

THE ETHICAL CONCERNS OF A PANDEMIC: A CRITICAL ANALYSIS AND OPINIONS OF THE INDIAN SITUATION IN COVID ERA

Ranjit Kumar Dehury*, Rajendra Mahanandia

School of Management Studies, University of Hyderabad, Telangana, India

Correspondence: ranjit@uohyd.ac.in

ABSTRACT

COVID-19 brought havoc in the world with its high infectivity and virulence. Many countries were caught unprepared in public health capacity and socio-economic parameters. In this trying time, public health ethics remain an unanswered question on many fronts of treatment and control of novel coronavirus. The objective of the paper is to analyse the significant ethical challenges faced during the COVID-19 pandemic. The pre-defined thematic areas based on critical issues are identified to understand the ethical concerns of prevention and control of COVID-19. Secondary sources of literature have been consulted, and pieces of evidence gathered to strengthen the arguments. The article also provides a recommendation on ethical measures for the preservation of human dignity and ethical practices. The human rights aspects of regulations during the pandemic of the coronavirus are discussed to understand various nuances of justice and liberty.

KEYWORDS

human rights, public health ethics, public health law, health diplomacy, lockdown, quarantine, justice and liberty, stigma

INTRODUCTION

The world has seen and faced many epidemics in the history of humanity. To name a few, plague, Spanish flu, chickenpox, smallpox, measles, polio, and many more, where human life had been threatened with massive mortality and morbidity. The recent flu-like epidemics like Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), which belongs to the coronavirus family, took heavy tolls on human life. The novel coronavirus (COVID-19) is believed to have originated in the Wuhan city of the Hubei province of China. [1] The coronavirus is named according to the outer fringe that seems to be the shape of a crown, which is a family of RNA

viruses. [2,3] The epidemic of China in late December 2019, reached India into the southern state of Kerala in the last week of January 2020. The pandemic forced India into total lockdown from the third week of March 2020. [4] The second wave of COVID-19 was found to be much more serious and engulfed both rural and urban areas with mayhem. India failed to match with the requirement of resources, where the public health challenges are many for such a gigantic epidemic of the highest order in recent times with multiple waves.

The World Health Organization (WHO) also declared this a Public Health Emergency of International Concern (PHEIC)

and later on as a “pandemic” to mobilize technical support and resource to fight the nano-unit measurable virus. [4,5,6] India invoke the Epidemic Act 1897 and Disaster Management Act 2005, in which the life and liberty of the people protected under the constitution were compromised.

The coronavirus is so much more virulent and infective that the entire globe is under threat, and the economic downturn happens with millions of lives in danger. [3] This is also referred to as the corona era by many media houses and opinion makers in India due to its protracted influence on humanity. The medical professionals, health care workers, police, and administrative personnel are also at the receiving end due to their direct involvement in the fight against the deadly virus. The lack of Personal Protective Equipment (PPE) and medication to fight against corona make the situation worse. The corona era knocks down every ethical standard set by the associations, professional bodies, governments, and multilateral organizations. Even new moral were norms drafted to combat the situation.

The objective of the paper is to discover and analyse the significant ethical challenges faced during the COVID-19 pandemic. Various predefined thematic areas are identified to understand the ethical concerns. For which authoritative sources were consulted, and evidence was gathered to strengthen the arguments. The literature search is done by using highly relevant keywords in trusted databases like PubMed, Scopus, Web of Sciences, and JSTOR. The thematic areas are discussed in the subsequent sections.

LOCKDOWN AND PUBLIC HEALTH ETHICS

Lockdown opens a Pandora box of public health preparedness in India in recent times. Due to poor management of lockdown the existing health care network is nearly non-functional, causing inconvenience to pregnancy care, cancer care, dialysis, emergency care, and many more. Although the government blows the trumpet about providing emergency medical services even during the lockdown period, there is still no transportation and availability of medical services in many parts of India, as reported by ground-level media and research personnel. This defeats the cause of continuums of care in primary health care services, which is the cornerstone of health care.[7]

There is rampant panic buying of the essential stuff by the citizens in the lockdown situation. There is also less socialization and more self-medication, which is dangerous for the people during the lockdown. The behavioural concepts like isolation, social distancing, and self-quarantine are detrimental to mental health conditions. [7] Although quarantine has a good effect on the health of the community, there are still personal sacrifices making the situation ethically challenging. During the swine flu epidemic, similar features were lockdown observed, which resulted in sheer anxiety among the people.[8] Many times online mental health counselling helped in coping with the situation and proved to be effective. [9]

The lockdown effect was found to result in gender inequality. The burden of care of the family, especially children and the elderly, was very adversely affected as well as the well-being of women. [10] In rural and urban areas, women are at the receiving end suffering from unattended health issues and domestic violence. One of the most significant public health concerns during the previous SARS and MERS experience is deteriorating mental health conditions among the victims.[11] Chinese researchers provided details about online counselling for health workers and those undergoing quarantine. Despite initial dissatisfaction with the government, the workers found a better work environment and emotional satisfaction after the provision of sufficient psychological support. [12] The nature of an unprecedented COVID-19 forced lockdown in various parts of the world which necessitates many immediate steps. In the first instance, to address a pandemic of unknown nature, few protocols were available on lockdown management. Whatever guidelines were available were those to address the situations of a terror attack or siege of a city in extraordinary condition. However, in a pandemic situation, the lockdown can be avoided by creating and enabling the citizens to adopt cautious behaviors in daily activities. This does not guarantee to contain the situation of an airborne or droplet infectious disease. Alternative methods of lockdown could have been used by following ethical norms in any outbreak of diseases.

ECONOMIC CONCERNS OF COVID-19

On the economic front, the world was threatened to a great extent because many marked blue-chip companies come to stand still in their business. The revenues of government weathered out, which results in the

unavailability of public services during the crisis time. Developing countries like India have more problems in augmenting medical services and feeding the underprivileged people for a longer period due to lockdown. The Strategic Preparedness and Response Plan (SPRP) was implemented for the protection of relatively weak states with a poor health system. The sole objectives of WHO and the government are to reduce transmission, provision of care, and augment communication networks to tackle the social and economic concerns. [5]

The Indian government asked the people to forget about their economic wellbeing and focus on their overall health of people. The poor in India does not have sufficient income to sustain their family. India is not self-reliant in many aspects of the economy and hugely depends on China and the European market to keep the economy operational. The breach in the global supply chain affects almost all economies. [13] The essential ingredients of various manufacturing plants in the pharmaceutical, engineering, automobiles, and aviation sectors usually come from China. Evidence has been found that the lockdown as a strict procedure in public health measures is in question, which is shown by the Indian Council of Medical Research (ICMR) study. [14] Researchers also confirm that people are much less likely to obey the rules and regulations of shutdown for more extended periods. [15]

In terms of psychosocial and economic aspects, the efforts of voluntary groups and voluntary organizations in providing food and other help to needy people are really notable. These organizations helped a lot to ensure the casualty is minimum. It has been seen that death due to COVID-19 took heavy tolls among the people serving on behalf of voluntary organizations in India. Despite economic concerns in the society a section of the community helped out in these situations.

PROVISION OF MEDICAL SERVICES

The provision of medical services in hospitals, irrespective of being public and private, are compromised to a great extent. The treatment of COVID-19 patients is in dismal conditions. The existing communicable and non-communicable diseases are not attended to in the hospitals due to fear of infections. Neither the patient nor the doctors and paramedic staff were ready to provide the services with utmost eagerness and compassion. Hence,

many of the hospitals even closed their emergency services in the corona era. Instances also found that if one staff member gets affected by COVID-19, the entire hospital was closed in the initial phase of pandemic, which resulted in the reduction of hospital services. Telemedicine provided at this time is just solving a minuscule of the mammoth problem on healthcare. The mode of transmission and herd immunity have to be understood to achieve success in the treatment process. [16, 17] Various mathematical models are used for the critical analysis of the situation of the diseases. Further assessment of the epidemiological process and immunological aspects need to be understood for successful treatment. [18]

There are models of epidemic disease dynamics working in many parts of the world. Accurate analysis is undertaken and treatment procedures are followed to achieve the desired result of treatment. Evidence found the effect of confounding variables like lockdown has a tremendous impact on the calculation of disease dynamics, and its influence still prevails. Further, adherence to social distancing norms in India has a significant effect on the control of COVID-19 initially. [19] Actually, many of the factors are ignored while calculating these estimates. Ultimately healthcare is not available to the needy, which poses ethical challenges (10). There is a daunting challenge for clinicians and the Food and Drug Administration (FDA) to select the right type of drugs to treat the patients. The limited observational and anecdotal evidence does not help much in the treatment of COVID-19. [20] Even the US Centres for Disease Control and Prevention (CDC) advocates for the use of some drugs in America, which were later on removed from the website. [21] The vetting of drugs with rigorous premarketing evaluation for safety is required for the approval of drugs. Further, adequate randomized control trials, which are used as a primary tool for the protection of the public are paramount in public health practice and ethics.

PUBLIC HEALTH PREPAREDNESS AND ETHICS

India shows a massive preparation for the new public health challenges of COVID-19. All people have to be treated equally. There must not be any deviation from the principles of the constitution in implementing healthcare programs. Health awareness, preventive measures, and treatment have to be provided within the ethical values and constitutional obligations. Irrespective of the socio-economic group, religion, gender, and ethnicity, everyone

has to be protected with the utmost care. However, reports mention there is some degree of discrimination in providing services to the people based on some attributes which are unethical.

In India, there are many unique features of cultural, demographic, epidemiological, and risk factor profiling that need to be addressed while forecasting and taking steps for preparedness and treatment. [19] Public health preparedness is in jeopardy due to a lack of water and sanitation, along with a lack of minimal resources in rural areas. Mere guidelines for the control of disease would not work rather, effort should be there for yielding results in the implementation. [22]

THE STIGMA ASSOCIATED WITH COVID-19

The most devastating nature of the corona era is the spread of misinformation, confusion, mental anxiety, and fear among the citizens. [5] The stigma must be avoided for effective treatment and control of the disease because people may conceal the virus to get rid of the stigma. The WHO has expert guidance, which helps people manage fear, stigma, and discrimination. [5] The WHO focuses more on myth busting and authentic information to help people in an ethical manner. [5] Anxiety affects many in society, which leads to stigma. Evidence found that isolated individuals in quarantine have shown fear, anger, and confusion. [23, 24] All these factors originated from the stigma associated with the disease.

In public health emergencies, there are many diseases that have stigma associated with AIDS, tuberculosis, cancer, and many infectious diseases. But, in a short period, the coronavirus affects many people in the grip of stigma. [7] The doctors, paramedics, and other essential care services providers are seen with huge suspicion in the community. It is challenging for them to stay in their locality with dignity. Many of the brothers and sisters of the north-eastern states of India are also treated badly due to their ethnic resemblance with Chinese people, the country where coronavirus is supposed to be mutated and originated. The migrant workers coming back to their native land are also maltreated despite their chance of infecting the community being dramatically low.

There is a subtle difference between social stigma and precautionary distancing in the context of COVID-19. Literature review has found that the notion of social stigma

carries the feeling of shame and embarrassment, which lasts for a more extended period, as we have seen in the case of HIV/AIDS and mental illness. However, during the pandemic of COVID-19, people maintained safe distancing, and such distancing was reduced in subsequent waves of COVID-19. The stigma is more dangerous for the dignity and life of any individual. Social distancing primarily focuses on the condition of concerned citizens with a degree of science and evidence. Hence, in an ethical and caring society, there must be awareness so as to avoid any social stigma. If it arises in a pandemic situation then civil society must act to remove the stigma.

HUMAN RIGHTS ASPECTS OF GOVERNMENT ACTIONS

India is a heterogeneous country due to its vast geography and diversity in culture, socio-economics, religion, ethnicity, language, and social groups. That is why the forefathers of India made a federal structure where provinces were given the power to plan and execute according to their necessity. During the corona era, the central government is found to be significantly powerful, and all the health and administrative regulations are applied throughout the country uniformly. Human rights are also blatantly violated by invoking the epidemic and disaster management Acts in India. People suffer from health emergencies and are not able to attend care facilities despite their ability to pay for healthcare services. The human rights aspects like protection of life and limb by the state are ignored to a great extent due to severe curtailing of the freedom of movement though with precautions. The police and the judiciary are not in a position to protect the right of the citizens.

Arguments have been by experts that the communication gap hampers the effort of government, especially in rural areas, grassroot levels, and religious circles. [25] The human rights issues are not highlighted by the current media due to various reasons such as focus in coverage of corona news, cozy with the current government, and their poor financial condition due to lack of profitable business. International bodies like The World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), USA, and Public Health England emphasize the human right issues such as dignified disposal of bodies and respect for the cultural and religious traditions of the victims. [26,27,28] In many cultures, people have their way of following different rituals of marriage, funeral, and cultural practices,

which is affected by social distancing and other public health norms suddenly. Migrant workers suffer from the abuse of human rights due to a lack of work and basic minimum amenities. Various horrifying stories of hunger, the aggression of police, atrocities at quarantine centres, and lack of medical care are reported often in India by media houses and human rights watch.

Rights of marginalized groups and ethics during epidemics and public health issues such as access to care, nutrition, and sanitation remain unaddressed for the vulnerable sections of Indian society. Nutrition is a basic need for the maintenance of health. Public health ethics have to be there to protect migrant workers, landless labourers, unorganized workers, and women workers. The well-to-do families in India have a fair amount of access to the basics of sanitation whereas the poor and marginalized population struggles to maintain basic sanitation and hygiene. Arguments are found that in this pandemic, the dalits, tribals, women, migrants, and Muslims are affected more than other people, especially in terms of loss of livelihood and income, and access to health services. As the majority of the marginalized people are landless and suffer from social and economic deprivation, the situation is worse. [22] The vulnerable sections of society suffer from depression and many other mental health challenges while coping with the situation.

In terms of ethics and vulnerable groups, the Honourable Supreme Court's instructions help in improving the situation of commercial sex workers during COVID-19. The honourable court intervenes in the provision of basic food supplies and medications to the vulnerable group without any discrimination by the government. In the early phase of the pandemic, they faced a shortage of many amenities which comes to the forefront, and subsequent with the help of state and central government the issues were resolved to a certain extent.

RIGHTS OF ANIMALS DURING THE CORONA ERA

The COVID-19 era put animals on the receiving end of care need, irrespective of domestic, stray, and wild animals. The care of animals, both for veterinary services and general care, is severely curtailed during the epidemic period. Myths and misconceptions are not just believed but also practiced by the less informed citizens of the nation. Many animals, including pets, are kept outside the house and

abandoned due to fear of infections. Despite no evidence of transmission from animal to human for the coronavirus, there is misinformation about zoonotic transmission in India. All of a sudden, the city dwellers, as well as rural people, try to keep themselves away from animals. Moreover, stray animals depend on the leftover food of society and act as scavengers in the community. Many people get mutual love from the animals by feeding them and playing with them. Stray animals are also part of our society with mutual benefits. The pets usually do not know to hunt for their food and beverage, and it is also not easy to develop such skills in a short period. If those pet animals are abandoned suddenly, it is challenging for them to sustain their life. Otherwise, it can be seen that the situation is about cruelty against animals endangering their lives and liberty. Animal ethics are compromised. With the world moving toward the "one health" concept, there is no scope for the violation of the public health ethics of animals.

COMPLIANCE WITH RESEARCH ETHICS

Most of the research reported during the pandemic is done in a fast-track mode to yield the result and use the findings for the prevention and control of COVID-19. This is a commendable step by governments for providing resources to conduct meaningful research. The research community is doing a job of creating new technology and knowledge by working tirelessly. Many of the investigations do not address ethical concerns due to a shortage of time and difficult circumstances.

Further, the experimentation on a human being for the quest of a cure has been reported in some places, which is difficult to accept with the existing protocol and guidelines. Many times, the protocols for research are also highly criticized due to its difficult nature. The ethics of triage also comes under the scanner in European countries where the decision to put patients on ventilation depends on certain algorithms based on age, severity, and survival chances.

The vaccine research helped in the prevention of COVID-19, which is high in demand. There should be clarity by the research community about the beneficiary of research work. They should also understand the use of research in the implementation process in the informed policy-making within a time frame.[29] A consortium of working groups for the development of research network with ethical values is needed.

International law and public health ethics during epidemics

International laws can give a free hand to the scientists to control the epidemics. Even bodies like WHO and multilateral agencies have some obligation in controlling the epidemic. However, the trade and commerce laws often play as an obstacle to the control of the outbreak. In the COVID-19 era medical supplies are inadequate in some parts of India, especially the import of vaccines and lifesaving medicines. If there is a supply ban by some country, then India may not get the required supplies. The same also happens if the Indian government banned the export of a particular medical supply, then the ordering country would face difficulties. In the COVID-19 era, this is common reporting in national and international media where everybody fights for scarce resources. There is absolutely no international cooperation regarding the rationing of medical supplies. Some countries just stockpile to use equipment and medicines for years to come, and others run out of stock within months. In general, the public health laws of a country prevail over international trade laws.

COOPERATION AMONG COUNTRIES AND ETHICS

The cooperation needed amongst countries to fight pandemics is beyond trade, commerce, socio-economic, and cultural exchanges. Indian state always provides support to disadvantaged countries during this pandemic. There is always a strong need for the development of cooperation in technology transfer for vaccines and the production of medical equipment. However, this should be driven by organic cooperation rather than mere control of diseases in the short run. By fostering scientific cooperation, we can create value in data sharing, cross-cultural trials of vaccines, and innovative treatment procedures. The decoding of the genome of the corona virus, the discovery of vaccines, and drugs to fight the disease is always more paramount than the business value. The regional cooperation among the South Asian Association for Regional Cooperation (SAARC) countries is one of the critical components developed by the current Indian government. [4,5] However, modern technology, for faster tackling of the issues, is available in the western world, which needs close involvement with other nations for the control of the pandemic.

The world cooperation for noble causes, like treatment and control of outbreaks, is also an ethical issue that needs to

be pursued by officials of not below the rank of head of the states. Then, scientists and health professionals should join in the front line to combat diseases. Non-cooperation will see and ensure the diseases keep winning, and humanity would bleed and lost. Hence, all requirements such as availability of resources, technical expertise, laboratory facilities, and administration come under the ethics of international cooperation.

The Indian government has found to learn a lot of things in the first wave of the pandemic and applied them in managing the subsequent waves both in technical and ethical concerns. The regional and global cooperation of the exchange of technology in covid management and social outreach in the process of containing the virus was at the help of the affairs, especially in the second and third waves.

Post epidemics construction

In hoping for the best, let epidemics be like SARS, MERS, and many other epidemics that come and go in the history of humanity and medicine. But the preparedness before, during, and after epidemics need to be strengthened. We cannot stop a pandemic completely, but we can be prepared actively to combat the situation in conceding minimal damages. Similarly, the post-pandemic construction can be done with efficiency. The scientific and medical fraternity must overcome the COVID-19 era, which is like a black hole in the history of medical sciences. The ethics in post-construction work must be aligned with human rights. The resource allocation must be judicious for addressing the ethical challenges of equitable distribution of medical resources and livelihood concerns. [4] Every disaster in India is followed by corruption and mismanagement of existing resources, which need to be minimized. Evidence shows that health education and awareness help in controlling the epidemic and post-construction work by preventing diseases. [30]

The role of the Indian government in providing help to neighbouring countries (Pakistan and Afghanistan), despite having strained relations with them, is also notable in a pandemic era situation. India also provides help to Srilanka and Maldives, whose development indicators are better than India. India being an information and pharmaceutical hub especially supported by private sector multinational companies had sufficient resources to share with the world. In the future, irrespective of economic conditions, the countries must align with the ethics and principles of sharing resources in case of need and insufficiencies. Hence in the

reconstruction of the beleaguered economies and health infrastructure, the global citizenry should play an important role.

CONCLUSION

An integrated model with a sustainable strategy is needed in India to address the myriads of problems the COVID-19 era poses in the Indian civilization. Addressing ethical issues is not a matter of quick services; rather, this needs a critical review of activities in the process of treatment of coronavirus. The dignity of every individual should be given importance while addressing the distal and proximal issues of the COVID-19 era. The implementation of programs, making operational guidelines, and protocols have to be in sync with the ethical value of society.

In a globalized era, the COVID-19 management strategy of the Indian government is influenced by foreign countries and vice-versa. The exchange of knowledge on the management of pandemic was seamless across countries except for very few aspects of having competing interests. Ethical concerns were also attempted to be addressed in a situation of chaos. In this context, the world must be a learning hot spot for future pandemics as well.

DECLARATIONS

- Ethics approval and consent to participate- This is policy review paper in which ethical clearance is not required. No human subjects are interviewed, or any intervention is not done. Authoritative sources have been consulted for which due references were given in the article.
- Consent for publication- Yes, as an academic institute the scholars were encouraged to publish in journals having international audience.
- Availability of data and materials- yes, most of the data were explained in the article
- Competing interests- There is no competing interest
- Funding- University Grants Commission, India, and IOE, University of Hyderabad, India. However, the funding agencies have no role in designing and conducting the study. IOE, University of Hyderabad, India provide partly the logistic support for conducting the study
- The Funding agencies have only supported in the logistic and financial support the researcher.

- Authors' contributions- The paper has only one author RKD. So, the author has done literature review, design, and analysing the data for the manuscript. The author approved the submitted version for review.
- Acknowledgements- Not applicable
- Authors' information (optional)- Not Applicable

ACKNOWLEDGEMENTS:

Dr. Ranjit Kumar Dehury acknowledges financial support to UoH-loE by the University of Hyderabad through the Institute of Eminence Project, Ministry of Education (Government of India) grant no. (F11/9/2019-U3(A)). However, the grant agencies have no role in designing and conduct of the study by the researchers.

CONFLICT OF INTEREST:

The author declares no competing or conflicting interests

References

1. Holshue ML, DeBolt C, Lindquist S, Lofy KH, Wiesman J, Bruce H, Spitters C, Ericson K, Wilkerson S, Tural A, Diaz G. First case of 2019 novel coronavirus in the United States. *New England Journal of Medicine*. 2020 Jan 31. <https://doi.org/10.1056/NEJMoa2001191>
2. Burrell CJ, Howard CR, Murphy FA. Coronaviruses. *Fenner and White's Medical Virology*. 2017:437. <https://doi.org/10.1016/B978-0-12-375156-0.00031-X>
3. WHO. Pneumonia of Unknown Cause – China. 2020. URL <https://www.who.int/csr/don/05-january-2020-pneumonia-of-unknown-cause-china/en/> (Last Accessed on 25.04.2021).
4. WHO. Coronavirus Disease 2019 (COVID-19) Situation Report – 46. 2020. URL https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200306-sitrep-46-covid-19.pdf?sfvrsn=96b04adf_2 (Last Accessed on 25.04.2021).
5. WHO. Rolling Updates on Coronavirus Disease (COVID-19).2020. URL <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen> (Last Accessed on 25.04.2021).
6. WHO Coronavirus Disease 2019 (COVID-19) Situation Report – 70. 2020. URL https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200330-sitrep-70-covid-19.pdf?sfvrsn=7e0fe3f8_4 (Last Accessed on 25.04.2021).

7. Banerjee D. The COVID-19 outbreak: Crucial role the psychiatrists can play. *Asian journal of psychiatry*. 2020 Mar 20;50:102014. <https://doi.org/10.1016/j.ajp.2020.102014>
8. Everts J. Announcing swine flu and the interpretation of pandemic anxiety. *Antipode*. 2013 Sep;45(4):809-25. <https://doi.org/10.1111/j.1467-8330.2012.01021.x>.
9. Yao H., Chen J.H., Xu Y.F. Rethinking online mental health services in China during the COVID-19 epidemic. *Asian Journal of Psychiatry*. 2020 (in press).
10. Editorial. The gendered dimensions of COVID-19. *Lancet* 395, 1168 (2020) doi: 10.1016/S0140-6736(20)30823-0.
11. Chan SS, So WK, Wong DC, Lee AC, Tiwari A. Improving older adults' knowledge and practice of preventive measures through a telephone health education during the SARS epidemic in Hong Kong: A pilot study. *International journal of nursing studies*. 2007 Sep 1;44(7):1120-7.
12. Liu S, Yang L, Zhang C, Xiang YT, Liu Z, Hu S, Zhang B. Online mental health services in China during the COVID-19 outbreak. *The Lancet Psychiatry*. 2020 Apr 1;7(4):e17-8.
13. Ebrahim, S. H., Ahmed, Q. A., Gozzer, E., Schlagenhauf, P., & Memish, Z. A. (2020). Covid-19 and community mitigation strategies in a pandemic. <https://doi.org/10.1136/bmj.m1066>
14. Chatterjee P, Nagi N, Agarwal A, Das B, Banerjee S, Sarkar S, Gupta N, Gangakhedkar RR. The 2019 novel coronavirus disease (COVID-19) pandemic: A review of the current evidence. *The Indian journal of medical research*. 2020 Mar 30.
15. Briscese G, Lacetera N, Macis M, Tonin M. Compliance with COVID-19 Social-Distancing Measures in Italy: The Role of Expectations and Duration. *National Bureau of Economic Research*; 2020 Mar 27.
16. Dimitrov NB, Meyers LA. Mathematical approaches to infectious disease prediction and control. *In Risk and optimization in an uncertain world* 2010 Sep (pp. 1-25). INFORMS.
17. Piazza NI, Wang H. Bifurcation and sensitivity analysis of immunity duration in an epidemic model. *International Journal of Numerical Analysis and Modelling, Series B*, 4 (2), 179. 2013;202.
18. Siettos CI, Russo L. Mathematical modeling of infectious disease dynamics. *Virulence*. 2013 May 15;4(4):295-306.
19. Shah K, Awasthi A, Modi B, Kundapur R, Saxena D. Unfolding trends of COVID-19 transmission in India: Critical review of available Mathematical models. *Indian J Community Health [Internet]*. 2020Apr.16 [cited 2021Apr.26];32(2 Special):206 -214.
20. Rome BN, Avorn J. Drug Evaluation during the Covid-19 Pandemic. *New England Journal of Medicine*. 2020 Apr 14. DOI: 10.1056/NEJMp2009457. https://www.nejm.org/doi/full/10.1056/NEJMp2009457?query=featured_coronavirus (Last Accessed on 25.04.2021).
21. Kim AHJ, Sparks JA, Liew JW, et al. A rush to judgment? Rapid reporting and dissemination of results and its consequences regarding the use of hydroxychloroquine for COVID-19. *Ann Intern Med* 2020 March 30.
22. Parmar D. Public Health during Pandemics and Beyond. *Economic and Political Weekly*. 2020 Apr 1;55(17):1-3. 2020 (Last Accessed on 25.04.2021).
23. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, Rubin GJ. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*. 2020 Feb 26.
24. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry*. 2020 Apr 8;10:2083.
25. Dasgupta A. Managing the ethical implications of coronavirus. *Nature India* 2020. doi:10.1038/nindia.2020.67 Published online 16 April 2020. https://www.natureasia.com/en/nindia/article/10.1038/nindia.2020.67?fbclid=IwAR12Mw4QZvez8mGCqCE1NXSuT1DiWdmnbchk7PDNWqPRbUTN_aP9PWP-Wrl (Last Accessed on 25.04.2021).
26. World Health Organization Interim guidance 2020. Infection prevention and control for the safe management of a dead body in the context of COVID-19. 2020.
27. Centers for Disease Control and Prevention 2020. Coronavirus Disease 2019: COVID-19 and funerals. 2020.
28. Public Health England 2020. COVID-19: Guidance for care of the deceased. Provision of basic services. 2020.
29. Townsend E, Nielsen E, Allister A, Cassidy SA. Key ethical questions for research during the COVID-19 pandemic. *Lancet Psychiatry*. 2020;7:381.
30. Johnson EJ, Hariharan S. Public health awareness: knowledge, attitude and behaviour of the general public on health risks during the H1N1 influenza pandemic. *Journal of Public Health*. 2017 Jun 1;25(3):333-7.