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Preparing for the Next Covid-19 Wave: Lessons for Delhi

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Introduction

During the peak of the second wave of Covid-19 in India between April and May this year, Delhi—which was by then in the midst of its fourth wave—was among the worst affected states in the country. Delhi was reporting 28,000 cases a day at the time—among the highest numbers in the world. The images resembled scenes from a war zone: the streets filled with ambulances as hospitals turned patients away, people gasped for oxygen in their car or an auto rickshaw, essential medical supplies were hoarded, and funeral pyres burned day and night.

Indeed, Delhi was among the states that recorded the highest numbers of reported deaths in the country. While *all* deaths reported per 100,000 population in 2019—the latest year for which such data is available—was 487, the reported numbers from Covid-19 alone in 2020 and 2021 put together accounted for 134 per 100,000.[1] Even taking only these reported deaths into account, Covid-19 has been a significant cause of death in these two years.

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Serosurveys conducted by the Delhi government as well as other agencies including the World Health Organization (WHO) have found very high levels of antibody presence among Delhi's population. The latest survey by the Government of Delhi started collecting samples for its seventh round of serosurvey in September 2021.[2] A sixth seroprevalence survey conducted during the April-May 2021 wave in Delhi found that 74.7 percent of the total Delhi population had been exposed to the virus.[3] While part of this would have been vaccine-induced antibodies, the proportion demonstrates the breadth of the pandemic during the last wave. That period revealed how Delhi, despite a relatively advanced health infrastructure compared to other states, was ill-prepared to handle the crisis. A survey of citizens in 17 states by a community social media platform in June 2021 ranked Delhi as the worst performing state in handling the second wave.[4]

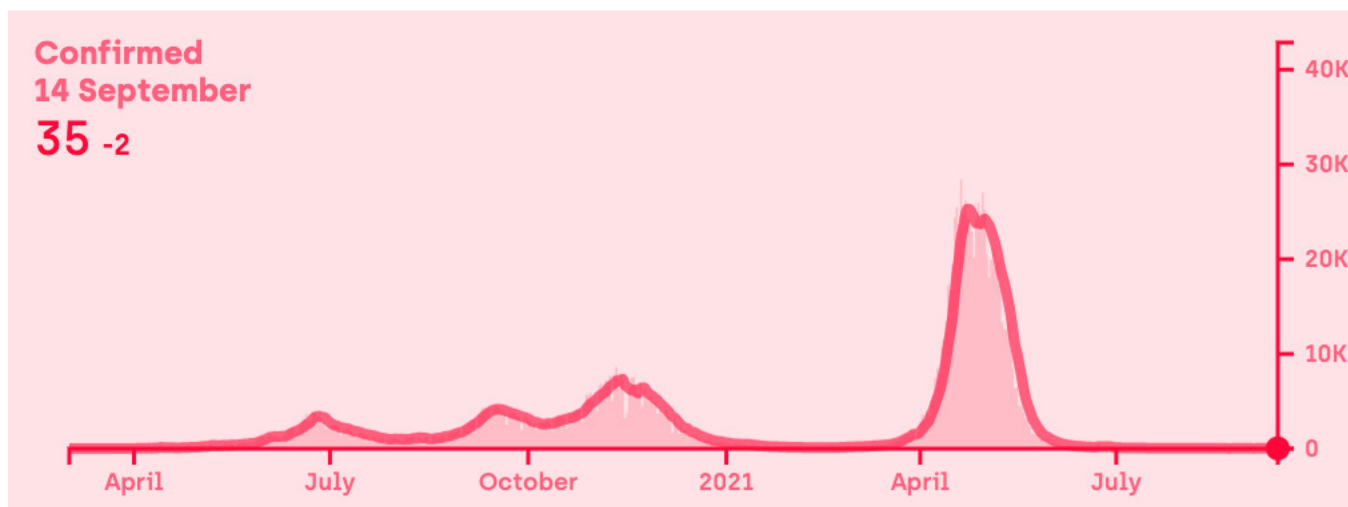
More than 9.3 percent of Delhi's population are above the age of 60—although lower than India's average of 10.1 percent, the absolute numbers are significant. Latest available government statistics indicate that comparing the population figures from the Census 2011 and projected numbers for 2021, the annual percentage growth rate of Delhi's elderly population is the highest among all Indian states.[5]

'Burden of Disease' estimates also indicate that Delhi has a significant load of non-communicable diseases: 13 cases of Diabetes and Kidney Diseases; three cases of Cancers; 33 cases of Respiratory Infections & TB; and five cases of Cardiovascular Diseases per 100 population.[6] These conditions are more prevalent among the elderly populations, and amplify their risks of Covid-19. A Delhi-based hospital study to assess the characteristics of Covid-19 cases in wave 1 (August to October 2020) and wave 2 (April to May 2021) found higher severity and mortality during the second wave for even younger patients under 45 years. This can be attributed to the Delta variant (B.1.617.2) which spread rapidly in the second wave.[7,8]

Between January 2020 and September 2021, Delhi has had four daily case peaks, each higher than the previous one (see Figure 1). The first three waves peaked with 3400, 4174, and 7341 cases, respectively; the most devastating fourth wave peaked with a high of 25294 cases (7 day average) and 398 deaths.

It is expected that high seroprevalence and high current rates of vaccination will help reduce the impact of a possible next wave. Delhi happens to have one of the highest vaccine doses administered per 1000 population amongst all Indian states and union territories.

Figure 1: Covid-19 Waves in Delhi



Source: https://www.covid19india.org/

This report builds from the insights shared in an ORF consultation with experts to determine what led to the crisis earlier this year and how Delhi's preparedness for another possible wave of Covid-19 can be improved. Questions were posed to 26 experts and practitioners from Delhi.[9] The purpose of the consultation was to gauge the distinct causes that led to the unprecedented impact of the last wave and to understand how it could have been handled differently, drawing lessons for the next wave.

The form posed questions on the state of health infrastructure, specific to human resources, bed allocation, oxygen crunch, medicine supplies and equipment; testing; vaccination drive; and public health communication in Delhi. To bridge any information gaps, the report also uses secondary data gathered from government sources, academic studies, and reporting in the media.

> “High seroprevalence and currently significant rates of vaccination could help reduce the impact of a possible next wave.”

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The Role of 'Conflictual Federalism'

Delhi has historically been caught in power struggles between the central and state governments—a phenomenon that analysts refer to as "conflictual federalism".[10] During the Covid-19 second wave, most of the experts who contributed to this report aver, Delhi became a victim once again of its own politics. "Constant tussle between the two different governments is affecting supply of healthcare services in Delhi," observed Rajeev Ahuja, development economist. Indeed, of much of the world's capitals, Delhi would arguably have the most complex governing structure. To begin with, it has a multiplicity of overlapping sub-national jurisdictions, including the Delhi government, New Delhi Municipal Council, multiple Municipal Corporations of Delhi and Cantonment Board—each of them supervised by a different agency or government.

The healthcare delivery system itself is more diverse than those of other cities, with Primary Urban Health Centers (PUHCs) existing under the National Urban Health Mission, along with Dispensaries, Mohalla Clinics, Polyclinics, Mobile Health Clinics, School Health Scheme Clinics, Homeopathic, Ayurvedic and Unani Dispensaries working under the Delhi government. Many other dispensaries and Maternal & Child Welfare Centres are operated by Municipal Corporations, Delhi Jal Board and Delhi Transport Corporation, Employees' State Insurance Corporation, and Central Government Health Scheme. In addition, power companies like BSES Rajdhani and Tata Power Delhi Distribution Limited (TPDDL), the Indian Railways, Reserve Bank of India, and even the State Bank of India, run healthcare delivery institutions in Delhi. The state government runs 39 hospitals in Delhi, and the MCD has six. Moreover, there are Central Government hospitals like AIIMS, Safdarjung Hospital, Lady Harding, RML hospital, and Patel Chest Hospital.[11]

As epidemiologist and public health specialist, Chandrakant Lahariya, pointed out, there is a "lack of clear demarcation of responsibilities amongst various agencies." There is no platform for bringing together these technical, political, and bureaucratic and governance institutions for crisis management in a situation like the one witnessed by the state in April.

Current health infrastructure and crisis management

Delhi's medical infrastructure is administratively divided across its 11 districts and 12 Municipal Corporation zones, each headed by, respectively, one Chief District Medical Officer (11 CDMOs in all) and 12 Chief Administrative Medical Officers (12 CAMOs).[12] There are 38 State hospitals in Delhi, seven MCD hospitals, 258 state dispensaries, and 92 MCD dispensaries, four New Delhi Municipal Council dispensaries, and 10 chest clinics.[13] Against a target of 750, the government has also set up 496 Mohalla Clinics, providing primary care.[14]

To be sure, Delhi has historically had a relatively better public healthcare infrastructure, primarily due to the many large tertiary hospitals, besides a thriving private sector. This is reflected in statistics on healthcare utilisation. A household survey in 2019 found that of all Delhi households, 41 percent accessed private healthcare, 12 percent, both government and private services, and 47 percent, government facilities.[15]

Among all Indian states and UTs, government expenditure on health as a ratio of aggregate government expenditure is the highest in Delhi. In the last decade, under the AAP government, this ratio had gone up substantially (see Figure 2). It seems, however, to have had only a limited impact on the household health expenditure. A 2019 survey found that on average, Delhi residents spent 9.8 percent of their annual household income on healthcare.[16]

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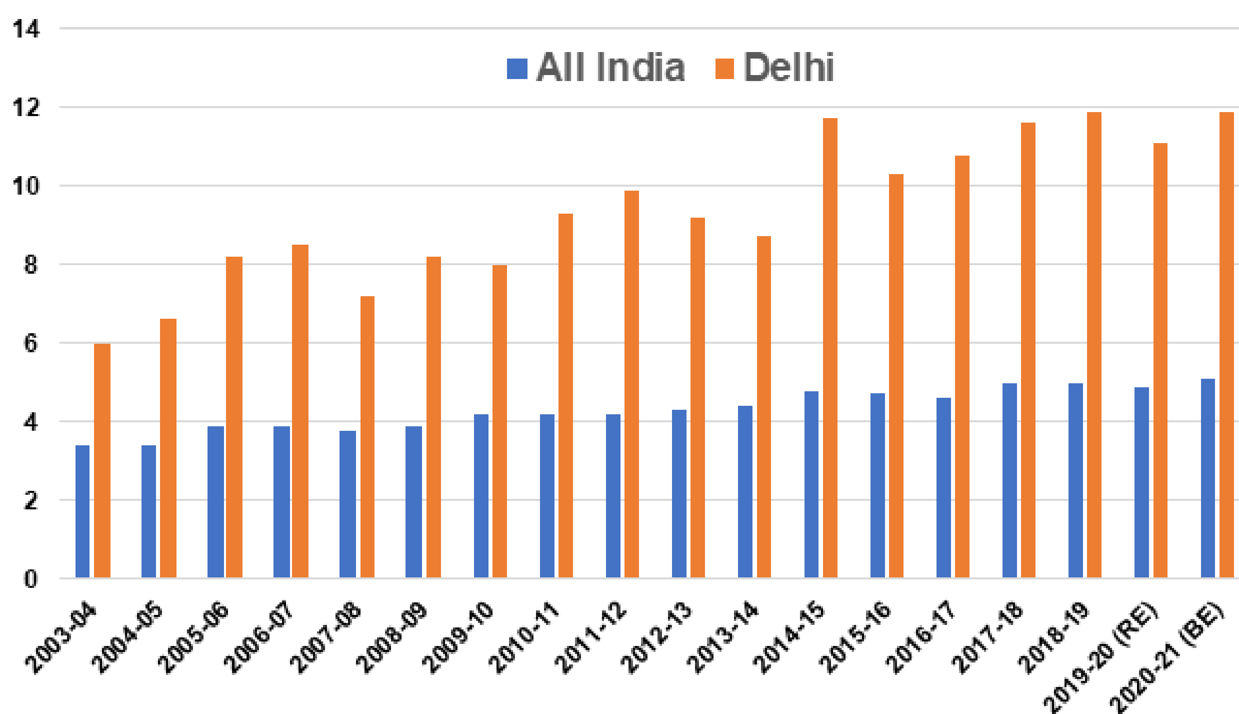
Figure 2:
Expenditure on Medical and Public Health and Family Welfare as Ratio to Aggregate Expenditure (%)



Source: State Finances: A Study of Budgets, by the Reserve Bank of India[17] *(2020, October)*

Delhi's Cascading Challenges

Medical Personnel

Despite having relatively better physical infrastructure in place, Delhi's healthcare systems—both under the state government and Municipal Corporations—have been reeling under severe staff shortages. A study in January 2020 had found that across the Municipal Corporation of Delhi (MCD) dispensaries and hospitals, there was a 21-percent shortage of medical staff and 50-percent gap in para-medical staff.[18]

The gap in State government dispensaries and hospitals was at 34 percent for medical staff, and 29 percent for paramedical personnel. As Lahariya observed, "It is time for the state government to learn lessons for filling vacancies and strengthening PHC services beyond curative services in Mohalla Clinics."

Allocation of Beds

During the massive wave in April and May 2021, patients scrambled for beds in private and public hospitals as Covid-19 cases surged.[19] Delhi was reporting over 20,000 cases daily during that period. With hospitals overwhelmed, patients were taken to nearby cities. Citizens turned to social media with pleas for beds, oxygen, and other medical supplies. As cases surged in Delhi, hospitals ran out of ICU beds with ventilators, which are extremely crucial for patients with severe disease.[20]

"There should have been proper monitoring of bed availability and arrangements for public information by displaying the number of beds available. A functioning information centre which was public friendly was required," noted Sheila Vir, Director at the Public Health Nutrition and Development Centre.

Oxygen Shortage

Studies have shown that during waves, there were instances of private hospitals in Delhi withdrawing services or charging exorbitant prices from patients, a situation exacerbated by the chronic oxygen shortages.[21,22] An interim report prepared by a Supreme Court-appointed audit team has found this phenomenon between April 25 and May 10 when the second wave of the Covid-19 was at its peak.[23] According to the report, the exaggerated demand by Delhi could have affected Oxygen supply to 12 states where the COVID-19 caseload was high. An ORF report in June found that as case numbers dropped, the inter-state conflicts over oxygen supply were slowly resolved.[24]

"Foreseeing the oxygen needs in time and doing the necessary preparation and advocacy for the same before the crisis, including legal measures, would have helped. But this required a pre-estimation of the size of the problem and mitigation arrangements such as conversion of industrial supplies in a systematic manner. Proper measures could have been made to curb black markets as well," noted Raman VR, Convenor, Public Health Resource Network and Head of Policy at WaterAid India.

Medicine Supplies and Equipment

During all four waves, in particular the devastating fourth one, Delhi had critical shortages in medicines, in parallel to the oxygen crunch.[25] People were seen hoarding medicines along with oxygen cylinders, partly driven by the bed shortage in hospitals, creating parallel structures in fear that the healthcare delivery system will fail them. Several incidents of fraud and black-marketing were reported.

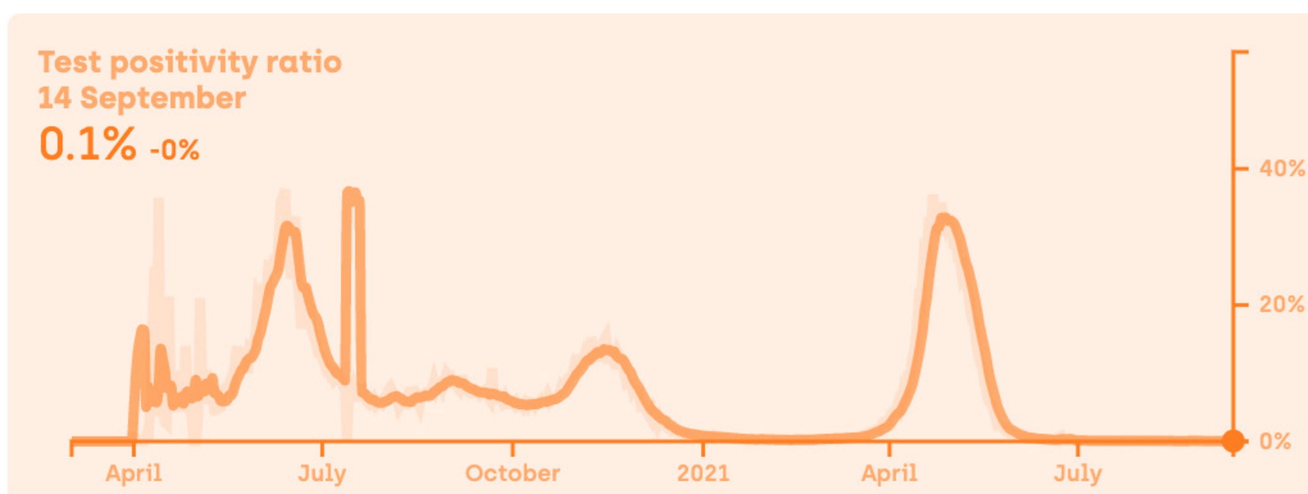
The Delhi government plans to ramp up medical oxygen supplies and transport, hiring health care workers, opening up makeshift centres, and adding infrastructure in the hospitals.[26] The Delhi High Court has condemned political parties and leaders for stocking medicines used for treating Covid-19 patients amid shortage.[27] In another quick move, the Delhi Police has swiftly released medical supplies seized in raids to hospitals.[28]

Testing

Delhi has been more aggressive than the rest of the country, on average, in tracing contacts and testing suspected cases. As of 14 September, almost 27 million tests have been conducted in Delhi. The test positivity rate has been kept under control for most of 2021, other than the April-May peak (see Figure 3).

During that peak, competing requirements had kept testing levels lesser than optimal, in some areas, according to experts. "They should have mobilised more human resources. Schools and colleges could have been converted to testing centers," observed Prof Geeta Trilok-Kumar, Director, Institute of Home Economics at the Delhi University.

Figure 3:
Test Positivity Ratio in Delhi



Source: https://www.covid19india.org/

Vaccination Drive

Amidst all of Delhi's COVID-19 challenges, the silver lining is in the pace of vaccination, especially since August. More than 65 percent of Delhi's population have received at least one dose of a Covid-19 vaccine, and almost one-third have been fully vaccinated. During April and May when the pandemic was raging, the proportion of those covered was very low.

"Going forward, at least one dose of vaccine coverage to most 45+/high risk individuals will reduce burden on hospitals as high previous infection plus one dose of vaccine equals two dose protection," said Anupam Kumar Singh, Consultant Physician at Arogya Hospital.

Public Health Communication

There was no clear and effective communication policy in place which led to a worsening of the crisis. Now, the government has devised a communication strategy. Recent research has called the Delhi government's Covid-19 approach as a "multi-level response" to the crises, taking steps to ensure that communication is integral to their response efforts.[29] Researchers have concluded that the establishment of specific communication channels via websites and social media platforms ensures that there is consistency and information symmetry across various levels of government. However, the focus on digital media may be resulting in the older and poorer populations missing out on the messaging.

"There could have been a platform for all stakeholders to come together, a dashboard where real time data could have been collected with rigour, with quality in time and then proper data-based decision making should have happened. The city could have been broken up into specific areas with clear micro plans and localised efforts should have been finalised," said Rajiv Tandon, Director for Health at RTI International, of the situation during the April-May peak.

"Earlier, there was no clear and effective communication strategy in place, which led to a worsening of the crisis."

Overall Recommendations

Delhi's complex governance structure is often set up for failure during episodes of health crises; the recurring Dengue outbreaks have shown such a pattern in the past. Until the current governance systems are reimagined, the capital will remain vulnerable. Delhi needs better and proportionate planning, and to put in place arrangements for forecasting, procuring, planning, distribution and monitoring of supply chains. Multiple health service facilities are underutilised because either the centres fail to adopt a patient-centric approach or they are ill-equipped; these issues require immediate rectification.

Installing a system of gatekeeping has become pertinent as advised by National Health Policy 2017, otherwise the secondary and tertiary health service centres will be overcrowded. The need for convergence and integration amongst, among others, UPHCs and ANMs, Anganwadi workers, and Swasthya Sevikas, is key. Rationalising administrative boundaries and community structures, including innovative models of mobile health units is a way forward that would lead to effective and timely referrals and follow-ups. The idea of incentivising the private sector to provide primary healthcare is also suggested, as a large percentage of urban population prefers private health facilities over public—this also makes it imperative to regulate the private health sector.

> Key to getting Delhi prepared for another Covid-19 wave, is reimagining its governance systems.

There is political consensus on the need for investments to respond to challenges regarding high costs of medicines and diagnostics. However, there is still a lot of potential in partnerships between the private sector and Delhi's Municipal Corporations responding to the demand side of healthcare seeking to transform patient behaviour more proactively, thereby optimising public health goals. This can be strengthened by creating robust referral networks involving both public and private sectors, where such need exists. NGOs, too, can play a bigger role as stakeholders facilitating community-provider-policymaker interfaces.

Cooperation between different stakeholders and institutions is required for Delhi to achieve the health Sustainable Development Goal (SDG 3) — not just to make the best use of finite resources, but also to capitalise on synergies and ensure policy coherence to achieve systemic change. Acknowledging health as a central component of urban planning and governance will help translate the vision of sustainable urban development for all into ground-level action.

1. Delhi must prepare a typology of different health governance structures operational to map the convergence of different actors in order to maximise public health outcomes. By this measure, there will also be integration of the UPHC and ANMs and other community workers such as the Anganwadi workers and Swasthya Sewikas, that would encourage effective monitoring and surveillance.

2. Delhi must leverage the opportunity offered by the Ayushman Bharat initiative to address gaps and duplication in comprehensive primary healthcare facilities in urban areas. If healthcare is shifted from state list to the concurrent list, it can potentially promote greater optimisation of the system and can rectify the pressure created by the inverted pyramid of care, whereby people skip primary care facilities to go to the advanced ones, even for routine ailments.

3. Delhi must pilot a referral network involving public and private hospitals in cities using Mohalla Clinics and PMJAY as a starting point. It is essential to provide urban health and wellness centres with a medical officer functioning as gatekeeper. There is also a need to rectify the approach in which the current UPHCs function and greater attention needs to be paid in adopting a patient-centric approach.

4. The Union government must streamline financial flows and avoid delays in transfer of National Health Mission fund allocations. At present, the Central financial flows often act as a bottleneck in the health system, which needs to find ways to effectively absorb the money being allocated. The interface between state health departments and urban local bodies, and the gap between supply and demand of healthcare provisions, need to be rectified. More optimal approaches to cater to specific urban needs should be implemented. This can be achieved by streamlining the financial flow, and awarding ULBs with more financial flexibility in order to avoid delays in transfer of NHM fund allocation.

5. Delhi must utilise the vast network of PMJAY hospitals, Mohalla Clinics and HWCs to improve existing surveillance and early warning systems. Moreover, introducing innovative models of mobile health units and round-the-clock health posts is advised, as it would allow timely referrals and follow-ups, and contribute towards rationalising administrative boundaries and community structures. Partnerships between municipalities and private actors too, can be optimised in this context.

6. Agile communication and coordination mechanisms are required in the urban health systems. There are inefficiencies in the existing 3-tier system due to the pressure that has been created by the 'inverted pyramid' type of demand on the existing health institutions. The need is for rationalised system optimised for access and quality which facilitates and incentivises two-way information flows. Effective monitoring, surveillance and accountability can only be held up through a more direct, streamlined flow of governance that promotes social audits and strengthens the role of NGOs and communities.

Recommendations for Covid-19 Preparedness

1. All health facilities, public and private, should remain operational and provide services to both Covid-19 and non-Covid-19 patients. The establishment of more Covid-19 hospitals that will tap public-private initiatives and CSR funds should be explored.

2. Early conversion of existing hospitals to Covid-19 hospitals if there is a next wave and increasing the proportion of oxygenated beds including HDU (high dependency units) and ICU beds in Covid-19 hospitals can help meet the high demand.

3. Delhi should create a centralised pool of health personnel for proper triage and management. Tele-consultation needs to be prioritised and only emergency cases are to be treated in hospitals. The state should ensure phased deployment of personnel to counter workforce fatigue and protect them from psychosocial stress by offering counselling sessions. Government hospitals should recruit more medical staff, to overcome vacancy gaps. The state can involve medical students, nursing students, paramedical staff, and trained volunteers, and re-employ retired paramedical staff as well as ex-service personnel. It can consider hiring temporary healthcare personnel from nearby states.

4. Delhi should have real-time, reliable information on zone-wise availability of beds. Functional helpline numbers and mobile-phone apps could play a role in efficient allocation of beds. Better preparedness through collaboration with different stakeholders—civil society organisations, the private sector, faith-based organisations, schools, universities and others—could help enhance bed capacity and facilitate more efficient ways of allocating them.

5. Delhi must have proper forecasting, procuring, planning, distribution and monitoring mechanisms in place. Rationing of oxygen supply and oxygen audit to ascertain actual requirement is needed. Setting up a robust delivery network of tankers for transportation of liquid oxygen from point of manufacturing to hospitals is a priority. A PPP system for scaling up oxygen delivery system, storage and access to medical oxygen in health facilities can be explored.

6. Medicines should be provided 24x7 through government-run shops, on prescription. Police raids are needed to check black-marketing and hoarding of medicines. There should be better coordination with hospitals to assess demand and ramp up of production and imports to meet such demand. A treatment protocol must be set, and all medical and paramedical professionals in both government and private sectors informed through social media platforms.

7. The government should expand the availability of trained laboratory staff for analyses; during the past peaks, such shortages led to delays in results. Home-testing needs to be ramped up, along with more mobile testing services. Testing camps can be organised with neighbourhood associations. Random testing in public spaces and commercial hubs can be put in place. Testing amongst the urban poor and homeless need to be improved, focusing on specific categories such as ambulant vendors. Enforcing testing and quarantine of passengers arriving from other countries, along with stricter adherence to travel guidelines issued by government, is necessary.

8. Delhi should work on offline mobile vaccination vans for last-mile connectivity with a focus on low-coverage pockets. Existing *anganwadi* centers can be converted to temporary vaccination centres. Greater involvement of community leaders, religious clergy, neighbourhood groups and other stakeholders can facilitate expansive messaging. Just before the April-May wave, it was reported that Delhi was one of the worst performers in the country in terms of vaccine wastage. Health personnel must be given trainings in monitoring and minimising wastage. Mohalla clinics can collaborate and learn from the CGHS facilities for streamlining vaccination. More focus to vaccinate the poorest and most marginalised groups is needed.

9. Strengthen public health communication on preventive behaviours, screening, testing, management, vaccines, and on busting vaccination and drug-related myths.

10. Staggered opening of market places, government and private offices, should be considered, while continuing work-from-home mode to some extent. Strict monitoring and rules for not following Covid-19 protocol in public places with mandated double-masking and physical distancing need to be implemented.

11. Shahid Jameel, Director of Trivedi School of Biosciences at Ashoka University, warns against complacency. "Though a large fraction of the population, possibly >67% would be seropositive and about 42% have received one dose of vaccine (at the point of response), testing should continue. Breakthrough cases should be characterised to track emerging variants. The bottom line is that Delhi's population density can lead to the surge of a more infectious vaccine escape variant much faster than most places in India."

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Annexure

Participants in ORF's Consultation

Rumi Aijaz	Senior Fellow, ORF
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Raman VR	Convenor, Public Health Resource Network and Head of Policy at WaterAid India.
Shahid Jameel	Director, Trivedi School of Biosciences, Ashoka University

Endnotes

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