right from school level and through mass media campaigning is the need of the moment. Although, it is not a moment to cherish, but the COVID-19 outbreak immensely contributed to India's Swachh Mission and building public health awareness among the people. If the governments facilitate resources and people continue to follow the same hygiene practices, it will have a remarkable positive impact on other health outcomes as well.

Building catastrophe resilient education system

While, the developed countries put continuous effort to compensate academic loss of the students with the help of well-equipped device, network to attend virtual classes, distributing lesson plans, study materials, conducting lectures online, India lags behind in having such infrastructure for the alternative arrangements. A considerable number of the students are not equipped to be present online due to the lack of resources and majority of the educational institutions are not equipped to provide such services. Hence, a substantial investment is

required not only to address current problems, but also to make the institutions resilient to future pandemics and other catastrophic circumstances.

Building catastrophe resilient health care system

The current situation of pandemic led lockdown and crisis are not only pulling down the plagued health care system but also highlighting lacunae in building preparedness to counter the pandemic. From the very beginning low and conditional testing, screening, limited laboratories, and scarcity of equipment ultimately heading towards underestimation of cases and outbursts in large numbers through community transmission. However, estimates from National Health Profile 2019 data reveal that India just has a 0.55 bed for 1000 population and 17,856 to 25,556 ventilators which is not sufficient to take the extra burden of pandemic [44]. Moreover, 63% of these resources are with the private sector. Besides, a shortage of PPE can increase the risk of infection among frontline health care workers. The country must go for health care reforms and adopt a comprehensive strategy to build a resilient public health care system not only for now but also for future. However, Kerala is becoming a model for India to battle against Nipah Virus earlier and first state to flatten the curve of COVID-19.

Conclusion

In this situation, India has taken the most obligatory step of lockdown to contain the spread of the virus. However, according to WHO, the identifying, screening and testing of a large number of the population irrespective of their travel history, symptoms, place of residence and economic condition is highly needed. The success stories of other Asian countries suggest that massive tracing and testing can detect the infected, stop the spread and widespread community transmissions. In addition, increase in supply of PPE is much required to reduce risk for the health workers.

Going beyond controlling the health crisis, it is critical to take inclusive protective measures to deal with the socio-economic crisis as well. Many other experts have adequately articulated that homelessness during the time of quarantine, loss of livelihoods, lack of health care, job loss, financial insecurity and hunger can make the life of large number of population more miserable. Nevertheless, state governments are taking steps as per their capacity and the central government also declared relief packages, although it is grossly inadequate as pointed above. Though, few questions are awaited to be answered shortly: whether the actual poor population will get the benefit or corruption and leakages will defer the process? In what extent the direct cash transfer will be beneficial for homeless households without bank accounts?

In addition, the country must prepare to address the multi-sectoral issues. Modernising educational institutions for virtual learning and related infrastructure is must to make the education system resilient to crisis circumstances. Besides, pandemics make women more vulnerable and increase gender-based violence. Gender responsive measures are critically needed along with developing government helpline, email communication, virtual space to

get connected with the advocates and counsellors to report, take advice and maintain mental health as developed countries already initiated.

Kerala model of identifying, tracing, testing and treating at the time of Nipah virus outbreak and also current COVID-19 must be replicated at the national as well as state level which will work as a stimulus to hailing health care system and affordable and equitable health care access to marginalised sections of the society. Centre and states must monitor other health care needs and medical requirements through public and private partnership in this crisis situation. The state must subsidise other health care services in the private sector hospitals and clinics for the humanitarian cause under this grim situation. Further, COVID-19 is affecting and will affect the progress towards the sustainable development goals (SDGs) and will minimise its investment.

In conclusion, we advance that the experience of Ebola and Zika outbreaks and unpreparedness of the global public health community reminds the value of research and development. In countries like India, strengthening research and development is urgently needed. In a long-run, a greater investment into clinical, biomedical, micro-biological and public health research for detecting the threat in advance, building resilient socio-economic and health systems, developing affordable diagnosis and understanding in advance the socio-economic, demographic and gendered impacts is of foremost importance.

References

1. Menachery, V. D., Yount Jr, B. L., Debbink, K....& Randell, S. H. (2015). A SARS-like cluster of circulating bat coronaviruses shows potential for human emergence. *Nature medicine*. 21(12), 1508.
2. Lin, X. D., Wang, W., Hao, Z. Y., Wang, Z. X... & Tang, G. P. (2017). Extensive diversity of coronaviruses in bats from China. *Virology*. 507, 1-10.
3. Dominguez, S. R., O'Shea, T. J., Oko, L. M., & Holmes, K. V. (2007). Detection of group 1 coronaviruses in bats in North America. *Emerging infectious diseases*. 13(9), 1295.
4. Lau, S. K., Woo, P. C., Li, K. S., Huang, Y... & Yuen, K. Y. (2005). Severe acute respiratory syndrome coronavirus-like virus in Chinese horseshoe bats. *Proceedings of the National Academy of Sciences*. 102(39), 14040-14045.
5. Hsieh, Y. H. (2015). Middle East respiratory syndrome coronavirus (MERS-CoV) nosocomial outbreak in South Korea: insights from modeling. *PeerJ*. 3, e1505.
6. PMC, J. E., & API, G. R. (2016). Middle East respiratory syndrome coronavirus outbreak in the Republic of Korea. 6(4):269-78.
7. Kandel, N., Chungong, S., Omaar, A., & Xing, J. (2020). Health security capacities in the context of COVID-19 outbreak: an analysis of International Health Regulations annual report data from 182 countries. *The Lancet*. Vol 395 Issue 10229.
8. Wilder-Smith, A., Chiew, C. J., & Lee, V. J. (2020). Can we contain the COVID-19 outbreak with the same measures as for SARS?. *The Lancet Infectious Diseases*.
9. World Health Organization. Middle East respiratory syndrome coronavirus (MERS-CoV). (2018). Geneva: World Health Organization, c2018. Available from: <http://who.int/emergencies/mers-cov/en/>.

10. Bagchi, S. (2015). India tackles H1N1 influenza outbreak. *The Lancet*. 385(9972), e21.
11. John Hopkins University & Medicine. Available from: <https://coronavirus.jhu.edu/map.html>
12. CDDEP. (2020). COVID-19 Modeling with IndiaSIM. India State-Level Estimates. 2020 24 March. Available from: <https://cddep.org/covid-19/>
13. COV-IND-19 Study Group. (2020). Predictions and role of interventions for COVID-19 outbreak in India Crisis Of Virus in INDIA (COV-IND). 22 March. Available from: https://medium.com/@covind_19/predictions-and-role-of-interventions-for-covid-19-outbreak-in-india-52903e2544e6
14. Reddy, S. Models on mortality are not reliable: Srinath Reddy. (2020). *The Hindu Business Line*. March 25. Available from: <https://www.thehindubusinessline.com/opinion/models-on-mortality-are-not-reliable-srinath-reddy/article31155506.ece>
15. Chandra, S., & Kassens-Noor, E. (2014) The evolution of pandemic influenza: evidence from India, 1918–19. *BMC infectious diseases*. 14(1), 510.
16. MoHFW. Seasonal Influenza (H1N1)– State/UT- wise, Year- wise number of cases and death from 2010 to 2017 (till 31st December 2017). National Centre for Disease Control. Director General of Health Services. Government of India.
17. MoHFW. Malaria Situation in India 2015. National Vector Borne Disease Control Programme. GoI.
18. MoHFW. World Malaria Report 2019. Geneva: World Health Organization; 2019. Licence; CCBY-NC-SA3.0 IGO.
19. MoHFW. Dengue/DHF Situation in India 2015. National Vector Borne Disease Control Programme. GoI.
20. Novel, C. P. E. R. E. (2020). The epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19) in China. *Chinese Journal of Epidemiology*. 41(2), 145.
21. Government of Spain. Ministry of Health Update 52. (2020). Coronavirus disease (COVID-19). (consolidated data at 9:00 p.m. on 03/21/2020) General Secretary of Health, General Directorate of Public Health, Quality and Innovation and Coordination Center of Alerts and Emergencies Sanitary. March 22.
22. Dowd JB, Rotondi V, Adriano L... & Mills MC. Demographic science aids in understanding the spread and fatality rates of COVID-19. medRxiv. 2020 March 31.
23. Golandaj, J. A., Goli, S., & Das, K. C. (2013). Living arrangements among older population and perceptions on old age assistance among adult population in India. *International Journal of Sociology and Social Policy*.
24. Choudhary, S. (2020). Elderly people may be more at risk of developing severe illness from Covid-19. *Livemint*. March 03. Available from: <https://www.livemint.com/news/india/elderly-people-may-be-more-at-risk-of-developing-severe-illness-from-covid-19-11583259211381.html>
25. Fullman, N., Yearwood, J., Abay, S. M., Abbafati, C., Abd-Allah, F., Abdela, J., ... & Abraha, H. N. (2018). Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a systematic

- analysis from the Global Burden of Disease Study 2016. The Lancet. 391(10136), 2236-2271.
26. Dey, S. (2020). ICMR: 70L test kits ordered, expected to reach anytime. The times of India. April 15. Available from: <https://timesofindia.indiatimes.com/india/icmr-70l-test-kits-ordered-expected-to-reach-anytime/articleshow/75150351.cms>
 27. World Bank. (2015). World Health Organization, supplemented by country data. Available from: <https://data.worldbank.org/indicator/SH.MED.BEDS.ZS>
 28. Gupta I & Bhatia M. (2020). International Health Care System. International Health Care System Profiles. The Commonwealth Fund. Available from: <https://international.commonwealthfund.org/countries/india/>
 29. Vij, Shivam. (2020). More than 300 Indians have died of the coronavirus, and nearly 200 of the lockdown. The Print. April 13. Available from: <https://theprint.in/opinion/more-than-300-indians-have-died-of-the-coronavirus-and-nearly-200-of-the-lockdown/400714/>
 30. Katariya M. Verbally abused, spat at, harassed: Northeastern citizens come under attack amid coronavirus panic. India Today. 2020 March 23. Available from: <https://www.indiatoday.in/india/story/verbally-abused-spat-at-harassed-northeastern-citizens-come-under-attack-amid-coronavirus-panic-1658826-2020-03-23>
 31. Bhattacharya, D.P. (2020). Thousands of litres of cow urine consumed in Gujarat daily. The Economic Times. April 1. Available from: <https://economictimes.indiatimes.com/news/politics-and-nation/thousands-of-litres-of-cow-urine-consumed-in-gujarat-daily/articleshow/74922747.cms>
 32. UNESCO. (2020). Global monitoring of school closures caused by COVID-19. Available from: <https://en.unesco.org/covid19/educationresponse>
 33. Slater J, Masih N. (2020). In India, the world's biggest lockdown has forced migrants to walk hundreds of miles home. The Washington Post. Mar 28.
 34. Arun T K. (2020). View: Go bolder and bigger on the COVID-19 relief package. The Economic Times. Mar 26. Available from: <https://economictimes.indiatimes.com/news/politics-and-nation/view-go-bolder-and-bigger-on-the-covid-19-relief-package/articleshow/74832795.cms?from=mdr>
 35. The Caravan. (2020). Concerned citizens' response to the COVID 19 relief package announced by the finance minister. Mar 27. Available from: <https://caravanmagazine.in/noticeboard/citizens-response-to-covid-relief-package-nirmala-sitharaman>
 36. Ministry of Housing and Urban Affairs. (2019). Handbook of Urban Statistics 2019, Government of India, New Delhi, India. 2019. Available from: <http://mohua.gov.in/pdf/5c80e2225a124Handbook%20of%20Urban%20Statistics%202019.pdf>
 37. Scroll. (2020). Covid-19 lockdown: 90% of migrant workers got no help from government or employers, shows survey. April 15. Available from: <https://scroll.in/latest/959271/covid-19-lockdown-90-migrant-workers-received-no-help-from-government-or-employers-shows-survey>
 38. NDTV. (2020). Domestic Violence Cases Have Risen Since COVID-19 Lockdown: Women's Panel. Available from: <https://www.ndtv.com/india-news/domestic-violence-cases-have-risen-since-covid-19-lockdown-womens-panel-2205133>

39. Wray, M. (2020). China's divorce rates rise as couples emerge from coronavirus quarantine. Global News. April 2. Available from: <https://globalnews.ca/news/6767589/china-divorce-rates-coronavirus/>
40. Ministry of Statistics & Programme Implementation. (2018). Household social consumption in India: Health NSS 75th round (July, 2017 – June, 2018). Government of India. Available from: <https://pib.gov.in/newsite/PrintRelease.aspx?relid=194918>
41. Office of the Registrar General of India, Vital Statistics Division. (2017). Report On Medical Certification Of Cause Of Death. Ministry of Home Affairs. Government of India. Available from: http://censusindia.gov.in/2011-Documents/mccd_Report1/MCCD_Report-2017.pdf
42. Sadeque, S. (2020). ****Correction****How the COVID-19 Pandemic is Affecting Women's Sexual and Reproductive Health. Inter Press Service News Agency. United Nation. April 7. Available from: http://www.ipsnews.net/2020/04/covid-19-pandemic-affecting-womens-sexual-reproductive-health/?utm_source=English+-+IPS+Weekly&utm_campaign=0609dee3f9-EMAIL_CAMPAIGN_2020_04_10_06_21&utm_medium=email&utm_term=0_eab01a56ae-0609dee3f9-5229201
43. Business Standard. (2020). Age of anxiety: Mental health is the next looming crisis in Covid-19 times. April 12. Available from: https://www.business-standard.com/article/health/age-of-anxiety-mental-health-is-the-next-looming-crisis-in-covid-19-times-120041001208_1.html
44. Singh P, Ravi S, Chakraborty S. (2020). COVID-19 | Is India's health infrastructure equipped to handle an epidemic?. Brookings. Mar 24. Available from: <https://www.brookings.edu/blog/up-front/2020/03/24/is-indias-health-infrastructure-equipped-to-handle-an-epidemic/>