sw&s | Social Work and Society International Online Journal

Impact of the Covid-19 on Major Cities of India: A Search

***Suresh Kashinath Ghatge**, Galgotias University*

***Anuradha Parasar**, Galgotias University*

Abstract: COVID-19 had a major effect in major cities of India led to inequalities in urban areas and affected livelihood, health and economy. Around 45 % of Delhi's street vendors and waste pickers reported high impacts on income and health; more than 37% of Mumbai's business establishments experienced job cuts and business shutdowns. Chennai is one of the worst affected regions, the mortality rates were high, especially in the geriatric population; Kolkata felt the strain in terms of anxiety and mental health, especially the womenfolk. The urban poor in Bengaluru were worst affected, many of the new infection cases reported came from this background. COVID-19 revealed the existing weakness in the informal settlements and informal economy, which should draw the attention of policymakers to the principle of equity and inclusive urban governance and development. Measures to reduce the transmission rate were specific precautions geared toward public health campaigns, telimedicine platforms, and physical distancing. Nevertheless, these interventions are built considering the population's socioeconomic status to indicate the need for strong public health systems and appropriate social protection throughout future shocks.

Keywords: "COVID-19"; "India"; "major cities"; "impact"

Introduction

The onset of the COVID-19 virus" at 2019's end resulted in the global pandemic, which devastated urban centers around the world. India is a densely populated country and the outbreak of COVID-19 delivered a devastating blow to India and the cities. The cities become an epicentre of the crisis due to the dense population of the country. India is a country with rapid urbanization and emerged as one of the countries that faced the most impact during the global pandemic (Gupta et al., 2022). Major Indian cities such as "Delhi, Kolkata, Mumbai, Bengaluru, and Chennai" were economic powerhouses, attracting migrants and boasting high population densities. The COVID-19 crisis has taken a toll on all the big cities in India and repercussions are across sectors of life. The high population density of Indian cities made social distancing horrible. The pandemic has affected the country in all aspects of the economy, public health, transportation and others (Das & Patnaik, 2020). Public transportation networks were overcrowded and poorly ventilated, which made them the centers of the epidemic.

The total population of India is nearly 1.34 billion as it has the largest population in the world and after the outbreak of the pandemic, 56,342 positive cases have been reported till May 2020 (Kumar et al., 2020). Nonetheless, diverse economic activities and complexities make it more challenging for the major cities of the country to continue with the daily courses. The major cities such as Mumbai, Kolkata, Delhi and others are the economic powerhouses that attract migrants and boast high population densities. However, due to the dense and overburdened situation of these major cities, it was nearly impossible to maintain social

distancing and proper sanitation. This situation made these cities highly susceptible to contagious diseases like COVID-19.

The pandemic delivered a devastating blow in India by sweeping across the states of India and impacting the lifestyle of major cities. Following Rawat et al. (2021), not only the economy and physical health, but Corona-virus has also affected the lifestyle of the citizens of different Indian cities during the time. Nonetheless, the first case in India emerged in January 2020 with travelers returning from Wuhan, China, the city from where the virus spread all over the world (Jamwal et al., 2020). The first case was reported from Kerala and with no time the virus spread rapidly across states and major cities. However, the pandemic has affected the economy, and healthcare and government initiatives have been taken to mitigate the issues and overcome the inequalities. The present research article focuses on the discourse and identifies the challenges that India and the major cities of the country faced during the time. Key areas such as the impact on the economy, environmental impacts, digital transformation, and public health have been focused on through the present report.

Research Question

How did the COVID-19 pandemic effect India's big cities, particularly in the context of their economy, public health, and ongoing urban inequalities, and what measures were taken to contain these repercussions?

Methodology

The study uses a qualitative, secondary approach. Extensive reading and synthesis of the literature and reports available is done to comprehend the diversified effect of the COVID-19 pandemic on major Indian cities. The study is based on data and findings already published, as opposed to primary data collection. The methodological rigor includes intensive reading of academic papers, reports, and news coverage on the socioeconomic, public health, and urban inequality effects of COVID-19 on Delhi, Mumbai, Chennai, Kolkata, and Bengaluru cities. Nonetheless, through the application of secondary qualitative approach, the study seeks to gain a comprehensive appreciation of the intricate interplay between a global health emergency and intrinsic urban susceptibilities in the Indian context based on a vast range of recorded experience and study.

Major Indian cities affected by COVID-19

The impact of COVID-19 can be mainly observed across major metropolitan cities of India, including “Delhi, Mumbai, Chennai, Kolkata and Bengaluru”. For instance, a recent report noted that the livelihoods of vendors in Delhi were severely impacted due to the onset of the pandemic (Majithia, 2020). Due to strict restrictions placed by the national government on travel and social gatherings, hawkers and street vendors were restricted from operating on Delhi's streets.

In Mumbai, one of the major negative effects of the COVID-19 period was observed, which involved job losses among the regional population. According to a recent report, around 68% of business owners in Mumbai reported that the loss of jobs was a major issue during the COVID period (Praja, 2021). This loss in jobs and business growth was mainly attributed to the significant lack of customers on account of travel and social restrictions placed by the government. Accordingly, almost all business holders in Mumbai city faced health and

financial problems during the COVID period. Furthermore, the aforementioned report also noted around 13% of total businesses permanently shut down due to a severe lack of income (Praja, 2021). Therefore, the impact of the COVID-19 pandemic in Mumbai was similar to that of Delhi in terms of income loss and health degradation of the population.

COVID-19's negative impact in Chennai can be mainly related in terms of the huge death toll among the population from the disease. The rate of deaths in Chennai, as determined for March and October 2020, was around 431 deaths per million infected (Jagadeesan et al., 2022). Additionally, the report also noted a stark increase in the male death ratio compared to the female death ratio, being 645 per million and 291 per million respectively. Additionally, the death ratio was found to increase in Chennai with the increased age of the population. For instance, Chennai people aged 80 or above faced a death ratio of 5635 per million (Jagadeesan et al., 2022). On the other hand, people aged from 61 to 80 reported a death ratio of 2817 per million. Therefore, the high rate of death among certain population demographics can be determined as the major issue of COVID-19 faced in Chennai city.

Considering a psychometric assessment of the people of Kolkata, COVID-19 left a negative effect on the overall population's mental health, alongside causing degradation of physical health. A recent report has noted that a majority of the population that experienced anxiety during the COVID-19 pandemic period were females, compared to males in Kolkata (Mukhopadhyay, 2020). This was mostly noted by the fact that females were more engaged in hygienic activities including hand washing and avoiding social gatherings compared to males. As presented by a recent report, women in Kolkata were considered safer compared to men in terms of COVID-19 deaths, with 66.8% being male deaths while 33.2% were female deaths in the city (Team MP, 2022). This signified that the lack of proper hygienic standards among the males was one of the major causes of a higher death toll among the male population in Kolkata.

Similar to COVID issues faced in Mumbai, the pandemic caused a significant adverse impact on the livelihood of the urban poor population in Bengaluru. A recent survey concluded that around 15,879 of the 39,510 new infections were contracted by the urban poor population in Bengaluru (Valiappa Foundation, 2022). This indicated that the majority of health impacts and deaths in Bengaluru during the pandemic period were observable among the urban poor.

Economic impact of COVID-19 in India

The impact of the COVID-19 crisis on the economic aspect of various Indian cities was multidimensional. Although the economic impact of COVID-19 on India has been significant it affected various sectors and aspects of the economy. During particularly strict lock downs, people lost their workplaces not only in the formal sector but also in the informal one. As opined by Ali & Kamraju (2020), the unemployment rate rapidly increased to the level of previous decades, indicating the highest historical maximum in this rate. Urban unemployment increased sharply to 20.9% during the April-June quarter of 2020, nearly two times the 8.9% of the same quarter in the previous year (PRS India, 2021). Various cities serving as significant financial and industrial centers of the country were largely concerned. Since India is one of the most densely populated countries in the world, the damage caused to it had to be experienced mainly by the same large cities.

Due to the outbreak of the pandemic, the GDP growth of the country crashed by 23.9% and GDP shrank by 7.3% during 2020-2021 (The Times of India, 2021). In addition to that, the

$2.9 trillion economy of India remains shuttered during the lockdown period (The Times of India, 2021). On the other hand, strict lock downs had been imposed that led to the closure of several small and medium-sized businesses, several factories, and transportation services. This situation played a significant role in disrupting the economic activity of the country. Nonetheless, businesses across all sectors were forced to shut down, leading to widespread unemployment. The household income in India was drastically impacted due to the lockdown.

Mumbai being the economic capital of India took a significant hit as the stock markets tumbled and several businesses were forced to close. The street vendors of cities like Mumbai, and Kolkata were experiencing a sharp decline in activity due to strict regulations. As mentioned by Duvendack & Sonne (2021), Mumbai is one of the most crowded cities in India and there is a need to impose strict lockdown to stop the spread of the virus and hence affect activities of the economic hub of India. The national Capital Delhi was also experiencing financial losses due to the shutdown of several construction projects. The daily wage earners of Kolkata also saw a decline in daily income level and the manufacturing sector was experiencing supply chain disruption issues.

The population of India witnessed the widening economic disparities during the outbreak of the virus (Gupta et al. 2021). During the first stringent national lockdown from April 2020 to May 2020, the individual income in India dropped by 40% and families living under the poverty line lost the income worth three months during that period (CentrePiece, 2022). However, unemployment in different cities rose unexpectedly and the economic slowdown pushed many households into poverty, exacerbating existing inequalities. Moreover, the pandemic highlighted the vulnerability of cities with a heavy reliance on a single sector. The need for diversification has been highlighted with the critical situation.

Apart from this, its overreaching effects on migrant workers in cities were particularly harsh and dire when, in March 2020, India instituted a sudden and drastic nationwide lockdown, in an attempt to contain the spread of COVID-19 (BBC, 2020). The “International Labor Organization” (ILO) placed a number of at least 40 crore (400 million) of India's informal workers at risk of being pushed into further poverty by the pandemic (The Print, 2020). Moreover, joblessness accounted to a full stop in earnings of daily wage earners who had virtually no savings. It resulted in a failure to pay rents and loans and resourcing to borrowing to relatives. This crisis was indeed massive and it caused rampant social, economic, and mental distress.

Impact of COVID on Public health in major cities of India

Health is a major concern for any country and due to the dense population of India, the impact of corona virus has become a major issue that needs utmost attention. The vulnerabilities of major cities of India have been exposed due to the COVID-19 pandemic as the cities transformed into a battleground against the relentless virus. The pandemic caused considerable suffering along with health and social disruption. As estimated, till October 2021 around 34.3 million people were infected and 0.45 million people died (DWIH, 2024). The major cities of India are characterized by densely packed housing and multiple generations living in single dwellings. Mumbai has a massive slum population residing in Dharavi, which exemplifies the public health challenge in this major city. The fatality rate in Mumbai was 3.7% in 2020 with 293,436 active cases and 11,119 deaths (Hindustan Times, 2022). However, the number of active cases became 501,543 in 2021 but the number of deaths declined to an estimated 5,261 (Hindustan Times, 2022). The initial surge in cases

overwhelmed healthcare facilities and hence, hospitals faced a shortage of medical equipment, medical staff, beds and essential supplies for the patients. In Delhi, residents faced a double threat to their respiratory health with preexisting air pollution concerns.

Public transport systems are the lifeblood of the major cities and these have become transmission vectors due to overcrowding and poor ventilation. The city of Joy Kolkata also faced challenges due to the ageing healthcare infrastructure and limited resources. The total number of COVID cases in Kolkata till 2021 December were 16, 38,485 with a 1.21% fatality rate (WB Health, 2021). However, the city witnessed a strong community response as the NGOs and resident welfare associations worked together to provide essential services and support vulnerable populations. The government of the major cities also takes the initiative by implementing tracking protocols and isolation centers to improve the situation. In Chennai, the government focuses on racing out to the slum dwellers and migrant workers to provide them with healthcare access and essential supplies.

Nonetheless, the pandemic led to a heightened awareness of hygiene practices like handwashing and mask-wearing, potentially having a long-term positive impact on public health (Smith et al., 2022). The outbreak of the pandemic has exposed the vulnerabilities of public health systems in major Indian cities and hence the governments have focused on multi-prolonged approaches to mitigate the issues. On the other hand, the lock downs caused by COVID-19, by isolating families into small residential areas for prolonged duration, inevitably raised tensions about space, autonomy, and mobility, and all too often resulted in a reported rise in domestic violence and child abuse. This can be consider as the case of mental health issues.

According to the NCW, a statutory agency of India that deals with women rights, the number of complaints of violence against women has doubled since the lockdown. The complaints of domestic violence that were brought to the attention of the National Commission for women increased immensely from 2,960 in the year 2019 to 5,297 in the year 2020 (Times of India, 2021). This figure dramatically rose to 257 during the final week of March 2020 (after lockdown announcement). In April and May 2020, the NCW received 3027 complaints on 22 types of crimes against women, of which 1428 (47.2 percent) were complaints of domestic violence and intimate partner violence (The Times of India, 2020). This figure is markedly higher than January-March 2020, when domestic violence cases amounted to 20.6 percent of the aggregate complaints.

Influence of COVID-19 on urban inequalities

From the beginning of the COVID-19 pandemic and its consequent impact on cities discussed previously, one can gain key insights into how matters of urban imbalances were precisely the way through which some areas such as informal settlements in cities were indeed more prone to incidences of pandemic spread. For that matter, it can be noted that the formal structural prejudice in cities such as the informal worker, people living in peripheral urban areas seem to have a subordinate social parameter compared to other urban dwellers. This categorization is analyzed concerning the job status as the “blue-collar job worker” did not have the luxury to work from home since the nature of their job compelled them to go out, in a process that went against physical distancing during this pandemic (Ruane, 2022). In addition, the study revealed that the majority of the informal sector employees suffered the negative effects of economic shock and were compelled to join the vicious cycle of poverty.

Poor savings, health insurance, and social security have worsened the situation of informal workers. Data on the poor population has revealed that their wealth has risen by a paltry one per cent only. In addition to income disparity, absence of labour rights, etc, there is a concern regarding the manifestation of morphological aspects of the society; which has resulted in one form of disparity or another, among people dwelling in the urban fringes. A report has explained why some slum areas are more exposed to the Covid 19 spread particularly the Dharavi and Kahra Talao in Mumbai due to the poor health facilities, sanitation and clean water (Thomas, 2022). Therefore, the data poses the question, of development for the rich or the poor, and at the same time, it exposes the enormous wage dichotomy that requires significant concern.

The above case existed in other cities and a similar situation can be observed where treated water is not available. Gqomfa, Maphanga & Shale (2022) highlighted the problem of untreated water and stated how wastewater is managed in "informal settlements" and how it comes in the manifestation of various water-related diseases. The above "spatial inequalities" depicting how people are being affected reveal that urbanization is beneficial to big cities only; change should be directed towards the "urban governance framework" and contribute to the enhancement of the policies. Besides, there is a requirement of an urban development project which will target to address the problems of peripheries in urban areas thus making it easier to avoid exclusion of any area (Sawyer et al., 2021). This pandemic distorted various relative structures within the urban structure and it questioned which steps had to be taken to minimize or eliminate it.

Urban equality's first dimension of distribution 'concerns itself with the tangible outcomes of equality in a decent quality of life encompassing; income, decent work, affordable housing, health care, basic and social services, and protection from violence for citizens in the urban centre in a sustainable manner' (Yap, Cociña & Levy, 2021). Such an unfair sharing is evident in the report on the provision of decent shelter and other human necessities such as clean water, sanitation, and enhanced livelihoods in congested informal settlements resulting in vulnerability to increased COVID-19 infection rates among poor households (Allen et al., 2021). Quarantine measures, despite the differences in the application of these measures, simply deprived the low-income inhabitants of cities of a terrible choice between the household members' health and such essentials as "income, food, water", and protecting oneself from "violence".

Aside from the effects of the viral infections on people who contract the virus, measures are being taken to contain COVID-19; including physical apart, lock downs, closure of "international" and "inter-provincial" borders, and stopping of transport have averted economic and means of living mechanisms in the world. It has resulted in the eradication of work and income besides challenging the production of food and crops, and disruptions in transportation networks and chains (Khanna, 2020). The disruption of "economic and livelihood systems" is further worsened by poor or almost non-existent social protection. According to the UN SDG Report (2019), among the entire global population, mainly within the "global south", only 45% of the people benefit from social protection. Henceforth, the adversity of the COVID-19 pandemic" towards inequalities across urbanization is observed as a major issue.

Strategies to mitigate COVID-19 impact

In retaliation to the growing threat of the COVID-19 pandemic", the major cities across India came up with various strategies to mitigate the COVID-19 impact during and after the pandemic period. For instance, there is an advisory from "MOHFW" under the "Government of India" (GOI) on the benefits of the "general public" to prevent COVID-19 from spreading within the national population. By usage of the motto "Help us to Help you," GOI is ensuring that society comes up with awareness (Preysi et al., 2021). Among these measures include the development and availing of materials concerning self-diagnosis of symptoms and how to prevent COVID-19 which may be heard when dialing a phone call (caller tune). The method of producing an awareness video to discourage spitting in public places as well as informing the people about the impacts is also useful. The Authorities also devoted resources to spreading information on respiratory hygiene, regular hand washing, social distancing (keeping 2 gaz or 2 meters apart), and use of face masks while across public places to minimize disease spread.

The stated ministry, "MOHFW" has made available the COVID-19 related information through the toll-free helpline 1075/011-23978046 across India. GOI also launched a "WhatsApp helpline number" for answering questions regarding COVID-19 (Jhunjhunwala, 2020). If living in a Red/Containment zone or being a government official, mandatory usage of the Arogyasetu app requires installation of the same by the concerned Government official or the person (Preysi et al., 2021). This app includes various media to spread awareness, released by GOI, on the causes and health impacts of COVID-19. This one generates and displays the overall risk level of the person who is using the app. Under the same Non-pharmacological Interventions, GOI has also emphasized strengthening the immune system of an individual against COVID-19 infection (Rachana et al., 2020). "Ayush ministry" has posted immunity booster videos Kaadha, turmeric milk, warm water, and usage of Unani and Ayurvedic medicines, supporting COVID-19 immunity. "AYUSH ministry" established the Ayush Sanjivani application for posting data related to non-pharmacological intercessions.

AIIMS and "The National Institute of Virology," Pune have established a core central reference laboratory to collate COVID-19 tests across India. Testing of COVID-19 in India was made possible by the government through the arrangement of private laboratories. The plan of elevating the private laboratories to conduct COVID-19 tests is somewhat effective primarily due to the expenses incurred towards establishing the lab. A cost of "15 to 20 lakh rupees" for thermocyclers of "PCR" and costly certification for bio safety and PCR cabinets is not possible across every laboratory in India (Gupta, 2020). A low number of qualified and trained clinical microbiologists and molecular biology technicians is also felt all over the country. According to ICMR guidelines, a total of "45,24,317 tests" were conducted within 6th June, including a total of "1,37,938 tests" in a day across 742 working laboratories (Government & Private) for COVID-19.

The COVID virus vaccine is in the making and many nations including India are participating in this process. The Indian Council of Medical Research (ICMR) gave approvals for registration of trials on "vaccines", usage of "hydroxychloroquine" and "convalescent plasma therapy" (Batta et al., 2021). It is considered relatively effective in severe forms of the disease. This treatment involves using the plasma of donors with "high neutralizing antibody levels" against COVID-19. The "novel corona virus vaccine and therapy" are some of the biggest challenges that are haunting all countries in the future.

A cross-sectional study done on "International health regulations" from "182 countries" showed that only 45% of the countries had precautionary capacities and 43% had "response categories" at the level of permitting function and "operational readiness" to manage this type of "epidemiological crisis" (Preysi et al., 2021). None of the South East Asian countries is at the level of operational readiness. Households in India are generally overcrowded due to the joint family system and self-quarantine when infected is challenging. Railway compartments, schools and other facilities across India are converted into quarantine centers but the effectiveness and capacity of these quarantine centers are not clear.

Earlier India demanded the "G20 summit" to help gain "essential medicines", "treatments", and "vaccines" at a reasonable price as the situation demands unity. G20 includes 19 nations alongside the "European Union" and is more concerned with international economic management (Saputra & Ali, 2021). India asked G20 countries, they had to come to a consensus to deploy diagnostic equipment, personal protection equipment (PPE) and healthcare workers to the countries that require it.

India pointed out a stimulus of 20 lakh crore concerning the slow-moving economic situation due to the lockdown. At the same time, to assist India in socially protecting itself from COVID-19, the "World Bank" has provided USD 1 billion in loans to the country (Marcos Barba, van Regenmortel & Ehmke, 2020). It was unveiled in 4 measures by the Finance Minister and is currently being regarded as a stimulator of the economy. The core objective is to support small firms, MSMEs and agriculture, reduce "provident fund relief" and "Total attempted deductions (TDS)". Narendra Modi, India's Prime Minister, recently introduced "Atmanirbhar Bharat Abhiyan" for Indians relying on themselves to revive their economic downfall (Kapoor & Tyagi, 2021). The programme includes assistance to state governments/chief ministers on state-specific reforms being undertaken, technology cum equity in education "during and post COVID", aiding "public sector enterprises" on "new policies for self-reliant India", and "corporate law changes" to improve firms.

Conclusion

The COVID-19 pandemic caused massive changes in the lives of urban people, in the major cities in India, including "Delhi, Mumbai, Chennai, Kolkata, and Bengaluru". These cities were majorly affected in their daily lives, business operations and functioning of their health sectors by the virus as well as the measures put in place to combat the virus. The article helps to look into the fact that these urban centers were the most affected by the crisis, especially in terms of affecting vulnerable groups. Income was also lost and people fell sick in Delhi among-st street vendors and scrap pickers, and in Mumbai many had to cut jobs and shut shops down. Both Chennai and Kolkata were affected by high mortality particularly among the aged and it was mainly the women who experienced increasing levels of anxiety and mental health complications. Proportionate infections and negative health outcomes were witnessed in Bengaluru among urban poor revealing the socioeconomic inequalities that lie deep-rooted.

This study is critical in pointing out that the pandemic increased preexisting inequalities in cities. Poor housing, housing in informal settlements and settlements with low income, where there is a lack of access to medical services, sanitation, and clean water, turned into hot spots of infection with COVID-19. Nonetheless, it has been identified that, the policy and practice implications are obvious and urgent. The COVID-19 experience clearly showed the urgent need of large-scale health crises and robust and responsive populations health systems, which

can address health crises of epidemic proportions and provide equitable access to health care. Moreover, it requires the embracement of sustainable and inclusive urban planning that incorporates the core requirements of all city dwellers particularly, those who are the most vulnerable.

Efforts to reduce the effects of COVID-19 involved the Indian government adopting several measures such as sensitization on preventive measures such as washing hands, observing social distances, and wearing face-masks. The government also released some applications like the Arogyasetu application to monitor health as well as increase awareness. Nevertheless, the level of the use of these measures was not the same, and the efficiency of their action in low-income regions is still in question. In general, the COVID-19 experience demonstrated the necessity of prepared and effective public health systems, inclusive and sustainable urban planning, and adequate social protection to improve the population's resistance to such events. The policymakers need to give a highest priority towards building social protection systems that provide safety nets for poor households and informal workers, preventing the harmful impact of impending shocks. Public health campaigns, telemedicine platforms, and developing track applications, though launched, experienced patchy effectiveness in poor communities, requiring appropriate and context-specific methods. It is imperative to solve these problems to minimize the negative effects in the future and make further urban policies more favourable for all people, starting with the most sensitive groups.

Conflict of interest

There is no conflict of interest with any author(s) in this work.

References:

Ali, M. A., & Kamraju, M. (2020). A study on impact of covid-19 pandemic on unemployment in India. *Re-Imagining the New Normal-The Transformational Lens of COVID*, 19, 50-61. https://gsmi-ijgb.com/wp-content/uploads/IJHED-V6-N2-P03-G-L-Parvathamma-Unemployment-dimensions-of-COVID-19.pdf.

Allen, A., Hofmann, P., Leblond, N., Walker, J., Kombe, W., Vouhé, C., ... & Prosper, R. (2021). COVID-19: A turning point to further sanitation justice?. *Interdisciplinary Perspectives on Equality and Diversity*, 7(1). https://journals.hw.ac.uk/index.php/IPED/article/download/103/94.

Barrera, K. G., & Shah, D. (2023). Marketing in the Metaverse: Conceptual understanding, framework, and research agenda. *Journal of Business Research*, 155, 113420. https://doi.org/10.1016/j.jbusres.2022.113420.

Batta, A., Khirasaria, R., Kapoor, V., & Varshney, D. (2021). Therapeutic clinical trials to combat COVID-19 pandemic in India: analysis from trial registry. *Journal of Basic and Clinical Physiology and Pharmacology*, 32(3), 267-278. https://www.degruyter.com/document/doi/10.1515/jbcpp-2020-0208/html.

BBC, (2020). *Coronavirus in India: Desperate migrant workers trapped in lockdown*. https://www.bbc.com/news/world-asia-india-52360757.

Buhalis, D., Leung, D., & Lin, M. (2023). Metaverse as a disruptive technology revolutionising tourism management and marketing. *Tourism Management*, 97, 104724. https://doi.org/10.1016/j.tourman.2023.104724.

Das, K. K., & Patnaik, S. (2020). The Impact Of Covid 19 In Indian Economy–An Empirical Study. International *Journal of Electrical Engineering and Technology (IJEET)*, 3(11), 194-202. http://dx.doi.org/10.34218%2FIJEET.11.3.2020.023.

Edwin, M., Saranya Nair, M., & Nagarajan, V. A. (2023). *The Metaverse in Industry and Logistics. Metaverse and Immersive Technologies: An Introduction to Industrial, Business and Social Applications*, 295-323. https://doi.org/10.1002/9781394177165.ch11.

Gqomfa, B., Maphanga, T., & Shale, K. (2022). The impact of informal settlement on water quality of Diep River in Dunoon. *Sustainable Water Resources Management*, 8(1), 27. https://link.springer.com/article/10.1007/s40899-022-00629-w.

Gupta, D., Biswas, D., & Kabiraj, P. (2022). COVID-19 outbreak and Urban dynamics: Regional variations in India. *GeoJournal*, 87(4), 2719-2737. https://doi.org/10.1007/s10708-021-10394-6.

Gupta, P. (2020). Why is SARS-CoV-2 testing not possible in every medical laboratory?. *Indian Journal of Pathology and Microbiology*, 63(2), 173-174. https://journals.lww.com/ijpm/fulltext/2020/63020/why_is_sars_cov_2_testing_not_possible_in_every.3.aspx.

Jagadeesan, M., Ganeshkumar, P., Kaur, P., Sriramulu, H. M., Sakthivel, M., Rubeshkumar, P., ... & Murhekar, M. (2022). Epidemiology of COVID-19 and effect of public health interventions, Chennai, India, March–October 2020: an analysis of COVID-19 surveillance system. *BMJ open*, 12(3), e052067. https://bmjopen.bmj.com/content/bmjopen/12/3/e052067.full.pdf.

Jamwal, A., Bhatnagar, S., & Sharma, P. (2020). *Coronavirus disease 2019 (COVID-19): Current literature and status in India*. https://doi.org/10.20944/preprints202004.0189.v1.

Jhunjhunwala, A. (2020). Role of telecom network to manage COVID-19 in India: Aarogya Setu. *Transactions of the Indian National Academy of Engineering,* 5(2), 157-161. https://link.springer.com/article/10.1007/s41403-020-00109-7.

Kapoor, B., & Tyagi, E. (2021). Atmanirbhar Bharat Abhiyan: An Initiative for Startups Ventures. Contemporary *Social Sciences*, 35. http://jndmeerut.org/wp-content/uploads/2021/10/Vol.-30-No.-3-2021.pdf#page=40.

Khanna, A. (2020). Impact of migration of labour force due to global COVID-19 pandemic with reference to India. *Journal of Health management*, 22(2), 181-191. https://journals.sagepub.com/doi/full/10.1177/0972063420935542.

Majithia, A., (2020). *COVID-19 and Delhi's Waste Pickers*. https://www.wiego.org/impact-covid-19.

Marcos Barba, L., van Regenmortel, H., & Ehmke, E. (2020). *Shelter from the Storm: The global need for universal social protection in times of COVID-19*. https://oxfamilibrary.openrepository.com/bitstream/handle/10546/621132/tb-database-covid-19-social-protection-responses-151220-en.pdf?sequence=21&isAllowed=y.

Mukhopadhyay, J. (2020). *Psychometric impact of covid-19 in Kolkata*. https://www.researchgate.net/profile/Jyotishman-Mukhopadhyay/publication/344851032_The_Journal_of_Community_Health_Management_Psychometric_impact_of_covid-19_in_Kolkata/links/5f939743a6fdccfd7b7a0ea6/The-Journal-of-Community-Health-Management-Psychometric-impact-of-covid-19-in-Kolkata.pdf.

Nwosu, A. U., Goyal, S. B., Rajawat, A. S., Kemat, B. B., & Mahmood, W. M. A. B. W (2024). Integrating metaverse and blockchain for transparent and secure logistics management. In *Applied Data Science and Smart Systems* (pp. 334-342). CRC Press. https://api.taylorfrancis.com/content/chapters/oa-edit/download?identifierName=doi&identifierValue=10.1201/9781003471059-44&type=chapterpdf.

Praja, (2021). *Report on Impact of COVID-19 in Mumbai*. Retrieved on 3 July 2024 from: https://www.praja.org/praja_docs/praja_downloads/Highlights_Report%20on%20Impact%20of%20COVID-19%20in%20Mumbai.pdf.

Preysi, C., Navreet, K. S., Srinivasan, G., & Heena, D. (2021). COVID-19 in India-Impact and mitigation strategies. *Biomed Pharmacol J,* 14(2). https://www.academia.edu/download/93350990/BPJ_Vol_14_No_2_p_643_650_2_.pdf.

PRS India, (2021). *Impact of COVID-19 on employment in urban areas*. https://prsindia.org/theprsblog/impact-of-covid-19-on-unemployment-in-urban-areas.

Rachana, A. R., Davalagi, S., Kusum, M. S., & Undi, M. (2020). Effectiveness of non-pharmacological interventions in containment of COVID-19 pandemic. *International Journal of Health Systems and Implementation Research*, 4(3), 5-21. https://ijhsir.ahsas-pgichd.org/index.php/ijhsir/article/download/90/101.

Rathore, B. (2023). Digital transformation 4.0: integration of artificial intelligence & metaverse in marketing. Eduzone: *International Peer Reviewed/Refereed Multidisciplinary Journal*, 12(1), 42-48. http://www.eduzonejournal.com/.

Ruane, P. (2022). From Pin Money Workers to Essential Workers: Lessons about Women's Employment and the COVID-19 Pandemic from the Great Depression to the Great Recession. *UCLA J. Gender & L.*, 29, 335. https://escholarship.org/content/qt4cv0x7k4/qt4cv0x7k4_noSplash_8735d8dfe26d3328f4b8a0a392091115.pdf.

Saputra, F., & Ali, H. (2021). The Impact of Indonesia's Economic and Political Policy Regarding Participation in Various International Forums: G20 Forum (Literature Review of Financial Management). *Journal of Accounting and Finance Management*, 2(1), 40-51. https://dinastires.org/JAFM/article/download/50/47.

Sawyer, L., Schmid, C., Streule, M., & Kallenberger, P. (2021). Bypass urbanism: Re-ordering center-periphery relations in Kolkata, Lagos and Mexico City. *Environment and Planning A: Economy and Space*, 53(4), 675-703. https://journals.sagepub.com/doi/pdf/10.1177/0308518X20983818.

Singh, H., Gupta, S., & Hassan, M. (2022). Metaverse: A new digital marketing trend. *Internatıonal Journal of Multidisciplinary Research and Analysis*, 3623-3628. https://doi.org/10.47191/ijmra/v5-i12-43.

Smith, S. R., Hagger, M. S., Keech, J. J., Moyers, S. A., & Hamilton, K. (2022). Improving hand hygiene behavior using a novel theory-based intervention during the COVID-19 pandemic. *Annals of Behavioral Medicine*, 56(11), 1157-1173. https://doi.org/10.1093/abm/kaac041.

Team MP, (2022). *Covid fatality rate higher in men than women: Data*. https://www.millenniumpost.in/kolkata/covid-fatality-rate-higher-in-men-than-women-data-465998.

The Print, (2020). *Covid-19 can push 40 crore informal sector workers in India deeper into poverty: ILO*. https://theprint.in/india/covid-19-can-push-40-crore-informal-sector-workers-in-india-deeper-into-poverty-ilo/397355/.

The Times of India, (2020). *Domestic violence accounts for over 47% complaints to NCW in "lockdown"*. https://timesofindia.indiatimes.com/india/domestic-violence-accounts-for-over-47-complaints-to-ncw-in-lockdown/articleshow/76161829.cms.

Thomas, D. (2022). Impact of covid 19 outbreak on urban cities in India. *International Journal of Social Science and Human Research*, 5(1), 324-328. https://ijsshr.in/v5i1/Doc/44.pdf.

Times of India, (2021). *Complaints of domestic violence against women spiked in Year of lockdown*. https://timesofindia.indiatimes.com/india/complaints-of-domestic-violence-against-women-spiked-in-year-of-lockdown-ncw-data/articleshow/81687915.cms.

Valiappa Foundation, (2022). *The Impact of COVID-19 in Karnataka*. https://www.valliappafoundation.org/resources/news-and-events/the-impact-of-covid-19-in-karnataka.html.

Yap, C., Cociña, C., & Levy, C. (2021). *The urban dimensions of inequality and equality*. https://openaccess.city.ac.uk/id/eprint/27107/1/gold_vi_working_paper_01.pdf.

Author´s Address:
Adv. Suresh Kashinath Ghatge, Ph.D.
Research Scholar, Galgotias University, Liberal Education
Greater Noida, Uttar Pradesh, India
suresh.k.ghatge@gmail.com

Author´s Address:
Prof. Dr. Anuradha Parasar
Dean Liberal Education, Galgotias University
Greater Noida, Uttar Pradesh, India
anuradhaparasar99@gmail.com