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RETHINKING CITIES

IN A POST-COVID-19 WORLD

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Editors' Note

Cities around the world have faced the brunt of the COVID-19 pandemic due to widespread international connectivity, the movement of people and goods, and commercial and recreational activities in constricted spaces. Denser cities have proved to be easy targets, perhaps due to the assumption that they are anathema for social distancing. However, density by itself need not be the only vulnerability. While cities like Mumbai, New York and London have reported staggering rates of infection, other dense cities like Singapore, Seoul and Hong Kong have managed to keep the worst of the virus at bay. According to a World Bank study of 284 cities in China, cities with extremely high population densities—such as Shanghai, Beijing, Shenzhen, Tianjin, and Zhuhai—have had far fewer confirmed cases per 10,000 people (1). Research on economic geography also shows that density helps economies grow—the higher the density, the shorter the distance between workers, businesses, and parts of supply chains (2).

What has caused so many major cities to crumble under the onslaught of the virus? Inadequate social and physical infrastructure—coupled with density—has proved to be the undoing of many big urban spaces. The lack of coordination and data amongst relevant authorities and other key individuals are also factors that have exposed certain cities to the outbreak more than others.

The longer the pandemic rages on, the more important becomes the question of how we live and grow in urban conglomerations. What are the fissures that COVID-19 has exposed in city-planning today? How can urban planning systems equip themselves better for future pandemic management? *Rethinking Cities* explores the relationship between the pandemic and urban health infrastructure, climate resilience, informal settlements and work, social infrastructure, and

commercial investments, to provide a potential direction for urban planning to mitigate the risks from future health crises.

Healthy Cities

The modern development of cities has taken root around a central binding theme, be it green cities, smart cities, or sustainable cities. The pandemic has revealed that making healthy cities a parameter for development is also essential. Strengthening urban healthcare infrastructure to handle the rush of patients with new infections, and disruptions in general healthcare services, particularly public health services like immunisation, will prevent urban populations from being exposed to additional infections and disease outbreaks. Existing urban primary health structures need to be strengthened physically and financially, along with effective and advanced monitoring, surveillance and accountability. City-level administration must also be seamless, and all tiers of healthcare must work together with a unique and standard pandemic related operating procedure.

Strengthening health infrastructure must also go hand in hand with using digital tools to amplify healthcare delivery. The COVID-19 crisis has seen a surge in the use of telemedicine services, which citizens were heretofore slow to embrace. The sudden increase in the use of digital health accessories will create the required testing ground for the advancement of health-tech that enables traditional forms of health services rather than replaces them. This shift in healthcare delivery shall also propel the arrival of digital-savvy health workers with technology-oriented education and skilling programmes being introduced in medical, nursing and para-medical curricula.

Green Cities

Some of the fractures introduced during the COVID-19 crisis are with regards to the lack of open spaces, ineffective resource management for the affected population, and disruptions in energy consumption. These are matters that have a base in the absence of appropriate urban planning for resilience and sustainability. A synchronised strategy that responds to both COVID-19 and the climate crisis must be implemented so that we do not see adverse effects of both during potential pandemics. Focusing on circular economy frameworks, sustainable urban mobility, and accelerating investment in green infrastructure and renewable should be priorities.

The transformation in the transportation sector will also need to align with the green agenda to make cities resilient and sustainable to future

pandemics. Changes in transit preferences and user behaviour due to paranoia about congestion will need to be balanced with institutional decisions on how to mitigate such bottlenecks. Creating well-ventilated public transport with congestion caps and pricing, and encouraging the use of non-motorised transport are some of the ways how this balance can be achieved.

After months of lockdowns and quarantine, with populations experiencing 'COVID-19 fatigue' and a breakdown in adhering to precautions, open spaces for recreation and physical activity have become crucial. Cities that lack such areas must re-evaluate space management to mitigate the mental and physical health impacts of pandemics in the future. These evaluations can be done in tandem with improving the city's climate-resilient facets. Land-scarce cities make it difficult to create new spaces; therefore, climate-harming spaces can be repurposed for environmentally-friendly gatherings for healing that do not compromise social distancing requirements but alleviate the anxiety of social isolation.

Inclusive Cities

Conversations surrounding the need for cities to accommodate the considerations of its vulnerable populations began much before the pandemic. This crisis has added a new dimension to the anguish of the vulnerable, and initiated a dialogue on what can be done to prevent such suffering in the future.

Pandemic responses must be bolstered by an urban-planning system that includes sex-disaggregated data collection on the number of people, number of households, pockets and areas of vulnerability, as well as the availability of sanitation and hygiene amenities. Preparedness and response plans cannot be made unless the number of people living in vulnerable areas and information on the civic amenities available to them is known. A focused drive to collate up-to-date data of formal-informal settlements and labourers in cities is essential to correctly gauge the funds that will be required to provide adequate access to food supplies, housing, sanitation, and financial services.

A gendered analysis of the effect of the pandemic on job losses and employment trends is also crucial to work on rehabilitation post-pandemic. Urban planning must include better data management to mitigate the deadliest impacts of future pandemics. This information, together with the effective coordination that city systems can provide, will be crucial in the deployment of essential services to the vulnerable.

Rising Cities

The post-pandemic world will see significant changes in the social, physical and financial infrastructure of cities. With safety being the primary consideration, building design and office layouts shall transform as per health protocols adopted during the crisis.

Cities will continue to create skyscrapers and slums simultaneously while keeping their urbanisation goals intact. However, an urban growth plan that synchronises formal employment generation with the formulation of effective housing schemes will prove to be the most effective.

As the post-pandemic world shrinks and the rapid progression of globalisation wanes, there may be a reconceptualisation of cities as singular nodes of trade, commerce and knowledge. The mobility of commodities and labour will be primarily restricted within demarcated governance zones, and cities may rise as self-sufficient units.

The COVID-19 crisis will result in substantial adjustments in how we shape, administer and live in cities. Our understanding of cities, as dense conglomerations of constant social interactions, might be overhauled. We must come to terms with this and ensure that systems undergo the changes that accompany this understanding, be it in mobility, housing, employment, or financial investments. While it may seem impossible to do in the immediate future, stakeholders must make concerted efforts in making the changes that will assist crisis prevention in the future, and also mitigate the adverse short-term consequences of the pandemic.

Aditi Ratho and Preeti Lourdes John

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HEALTHY CITIES

Healthcare Delivery Must Embrace the Digital Space

Sheetal Ranganathan

In the pre-COVID-19 phase of the fourth industrial revolution, policy discourse on smart cities and urbanisation was dominated by sustainability. The primary question asked was how technology could be ecologically harnessed for human development. A smart city would necessarily be a 'green city', run mainly on renewable resources. Also, it would be an 'intelligent city' powered by digital technology and knowledge. Being green and intelligent would pre-suppose that cities, with its dwellers and infrastructure, would be prepared to absorb and recover from economic, environmental, social, or governance-related shocks.

An important measure to judge the 'smartness' (1) of a city would be its resilience index (2). This index would be calculated by processing scores on key performance indicators falling under the risks mentioned above. For instance, performance rating on public health (sanitation, health infrastructure, quality of medical services) is one of the critical indicators under the social category. Other indicators like education, welfare and safety of neighbourhoods would also add to the resilience score on social risk. Effort towards improving the resilience index, however, need not necessarily make its carrier city immune to broad-sided shocks—especially full-blown global crises such as the COVID-19 pandemic, or public health emergencies such as the Ebola outbreak, Chernobyl disaster and the Bhopal gas tragedy.

COVID-19 has pushed humanity into an existential crisis, mainly because it caught us off guard, hindering our ability to fight a global threat of an unprecedented scale. A common adage is that health is a person's wealth and is non-renewable if lost. COVID-19 is a potent reminder for humanity to revisit and value such wisdom. It is a wake-up

call for countries to pull public health outside of the social category and into an exclusive group of its own.

Smart cities of the COVID-19 and post-COVID-19 time must balance being intelligent, green and healthy to stay steady in both calm and rough weather. If a city were an individual, a postulate from age-old Hindu philosophy would be invoked to determine its total well-being. Ayurveda says *Satvamatma sariram ca trayamaitattridandavat*. Translated from Sanskrit, this means 'as the tripod of mind, soul and body maintain the balance on which the living world stands' (3). For a city, digital infrastructure will be a mark of its alert mind, going green will preserve its soul, and the health of its people will safeguard its body. It is, therefore, imperative that city development and urbanisation embrace digital technologies in the delivery and consumption of health to be future-ready and relatively safe from new health exigencies.

Future of Healthcare: High-Touch and High-Tech

Just as the year the Internet was created (1989) is pegged as the dawn of the digital age, 2020 will be remembered as heralding the era of digital healthcare. From a few thousand Internet users in the early 1990s to 50 million in 1999 to more than five billion in 2019 (4), the 'digital' way of life has permeated the personal and professional space of people at record speed. However, the digital baptism of healthcare happened two decades too late. The digital space for healthcare has thus far been restricted to back-office tasks such as information flow management, staffing and logistics, revenue process optimisation and, more recently, the creation and maintenance of electronic health records. Core services within healthcare have remained in a high-touch, people-to-people delivery mode, notwithstanding the socio-economic status of cities and communities across the world.

COVID-19 will transform such healthcare delivery from being predominantly physical to becoming a blend of physical and digital—'phygital'. Buttressed by technology, the essential nature of healthcare will continue to stay high-touch to become more patient-centric, whether virtually or physically. Healthcare can never entirely be in the digital space because of the apparent inability of conducting physical examinations during virtual consultations. Patients must be on-premises for, among other things, full clinical examination, advanced diagnostics tests, day-care procedures and treatments. However, COVID-19-induced behavioural transformations, such as the need for physical distancing and a heightened sense of hygiene and sanitation, will continue to remain necessary and non-negotiable elements of the care pathway to minimise

the risk of infection spread at all layers and steps. No health system anywhere in the world has been able to withstand the test of COVID-19. Redefining the social order warrants a redesign of health systems to manage the increasing incidence of diseases within limited resources, with the added paranoia of transmission of infections.

Rethinking Cities for Connected Care

City design will have to be realigned to support a connected care ecosystem with a mix of physical and digital elements across the multi-pronged healthcare delivery value chain. As a kneejerk reaction to combat COVID-19, many countries have taken a platform approach for crisis management, where existing technology and assets have been leveraged to develop essential toolkits comprising the following elements:

- Contact tracing apps

- Mobile technology and drones for surveillance

- Transformation of hotels and stadia into quarantine zones

- Segregation of COVID-19-only treatment wings within hospitals

- Harnessing 3D printing and robotics for ventilator design and production

- Enabling telemedicine practice with regulation changes

- Implementing rapid diagnostic techniques

- Testing existing combinations of anti-viral drugs and immune modulators as a potential cure cocktail

- Devising vaccine design and production approaches with a never-heard-before speed and international collaboration

Several smart innovations and strategies have already been piloted during the crisis. As all cities prepare to move from crisis-control mode into a risk-acceptance mode in preparation for the new normal, long-term urban design adjustments are needed.

The extent of work needed to remodel delivery infrastructure and service facilities will vary within cohorts of cities, based on their position on the scale of urban development. The cultural milieu, along with the following operational and structural realities of a city will determine the composition and proportion of design changes required to repurpose existing resources or to build new customised solutions.

Internet connectivity and smartphone penetration: A critical and essential pre-condition, this will determine not only the feasibility of health services to be delivered virtually, but also the choice of apps and the extent of advanced features that the health-tech aides could support in a connected care system. It is essential to enable efficient patient triaging within the digital and physical steps in the care continuum

Epidemiology profile of the region: Factors like age, occupation matrix, genetic profile and innate immunity along with environmental conditions influence the propensity of diseases and health risks within a population, thereby determining the city's epidemiology profile. The evolving epidemiology profile of a city presents leading indicators for infrastructural adjustments and resource planning to strengthen resilience, such as decisions related to several emergency rooms, isolation rooms, number of beds per ward, equipment readiness and speciality physician staffing. For example, a city with a dominant section of older people will also need provisions for critical care in the home setting

Socio-economic profile of city residents: The ability to pay, education levels, insurance coverage and other socio-economic indicators hold direct correlation to the acceptance of sophisticated new-age technologies for a city's residents. The better the score on these, the easier it will be to prepare cities for future health crises

Terrain and population distribution: Whether digital tools can be used to optimise the supply chain and last-mile delivery of health products (especially pharmaceutical products and vaccines) is influenced by the terrain and population density of a city. For example, cities with populations living in difficult-to-reach topologies must consider using drones for surveillance and the delivery of medical essentials

Tourism and inter-city movement: In the wake of the COVID-19 pandemic, all cities must be ready with robust surveillance infrastructure to track infectious diseases and the rate of spread. The risk of imported contagious diseases multiplies with a city's tourism attractiveness score, so cities must accordingly work on crisis responses

Governing law, the flexibility of inter-city collaboration: A city, as a unit-level entity, may not be suffused with enough resources and funds to be self-sufficient in the time of public health crises. Therefore, cities must develop a shared ecosystem and incentive schemes to manage surges and shortages and to enable virtual care (such as sharing tele-ICUs and mobile health clinics) with valid inter-city practice licences for doctors, paramedics and other health workers

Culture: Health infrastructure and resource planning for a city will be reflective of whether the community approach towards health is preventive or reactive. For example, city redesign with a preventative mindset would assume facilities for wellness, physical fitness, health food joints, diagnostics lab network, use of health sensors and surveillance apps in the plan along with the measures mentioned above

Preparing Health Workers for a Digital Future

As cities remodel infrastructure and prepare to slip into a method of operations governed by new rules to transform healthcare for the digital age, one must ask if the current healthcare workforce is prepared to deliver a digital future? The answer is no, in terms of the will and skill required to work with health-tech tools that run at the intersection of medicine and engineering, and use new-age technologies such as artificial intelligence (AI), machine learning (ML) and robotics. This field is in its nascent stages; however, there have been instances where AI-based diagnostic algorithms have conceptually matched or outperformed human judgement. For example, a deep-learning algorithm was able to detect lung cancer on a low-dose chest computed tomography (5), (6).

In recent years, two schools of thought have emerged within the medical fraternity. One sees AI- and ML-powered health-tech solutions as augmenting clinical decision-making, thereby creating more time for patient care and improving health outcomes (7). These tools are also expected to help ease the burden on physicians and nurses who are overworked and burning out (8). The opposing view is that algorithms cannot ever be human-centred enough to warrant trust in the safety and accuracy of their results. Besides, they also view AI tools as posing a threat to the medical profession such that these will selectively replace human medical specialists (9).

COVID-19 has indeed thawed the digital inertia long enough for doctors and patients to embrace the benefits of technology. Telemedicine, a simple yet powerful tool in health-tech, has existed for more than three decades, but it has only been widely adopted during the COVID-19 crisis (10). The acceptance of this part-virtual mode of healthcare operation has encouraged and accelerated the notion of technology being an enabler rather than a replacer. Digital technologies will become an integral part of the new normal in healthcare. However, the use of telemedicine may not fully reflect the extent to which the evolving digital trends will soften the stand of the AI/ML contrarians in evaluating digital health as an opportunity and not a threat.

Irrespective of these views, it is the need of the hour to prepare health workers to become digital-savvy and technology-oriented. Health-tech must be introduced as a specialised subject in the medical, nursing and para-medical curricula (11). Such healthcare professionals will be the most qualified to form a combination-perspective on the digital health tools of the future and to provide a value-based assessment. More importantly, their evaluation will be drawn from the lens of patient-centricity, without having to cross the valley of traditional mindsets and technological apathy.

Conclusion

Once the pandemic has passed, delivering and experiencing efficient, convenient, participative and infection-proof healthcare will become the way of life. Patients and of the digital future will be more empowered, more engaged and more in control of their health and disease management journey (12). Additionally, they will have access to more effective medical products and cures of the future, together with personalised attention and empathetic care. Ultimately, the result of healthcare going 'phygital' will be the aim and purpose of medical care itself—well-served patients.

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India's Urban Healthcare System Must Adapt to the New Normal

Oommen C Kurian

In the initial phase of the COVID-19 pandemic, the impact of the virus was predominantly in urban areas around the world. Due to a range of reasons, including high population density, shared services, higher exposure to travellers and systemic constraints on social distancing, surges in COVID-19 cases and deaths were seen in urban hotspots across the globe, quickly overwhelming the existing healthcare delivery capacity. Stark health disparities that exist in the urban landscape are shaping the impact of the pandemic. This brings to the forefront the need for equitable and fair urban planning, including health planning.

Indian Scenario

In India, the three states with the highest number of cases—Maharashtra, Tamil Nadu and Delhi—are also among the most urbanised. Even for states that are less urbanised with a high number of cases, such as Rajasthan, Madhya Pradesh and Uttar Pradesh, the primary spread has been within its cities (Jaipur, Indore and Agra, respectively). Some estimates suggest that just 13 Indian cities account for 70 percent of the total COVID-19 cases in the country (1). The relatively lower impact COVID-19 has had on India till now could be explained in part by the country's lower levels of overall urbanisation. Nevertheless, with its devastating effect on economic stability, this pandemic particularly calls into question urban health resilience (2).

The changing epidemiological profile of the population, particularly in urban areas, makes citizens more vulnerable to COVID-19 due to the increasing burden of non-communicable diseases (NCDs). Recent research points out that in the wake of urbanisation, globalisation, and economic growth, there has been a significant shift in the nutrition

profile of the population. High rates of undernutrition characterise this shift alongside increasing rates of obesity. Simultaneously, the proportion of diet-related NCDs is increasingly a significant cause of death; even as the communicable, maternal, neonatal and nutritional causes (referred to as 'Millennium Development Goals (MDG) conditions') are reducing. What is often called "the over-nutrition epidemic" has been historically more visible in wealthier states and urban areas. Incidentally, these are the same regions being impacted disproportionally by COVID-19 (3).

Over the last three months, the impact of COVID-19 on urban health systems has been immense—in terms of overwhelming health facilities due to the patient surge, the pressure of broad testing requirements put on the health workforce, and the significant disruptions in the provision of non-COVID-19 healthcare services across the preventive, curative and rehabilitative spectrum. Given that many hospitals are being seen as hubs of infection that put their staff and patients at risk, there is an urgent need to ensure safe continuity of non-COVID-19 healthcare services in urban areas as the coronavirus spreads. The fear of infection has led to the closure of many private hospitals to non-COVID-19 patients suffering from illnesses like cancer, malaria, HIV, tuberculosis, non-communicable diseases, and childhood pneumonia.

This scenario underlines the need to streamline urban health governance, starting from primary level care. In India, urban health is governed by a mix of stakeholders in a three-tier system involving the Ministry of Health and Family Welfare, urban local bodies and state governments (4). There are also other players, ranging from a largely unregulated private sector to multiple autonomous organisations that provide health services. Over the last few decades, India's urban population has dramatically grown because of increased migration and spatial expansion, bringing ever-increasing pressure on living spaces and provision of service delivery. Many slums exist in an abysmal state, without essential water, sanitation and solid water disposal services (5), rendering comprehensive health plans and programmes, such as the Urban Health Mission and National Health Policy, not entirely effective.

With India's constant growth in urban population and agglomerates, it has become important for the governance structure in health delivery to be streamlined, a need that is amplified in the times of pandemics such as COVID-19. The multiplicity of organisations with overlapping jurisdictions, paired with an absence of cooperation, has caused the urban health system to face several challenges. Municipal problems of insufficient urban service delivery and unfair access to local facilities must be addressed, along with the difficulties of regional planning, land management, transport connectivity and peripheral problems that impact

social determinants of health (6).

In the Indian health system, rural-urban disparities in health outcomes are favourable to urban areas, powered in part by better access to health services in the urban areas (7) and higher incomes, despite what scholars call a historical "anti-urban bias in the political regime" (8). Due to comparatively improved outcome indicators, urbanisation is often used interchangeably with development. India's rural health system cannot absorb funds (9). Given the stark urban-rural health outcome differentials, one anticipates that the situation in the urban areas is much better. Yet, only 67 percent of the National Urban Health Mission fund was utilised in 2018, calling into question the kind of urban health governance that is in place (10).

Urban Disparities

In 1950, less than 20 percent of India's 554 million inhabitants, the world's second-largest population, lived in urban settlements. By 2011, 31.16 percent (377 million) of India's total population (1.2 billion) were living in urban areas. However, research by the World Bank has shown that these numbers are based on an administrative definition for urban areas that likely results in an underestimation of the size of the urban population in India. Based on an alternative measure called the agglomeration index, World Bank researchers found that more than half of the country's population lived in urban areas, as early as in 2008 (11).

According to latest UN estimates, India currently has 461 million urban dwellers. It will contribute most to the global urban increment with the addition of 416 million urban dwellers, nearly doubling the size of its urban population between 2018 and 2050 (12). India has five megacities (cities with more than 10 million inhabitants) today—Delhi, Mumbai, Kolkata, Bengaluru and Chennai. By 2030, Ahmedabad and Hyderabad are expected to be added to the list. Given this fast-growing urban population and the potential for pandemics due to the high concentration of people, urban areas have health vulnerabilities that need specialised attention. Also, there are new challenges due to adverse living conditions and the looming threats from environmental degradation. The report by the High Powered Expert Committee set up by the Ministry of Urban Development in 2011 found that 4861 out of the 5161 cities/towns in India did not even have a partial sewerage network (13).

The proliferation of malaria is often linked to agricultural and rural development, but poor urban sanitation and the presence of stagnant water have made malaria an urban disease in many parts of the country (14). For example, urban cities like Mangaluru and Udupi contribute

to about 72 percent of Karnataka's malaria burden (15). Drug-resistant tuberculosis in India is also often concentrated in certain urban areas. Incidences of diseases like dengue are also increasingly associated with urbanisation (16). As the infectious diseases and NCD burden undergoes a rapid change in India, recent studies have focused on the need to expand and upgrade the primary health-care services. Based on the National Sample Survey for 2014, only 3.9 percent people in urban areas accessed the network of peripheral public health facilities for healthcare needs other than childbirth (17). This is noticeably inadequate considering the proliferation of disease in urban areas.

There is a broad consensus that the rapid population growth in India's cities has outpaced the ability of the municipal bodies to build the necessary infrastructure needed for healthy and safe urban lives (18). Urban areas have had many versions of primary health centres. These have varied from state to state, and have provided a range of services like urban health posts, urban health and family welfare centres, and urban health centres. Analysis by the Ministry of Health has shown that such services have, however, been sporadic and unsystematic in their population coverage, service package and locations (19).

Government Response

India has had Urban Family Welfare Centres since the first family planning program launched in 1952. In the 1980s, urban health posts were opened to provide primary healthcare for the urban slums and the urban poor (20). Multilateral donors have also been directly involved in the strengthening of urban health systems. Chennai, Bengaluru, Kolkata, Hyderabad, Delhi and Mumbai have run World Bank-supported India Population Projects, under which 479 urban health posts, 85 maternity homes and 244 subcentres were created across cities (21).

At the same time, Ayushman Bharat, through its health and wellness centres, marks the much-delayed shift from selective primary healthcare to comprehensive primary healthcare. This shift will reduce the need for people to visit secondary and tertiary hospitals (22). The operational guidelines for health and wellness centres state that in the urban context, the urban primary health centres or urban health posts would be strengthened as health and wellness centres to deliver comprehensive primary healthcare. The norm of 'One Female Multipurpose Health Worker per 10,000 population,' supported by four to five accredited social health activists, will enable outreach services, preventive and promotive care, and home and community-based services (23).

Mapping Urban Problems and Solutions

Although the National Urban Health Mission was launched in 2013, it has not taken off well due to the under-allocation and sub-optimal use of resources. Initial work on urban health has highlighted the challenges in the governance of urban health services. India's urban health is governed by the Ministry of Health and Family Welfare, urban local bodies and the state governments. The fact that health is a state subject, and that urban areas are hubs of private healthcare delivery (an area that is very lightly regulated), adds more layers to the existing complexity.

Healthcare in urban India has been delivered in a mostly arbitrary and unplanned manner so far. The informal and overlapping nature of the economy, labour and settlements have resulted in bottlenecks in physical and financial access in the system. To a large extent, the practice of public health lay with the government; however, due to the massive influx of people towards urbanised centres, the approach towards healthcare has changed. Now, this approach involves multiple other stakeholders, from private partners to several autonomous organisations. Infrastructure creation by the private sector is concentrated in urban areas due to the proximity of a population that can pay.

This uncertainty in healthcare delivery necessitates a mapping of the flow of governance for urban healthcare services amongst the three tiers of government: the centre, the state and the local bodies.

The looming NCD burden that makes a large proportion of urban residents vulnerable to COVID-19 is also linked to a growing culture of physical inactivity. Studies have shown that levels of physical inactivity are a significant risk factor in India, with only fewer than 10 percent of the population regularly engaging in recreational physical activity. It is estimated that the number of inactive individuals in India is 392 million (24). The prevalence of physical inactivity is significantly higher in urban areas (65.0 percent) compared to rural areas (50.0 percent), and among women (63.0 percent) compared to men (45.7 percent) (25). Without adequate allocation of space for parks, stadiums, swimming pools and other facilities, a culture of physical activity cannot be taught. A communication strategy needs to be evolved that focuses on sports, yoga and other options, and that captures all demographic groups and promotes a healthy and active lifestyle.

The lack of space, and access to sanitation, water and other facilities in dense urban informal settlements, amplify risks by impacting people's ability to practice physical distancing and their response to public health crises. Disruptions in general healthcare services, mainly public health

services like immunisation, will expose urban populations to additional risk factors in the form of infectious disease outbreaks. There is a need for strengthening and rationalising existing urban primary health structures, a need for strong financial governance, and effective monitoring, surveillance and accountability systems in urban areas. This need has never been more prominent than during the COVID-19 crisis, when even the cities like Mumbai, which has the best healthcare delivery system in the country, are quickly being overrun by a fast-paced virus, primarily because of the lack of coordination between the public and the private sectors. India's urban landscape will have to move towards a trajectory of healthier behaviours at the individual level, and more accessible and efficient healthcare services at the primary, secondary and the tertiary care levels.

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GREEN CITIES

Reimagining Urban Spaces for Community Connections and Climate Resiliency

Elizabeth Hessek and Ashali Bhandari

Beyond the devastating health and economic crises engendered by COVID-19, the impact of the global pandemic is visible in the social distancing practices transforming human interaction around the world. Partly a call to action to support frontline workers, partly a safety precaution for individual health, social distancing has profoundly changed how communities move through public space. Cities are now dotted with physical reminders of the threat of disease. Lines of tape on the sidewalk and painted circles (1) on the street separate shoppers waiting to buy food. Public bathrooms are locked (2) and playgrounds (3) are cordoned off. Masks are ubiquitous. Stay-at-home orders have emptied streets of vehicles and plazas of people. The gathering spaces that are used to build community and social capital are off-limits. When public spaces are stripped of their potential for assembly, we are left with several questions—Where do we go to celebrate? Where do we go for civil discourse? Where do we go to support each other during times of duress? Technology has provided a lukewarm answer (4) to some of these questions, but it is an inaccessible solution (5) for many communities. Without hope for a vaccine in the near future (6) and with the awareness that our globalised society may experience increasing health crises (7), social distancing techniques are likely to be the new normal even after economies reopen.

The issue of reimagining urban public space in an era of social distancing is undeniably related to the ongoing climate crisis. The World Health Organization (8) states that changes in infectious disease transmission patterns are a likely significant consequence of climate change. However, stay-at-home orders will become untenable as the effects of climate change worsen urban liveability.

Cities are at the forefront of the anthropogenic climate crisis. As the global urban population is expected to increase by up to three billion people by 2050 (9), cities will require extensive urban construction that must also mitigate greenhouse gas emissions and limit global warming. The impacts of climate change are already tangible and drive the urgency with which cities must act. Cities like Venice (10) and Jakarta (11) are experiencing rapid rates of subsidence that, when compounded with sea-level rise predictions, render much of both cities underwater by 2100. Heatwaves, which are already more extreme in cities due to the urban heat island effect, are rising in both intensity and frequency (12). Finally, extreme precipitation events and storm surges are likely to result in increased flooding, especially in coastal regions (13).

As this reality of climate change plays out in cities, urban planners are developing local solutions to mitigate its effects. One compelling intervention is the development of green and blue infrastructure, which provides cities with social and physical benefits while addressing environmental challenges. Green and blue infrastructure solutions include the development of new parks or trails; in land-crunched cities, it can also involve retrofitting existing urban spaces to address climate risks and provide community benefits in an era of social distancing. These changes would go far in eventually mitigating the transmission of diseases during a pandemic as well.

Adaptive Green Infrastructure

Green areas like parks and forests help cities reduce the risk of flooding through runoff retention and infiltration (14). In Singapore, the government is investing heavily in developing green spaces for this purpose. As a densely populated, low-lying island state, Singapore is at risk of flooding from sea-level rise and extreme precipitation events (15). Through a program called Active, Beautiful, Clean Waters, the government is creating urban green spaces to improve drainage, slow runoff speeds and reduce pollutants in its water bodies (16). Through one initiative, they are working to green a large part of the 6000-hectare catchment area of the Kallang River. At one location where the river abuts the St. Andrew's village, the city has installed rain gardens, which increase the natural drainage capacity of the catchment area and filter pollutants from stormwater before they enter the river to reduce riverine flooding and pollution. The city has maximised the utility of this space by adding a community plaza, lookout decks and an outdoor classroom for students to engage with nature (17).

Other cities are using trees to reduce air pollution and sequester carbon to offset greenhouse gas emissions. This is important as the

Intergovernmental Panel on Climate Change has warned that to achieve pathways that keep global warming within the limits of 1.5°C, carbon dioxide removal will be required to neutralise emissions (18). As cities recognise the plethora of benefits that trees provide, in terms of ameliorating air pollution, lowering temperatures, slowing stormwater and capturing nutrient loads to improve the quality of urban water bodies, many are focusing on planting trees to avail of these benefits. Chicago, for example, has planted more than 42,000 trees since 2011 (19). These trees serve as a carbon sink for the city by storing 14.8 million dollars of carbon (20); they have also led to a reduction of about 16.4 million kilograms of air pollution annually (21). Other cities are following suit: Melbourne has created an urban forest strategy which aims to increase forest cover by 40 percent, including tree plantations in urban parks (22), and Dakar is planting trees along its 7-kilometre coastline to kickstart efforts to "green" the city (23).

Innovative Blue Infrastructure

Blue infrastructure solutions can also help cities address climate risks. Rotterdam, which faces flooding risks from the increasing frequency and severity of rainfall, riverine flooding, high groundwater levels and sea-level rise, has had to be creative in tackling its multifaceted flood risk (24). In 2013, Rotterdam opened its water plaza, the Benthemplein, which serves as a community space for locals with activities like youth theatre, church services and skating when there is no flood risk (25). However, during high-intensity rainfall, the water square retains direct precipitation and rainfall from the adjacent buildings with a capacity to hold 1.7 million litres of water. This reduces the burden on the city's existing sewage system during storm events to reduce overflows and flooding in the city area (26). The water is later infiltrated into the ground or pumped into canals after the rainfall has ended.

Benthemplein Water Square: A community space that mitigates flood risk

Source: "Case Study: Benthemplein Water Square: An innovative way to prevent urban flooding in Rotterdam," C40 Cities, last modified August 27, 2014, https://www.c40.org/case_studies/benthemplein-water-square-an-innovative-way-to-prevent-urban-flooding-in-rotterdam

Green Space for Community Connection

Beyond environmental benefits, natural spaces offer physical and mental health benefits that could position green space development as a solution to the multifaceted problem of providing community space in the era of social distancing. Since the beginning of the stay-at-home orders in the US in mid-March 2020, local governments that kept parks and trails open saw a marked increase in usage when compared to the same period in 2019 (27). Near Philadelphia, Pennsylvania, where the first coronavirus cases were identified in the state, trail use in April 2020 increased 65 percent from April 2019 (28). This trend is reflected across Pennsylvania's trail network.

What explains the dramatic increase of trail use under stay-at-home orders? Research shows that when social distances are respected, the coronavirus is unlikely to spread in outdoor settings (29), (30). Furthermore, studies show that time spent outdoors creates a sense of community, belonging, shared purpose, and reduced isolation (31). A mere 20 minutes spent in nature reduces the stress hormone cortisol (32). Some studies even demonstrate that physical activity ameliorates neuroplasticity in post-traumatic stress disorder (33). During a time of

increased isolation and stress, it is clear why individuals are flocking to parks and trails when they can do so. Despite social distancing, green spaces are serving as communal spaces for healing.

These spaces include urban farms, which serve diverse communities and ensure access to food in marginalised neighbourhoods. In Philadelphia, hundreds of citizens, especially migrant and refugee populations, grow food on city land. Southeast Asian refugees grow Thai roselle in South Philadelphia, while Mexican immigrants grow jalapenos and gandules in the neighbourhood of Kensington. About 67 percent of these farms are located in areas where poverty rates are higher than city averages (34). These urban farms have provided neighbourhoods with open community spaces that increase food access and engagement with the environment while having reduced crime in some areas (35). During the COVID-19 outbreak, the city has allowed these farms to remain open as they provide essential services for both people and the environment.

These proven benefits of spending time in nature make a strong case for investing in public green and blue spaces as social distancing becomes the norm. As urban populations continue to expand in the presence of climate change, expanding green spaces can accommodate a need for gathering and healing without compromising healthy social distancing. Green spaces are already conceptualised to mitigate climate change. There is an opportunity to imagine them as areas to minimise the stress of social isolation as well.

Solutions for Land-Scarce Cities

Unfortunately, not all cities have space and financial resources to create hectares of urban parks and forests to address climate risks. Paris, for example, is Europe's densest capital with only 14.5 square metres of green space per inhabitant (36). Therefore, the city is focusing on greening a tangible asset that already exists within the city—schoolyards. Paris has a plan to convert 700 concrete schoolyards into "oases" of cooler temperatures by 2050 (37). The city has already converted ten schoolyards into oases by replacing asphalt with a porous material and increasing green spaces. The renovated schools are expected to generate a "10 percent decrease in average surface temperatures and a decrease in daytime air temperatures by 1 to 3 degree Celsius" (38). After a deadly heatwave in 2003, in which 700 Parisians died, the city has been committed to reducing its risk to urban heat and protecting vulnerable populations like children and the elderly. These oases have been designed with the support of the community and are open to the public during heatwaves.

Medellin in Colombia has also taken a creative approach in reducing its vulnerability to urban heat. Through an initiative called the Green Corridor Project, the city has greened 30 roads and waterways to reduce temperatures by more than 2°C. Many of these areas have bicycle paths that are now shaded and cooler for citizens to use, promoting eco-friendly transportation within the city. Along with addressing the risks of urban heat, this initiative has generated employment in green jobs to maintain these urban "paradises" (39).

At the onset of the COVID-19 pandemic, Philadelphia closed a major thoroughfare to vehicular traffic (40) in the interest of facilitating social distancing among trail users. This closure immediately improved stormwater runoff into the river and expanded Philadelphian's access to safe recreational space. In São Paolo, Brazil, a massive highway that writhes through the city centre (known as the Minhocão after a mythological earthworm) transforms into a popular park every weekend, closed to vehicles (41). Air pollution in the neighbourhood improves significantly during the transformation; the city recently announced plans to make its transformation into green space permanent (42).

The Minhocão provides critical recreational space and improves air quality in São Paolo

Source: Christopher Pillitz, "The Minhocão Highway of São Paulo: Living with the Big Worm," Domus, March 12, 2020, https://www.domusweb.it/en/architecture/gallery/2020/03/12/living-with-the-big-worm.html

Conclusion

In each of these cases of taking space away from climate-harming uses and repurposing it for environmentally friendly uses, the community also received increased space to benefit from recreation. Neither the climate crisis nor the threat of a pandemic is receding from our collective futures. New residents will continue to move to cities, new diseases will continue to necessitate social distancing, and new climate realities will force governments to make significant changes to the way cities are conceptualised. As the first phase of COVID-19 is now behind us, let us reconceptualise environmentally resilient spaces as places that also promote resilient communities.

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Building Blocks of a Post-COVID-19 Green City

Tanushree Chandra

Cities are home to over 55 percent of the world's population (1). Buzzing with life and activity, they drive the levers of an economy's growth and development. The COVID-19 pandemic has inflicted a massive blow on all global economies, and cities have been at the forefront of the crisis. A failure to mitigate the grim realities of the pandemic has highlighted the deep vulnerabilities and inter-linkages between health, social, economic and environmental systems in cities. The crisis has dramatically upended the contours of some of the most iconic cities around the world. At the same time, it has afforded individuals living in some of the most polluted cities a rare glimpse of unpolluted skies and clean air.

The pandemic has offered the perfect opportunity to rethink the traditional building blocks of cities. As governments all over the world develop strategies to spur economic revival, they must rebuild cities in a way that they embody the core principles of sustainable and resilient development. Four building blocks can mould the foundation of green cities in a post-COVID-19 world.

Rethink Urban Mobility

Urban transport is one of the sectors that have been most radically impacted by the pandemic and lockdown measures. Some of the busiest and most crowded streets, once crammed with an endless fleet of vehicles and people, were replaced by deserted and empty stretches during the lockdown. Unsurprisingly, this has had a dramatic impact on air pollution levels, carbon emissions and the overall environmental footprint of cities. Research published by IQAir, a Switzerland-based air quality technology firm, revealed that New Delhi, Seoul and Wuhan

recorded a drop in PM2.5 levels of 60 percent, 54 percent and 44 percent, respectively, as compared to 2019—just on account of the pandemic (2).

City	Average PM2.5 during lockdown 2020 (µg/m³)	Reduction compared to 2019	Reduction compared with prior 4-year average	3-week lockdown dates, 2020
Delhi, India	32.8	60%	55%	Mar 23 - Apr 13
Seoul, South Korea	24.1	54%	32%	Feb 26 - Mar 18
Wuhan, China	35.1	44%	50%	3 Feb - Feb 24

Source: COVID-19 Air Quality Report, IQAir

While the pandemic-induced climate dividends are likely to be temporary, they do offer an unprecedented opportunity to lock in the benefits of reduced congestion and air pollution by shifting to a sustainable and efficient urban mobility paradigm. Cities such as Milan, Paris, Bogota and Barcelona have embedded green mobility in their COVID-19 recovery plans, announcing that they will reallocate miles of street space to cycling and walking to fend off a resurgence in car traffic and pollution after their economies reopen (3). In a similar vein, the UK government has announced a £2 billion package to put cycling and walking at the heart of their COVID-19 recovery strategy (4). Even though some of these measures are temporary, they could catalyse long-term pro-climate behavioural change among the public. Another favourable trend that has gained traction due to COVID-19 and is likely to outlive the pandemic is the rise in teleworking. As employers such as Twitter, Mondelez and Nationwide (5) prepare to make a permanent switch to remote working, the pressure on urban transportation systems and the overall environmental footprint associated with commuting will be significantly reduced. Remote working will also allow employers to institute staggered timings at their offices. This will prevent congestion on public transport, making it a viable commuting option even as individuals observe social distancing.

As cities gradually lift lockdowns, private vehicles, perhaps the safest option to protect from the virus, are expected to see a surge in usage. City administrations must prevent this undesirable trend by adopting a two-fold strategy. First, the use of public transport must be incentivised by reducing fares, disinfecting public vehicles and stations, and reducing passenger occupancy to ensure social distancing. Second, disincentives for private transport, such as congestion pricing and parking fee, must be instituted. Electric vehicles, however, must be excluded from the ambit of such disincentives. Instead, the government must give additional concessions and incentives to electric vehicles to attract consumers intending to make new vehicle purchases.

The pandemic has provided a rare snapshot of how cities can look if emissions and pollution from the transportation sector are controlled. City administrations must capitalise on this opportunity to embrace a more sustainable mobility paradigm.

Embrace the Circular Economy Framework

An urban circular economy is one in which cities keep resources in use for as long as possible, extract the maximum value from them while in use, then recover and regenerate products and materials at the end of their life (6). As opposed to the traditional linear economy model in which we make, use and dispose resources, the circular model focuses on building and preserving economic, natural and social capital. With the health, economic and environmental systems of cities crumbling under the pressures of COVID-19, the fragilities intrinsic to the traditional linear economy model have been exposed. The pandemic is a clarion call for developing economically efficient, resilient and sustainable cities. Embracing the concept of circularity and using it as a guiding principle will be crucial to ensure this.

Cities like Amsterdam have emerged as global trailblazers on this front. The city's municipality is the first in the world to adopt economist Kate Raworth's Doughnut model (7) and Circular Strategy 2020-25 (8) as the
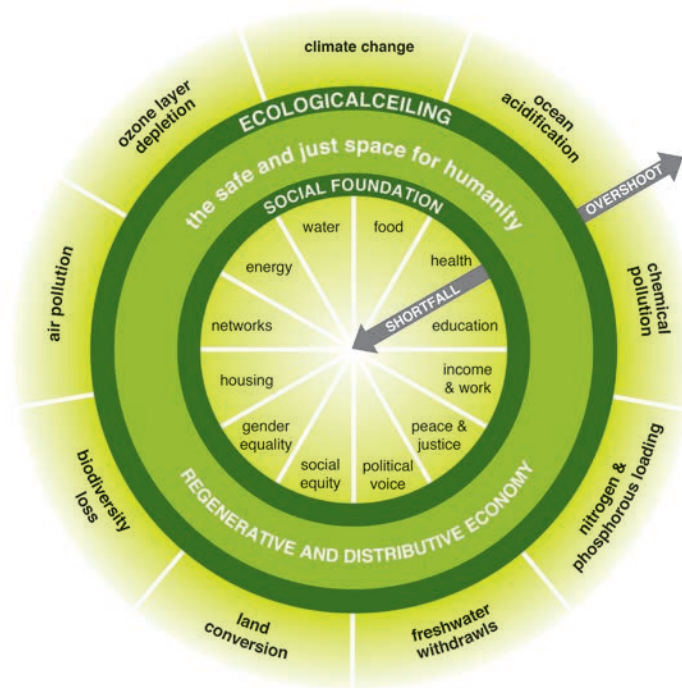
Source: Kate Raworth, Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist

policy basis for its COVID-19 revival plans. The new model and strategy focus on preserving value by reducing use and processing waste more intelligently across three major value chains—food and organic waste streams, consumer goods and the built environment—to achieve a fully circular city by 2050.

South Korea has also made great strides in adopting a circular economy framework. The Metropolitan Government of Seoul launched the Sharing City project to revive a tradition called "Pum-a-si"—where people share food with neighbours and borrow and lend tools—in a modern-day context of a global city (9). South Korea, much like the European Union, is leveraging regenerative models and circular economy principles by adopting the Green New Deal as a central pillar for its COVID-19 economic recovery (10).

The circular economy framework promotes resilience in the face of unforeseen disruptions, such as pandemics and natural catastrophes. As city administrations mobilise resources to battle the health emergency and catalyse economic recovery, embracing circularity will go a long way in achieving economic, social and environmental sustainability.

Invest in Green and Energy-Efficient Infrastructure

As cities prepare for an economic recovery, the steps they take must accelerate the transition to a more sustainable and competitive model. A core element of the transition is investing in green infrastructure at the city-level. This primarily includes energy-efficient housing retrofits; renovations such as improved insulation, heating, and domestic energy storage systems; energy-efficient lighting; and rooftop solar installations and electric vehicle charging infrastructure. The Mayor of London has taken an essential step in this direction by launching a £3.6 million programme (the Retrofit Accelerator for Homes programme) in February 2020 (11), setting an example for cities all over the world to emulate. Furthermore, since cities act as the first and last line of defence during natural disasters, outbreaks of infectious diseases and other unforeseen crises, investing in the creation of resilient infrastructure must be an integral part of the economic recovery strategy.

The pandemic has created unprecedented turbulence in the labour markets. Sectors such as recreation, tourism, aviation and hospitality have seen massive disruptions and lay-offs. The economic revival of cities will crucially hinge on the creation of new, alternate jobs for thousands of workers rendered unemployed by the crisis. Investment in green infrastructure will not just build physical capital for cleaner and greener

cities but also create many local jobs. Such investments would, therefore, provide a powerful pro-climate and economic stimulus.

Sustainable infrastructure is not just confined to energy-efficient and resilient construction; it also includes investment in the natural infrastructure, green cover and green spaces within cities. Soil and landscape restoration projects, investment in parks and community gardens and tree plantation drives could create jobs over the short term while also generating net benefits from carbon sequestration, watershed protection, better crop yields and forest products. Additionally, as detailed by the World Health Organization, green urban spaces will improve the physical, social and mental well-being of citizens as they venture out of their homes freely (12).

The economic and environmental rationale for supporting investment in green urban infrastructure is compelling. However, mobilising adequate capital to finance it would be a challenge for municipal governments as the pandemic has tightened their fiscal constraints. Issuing green municipal bonds could be an exciting option that cities could explore to address this problem.

Ramp Up Renewable Energy Deployment

The combined impact of the pandemic, global economic contraction and the oil price collapse has created the perfect storm to ramp up investment in renewables. With leading oil, gas and petrochemical companies losing an average of 45 percent of their total market value since the start of 2020 (13), the decade-long systemic decline of the fossil fuel industry had been rapidly accelerated. According to the International Energy Agency's Global Energy Review 2020 (14), coal will see the most significant decline since World War II, alongside sharp reductions for gas and oil. Nuclear power is relatively less affected, while renewables are the only energy source on the rise in 2020.

Change in global energy demand by fuel, 1970-2020
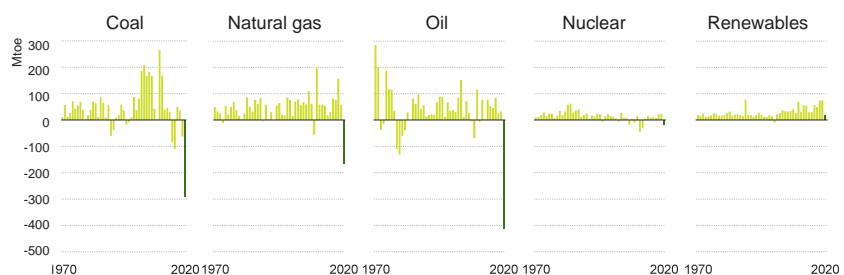
Source: Global Energy Review 2020, International Energy Agency.

The massive fall in energy prices also provides the ideal opportunity to cut brown fiscal incentives such as fossil fuel subsidies. These incentives could be redirected to renewables or could be leveraged to relieve the pressure on fiscally constrained governments.

In most major cities, the share of renewable in the energy mix has been rapidly increasing. This is a trend that should not only be sustained but also ramped up. Existing market conditions have never been better positioned to facilitate the expansion of renewable energy in cities. Over the past decade, solar PV module prices have fallen by around 80 percent (15) while onshore wind energy prices have fallen by 70 percent (16). Low costs, improved technology and declining interest rates provide the ideal market ecosystem to step up financing for renewables.

Conclusion

The COVID-19 pandemic has demonstrated that the traditional building blocks of cities are dangerously fragile and precariously unstable. It has also given us a sharp warning and a staggeringly bleak preview of the catastrophes that unmitigated climate change will unleash upon cities. As governments, institutions and private citizens join forces to mitigate the havoc wreaked by the pandemic, it is important to reimagine the traditional foundations on which cities stand. A coordinated and coherent strategy that responds to COVID-19 and the climate emergency must be implemented to salvage economies from the pandemic-induced recession. Such an approach must put the economy on a resilient and sustainable growth trajectory. It must embody the circular economy framework and a sustainable urban mobility paradigm while aiming to accelerate investment in green infrastructure and renewables. How the fundamental blocks of cities are reimagined and rebuilt will shape the future of cities and communities all over the world.

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Transportation Must Transform in the Post-Pandemic Era

Amruta Ponkshe

In response to the COVID-19 pandemic, several cities around the world stopped or strictly reduced the frequency of their public transport services. As cities look to resume normal life after months of lockdown and shelter-in-place policies, rapid changes are occurring in urban transport across continents. The Open Streets movement (1) is catching on in cities, from Bogota in Colombia to New Zealand's Auckland. Developed and developing countries are embracing a post-COVID-19 world in different ways.

Several developing countries, especially those in Asia, are making a rapid return to pre-COVID-19 times in a bid to restore some normalcy in people's daily lives. Asian cities (2) that have resumed life post lockdown have put in place measures to change the way people commute. Social distancing has become the norm in Seoul and other parts of South Korea (3), while traffic and traffic congestion is back on the streets of Beijing in China (4).

Cities in Europe, the US and certain parts of the southern hemisphere, on the other hand, have used the COVID-19 lockdown to drive home policies that were proposed but neglected until now. They are investing in sustainable transportation practices and utilising lower footfalls to test and perhaps permanently adopt practices that have proven to be beneficial to the economy, environment, and health and wellbeing of citizens (5). Several cities like London (6), New York (7) and Milan (8) have announced plans that show a widespread rethinking of streets (from being for cars to being reserved for people), bicycles, other non-motorised transport (9).

As India's cities have resumed life after lockdown with no solutions or measures announced by the government to curb traffic congestion, they look set to follow China's example, returning to the smoke-filled (10) congested 'normal' of the pre-COVID-19 era. In 2018, road accidents killed more than 150,000 people in India (11), while in 2017, air pollution killed over 1.2 million people (12).

In the coming months, once the curve has been flattened sufficiently, transit authorities will have to face the new realities of the post-COVID-19 cities. Studies are showing a reduced interest to use public transport due to concerns of hygiene and disease transmission in close quarters (13). Additionally, physical distance measures on buses and trains will mean a loss of ridership and, consequently, considerable losses in revenue. Public transit authorities are set to see tough days ahead. Public transport enhancements are typically seen as solutions to vehicular air pollution, road fatalities and extreme congestion. But how will transit agencies worldwide rise to the challenges posed by COVID-19? It is first crucial to understand the broader philosophical debates that shaped cities in the 21st century. For city planning, and to enable the efficient transport of people, resource and services, two variables were considered—density versus sprawl (14).

In the contemporary model for city transport, density is often equated with congestion and discomfort. However, if managed appropriately, the lived experience of density does not amount to congestion (15). The lived experience of sprawl, on the other hand, equates to overcrowding at the point from where density in a city is inevitable, at vital hubs like the city centre and other important urban centres. Density thus becomes a factor of location—areas of prime real estate, areas of trade and industrial clusters, areas providing access to city services, and commercial and entertainment hubs like shopping districts and performance venues (16).

However, density alone does not create congestion. Instead, it is the mismanagement of density that does, which will be problematic in the post-COVID-19 world. Here, congestion is measured in terms of:

The proximity between people, which is the classic definition of density (available living space per unit of people). For instance, the densely populated urban informal settlements in Mumbai.

Time taken to access services. For instance, a hospital is an hour away in peak-hour traffic in New Delhi, while it may only take 15 minutes during non-peak hours.

Money needed to reach these places. A toll road may deter commuters. Taking the toll road may be expensive, but it drastically cuts down on the time taken to reach a destination.

Post-COVID-19 Urban Movement

The COVID-19 lockdowns have presented a glimpse into the future of a hot, crowded and climate-uncertain world. With sea levels rising and the threat of climate-related disasters looming, it is necessary to reconsider how the post-COVID-19 world should operate (17). Absolute social distancing as adopted by some countries during the lockdown is not a sustainable option in the long-term. Social mingling and the exchange of ideas through physical interactions is the fundamental basis of urbanisation and the progress of civilisation.

Consider a hypothetical city venue like a concert hall. It has a fixed intake capacity where the design dictates its size, which defines how many people can comfortably be accommodated to experience a performance at the venue. In the post-COVID-19 world, these design restrictions can be framed with the 'safe-distance' principle. This translates into extended minimum distance specifications for city design. Now, consider that the venue ensures its 'supply chain'—the movement of people from their origins (homes, hotels, rented accommodations) to their final destinations—also enables the optimum 'physical distance', as specified by the city's updated design standards, to be maintained. With these new designs, the concert hall can ensure it issues only a fixed number of passes so that its patrons are able to maintain physical distance yet have social exchanges.

Cities has man such venues that cater to people from all walks of life. Business hubs, shopping markets, educational institutions, concert arenas, courts and government offices are venues that drew huge crowds before the coronavirus hit. In a post-COVID-19 city, the institutions and venues will realise that moving from the city centre to a suburban area is more feasible, profitable and convenient for managers of these institutions and for commuters.

Let us assume that after reopening in the post-COVID-19 era, shops, educational institutions, courts and government offices move most of their services to the digital space or closer to the people who use these services, in smaller locations in the suburbs or provide at-home services. This means the net number of trips going into the city will also reduce. Due to decreased demand, the city transit will face reduced ridership during peak and non-peak transit times. As services and institutions move closer to people's origins, either online or through local branches,

citizens will not need to access them from the city centre.

However, to ensure that physical distancing is still possible for all other venues that are bound to draw occasional crowds, such as concert places and courtrooms, it is necessary to ensure that they issue a fixed number of access permits so that physical distancing is maintained through design within the venue, and physical distancing is maintained across supply chains (transport networks).

Slowly, the emergence of post-COVID-19 advisories in various spheres of urban life—museums (18), (19) hotels (20) and sports venues (21)—are highlighting the reality of maintaining physical distancing. Thus, as the post-COVID-19 'new normal' is established, it is inevitable that our travel patterns will change and, consequently, our transit agencies will have to adapt to the changing user demand. This will also give rise to a changed preference, such as people who previously travelled in shared taxis or other modes of transport will now prefer to move in individual cabs. Cities have used big data algorithms (22) to predict COVID-19 hot spots. Similar techniques can be used to predict upcoming travel patterns to avoid and disperse crowds.

The demand for open spaces, preference for well-ventilated coaches and healthier means of transport is likely to rise. COVID-19 has changed communication and transportation as we know it. In the coming months, it remains to be seen if society has really gotten the message that the pandemic has been sending us. European (23), (24) and American (25) cities have already jumped onto the walking, cycling, non-motorised transport bandwagon. In India, experts have long been advocating the benefits of non-motorised transport (26). It is time to institutionalise the efforts of a few cities and encourage walking, cycling, and other non-motorised transport option for short distances through well designed, articulated and enforced policies.

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INCLUSIVE CITIES

Women and the City: Embracing Gender-Sensitive Policies

Saloni Atal

The COVID-19 pandemic has had an unprecedented disruptive impact on urban systems. Across the globe, cities are at the frontlines of pandemic response measures implemented by national governments and are being tested to the extreme. Simultaneously a health, economic and social crisis, COVID-19 presents a formidable challenge. As the crisis unfolds, it is becoming clear that the pandemic has gendered impacts that cities will need to take into account.

In many parts of the world, women and girls are already at a disadvantage, with limited economic assets, education and job opportunities, and they could find themselves further behind when the crisis ends (1). Firstly, women may face a heightened risk of exposure to the virus as they make up large parts of the health workforce and the majority of caregivers in homes and communities. Secondly, many women work in the informal sector and lack any job protections. Thirdly, the enforcement of quarantines and social distancing has put women at increased risk of gender-based violence and, at the same time, women's access to support networks, social services and sexual and reproductive health facilities has diminished (2). Still, women continue to lead efforts to protect and serve their communities in various capacities, including as leaders and policymakers.

While the focus has been on rapid response, there has been understandably limited evidence so far of gender analysis in measures being taken by cities for data collection and monitoring, policy or programmatic intervention (3). According to the World Resources Institute, putting women and girls at the centre of pandemic response will be essential for urban preparedness, recovery and resilience (4). A

gender-sensitive response means considering how gender norms, roles and relations shape women's and men's differential vulnerability to COVID-19, including its health, economic and social consequences, and crucially, including the voices of women into governance and decision-making (5). Building on lessons from past health emergencies and ongoing work on women's empowerment, there are five key ways in which cities can take a gender-aware approach and set the stage for both recovery and resilience.

Protecting Victims of Domestic Violence

While enforced confinement and social distancing are necessary strategies to curb the spread of the virus, staying at home has put many women at risk of domestic violence and with an inadequate network of support. Contributing factors include strains in the household due to unemployment, job insecurity, the psychological toll of being locked in for an indefinite period and the social sanctioning of violence against women (6). Data released by cities across developed and developing countries reveal an unprecedented increase in calls from women seeking help to deal with abusive partners since restrictions on movement were imposed (7). As part of the response to the spike in instances of domestic violence, many countries have launched dedicated helplines for women (8). While this is a positive and necessary step, a helpline alone may not be sufficient to tackle the problem. Like fighting the pandemic, dealing with gender-based violence is a multi-layered and complex task. According to UN Women, less than 40 percent of the women who experience violence seek help, and among those who do, very few seek institutional or formal support (9).

A national helpline, therefore, needs to be backed up by community- and locality-based support systems. Supporting women in distress has to be treated as an "essential service", and city authorities must work to identify partners (such as women's organisations, self-help groups and community volunteers) who can reach affected women. India's Ministry of Health and Family Welfare, for instance, has encouraged urban authorities to leverage on the network of Accredited Social Health Activists (ASHA) workers, who are all female, as a valuable point of interface between communities and the public health system. Guidelines released by the ministry (10) suggest that ASHA workers can inquire informally about instances of domestic stress and violence during regular home visits and also reach out to the men in the community. They can further monitor nutrition and health, ensure food provision, and provide counselling and advice on legal aid for victims of domestic violence. Similarly, in Europe, many cities have already responded to the crisis of rising domestic violence in innovative ways. The French government, for instance, has

facilitated the use of empty rooms in collaboration with hotel chains for women fleeing dangerous environments (11).

Maintaining Access to Maternal, Sexual and Reproductive Health Services

COVID-19 has disrupted women's access to maternal, sexual and reproductive health services as health systems become overloaded, and resources are redirected towards emergency response. Experience from past epidemics such as the Ebola crisis shows that this leaves women to suffer consequences such as higher maternal mortality, pregnancy complications and unsafe abortions (12). A recent UN study predicts that there could be 47 million women in low- and middle-income countries who will not be able to access contraceptives, leading to seven million unwanted pregnancies. The pandemic will also likely impact the work of programmes focused on ending female genital mutilation (FGM) and child marriage, resulting in approximately two million more FGM cases and 13 million more child marriages over the next decade than would otherwise have occurred (13). Data emerging from news reports suggest that women's menstrual health needs have also been overlooked in local government responses through a failure to include items such as sanitary napkins in "essential" supply chain operations during the lockdowns (14).

This data provides an alarming view of the future that could confront women and girls if efforts are not urgently made to secure their welfare and ensure their reproductive rights. Local authorities in cities will need to prioritise and safeguard maternal, reproductive and sexual health services for women in their pandemic response. In light of reductions in outreach work and closure of community clinics, the World Health Organization (WHO) recommends that urban authorities (15) leverage telehealth options (self-monitoring through mobile applications, helplines and video calls) for services that may usually be provided through community outreach, such as immunisation, antenatal care and screening for non-communicable diseases. Non-state providers (both profit and non-profit organisations) can be engaged to provide services digitally where government facilities lack telehealth channels. The WHO recommends that digital services and public health messaging be prioritised for hard-to-reach and vulnerable groups such as women and girls in informal settlements, disabled, elderly and pregnant women. The menstrual health needs of women in quarantine and isolation facilities should also be considered, and provisions for essential personal hygiene products must be made (16).

Supporting Women in Risky and At-Risk Jobs

In addition to health risks, data also suggest that women are more vulnerable to the economic risks associated with the COVID-19 pandemic. Firstly, women make up almost half of the qualified health workforce globally and the majority of those working at the frontlines of this pandemic, including community health workers, testing teams, nurses and sanitation workers (17). Women are, therefore, not only at the frontline of fighting this crisis but also at a potentially higher risk of being infected. In India, for instance, ASHA workers have been deployed in rural areas and now increasingly in cities to improve surveillance, behaviour change messaging and contact tracing. However, reports suggest that they are underpaid and face severe shortages of personal protective equipment (18). City authorities must prioritise the provision of protective gear for female health workers who are at high risk to protect and support them in their anti-virus efforts.

Secondly, many of the industries indirectly affected by quarantines and lockdowns, including tourism and restaurants, have high female labour force participation rates globally. Women also make up a large portion of workers in the informal sector—street vendors, domestic workers and caregivers—especially in low- and middle-income countries (19). Women in these sectors will be the worst hit by the coronavirus-imposed economic slowdown as they typically have small savings and no social safety net to fall back on. Women also carry a greater responsibility than men for child and elder care, and as schools close and family members fall sick, these demands are likely to grow, making it harder for women to resume work (20). The regeneration of the female labour force in the wake of this crisis will depend on gender-sensitive and targeted support measures for women workers. Several governments have already announced social protection programmes to protect incomes and jobs, without attention to gender (21). Government cash transfer schemes in low- and middle-income country contexts where e-payments may not be feasible, including Bangladesh and India, are failing to reach millions of women who lack bank accounts or the physical means to access a bank (22). In a post-pandemic context, supporting women in the formal and informal sectors will be essential for urban economic recovery, and local authorities will need to take extraordinary measures to complement state-level efforts. Local authorities can provide support around operations and delivery mechanisms to avoid health risks linked to cash distribution. Women's groups in communities can be leveraged as networks for effective communication and delivery. Other measures local authorities can take is freezing rent payments and preventing homelessness among women who have lost their livelihoods and income security (23).

Women's Participation in Urban Governance

The COVID-19 crisis has seen authorities in cities taking the lead in protecting and serving citizens. Although the expanded authority that urban local bodies are exercising is necessary to respond to a dynamically changing situation, it raises questions about effective governance. Women globally are poorly represented in municipal, state and national decision-making bodies (24). Within the context of global health governance, Global Health 50/50 studies show that while women constitute over 75 percent of the healthcare workforce, they occupy less than 25 percent of leadership positions (25). This is concerning because women's socially prescribed care roles and their front-line interactions with communities typically place them in a strong position to identify trends that could signal the start of an outbreak and improve global health security (26). Women's participation in governance is more than a moral imperative for local authorities. Evidence from past epidemics and the business sector shows that women's inclusion in governance and decision-making advances stability, community trust, financial accountability and reduces groupthink and health inequities (27). Urban governing bodies must set up spaces to engage women and girls in COVID-19 response and recovery efforts. Through women's organisations and other community partners, local authorities can gain access to women most affected by the crisis and least likely to have their voices heard, including slum-dwelling, elderly and disabled women.

Gender-Disaggregating Data

City authorities are leveraging technology to collect real-time data on the spread of the coronavirus and enable coordination of emergency response services. COVID-19 trackers, drones, surveillance cameras, applications for coordinating city departments and logistics, and telemedicine for medical appointments are being used across several cities (28). However, there is little evidence of gender disaggregation in these data monitoring initiatives, or analysis of data separately for men and women (29). Given past evidence that health emergencies impact women differently, gender disaggregating data will help understand which groups of women are the most vulnerable and how risks to their health and wellbeing can be mitigated. Local authorities must collect and publicly report effects of the pandemic on women and girls in terms of disease transmission and other social indicators such as unemployment rates, care burden, incidents of sexual violence and attendance in schools. At a minimum, reports should include the number of deaths occurring in men and women at national and sub-national levels (30). Gender blindness in data collection and monitoring

can be detrimental to evidence-based policy response and more broadly, to cities delivering on the Sustainable Development Goals (31).

Looking Forward

The need for more gender-equal cities was recognised even before the COVID-19 crisis hit. The current dramatic situation lends increased urgency to the call to action. The COVID-19 outbreak highlights, even more, the gender and social inequalities built in cities and the need to find strategic responses that have at their core a commitment to women. It is not only a crisis, but also an opportunity to imagine a "new normal" that is sensitive to the needs of women and girls. Women are not only vulnerable but also vectors of positive change in their homes and communities as the majority of frontline health and care workers. A gender-sensitive approach to urban recovery will, therefore, promote both health equity and gender equity.

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Protecting the Future of Urban Workers in a Post-Pandemic Automated World

Aditi Ratho

The COVID-19 pandemic has fast-tracked the latent changes occurring in the workspace with regards to digitisation, automation and the gig economy. The urban environment has always been the "testing ground for these new technologies impacting the workforce" (1), and the crisis provides a new lens to conversations surrounding the future of work in cities. The increased need for social distancing in the absence of a vaccine, and the fear among businesses of bleeding accounts due to possible future lockdowns, will result in palpable changes in the workforce, which will need to be bolstered by appropriate social protection policies.

Work in the Time of COVID-19

Organisations and institutions around the world have made 'work from home' mandatory, to curb the spread of the virus, and propagate necessary social distancing by eliminating the need for employees to make crowded commutes, especially in urban conglomerations. To mitigate the impact of any such future shocks to the economy, companies may need to consider introducing remote working models permanently.

For workers whose output can be reflected through a computer or telephone, remote working can quickly become the norm. People have been working remotely for decades thanks to digital innovations and the growth of the digital economy. According to a 2018 survey by the US Bureau of Labour Statistics (BLS), 30 percent of workers, or 41.6 million people, can work remotely (2). About 60 percent respondents who work in "management, business and financial operations" told the BLS that they could work from home. However, fewer than 10 percent of workers said they could do so in categories described as "services," "construction

and extraction," "installation, maintenance and repair," "production" and "transportation and material moving" (3). This shows that professions such as writing, customer support, accounting, coding, and data entry can be justified with remote working contracts or flexible office attendance. But for roles that require physical or human interaction, remote working will not be possible.

If paranoia surrounding future pandemics persists, it could lead to a divide between the digital elite who have access to computers, phones, and the internet, and the digital underclass that cannot avail these facilities. As per data from the US labour department, unemployment rose to 14.7 percent, with 20.5 million jobs lost in April after the country went into lockdown (4). By the end of May, this number increased to a staggering 41 million (5). The UK saw 600,000 job losses between March and May, with the number of people making work benefit claims going up by 126 percent (6). In India, data from the Centre for Monitoring Indian Economy revealed that the unemployment rate went up from 8.75 percent in March to 23.5 percent in May (7).

Real-time survey evidence in early April from the UK, US and Germany revealed that the labour market impacts of COVID-19 differed across countries; 18 percent (US), 15 percent (UK) and five percent (Germany) of the 20,910 respondents said they had lost their jobs (8). How did Germany escape the brunt of the impact? The country runs a 'short-time work scheme', which is a part of "public programmes that allow firms experiencing economic difficulties to temporarily reduce the hours worked while providing their employees with income support from the State for the hours not worked" (9). About 35 percent of the German respondents were asked to reduce their working hours under this scheme, which led to a lower percentage of job losses.

While the formal economy has clearly taken a beating, the informal economy has fared far worse given the lack of contracts, employee benefits, and protection from economic shocks. The COVID-19 crisis has had devastating repercussions for informal workers and low-skilled migrant labourers in developing countries. Within countries, rural to urban migration are high; for example, people from drought-prone regions in the Indian state of Maharashtra move to Mumbai to work as labourers in brickmaking, construction and other such sectors. The demand for cheap labour has also led to high volumes of immigration between countries, such as from India to the Gulf states. The loss of jobs, lack of social security, and being stranded in an alien city and country were some of the problems faced by migrant workers during the peak of the crisis. As lockdowns and containments ease, and migrant workers return to their hometowns and countries, they face a new crisis—chronic

unemployment and the loss of earnings and remittances for their families.

With new variations of social distancing that localises production and labour, there will be a shortage of migrant labourers in the entire range of the global and local supply chain in the future. Countries will also isolate and change their methods of outsourcing manufacturing activities to contain any disease spread in the aftermath of COVID-19. These changes may lead to an acceleration in automation, and the reallocation and reskilling of those who will lose their jobs should be a priority for governments post-pandemic.

Accelerated Automation

Automation in industries and workspaces attempts to boost productivity by removing unnecessary human variables and errors, and creating efficient and predictable systems. This will be an asset in the COVID-19-induced social distancing world, but has raised apprehensions of technology replacing jobs. For instance, the April American Worker Pulse Survey Report revealed that 44 percent of US workers are concerned about their jobs being replaced by technology (10). On the other hand, Deloitte's 2019 Global Human Capital Trends Report, which surveyed 10,000 leaders in 119 countries, revealed that companies still "fear" these technologies; only 26 percent of respondents said their organisations were "ready or very ready" to address the impact of these technologies (11). Furthermore, most companies had not yet equipped their employees with the required skills to use the technologies that they have now been forced to turn to due to the pandemic. Only 17 percent of the leaders said they had made significant investments in reskilling their employees even though they would like to use the technology to augment their productivity (12). A KPMG report on "easing the pressure points" backs this claim by revealing that skills shortages are inhibiting the growth of artificial intelligence (AI). Although firms are actively investing in AI technologies, they are hindered by a lack of coordination, integration and prioritisation (13).

These statistics illustrate that while discussions on COVID-19 leading to accelerated automation and redundancy of human labour are ongoing, companies had not caught up when the pandemic hit, which has only contributed to the increasing levels of insecurity and losses faced by employers and employees. Given this lack of preparation, cities will still have their commercial hubs of activity in the immediate aftermath of the crisis as they would need to acquire a skilled workforce before completely overhauling their under-prepared systems. Thus, the immediate change that will be seen in the post-COVID-19 world will be an upsurge in skilling activities to attempt accelerated automation, and evolution of

company policies to manage the changes resulting from the switch to new technologies. Better person-to-person coordination between firms in different sectors needs to be entrenched so that the shocks caused by technological changes can be absorbed.

Increase in "Alternative Work"

A 'gig worker' is broadly defined as one who performs work and earns from such activities outside of the traditional employer-employee relationship. 'Alternative' work is a broader net that includes work performed by outsourced teams, contractors, freelancers, gig workers, and the crowd (outsourced networks) (14). The number of self-employed workers in the alternative workforce in the US is projected to triple to 42 million, with gig workers likely to comprise 43 percent of the US workforce this year (15). Silicon Valley technology companies now employ more contract workers than regular employees. Google, for instance, employs more than 121,000 temporary, vendor and contract workers as compared to its 102,000 full-time employees (16). E-commerce platforms like UrbanClap have driven a massive increase in employment in India. For instance, food delivery provider Zomato, which operates in 550 Indian cities (17), has engaged approximately 250,000 people as delivery agents (18).

These workers rely on customer demand for their earnings. Pandemics significantly affect the use of the service, which in turn affects earnings. Without social security benefits like steady income, health and maternity benefits, these workers take massive risks. According to a 2019 US Federal Reserve report (19), 58 percent of gig workers are not able to afford an emergency bill as compared to 38 percent workers who are not a part of the gig economy.

Last-mile delivery is also an area in which automation (in the form of drones) could replace human contact while adhering to increased social distancing measures in the future. These eventual job losses due to automation must be accounted for by creating reskilling initiatives. The pandemic has only exacerbated the woes of the alternative workforce. With an overwhelming proportion of the workforce already facing issues of lack of job security and employment benefits, governments must include pandemic-related clauses into social protection schemes to safeguard them in the future.

Cost of Working in Cities

Having a physical office space involves several overhead costs, such as rent and electricity. While these costs seemed essential due to their assumed

relation with output, the remote working environment kickstarted during pandemic lockdowns has led to a discussion on doing away with physical office spaces in the future.

Based on data collated from Bengaluru, Hyderabad, Chennai, Pune, Mumbai and Delhi-NCR, Indians, on average, spend 7 percent of their day commuting to their offices (20). In the UK, 3.7 million workers travel for two hours or more every weekday to reach their offices (21).

One reason for such long commute times in India and the UK is the high cost of rent around urban commercial workspaces. Research on six Indian metropolitan cities—Delhi, Mumbai, Kolkata, Bengaluru, Hyderabad and Chennai—showed that the central parts are the most expensive, and the cheapest rents are in areas farthest from the city centres. The average rent across the six metro cities accounts for approximately half of the average income, making affordable living near central workplaces a challenge for an average city dweller (22). In the UK, soaring rents and high property prices in the cities means that people were less likely to be able to afford to live near their places of work (23).

An increase in remote working can be a boon for urban white-collar workers who struggle with their commute and high property and rental prices. If companies adopt and encourage remote working, not only will their overhead costs reduce, but employees will also spend less time commuting and pay lower rents, thus reducing the overall cost of working in cities. These advantages should be offset against laying off employees in place of digital growth.

Conclusion

Disease outbreaks in the past have shown how urban spaces can be redesigned to build better pandemic responses, such as the establishment of sanitation systems in urban London in the 19th century in response to the cholera outbreak (24). The need to initiate better pandemic responses post COVID-19 will lead to a new form of jobs to design a cityscape that fits social distancing norms. Helplines of health professionals, sanitation and hygiene committees for industries that depend on physical and human contact and new nodal authorities for migrant-management in cities have already emerged. Data collection agencies for informal settlements like in India, and personnel to manage the decentralisation of services and nets of smaller last-mile delivery zones will also crop up. These future jobs will be essential in attempting to curb the negative impacts witnessed due to the COVID-19 pandemic.

We have been pushed into the digital era without having prepared for the impact on the digital underclass and informal labourers. This hibernation into the digital space, which has limited the need for physical activity and connection, has been restricted to an elite percentage. We must now fast-track the adoption of social protection, employee benefit schemes for economic shocks, and the retention of the lost and insecure workforce that has sprouted because of the hyper-digitalisation of work and the impact of COVID-19.

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Providing Urban Poor with Livelihoods is Crucial Post COVID-19

Ramanath Jha

P andemics and epidemics over the past few decades have become increasingly urban-centric. This is primarily because the world has urbanised, with about 55 percent (1) of all people now living in urban areas. Accompanying this phenomenon is the spectacle of urbanisation of poverty—rural poor aspiring to escape rural distress and lack of employment by migrating to cities in search of livelihood opportunities. Over the years, cities have also densified, both in demographic density and economic concentration, and have become the primary generators of national economies. Unfortunately, in the process, they have also provided a natural breeding ground for pandemics.

Around the globe, more than a billion people (2) live in urban poverty, many of whom struggle to eke out a living. Cities in South Asia (33.4 percent) and Sub-Saharan Africa (50.7 percent) accounted for the most significant numbers of global poor (3) between 1990 and 2013. Most countries with an urban poor population lack robust schemes to ensure they have a livelihood. Fortunately, livelihood strategies for the urban poor are broadly replicable with some local contextualisation. Cities with comprehensive urban planning and governance models that adequately factor in poverty planning, and that are financially backed by their central governments, will succeed in alleviating the various dimensions of urban poverty.

Indian Cities, COVID-19 and Social Security

India is no exception to the realities of the urban poor. The country has steadily urbanised, leading to the rise of populations concentrated in megacities and metropolitans. A significant part of this urbanisation has been catalysed by the urbanisation of poverty, evidenced by the large

slum populations in cities, rising street vending and the numerous urban activities dependent on migrant labour. The country's economy is driven by cities, and their urban demographic and economic densities have allowed the pandemic a welcome playing field.

These factors have led the COVID-19 pandemic to hit the urban economy the hardest. National and state governments reacted by attempting to control the spread of the disease through phases of lockdowns that imposed home confinement, the mandatory wearing of masks, social distancing and complete economic inactivity. This was bound to emaciate the urban poor the quickest since they survive at the bottom of the economic ladder, and their overall safety net is the weakest. This was in stark evidence as lakhs of migrant workers, stuck without work and away from their permanent homes, had to walk (4) thousands of kilometres to get back to their hometowns.

While the security net provided by the Indian government's economic package—comprising free ration, gas and money—provided some relief to many, several others were left outside its folds. Moreover, the large numbers that wanted to go back home despite the economic package shows that the assistance was either insufficient or not delivered.

Post-Pandemic Urban Economy

The sustainable answer can only be provided by opening up the urban economy. The details of the strategy would indeed be predicated by the pandemic and how it pans out. But the lockdown cannot be a cure worse than the disease. Additionally, it would not be enough to open up the rural areas and keep major urban centres under lockdown. As we have seen, it is the mega and metropolitan cities that house the bulk of the nation's economy. Economic revival, therefore, will heavily depend on a calibrated design of economic resurgence in urban areas.

Although India has slowly emerged from lockdown, the shape of the post-shutdown economy is still unclear. All businesses that are primarily urban and find it difficult to handle social distancing will suffer until the pandemic plays itself out. Their probability of making a comeback will depend on their ability to conform to the basics of pandemic containment. It is quite likely that some of the businesses would fail that test and would have to shut down, resulting in the loss of many jobs. The entertainment and lifestyle (5) industry, restaurants, tourism (6) and transport (7) have been battered out of shape. Those who have lost their jobs in these sectors will have to be reskilled and find alternate employment. The government will have to make efforts to promote such work by aiding the growth of alternative businesses

through policies that catalyse the changeover. Some of these changes are evident. Online shopping will gain momentum and in turn will trigger a larger packaging industry and delivery services, as will the food delivery sector.

While a city's economy comprises both the formal and the informal sectors, the ability of India's formal sector to generate employment has been showing severe fatigue. The pandemic has severely dented the government's economic capacity, and so it will be a high expectation to hope that the public sector could generate largescale employment. The informal economy is the best bet to create jobs for the urban poor. Nearly 81 percent of India's employed population (8) makes a living from the informal sector. Fewer barriers to entry, nominal need for initial capital and skill, flexibility in hours and participation, and the scope of combining household errands with earning opportunities make the informal sector an ideal tool for employment. Additionally, the size of such enterprises enables them to offer custom-made services that large enterprises cannot provide. The government should step in to provide adequate support systems to the informal sector through the allocation of land and microcredit, and through policy and institutional mechanisms. Similarly, self-help groups deserve greater encouragement.

Local Livelihood Strategies

At the city level, employment and livelihood strategies are best formulated based on the dynamics of the local economy. This strategy should also factor in the strong linkages that exist between the formal and the informal sectors. For this purpose, a survey of the local economy ought to be undertaken. A demand survey to identify potential economic activities, the skill base and the existing skill and educational levels of the poor and slum population is needed. Potential training strategies should be devised to cover any gaps. This will facilitate the identification of livelihood opportunities in the city for the poor. Based on the survey, skills training, and institutional and financial support programmes should be designed. These steps should be taken in partnership with the corporate sector, which will likely absorb the skilled workforce.

The setting up of Livelihood Resource Centres in cities may be a good step for improving livelihood opportunities. These centres can provide information on possible placements, register candidates needing employment and interface with potential employers. They could also deliver information on household services like domestic assistance, nursing care for the sick and the old, cooks and catering, as well as maintenance services such as plumbing, electrical and mechanical repairs.

India has set up the National Skill Development Corporation India as a public-private partnership company, with the primary objective of facilitating skilling on a massive scale. Since its inception, over 5.2 million students have been skilled. The Pradhan Mantri Kaushal Vikas Yojana runs a Skill Certification Scheme, enabling a large number of young men and women to undergo industry-relevant skill training and secure better-paid jobs. The Deen Dayal Antyodaya Yojana is another government-run programme that helps the youth access gainful self-employment.

Embracing the Informal Sector

The availability of a combined living and work area—as in Dharavi (9), Asia's largest slum—would be of great help to the urban poor. Dharavi is as much a residential space as it is industrial. Over time, two-storied structures have become ubiquitous, with residential premises on one floor and a workspace on the other, often allowing all members of a family to assist in an enterprise. National policies on housing the poor can draw from such models. Furthermore, providing workspace in residential areas can be instrumental in increasing the number of women in the workforce, making them more productive while ensuring their safety and convenience. This not only addresses a gender inequity problem but also allows families to earn much more than otherwise possible.

The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, passed by the Indian parliament in 2014, legalised street vending and aims to protect the livelihood of street vendors (10) and provide them with a conducive environment to carry out their business. About 2.5 percent of a city's population could be accommodated in the vending zones, depending on the holding capacity. Some vending spaces can be made available for multiple uses, allowing more than one vendor in different time slots. Eight-hour slots will enable a greater number of vendors to earn a living. Underutilised spaces such as parking spaces unused on weekends or holidays can be used for vending. Once cities return to normal life, the urban local bodies will have to make arrangements to ensure proper distancing measures are in place for street vendors. Street vendors must also be provided with safe drinking water as well as water to wash and sanitise their hands and carts, hygienic toilets, electricity and storage facilities.

Future of Livelihoods: Universal Basic Income vs Employment Guarantee

Many kinds of interventions to create livelihoods for the urban poor have been tried in different countries. In Kenya's Homa Bay county, the upgrading of markets (such as the Nyakwere open-air market) and public spaces, and increased access to roads were critical components of the livelihoods programme (11). In Colombia, street vendors successfully claimed the right to work in public spaces through the constitutional mechanism of the '*tutela*' (12). Similarly, the Microeconomic Reform Strategy was a central component of the 2005 policy guidelines for implementing pro-poor local economic development in South Africa (13). In Thailand, Sunday markets in public spaces have been a great tourist attraction. Unfortunately, many of these efforts ended as pilot programmes.

It is in this context that the idea of universal basic income should be viewed. India, and many other countries, have been considering universal basic income programmes long before the pandemic hit. In India, the discussion has centred on the rural population, with the national and state governments responsible for funding. In the cities, the onus would be on urban local bodies to fund such a scheme; however, it will be hard for them to do so given their limited finances. Crucially, the concept of a livelihood revolves around the provision of work and work opportunities and not just the disbursement of a dole. Given the likely sizeable growth in the number of urban poor on the back of rampant urbanisation, cities must consider replicating rural employment guarantee schemes to ensure sufficient livelihood opportunities.

As India urbanises, a higher number of rural poor will shift to the cities in search of informal employment. Consequently, for the next several decades, urban local bodies will be expected to mitigate poverty in massive numbers. Placing this onus only on urban local bodies is flawed. The central and state governments must step in to mitigate the situation. For instance, the Odisha government's announcement (14) of an Urban Wage Employment Initiative is worth observing. This would enable the urban poor working in the informal sector to get immediate wages by the execution of labour-intensive projects. Replicating such a scheme around the country will ensure access to livelihood for thousands of India's urban poor. At the same time, a plan such as this is replicable across countries. It promises substantive employment continuously and at the required scale.

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RISING CITIES
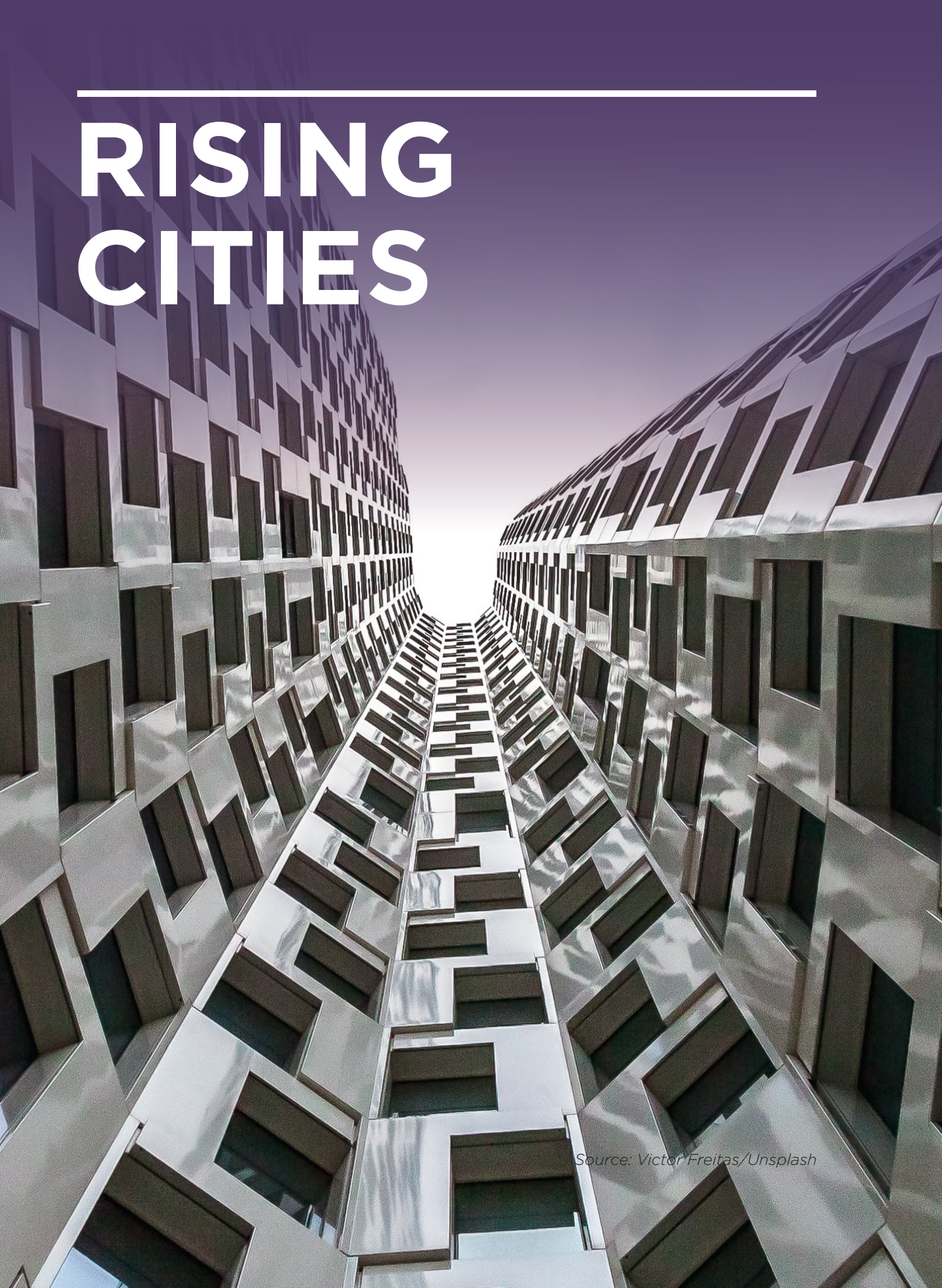
Reimagining the Workspaces of the Future

Sangeet Jain

While there is much to complain about modern living, perhaps no other institution has invited quite the sort of universal pique that the office has. There has not been a good word said about the office in years. However, as much of the world was forced to hunker down at home amid the COVID-19 pandemic, among the many grouses aired on the Internet was a collective longing for routine and the shared tribulations of office work. A large chunk of the workforce did spend an extraordinary amount of time in offices after all, and the sudden shift to remote work led many to question what comes next. Will the conveniences of work from home prove simply too attractive and lead companies to deem offices as anachronistic, wasteful extravagances to be done away with? Or will the office persist, battered or in a different avatar? As the world emerges from the coronavirus-induced lockdowns, the workplace as we know it today may well cease to exist.

The question we ask is a privileged one at its core, as the pandemic has exposed the inequalities inherent in our depraved labour market structures. The impact of the viral outbreak has been profoundly asymmetric, with most work having simply collapsed. Even among those fortunate enough to be in employment, the possibility of remote working is a white-collar luxury—most workers around the world still must go to work. As MIT's Elizabeth Reynolds put it succinctly at a recent *Financial Times* webinar (1), how shall we make workplaces safer for those who have to go in to work, and working remotely more effective for those who do not?

End of the Office?

As the pandemic struck, a vast number of offices across the world witnessed a mass exodus as companies rapidly moved their entire staff to work from home. For many of these industries, murmurs proclaiming the death of the office were not exactly new: these trends have been underway for a while (2) as city rents skyrocketed and the digital revolution's "weightless economies"(3) made work from home an occasional possibility. All that the pandemic seems to have done is accelerated these trends and, in that process, bust the myth of the office being "essential" for many. Whether it still remains desirable is an open question and will determine whether these companies shall continue to invest in increasingly expensive physical workspaces going forward.

The COVID-19 induced recession is likely to place tremendous pressure on companies to cut costs, and getting rid of expensive properties may be a prerogative for some executives who would rather spend the money on subsidising remote working arrangements for employees. Some companies, like food giant Mondelez and investment bank Morgan Stanley, have already indicated their intentions to downsize their physical presence (4). Real estate developers have their hearts in their mouths as they watch companies question their spatial requirements. According to Savills' CEO Mark Ridley (5), we may indeed see some disruption in the secondary real-estate market as some companies ditch their properties, but it is unlikely that this will be as widespread a trend as feared. There may even be a reason for optimism (6), as a reversal of densification within workspaces may create a need for more offices and even bigger spaces than before.

Even tech companies, which have been the first and most enthusiastic adopters of work from home policies, are not looking to get rid of their office campuses completely (7). Decisions on this front are likely to be nuanced and carefully considered: the office still holds tremendous value for companies as a space for employees to congregate and collaborate, and work towards a shared purpose. Working in communities makes for more enjoyable work, contributing to a shared sense of meaning and loyalty, a culture that video calls can scarcely emulate. Some organisations place so much value in physical presence that a hedge fund in the US reportedly booked a hotel for its traders to stay close (8). The pandemic has also made it painfully apparent that working from home is an uncomfortable adjustment for many employees, especially working mothers juggling childcare with work and people working from cramped apartment buildings with no space for a home office. Twitter has taken the leap to reimburse its employees (9), including contract workers, for their home office expenses. Slack has also offered a stipend to employees

for working from home, along with a mobile and internet allowance. Work from home may not be as desirable as it seems, and companies are therefore far more likely to adopt hybrid models of work, blending remote and office teams and giving workers the autonomy to work more flexibly.

Changing with the Times: Workplace Design

We can also expect a rise in distributed working (10), with companies looking to create multiple hubs to distribute the risk of an office being potentially struck down by the virus. A few are already looking to co-working space providers to step in and provide decentralised office spaces across cities. The pandemic, however, is also a curveball for the co-working industry, and it is unclear at present how the industry's business model, currently based around community working, will adapt. Co-working could get a boost from those looking to outsource the trouble of providing high-maintenance workspaces and those needing low-cost, flexible office spaces for their employees. However, this will depend on how well the industry adapts to the need of the hour. Providers shall need to pivot from a focus on cosy huddle-zones to sanitised, open spaces allowing social distancing, as security becomes the paramount consideration for employers. This may affect co-working business models considerably and make it economically unviable for the smaller providers to survive. Those that can are likely to capture the market.

The transformation of workplaces will also necessarily impact and be impacted by changes in urban policy and design triggered by the pandemic. Companies are keenly aware that most employees in cities depend on mass transit for their commute to work, which could pose a particular threat in the post-COVID-19 world. The RPG Group, for instance, has mandated that entry to its offices shall only be allowed for those travelling by personal or office vehicles (11). Companies may also opt for staggered work shifts or flexible working to ameliorate health risks. With remote working becoming viable, workers may also choose to move to less-dense suburban areas that promise a better quality of life; however, people tend to be 'sticky' and' immobile', which may prevent them from doing so (12).

The workplaces we return to post-COVID-19 are likely to look very different from those we left behind. With safety trumping all other considerations, building design and office layouts shall undergo a significant transformation (13), conforming to stringent public health protocols and worker expectations. Employees can expect thermal

screening on entering office buildings and may have to don masks and protective equipment at all times. Buildings might have to be disinfected at regular intervals, and visibly so, to appease worried employees (14). Companies may also have to keep ambulances on standby and offer substantial health benefits to attract employees. The possibility of rapid contagion would mean most companies shall have to instate wide-scale testing of workers at regular intervals (15). Intel, for instance, plans to screen its employees for COVID-19 symptoms regularly. Employees can also look forward to the probability of better-ventilated offices, as employers seek to ensure superior indoor air quality and circulation. The money would be well spent on UV air filtration systems and dehumidifiers, as it would have huge payoffs for employee health and productivity (16).

The pandemic may also soon spell the demise of skyscrapers (17), which have dotted city skylines for decades, as vertical architecture poses a significant challenge to social distancing requirements. Elevators are likely hotbeds of germs, and therefore moving people around vertically may no longer be a safe proposition. Presently, companies are encouraging small, cost-effective measures to reconfigure the workspace, such as numbering chairs, asking workers to take the stairs, ensuring that elevators run on half-capacity, and staggering work timings to avoid queues. A bigger change would be the end of the much-disparaged open-plan office (18). With offices suddenly keen to put walls between people, the demand for perspex, plexiglass and "sneeze guard partitions" to separate desks has spiked. Zenbooth CEO Sam Johnson advises that companies should opt for translucent, porous dividers to avoid boxing in employees and reinforcing a feeling of isolation (19). The focus must be on maximising safety but also preserving a semblance of the collaborative and interactive benefits of being in an office space. Inventive solutions have cropped up already. Cushman & Wakefield is using colourful carpet tiles to demarcate zones and companies are also instituting one-way lanes within offices to avoid people bumping into each other. How far these measures will be adhered to is an open question. Contactless entryways, less obtrusive furniture, and in-office videoconferences instead of large meetings could be the new normal.

Office cafeterias and other communal spaces could soon look quite different as well. Coffee machines, food courts and microwaves at work may well be a thing of the past. Shirish Subramanian at Ubaal Chai believes that vendors supplying offices would also have to ensure flawless hygiene and put contactless delivery systems in place to survive (20).

Navigating Uncertainty

The future of workplace design appears to be mostly benign, if slightly awkward. However, a particularly disconcerting trend is also being catalysed further by the pandemic—the rise of workplace surveillance. Companies that are not used to navigating the new world of remote work are finding themselves leaning heavily on surveillance tools to ensure outcomes. This is especially the case for those that relied on presenteeism as a proxy for measuring productivity. Barclays has been contemplating employing surveillance software, raising many eyebrows in the industry (21), while Amazon has been conducting surveillance in its warehouses for a while now. Emerging technology has made intrusive tools (22) like InterGuard available, which can be hidden on workers' computers to monitor them without their knowledge. These developments have massive implications for privacy, and the disruption caused by the pandemic may entrench the use of such solutions. Already, it appears that contact-tracing apps and movement-tracking software are likely to be widely adopted and accepted by workspaces. Going forward, offices may demand employee health records and depend on facial recognition technology to monitor their movement. Many companies like Basecamp and Waster have denounced this trend severely and have chosen to opt for self-regulation instead (23). Siemens, for instance, has developed (24) a self-declaration app where workers record their symptoms and only a select few get office access. Surveillance can have paralysingly detrimental effects on employee morale and foster discontent and anxiety among workers. Placing trust in employees, especially amidst uncertainty, will be the key to ensuring long-term productivity.

One word may sum up the future of workspaces—flexible. With uncertainty abounding in every quarter, organisations shall find that agility and flexibility will be crucial in navigating the future of work. It is likely to be a cautious transition with some struggle, as workers and employers attempt to find a balance with these bleak measures and prohibitive designs in place. On the flip side, workers could be granted more autonomy and offered the option to work flexibly more often, as the pandemic has provided a mass crash course in operating digital tools that allow for more seamless collaboration remotely. Offices could also take the opportunity to become more attractive, serving as brainstorming hubs to touch base rather than sites of daily drudgery. The pandemic may have done the office a huge favour, forcing a long-overdue reckoning. As the flurry of video calls make employers more empathetic to their employees' responsibilities and life beyond work, perhaps the workspaces of the future shall be more accommodating and flexible, and more in tune with their employees. The coffee-machines, however, will be sorely missed.

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The Rise of Cities: Economic Drivers in the Post-Pandemic World

Soumya Bhowmick

Cities that are defined by cultural leadership or economic strength have dominated throughout history, from Athens being known as the first 'European City of Culture' (1), to the sovereign city-state of Singapore being a global financial hub. The rise of city systems has not always been dominated by issues of sovereignty but is mostly driven by the historical perceptions and economic activities that surround them. For instance, Mumbai is India's financial centre, while Kolkata is touted to be the country's cultural capital.

The forces of globalisation were in play long before the term was coined. The movement of people and goods over vast territories have occurred for centuries, notably since the spice trade in the medieval era. The trend of inter-dependency between and within nations over the centuries resulted in the immediate and debilitating economic impact on goods and services due to the current COVID-19 outbreak. The disruption of the supply chains due to the pandemic will result in a tilt towards domestic production despite the higher cost required to increase efficiency in local consumption and production processes. This was also reflected in Indian Prime Minister Narendra Modi's speech in early May, calling for citizens to buy 'local' and become *atmanirbhar* (which translates to 'self-reliance') at the city, state and nation level. The migration of people, ideas and information, along with the movement of goods is at the risk of waning in the post-COVID-19 world. As the world reels under the COVID-19 pandemic, foreign diplomacy is strained and regional statecraft within federalist structures are at unprecedented crossroads. How will cities grow to prominence in the post-pandemic global order?

Growth of Urban Economic Centers in COVID-19 era

Large metropolitan cities have dense populations. About four billion people—or 54 percent of global population—reside in cities (2). Rapid urbanisation has resulted in extreme pressure on resources such as water and energy and has also led to unequal access to necessities such as food and healthcare. This has proved to be a major hindrance in handling the spread of COVID-19. Additionally, cities across the world have proved to be ground zero for the pandemic, due to their robust connectivity networks. Given such circumstances, the interest in insulating cities in the future is bound to grow. This will pave the way for urban centres to become more independent, evolving into essential nodes of economic activity and governance.

While cities may be hubs of economic activity, there is still not enough financial autonomy. In India, for example, municipal financing in cities is one of the leading causes of local governments being at loggerheads with each other. The 74th Constitutional Amendment conferred functional autonomy but inadequate financial autonomy to local governments (3). Consequently, there is a lack of revenue to keep up with the increasing pace of population growth in cities. This results in high dependency on state governments for financial resources, which has been grossly inadequate (4). The availability of such municipal financing may become more perilous during and after the COVID-19 crisis as governments at all levels are struggling for funds.

About 60 percent of the world's population is projected to be city dwellers by 2030, and the world is estimated to have 43 megacities (cities with more than 10 million inhabitants) (5). This would require a proportionate growth in urban capacities. The growing importance of cities as the point of trade, investments and para-diplomacy in the post-COVID-19 world makes it imperative for the urban systems to be made "inclusive, safe, resilient and sustainable", as determined in the United Nations' Sustainable Development Goal 11 (SDG 11) (6).

Asia and Africa are the regions with the fastest-growing urban agglomerations characterised by cities with fewer than a million inhabitants. India ranks low among the South Asian Association for Regional Cooperation (SAARC) nations in progress made on SDG 11, underpinning the urgent need in the sustainable transformation of its cities to attract investments and conduct robust trade in the future (7).

'Divorcing' China for Now?

The COVID-19 pandemic has resulted in the disruption of trade and investments, especially for sectors such as tourism and manufacturing. China is the global manufacturing hub and accounts for 12 percent of the world's GDP growth rate (8). The over-dependency on Chinese manufacturing is now hurting global economic growth. During the SARS outbreak, China only contributed to about 4 percent of global output, which has now increased to a whopping 16 percent (9). With the COVID-19 virus originating in China, and the subsequent allegations against the country over its handling (10) of the crisis, investors have begun to consider shifting their manufacturing activities to countries like India, Bangladesh, Thailand, Vietnam and Philippines (11). The pandemic could be an opportunity for India to become a manufacturing hub and expand its export base. However, with land and labour cost about 12 percent lower in Southeast Asia, India faces a formidable challenge. Although India's market size might offset the production costs by 6-7 percent, the remaining gap will need to be closed by implementing incentives at regional levels driven by the booming cities in the regions (12).

Amidst the COVID-19 outbreak, many South and Southeast Asian cities are also projected to become the focal point of foreign investments. While Singapore has already made early gains on this front (13), in India, the state governments of Telangana and Tamil Nadu are stepping up to attract firms to their largest cities (Hyderabad and Chennai). Several multinational companies have expressed an interest in shifting their value chains to India, which will boost the country's growth opportunities. While Japan has pledged US$2.2 billion to facilitate companies to move their production facilities out of China (14), German footwear company Von Wellx is set to relocate its production from China to Agra in India (15). Besides, the pandemic has led to developed economies such as the US, Germany, and Japan seeking to dilute their dependency on China, which puts developing countries like India at an advantage.

## Investment in Indian Cities

Progress towards building strong cities as economic epicentres in India is at the mercy of the country's federalism structure and its impact on investment and governance. A competitive economy produces policy that is efficient and can benefit the entire country. Regional competitiveness and city-oriented growth get as much importance as national competitiveness (16).

The policies of 'competitive federalism' have already been adopted for the achievement of the developmental goals in India through its flagship 'Make in India' initiative (17). Different states have also launched their own campaigns, such as 'Vibrant Gujarat', 'Happening Haryana', and 'Magnetic Maharashtra'. The state capitals have been the drivers of these campaigns in terms of their operational and financial administration. In the same vein, the UN points towards India's Smart Cities Mission (18) for building sustainable cities with proper infrastructure facilities.

Such policies are aimed at attracting foreign direct investment (FDI) into the Indian economy. Over the 2008-09 and 2017-18 period, Mumbai and New Delhi received the highest inflows of FDI, at a ten-year average of INR 467.34 billion and INR 295.88 billion, respectively. In a post-COVID-19 world, with the Indian population making for a booming product market and a technologically trained human capital base, India's big cities are bound to see higher growth in investments, making city-led trade more robust.

Figure 1: FDI Inflow into Reserve Bank of India's Regional Offices (in billion Rupees)
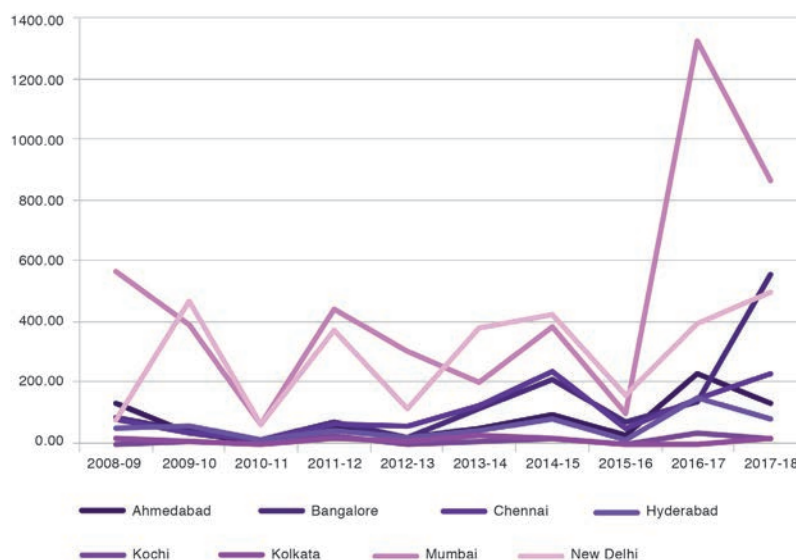
Source: Author's own; data from Ministry of Commerce and Industry, Government of India

Restrictive Human Capital Flows

The growth of cities is dependent on the migration of skilled and unskilled labour. The Gulf cities, for instance, thrive on their accumulated wealth operationalised by an influx of skilled labour from the western countries and unskilled workers from Asian nations (19).

This dynamic interaction between physical and human capital catalyses the global economy in varying proportions. However, cities with large migrant populations have proved to be at a vulnerable position during the spread of COVID-19. An integrated approach must be adopted to avoid any similar challenges in the future.

Countries will likely adopt more protectionist policies to not only prioritise their available human capital but also prevent further waves of COVID-19 infection. This will bring down the migration of labour between cities and will impact the global economy in four significant ways. First, many production processes might turn inefficient in the medium term due to a lack of physical assets and complementary human skill sets. Second, wages will fall as there will be an oversupply of labour following the return of migrant workers to their homes. This is particularly likely for unskilled rural workers in developing countries such as India (20). Third, unemployment will rise, exacerbating the levels of poverty and hunger, and related casualties. For poorer nations such as India, where 50 million workers have relocated to other cities in search of livelihoods (21), the migrant distress amidst the pandemic is appalling. Finally, small businesses that are dependent on migrant labour will not be able to sustain themselves in the short or medium term. Hence, post-pandemic policies must prioritise these issues to restore the health of the economy.

Conclusion

At a time when the global economy is steadily declining, with the COVID-19 outbreak set to decrease the growth rate of many economies, countries must enhance the economic linkages with their regional partners. In India, the focus must shift towards strengthening the cooperation with sub-regional organisations in South East Asia, such as the Association of South-East Asian Nations, Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation and SAARC, with the main objectives of containing China and boosting domestic economies. India's Act East policy is seen as a crucial alternative to China's Belt and Road Initiative, with the eastern and northeast cities, such as Kolkata and Guwahati, playing a vital role in enhancing regional ties as 'gateways to Southeast Asia' via Thailand and Myanmar (22).

The mobility of commodities and labour will be primarily restricted within demarcated governance zones in the post-COVID-19 world. As the World Health Organization terms it, the 'infodemic' resulting from this pandemic may also be responsible for feeding into the residual fear of COVID-19 in the near future. This will not only indirectly lead to cities and regions emerging as self-sufficient units but could also

lead to alternative frameworks of para-diplomacy across governance regimes. However, regional tendencies and national priorities should not become so extreme as to result in dysfunctional federalist structures or strained diplomacy. Additionally, careful consideration must be given to alleviate the disadvantageous position of the urban and rural poor during the COVID-19 crisis as they form the human capital base of most developing nations.

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From Slums to Skyscrapers: Redesigning Urban Habitat Policies

Renita D'Souza

The COVID-19 pandemic had brought the world to a grinding halt until recently, inflicting unprecedented damage to life and causing widespread economic loss. Approximately 1.2 billion residents of slums and crowded spaces and the homeless were COVID-19's easiest prey (1). From the favelas in Brazil to the shanty towns in South Africa, from India's Dharavi to Pakistan's Orangi town (2), housing poverty and urban housing shortages have undermined strategies to flatten the COVID-19 curve, bringing to light the need to tackle the problem of slums across the globe by questioning the effectiveness of urban housing policies.

Slums are characterised by a lack of privacy, overcrowding and congestion, and the scarcity of resources (including water and sanitation). These characteristics of slums make adherence to the World Health Organization's social distancing norms and other coronavirus-combating exercises a difficult proposition.

In India, people living in slum areas account for 17.37 percent of the urban population (3). The numbers below reveal some glaring details about life in the slums (4):

- The room-person ratio in India's urban slums is 1:41. This ratio is the highest in West Bengal (1:242), followed by Uttar Pradesh (1:80), Gujarat (1:70) and Maharashtra at (1:67)

- About 39 percent of households acquire their drinking water from sources outside their residences

- Nearly nine percent of India's urban slum population is required to walk more than 200 meters to access their source of drinking water

- About 18 per cent of slum households rely on public taps or standpipes for water for non-drinking purposes

- About 27 percent of the slum-dwelling units have access to water but lack access to either detergent or soap in or around the bathroom

- About 10.32 percent of households lack bathroom facilities, with residents compelled to defecate in the open

Brazil has 12 million people residing in informal settlements, or *favelas* (5). The country has recently emerged as the global epicentre for COVID-19 (6). Small, cramped up, congested favelas prevent any kind of social distancing. These crowded spaces lack basic sanitation and access to clean and safe drinking water (7). Those residing in favelas do not have access to piped water and other essentials (8). The Brazilian government has barely provided any pandemic aid (9), and the onus of providing food and hygiene products to the poorest in the megacity of Rio de Janeiro is on the community organisations (10).

Weaknesses in Housing Policies

Studying India and Brazil's existent housing policies illustrates that there is great scope for more effective plans. Similar exercises in other countries with informal urban settlements will help arrive at insights to resolve many of the issues that plague these areas.

India

The proliferation of informal settlements in India can be attributed to the ineffectiveness of the housing policies launched since Independence. No housing policy has managed to arrest the growth of informal settlements. Had these policies been effective in handling informal settlements, it would have translated into greater resilience against the COVID-19 crisis. Mostly, housing schemes have crowded out the slum dwellers to the peripheries of large and thriving cities so that the land initially occupied by these dwellers can be usurped by the developers of posh skyscrapers, further accentuating the disparity in the standard of living between the rich and the poor.

The substandard quality of the dwelling units constructed under the housing schemes during the 1951-1961 period compelled the beneficiaries to leave and return to the slums. Some of these programmes charged high rents for the dwelling units. The newly constructed homes were located away from the epicentres of employment and livelihoods, and therefore, slum dwellers preferred living in slums rather than moving into these homes. There was no community participation in

creating these housing schemes, which led to the rejection of the newly constructed dwellings (11).

Despite the recognition of important linkages between housing solutions and access to employment opportunities and basic services, the housing schemes in the 1970s and 1980s failed to generate a substantive impact on the informal settlements scenario in the country. Much like the previous housing schemes, these programmes also failed in enrolling community participation in their formulation. The expansion of the housing finance market during this period only brought greater financial inclusion gains for the higher and the middle-income groups and not for the poor (12).

A lot of criticism has been levied against both the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Rajiv Awas Yojana (RAY) schemes in 1990s for delivering dwelling units that are uninhabitable in terms of structure and size. The newly constructed homes had several structural defects, such as damp indoor walls and leaky ceilings, and are in areas that do not have the critical infrastructure, such as electricity, water supply, sewerage and solid waste management. Most of the housing projects were located in areas with open spaces functioning as garbage disposal zones and were far away from income and employment opportunities. This limitation was further accentuated by the lack of access to public transport. As a result, much of the housing units created under the JNNURM and RAY government schemes were rejected by the slum dwellers, who chose to continue living in informal settlements (13).

India has an estimated urban housing shortage of 11.2 million homes, which the Pradhan Mantri Awas Yojana (Urban), or PMAY (U), aims to cover. Since its launch in 2015 and as of 20 April 2020, the construction of 10.5 million homes has been sanctioned. Of these, only 3.34 million homes have been built, and 6.4 million others have been grounded for construction (14). The progress has been sluggish, with only 32 percent of the work completed in about six years.

The grants promised under the beneficiary-led construction component of the PMAY(U) require appropriate land-related documents to be presented. However, land and property records in India are in shambles, giving rise to issues related to unclear land titles. Obtaining property documentation in India is a difficult proposition since property records are maintained by an agency different from the one looking after housing issues. Furthermore, most of the homes built or augmented by the low-

income segment are found in the margins of cities that are not notified as 'urban' by the government. As a result, they are rendered ineligible for monetary assistance under the PMAY (U) scheme (15).

Brazil

The establishment of the National Housing Bank in 1964 marked the launch of an effective national housing strategy in Brazil. During the 1964-1986 period, COHABs (housing companies) undertook financing for low-income families (16). This financing activity generated improvements in terms of providing social housing. COHABs initially only assisted families with incomes lower than three minimum wages. However, given the high default rates within these communities, COHABs eventually shifted focus to families with incomes between three to five minimum wages, causing the mission to drift away from affordable housing (17).

The most important housing scheme launched in Brazil is the Minha Casa, Minha Vida (PMCMV) programme in 2009, which aimed to make home ownership accessible to low-income families through the provision of high subsidies and low monthly instalments (18). The poor encounter several hurdles in owning a home. With this in mind and the fact that most people living in favelas operate in the informal sector and find it difficult to furnish legal documents such as proof of income, the PMCMV programme has relaxed the legal requirements of contracts.

Nevertheless, families that are involved in informal jobs with measly earnings, such as street vendors and domestic help, find it difficult to pay the expenditures resulting from living in homes with subsidised utilities and condo fees. These account for the lowest-earning PMCMV beneficiaries (19).

Those who hold on to their homes under the PMCMV programme can do so because these houses are in the peripheries of the cities, where land prices are lower. As a result, the poorest beneficiaries of the PMCMV are away from employment opportunities and public transportation. Solving the problem of homeo wnership through affordable housing imposes constraints on residential mobility (20).

Those who have bought more homes in city centres in relatively expensive areas ultimately yield to real estate pressure. For instance, São Paulo real estate prices rose 153 percent between 2009 and 2012. Beneficiaries end up reselling their units and return to poor quality living (21).

Towards an Effective Housing Policy

Affordable Social Rental Housing

When the lockdown was first announced in March in India, thousands of migrant workers and the urban poor, most of them employed in the informal sector, were left in the lurch with no work and no wages to support their food and housing expenses. Further, about 70 percent of the rental housing of the urban poor is informal, making them vulnerable to evictions (22). In response, the finance minister announced an affordable rental housing scheme for the urban poor and migrant workers under the PMAY—government-funded homes, especially those under JNNURM and RAY that are vacant, will be offered for rent at concessional rates (23). This is a welcome step, but it should not be a measure limited to the COVID-19 crisis. This initiative must be continued in the post-COVID-19 era as well.

Private entities in India that run pay-as-you-go hostels for temporary and seasonal migrants face many hurdles in running their business, including high tariffs for electricity and water, prohibitive costs of leasing properties and a lack of support from financial institutions. As part of their efforts to extend affordable rental accommodation, the government must assist such entities in many ways, such as according infrastructure status to avail tax concessions and extending grants under the Affordable Housing in Partnerships plan of the PMAY (24).

As far as Brazil's PMCMV programme is concerned, its flaws may be remedied by considering housing models apart from home ownership. Home ownership may be complemented by the establishment of a rent subsidy system to assist the poor financially. Other models that may be considered for Brazil include collective co-ownership (in which the occupants co-own living spaces), or community-based land trusts, which provide financial assistance to non-profit organisations to set up and operate housing spaces on behalf of a community (25).

Governance and Outcome Guidelines to Existing Housing Schemes

Cramped up spaces, lack of water supply, open sewers and exposure to garbage dumps have proven costly in the fight against COVID-19. Appropriate governance, transparency, accountability, and outcome protocols need to be incorporated into the schemes for enhancing the quality of housing solutions delivered to ensure they are not of substandard quality.

Fortifying the Affordable Housing Ecosystem

Developers in the affordable housing space in India function within a weak ecosystem. The government must contemplate developing public-private partnerships that empower developers in this space to tackle deficiencies at every level of the value chain (26).

Expanding Floor Space Index

Despite being densely populated with less land, cities like Mumbai are not as tall as Hong Kong or New York. India's restrictive land-use regulations do not allow floor space index in cities to exceed five; the figure is ten and upwards in New York, Hong Kong, Singapore and Tokyo. As a result, the prices of realty are prohibitively high in Mumbai, such that the urban poor are unable to afford formal housing (27). The authorities must consider changing such regulations to economise on land and bring down the price of real estate in cities like Mumbai.

Urbanisation and Employment Generation

Urban India accounts for about 63 percent of the national GDP (28). However, Indian GDP owing to urbanisation is a product of 'jobless growth' since most of it is accounted for by the informal workforce. Urban GDP is a product of the industry and services sectors, essentially non-farm employment. Of the total non-farm employment, 83.5 percent is accounted for by the informal workforce (29). One of the reasons for slum proliferation in cities is the failure of urbanisation in generating gainful formal employment. A severe lack of formal well-paying jobs has taken away the ability of the low-income groups and migrants to use rental accommodation, let alone a permanent residence.

While launching rural areas on the path of urbanisation, the aim must be to synchronise formal employment generation and the formulation of housing schemes within the broader agenda. Policymakers must understand that employment generation, urbanisation, and eliminating housing poverty are the three vertices of the same triangle. Trying to solve the problem of housing without solving the problem of employment in the context of urbanisation is a recipe for failure. This is true for all countries, including Brazil.

The COVID-19 crisis has blown holes into several urban policies. One can only hope that countries learn from the lessons of the current crisis and not wait until the next disaster before rectifying their housing policies to accommodate the concerns of the urban poor, slum dwellers and migrant workers. Countries with densely populated urban informal

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Inclusivity in Knowledge Cities in the Post-COVID-19 World

Manvita Baradi and Kaninik Baradi

Organisations, businesses and individuals are in a constant state of competition in the contemporary world. So are cities. Until recently, we have thought about cities in terms of their economic output. Now we need them to be liveable, sustainable and friendly places for all. A city's performance does not simply depend on the size of its population, its production facilities and physical infrastructure; it is increasingly more dependent on the availability and communication of knowledge, and its social and intellectual capital.

City governments are inherently the third tier of the governance structure. Cities are usually dependent on the federal and national governments for developmental funds and grants. They have limited sources of revenue and are not autonomous organisations. The leadership endows cities with visions and titles of becoming green cities, sustainable cities, cultural cities, smart cities, education cities, liveable cities or 'knowledge cities'.

We are moving into a world of globalised cities where knowledge is the most valued commodity. In a post-robotics and post-artificial intelligence society, a nation without a thriving intellectual economy is doomed to fail (1). Knowledge cities are conceived as urban centres that cater to these industries of the future. They prioritise the needs and lives of creative, innovative and skilled individuals, and strive to be attractive places to live and build networks (2). Knowledge-based development is a form of advancement that considers knowledge as the substrate of a development strategy. Knowledge-based urban development is an integrated approach to transition cities and regions into sustainable, livable and prosperous localities (3). This economic conceptualisation does not exist in isolation. The knowledge city generally comes pre-

packed with the 'smart city'. Data-driven management, digital infrastructure, e-governance and efficient urban systems are also part of this vision.

But these ideas miss another issue that cities need to address. Any image of a sustainable city needs to consider how it can include its most vulnerable residents. Without this, knowledge cities will remain a distant dream. The pandemic has proved that currently, many urban workers are connected to cities by the thinnest of threads. Giving them the confidence to not only return to the cities but to stay there in the event of further disasters will require systems that ensure their voice and their safety in cities.

Inclusive Development of Knowledge Cities: The Indian Case

India lives in its cities and not in its villages. By the beginning of the 21st century, 30 percent of India's population was already "urban", and its economy based on the service sector (4). This trend is going to rise, and cities are going to be the foundation of the country's economy.

Despite the economic juggernauts that Indian cities are, large swathes of their residents live in abject poverty. Urbanisation, unplanned growth and a shortage of affordable housing have led to roughly 26-37 million urban households (33-47 percent) living in slums and unauthorised housing (5). They face similar issues of little to no access to sanitation and healthcare, and even to the public distribution systems (rations). Resource scarcity is not the main problem; most of the urban poor find their livelihood in the informal sector, which is not accounted for in the system (6). Low levels of education and skills leave them trapped in ancestral professions, and unable to negotiate the real value of the tasks they perform. As we move toward reimaging the post-industrial city, we need to ensure that these systemic failures are addressed. The most important of these are housing and livelihood; the first represents a city identity for urban workers, and the second becomes the core of their access to entitlements and their safety nets.

Lack of Housing

Housing is central to inclusive urban development. In the last decade, there has been a push for 'housing for all' by creating a market for affordable housing. Slum-dwellers living in poor conditions face the threat of eviction and demolition every day. Such unauthorised housing means that they also lack access to basic services like water and sanitation and do not have 'residence' in the city (7). In the event of a demolition,

hard-earned investments in their home are erased overnight. Despite the provision of affordable housing being a priority area for the Indian government, providing housing through an ownership model has been increasingly difficult. The poor have no access to formal housing finance, and no social security to protect them in emergencies. Banks do not find small loans for these purposes to be worth their time. Ironically, even the 'affordable' housing market cannot be afforded by the poorest of the poor (8). Waste pickers, sanitation workers, or daily wage earners some of whom have been urban residents for generations, still live in informal housing. Distressed migrants stand no chance of gaining a foothold in the city. The private sector-led affordable housing market caters only to the lower middle class.

The biggest irony is the availability of 11 million vacant houses across urban India that, according to the Technical Group on Housing shortage, could take care of about 85 percent of slum households (9). It is a testament to the distortions and disjointed interests of our land markets, housing sector, laws, and financial mechanisms that we are not able to do this.

Solving the housing crisis is not an issue of making more houses. It is providing appropriate transit accommodation for migrants, creating rental policies and mechanisms for those that are currently going without such provisions, gaining the trust and balancing the interests of homeowners, and truly forming the spirit of inclusive development.

For a true knowledge city, this type of housing must also meet additional requirements. It must come with access to transit, healthcare, education and public spaces. It is not simply a matter of giving people four walls and a roof, but to provide them with the tools to make a life within it.

Employment and Skills

Informal trades, such as domestic work, construction work or waste picking, dominate nearly 25 percent of India's urban employment (10). Many of these people are not in these professions by choice. They have never been allowed to learn the skills necessary to access a formal profession. We are living in a time with record unemployment and a record number of vacancies due to a lack of skilled workers. We need robust and industry-led skill development initiatives combined with an effective work placement system (11).

A well laid out strategy for providing skill training will take trainers and training institutes to the villages, where the demand for skill originates. These skill development training and vocational courses must then

culminate in employment generation, whether through direct placement, or entrepreneurial training. Currently, there are various missions/ policies and programmes offering skill development training. However, one of the major issues is that these programmes lack convergence. The skill development programmes cannot be seen in isolation. There is no convergence of skill development programmes with other programmes on health, education, water and sanitation, insurance or legal rights to enable linking of the trainees with other government schemes and avail benefits of the same. A robust skill industry integration platform is required to ensure better coordination between all stakeholders, vocational institutes, companies, government and funding institutes. Without this, even if people return to cities post-COVID-19, we will still be vulnerable to more disasters like this one.

Can Technology Solve the Problem?

Cities cannot work on these solutions alone. While cities are the implementers and the most equipped to address the needs of their residents, they need access to mechanisms, technologies and architectures. The Ministry of Housing and Urban Affairs has come up with various initiatives under the Smart City mission—Open Government Data, Data Exchange Platform and the Data Marketplace. Knowledge cities will have to learn how these systems can be turned into indicators, and administrators will have to develop a holistic view of the city.

The challenge that we face today is not of developing technology, but of being able to create a technology that can act as a seamless extension for those using it. The current smart city model has sunk tremendous resources into control rooms and interfaces, without once asking, "What does the municipality really need?" A knowledge city is one that not only creates new technology but also turns the new technology into an asset rather than a liability. This has been apparent during the COVID-19 crisis where systems such as hospital bed trackers have consistently failed to give accurate information.

Among the Indian megacities, Ahmedabad can claim to be a true knowledge city. Since its inception, this city has had a unique institutional and economic structure. The city built a drainage system in 1888, and unlike in other cities in India, this system was funded by local mill owners. The culture here incubated many institutions of research, innovation and education, like the first Indian Institute of Management, Indian Space Research Organisation, Centre of Environmental Planning and Technology, Physical Research Laboratory, and many colleges and universities (12). The heart of the city has always been an education zone, with good connectivity and transport. The city has always been agile and

able to bring experiments in urban planning and management, such as the country's first Bus Rapid Transit system (13), riverfront development (14), slum networking programme (15), and the first to employ professional managers in the administration. It also became the first city in Asia to issue municipal finance bonds and to get a credit rating (16). Overall, the connections between academia, industry, non-profit organisations and government enable innovations to happen here that do not happen elsewhere.

Ahmedabad has made strides towards efficiency, inclusivity and the utilisation of knowledge that few other cities have. The biggest area where the city lags is in its use and development of information technology (IT) and the encouragement of high-value industries like finance or research and development. Due to an aggressive push towards going digital thanks to the COVID-19 pandemic, Ahmedabad is now in a prime position to capitalise on ease of access to IT resources. Ahmedabad is arguably also the only knowledge city and smart city that is also is inclusive. The city has led the way on all kinds of programmes for the urban poor, such as slum electrification and organisations like the Self Employed Women's Association.

These initiatives form the foundation of a sustainable urban society. India's cities have much more to learn from the things that have happened here than from many other global knowledge cities. However, it still faces the challenge of communal inclusivity, and the lack of housing for all communities and sections of society is still a distant dream. In the coming years, we will see each region define a city in its unique way.

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