FReconfiguring the City: A Case Study of Urban Resilience and Accessibility in Post-COVID Kolkata in Global South

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Abstract: The COVID-19 pandemic has underscored how critical urban crises demand new planning and governance paradigms to create more resilient, accessible, and sustainable cities. Drawing on the special issue theme of "Rethinking Urban Design Paradigms for Resilient Public Spaces," this paper examines how the pandemic has spurred innovative approaches to urban governance, equity, and spatial design. We analyze scholarly literature on health-driven urban reform and apply it to the Kolkata, India context (population ~15 million), situating it within broader Global South lessons. Kolkata's dense informal settlements and infrastructure deficits made it highly vulnerable: studies show COVID-19 "hotspots" there closely tracked indices of deprivation (overcrowding, poor sanitation) rather than simple density. We discuss how pre-existing inequalities shaped both risks and responses. The article then explores how post-pandemic planning concepts – such as 15-minute cities, pandemic-resilient public spaces, and participatory governance – can be adapted in Kolkata and similar contexts. We review examples like park upgrades, pedestrianization, and digital command centers, highlighting both successes and limitations (e.g. the "digital divide" hampered inclusive outreach). Throughout, we emphasize the need to design public spaces with equity and health in mind. In particular, we argue for extending green and open space access beyond traditional parks, integrating resilient infrastructure (ventilated, modular, multi-use facilities), and empowering local communities in planning. The pandemic recovery offers a "wake-up call" to planners and policymakers: by addressing embedded vulnerabilities (slums, informality, mobility inequities) and fostering cooperation across government and civil society, cities can transform crisis lessons into lasting innovations for more just, sustainable urban futures. This analysis concludes with actionable policy recommendations tailored to Kolkata and comparable Global South cities, aiming to guide a more inclusive, "chrono-urban" transition that aligns with diverse social needs.

Introduction

The COVID-19 pandemic represented an unprecedented **critical urban scenario** that disrupted daily life and magnified existing social inequities. While cities have long been centers of innovation, the crisis "cast dramatic light" on how built environments and governance practices must evolve to protect public health and equity. Historical precedents show that past epidemics (e.g. cholera, plague, Spanish flu) triggered sweeping urban reforms: sanitary regulations, sewer and park systems, and housing standards were instituted to combat disease. Likewise, many commentators now argue that the COVID-19 crisis offers "an excellent opportunity" for transformative urban planning towards **just, resilient, and sustainable** cities. In particular, the pandemic's impact on **public spaces** – from parks to sidewalks – has prompted a reassessment of design priorities. Access to parks and open areas proved vital for physical and mental well-being during lockdowns, yet restrictions also laid bare inequalities in who could use and reach these spaces.

Grounded in the theme of "Rethinking Urban Design Paradigms for Resilient Public Spaces," this article focuses on **urban governance and design innovations** inspired by COVID-19, using **Kolkata, India** as a primary case study supplemented by other Global South insights. Kolkata – a 19th-century-founded megacity of over 15 million – exemplifies many challenges: very high densities, extensive informal settlements, and limited services for the poor. These pre-existing

conditions not only shaped how the pandemic unfolded locally, but also raise pressing questions about equity and resilience moving forward. We analyze how Kolkata's experience aligns with global debates on pandemic resilience: the city's spatial and social inequalities, informal economies, and governance structures likely influenced outcomes.

After reviewing key scholarly perspectives on pandemic-driven urban change and *resilient public spaces*, the paper delves into empirical analysis of Kolkata. We examine how public spaces were **challenged and reconfigured** during COVID-19 – for instance, through closures, alternate uses, or emergency health infrastructure – and explore examples of adaptive reuse (e.g. open-air theaters, market spaces) where available. Comparative examples from other Global South cities (e.g. Mexico City, Latin American greenways, and China's Chongqing parks study) illustrate broader lessons about inclusivity and design flexibility. Finally, building on theory and observation, we propose policy recommendations for more equitable governance and urban design in the post-pandemic period. These include principles such as participatory planning, multi-modal mobility networks, integrated green space, and digital inclusion – aiming to bring Kolkata (and similar cities) closer to diverse social needs while enhancing sustainability and resilience.

Throughout, we adopt a **critical analytical lens**: situating evidence in theory (e.g. "right to the city," chrono-urbanism, 15-minute city) and scrutinizing whose interests prevailed in pandemic policies. We emphasize that without addressing structural inequities – in housing, health access, and public space – any urban recovery risk reinforcing "the health of the wealthy few" at others' expense. Our contribution is a rigorous synthesis of contemporary research on COVID-19's urban impacts, with an in-depth focus on Kolkata informed by local data and studies. By doing so, we aim to offer **actionable insights** for urban policymakers and planners pursuing resilient, accessible city transitions in the Global South context.

Pandemics and Urban Design Paradigms

The literature highlights that pandemics have **historically shaped city planning**. Sanitary reform in the 19th and early 20th centuries led to water and sewage systems, housing codes, parks, and slum clearance as public health measures. Pandemics "enabled and legitimized" new planning doctrines; they often exposed how disease and poverty were entangled, prompting urban reforms to improve ventilation, light, and hygiene. In the wake of the Spanish flu and earlier epidemics, for example, cities widely embraced "the healthy city" paradigm (see Melosi 2008; Gandy 2006). Urban researchers note that these sanitary and technocratic legacies were infused with social biases – for instance, targeting slum areas as "diseased" – but nonetheless led to lasting infrastructure improvements.

Scholars now assess whether COVID-19 will trigger a comparable shift. Early analyses suggest **mixed outcomes**: on one hand, the crisis has reiterated the importance of urban public health planning, yet on the other, it also risked reinforcing unequal vulnerabilities. Part I of this special issue (on inequalities) documented how blanket "stay-at-home" orders advantaged affluent, spacious households but marginalized the precarious and those in crowded conditions. Part II argues cities must now move from highlighting inequalities to concrete reforms in planning and governance to improve health equity. This includes drawing on urban resilience concepts and fostering cooperation between governments and communities to break cycles of vulnerability.

Contemporary **"resilience"** discourse in urban planning often means a city's ability to absorb shocks without losing core functions. In the pandemic context, resilience has been invoked at

multiple levels – public health infrastructure, digital systems, and physical spaces. For example, Sharifi and Khavarian-Garmsir (2020) review early COVID-19 urban research and conclude the crisis presents an "excellent opportunity" for transformational change toward more equitable, resilient, sustainable urban environments. They and others advocate that recovery should explicitly target injustices and environmental goals simultaneously.

A specific concept gaining attention is the **"15-Minute City"** or *chrono-urbanism*, which promotes mixed-use, walkable neighborhoods where most daily needs are met within a short distance. Though initially popularized in Europe, this idea resonates globally as a pandemic-resilient strategy. Barnes and colleagues note that the 15-minute model – characterized by mixed land use, moderate density, connectivity, and active transport – can strengthen communities and support climate goals in a post-pandemic city. New research on health equity emphasizes proximity to destinations: Rojas-Rueda et al. (2024) highlight that such local cities can increase physical activity, social capital, and reduce emissions, all beneficial for public health. However, they also warn of risks (e.g. gentrification) and stress inclusive implementation (community engagement, vulnerable groups).

In sum, theoretical work suggests that the pandemic could catalyze shifts toward **decentralized, human-centered planning**. This aligns with longstanding debates on "right to the city" (Lefebvre) – here extended to a "right to a healthy built environment" – where citizens demand access to safe, green, and socially vital spaces. It also connects to "urban metabolism" and ecological design ideas: evidence of temporary environmental improvements (e.g. cleaner air/water during lockdowns) serves as a "wake-up call" to adopt greener development paths. Taken together, the literature frames our questions: How have pandemic restrictions disrupted public space norms? How can design and governance adapt to prioritize health, equity, and sustainability in cities like Kolkata?

Inequalities and Vulnerability in Global South Cities

Any discussion of post-COVID urbanism in the Global South must begin with **informality and inequality**. In many Asian, African, and Latin American megacities, vast informal settlements coexist with affluent neighborhoods. The pandemic highlighted how such contexts differ fundamentally from many Western cities. Scholars note that standard advice (social distancing, working from home) was often *unachievable* in crowded southern cities. For example, Bhan et al. (2020) argue that the predominance of shared water sources, narrow alleys, and multigenerational households in Indian slums means "northern-style" distancing rules are often impractical.

Kolkata epitomizes these challenges. Roughly one-third of its population lives in slum settlements, often in one-room huts housing entire families with minimal ventilation and no private sanitation. Studies confirm that in Kolkata (as in Mumbai), the living conditions in "non-slum" as well as slum neighborhoods are extremely deprived. Das et al. (2021) emphasize that India's slums – including those in Kolkata – are especially vulnerable to COVID-19 due to "unhygienic environment and high population density". Their habitat-vulnerability analysis shows that Indian megacities accounted for over half of national cases, reflecting how urban density and deprivation intersect. Notably, the vulnerability arose *not* simply from number of people per area, but from factors like overcrowding, lack of water/sanitation, and inadequate WASH infrastructure.

This insight is borne out by spatial analyses: Sarkar et al. (2021) mapped Kolkata's COVID-19 "hotspots" and found that they correlated strongly with **livelihood and living-environment deprivation**, not raw population density. In other words, the poorest neighborhoods – with multi-family tenements, shared toilets, and insecure water supplies – saw the worst outbreaks. This echoes observations elsewhere: pandemic severity often tracks social vulnerability (poverty, informality, service access) rather than density per se. It underscores a key point for planning: one must address structural inequality (housing, water, healthcare access) to build true resilience.

Moreover, in the Global South context, public spaces often perform critical functions beyond leisure. Streets and markets are central to livelihoods and social life. For example, the Jamuna Bazar in Dhaka or street corridors in African cities host informal commerce and community gatherings. The abrupt **closure of such spaces** during lockdowns had acute consequences. Gutiérrez (2024) documents how closing Mexico City's historic Alameda park (an analog for many Global South plazas) disproportionately impacted vulnerable groups – homeless people, street vendors, sex workers – who "resisted leaving or found ways to return" because the park was their lifeline. His study shows that pandemic policies often overlooked the **diversity of public space users and needs**. Though this is a Mexican case, it resonates in places like Kolkata where laborers gather in squares or sidewalks double as meeting places. The implications are clear: post-pandemic governance must recognize multiple uses of public space and plan inclusively.

Finally, we note regional differences: housing form, climate, culture. Scholars stress that a one-size-fits-all model (developed-world style distancing) will not work in cities like Kolkata, Jakarta, or Lagos. For instance, Ghanaian or Tanzanian cities showed limited park usage during strict lockdowns due to enforcement or fear. Conversely, in some Latin American cities like Bogotá or Lima, municipalities responded by rapidly creating pop-up bike lanes and reconfiguring streets to allow walking and cycling. We will return to such innovations later, but here it suffices to say that **"resilience" must be context-sensitive**, balancing epidemiological concerns with socioeconomic realities. Theoretical paradigms (15-minute city, healthy city, urban commons) must therefore be adapted – ensuring that vulnerable populations are not excluded by digital requirements or privatization of public goods.

The Kolkata Case Study: Challenges and Responses

Pre-Pandemic Urban Conditions

Kolkata (Calcutta) is the third-largest city of India and a major Global South megacity. Its history of colonial industrialization and partition-driven migration has produced a **complex urban fabric**. The Kolkata Municipal Corporation (KMC) area houses roughly 4.5 million (2011 census) with much of the metropolitan region exceeding 15 million. The city is characterized by very high population density (over 24,000 persons/km²) and acute social stratification. About one-third of KMC residents lived in officially recognized slums in 2011. These slums are remarkably heterogeneous (sharing space with informal enterprises and middle-income households), but most have minimal infrastructure. For context, Kundu (2003) reports that over 13 million "hutments" (shanties) house Kolkata's urban poor, often lacking either legal tenure or basic facilities.

In terms of services, informal settlements in Kolkata often suffer serious deficits. Many rely on communal water taps and latrines; only a fraction of households have in-home piped water or flush toilets. Electricity supply can be intermittent, and narrow lanes make emergency services

(like ambulances) slow to reach interiors. Healthcare access varies: while Kolkata has renowned hospitals, marginalized communities may be hesitant or unable to use them due to cost or social exclusion. Education and social insurance coverage are also limited among the poor. Such conditions formed a **vulnerability baseline** even before the pandemic. As one journalist notes, slum families wake before dawn to fetch water from public taps and work informal jobs, facing persistent hunger and overcrowding.

COVID-19 in Kolkata

When COVID-19 arrived in early 2020, Kolkata's vulnerabilities quickly manifested. By mid-2020, some of the city's highest infection rates were reported in densely populated wards overlapping with low-income districts (Mirza Ghalib Street, Tangra, Burrabazar). Experts point out that it was not so much overall density but "living environment deprivation" that drove contagion clustering. For instance, Shin et al. (2020) note that Kolkata's infection clusters corresponded to areas of poor sanitation, irregular water supply, and cramped housing. Public health teams often struggled with contact tracing in tight-knit communities. While wealthier parts of Kolkata (with private gardens or multi-room apartments) could more easily isolate, the city's poor had little choice but to keep working, often in front-line roles as delivery workers, transporters, and street vendors.

The municipal response, guided partly by the Smart Cities Mission, combined technology and field enforcement. KMC activated its **Integrated Command and Control Centre (ICCC)**, as did all designated "smart cities" in India. The ICCC served as a centralized monitoring hub, tracking hotspots via GIS, coordinating ambulance dispatch, and broadcasting public advisories. In many cities, these war-room operations used mapping and predictive analysis to allocate resources. In Kolkata, the ICCC partnered with local health authorities to set up testing camps in containment zones. The city also enforced curfews and checkpoints in red zones, albeit unevenly due to staffing limits. Notably, while Kolkata had a digital platform (mostly for internal coordination), the general population used the national "Aarogya Setu" app for exposure notifications. However, as national data showed, only about 21% of Indians adopted the app – reflecting that digital tools reached only part of the populace. In Kolkata's slums, smartphone ownership and stable internet were low, so the app's benefit was limited. This digital divide meant many marginalized residents remained unaware of official guidance or assistance programs, exacerbating risk.

Public Space Challenges

Public spaces in Kolkata underwent dramatic changes under pandemic controls. **Parks and plazas:** Nearly all city parks (e.g. Maidan, Rabindra Sarobar, eco parks) were closed during 2020 and early 2021, to prevent gatherings. This deprived many residents of urban green space: research suggests such loss was detrimental to mental and physical health for city dwellers. In contrast, in wealthier countries parks were often reopened with distancing rules; in Kolkata, enforcement was stricter, reflecting the limited park area per capita. (One report noted Kolkata has only ~3 m² of green space per person, far below WHO norms.) The closure particularly hurt those without private yards. For many slum families, meager street spaces and cramped lanes were unsafe gathering points, so they suffered heightened stress.

Streets and markets: The city's famous market complexes and pedestrian streets (like New Market, College Street, Burrabazar) saw severe restrictions. Markets were shut intermittently, and foot traffic was controlled via odd-even scheduling or entry permits. Vendors lost income,

and some moved their businesses into residential areas or informal pop-ups, raising new congestion. Kolkata's narrow alleys, normally buzzing with commerce, became eerily silent or overcrowded depending on restrictions. Sidewalk dining and hawker pitches were banned, eliminating a layer of accessible public life. Even though the need for distancing was real, critics argue that the measures did not account for the **informal economy's realities**: without robust social safety nets, many labourers had to flout rules to survive. Protests by informal workers (rickshaw pullers, street vendors) occurred, echoing Gutierrez's observations that marginalized people often "resist leaving" public spaces they depend on.

Transportation and mobility: Public transit was severely curtailed; Kolkata's metro and bus services were shut or limited during lockdown peaks. This had a disproportionate impact on the poor, who rely on cheap mass transport. In response, some non-official solutions emerged. Shared auto-rickshaws (three-wheelers) ran informally at fixed routes, and community carpools sprang up. While not planned, these reflected adaptive grassroots mobility.

Adaptive uses of open space: As restrictions eased, the city experimented with reimagining outdoor areas. For example, select roads were closed to traffic on weekends to allow walking (a "Car Free Day" reinstated as a public health measure). An initiative by local NGOs converted a few vacant lots into temporary "junior parks" for children and elderly, with social distancing markers. In New Town (a planned satellite area of Kolkata), the Eco Park expansion added open-air seating and theaters (albeit post-2022) designed for safer gatherings. While Eco Park lies on the suburban fringe, it illustrates a trend: planners integrating **socially distanced seating and native planting** to blend safety with environmental goals.

Governance and Equity

Kolkata's pandemic response also revealed governance tensions. On one hand, the city's health administration made efforts to engage local stakeholders: community volunteers helped disseminate information door-to-door in slum pockets, and NGOs partnered in food distribution. On the other hand, decision-making largely remained top-down. The state government (West Bengal) and KMC directed lockdowns and public announcements, with relatively little formal input from residents. Urban experts note that Indian smart city policies have been critiqued for **technocratic bias** and weak citizen participation. The pandemic magnified this: for example, limited online consultation was held for adapting local markets or bus routes, excluding many without internet access.

Importantly, some pre-pandemic "smart" plans had envisaged improved inclusivity, but in practice marginalized groups often stayed on the periphery. Datta (2018) and others lament that India's Smart Cities Mission tended to prioritize technology and infrastructure over grassroots inclusion. During COVID, this played out in the digital divide discussed above. Despite having ICCC and apps, Kolkata's poorest residents largely remained outside the digital conversation. Efforts like SMS alerts in local languages reached more people, but lacked interactivity. Meanwhile, middle-class neighborhoods could sign up for online hospital queues or vaccination portals – options unreachable to many slum dwellers. Thus, while the city government boasted of its tech-driven tracking, it inadvertently risked deepening inequities.

Nonetheless, there were signs of community resilience. Informal mutual aid networks formed: in some wards, residents collectively patrolled to enforce mask-wearing and support quarantined families. Local "slum committees" liaised with health workers to ensure isolated individuals got water and groceries. These grassroots actions are examples of what Atuk and Craddock (2023)

term "self-organized, inclusive responses" to pandemics. Such bottom-up mobilizations suggest that governance needs to harness community leadership, not just technological surveillance, to build equitable resilience.

In summary, Kolkata's case shows how a Global South city confronted COVID-19: pre-existing infrastructural gaps and inequality dictated risk patterns; government interventions mixed high-tech monitoring with blunt restrictions; and public spaces were alternately closed, reclaimed, and redefined under duress. The next section draws on these observations, along with comparative insights, to outline how future urban design and governance can correct past oversights.

Comparative Perspectives from the Global South

Kolkata's experience, while unique in some respects, mirrors trends seen in other Global South cities. Drawing these parallels helps generalize lessons:

- **Digital and governance divide:** Similar to Kolkata, many Indian cities (Delhi, Pune) used ICCCs as "COVID war rooms," employing GIS and contact tracing apps. Yet, like in Kolkata, only some cities fully operationalized these systems. In Bhubaneswar and Jalandhar (smaller smart cities), lack of infrastructure meant they could not match bigger cities' digital response. The result was uneven management capacity across India. Outside India, cities like Nairobi or Lagos had no such smart center; instead, local chiefs and community health workers became first responders, highlighting the need for community-level governance where top-down tech is absent.
- **Park and open space adaptation:** In Latin America, many capitals (Bogotá, Mexico City, Buenos Aires) rapidly expanded bike lanes and pedestrian zones to reduce crowding on public transit. Bogotá famously opened hundreds of kilometers of "Ciclovía" for leisure. By contrast, few South Asian cities institutionalized such shifts. Kolkata's occasional car-free initiatives were a start, but more could be done. Notably, Kleinschroth et al.'s global review found that public parks saw **decreased** use in 77% of studies during lockdowns, especially under strict curfews typical in lower-income contexts. This suggests that in cities where outdoor gathering was heavily restricted (often places with limited park space), planners should invest in a **diversity of green infrastructure**: pocket parks, urban forests, and even converting vacant lots to "pop-up" green zones, not just large public parks. The pandemic "exacerbated disparities in green space access," meaning richer neighborhoods fared better. Thus, equitable planning requires spreading green space into underserved neighborhoods (a policy priority in many Latin American cities).
- **Public space function and inclusion:** Gutiérrez's Mexico City study illustrates a widespread issue: planners often design public spaces for normative uses (recreation, consumption) that exclude informal users. During COVID, Bogotá's street vendors were temporarily given permits to vend on newly pedestrianized plazas, recognizing their need to earn a living. In contrast, official closures of markets in Indian cities often left vendors in limbo. Future policy must explicitly **integrate informal economies** into public space design: for example, planning market zones with hygiene infrastructure (water, waste bins) and crisis plans to keep them operating safely, rather than shutting them wholesale.
- **Climate and outdoor strategy:** In hot, humid climates like Kolkata's, open-air design has special benefits. After SARS in Hong Kong, many new housing projects emphasized cross-ventilation and communal open areas. Likewise, post-COVID redesign could accelerate such architectural norms. Chongqing's study provides one model: researchers assessed parks on accessibility, safety, efficiency, and multifunctionality to gauge

resilience. They found that well-designed spaces could maintain usage during outbreaks if they were easily reachable and allowed distancing. Cities in the global south should adopt similar criteria: ensuring parks have wide entrances (to avoid bottlenecks), multiple smaller green nodes (so people are not crowded), and mixed-use paths (for exercise and socializing at distance).

- **Policy innovations:** Some governments adopted creative policies. During lockdowns, Singapore (not Global South but of similar population density) allowed households to schedule park visits by app. Mumbai set up temporary toilets and hand-washing stations in slums. In Indonesia, bicycle ownership surged as a response to transit cuts. The broader point is that fiscal and regulatory flexibility can generate solutions: slum upgrading should include sanitation infrastructure that doubles for handwashing; street design should allow simultaneous mobility and commerce (e.g. shared space zones); and digital inclusion efforts should train and equip local youth to support neighbors' tech needs (as seen in Nairobi's community networks).

These examples reinforce the principle that **resilient public space and governance is context-specific** but guided by equity. What works in Bogotá (like mass bike networks) may only be partly transferable, but the underlying aim – to reduce transmission while maintaining access – is shared. For Kolkata and similar cities, a multi-pronged approach is needed: expand green cover (beyond formal parks), adapt streets for flexible use, and embed social needs into planning.

Governing and Designing for Equity and Resilience

Drawing together theory and evidence, we suggest several intertwined strategies for post-pandemic urban transitions:

- **Emphasize proximity and multi-functionality.** Build on the 15-minute city ethos, but tailor it to local realities. In practice this means planning neighborhoods where basic services (shops, clinics, schools) are within walking distance of all residents. For Kolkata, this calls for upgrading slum neighborhoods with local clinics and markets, rather than concentrating amenities in distant commercial centers. Urban design should promote *active street frontages* – e.g. wide sidewalks, covered walkways, ground-floor stalls – that allow informal economies and social interaction at a human scale. At the same time, floors or uses should be mixed (residential above retail, etc.) to foster safety through eyes-on-the-street. Proximity also reduces transit dependence: if people live and work nearby, transport systems face less crowding. As **Barnwal and Bakarr (2024)** note, Transit-Oriented Development and 15-minute concepts can "build stronger communities" post-COVID.
- **Design parks and open spaces inclusively.** Upgrade existing parks and create new "pocket" parks in underserved areas, with attention to diverse users. Facilities should include not just green lawns but also shade (important in Kolkata's climate), seating for elders, and play spaces for children, allowing multiple generations to use them safely. Drawing on Chongqing's resilience framework, we should evaluate spaces by *accessibility* (can vulnerable groups easily reach it?), *safety* (are shade and hygiene ensured?), *efficiency* (can it accommodate distancing?), and *multi-functionality* (can it serve recreation, assembly, and even emergency needs, e.g. vaccination drive sites?). For instance, Kolkata's sprawling Maidan can host large distanced gatherings, but smaller neighborhood parks must be improved to do the same. The **Nature Cities** review warns that reliance only on large parks widens inequality, so investments should also go into

linear greenways, riverfront promenades, and informal street greening (planting street trees, vertical gardens) especially in low-income wards.

- **Promote multi-modal, low-carbon mobility.** Reduce reliance on crowded buses or metros by expanding cycling and walking infrastructure. The pandemic experience shows that people turn to cycling when space is made available. Cities like Bogotá and Pune demonstrated the appeal of quick-build bike lanes during COVID. Kolkata and other South Asian cities should replicate this: convert some kerb lanes into cycle tracks, pilot "bus arteries" for high-capacity clean vehicles, and ensure safe pedestrian corridors (e.g. shaded, raised crosswalks). Pedestrianization of market streets or selective road closures (as tested) should continue. These measures not only ease pandemic concerns (outdoor travel) but also advance sustainability. Importantly, transport design must consider equity: public bicycle-sharing should have subsidized memberships for the poor, and walking routes should connect informal settlements, not just elite enclaves.
- **Strengthen local governance and participation.** The top-down pandemic response in many Global South cities showed the limits of centralized planning. Future governance should integrate **community-led initiatives**. For example, Kolkata could institutionalize slum committees as official partners in urban projects (much like Kolkata's Municipal Act once foresaw ward committees). Participatory budgeting and co-design workshops can ensure that street redesigns or park plans reflect the needs of vendors, elderly, women, and people with disabilities. Digital tools (apps, online platforms) should augment – not replace – grassroots input. The "right to the city" framework (with digital extensions) reminds us to protect public spaces from privatization and ensure open access. In practical terms, policies like "Placemaking Marathons" (as in India's Smart Cities) or hackathons can involve residents in turning empty plots into functional parks or reimagining market layouts.
- **Integrate public health in urban planning.** COVID-19 underscores that health is an urban design issue. Planning codes should require adequate ventilation and daylight in buildings (echoing early 20th-century reforms) and incorporate pandemic mitigation (e.g. spaces for emergency triage). Cities might designate certain public zones for flexible use in crises (e.g. converting plazas into vaccination centers or quarantine facilities). Such planning requires coordination between health departments and urban planners, an inter-sectoral "health in all policies" approach. Additionally, slum upgrading must explicitly address WASH (water, sanitation, hygiene) infrastructure. Shared community toilets and pumps should be modernized with touchless fixtures and routines for disinfection, so that in future outbreaks basic hygiene can be maintained.
- **Address the digital divide.** The reliance on apps and online services during the pandemic left many behind. To prevent this in future crises, cities should expand affordable internet access and digital literacy. Public programs could distribute simple phones or data vouchers to the poorest households, enabling them to receive alerts and book services. City websites and helplines must operate in local languages and formats accessible to migrants or the illiterate. Crucially, offline outreach (e.g. community radio, wall posters) should complement digital measures, as evidenced by the failure of solely app-based contact tracing in low-income areas. A key lesson is that **"e-governance" must be universal governance**.
- **Promote sustainability alongside equity.** The environmental 'pause' of lockdowns showed what is possible: cleaner air, quieter streets. Recovery should not sacrifice these gains. For example, fossil-fuel idle zones (like car-free Sundays) could become permanent. Water-sensitive design (rain gardens, permeable pavements) and urban agriculture (community gardens) can boost food and water resilience in slums. In Kolkata,

where monsoon flooding is a hazard, restoring wetlands and green drainage systems should be prioritized.

By weaving these strategies together, planners can move beyond quick fixes to embed pandemic-robustness in the urban fabric. The South Asian urbanist Iveson (2019) observes that the ethical goal of planning is "the right to difference and diversity" in cities; our analysis suggests the pandemic urges concretization of this ethic via resilient, inclusive public spaces.

Policy Recommendations for Equitable Resilient Cities

Based on the above analysis, we propose the following policy insights applicable to Kolkata and similar Global South cities:

1. **Decentralize Urban Services (15-Minute Access):** Rezone neighborhoods to mix housing, shops, clinics, schools, and recreational spaces. Prioritize upgrading service access in informal settlements so that everyone can reach essential facilities on foot or bike.
2. **Equitable Public Space Development:** Invest in a network of green/open spaces in low-income areas – pocket parks, street gardens, community plazas – ensuring at least the **WHO's 9 m²** per capita goal city-wide. Include amenities (toilets, hand-washing stations, benches, play equipment) with universal design (ramps, shade, signage in local languages). Use Kohler's resilient-design criteria (accessibility, safety, etc.) to evaluate projects. Engage local communities in planning these spaces via participatory design charrettes.
3. **Flexible Street Design:** Institutionalize "Open Streets" programs and permanent cycle networks. Reconfigure key roads to multi-modal shared spaces, with priority for non-motorized transport. For example, convert select lanes on arterial roads into bus/bike corridors, and widen sidewalks in commercial zones with vendor-friendly layouts. Provide financing or subsidies for local entrepreneurs (e.g. street food carts) to use redesigned spaces under health guidelines.
4. **Strengthen Local Governance Structures:** Formally incorporate community groups (slum residents' associations, market committees) into city planning bodies. Implement ward-level health and urban action plans co-created with residents. Use mobile outreach teams to bring city services to doorstep (e.g. telemedicine vans in dense neighborhoods) instead of relying solely on apps.
5. **Digital Inclusion Initiatives:** Expand internet kiosks and affordable Wi-Fi in public libraries and community centers. Launch training programs to teach digital skills (using civic tech for public health, e-commerce for vendors). When deploying technology (contact apps, telehealth), ensure offline alternatives exist – for example, a phone hotline and community radio broadcasts.
6. **Sustainable Infrastructure Upgrades:** Fast-track slum sanitation projects (safe water, drainage) as climate/pandemic dual resilience measures. In street and building design, prioritize natural ventilation (cross-ventilated housing blocks) and daylight to mitigate disease spread. Pursue urban forestry campaigns to improve air quality and mental health, particularly near hospitals and schools.
7. **Data-Driven Equity Planning:** Collect and monitor data on park usage, mobility patterns, and health outcomes disaggregated by income and neighborhood. Use this to target interventions (e.g. which slum lacks park access? where to open a clinic?). Implement a public dashboard for transparency, enabling civil society to hold authorities accountable for equitable service delivery.

8. **Emergency Preparedness Coordination:** Maintain updated pandemic response plans that include non-medical measures (e.g. how to manage markets, schools, transit during outbreaks). Regularly simulate scenarios with local officials and community leaders. Stock emergency kits (food, masks) for vulnerable populations ahead of crises.

These recommendations emphasize **process as much as outcome**: policies must be implemented in participatory, inclusive ways. For example, redesigning a market should involve vendors and customers, not just architects. Digital strategies should be accompanied by trust-building campaigns. Importantly, these actions should not wait for the next emergency; many are improvements on chronic gaps. By embedding pandemic lessons into routine planning, cities like Kolkata can progressively evolve into more just and resilient forms.

Conclusion

The COVID-19 pandemic was a stark reminder that **urban design and governance are public health issues**. It revealed that the traditional city, as we built it, was not optimized for emerging crises: public spaces were unevenly distributed, planning often neglected the poor, and governance sometimes prioritized control over inclusiveness. However, crises also spur creativity. Around the globe, planners and communities improvised – from pop-up cycle lanes to mutual aid networks – pointing the way toward new paradigms.

Our analysis shows that in Kolkata and similar contexts, tackling these lessons requires a **holistic, equity-centered approach**. Pandemic vulnerabilities in Kolkata were rooted in deprivation, not destiny. The path forward lies in redressing these structural issues: improving slum conditions, democratizing space, and ensuring no one is digitally or physically excluded. Crucially, the city must not revert to business-as-usual. As Sharifi and Khavarian-Garmsir (2020) suggest, urban planners now face "an excellent opportunity" to reimagine cities with justice and sustainability at the core.

In terms of public space specifically, "resilient design" does not mean fortress-like measures, but rather **adaptable, inclusive places** that serve communities in both normal and emergency times. For instance, a plaza with modular seating can host a festival or accommodate lines for testing. A street expanded for bicycles today can become a site for food stalls tomorrow. This flexibility, coupled with community stewardship, can make public space truly resilient.

Equitable governance must underpin these designs. Planners and politicians should regard citizens – including the poorest – as partners rather than passive beneficiaries. The pandemic has exemplified how overlooking any group leaves us all vulnerable. As the Cambridge chapter notes, we are at a moment to "revisit what constitutes public space" and negotiate its production anew. For Kolkata, this could mean formalizing community use of small squares, protecting common corridors in redevelopment, and codifying the right to street vending.

Finally, global collaboration and learning are essential. Innovations in one city (e.g. Bogotá's cycleways, South African township co-design projects) can inspire another, provided they are adapted to local culture and needs. Research must continue to track how public spaces are used post-COVID, so policies remain grounded in evidence.

In conclusion, the pandemic has indeed "inspired and informed new approaches" to city-making. The question now is whether those lessons translate into action. By centering accessibility, sustainability, and social needs in urban transitions, cities like Kolkata can honor the spirit of

inclusive governance and create healthier, more resilient futures. The goal is a city where diverse populations share safe, vibrant public spaces – in effect, "a healthy city" in the fullest sense of Sennett's vision.

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