Advances in 21st Century Human Settlements

T. M. Vinod Kumar *Editor*

COVID 19, Containment, Life, Work and Restart

Regional Studies

Springer

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This Series focuses on the entire spectrum of human settlements – from rural to urban, in different regions of the world, with questions such as: What factors cause and guide the process of change in human settlements from rural to urban in character, from hamlets and villages to towns, cities and megacities? Is this process different across time and space, how and why? Is there a future for rural life? Is it possible or not to have industrial development in rural settlements, and how? Why does 'urban shrinkage' occur? Are the rural areas urbanizing or is that urban areas are undergoing 'ruralisation' (in form of underserviced slums)? What are the challenges faced by 'mega urban regions', and how they can be/are being addressed? What drives economic dynamism in human settlements? Is the urban-based economic growth paradigm the only answer to the quest for sustainable development, or is there an urgent need to balance between economic growth on one hand and ecosystem restoration and conservation on the other – for the future sustainability of human habitats? How and what new technology is helping to achieve sustainable development in human settlements? What sort of changes in the current planning, management and governance of human settlements are needed to face the changing environment including the climate and increasing disaster risks? What is the uniqueness of the new 'socio-cultural spaces' that emerge in human settlements, and how they change over time? As rural settlements become urban, are the new 'urban spaces' resulting in the loss of rural life and 'socio-cultural spaces'? What is leading the preservation of rural 'socio-cultural spaces' within the urbanizing world, and how? What is the emerging nature of the rural-urban interface, and what factors influence it? What are the emerging perspectives that help understand the human-environment-culture complex through the study of human settlements and the related ecosystems, and how do they transform our understanding of cultural landscapes and 'waterscapes' in the 21st Century? What else is and/or likely to be new vis-à-vis human settlements – now and in the future? The Series, therefore, welcomes contributions with fresh cognitive perspectives to understand the new and emerging realities of the 21st Century human settlements. Such perspectives will include a multidisciplinary analysis, constituting of the demographic, spatio-economic, environmental, technological, and planning, management and governance lenses.

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Prof. / Professor T. M. Vinod Kumar had 49 years of experience in Urban Planning, as a teacher, researcher, and adviser/consultant and worked in India, China, Bhutan, Nepal, Malaysia, Indonesia, and Hawaii USA. He was Dean of Studies, Head of the Department of Urban Planning, Head Centre for Systems Studies and Analysis, Centre for GIS and Remote Sensing, and Centre for Urban Studies of School of Planning and Architecture, New Delhi; Visiting Professor National Institute of Technology, Calicut, and Institute of Technology Bandung, Indonesia and Professional Associates, East-West Resources Systems Institute Honolulu, Hawaii, Fellow Centre for the Study of Developing Societies, Delhi, Project Manager in Council for Social Development, New Delhi, Regional Program Coordinator at the International Centre for Integrated Mountain Development (ICIMOD) and Planner-Engineer at the Ford Foundation. He is the author of many books and journal articles. He coordinated and edited *Geographic Information System for Smart Cities* (Copal: 2014), *E-Governance for Smart Cities* (Springer:2015) *Smart Economy in Smart Cities* (Springer: 2016), *E-Democracy for Smart Cities* (Springer: 2017) and *Smart Metropolitan Regional Development: Economic and Spatial Design Strategies* (Springer-Nature: 2018), *Smart Environment for Smart Cities* (Springer Nature: 2019) and *Smart Living for Smart Cities Vol. 1 Case studies and 2 Community Study and Ways and Means* (Springer Nature: 2020). He is now working on four books to be published by Springer

Nature entitled *Smart Global Megacities: Collaborative Research Tokyo, Delhi, Mumbai, New York, Hong Kong-Shenzhen, Calcutta, Bangalore, Chennai, Hyderabad, Ahmedabad, Kochi-Kannur* Vol. 1 and 2 (in 2021) and *Smart Master Planning for All Cities: Innovations and Case Studies* Vol. 1 and 2 (in 2022).

Introduction

COVID-19: Containment, Life, Work and Restart Urban and Regional Studies

T. M. Vinod Kumar

Abstract COVID-19 manifests as a viral respiratory disease that first was imported from Wuhan, Peoples Republic of China and then it spreads from human to human when they come in to contact everywhere in every continent. The response has been national and state governance with cooperation from the local government based on disaster management laws. The public health system became the frontline Corona Warriors and was respected by all for their services, but the system capacity was evaluated for its capability to have an unusually substantial number of patients. Many disciplines jointly must contribute a knowledge-based solution based on time-series data on infected, recovered and died as well as more reliable serum tests. When a nation declares one peak has reached the local data shows it has not and so local governance shall be the effective measure based on local data for COVID-19 governance. This book concentrates on local governance for COVID-19. This book believes that COVID-19 cannot be eliminated like smallpox or polio. It can appear and disappear seasonally like common cough and cold, with never-ending mutation of the virus, but it can cause deaths even after we had full vaccinations. The public health systems came out with preventive culture such as wearing masks, practising social distancing, washing hands with disinfectants etc. to combat this virus. The police were deployed to implement preventive measures enumerated above. In this process, both police and public health workers got infected and can even threaten the entire population with more deaths and collapse of the public health system. This book advocates concentrating on urban centres for COVID-19 because of high population density and public realms where the danger of COVID-19 spread from human contact is maximum. The use of humans for data collection and management involving surveys and analysis, policing and intervention of public health persons are all risky prepositions for the individuals involved. This book concentrates on the public realm for work and living and finds an alternate solution that can automate COVID-19 prevention methods with less human involvement. This book gives more importance to local governance based on local data and the use of tools available for local governance such as Master Plans, Zonal Plans, Public realm management using

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ICT-IoT systems, E-Democracy and E-government. These require modifications to the existing body of knowledge based on COVID-19 prevention capabilities. Hence zonal plans may get modified and non-human control of the public realm may be institutionalized. This chapter brings together the state of knowledge on all these discussed and the rest of the chapters use many of them to demonstrate locally based solutions based on locally generated data.

Keywords Corona virus spread locally in aggregate and spatial · Governing responses · Related urban research and design issues · The urban restart · Carrying capacity of public realm · The smart Asparsa new urbanism principles for smart community · Recommended spatial approach · Tools for COVID-19 preventing urban restart project · Research objectives of COVID-19 project · Strategies and design of future of smart living and smart work post COVID-19 · Smart metropolitan regional development · Smart economy and smart work in Kozhikode Metropolitan area post COVID-19

1 The Virus Spread COVID-19 in Brief

The status of COVID-19 pandemics in the world and India is presented in a few maps from the WHO dashboard, which gives the status of the cases, deaths and vaccination, respectively, daily. For January 7, 2022, the WHO dashboard gives data for the world as well as for individual countries for example India as given below (Fig. 1).

COVID-19 pandemic spread and its disaster governance locally, regionally and globally throws challenges unknown to humanity [1–3]. For the first time, we see Chief Ministers, Prime Ministers and Public Health officials giving daily statistics and their decisions on fighting the pandemic based on data through TV News and other news media. The community is organized to run a community kitchen and deliver food and the government provides free rations for the needy. Helpless migrant workers rush back to their home states. Although it spreads eventually to all parts of the country both urban and rural infecting all with or without symptoms, it starts and remains an urban phenomenon that requires great attention. The infection, recovery and death we see every day during the pandemic create a situation to find a better way based on city studies to intervene in the urban system so that humans that created the system are asked to live and work and then adopt a new urban restart based on the yet new urban culture that transforms the existing urban culture as well as the future urban structure. This is the subject matter of the book, and this chapter introduces what it is all about. During the pandemic, disease spread occurs in waves until all are infected and then the intensity of waves in terms of infected, recovered and death then starts diminishing in the later part but will then become a periodic urban phenomenon that cannot be ignored is the challenge of an urban restart.

What is prominent in the wake of this pandemic is a great disruption of all that happens in cities and the prominence of the government hierarchy in a federal system

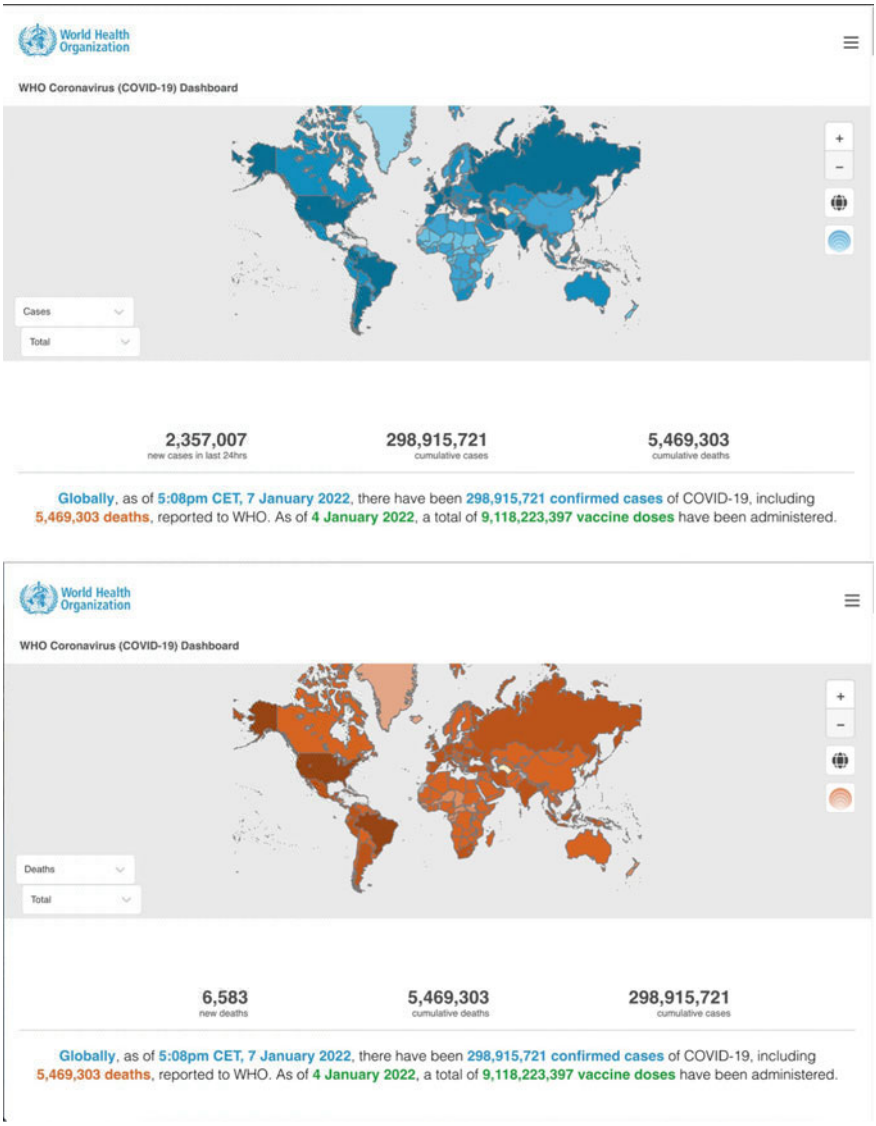


Fig. 1 WHO dashboard COVID 19. *Source* WHO

of governance in sorting out for the best interest of the citizen. The wet market in Wuhan China sells wild animals for food for local Chinese. Such markets are banned by many rule-based democracies around the world. The reason for this restriction in democracies is the first wildlife protection and second to avoid unknown animal to human transmission of diseases like COVID-19. From Wuhan, the virus is most dangerous to humanity with far-reaching impacts on living and working transmitted

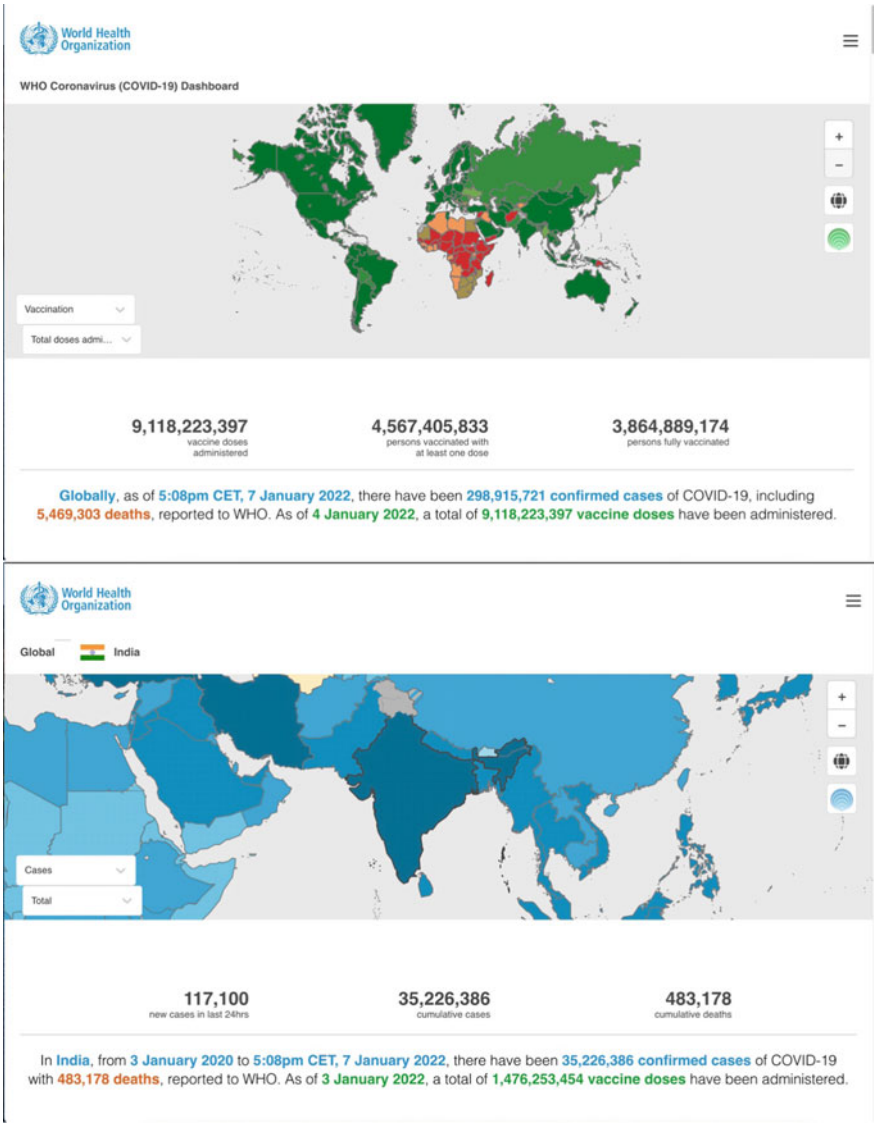
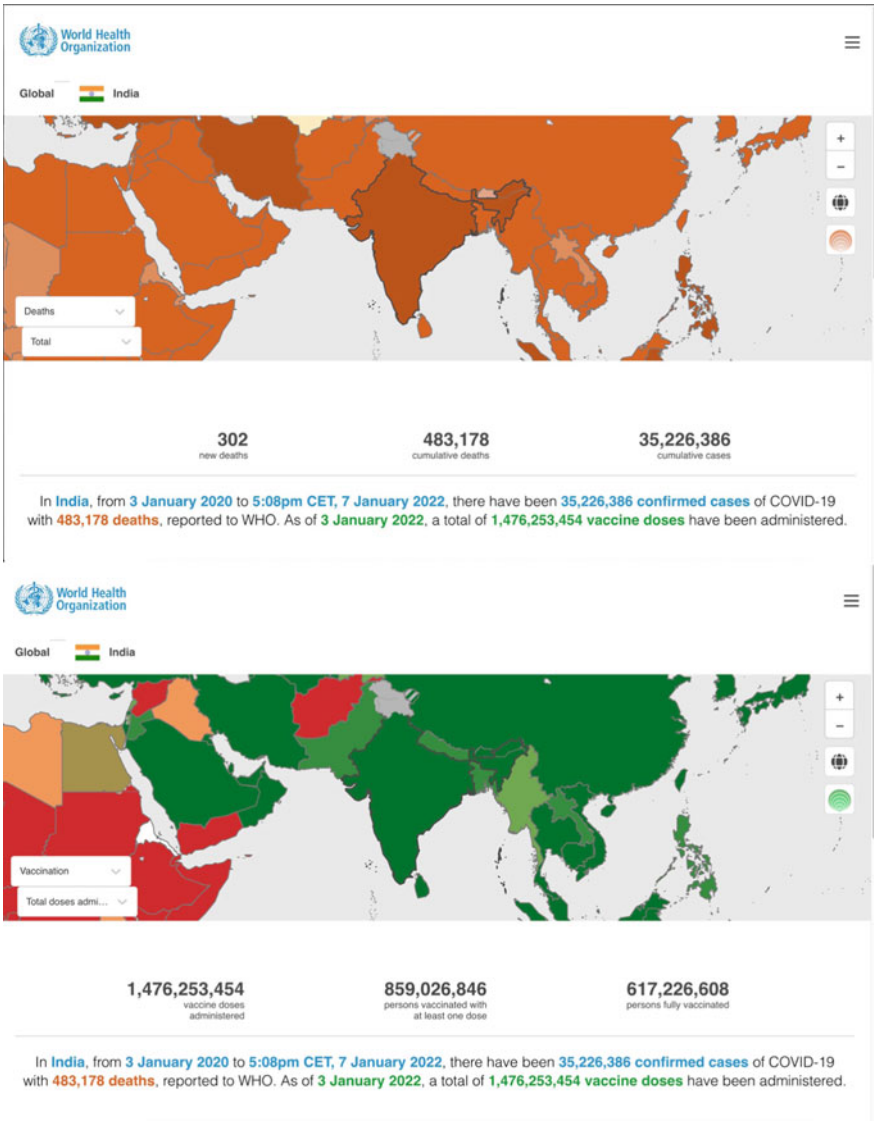


Fig. 1 (continued)

from animal to human. Until then this infection is unknown as regards its protocol for diagnosis and remedies. This virus seems to have transmitted from the breath through droplets and aerosol and affected the respiratory organs and breathing soon some patients moved to ventilators, and some died soon after in varying proportions of those identified as affected. It was also found that this virus spread at a hitherto rapid rate from human to human by contact had spread all over the world



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instantly. First, it was felt that children below 10 years and senior citizens above 60 are most vulnerable but statistics worldwide have not substantiated it fully and often quote other age groups from country to country. Those with the premorbid condition also are found very vulnerable. Many got infected with no symptoms, but testing confirmed the incidence of COVID-19, which was most dangerous but seemed innocent carriers of this virus. Deaths were reported from few with death rates varying

from country to country, which seems not correlated with the income level of the country. The spread locally was alarming, and many deaths produced more local spread than imported. Since the dead body can also transmit disease, the special cremation protocol was followed including the protocol to limit the funeral event to 20 persons were also followed. For many reasons, this virus was not announced immediately by the People's Republic of China to the world through the World Health Organization so that there can be precautions for further spread. In China, domestic air travel stopped immediately but not international air traffic resulting in a situation of unannounced Pandemic. The rapid economic development of the People's Republic of China and the initiation of the Belt and Road Initiative by China further spread the virus wherever the Chinese population are in business along the Belt and Roads either for construction or running industries and services. The older generation of silk roads spread science, mathematics, culture and religion along with locally produced surplus commodities, but newer ones spread disease and pandemics. The rapid economic development in the People's Republic of China created many Chinese tourists who travel around the world. Their travel spread the virus during the holiday season like the Chinese New Year worldwide. It was extremely late when the World Health Organization woke up and declared the epidemic a pandemic.

In most countries first, the disease got imported from travellers from outside the country not necessarily China or the outside federal states. The gateway for the entry of the disease was airports, railway stations and bus terminals and cars and buses from outside. The rest is history and statistics are reported daily of those affected, who died and recovered. I have not made any attempt to illustrate it in this para with ever-changing numbers daily. There is daily reporting by those who govern at the chief ministers' level in some states and related administrators every day as per the democratic tradition. The printed media came out with many expert articles and visual media spent considerable time on COVID-19. The virus in the process got mutated into many forms. Many Vaccines for viruses are under a certain stage of development around the world and are also authorized to use by WHO. The vaccine came out by the end of 2020 or early 2021. Vaccine delivery with a cold chain is costly for many countries and people below the poverty level. The urgency of the situation made their development so rapid than at any time in the history of the development of vaccines before that for other epidemic diseases. The virus nationalism made this extremely competitive in virus research and production that some vaccines got registered like Sputnik 5 from Russia before its full mandatory stages of testing and validation before registration, but it is now being assessed in some other countries the missing stages of testing. The disease has an incubation period of 14 days and above. The person affected sometimes carries a virus with no symptoms at all as discussed and others start showing symptoms such as temperature, cough and respiratory troubles after a fortnight. Both these types of patients freely spread the disease and the number of persons infected with contact increased disproportionately higher than those imported. Contact testing, tracing, breaking the chain, isolation and treatment became the new mantra to fight the disease. Everyone called for an increased test, but the test was time-consuming, specially equipped labs to assess coronavirus were few and the kits were costly. The home and institutional quarantine then became the norm

for 14 days and some government tries to reduce it to 7 days. There were lockouts countrywide, then district-wide and followed by selected high infected areas called hotspots. The public health systems got strained with this virus since this system is not prepared with special equipment and number of beds and adequate medical professionals. The police force worked hard to implement with fines all the protocols from time to time of Virus Governance that is universally applicable or special for selected affected areas or clusters. Both police forces and health service staff got infected despite all care they extended for prevention. There were one wave and the second and third waves of disease in many countries, federal states, cities, and union territories. There were few instances of reinfection for those who were treated earlier. The number discharged after quarantine, and treatment in hospitals became bigger and often surpassed the number infected daily. It is interesting to note that later the imported disease from outside became less and less and those affected with local contacts increased increasingly.

As stated, it was found that testing is a costly affair and was time-consuming. There was no instant testing where the result is known soon after the sample is taken. To start with, the test was conducted on only those who are suspected of affliction by contact tracing methods. Soon it spread and massive random or purposive sampling-based testing started in many places. There was also a serum test in many rounds on a sampling basis to find the spread, and it was found that the spread is at an alarming rate. Testing, more testing, contact tracing of those affected and treatment and quarantine became the norms. Face masks and keeping a social distance of two metres were used everywhere often marked on the floor to guide the population on social distancing. The places where this social distance is difficult such as religious congregations and schools and colleges, cinema theatres and so on were first closed for many months and then opened systematically with capacity restrictions. The health care system was assessed for its full capacity for equipment and healthcare professionals to treat the patients, especially with costly ventilators requirement on a massive scale. The oxygen supply was made uninterrupted by Governments to hospitals. Many specialized COVID hospitals with beds and equipment came up within brief time intervals since the numbers were found uncontrollable with the existing setup. The medical team were the front-line Warrior and appreciated by all for their challenging work and services sometimes endangering their own life.

Many stages of lockouts followed by unlocking announced by the government gradually resulted in the contraction of the economy alarmingly rapid in size and recession, it also created massive unemployment for all especially the informal sectors of the economy and migrant labourers. They faced hunger in the twenty-first century. The daily normal life was disrupted with consequent mental and emotional discomfort and reported suicide of COVID-19 patients in hospitals. The government spending was increased since many below poverty must be provided free food and rations for extended months. Most government expenditure went for relief and not for the development or creation of vital infrastructure.

2 The Serosurveys of India and Kerala

The first India-national severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) serosurvey in India was conducted in May–June 2020, among adults aged 18 years or older from 21 states and found a SARS-CoV-2 IgG antibody seroprevalence of 0.73% (95% CI 0·34–1·13). I quote from the surveys, "The second household serosurvey was conducted among individuals aged 10 years or older in the same seven hundred villages or wards within seventy districts in India that were included in the first serosurvey. Individuals aged younger than 10 years and households that did not respond at the time of the survey were excluded. Participants were interviewed to collect information on sociodemographics, symptoms suggestive of COVID-19, exposure history to laboratory-confirmed COVID-19 cases, and history of COVID-19 illness. 3–5 mL of venous blood was collected from each participant and blood samples were evaluated using the Abbott SARS-CoV-2 IgG assay. Seroprevalence was estimated after applying the sampling weights and adjusting for clustering and assay characteristics. The survey then randomly selected one adult serum sample from each household to compare the seroprevalence among adults between the two serosurveys.

Between Aug 18 and Sept 20, 2020, the survey enrolled and collected serum samples from 29 082 individuals from 15 613 households. The weighted and adjusted seroprevalence of SARS-CoV-2 IgG antibodies in individuals aged 10 years or older was 6.5% (95% CI 5·8–7·4). Among 15 084 randomly selected adults (one per household), the weighted and adjusted seroprevalence was 7.1% (6·2–8·2). Seroprevalence was similar across age groups, sexes, and occupations. Seroprevalence was highest in urban slum areas followed by urban non-slum and rural areas. We estimated a cumulative seventy-four three million infections in the country by Aug 18, 2020, with 26–32 infections for every reported COVID-19 case. One in fifteen individuals aged 10 years or older in India had SARS-CoV-2 infection by Aug 18, 2020. The adult seroprevalence increased tenfold between May and August 2020. A lower infection-to-case ratio in August than in May reflects a substantial increase in testing across the country. Some 67% of India's population above the age of six has been exposed to COVID-19, according to the latest national serosurvey. The Indian Council of Medical Research (ICMR) surveyed 36,227 people across twenty-one states in June and July—and found that two out of three have antibodies. Four hundred million people were vulnerable to the infection, officials warned against lax Covid protocols."

Daily statistics that monitor the death, inpatient and quarantine patients admitted to ICU were published daily in all local newspapers and TV channels. Many issues to face the pandemic were felt at the national and state levels with immediate interventions to remedy the current malady. This includes free food kits, community kitchen, voluntary effort, hotspot surveillance, mask manufacturing, augmented oxygen generation and supply to hospitals and so on.

"The fourth serosurvey shows there is a ray of hope, but there is no room for complacency. We must maintain Covid-appropriate behaviour," ICMR chief Dr. Balram Bhargava said. Sero-prevalence means the presence of antibodies against Covid-19 in the population. For the first time, the survey included children, between six and 17 years—and more than half of the 8,691 samples that were evaluated had antibodies."

The serosurveys conducted by different states with adequate sample sizes show a different picture in different states. For example, the state of Kerala showed a disproportionately higher prevalence of COVID-19 in comparison with the rest of the country despite the higher standard of health care there. The daily patients reported classified into inpatient, outpatient and home and institutional quarantine, COVID-19 hotspots as well as deaths. There were many numbers than in other states. There was also an under-reporting of death in Kerala to display the capability of the ruling dispensation. Since the death is tied up with compensation, this record is being corrected to save face among people.

"The summary of serosurvey result is as follows. Serosurvey: 70% in Kerala may have acquired natural immunity against COVID-19 (Vide C. Maya GOK, THIRUVANANTHAPURAM, OCTOBER 19, 2021, 16:01 IST UPDATED: OCTOBER 19, 2021, 16:01 IST). According to Maya, When the State was organising mass vaccination drives to protect the community from the ill effects of COVID-19 infection, the natural infection had already penetrated 70% of the State's population. The third round of serosurvey conducted by Kerala across all districts to assess the levels of COVID-19 antibodies in the population has reported that post second wave, at least 70% of the population may have achieved natural immunity against COVID-19. While the overall seroprevalence in the adults in the community is estimated at 82.61% (either Anti -spike IgG antibody or Anti-nucleocapsid IgG antibody), the health. This means that even when the State was organising mass vaccination drives to protect the community from the ill effects of COVID-19 infection, the natural infection had already penetrated to 70% of the State's population."

"The seropositivity of 70% observed among the unvaccinated population may be an indicator of the background infection rate in the population" is how the health department has chosen to put it. The other side of the story is that since natural immunity is stronger and more long-lasting than the immune cover provided by any of the vaccines currently in use, Kerala is in a much better position now as far as population immunity against COVID-19 is concerned, than it had been in June this year," despite there being a disproportionately higher daily incidence of COVID-19 among the population in Kerala in comparison to the national figures. This shows that immunization is not the sure and final remedy for COVID-19 pandemic, but the social distancing and other preventive measures discussed in this chapter elsewhere.

"In June, the fourth round of serial serosurvey conducted by ICMR had estimated seroprevalence of only 44.4% (42.7% for S1spike protein receptor-binding domain (RBD) neutralising antibodies) in Kerala against a national average of 67.6%. Seropositivity amongst those who were fully vaccinated has been pegged at 90% (89.92).

The difference in seropositivity amongst the unvaccinated (70%) and the vaccinated (90%) in population samples indicates that 20% of the State's population have only vaccine-derived immunity, among whom, breakthrough infections will continue to be reported for some time.

Given the heterogeneous pattern of natural immunity in the State (as seen in the variation in seroprevalence across districts) and waning vaccine immunity, shortly, these breakthrough infections are likely to occur in clusters in regions where vaccination coverage has been high but natural infection has been a low dose of the vaccine also went up from 30% in May to over 80% by September, when the current serosurvey was undertaken. Hence, we would like to believe that a chunk of Kerala's population now has hybrid immunity (combination of immunity from natural infection and vaccination), which is stronger and sustainable," said T. S. Anish, public health expert. Low seropositivity amongst children was observed. The fact that only 40.2% of the State's children (5–17 years) have natural immunity against the virus is quite concerning because this is one group that is vulnerable to COVID-19 as they do not have the protection of the vaccine. The low seroprevalence in this group indicates that when schools reopen next month, large-scale clustering of COVID-19 cases could be expected in schools and within families. Children are the only group where the seroconversion has been due to natural infection alone. District-wise, the seroprevalence among children ranged between 7.9% in Wayanad and 63.3% in Kasaragod.

The State claims that "the low levels of seropositivity among children is a surrogate of flattening of the curve of natural COVID-19 infection of the State and an indicator of the State's fight against the rapidly spreading infection". The State used two assays to estimate anti-spike antibodies (signals immunity through vaccination or natural infection) and anti-nucleocapsid antibodies (signals either prior natural infection or vaccine-derived immunity through Covaxin). The enormous difference in seroprevalence due to anti-spike antibodies (82.14%) and anti- nucleocapsid antibodies (19.26%) is quite surprising, indicating that seroconversion in the State has been contributed through anti-spike antibodies. It does raise questions about the efficacy of the seroconversion rate of Covaxin.

The survey also included 7,252 healthcare workers—and 85% of them had antibodies. Eighty-two per cent in the 18+ age group have antibodies, finds Kerala serosurvey. The third phase of the seroprevalence survey was held in September among six categories of the population—those aged above 18, pregnant women, children between 5 and 17, the tribal community, residents of coastal areas and urban slums dwellers—to diagnose the rate of infection. Eighty-two per cent in the 18+ age group have antibodies, finds Kerala serosurvey. The latest serosurvey conducted by the Kerala Health Department to estimate the prevalence of SARS-CoV-2 infection in the state has revealed the presence of antibodies in 82.6% of samples taken from residents aged 18 years and above.

The third phase of the seroprevalence survey was held in September among six categories of the population—those aged above 18, pregnant women, children between 5 and 17, the tribal community, residents of coastal areas and urban slums

dwellers—to diagnose the rate of infection. Unlike the previous serosurveys held by the ICMR, this time the 13,000-odd samples were collected from all districts.

Presenting the survey result in the Assembly, Health Minister Veena George said the high prevalence of antibodies in the sample population could be due to the natural infection of the virus or vaccination coverage in the state. The survey revealed that the presence of antibodies was high among the tribal community (78.2%), residents of coastal areas (87.7%) and urban slums (85.3%). However, the presence of antibodies was lowest among children in the age group 5–17 years (40.2%). This assumes significance as Kerala is all set to open schools from November 1 which got postponed to partial. The September serosurvey results are in stark contrast to an ICMR serosurvey in May. In the May survey, Kerala's seroprevalence at 42.2% had been much lower than the national average (67.6%). This implied that over half of Kerala's population remained susceptible to COVID-19.

The Technical paper COVID-19 ICMR Sero-Surveillance 2nd Round—Kerala summarizes the Results of ICMR Seroprevalence studies: Kerala as quoted below. "ICMR was doing population-based seroepidemiological studies to measure the extent of spread of infection in an area and recommend containment measures accordingly. The strategy for population-based sousveillance adopted is repeated cross-sectional investigation in the same geographic area to establish trends in an evolving pandemic. Two rounds of such studies have been completed—one in May and another in August. The survey was conducted in the general population among individuals aged 18 years or more in selected representative 736 districts in India. Samples are collected from three districts of Kerala (Ernakulam, Palakkad, and Thrissur). ICMR has communicated the results of the second serosurvey as per D.O.No. ECD/COVID r9lt\ {isc. /2020 Dated, the 30rh September 2020. The current paper discusses the results of the sero-surveillance and its interpretation for Kerala (Tables 1 and 2).

1. Kerala's seroprevalence in August was eight times less than the national average.
2. The state's seroprevalence increased by 2.4 times over 3 months. The national average increased by nine times during the same period. Different states' increases may be further higher than the national average.
3. This shows the effectiveness of robust containment measures including quarantine norms, following sanitized corridors for travellers coming from outside the

Table 1 Summary of results—Kerala

Dateofsample collection	May 18–23rd	August 24–26th
Total IgG positive	4	11
Total tested	1193	1281
% IgG positive	0.33%	0.8%

Table 2 Comparison of results with national average

	May 2020 (%)	August 2020 (%)
Kerala	0.33	0.8
National average	0.73	6.6

state, effective contact tracing, rapid detection of cases through improved access to tests and isolation of COVID positive cases, picking up clusters' formation at the beginning through surveillance and containment measures within clusters and the 'break the chain' measures that were adopted in the state.

4. It is worth noting that the estimated gap of unidentified cases was very less in Kerala as compared to the national average.
5. All credits for the lower prevalence of COVID in the state go to the responsible citizens of the state who followed all COVID protocols rigorously and cooperated with all containment measures. All line departments coordinated actions have contributed to maintaining low infectivity rates in the state till August.
6. This also implies that further cutting down transmission is possible if all citizens strictly follow physical distancing by reducing the number of primary contacts, use masks and practice hand hygiene and all shops/establishments/markets follow "COVID compliance."
7. Understand how the infection is spreading in the country, all states' comparative analysis is possible. It will clarify the rate of infection spread in various parts of the country and the state.
8. All the states must take uniform actions to ensure that the infections come under control. If not, the virus will keep circulating in the community and cause illness and fatality till it reduces its virulence.

ICMR study suggests that the IgG positivity has gone up from 0.33 to 0.8%. This needs to be seen in the context of the vulnerability in the state such as a high density of population, an inflow of people from outside the country and other states, a high percentage of the elderly population, high percentage of people with morbidity. Despite all these adverse situations, the state is maintaining low infection transmission as reflected through the ICMR study. It shows the sincere efforts of all at the grassroots.

Director of the All-India Institute of Medical Sciences (AIIMS), New Delhi, Dr. Randeep Guleria hailed the ongoing COVID-19 vaccination drive in the country and said that no booster dose is required in the country as of now.

Speaking at the launch of the book "Going Viral: Making of COVAX in—The Inside Story", authored by ICMR Director-General Dr. Balram Bhargava, Dr. Randeep Guleria said, "It is unlikely that the third wave of COVID-19 of a magnitude comparable to the first and second will hit India. With time the pandemic will take an endemic form. We'll continue to get cases, but the severity will be highly reduced."

He also underlined that the absence of a surge in cases now suggests that vaccines are still protecting against the virus and there is no need for a booster dose for now. Lauding India's progress in terms of medicine, Dr. Guleria further said, "When H1N1 had hit India, vaccines were imported from foreign countries. From importing vaccines to manufacturing our indigenous vaccine, we have come a long way. Today, our COVID-19 vaccines are being exported to other countries."

Speaking on the current situation of COVID-19 in the country, Dr. V K Paul, a Member of NITI Aayog warned that the pandemic is not over yet and will not likely be over in near future. "It might become an endemic instead of a pandemic or could

be a pandemic in a pandemic. The virus might take a different shape, but India is ready to deal with the situation. We are in a better situation now," he added.

The reduction in infection rate and the absolute number of cases is possible only if people follow health advisories and change behaviour by taking prevention measures.

3 The Full Vaccination or Full Natural Immunity or Hybrid Immunity is not the Foolproof Remedy for COVID-19 Pandemic

Based on all serosurveys conducted and analyzed at the world, national and state levels, I submit a hypothesis that full vaccination or full natural immunity or hybrid immunity is not the foolproof remedy for COVID-19 pandemic. It is undoubtedly required. It is the social distancing and redesign of the city for work and living.

This is substantiated by the fact of rising COVID cases in Europe despite high vaccination rates and even applications of booster doses do not prevent further waves. The European situation is a similar reason for worry in Kerala (November 11, 2021, Indian Express) where a high rate of vaccination has occurred, but the incidence of diseases is not vanning, many days, it is as high as 50% of total India. Europe with a high rate of vaccination record saw a 6% increase in new infections in mid-November 2021 compared with the week before, and a corresponding 12% rise in deaths. The rising curve of COVID-19 infections in European countries, especially among fully vaccinated people there, can be worrying for a state like Kerala specifically because the health care standard is like the Europe, where breakthrough infections are spiking each day, said a member of the state's expert panel. Then what about the rest of the states in India?

Germany, whose 67.2% population is fully inoculated in November 2021, reported over 50,000 cases, the highest since the beginning of the pandemic. The UK, one of the worst-affected countries in Europe in terms of COVID fatalities, has also been reporting over 35,000 cases this week. A virus gets mutated. First, we had Delta variant spreading in all parts of the world with more rapid spread capability than prevalent and now the World Health Organization (WHO) classified a new variant of SARS-CoV-2, currently circulating in South Africa, as a "variant of concern." It is also named Omicron much more efficient in spreading disease above Delta variant capability. This adds to further dilemma and makes us doubtful vaccination alone strategy cannot deliver the required state but a combination with a change in living and work in the urban habitat.

Europe saw a 6% increase in new infections mid-November 21 compared with the week before, and a corresponding 12% rise in deaths. The WHO said Europe was at a "critical point" and could be seeing a spurt in cases due to "uneven vaccine coverage" and premature relaxation of restrictions.

Dr. Anish TS, a member of the expert committee advising the Kerala government on COVID-19, said on November 21, "It is worrying for us because Kerala is