

# BUILDING RESILIENCE AND COPING MECHANISM FOR PANDEMICS

A study on local governments' response  
to Covid-19 and roadmap for resilient future





# *Building resilience and coping mechanism for Pandemics*

*A study on local government's response to Covid-19 and roadmap for resilient future*

*Published By*

United Cities and Local Governments Asia Pacific (UCLG ASPAC)  
Belt and Road Local Cooperation

©2021 UCLG ASPAC – BRLC

The Report has used official data released by central, regional and local governments, and additional information gathered by the UCLG ASPAC research team from other reliable sources. It is important to acknowledge that data varies according to definition and sources. The reports tries to highlights the initiatives taken by the local governments especially by the countries implementing projects of the Belt and Road Initiative. The report also brings and shares the experience on COVID-19's responses, challenges and strategies from different regions and nations of the world for building more robust pandemic management system at local level and make local governments pandemic-proof.

All rights reserved.

No part of this publication may be reprinted or reproduced or utilized in any form or by any electronic, mechanical or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Published By

United Cities and Local Governments Asia Pacific  
Jakarta's City Hall Complex, Building H, 21th Floor Jl. Medan Merdeka Selatan no 8-9  
Jakarta, Indonesia

Web: <https://uclg-aspac.org/brlc/>, Email: [secretariat@uclg-aspac.org](mailto:secretariat@uclg-aspac.org)

Secretariat of UCLG-ASPAC Committee on the Belt and Road Local Cooperation  
Floor 18, Building C, Civic Center, 18 East Jiefang Road, Jiangan District,  
Hangzhou, China

Web: <https://www.brlc.org.cn/>, Email: [secretariat-brlc@hzfao.gov.cn](mailto:secretariat-brlc@hzfao.gov.cn)

## DISCLAIMERS

The terms used concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries, or regarding its economic system or degree of development do not necessarily reflect the opinion of United Cities and Local Governments Asia Pacific and Belt and Road Local Cooperation. The analysis, conclusions and recommendations of this report do not necessarily reflect the views of all the members of the United Cities and Local Governments Asia Pacific.

# About UCLG ASPAC

UCLG ASPAC is the largest regional section of the United Cities and Local Governments (UCLG), a worldwide association and the only local government organization recognized by the United Nations. UCLG was established on 01 January 2004 and is headquartered in Barcelona, Spain.

UCLG ASPAC was established in Taipei on 14 April 2004. UCLG ASPAC is the key knowledge management hub on local government issues in the Asia Pacific region. Its scope of work includes advocacy, capacity building, policy and research, programme and projects, and decentralized cooperation. The Asia and Pacific region has linkages to more than 7,000 local governments. It represents well over 3.76 billion people, making up more than half of the world's population, and incorporates economically fast-developing countries such as China, India, and Indonesia.

UCLG ASPAC members are mostly individual city and local governments and their associations. UCLG ASPAC Secretariat is hosted by the Capital City Government of Jakarta, Indonesia.

# About BRLC

UCLG ASPAC Committee on the Belt and Road Local Cooperation (BRLC) was inaugurated at Thematic Session on People-to-People Connectivity at the first Belt and Road Forum for International Cooperation in Beijing. BRLC is founded, within the framework of UCLG ASPAC, by Hangzhou Municipal Government and the Chinese People's Association for Friendship with Foreign Countries (CPAFFC) with the Secretariat located permanently in Hangzhou.

With the mission of Openness, Cooperation, Sharing and Win Win, BRLC, based on the UCLG ASPAC, is committed to integrating the Belt and Road Initiative into exchange and cooperation among local governments with various practical exchange and cooperative programmes and activities; to building a cooperation platform to share experience and resources for mutual benefits and win-win outcomes in the fields of economic development, culture and education, urban governance, rural development and internet economy, thus achieving “people-to-people bonds” and “state-to-state relations”. Meanwhile, BRLC will form a work pattern which is dominated by the Committee and participated by social forces so as to utilise social resources and integrate forces from all parties to jointly conduct international exchange and cooperation.

BRLC warmly welcomes members of UCLG ASPAC and other regions of UCLG, cities along the Belt and Road route, Hangzhou's sister cities and other related cities or organisations.

# Foreword

Covid-19 has proved to be not just a health crisis but a global humanitarian challenge. The Pandemic not just affected lives but ravaged economies and livelihoods globally. Coronavirus related deaths have crossed the three-million mark. The economic loss is still being measured.

Cities remained the worst affected because of their population density and connectivity with the world. The unique characteristic and strength of cities and towns became their weakness as the virus spread fast in cities than in smaller communities. The crisis has underlined the significance of resetting our city systems to make them pandemic-proof, inclusive, and environmentally sustainable. The Pandemic is forcing us to decide our new priorities. Despite being worst-hit, cities have shown us how to reach out to the people on the margins in difficult times and assist them in restarting their lives.

Over 12 months have passed, but the Pandemic is far from over. Many countries have entered into the downward trajectory of the virus spread, but some countries are witnessing new peaks in daily cases.

At the onset of the Pandemic, when governments in several countries were still on the fence and evaluating the degree of preparedness to deal with the pandemic and associated challenges, local governments forced their hands. They transformed pandemic management into a strategic focus.

The ongoing crisis has been challenging for urban spaces not just in terms of how they operate their health systems but also how well they manage networks of interdependence, socioeconomic contact, and interactions. The Pandemic has exposed the fundamental weaknesses in societies and allowed us to correct things in time. Despite the persistent global collaborative efforts, the Pandemic is still a threat to lives and livelihoods. It has also proved a challenge for countries that worked hard for decades to achieve global goals relating to poverty alleviation and socioeconomic social equality. The crisis has pushed millions of people into poverty and left many jobless. The report provides details of the impact supported by official data by national governments and research organizations.

Every country faced the challenge of balancing outbreak prevention strategies against efforts to save their economies and maintain socioeconomic equity. Many countries have shown exemplary evidence of proactive, practical action plans that can be transformed into a long-term roadmap to make them Pandemic resilient. This report aims to analyze the impact, experiences of countries and scoop out the best learning for laying a future roadmap for a resilient future. UCLG ASPAC is presenting this study to highlight ground realities in different nations, especially in the Belt and Road Initiative countries.

There are numerous string of stories from different parts of the world after a strange viral outbreak in Wuhan, China, in the last few days of 2019. No one thought the outbreak

would be global and on such a large scale. The situation in China quickly worsened and dramatically improved in few months, faster than many countries affected. There are a lot of lessons we can learn from what China experienced and how they responded. This report brings such success stories not just from China but from many other countries.

Our societies, especially urban spaces, have emerged stronger and robust after experiencing epidemics. Fostering an adaptive, responsive city system became a priority overnight by transforming sanitation systems after Cholera, Plague, Spanish Flu, etc. This time is no different. Cities are transforming their health systems and making them resilient. The new normal has also witnessed an increasing consciousness and public pressure around the importance of clean and healthy living environments. To build a resilient future, local governments have to focus on three fundamental building blocks—the technology core, the policy regime, and effective implementation mechanism, with the former augmenting the latter two.

We hope that our small but collaborative actions will contribute to an active knowledge on pandemic management and inspire local governments to accelerate their actions to achieve the objectives of Sustainable Development Goals while making their cities resilient and healthy at the same time. If we miss the opportunity to learn from the crisis and be well-prepared for similar crises, then when we face such a situation in the future, we will distrust our ability to respond.

Best,

**Dr Bernadia Irawati Tjandradewi**

Secretary-General

UCLG ASPAC

# Table of Contents

About UCLG ASPAC

About BRLC Committee

Foreword by Secretary-General, UCLG ASPAC

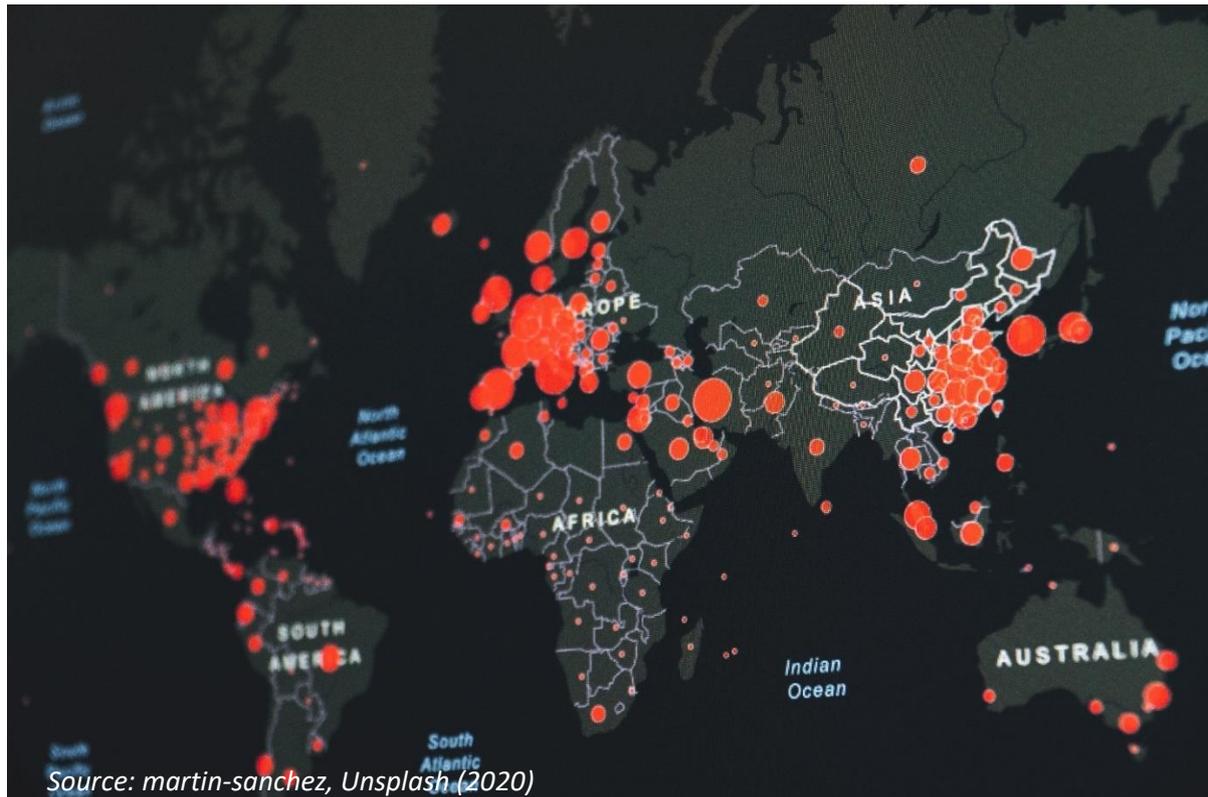
1. An Overview of Pandemic Management and Urban Resilience
  - I. History of Pandemics, response and management
  - II. Evolving urban resilience
  - III. Global Spread of Coronavirus and Cities
  - IV. Scale of Covid-19: Impact on Health, Economy and Urban Infrastructure
2. Local Governments and Combat with Pandemic
  - I. Policy Interventions
    - Measures to Contain the Spread and Local Pandemic Management
    - Urban responses to address health and social concerns
    - Environmental Impact on Cities
    - Addressing Economic Challenges Locally
  - II. Leveraging technology and innovation in Pandemic management
    - Infodemic: Dealing with misinformation
  - III. Road to resilience
3. Building Urban Resilience for achieving global goals
  - I. Global Scenario: Covid-19 and its impact on progress on SDGs
  - II. Building Resilience at Local Level for achieving global goals
  - III. Localisation of SDGs
4. Case Studies: Best Practices from Cities in BRI Nations
  1. Hangzhou, China
  2. Ho Chi Minh City, Vietnam
  3. Izmir, Turkey
  4. Manama, Bahrain
  5. Rome, Italy
  6. Algiers, Algeria
  7. Riyadh, Saudi Arabia
  8. Shanghai, China
  9. Athens, Greece
  10. Indonesian cities
  11. Wuhan, China
  12. Daejeon City, South Korea
5. Conclusion – LGs need to rise to resilience

Abbreviations

Bibliography

# Abbreviations

COVID-19	Coronavirus Disease
GDP	Gross Domestic Product
HDI	Human Development Index
ICAO	International Civil Aviation Organization
ILO	International Labour Organization
LG	Local Government
LGA	Local Government Associations
NUA	New Urban Agenda
OECD	Organisation for Economic Co-operation and Development
SDG	Sustainable Development Goals
SMEs	Small and Medium Sized Enterprises
UCLG ASPAC	United Cities and Local Governments Asia Pacific
UK	United Kingdom
UNDP	United Nations Development Programme
UN	United Nations US United States
VLRs	Voluntary Local Reviews
VNRs	Voluntary National Reviews
WHO	World Health Organization



## Chapter 1

# Overview: Pandemic, Its Management, and Evolution of Urban Resilience

- 1) History of Pandemics, Response and Management
- 2) Evolving Urban Resilience
- 3) Global Spread of Coronavirus and Cities
- 4) Scale of Covid-19: Impact on Health, Economy and Urban Infrastructure

## 1. History of Pandemics, Response and Management

Human population has suffered pandemics of varied scale several times in history. These events have caused severe damage to humanity in various forms, and their impacts have been long-lasting on societies. The pandemics taught great lessons to cities and impelled them to improve their governance, planning and urban management systems. It has resulted in the evolution of building resilience. The pandemics strongly shaped the economic, political, and social aspects of human civilisation. With the advent of advanced medicines and vaccinations, the threat of pandemics and their impacts on people have reduced but not completely eliminated.

Over time, human started living in a global village. Travel between places, transportation of goods and services became easier, faster, cheaper and smooth. From living in small communities in villages to living in metropolises, humans have come a long way. In less than 100 years, the world urban population has grown from 30 per cent to 56 per cent. Asia and Africa registered maximum growth from 17.5 per cent to 51.1 and 14.3 to 43.5, respectively.

The 21<sup>st</sup> Century witnessed the historical movement in urbanisation. The United Nations (UN) estimates, for the first time in 2007-08, more people started living in cities, where people live in close proximity. Since 1950, the urban population has grown significantly worldwide. The world urban population was 30 per cent in 1950, which reached 56 per cent in 2020. Asia and Africa recorded the highest growth, and it is estimated that these regions will account for the highest urban growth in the next couple of decades. [Source: UN Population Division]

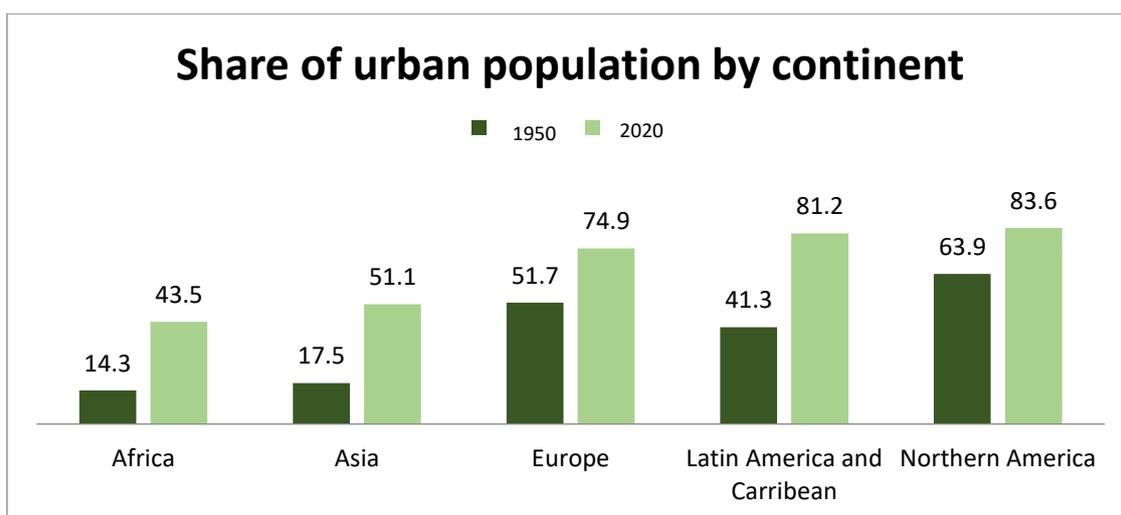


Figure 1. Source: UN Population Division<sup>1</sup>

With urbanisation trends and increase in global trade and business, air travel has also been increasing at a fast pace and in the last ten years, according to International Civil Aviation Organization (ICAO) 's compilation of annual global statistics, the total number of passengers carried on scheduled services rose to 4.3 billion in 2019. It is important to note that the growth in the Asia Pacific was reported highest at 9.5 per cent. The number of people travelled came down drastically by more than 50 per cent in the pandemic era. In a statement, the ICAO said, “that as seating capacity fell by around 50 per cent last year, that left just 1.8 billion passengers taking flights through 2020, compared with around 4.5 billion in 2019. That adds up to a staggering financial loss to the industry of around \$370 billion, “with airports and air navigation services providers losing a further 115 billion and 13 billion, respectively.”<sup>2</sup>.

Since human connections and their interdependence for goods and services have been growing steadily, such global interdependence has grown at a fast rate and helped countries greatly in improving their socio-economic conditions. Such a connected world provides a fertile ground for any virus to spread at a rapid speed, especially in urban areas hence cities have to keep updating

their ordinance to combat pandemic and must use the power of the connected world to address the issue astutely.

In the 21<sup>st</sup> Century, the Belt and Silk Road is such an initiative connecting countries and cities and promoting knowledge and resource sharing, forging cultural relations for mutual benefit. It is essential to improve city-to-city relations further to augment the processes of sharing knowledge and resources.

## 2. Evolving urban resilience

A silver lining in urban response to the pandemic is: cities have been successful in reducing the death rate consistently over centuries. It is to be noted that Bubonic Plagues killed almost 200 million people that was 51 per cent of the population of that time. The Plague of Justinian killed 40 million people (19.1 per cent of the total population). Since then, the death rate keeps coming down as the people developed better immunity with improved healthy habits, built better sanitation systems, and took great leaps in medical care and medicines.

Humans learnt from their experiences of suffering from the pandemics and invested in building a healthcare system, advanced medicines, and scientific discoveries to save lives and mitigate the impacts of the diseases. In the 20<sup>th</sup> Century, the Spanish Flu wreaked havoc and killed 45 million people that accounted for approximately 2.5 per cent of the world population those days.

Here is the list of pandemics occurred in the past<sup>3</sup>

Name	Time period	Type / Pre-human host	Death toll
Antonine Plague	165-180	Believed to be either smallpox or measles	5M
Japanese smallpox epidemic	735-737	Variola major virus	1M
Plague of Justinian	541-542	Yersinia pestis bacteria / Rats, fleas	30-50M
Black Death	1347-1351	Yersinia pestis bacteria / Rats, fleas	200M
New World Smallpox Outbreak	1520 – onwards	Variola major virus	56M
Great Plague of London	1665	Yersinia pestis bacteria / Rats, fleas	100,000
Italian plague	1629-1631	Yersinia pestis bacteria / Rats, fleas	1M
Cholera Pandemics 1-6	1817-1923	V. cholerae bacteria	1M+
Third Plague	1885	Yersinia pestis bacteria / Rats, fleas	12M (China and India)
Yellow Fever	Late 1800s	Virus / Mosquitoes	100,000-150,000 (U.S.)
Russian Flu	1889-1890	Believed to be H2N2 (avian origin)	1M
Spanish Flu	1918-1919	H1N1 virus / Pigs	40-50M
Asian Flu	1957-1958	H2N2 virus	1.1M
Hong Kong Flu	1968-1970	H3N2 virus	1M
HIV/AIDS	1981-present	Virus / Chimpanzees	25-35M
Swine Flu	2009-2010	H1N1 virus / Pigs	200,000

Name	Time period	Type / Pre-human host	Death toll
SARS	2002-2003	Coronavirus / Bats, Civets	770
Ebola	2014-2016	Ebolavirus / Wild animals	11,000
MERS	2015-Present	Coronavirus / Bats, camels	850
COVID-19	2019-Present	Coronavirus – Unknown (possibly pangolins)	2.7M (Johns Hopkins University estimate as of March 16, 2021)

Figure 2. Source: Visual Capitalist<sup>4</sup>

In addition to advancement in the medical field, over time, societies have developed survival strategies to deal with Pandemics. The past pandemics have taught us the significance of the quarantine measures to slow the spread of the virus.

The port city of Ragusa (now known as Dubrovnik) passed the first quarantine law during the Bubonic Plague, or Black Death, on July 27, 1377. It stipulated: “Those who come from plague-infested areas shall not enter [Ragusa] or its district unless they spend a month on the islet of Mrkan or in the town of Cavtat, for disinfection.”<sup>5</sup>

Similarly, Plague and Yellow Fever made governments more aware of the significance of public sanitation. While dealing with these events, cities have announced lockdown and quarantining of infected citizens, precursors to modern conceptions of public health. People started the use of masks during the outbreak of the Spanish Flu. The past pandemics and health crisis have forced urban planners’ hands to focus on improving sanitation standards in communities, enlarging access to clean water, shaping public health policies and rethink basic amenities for all in cities.

The ongoing crisis has caused many significant cities to crumble and forced them to think about the efficiency of their social and physical infrastructure. Almost a year is gone, but the pandemic is still raging on in many countries. The Covid-19 has posed a critical question: how would we govern urban conglomerations. Some cities have already shown the way.

In China, local volunteers Chengdu enforced Covid-19 regulations. Similarly, Hangzhou, along with a local university, got engaged in developing educational materials for students and the public. In the United States, the local government in California enforced the ‘stay at home’ measure well before the federal and state governments. During the 1918 ‘Spanish flu’ outbreak, North Carolina used local governments and communities to control the pandemic.<sup>6</sup> There are several such successful case studies from many cities around the world and are featured in the following chapters of this report.

Covid-19 has exposed faults in the urban ecosystem and warned to address the issue in time. Undoubtedly, the health crisis borne out of a virus is colossal, but, ultimately, cities have triumphed over infectious diseases many times before. Cities in the post-Covid world will emerge more assertive with a renewed vision on robust and inclusive healthcare systems while balancing environment and development.

### 3. Global Spread of Coronavirus

COVID-19 pandemic, the major global health crisis of the Century, has exposed vulnerabilities in urban health infrastructure and healthcare systems. It has exerted its pervasive impacts on almost every aspect of human lives. The first case was reported in Wuhan, China, in December 2019, and

within three months, the contagion spread in more than 200 countries. Till the writing of this report, almost 125 million people have been infected, and approximately 28 million people died of the coronavirus disease.

Total Cases Confirmed Globally	<b>125,234,087</b>
Total Deaths Worldwide	<b>2,749,397</b>
Number of countries with cases	<b>214</b>

Figure 3. Source: Thinkglobalhealth.org \*As of March 25, 2021<sup>7</sup>

Since December 2019, this outbreak caused by a novel coronavirus was structurally related to the viruses that caused severe acute respiratory syndrome (SARS) and the Middle East respiratory syndrome (MERS). During 2002-03, a total of 8,098 cases of SARS were identified; of these, 774 died. The later outbreak by MERS infected 2,494 individuals, among which 858 died since 2012.

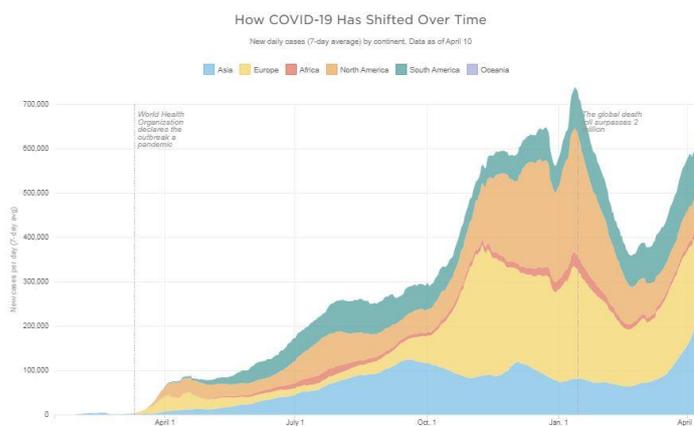


Figure 4 Source: Ourworldindata.org

China informed the World Health Organization (WHO) of a cluster of cases of pneumonia of an unknown cause in Wuhan City in Hubei province. On January 9, 2020, the WHO issued a statement saying Chinese researchers have made a “preliminary determination” of the virus as a novel coronavirus. And, on March 11, 2020, it released a statement saying... “WHO has been assessing this outbreak around the clock, and we are deeply concerned both by the alarming levels of spread and severity and by the disturbing levels of inaction. We have therefore assessed that COVID-19 can be characterised as a pandemic. Pandemic is not a word to use lightly or carelessly. It is a word that, if misused, can cause unreasonable fear or unjustified acceptance that the fight is over, leading to unnecessary suffering and death.”<sup>8</sup>

According to the Pandemic Notebook released by the Hindu newspaper group, a ‘Pandemic’ is an epidemic that has spread globally, affecting large numbers of people. An infectious disease is called an ‘Epidemic’ if it affects a population in a region. The sudden spike in cases of a disease is called an ‘Outbreak. It is also limited to comparatively a small area like a city or district.’<sup>9</sup>

## What is Coronavirus

Coronaviruses are a large family of viruses with some causing less severe common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). The SARS-CoV-2<sup>1</sup> is a coronavirus very similar to the one that caused SARS. Many coronaviruses are zoonotic, meaning they are transmitted from animals to humans. While the SARS coronavirus is thought to be an animal virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals (civet cats) and first infected humans in the Guangdong province of southern China in 2002, the MERS coronavirus was passed on from dromedary camels to humans in Saudi Arabia in 2012. There is evidence that the SARS-CoV-2 has also been transmitted from bats.<sup>1</sup>

Despite the progress made in technology, communication and health over the years, the outbreak, epidemics and pandemics continue to pose a threat.<sup>10</sup> *Historic or periodical pandemics never perceived global threats, not as close to the scale of climate challenges. For instance, 1918's Spanish Flu (H1N1) did not pose a global threat to civilisation and habitability when it comes to geographical coverage and the number of people affected by that pandemic. In the early 21st Century, the resurgence of pandemics, notably the Swine flu, SARS, MERS, and Ebola virus, did have a high trajectory of impacts, but they were confined within limited geographical entities, and the nature of spread was also within a fair degree of control. The spread of Covid-19 and its scale of impact is unprecedented.*

## 4. The scale of Covid-19 Impact on Urban Health, Economy & Infrastructure

Cities have been at the front position in the global fight against the pandemic. The battle against the virus has made an indelible mark on the outlook of the cities. It made us re-imagine urban development and the role of local governments in different dimensions - social, cultural, economic, and environmental. At the onset of the pandemic, lockdowns, curfews, massive airport screenings, quarantines, and social distancing became the norm across the globe. From Wuhan to New York to Mumbai, urban life came to a screeching halt, and the ever-buzzing cities wore a deserted look.

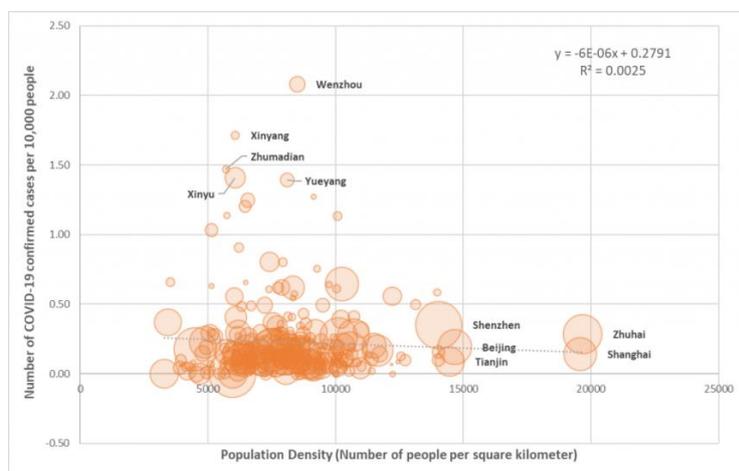


Figure 5 Source: World Bank<sup>1</sup>

At the beginning of the pandemic, it was essentially an urban crisis in almost every affected country as 70 to 90 per cent of cases came from urban areas. It was observed that cities with a high density of population became easy targets. However, the density was not the only weak point. As many large and dense cities like Mumbai, New York and London reported shocking infection rates, other similar cities like Singapore, Seoul and Hong Kong managed to contain

the virus. A World Bank study of 284 extremely high population density cities in China, such as Shanghai, Beijing, Shenzhen, Tianjin, and Zhuhai, had far fewer confirmed cases per 10,000 people.<sup>11</sup>

The coronavirus disease (COVID-19) critically impacted global health systems and economies in all countries. The devastating impacts of the pandemic were starkly visible in urban areas. Health systems came under enormous strain even in the cities having world-class facilities. It was exacerbated in inequity in the delivery of healthcare services. The movement of the people was severely affected but in the last quarter of 2020 witnessed normalcy in many cities of the world. The graph shows the trend of people’s movement in selected cities during different months of 2020.

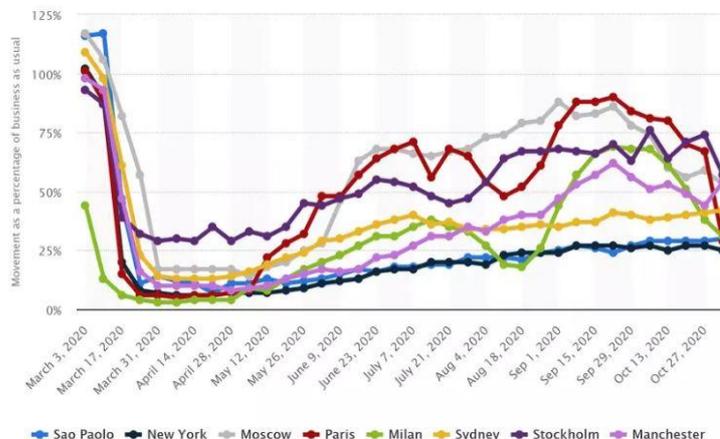


Figure 6 Source: www.ourworldindata.org

As the outbreak began spreading in Europe and the USA, the ranking from the 2019 Global Health Security Index, an assessment of 195 countries’ capacity to face infectious disease outbreaks, compiled by the US-based Nuclear Threat Initiative and the Johns Hopkins School of Public Health’s Center for Health Security. The USA, the UK were ranked first and second; while South Korea was ranked ninth, and China 51<sup>st</sup>, most African countries were at the bottom. Contrary to the findings, the US and UK Governments have provided among the world’s worst responses to the pandemic. In the early phase of the pandemic, neither country had widespread testing available, as strongly recommended by the WHO, alongside treatment and robust contact tracing.<sup>12</sup> It is still to assess what worked best for the successful cities in these countries. It gives a scope of the study to assess the role of urban local governments in these countries.

The economic impact of the crisis was also unparalleled. The International Monetary Fund predicted that over 3 per cent shrink in the global economy in 2020 – the steepest slowdown since the Great Depression of the 1930s. The contagion impacted the flow of goods and services resulting from pandemic related restrictions, the decline in economic activities, and budgetary cuts.

It is important to note that about 80 per cent of global GDP comes from cities. Working hours across the globe fell by 14 per cent in the second quarter of 2020 compared to the same period of 2019. It amounted to a loss of 400 million full-time jobs. The informal sector represents 67 to 90 per cent of total employment in low and middle-income countries. Informal workers lost about 60 per cent of their earnings in the first month of the pandemic, and the number was as high as 80 per cent in Africa and Latin America. As many women work in the informal economy and the hardest-hit sectors, their livelihood was severely affected.<sup>13</sup>

Over a year has passed since the COVID-19 outbreak, the accumulating human toll continues to raise concerns even after the availability of vaccines. Many countries are facing the second, third wave of the pandemic. It is time for cities to learn from the experiences of the cities which have done excellent work in managing pandemic and associated challenges. Still, the global economic

## #1 Building Resilience and Coping Mechanism for Pandemics



outlook is uncertain. The curtailment of economic activity on this scale was first-time in living memory. But it could have been a lot worse if the national and local governments have not taken timely decisions.

City governments have to equip themselves better for future pandemic management. ULBs will have to make policies and programs for improving urban health infrastructure, building local economic resilience to mitigate the risks from future health crises, and creating a robust social security net for inclusive and sustainable growth.



## Chapter 2

# Local Governments and Combat with Pandemic

- 1) Policy Interventions
  - Measures to Contain the Spread and Local Pandemic Management
  - Urban responses to address health and social concerns
  - Environmental Impact on Cities
  - Addressing Economic Challenges Locally
- 2) Leveraging technology and innovation in Pandemic management
  - Infodemic: Dealing with misinformation
- 3) Road to resilience

The outbreak of the Covid-19 pandemic caught the governments worldwide off guard. It was a challenging task to respond to the unprecedented event promptly. Politicians and policymakers had to make policies for a crisis that most of them had no experience of handling. The countries scrambled with unprecedented emergency actions to contain the virus's spread to save lives and livelihoods by enforcing strict lockdowns, travel restrictions, social distancing measures, public awareness programs, testing and quarantining policies, and income support packages. All these measures had a good intention of saving the lives of people. Still, these decisions put millions of people worldwide out of their job, forced many businesses to shut operations and widened the economic disparity in societies by hurting the most disadvantaged communities the most.

Like national governments, local or sub-national governments also had the challenge of doing an unusual task. They had to implement the evolving policies at the local level and also prepare their health systems to tackle the virus spread. Despite these challenges, many countries and cities performed well in managing the effects of the virus's spread and also the economy. They overhauled their health systems quickly to save lives and made pro-people policies to help them in the time of crisis. This chapter focuses on the challenges faced by the national and sub-national governments during the ongoing pandemics and their policy response. The chapter also provides insight into how the governments used technology in pandemic management and how they dealt with the economic challenges that evolved while managing the pandemic.

## 1. Policy Interventions

### A) Measures to Contain the Spread and Local Pandemic Management

Most countries worldwide enforced strict measures to break the chain of the infection and slow the spread of the virus among citizens. In the absence of no vaccine available at the early stages of the pandemic, it was essential for countries to implement non-pharmaceutical interventions (NPIs) in response to the epidemic to delay and moderate the virus's spread in a population.<sup>14</sup>

Besides, to curb the spread of the virus, the objective was to give government agencies time to prepare themselves to deal with the evolving challenges of the pandemic and associated challenges. Studies have shown that cities and states with early and broad isolation and preventive measures had 30 per cent to 50 per cent lower outbreak and fatality rates than other cities during the Spanish Flu nearly a Century ago.<sup>15</sup> In the case of Covid-19, one of the first policy decisions by most countries was to suspend international flights and close international borders.

The Indian Medical Council of Research report says that a single Covid-19 patient can infect over 400 people in just 30 days. By this calculation, the chain of infection can become deadly, especially for people with co-morbidity conditions and the elderly. Taking a cue from the lessons from the earlier pandemics, many nations came out with lockdown measures restricting people's mobility. The lockdown measures varied in severity and duration across cities, regions and countries.

Oxford Covid-19 Government ResponseTracker (OxCGRT) developed an index to exhibit levels of policy measures by the countries to contain the virus spread. It has collected various policy responses to the pandemic based on 11 indicators, namely, school closure, workplace closure, cancellation of public events, closure of public transport, closure of public campaigns, imposing movement restrictions, imposing international travel controls, introducing fiscal and monetary measures, emergency investment in health care, investment in vaccines, testing policy, and, contact tracing, etc.

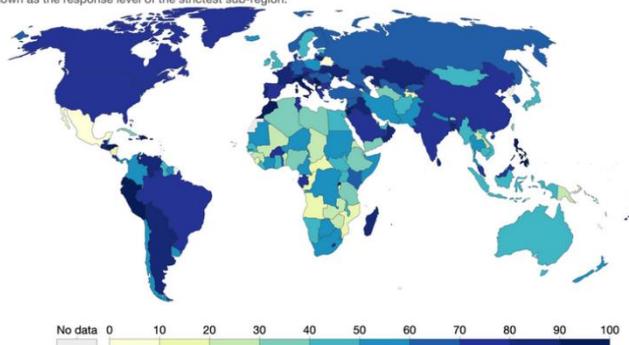
Here is the list of some countries and their rankings on the Stringency Index. <sup>16</sup>

Countries or Regions	Stringency Index
Dominican Republic	100
Honduras	100
Libya	100
Congo	97.22
Bahamas, Bermuda, Bolivia, Georgia, Guatemala, India, Laos, Philippines	96.3
Italy	93.52
Bangladesh	89.81
Pakistan	89.81
France	87.96
Russia	85.19
New Zealand	83.33
Indonesia	80.09
Netherlands, United Kingdom	79.63
Brazil	77.31
Germany, Singapore, Thailand	76.85
Malaysia	73.15
United States of America	72.69
Switzerland	69.44
Hong Kong, China	66.67
Finland	60.19
China	56.94
Japan	47.22
South Korea	43.52

Figure 7 Source: Oxford Covid-19 Government ResponseTracker<sup>17</sup>

COVID-19: Stringency Index, Mar 21, 2020

This is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.



Source: Hale, Angrist, Goldszmidt, Kira, Petherick, Phillips, Webster, Cameron-Blake, Hallas, Majumdar, and Tatlow. (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." *Nature Human Behaviour* – Last updated 22 March, 15:00 (London time) CC BY

Figure 8 Source: Oxford Covid-19 Government ResponseTracker

The findings are based on the number and intensity of closure and containment policies on a scale of zero to 100. Fifteen countries reached 100 on the stringency index, while seven never surpassed 50. The countries with the highest average stringency were Honduras, Argentina, Libya, Eritrea and Venezuela. Those with the lowest were Nicaragua, Burundi, Belarus, Kiribati and Tanzania.<sup>18</sup>

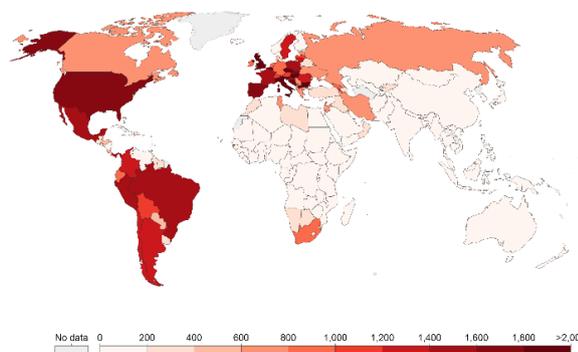
Countries have been witnessing varying trends of falling and rising infections and changing their policy reforms. Many countries have seen

successive waves, and they have tried phasing in and out of restrictive policies. It has now evidently clear that governments restrictions help in breaking the chain of infection. Shreds of evidence suggest that well-timed, strict restrictions have a more significant effect than slower, weaker ones. No formula is a panacea. For example, Peru suffered despite restrictive policies. It reflects that a host of factors work together with restrictive policies. Some evidence also suggests that more robust economic support makes COVID-19 restrictions more effective.<sup>19</sup>

Initially, these measures did benefit in controlling the spread and curb the death toll. Even after imposing strict lockdowns to break the rising wave of infections, cities in many countries, which did not improve their healthcare systems for instant requirements, came back to square one. During the course, millions of people suffered an economic blow. The images of hundreds of thousands of migrant workers moving out from cities and walking or cycling to their villages are still fresh in the people's minds. Government interventions caused substantial economic and social costs while affecting individuals' behaviour, mental health and social security. Governments' decisions on social distancing, movement restrictions, and lockdowns have negative associations with people's mobility to retail and recreation centres, groceries and pharmacies, parks, transit stations, and workplaces.

Cumulative confirmed COVID-19 deaths per million people, Apr 1, 2021

Limited testing and challenges in the attribution of the cause of death means that the number of confirmed deaths may not be an accurate count of the true number of deaths from COVID-19.



Source: Johns Hopkins University CSSE COVID-19 Data

Figure 9. Source: John Hopkins University CSSE

Global data set and the reports from countries strongly suggest that COVID-19 almost everywhere is urban-centric. In the early months of the virus spread, the global report provided

by worldometer.com reveals that the top-ten countries that have suffered the highest number of COVID-19 cases are among the very highly urbanised countries.

Hence the role of municipal government as the first respondent becomes most critical. Their policy response and the way they implement policies determine the resilience capacity of cities. It is widely accepted that cities generally are better equipped with healthcare facilities and resources to respond to the COVID-19 crisis. Cities are also places where people live and gather for social, political, religious and cultural events, thus at risk of spreading the virus among residents and challenges to implement social distancing. For example, a winter festival (Sapporo) and a live-music clubhouse (Osaka) were the clusters that infected many. Several religious gatherings in cities have also caused the virus spread from Kuala Lumpur (Malaysia) to Daegu (Korea).

In response to the crisis, cities led in every region and presented new and out-of-the-box ideas. Many cities from developed nations collapsed while small cities did well despite constrain in resources. The panacea to the pandemic is a mixture of multiple ingredients. Cities with proactive leadership and efficient governance with a better system for equity in delivering services managed the health crisis better. There are many examples from cities those tossed unique policy measures and were replicated elsewhere for their effectiveness.

## **B) Urban responses to address health and social concerns**

Paris city (France) coordinated daily crisis meetings involving all stakeholders. It regularly updated the required information on paris.fr website. The city used Covidom, a digital application to monitor confirmed or suspected patients in their home. The app allowed hospitals to regulate patient flows. The city also opened two centres specifically for homeless people, who could be infected but did not require hospitalisation. The Paris Opera and Apollo Theatre made their productions digitally available for free. On April 27, 2020, Paris, in collaboration with Parisian Public Hospitals and ACCOR hospitality company, launched the "COVISAN" project to quarantine potentially infected and protect their families.

Bilbao (Spain) collaborated with the local community to provide help to the people in need, especially the senior citizens. Citizens were directed to identify such people in their locality or neighbourhood and contact Municipal Social Services so the authorities can help them.

Vienna (Austria)- Vienna transformed an exhibition hall into a medical care facility to provide food and primary medical care to people with mild symptoms. The centre was meant for the people who did not need treatment at a hospital but had difficulty caring for themselves at home.

The City commissioned technology company Atos and asked them to develop an Epidemic Management System (EMS) to contain the spread. The city also made EpiSYS to other municipalities in Austria and assisted them in managing patient data, including tracking patient incident reports in real-time. For students, the city offered its free Förderung 2.0 ("Support 2.0") tutoring initiative for students aged between 10 and 14 year.

Bogota (Columbia) initiated a public-private partnership between health service providers to ensure that the city health system does not face a shortage of medical resources. The availability of facemasks, sanitisers, and other medical supplies was managed.

Daegu Metropolitan City, like many other South Korean cities, launched 'drive-thru' COVID-19 testing facilities. It allowed medical staff to test citizens in their car. It made testing quicker and

safer for patients not willing to visit a hospital. The process takes just about 10 minutes, and patients are informed about the results via text message within three days.

The City of Düsseldorf started a 24/7 information line on Corona Virus, including a live ticker on its website's homepage. The Mayor of the city addressed the locals and explained how the city would fight the crisis. A special, dedicated diagnostic centre was set up centrally to reduce the excess burden on general medical practices. A refugee centre was used as a quarantine station for potential patients who couldn't self-isolate. The City offered services to people at risk and assisted them in their day-to-day essentials. The city established a counselling service for people isolated at home.

### C) Mainstreaming environmental concerns locally

As cities imposed lockdown and shut off their economic activities, cities and their most buzzing and happening places wore a deserted look. The situation was the same everywhere from Times Square in New York, Champ De Mars in Paris, to Duomo in Milan. These bustling sites, on regular days, remain filled with thousands of people and cars. Cities became so desolate that one could just hear the distant wailing of an ambulance or the siren of a police vehicle occasionally.

Coronavirus lockdowns gave wildlife a unique chance to experience urban life with hardly any humans around. The mass quarantine halted vehicular movements, production in factories, power plants, air transport and almost everything, dropping thereby emission levels. An analysis published in Nature Climate Change has claimed that lockdown measures have contributed to about a 17 per cent reduction in daily global carbon dioxide emissions compared to the daily global averages from last year. The environmental gains could be temporary, but cities are reimagining themselves in the post corona world.

City leaders from New York to Paris to Bogotá are focusing on expanding pedestrian pathways and cycling areas so citizens can properly social distance while still getting exercise and fresh air. New York mayors closed off 40 miles of roads in the city and allowed it to be used for recreational use. Bogotá, Paris, Vienna, Mexico City, and Milan are several other cities focused on pedestrian and cycling needs.

During the pandemic, the city introduced 50 kilometres of pop-up cycle lanes known as "coronapistes" to ease pressure and decongest public transport during the pandemic. Paris Mayor announced plans to allocate over 400 miles of roadways to cyclists. The city is also planning to remove over half of Paris's car parking spaces and turn the famous Champs-Élysées into a "fantastic garden". It is part of its decadal plan of becoming the greenest city of Europe. Paris has made short-term and long-term policies to re-imagine its urban spaces for building a resilient future. Vienna announced an additional 35km for cyclists, adding to the 550 km already secured by an ambitious and proactive policy since the 1970s.

Barcelona transformed many areas of the city into green space to reduce pollution. It is known that the city is a pioneer of the superblocks concept that was first introduced in 2016. Superblocks are neighbourhoods of nine blocks where vehicular movement are restricted, and pedestrians and cyclists use streets inside. The city has recently announced the expansion of green zones. The plan will cover 21 streets and have space for 21 new pedestrian plazas at intersections. At least 80% of each street is shaded by trees in summer and 20% unpaved. A public competition in May 2021 will decide the final design.<sup>20</sup> The plan's purpose is to ensure that no resident will be

more than 200 metres from a green space. The Barcelona plan is estimated to cost €38 million (£34 million).<sup>21</sup>

According to a recent Harvard study, pollution can cause higher death rates from COVID-19 since the disease is a respiratory illness. Pollution affects the lungs, which emphasises the need for more green space. With more natural areas, air contamination can decrease, and individuals can stay at low risk for contracting the virus. To implement green spaces, cities can look into playgrounds, parks and community gardens. Mass initiatives for planting trees can also be effective. For instance, city developers can use mechanically stabilised earth (MSE) in a community garden to enforce it as part of the infrastructure. With structures like this one, green space becomes more of a standard necessity than a display.<sup>22</sup>

The pandemic has shown that congestion, pollution and lack of green space can damage people's health. Expanding pedestrian areas provides citizens with space they need to exercise and limits the number of cars. These initiatives must be implemented in every city wherever it is feasible. Many cities in the Asia Pacific are spreading awareness on environmental protection and encouraging people to use less disposable items, use cars less, adopt sustainable products, etc. With the push for a sustainable future, consumers are opting for 'green products' and 'services' which adopt sustainable practices.

Cities can leverage the progress in this direction to promote sustainable practices in their jurisdiction. This can pave the way for a greener and steady state of our urban spaces despite evolving challenges. When the situation becomes normal, cities cannot return to business as usual and have to re-imagine the way they function. Cities will have to understand that a growing economy needs to respect the carrying capacity of nature.

#### **D) Addressing Economic Challenges Locally**

The International Monetary Fund (IMF) estimated that the world economy shrank by as much as 3.5% in 2020. The lockdown restrictions resulted in millions of people losing their livelihoods and contraction in countries' Gross Domestic Product (GDP). In response, governments and central banks worldwide took unprecedented economic decisions and announced generous economic stimulus packages to neutralise the economic disruption caused by the pandemic and tried to provide relief to people and companies suffered.

Here is the list of select few countries which suffered GDP decline in the second quarter of FY 2020-21.

## Economic decline in the second quarter of 2020

The percentage decline of GDP relative to the same quarter in 2019. It is adjusted for inflation.

Our World in Data

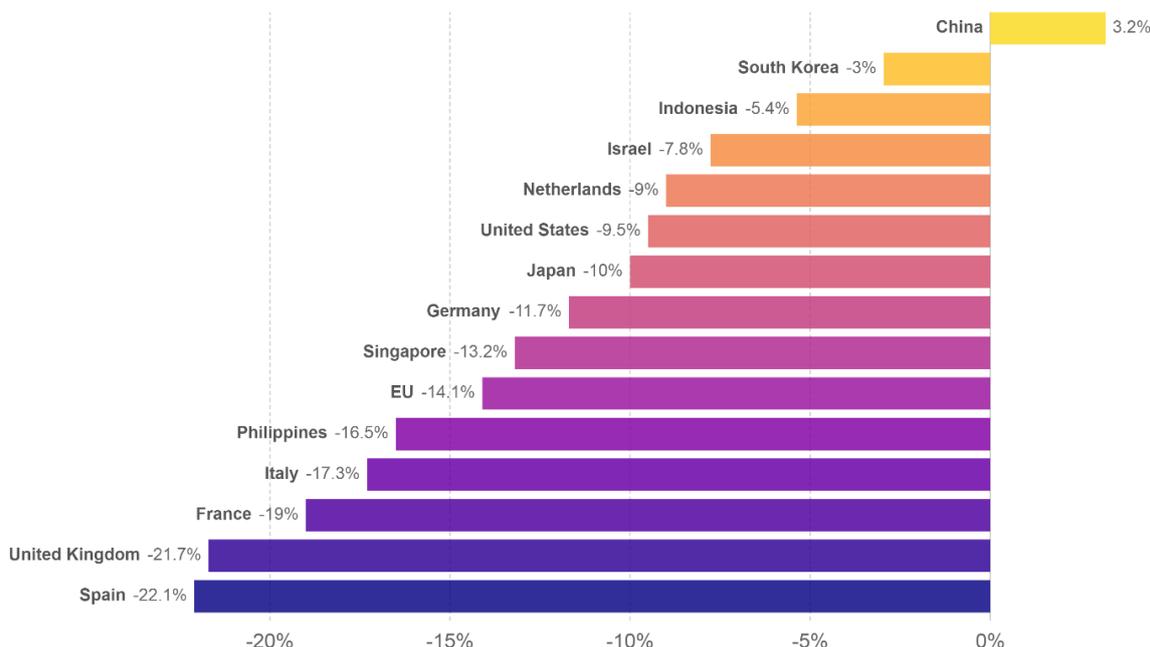


Figure 10 Source: Ourworldindata.org

The country that faced the pandemic first, China, planned to mitigate any systemic financial risks. As the crisis was unfolding, the People Bank of China prioritises building systemic financial risk prevention and control system. The Chinese government closely scrutinised the debt-to-GDP ratio and reduced debt levels at the local government level.

The PBOC has cut many interest rates since the beginning of the crisis. It cut its benchmark one- and five-year prime rates twice, once on February 16, 2020, and then again on April 19, 2020. This brought the one-year rate down from 4.15% to 3.85% and the five-year rate down from 4.80% to 4.65%.<sup>23</sup> It is to be noted that China was the only major economy to grow in 2020, but its future growth is dependent on global economic recovery.

As soon as mid-March 2020, many local governments in China began issuing prepaid spending vouchers to boost consumer spending, but the amounts are reportedly relatively small.<sup>24</sup> The Chinese government asked banks to extend the terms of business loans and commercial landlords to reduce rents.<sup>25</sup> Regional and local governments have also been increasing subsidies for certain auto purchases and raising the cap on the number of cars owned in each locality.<sup>26</sup> The government asked lenders to give smaller companies debt deferments from January 25 to June 30, 2020. Banks have been asked to provide forbearance on the mortgage and other personal loans.<sup>27</sup> On May 22, Chinese Premier Li Keqiang said banks could allow small businesses to only pay the interest on loans until the end of March 2021. On May 22, 2020, the government of China unveiled a \$506 billion package stimulus, which also contained funding for local governments to stop the spread of COVID19 and business tax cuts. This was accompanied by the issue of special treasury bonds by Beijing for the first time since 2007 and increasing the limit on special bonds that local governments can issue.<sup>28</sup>

According to the IMF, the COVID-19 pandemic has prompted an unprecedented fiscal response worldwide to support health systems and provide lifelines to vulnerable households and firms. Fiscal measures announced as of September 11, 2020, are estimated at \$11.7 trillion globally, or close to 12 per cent of global GDP.<sup>29</sup> Half of these measures have consisted of an additional spending or forgone revenue, including temporary tax cuts, and the other half liquidity support, including loans, guarantees, and equity injections by the public sector. The size and composition of fiscal support have varied vastly by country, reflecting in part countries' available fiscal space.<sup>30</sup>

In April last year, a World Bank report suggested that 126 countries introduced social protection and labour market policies in response to COVID-19. Though, the coverage of these policies remains a challenge for many countries. Currently, 130 new cash initiatives have been introduced as COVID-19 responses. The Philippines, for example, introduced five new cash programs alongside its national Pantawid program. For example, income support in childcare vouchers or allowances is being provided in Italy and South Korea. Other social assistance programs include support for homeless populations, as planned in Spain; subsidies that let utilities waive fees for essential services, as in El Salvador; waivers for loans and other financial obligations, as in Bolivia; and COVID19-sensitive public works, which are being tested in the Philippines.

Korean government decided to finance subsidies of up to two-thirds of wages to help employers retain workers. It is capped at USD 66 per employee per day. Malaysia is providing up to RM100 million (around US\$23 million) to the Human Resource Development Fund on a matching grant basis. This will fund an additional 40,000 employees. There are just a few examples. Such temporary social protection measures will undoubtedly help in negating the immediate negative impacts and fill gaps in coverage and adequacy of existing social protection systems.<sup>31</sup>

Like nations, cities also made projections of the economic impact. According to a report from the Organisation for Economic Co-operation and Development (OECD) released in July 2020, Paris (France) saw its economic activity decrease by 37 per cent since mid-March, in contrast to the 34 per cent at the national scale. It is estimated that the crisis will cost the city EUR 400 million. Barcelona (Spain) estimated a drop of 14% in GDP. Belfast, Bristol, Cardiff, Glasgow, Birmingham, Leeds, Liverpool, Manchester, Newcastle, Nottingham, and Sheffield (the United Kingdom) incurred a financial loss of GBP 1.6 billion. The cities which were dependent on tourism for their earnings largely were poorly affected. An initial estimate of the expected economic impact in Amsterdam (The Netherlands) is significant. The economic fallout is estimated at EUR 1.6 billion per month if the crisis continues, and a 1.5-2.8 per cent decrease in growth, instead of the 2.3% growth initially expected. As mentioned earlier in the chapter, the economic impact of the pandemic on the nation was overwhelming; the local impact was no less. In addition to financial measures taken by the national governments, cities took many initiatives to keep themselves and local businesses afloat.

For example, Frankfurt (Germany) promoted local shops, businesses, and restaurants using posters and online ads as part of its economic support programme. The city encouraged citizens to support the local businesses. Paris provided aid of EUR 50 to 150 per month to 28000 low-income families. Paris announced the freezing of rents, road and terrace taxes and miscellaneous municipal taxes for closed business and NGOs, the agricultural sector to support its citizens in time of crisis.

Even the municipalities facing financial strain extended their helping hand to locals. Detroit restored water services to thousands of households that had not paid bills. Copenhagen

(Denmark) accelerated the implementation of municipal construction projects to create new jobs in the city administration. This is facilitated by lifting restrictions on capital expenditures on public procurement. Ghent (Belgium) took extra support measures in favour of the local economy (such as deferral of payments) and also facilitated, for example, the matching between requests for support and supportive volunteers, through the specially launched volunteer platform - “Ghent Helps”. Ghent provided additional funding to 21 schemes to offer shelter and food for the homeless.

Municipalities played a crucial role in many cities in helping the local businesses revive by a host of initiatives. The pandemic underlines the importance of having adequate planning for economic resilience while making plans for disaster and pandemic management.

## 2. Leveraging technology and innovation in Pandemic management

The advent of technological inventions in the 21<sup>st</sup> Century has made life easier. One can call a taxi for their mobility needs, order food, make online payments, watch their favourite shows and movies anytime, anywhere on their smartphones using a fast mobile network. It was not the same for the earlier generations. Technology has improved human lives in many aspects, including healthcare.

At the onset of the pandemic, scientists and engineers worked on many technological tools to help trace, track new cases, and prevent the contagion spread. The use of digital technology by governments globally to combat Covid-19 has been crucial in our fight against the coronavirus. These technologies could be loosely organised into seven functional categories: Information management, detection and containment, Healthcare provider enablement, Treatment acceleration, Economic resilience, Social cohesion, and Cybersecurity. There are several such initiatives from various parts of the world.

It was evident that the lockdown measures had hit the poor hard. The poor had lost their livelihoods, on which they were dependent on running their daily lives. It was apparent in both developed and developing countries both. To assist the poor in the United States of America, companies partnered to create a comprehensive, crowdsourced open-source interactive map of free meal sites—10x Management and WhyHunger: Find Food COVID—in the US to address food insecurity. In many countries, social media pages were created to connect with the people who need food or any other essential goods during the lockdown. Studies suggest that buying online groceries and food products have increased substantially by 150 per cent.

Interactive mapping technology was made available to the public to keep them informed about the virus's spread in their cities' specific localities and assist city governments in their containment efforts. These dashboards and mobile application used big data to track case growth, recoveries and trends on both national and international scales. Almost every country has developed such platforms and applications. Some of these include AccuWeather: Coronavirus Tracker, Baidu: Baidu Maps (in Chinese), HERE technologies: Tracking coronavirus, IBM and Weather.com: COVID map, Microsoft: Bing COVID tracker, Tableau Software: COVID-19 Data Hub, TIBCO: Global and US Heat Map, AarogyaSetu by Government of India, University of Botswana and Government of Botswana: COVID-19 Botswana Dashboard, and Yandex: COVID map (in Russian). Several contact tracing apps were also used during the pandemic. DP-3T: Protocol White paper, Government of Germany, SAP and Deutsche Telekom: Corona-Warn-App, Apple and Google: iOS and Android APIs for contact tracing, Australian government: COVIDsafe app, Government of Iceland: Rakning

C-19, MIT: PACT: Private Automated Contact Tracing, Singapore government: TraceTogether app, and Zurich: GeoHealth app.

Many of these applications provided additional feature of Self-Assessment for citizens and Covid-tracker. People could conduct self-assessments via mobile or online platforms by answering a couple of questions. After the diagnostic result, these platforms also informed individuals about suggested steps to be taken, including reporting to health administration, accessing symptom monitoring tools and using treatment assistance.

The governments used technology to ease data collection and enable repatriation processes for citizens stranded abroad during the lockdown. Germany's Foreign Ministry and SAP launched the unique project, [rueckholprogramm.de/Citizens Return Campaign App](https://rueckholprogramm.de/). According to SAP Global, the project was built in just 24 hours to assist German citizens stranded abroad because of travel restrictions. German Foreign Ministry did have an app for helping German citizens in isolated emergency conditions. Still, it was not "built to cope with huge numbers of people trying to log on" as stranded Germans got a "server unavailable" message. But the advanced technology and the commitment of the government and scientific community came to aid, and the app was Citizens Return Campaign App was built in less than a day. Public transport has also witnessed a drastic decrease in city limits as people are opting for personal vehicles to keep themselves safe from the virus. It has wreaked havoc for the transport service providers as they are working on 10-20 per cent efficiency. The transport technology company, Optibus, is offering offers mass transportation agencies no-cost planning services so that they can find the best routes, schedule crew workflow and manage costings to help make mass travel in the age of COVID-19 workable.

In terms of concentration, it is worth highlighting the degree of innovation from China, where companies in collaboration with the government are pushing the boundaries of what can be achieved with existing technology. Examples include e-contract service in WeChat and several smart digital sourcing platforms on blockchain for small businesses, and various AI-powered solutions for detection and subsequent rapid diagnosis of the virus.<sup>32</sup> Technology has also proved to be effective in assisting frontline workers in their activities. Drones have made it convenient to transport medical samples and quarantine material with minimal risk. Such a drone was first used between Xinchang County's disease control centre and the People's Hospital. Other countries also used drones for varied purposes, including patrolling public spaces, tracking non-compliance to quarantine mandates and thermal imaging. In many places, robots were also used to clean and sanitise hospitals and deliver medicines without any human contact. The unavailability of medical equipment, sanitisers, and masks was a problem in the pandemic's initial months. Mirakl, a technology provider company based in Europe, partnered with the French government to create a one-stop platform where manufacturers, distributors and subcontractors can communicate over orders of hand sanitiser for medical use. It helped in optimising the production and provide hospital and healthcare facilities with the required medical supply.

Some private technology companies came out with small yet effective solutions for individuals. One of these included a high-tech finger ring that used advanced sensor technology connected with an easy-to-use mobile app to deliver precise, personalised health insights straight from the user's body. It also measures the change in body temperature, Heart Rate Variability (HRV), Respiratory Rate, and insights into a person's health. Though it does not replace the need for a medical practitioners consultation, it provides information about the change in the vital health parameters to make timely informed decisions. It could be proved beneficial in the cases of asymptomatic patients. South Korean medical software company Lunit develops artificial

intelligence programmes that can diagnose lung diseases via X-ray images. The company has now made its software available online for free. Hospitals in Brazil and South Korea can upload up to 20 cases per day for AI diagnosis. The company says innovations like AI have been an essential contributor to flattening the curve of COVID-19 cases in South Korea.<sup>33</sup> Telehealth technologies have proved to be a lifesaver in many instances. They offer a cost-effective means and also reduce the burden of medical facilities so that they can treat patients in serious medical condition.

Government agencies and leaders used digital technology to regularly communicate with regional and city leaders to make informed and participative policies for dealing with the pandemic. The technology also became popular for private companies for their official meetings with employees working from homes. Academic institutions used the technology for running regular classes for their students. Online meetings, classes and webinars have become a norm in the pandemic time. According to Zoom, one of the most popular video conferencing apps, the daily meeting participants zoomed to up to 350 million in April 2020 from a peak of 10 million in December 2019. The pandemic had expedited the digital transformation of companies from years to a few weeks. The acceleration in digital transformation was essential to remain in business. According to Digital Engagement Report by a digital technology solution provider, Twilio, companies in Japan, Germany and Singapore say COVID-19 accelerated their digital communications strategy by over seven years while organisations in the United Kingdom and France saw more dramatic increases in digital transformation budgets due to COVID-19.

Local Governments also took the front seat in using technology for pandemic management. The city of Newcastle (UK) used smart city technologies to assess whether social distancing is respected. In South Korea, Daegu and Seoul used the data hub, video surveillance system, bank card usage to trace patient routes. Such data was made publicly available so that people who came in contact could self-quarantine themselves. The city has put a system to ensure the privacy and safety of data being shared by the general public. Some cities used collective density and mobility patterns. For instance, Mexico partnered with Google Maps and Waze for monitoring mobility trends. Budapest used technological tools to identify high concentrations of people.

COVID-19 spotlighted the digital divide. Cities made sincere efforts to bridge the gap and assist those who did not have access to the Internet. Boston gave high school students a free "cell phone/hotspot" through the 1Million Project. Boston and New York public schools provided a Chromebook to students in need of a device. In Yokohama (Japan), the lessons were broadcast on the subchannel of a local TV station (TV Kanagawa) to ensure that students not having access to Internet can study. Milan (Italy) launched a call for donations of devices or internet connections to schools for supporting online learning. It is a snapshot of a select few technology companies, national and local governments using advanced innovations to combat the pandemic. Several others are using big data analytics, sensor-based technologies, AI, cloud computing and other advanced technologies to help organisations process data, give insights to deal with the pandemic and associated challenges. Some of them have made their technology free to use.

The world is still grappling with the pandemic and technological innovations and initiatives multiplying to end people's suffering by helping healthcare workers, treating patients effectively, and developing effective vaccines. The combat may be far from over, but the learning of the war against the pandemic would go a long way in shaping and integrating our technology to build a robust and effective healthcare system. It is also essential for local governments, especially in developing countries, to adopt advanced technology in their governance and management.

### A) Infodemic: Dealing with misinformation

Misinformation in the time of health crisis is not a new phenomenon. Still, the advent of fast and mass- communication systems has made it a serious threat to the governments to manage pandemics. In the last one year, the nation suffered the severe pandemic of the Century, but they faced the challenge of dealing with another viral disease—misinformation.

As the world was coming to terms with coronavirus and COVID-19, WHO coined another word: "infodemic" – an overabundance of information and the rapid spread of misleading or fabricated news, images, and videos. Like the virus, it is highly contagious and grows exponentially. It also complicates COVID-19 pandemic response efforts. "We're not just battling the virus," said WHO Director-General TedrosAdhanom Ghebreyesus. "We're also battling the trolls and conspiracy theorists that push misinformation and undermine the outbreak response."<sup>34</sup>

Many social media sites, including Facebook, Google, Microsoft, LinkedIn, Twitter, Instagram and many more, are using AI to remove misleading content from their platforms. For example, Facebook enables users to flag false information and, after confirmation, removes it from its platform. Messaging app also flags many time forwarded messages to caution users to recheck the authenticity and restricts mass sending. Governments also used these platforms to amplify messages from health authorities to send news updates, warnings and tips to the public.

Internet is flooded with an increasing number of false and misleading information about the COVID-19 outbreak. Artificial Intelligence can monitor and curb the spread of rumours. AI can be used to streamline searches of people and direct them to accurate and scientific information. Many prominent search engines and portals provided a special section on their home ages to access reliable and authentic information from the national governments and WHO. Also, AI chatbots were used to answer queries of the uses regarding the disease and its symptoms.<sup>35</sup>

Since Internet has no boundaries, so the role of national governments, international institutions, technology institutions, and local governments are equally important. At their end, LGs could develop a reliable local communication system with communities for busting myths, curtailing rumour spread, and providing reliable information to the public.

## 3. Road to resilience

Cities have begun planning life after the pandemic. The most critical part of the recovery plan would be building resilience to mitigate the impacts of any impending crisis. During the Covid-19, it has been difficult for countries to take policy decisions instantly as the crisis was unfolding. Some of these decisions helped communities and citizens, while some backfired. The lockdown measures in many countries pushed millions of people into poverty and compelled them to make difficult choices. The economic stimulus and social welfare schemes did assist people in restarting their lives. It became apparent that economic revival is linked with inclusive growth and cannot be done without having a social protection plan for disadvantaged communities.

One of the most surprising things was the adoption of digital technology and how quickly cities, countries and organisations transformed themselves. However, the issues of data privacy and surveillance came to the fore too. Integrating policies, environmental, socio-economic issues and technology can be instrumental in creating a robust pandemic-proof ecosystem. LGs will have to make their infrastructure and workforce ready for technology adoption.

## #1 Building Resilience and Coping Mechanism for Pandemics



Cities are also rolling out a series of environmental initiatives to ensure public safety and bolster the fight against climate change. The green recovery plan of many cities gives us hope for a sustainable and greener future. Local leaders will have to understand economic and infrastructural progress cannot be infinite on a finite planet. Cities will also have to learn this fundamental fact highlighted by the pandemic this year because most of our mighty cities, despite having the best of the resources, collapsed severely.

The pandemic has had numerous learnings for countries, municipalities and individuals that can be used to make urban communities and societies safer and resilient in any such crisis in the future.



Source: Japan Tsunami, Canadian Red Cross (2011).

## Chapter 3

# Building Urban Resilience for achieving global goals

- 1) Global Scenario: Covid-19 and its impact on progress on SDGs
- 2) Building Resilience at Local Level for achieving global goals
- 3) Localisation of SDGs

## 1. Global Scenario: Covid-19 and its impact on progress on SDGs

The coronavirus pandemic has reflected the underlying issues in the urban ecosystem. Millions of people experience untold misery and suffering as the virus overwhelms health infrastructure in cities, supply chain management and service delivery systems. It is hurting the efforts of achieving several objectives envisioned under Sustainable Development Goals (SDGs), New Urban Agenda and Paris Climate Accord.

UNDP estimated global human development—a combination of education, health, and living standards—fell in 2020 for the first time since 1990 when measurements began. UNDP Administrator Achim Steiner said, “The world has seen many crises over the past 30 years, including the Global Financial Crisis of 2007–09. Each has hit human development hard, but overall, development gains accrued globally year-on-year. COVID-19, with its triple hit to health, education, and income, may change this trend.”<sup>36</sup> COVID-19 is likely to slow the progress towards achieving the SDGs. A report Evaluating progress on the SDGs by GlobeScan and The SustainAbility Institute by ERM show that sustainability practitioners continue to report unsatisfactory progress toward achievement of the 17 Sustainable Development Goals. Around 54 per cent of sustainability experts said that the progress has been poor, and others rated in neutral. It was shocking to see that just 4 per cent were satisfied with the achievements.

The pandemic has posed a colossal challenge but also gave cities a chance to speed up their efforts for achieving the Sustainable Development Goals (SDGs) that will decide the well-being of all, humans and the environment both. The pandemic may have given a severe blow to global efforts. The effects could be far-reaching than temporary if the right initiatives are not taken to bring the progress back on track with corrective measures.<sup>37</sup>

The pandemic has exposed systemic inequalities during the health crisis. The world has witnessed groundbreaking and quick solutions to provide relief to citizens and lay an inclusive roadmap for development. Digital solutions in Colombia helped reach over 2 million people with a new social protection scheme in a few weeks. Energy pricing reforms appear imminent to increase fiscal space. And the burden on women to carry out unpaid domestic work during lockdown has sparked calls for investments in the care economy, similar to those in Uruguay.<sup>38</sup>

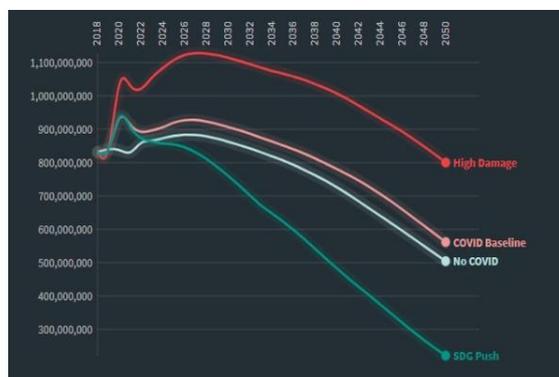


Figure 11 Projected number of people under poverty under different scenarios.

Under a ‘COVID Baseline’ scenario, the pandemic could raise the number of people living in extreme poverty by 44 million in 2030. Uncertainties are manifold, and under a ‘High Damage’ scenario, the world could see a staggering 251 million people driven into extreme poverty by the pandemic, bringing the total number to 1 billion by 2030. (Figure 1)<sup>39</sup> The research indicates that

focused SDG investments can put the world back on the same development trajectory as before COVID-19.<sup>40</sup>

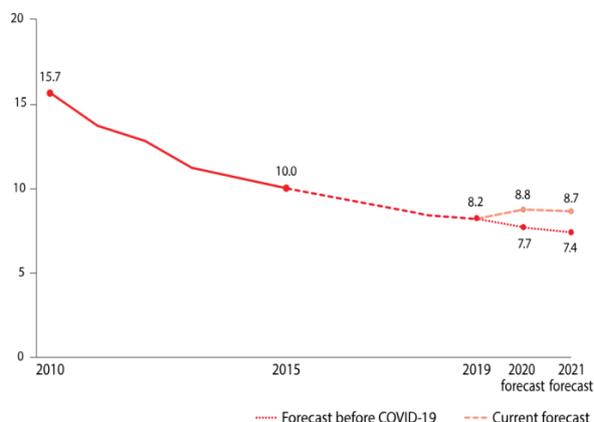


Figure 12 Proportion of people living below \$1.90 a day, 2010–2015, 2019 nowcast, and forecast before and after COVID-19 (percentage)

In the wake of the health crisis, eradicating hunger and achieving food security remains a challenge. The situation is worsening owing to economic slowdowns and disruptions caused by a pandemic-triggered recession. To combat the threats posed by the pandemic, countries need to take immediate action to keep the economic engine running, strengthen food supply chains and increase agricultural production. The direct impact of health crisis could be seen in (Figure 2<sup>41</sup>). Poverty could rise by 50–60 basis points.

In the time of the health crisis, ensuring healthy lives and promoting well-being for all was the

primary requirement that is also the SDG-3. The world witnessed sluggish progress in achieving Goal 3 targets. Many studies suggested that Covid-19 could throw future progress off the track and make it impossible to achieve the targets in time. The combined impact of the pandemic on health systems, economy and restriction in people’s movement could have potentially disastrous consequences and reverse decades of improvements in health outcomes.

An estimated 1 billion people had to spend a minimum of 10 per cent of their household budgets on health care in 2020. The income loss due to lockdown measures exacerbated the situation for the low-income families in developing countries where no financial or social assistance was made available. The crisis has underlined the importance of universal health care for all.<sup>42</sup>

The pandemic has forced the hands of the governments to focus on immediate healthcare requirements borne out of the pandemic and pushed the agenda of SDGs on the back seat. The health crisis has overburdened the existing healthcare systems, and during the year, most of the facilities were handling or catering to Covid-19 patients only. People suffering from other severe medical conditions could not get adequate medical care, and many delayed their check-ups, medical care. Even the national and state governments globally have requested citizens to delay non-urgent medical surgeries until the pandemic is over.

An article published in the medical journal Lancet says the COVID-19 threatens to reverse the progress of SDG 3 that aims to ensure healthy lives and well-being for all. During the crisis, 70 countries have halted childhood vaccination programmes, and in many places, health services for cancer screening, family planning, or non-COVID-19 infectious diseases have been interrupted or are being neglected. Health service disruptions could reverse decades of improvement, warns the report. Allowing people to slip through these service gaps could affect population health for years to come.<sup>43</sup>

# #1 Building Resilience and Coping Mechanism for Pandemics



Figure 13 Impact of Covid19 on SDGs. Source: UCLG ASPAC

People suffering from other diseases and comorbidity conditions have become vulnerable to the Covid-19 as the medical services are overburdened and only focusing on treating COVID-19 patients. The situation is worse in low-income countries because of the strain on existing infrastructure, which was hardly resourced. Many people cannot access medical services they require as even the governments in many countries have asked people to delay their surgeries and other medical treatments, if possible. Such a situation can result in an increase in illness and deaths from other diseases.

The pandemic has also highlighted the shortage of health workers in many countries. Over 40 per cent of all countries have fewer than ten medical doctors per 10,000 people; over 55 per cent of countries have fewer than 40 nursing and midwifery personnel per 10,000 people. An additional 18 million health workers are needed, primarily in low- and lower-middle-income countries, to achieve universal health coverage by 2030.<sup>44</sup>

In the absence of a well-timed policy decision and effective implementation at the local level, COVID-19 can undo the progress made in controlling maternal and child deaths. The pandemic has not just disrupted routine immunisation, access to regular health care facilities but also reduce access to essential nutrient foods for children guaranteed under welfare schemes. If the corrective measures are not taken, 118 low- and middle-income countries could see an increase of 9.8 to 44.8 per cent in under-5 deaths per month and an 8.3 to 38.6 per cent rise in maternal deaths per month.<sup>45</sup>

The pandemic also spotlighted the excess burden on women as nursing staff. Based on global 2013–2018 data, women comprise over 76 per cent of medical doctors and nursing personnel combined, but the distribution varies considerably between the two occupations. Women represent just over 40 per cent of medical doctors but almost 90 per cent of nursing personnel.<sup>46</sup>

Cities are already on the frontlines in the impending climate crisis. As the global urban population is expected to increase by up to three billion people by 2050<sup>47</sup>, cities will have to act urgently to save lives. Cities like Venice and Jakarta are experiencing rapid subsidence rates that, when compounded with sea-level rise predictions, render much of both cities underwater by 2100<sup>48</sup>. Heatwaves, which are already more extreme in cities due to the urban heat island effect, are rising in intensity and frequency. Finally, extreme precipitation events and storm surges are likely to increase flooding, especially in coastal regions.<sup>49</sup>

According to a UCLG ASPAC study, there are some critical effects of the pandemic on achieving different SDGs (Figure 3). Many of these issues could be addressed at the local level by making LGs efficient in planning exigencies. For example, cities should not let the regular immunisation of children affected by deploying additional resources required to handle the strain put by the pandemic on the health system.

## 2. Building Resilience at Local Level for achieving global goals

Covid-19 has proved to be an urban phenomenon as over 90 per cent of COVID-19 cases occur in urban areas. Addressing the issues of the most vulnerable in cities is decisive for building resilience. The data suggest that over 1 billion people living in informal settlements and slums in cities need to be addressed. The pandemic has exacerbated their issues like inadequate housing facilities with limited access to water, sanitation and waste management. The poor also faced the challenge of overcrowding of public transportation and limited healthcare facilities, and thus, low-income colonies or informal settlements became epicentres within epicentres in many cities.

Many urban dwellers in the developing world work in the informal sector and are at high risk of losing their livelihoods as cities lockdown. Even before the coronavirus, four billion people in the cities were facing worsening air pollution, inadequate infrastructure and services, and unplanned urban sprawl.

The issue of availability and access to open public spaces in cities came to the fore during the lockdown measures taken during the pandemic. The need for adequate allocation of urban land to open public spaces was strongly felt. In terms of access, the percentage of the population that can access open public spaces (within 400 metres walking distance along with a street network) averaged 46.7 per cent. Wide disparities in access are observed across regions, ranging from 26.8 per cent in Eastern and South-Eastern Asia to 78 per cent in Australia and New Zealand. Within countries, smaller cities consistently recorded higher levels of access than large cities.<sup>50</sup>

Restriction in the operation of public transport options reduced access to open public spaces in many countries. These places also provide livelihoods to street vendors and others dependent on informal economic activities. The livelihoods of informal workers operation in these places were affected in cities worldwide.

Urban planning is crucial for improving public health and mitigating people's vulnerabilities to other hazards, such as natural disasters. Successful examples of containing COVID-19 demonstrate the remarkable resilience and adaptability of urban communities in adjusting to new norms. Many cities have laid down their plans to enlarge the pedestrian pathways and cycle lanes to make their recovery a green recovery.

Cities have no option but to emerge stronger from the pandemic to recover fast and build robust resilience and be ready to tackle any such crisis in the future. To determine the enduring

prosperity of cities and their people, LGs have to plan urban expansion, infuse investment for bettering infrastructure and services, mitigate risks and respond to the needs of growing populations in a sustainable and balanced way.

Cities must explore the possibility of developing a well-crafted strategy to respond to COVID-19 and the climate crisis. LGs must prioritise circular economy frameworks, sustainable urban mobility, and investment in green infrastructure and adoption of renewable. Additionally, LGs must study the relationship between the pandemic's impact, and climate resilience, inclusive policies, and social infrastructure to give a proper direction to local planning and governance.<sup>51</sup>

Cities in many countries can play a vital role in improving access to education, bridging the gender gap, end violence against women, enlarge access to sanitation and other essential services. LGs will also have to promote renewable energy, build economic resilience, frame inclusive urban planning policies and design, address climate change and associated challenges to build strong local resilience. All these issues must be amalgamated for making local resilience plan for cities.

### 3. Localisation of SDGs

The COVID-19 pandemic threatens to amplify and exploit urban vulnerabilities across the globe. The significance of building local resilience is felt more than ever. *Cities must use the learnings from the crisis to overhaul their urban engines, make them resilient to such emergencies, focus on sustainable development, and avert the impending climate change crisis.*<sup>52</sup>

**In the post-Covid-19 era, cities will have to work on all social, economic, environmental and technological aspects for accelerating their efforts to become resilient. It will automatically aid the efforts for achieving objectives under SDGs and other global goals.**

The shutoff of economic activities in cities had a positive impact on the environment. To build back better, cities must learn that making cities cleaner is possible by spreading awareness on sustainable coexistence and curtailing activities harmful to the environment.

Many cities are building smart cities ecosystem and adapting technology to improve governance and urban management. Cities will have to bridge the digital divide and improve internet access for all at the local level if they want to reach out to every citizen and enlarge the impact of their digital governance and management policies. During coronavirus lockdowns, many people relied on the Internet for daily activities, including working from home, taking online classes, shopping and socialising. However, almost half of the world's population do not have access to the Internet. Till 2019, 53.6 per cent of people or 4.1 billion people, were using the Internet. The trend was not universal; low-income and middle-income countries had a poor share. In Oceania and sub-Saharan Africa, only 22 and 26 per cent of people had access to the Internet in 2018. The figure was 84 and 87 per cent in Europe and Northern America, and in Australia and New Zealand respectively.<sup>53</sup> Cities can lay an important role in improving internet access in their jurisdiction while adapting advanced technologies and implementing smart city policies.

Local Governments need to learn from the various aspects of the pandemic and plan their future development, not just making themselves efficient in handle pandemics and disasters but also learn the nuances to handle the social aspects of the evolving urban challenges. For example, a gendered analysis on the impacts of the pandemic on job losses and employment trends could help in making rehabilitation and recovery plans post-pandemic.

The role of cities is of supreme importance in the crucial decade of action to achieve SDGs as they can expedite the processes at the local level. The learning from Covid-19 will serve to reset urban priorities toward a greener future in line with the UN Sustainable Development Goals (SDGs).

Cities are gearing up to return to normalcy. They must seize the opportunity and plan for a brighter urban future with an eye on the rearview mirror to understand the multi-dimensional impacts of the pandemic, their response and learning. One of the big lessons for humanity this year is to slow down and rethink the priorities. It is valid for our urban spaces too. Many cities worldwide have started working in this direction by focusing on creating an ecosystem that ensures better living conditions for everyone in the city. City leaders need to keep assessing their requirements and priorities regularly. Growth without responsibility is not good enough.

The interrelating challenges of health, economy, environment and sustainability have become more apparent during the pandemic. It is an opportunity for countries and cities to integrate their efforts to address these issues holistically, not in silos.

*António Guterres Secretary-General, United Nations*

“Everything we do during and after this crisis [COVID-19] must be with a strong focus on building more equal, inclusive and sustainable economies and societies that are more resilient in the face of pandemics, climate change, and the many other global challenges we face.”<sup>54</sup>

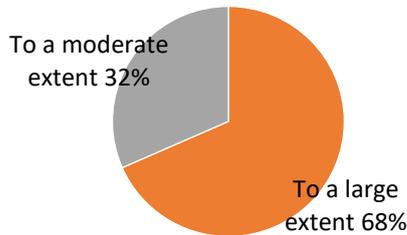
### **Box Item: Survey Result: The State of Localisation of SDGs and Local Response to Covid-19**

A total of 38 cities from the Philippines and Malaysia participated in the survey “The State of Localisation of SDGs and Local Response to Covid-19”. The cities participated in the survey are: Local Government Unit of Vigan City, City government of Makati, Miri City Council, Kuala Lumpur City Hall, Subang Jaya City Council, City Government of Baguio, LGU Catbalogan, LGU Vigan City, LGU Maasin City, Cabuyao , Local Government Unit of Cauayan City, Local Government Unit(LGU)-Tuguegarao City, City Government of Valenzuela, Local Government Unit City of Balanga, LGU Valencia City, City of San Fernando, Pampanga, Science City of Muñoz, City Government of Cavite, LGU Tagum, Local Government of Baguio, LGU Ligao City, Local Government Unit - Himamaylan City, City Government of Cotabato City, LGU - Toledo City (Philippines), Laoag City Government, City Government of Tabaco, LGU - City of Naga, Cebu, City Government of Calapan, Angeles City Hall Local Government Unit, City Government of Meycauayan, City of Malabon, Iloilo City Government, City Government of Legazpi, City Government of Zamboanga, City of Dipolog (Philippines) and City Government of Davao.

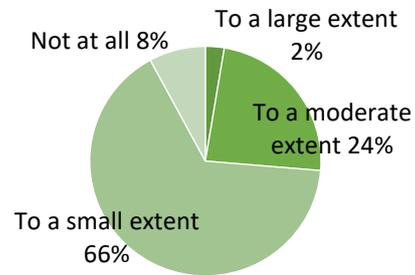
These cities responded to a questionnaire having 22 questions. The questions were designed to understand cities’ source of revenue, development objectives, the impact of Covid-19 on their municipalities and main challenges faced, the effectiveness of coordination mechanism in managing the COVID-19, COVID-19 pressure on municipal/provincial/state/district expenditure in different areas, Economic recovery measures availability, desired policy direction, prioritised policy tools for a successful exit and recovery strategy, desired National-level policy instruments, COVID-19 crisis impact to progress of localising the SDGs, and municipal/provincial/state/district government’s main challenges in localising the SDGs during COVID-19 crisis.

## What is the primary source of revenue of your municipality/province/state/district?

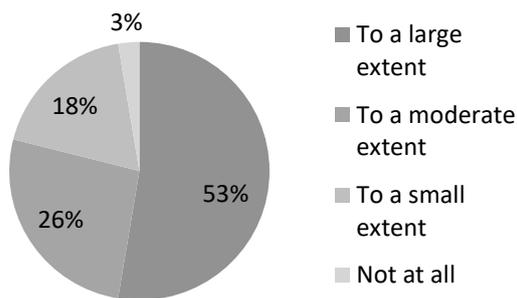
[Taxes]



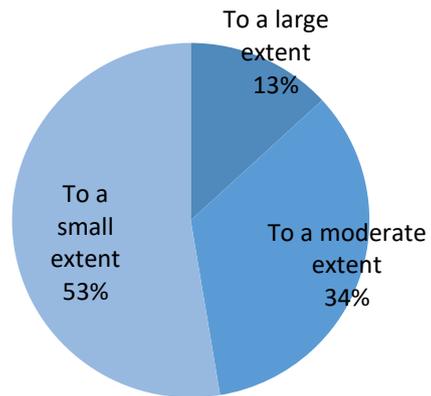
[Grants]



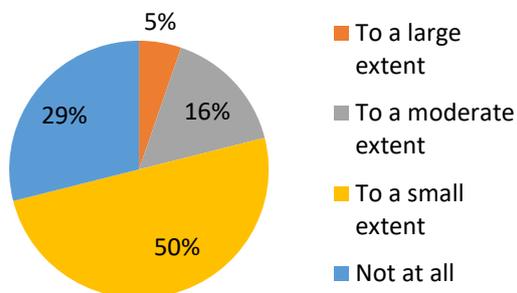
[Transfer from the national/federal government]



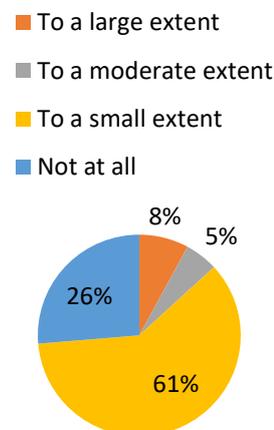
[Service charges and fee]



[Subnational borrowing]



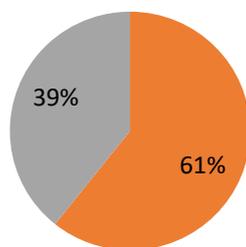
Others



## COVID-19 crisis overall impact on your municipality/province/state/district

COVID-19 crisis overall impact on your municipality/province/state/district.

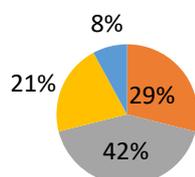
Moderate Strong



## Your municipal/provincial/state/district government's main challenges in managing the health crisis.

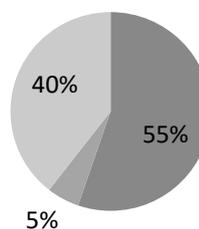
[Lack of technical means and equipment]

Very challenging  
Somewhat challenging  
A little bit challenging  
Not a challenge

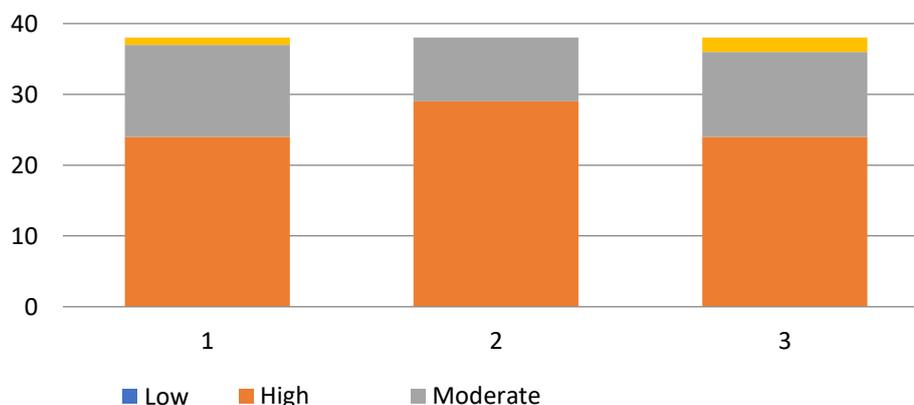


Vertical coordination mechanisms between the central and subnational governments

somewhat effective  
not effective  
very effective



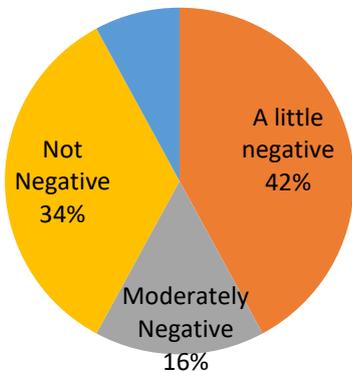
Prioritized policy tools for successful exit and recovery strategy in your municipality/province/state/district. [Coordination in the design and implementation of measures among all levels of government]



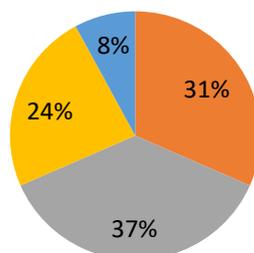
### COVID-19 crisis impact to progress of localising the SDGs in your municipality/province/state/district.

[Vision making]

Very Negative 8%

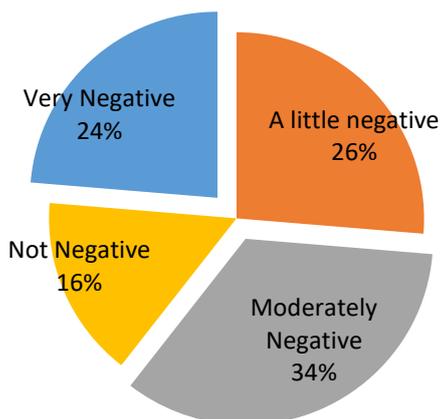


Mainstreaming the SDGs into local development/sectoral plans

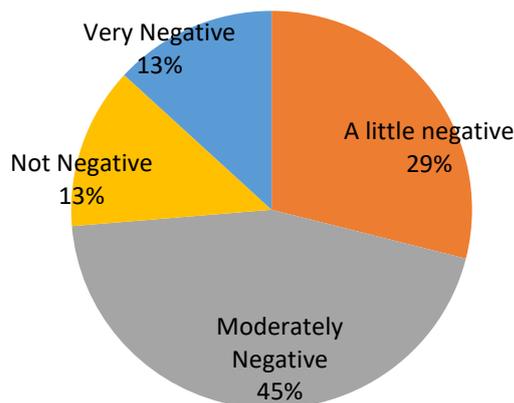


- A little negative
- Moderately Negative
- Not Negative
- Very Negative

Financing programs relevant to achieving specific SDGs

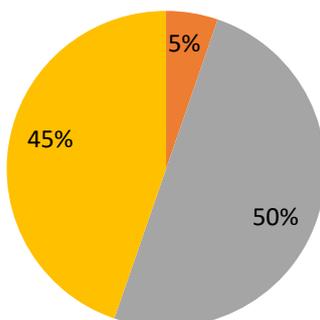


Monitoring and data collection



Your government's main challenges in localizing the SDGs during COVID-19 crisis. [Shifting priority]

- A little bit challenging
- Very Challenging
- Somewhat challenging



## Snapshot of Survey Outcomes

### Revenue Generation

- A majority of surveyed cities depend on taxes for their revenue generation.
- Only 2 per cent of cities have grant as their primary source of revenue, while 66 per cent depend on the grant to a small extent.
- 53 % LGs largely dependent on fund transfer from the nation and federal government.
- To a small extent, 53 per cent of cities depended on service charges and fee.
- Only 5 per cent of municipalities were dependent mainly on subnational borrowing.
- To a small extent, as many as 61 per cent of cities generated revenue from other sources.

### Challenges, Impact and Response to Covid-19

- Thirty-nine per cent of cities reported that the impact of Covid-19 was strong in their jurisdiction.
- A total of 29 per cent of cities surveyed believed that managing financial resources and arranging technical equipment was very challenging during the pandemic.
- Fifty-five per cent of cities believed that the vertical coordination mechanism between the central and sub-national governments was somewhat effective.
- Availability of legal/regulatory capacity to take the initiative, linking crisis exit plans and recovery strategies to sustainability agenda (e.g., SDGs, climate actions) was prioritised by 63 and 76 per cent of participants cities.

### Covid and SDGs

- Forty-two per cent of cities reported that the impact of COVID-19 on SDG' vision making was a little negative.
- About 38 per cent of cities said that mainstreaming the SDGs into local development/sectoral plans became moderately negative after Covid-19.
- Financing programs relevant to achieving specific SDGs had a little negative impact because of the pandemic, said 34 per cent of participant cities.
- A majority of cities asserted that monitoring and data collection had a moderately negative impact on localising the SDGs in their municipalities.
- As many as 50 per cent of cities believed that shifting priority had a very negative impact on localising the SDGs during the COVID-19 crisis.



## Chapter 4

# Case Studies: Best Practices from Cities in BRI Nations

- 1) Hangzhou, China
- 2) Ho Chi Minh City, Vietnam
- 3) Izmir, Turkey
- 4) Manama, Bahrain
- 5) Rome, Italy
- 6) Algiers, Algeria
- 7) Riyadh, Saudi Arabia
- 8) Shanghai, China
- 9) Athens, Greece
- 11) Indonesian cities
- 12) Wuhan, China
- 13) Daejeon, South Korea

## Case Study – HANGZHOU, CHINA

### Hangzhou led the way in using technology against the virus

As COVID-19 continues spreading across the world, measures taken by Chinese cities like Hangzhou may be instructive for countries still struggling to contain the virus. Hangzhou, the capital city of the Zhejiang Province, is located around a thousand miles from the epicentre of coronavirus pandemic in China, Wuhan. Zhejiang Province became the first to raise the risk management response to the highest level in the early days of the outbreak, even when there were no confirmed cases in the province. It demonstrated how, in such cases, overreacting was better than not reacting at all.

From very early on, city authorities of Hangzhou had started providing clear guidance and information on the severity of the disease and about the degree and scope of lockdowns. According to the Health Commission of Zhejiang Province, 6 cases were first reported on January 19, 2020, and the cumulative cases had reached only 169 as of February 20, 2020. On January 23, 2020, the whole of Zhejiang province announced a Level I Public Health Incident Alert, the highest level of emergency public health alert and response cited in the nation's public health management system. This measure quickly imposed maximum restrictions on the movement of people.

On February 3, 2020, authorities announced that every community in most of the districts of Hangzhou city would be kept under closed management and that only one family member would be allowed to leave the house to buy daily essentials every two days. The city is home to over 10 million people. Additionally, to resume the production of essential services and simultaneously prevent the transmission of the virus, Hangzhou arranged chartered transportation to help many migrants return to their native places.

Hangzhou also became one of the first cities to use big data and information technology in the prevention, tracing and control of COVID-19. The new approach was named "one map, one QR code, and one index," and this system of Health QR codes was established for everyone in the city, in addition to everyone who entered the city. The green code allowed one to move freely; the yellow code required a seven-day self-quarantine; the red code required a 14-day self-quarantine. The yellow and red codes could be turned green after completing the quarantine time if no symptom of the virus had appeared. It was made compulsory for each individual to monitor their temperature and update their profile daily to maintain their health status. The health database thus generated was closely monitored by Hangzhou's Center for Disease Control and Prevention.

In contrast to Wuhan, government officials in Hangzhou were well prepared by January end to mobilise and allocate resources immediately and to manage and monitor the evolving coronavirus epidemic in a proactive manner, which ultimately sought impressive results. In Hangzhou, around 204 public health physicians were deployed to investigate cases, identify close contacts of confirmed cases, and ensure that they remained under quarantine and surveillance of healthcare workers. Doctors in the city completed the world's first double-lung transplant surgery on a COVID-19 patient during the outbreak.

The successful implementation of prevention and control measures against COVID-19 in Hangzhou became an example for other parts of the world to follow in their fight against the pandemic. What Hangzhou did was to make everyone and each individual responsible. It got every unit involved and made officials accountable in the time of crisis, which turned out to be a much-needed measure. Zhejiang University School of Public Health developed easy-to-understand educational materials for students and awareness materials for the public with information about COVID-19 and how they could prevent the spread at the local level.

Local citizens, communities and businesses also banded together to help the city overcome the pandemic. People made donations in addition to volunteering for works. To build trust with the people during the outbreak, details of donations and expenditures were shown publicly every day on the government's official website and in the local newspaper Hangzhou Daily. As of February 2, 2020, the Hangzhou Red Cross had received over 174 million yuan from citizens, organisations and companies to support healthcare workers and other frontline workers. A special delivery service was also launched to provide healthcare and essential services to those who could not access it, like people strictly under quarantine, older adults, and people with disabilities.

Hangzhou also used big data generated by cellphone numbers, transportation records and online payment records to disrupt the transmission of the virus. For example, when a taxi driver was tested positive for COVID-19 in Zhejiang province, most of his passengers within 14 days were tracked down with their online payment records by the authorities concerned. Furthermore, nine other passengers who had paid in cash reported to local authorities after seeing the trip details published on public media. It was made compulsory for all train riders to register a personal cellphone number while purchasing a ticket when the lockdowns were eased across the nation. It facilitated authorities in tracking down and contacting passengers suspected of infection or sharing a ride with a coronavirus patient. Used together with the national digital railway ticketing system, transit-based big data turned out as a powerful tool to track and tackle possible transmission of COVID-19 infection.<sup>55</sup>

## Case Study – HO CHI MINH CITY, VIETNAM

### Saigon effectively fought the most of COVID battle outside hospitals

Vietnam reported its first case of COVID-19 in January 2020. Four months later, the nation had reported only 300 additional cases, with no fatality. At the end of January, when coronavirus was mainly confined to China, the Government of Vietnam said it was 'declaring war' on the virus, fully knowing that its medical system's capacity and funding were limited. Ho Chi Minh City, commonly known as Saigon, is a densely populated metropolis with a population of 8 million. It had only 900 intensive care beds, and a COVID-19 outbreak in the metropolis would have easily overwhelmed the system.

To stop the contagion from spreading across the city, authorities instituted a series of strict quarantine policies very early in the course of the pandemic, as compared to even

China. They meticulously tracked, documented, and quarantined anyone and everyone who potentially came in contact with the virus. The city also kept track of second, third, and fourth levels of contact to infected persons. Then these people were put under successively stringent levels of movement and contact restrictions for pre-defined periods of time.

The city chose to depend on its already established robust state security apparatus and initiated a widespread public surveillance system with the help of its military instead of relying on the weaker state of its medicine and technology systems.

Experts believe that one of the reasons Vietnam was able to act so quickly and keep the case count so low is that the country had the experience of dealing with the SARS (Severe acute respiratory syndrome) epidemic in 2003 and human cases avian influenza between 2004 and 2010. Although Vietnam is a centralised nation, the government gave local authorities the freedom to make several critical decisions to tackle the pandemic, which allowed people with more on-ground knowledge of the spaces to draw appropriate measures, including the city of Ho Chi Minh.

Between July and September 2020, the people were eager to travel and as a result, what started as a nosocomial transmission quickly developed into community transmission. As a result, at the end of July, reports of new COVID-19 cases had increased by 30 per cent. Ho Chi Minh City, which recorded more cases in this wave, adopted similar measures as before; imposed lockdown, introduced travel bans and closure of businesses.

With the help of widespread testing and aggressive contact tracing, the city could contain the third wave of coronavirus before it could get worse. Health officials in the city chose contact tracing to cut all legs of the transmission network of the cascading virus. After a confirmed case was identified and taken into treatment during July's wave in the city, those who stayed less than two meters from them for 30 minutes or more were also located. Due to experiences of the past, local officers of the metropolis and medical officers coordinated well with each other in conducting an epidemiological investigation, identifying places that the COVID-19 patient had been to and activities they had participated in for a week or more before testing positive.

This dragnet then helped the city's administration collect the identities of people who would have gotten infected or had just turned into a carrier and thus, were spreading the virus. There were concerns about policy, but mostly, citizens had no issue in relinquishing some privacy for the time being if it meant saving lives.

City authorities sealed the borders, constantly monitored suspected cases along with the confirmed cases of COVID-19 in the city, and many people were put under quarantine, especially those who had returned from the Danang province. Anyone and everyone who had come in contact with a confirmed case of COVID-19 or had travelled to a COVID-19 affected region was immediately required to get tested and put himself or herself in isolation for two weeks, irrespective of the fact that they showed any symptom of the infection or not.

Simultaneously, the city had also introduced public awareness programmes to reach its large population, mainly migrants from other towns and villages who had resided in the city for job opportunities. City authorities also encouraged a neighbourhood watch system, where the citizens were asked to inform the authorities in case anyone in their neighbourhood was infected with the virus and they had not already told the authorities. Since the city and its people had earlier faced the effect of such transmissible diseases, they were more than willing to comply with the guidelines, including wearing masks, following social distancing, and keeping neighbourhood watch.

According to Tran Le Thuy, Director of Centre for the Media and Development Initiatives, Hanoi, the most commendable part of the government's response to the pandemic was treating it purely as a health crisis and not a political matter, which allowed effective governance at the local level. The government adopted the motto that if everyone in the nation stays alive, the economy can be dealt with later.

Vietnam decided to open borders for foreign workers, and Ho Chi Minh City started receiving its workers back from their towns and villages to rebuild the economy. However, the city remains alert with the vaccination programmes still in process and continues its rapid testing, aggressive tracing of cases, and selective isolation and quarantine measures.

## Case Study –IZMIR, TURKEY

### Izmir' early resilience plan and action paid off against the wave of COVID-19

Turkey fits in the category of the few countries that responded pretty quickly to the racing spread of COVID-19 with testing, tracing, isolation, and movement restrictions. Many countries last year struggled to implement effective tracing programs and often depended on volunteers. Turkey's contact tracing system, however, dates back to nearly a century, which was developed then to fight measles and tuberculosis.

Turkey is home to more than 4 million refugees, which makes Turkey hosting more refugees than any other country in the world. The nation, with the help of funding from the European Union, Turkish Red Crescent and IRFC, was able to provide monthly cash assistance to the most vulnerable families through the Emergency Social Safety Net (EESN), which is claimed to have benefitted over 1.7 million refugees. Additionally, in a bid to build trust, Turkey's nine Service Centres spread across Turkey have remained fully operational to provide informational and support rolls by taking robust measures to ensure the safety of both its staff and visitors.

With the onset of the pandemic, Turkey launched a 21-point stimulus package worth USD 15.4 billion. Furthermore, Izmir Metropolitan Municipality immediately started Crisis Municipality practice and prepared a "COVID-19 Resilience Action Plan" following the instructions of the city's Mayor. Under this resilience action plan, the municipality improved internet access, distributed tablets to students, and created community education centres to increase students' access to the expanded digital education platform.

Arrangements were made by the Turkish government for the establishment of mobile hospitals, especially in mountain villages. They could quarantine 50 people, with health equipment available in AKS vehicles. Measures were taken to protect the daily workflow in the nation following occupational safety. Therefore, measures like body temperature measurement, hygiene and social distance education, the use of masks and gloves, and disinfection of buildings, vehicles, tools and equipment, were made compulsory. Within the scope of the Presidency circular and Izmir Metropolitan Municipality circulars, a remote working system was adopted primarily for office personnel to prevent disruption of services.

Under Izmir's Crisis Management programme for COVID-19, a different approach was adopted for coronavirus testing. The hospital management turned a safety cabinet into a health cabin to take samples from patients. In this way, contact between healthcare professionals and patients was minimised, and healthcare professionals were enabled to take samples without having any direct contact with patients tested for COVID-19.

Izmir Metropolitan Municipality further allocated 1,10,000 square meters in Gaziemir Fair facilities and 23,000 square meters in Kültürpark to the use of the Ministry of Health as field hospitals. Izmir Municipality provided free public transport and parking to all healthcare personnel, pharmacists and pharmacy employees working in Izmir and fighting the coronavirus. The municipality also distributed masks (2000 per day), visors and snacks (600 per day) to the city's health institutions.

To further stop the spread of coronavirus infection in cities, public vehicles such as metro, tram, bus and sea transportation, service buildings of public institutions, schools, parks, gardens, and all other public spaces in the city were disinfected regularly. Disinfectants were placed at each bus stop, station and pier for commuters, which worked 24/7. By April 2020, Izmir Metropolitan Municipality, with the help of the Government of Turkey, had already introduced an application or machine called 'Maskmatic', given inadequacy when it came to having access to masks. With the application placed at metro stations, the residents of Izmir were able to receive a "hygiene package" containing four masks and 100 millilitres of disinfectants using their Izmir transportation card, free of charge.

In Turkey, 57,011 litres of disinfectant was used to purify public spaces in the first week of March last year, resulting in the disinfection of 16,290 public buildings (taxies and taxi ranks, minibuses and minibus stops, Izulaş and Eshot buses, hospitals, pharmacies, post offices, banks, and service buildings of public institutions) and 3,273 kilometres of streets and sidewalks in the early stages of the pandemic. Detailed measures and arrangements were quickly put in action by the Izmir Metropolitan Municipality to adapt public services to the new coronavirus pandemic. In public transportation, few changes in 220 rail system cars, 1,460 buses, 375 taxies, 246 service buses, 317 minibuses and 118 cooperative vehicles made them suitable for citizens to follow physical distancing.

Izmir Metropolitan Municipality created an all-inclusive solidarity campaign for people in need in Izmir due to the new coronavirus outbreak. The distribution of food and hygiene materials, which was earlier initiated primarily for people over 65 years of age and without

an income, was later organised as a solidarity network throughout Izmir. Network of professional chambers, businessmen and thousands of volunteers in Izmir ensured social solidarity and saw to it that the needs of those in need and those who could not leave their homes were met. In April 2020, 400 TL was deposited in each of the accounts of 40 thousand families in need registered in the municipality's database. This was done to help families who were unemployed and had lost their source of income due to a pandemic. Additionally, looking at the absence of businesses supporting the food needs of street animals due to the pandemic, Izmir Metropolitan Municipality distributed 70 tons of pet food in 19 districts of Izmir and even outside the metropolitan area. Metropolitan Municipality continued distributing food for street animals in 11 central districts in cooperation with NGOs throughout the pandemic.

## Case Study – MANAMA, BAHRAIN

### 21<sup>st</sup>-century technology was shield against COVID in Manama

The World Health Organisation commended Bahrain for its swift and effective countermeasures against COVID-19. As far back as February 2020, Bahrain had set up a war room and had built a camp for 3000 pilgrims returning from Iran to filter and treat COVID-19 positive cases.

The officials of Manama, the capital city of Bahrain, after assessing the situation, turned towards technology for response to the sudden and new public health crisis. The country quickly developed an information and contact tracing app called BeAware. The app recorded over 9,73,000 downloads by August. It helped authorities identify cases, trace people who might have gotten infected, and provide its citizens with regular updates on cases and measures taken within Bahrain and across the world. The app, with the facility of e-services like booking appointments for tests and viewing their results, soon became a core component of Manama's collective response to COVID-19.

According to the authorities of Manama, it was due to contact tracing and notification efforts enabled by the BeAware app that health authorities were able to identify and isolate most cases before the development of symptoms, consequently minimising the potential for onward transmission. Bahrain recorded one of the highest per capita testing rates in the world. They had conducted around 9,12,000 test by the first week of August 2020, and more than 20 per cent of the contacts identified and notified through the BeAware app had tested positive.

The health ministry of Bahrain issued Royal Directives to provide free COVID-19 tests and treatment for all citizens and residents in the Kingdom of Bahrain. This step acted as an effective mitigation method against the ever-spreading virus in the capital city, for without the worry about costs associated with being tested or follow-up medical care, the urban population, including the urban poor, trusted the government and were prompted to get tested whenever and wherever they felt the need to.

The government in Manama also distributed electronic bracelets compatible with the BeAware app, which sent an alert to a governmental monitoring station of any suspicious

activity by a person put under quarantine. Individuals isolated in their homes because of infection wearing the electronic bracelet were required to remain connected to the app at all times via Bluetooth, with GPS enabled to track movement, thus ensuring that they do not leave their location. Those under self-isolation were also asked to set their location, most likely their place of residence, and made to remain in that location until cleared.

Meanwhile, officials of the health ministry let the authority randomly ask the patient concerned to send a picture, which was a must for self-isolating individuals to respond, that clearly showed their face and the bracelet. An immediate alert was also sent to the monitoring station if the wearer moved further than 15 metres away from their phone. According to Bahrain's Information & eGovernment Authority (iGA), violators were liable to face legal penalties, potentially getting sentenced to imprisonment for not less than three months, as well as a fine between \$2,660 and \$26,595, or either one of the two penalties. Attempting to remove or tamper with the bracelet was also considered a violation. Thus, the resilient Manama demonstrated an example of leveraging technology to safeguard the well-being of citizens and residents when at war against a widespread pandemic.

When faced with the reality of the poor and vulnerable getting more affected due to the pandemic, the Government of Bahrain approved a financial rescue package, which amounted to 28 per cent of the country's Gross Domestic Product. Besides, the Supreme Council for Women in Bahrain distributed essential commodities and health supplies to families supported by Bahraini women, based on the lists of needy households whose living conditions were being monitored by the council.

The government also transformed a TV sports channel into an educational channel. It was hell-bent on using every resource to use in the war against the virus, to lessen its impact on the nation and its people. All individuals and businesses in the country were exempted from municipal fee, industrial land rental fee and tourism fee for three months from April 2020, after recognising the increase in unemployment rates and businesses shutting down due to the pandemic.

Innovation became the bone to rely on in Bahrain's fight against COVID-19 as engineers from the Bahrain International Circuit, in partnership with Salmaniya Medical Complex's Respiratory Therapy Department, designed breathing apparatus units be used for non-ICU patients in need of respiratory assistance. Bahrain's Ministry of Health was quick to recognise the new asset, and it was put to use in several hospitals to assist healthcare workers in non-ICU wards of COVID-19 positive patients.

Bahrain's resilient fight against COVID-19 offers perspective on how working citizens, residents, volunteers, government officials, and a responsible government working together can help a nation maximise the benefit of mobile applications, innovative technology and smart solutions in its response to whatever challenges it faces, even if the challenge turns out to be the greatest global challenge that this generation has ever seen. Bahrain showed foresightedness in their actions and great aptitude in responding proactively and early to the approaching pandemic.

## Case Study – ROME, ITALY

### Volunteers made Bari and Rome resilient to the pandemic

After the World Health Organisation declared the COVID-19 outbreak a public health emergency of international concern, the Italian government declared a six-month-long state of health emergency and entrusted the Civil Protection Department to coordinate interventions necessary to deal with the emergency in the national territory. The primary measures taken up by the government, health system, and citizens were the same in Italy as they were in the rest of the world. What stood out was the role that Italian citizens played as volunteers in the densely populated cities when Italy emerged as one of the worst-hit nations.

Italy comprises a regionally organised NHS, which mainly provides free healthcare at the point of delivery and is regionally administered, with the central government sharing responsibility with the respective regions for healthcare services planning and delivery. However, few systematic issues started emerging as issues of concern as the pandemic progressed, such as the impact of prolonged cuts and cost-containment measures, widespread shortage of human resources, regional variations in the quality of services and outcomes, ageing workforce (average age of 51 years), delays in the digitisation process, and inadequate budget allocation for preventive measures.

In March 2020, hospitals in the cities of north Italy started reporting system saturation, majorly owing to high patient loads requiring intensive care. One of the most afflicted areas was in the city of Bergamo. The shortage of hospital beds, ventilators and health professionals became a concrete threat in cities. Health professionals from different disciplines were converged to COVID-19 patient care. By March 22, a total of 4824 healthcare workers had been infected (9 per cent of the total cases at the time), and 24 doctors were dead across the nation. The situation worsened as the issue that tests were not available for most health workers and personal protection equipment kits were in short supply started being reported from across the country. By May 4, 154 medical doctors had died from COVID-19 infection in Italy.

In March 2020, when Italy faced unprecedented pressure on its health system, cities like Rome, Bari, and Vienna appealed to relocate staff from abroad to help in Italy, where, as of March 30, more than 1,00,000 people were known to have contracted COVID-19, at least 11,500 of whom had died. Authorities also asked 300 volunteer doctors and 500 nurses to work in the city hospitals worst hit by the outbreak in Italy. Responding to the appeal, almost 17,000 people came forward. The government provided these medical professionals with reimbursement of travel expenses and provided a 200-euro daily wage from the government for their services.

International NGOs and many volunteers came forward to protect health workers. They provided them with safer infrastructure and personal protective equipment. They also filled gaps on the periphery of the crisis in cities including Rome, such as services for migrants, the homeless, unaccompanied minors, and other vulnerable categories.

NGOs like ActionAid Italy used lessons learnt during a disastrous 2016 earthquake in central Italy to put together Covid19italia.help – a digital hub to keep citizens safe and informed, where users can access information, aid opportunities, and verified news. The Italian Red Cross Society organised a volunteer programme for ordinary citizens during the pandemic. The medically trained volunteers were deployed on ambulances and first aid activities. Others helped by running food and medicine deliveries to elderly or immuno-compromised people and by checking the temperatures of the few passengers at airports and train stations.

Francesco Boccia and Antonio Decaro, Mayor of the southern city of Bari and Regional Affairs Minister, proposed creating a 60,000-strong corps of volunteers in May. These volunteers were recruited and trained by the city's civil protection unit to help control access to parks or markets, counting the number of people entering or leaving or explaining the rules of access to beaches when they reopen. After the training, they were deployed to take up different responsibilities, including training groups of volunteers in other cities of Italy.

Some volunteers in Rome even formed an association to help the city's poor with legal and material assistance, including access to food banks. Its volunteers delivered food in Ciampino, on the outskirts of Rome, while the association kept coming up with ways to keep its food distribution going through home deliveries. More than 1,00,000 volunteers at ANPAS (Italian associations that assist the general public) continued guarantying emergency transport across the country, simultaneously playing their part in operations centres, call centres and regional task forces, putting up tents for triage screenings at hospitals, collecting medical supplies and much more. Every day, food banks across Italy collected food and distributed it to around 7,500 charity outlets assisting one and a half million people in poverty.

Online volunteering had proliferated with the emergence of COVID-19. In Vienna and Rome, citizens who wanted to volunteer from home translated important documents such as the new health protocols that were shared with the public and that were evolving with the emergency daily and looking for as much personal protection equipment as they could find, for which they would scour the internet, make dozens of calls, compare prices and try to judge the reliability of products on which their colleagues' lives depended.

It is extremely easy to see the value of the planning skills and the strategic role volunteers' sector played in Italy's recovery. "Together with doctors, nurses and pharmacists, more than 1,00,000 volunteers are on the front line every day battling the COVID-19 emergency," wrote the Italian Ministry of Health, thanking every person who came forward when Italy was in a brutal war with the virus last year. These volunteers found during the lockdown that staying at home was not for them, and therefore stepped out to help others. They abided by the government's instructions to protect themselves and those they assisted, thus making an essential contribution to easing a situation that, day by day, threatened to become unbearable for Italy as a nation.

## Case Study – ALGIERS, ALGERIA

### Algiers worked on financial schemes and e-commerce to tackle the pandemic

Algeria imposed a strict lockdown right after the first infection of COVID-19 was recorded in February 2020 in the nation. Although the country has been going through political upheaval for the past two years, the government managed to sail the nation through the fatal year of 2020. As the cases peaked in May, Algiers, the capital city of Algeria, came face to face with the inadequate number of ICU beds in the city and the lack of health infrastructure. However, the Ministry of Health of Algeria, with the help of fast and efficient decisions and the fluidity of information sharing in the nation, reduced the pandemic's spread and the rate of mortality caused by it.

The bigger problem for Algiers was to have its citizen maintain social distancing in the densely populated city. Therefore, acting quickly and decisively, university, schools and training centres were closed entirely by March 12, 2020, by the city authorities. Immediately after, flights were suspended, mosques were closed, and restrictions were imposed on travelling and commercial activities. The government held press conferences daily to offer detailed information on the virus, including daily figures of new cases and steps that they were undertaking to help the citizens. It ensured direct communication to build trust among the citizens at the time of the health crisis. To limit the movement of people in the city and to contain the spread of the virus, Algiers gave a major push to home delivery activities.

The government, in a unique step, introduced various tax reforms and measures to ensure its citizens' social security during the pandemic. To support the companies and businesses established in the capital city, which were financially impacted by the health crisis, the city's public authorities postponed the return declaration and payment dates. Taxpayers across the nation who found themselves in a difficult financial situation were allowed to request a repayment schedule for their tax debts. Additionally, taxpayers that have previously benefited from a repayment schedule could also request an adjustment of their schedule in case of difficulties in cash flow.

At the end of July 2020, the General Taxation Department of the Algerian government published a press release on its website on new tax measures to support businesses. It stated that fines, increases and penalties charged for late filing of declarations and payment of related duties, taxes and fees were cancelled as part of the tax-related measures adopted by the public authorities in support of economic operators that were highly financially impacted by the health crisis. Late payment penalties related to tax rolls were also cancelled, and taxpayers in financial difficulties were allowed to request the competent tax collector the granting of a payment schedule for the payment of the taxes due, according to their financial capacities. Officials in Algiers were quick to act on raising awareness among its residents about the reforms.

In another set of measures, at the very start of the pandemic, the Bank of Algeria reduced the minimum threshold of the liquidity ratio from 100 per cent to 60 per cent, which allowed banks in Algeria to have more money to lend, which in turn led to decrease in lending rates for the general public. Due to the lockdown, economic activities were at a standstill in Algiers, like every other city worldwide. To increase the nation's money supply at such a time and to expand the economy, the Monetary Policy Operations Committee decided to reduce the required reserve ratio from 10 per cent to 8 per cent and to lower the reserve ratio by 25 basis points.

Huge volumes of social transfers, grants of tax relief, social housing policies and support for entrepreneurship, in addition, were provided by the authorities of Algiers.

The COVID-19 pandemic hit the housing sector particularly hard, which prompted its government to swiftly respond with various measures to alleviate the negative consequences of the crisis for tenants, borrowers, builders and lenders. Rental market restrictions such as rent controls introduced by Algiers helped tenants in the short term.

The United Nations Development Programme noted two distinct ways in which the Algerian population demonstrated resilience towards the pandemic. One, urban centres and merchants in the capital city had turned away from their cash-based system and moved towards e-commerce, for it limits the amount of person-to-person contact involved in economic transactions of all sorts. Merchants in other cities, and even villages, followed suit. The other way adopted by Algerians was that villages often self-isolated themselves if any coronavirus case was detected. The pandemic may have highlighted the nation's weaknesses, which officials have noted down to work on. Still, it also allowed the communities and officials to find numerous other ways to respond to the pandemic in full force.

The early measures taken by the Algerian government had brought the COVID-19 situation under control, without having the authorities resort to extreme measures such as declaring a state of emergency to deal with the spread of the virus.

## Case Study – RIYADH, SAUDI ARABIA

### Epidemic of 2012 had prepared Riyadh for the pandemic of 2020

The current COVID-19 pandemic caused by the infectious SARS-CoV-2 virus has already negatively affected millions of people and the economies of countries worldwide. However, the challenges that Saudi Arabia and its capital city, Riyadh, had faced during the Middle East respiratory syndrome coronavirus (MERS-CoV) epidemic that began in 2012 enabled the nation to show marked improvements in its response to the current pandemic.

The first several cases reported in Saudi Arabia were in the City of Al-Qatif (in the Eastern Province) and were attributed to people who had returned from Iran. However, the death rate per million population due to COVID-19 has been very low in Saudi Arabia, which

could be a result of the Ministry of Health's (MOH) preparedness and efforts in terms of increasing hospital capacities, and providing appropriate treatment protocols.

A series of proactive decisions were initiated by Riyadh, even before the first case was reported in the country, because of an anticipation of possible disease spread. First, a high-level task force headed by the MOH was established to prevent the pandemic. Second, Royal and Ministerial Orders immediately announced the suspension of many activities in which crowds could potentially gather to curb the spread of the disease. The suspensions started with no-issuance of new tourist visas. Allowance of Umrah (a religious ritual that can be undertaken any time of year in Makkah) was suspended for visitors first and later for all citizens and residents of the country as a preventative measure. International flights were cancelled altogether. All schools and universities were closed, and public and private workers were asked to remain home until further notice, except for those who keep safety and security or deliver products. The orders culminated in an almost 24-hour curfew for everyone in the country. Moreover, survey data released later established that once the government had partially lifted the curfew, the cases peaked, which showed the importance of public health measures and its influence during the early stages of the pandemic.

In 2012, another member of the coronavirus family, MERS-CoV, had caused havoc in Saudi Arabia. Both SARS-CoV-2 and MERS-CoV cause severe pneumonia. MERS-CoV caused greater disease severity among infected patients, SAR-CoV-2 has a higher rate of transmission. From 2012 to 2015 in Saudi Arabia, a widespread infection caused by MERS-CoV had strained the nation's health care system. It caused a high casualty, with the fatality rate of about 34 per cent in the general population and about 22 per cent among health care workers.

One of Riyadh's crucial lessons from that outbreak was the paramount role that infection control units play. Most hospitals had underestimated the role of these units during the MERS outbreak. However, after the MERS outbreak, many national programs were established in Saudi for teaching infection control measures, which were developed and monitored by the MOH and the Saudi Commission for Health Specialties. Because of those very programs being in place, their implementation and the number of already trained staff played an all-important role in the war against the COVID-19 pandemic in the city.

The previous epidemic had also highlighted the importance of preparedness of a health care system, which led to many hospitals in the city increasing the number of isolation units, beds in their intensive care units, and ventilators, which ultimately helped the health system of the city from falling apart as it had happened in many well-established cities of other nations.

Public health surveillance studies were scarce during the MERS epidemic, having very few professional Saudi epidemiologists available and insufficient case tracing. To increase the number of professionals in public health, the MOH later supported the establishment of an Epidemiology major in Saudi Universities. Consequently, Saudi was able to undertake

case transmission tracking for the COVID pandemic using local expertise, which was evident in Riyadh during the pandemic.

Furthermore, based on the MERS outbreak experience, several organisations, including the Saudi Centers for Disease Control and Prevention and Reference Laboratories, were developed under the MOH to monitor infectious diseases over time efficiently and provide support to the primary health care clinics in the nation. Many experts believe that the most critical lesson learnt and worked upon by the city after the MERS outbreak was the importance of research and development. The MOH, King Abdulaziz City for Science and Technology, and various Saudi Universities are currently sponsoring many national and regional projects promoting the development of vaccines and promising therapeutic targets, as well as innovative technologies, to help contain the ongoing Covid-19 pandemic and support research aimed at understanding the pathogenesis of the disease.

According to Algaissi A, the MERS-CoV epidemic helped Saudi Arabia in establishing a public health system that was more alert as well as had better infection control policies and measures. The City of Riyadh has undoubtedly improved in terms of clinical and scientific research on epidemics. The whole nation will soon build and establish appropriate biocontainment laboratories as it has started moving into better governance of research and development. The experience learned from the MERS-CoV epidemic helped the city and the country to be better prepared for the outbreak of SARS-CoV-2 (or COVID-19), making Saudi Arabia among the first countries to implement early and unprecedented precautionary measures to prevent the spread of COVID-19 in the country and to remain fully prepared to mitigate its impact when it arrived.

## Case Study – SHANGHAI, CHINA

### Shanghai demonstrated the effectiveness of early preparedness against COVID-19

Shanghai, a city in China known as a transportation hub and having close economic ties with the Hubei Province (the epicentre of the COVID-19 outbreak in China), was considered highly vulnerable to the coronavirus. However, with the help of early preparedness and multiple appropriate measures, the city of around 30 million people did better at containing the outbreak than most such populated cities in the world.

After facing the SARS crisis in 2003, China had established a National Emergency unit. Under this unit, mechanisms, plans, and emergency management offices could be created at national and local levels in time of any future crisis. China used this unit during the onset of the COVID-19 pandemic in January 2020, allowing enhanced cooperation between different departments, and unified and standardised information sharing and management processes at a single platform for all of China. This helped Shanghai in ensuring quick decisiveness and response to the pandemic.

Due to the weathered outbreaks of an array of infectious diseases, including hepatitis, A crisis in 1988, SARS in 2003 and H7N9 in 2013, scientists and healthcare workers in China were quick to point out the preventative measures against the SARS-CoV-2 infection,

including wearing masks, washing hands regularly, and maintaining social distancing. COVID-19 turned out like a cascading infection at a level higher than others. This prompted Shanghai, with extensive experience along the way in terms of outbreaks of infectious diseases, to take measures, which sought to cut the contagion chain at three primary levels: individual-infected person, community and high-risk area. At each level, authorities had also defined failure scenarios to map out their possible effects and control measures.

Due to the already widespread use of smartphones in the city, which included even informal workers and old-age people, it became highly plausible for the government to trace suspected cases, healthiness level of public spaces, etc., with the help of smartphone applications.

Shanghai has been structured in terms of compartments which are residential conglomerates, in which committees are formed to promote cohesion in the community, a sense of belonging, and also to ensure that the rules are followed at the neighbourhood scale. The city authorities put these already formed neighbourhood communities in charge of taking the temperature of the people at the entrance of each residential compartment and paying more attention to the most vulnerable inhabitants. These communities are either private or voluntary based on the socio-economic conditions of the compartments, but they were there in every neighbourhood. Given the high population density of the city, these neighbourhood committees allowed the city authorities to closely trace and control the health conditions of the inhabitants, thus enhancing the government to activate fast responses to new cases and to stop the spread of the virus.

In early January 2020, weeks before China imposed a lockdown in Wuhan, Shanghai had started training its doctors to ensure that they were armed with the proper knowledge before the first COVID-19 positive patient – the disease caused by the new coronavirus – appeared in the city. Furthermore, it had deployed over 550 public health officials to trace the close contacts of 1,071 suspected patients very early in 2020. Experts lauded the thoroughness of these officials, for they included questions like the size of the patients' apartments, which stalls they had visited at a produce market, and what kind of food they had bought there.

Reports suggest that in Shanghai, the time it took from seeing the first symptoms of COVID-19 in a person to diagnosing the illness was as short as one day on average. The authorities of the city made sure to meticulously and rigorously comb all communities for patients. Other than antigen tests in the early period, the hospitals also considered CT images and epidemiological evidence to identify and isolate suspected cases.

Shanghai also had Hu Bijie, a member of the National COVID-19 Medical Expert team, carry out a training session in late January for medical staff in the city. He had emphasised detecting the early signs of infection and its importance among healthcare workers. Consequently, the city reported zero cluster infections among doctors and nurses, where Wuhan and Beijing had reported numerous infections at hospitals.

Zhang Wenhong, Head of the Shanghai Medical Treatment Expert Team, said that without early preparedness, an outbreak in the Shanghai city could have been disastrous, majorly because of the high population density. He attributed the city's success in preventing new COVID-19 cases from rising exponentially to the intense discipline shown by the people. Additionally, during the reopening of the city, authorities ensured every preventative measure be followed strictly by every resident, including wearing masks, using QR Health Code, ventilating public spaces, etc. Not allowing any laxity in terms of COVID appropriate behaviour in the city helped Shanghai dodge the bullet of the second wave of coronavirus as well.

## Case Study – ATHENS, GREECE

### Athens undertook 'Whole-of-society' approach in its fight against COVID-19

The first case of SARS-CoV-2 infection was detected on February 26, 2020, in Greece, Athens. The government's primary focus became containment of the virus spread, keeping in mind the shortage of ICU beds in the country. Acting promptly, the Government of Greece imposed a nationwide lockdown when only 624 cases had been detected. The National Health Care System was restructured in a bid to fight the approaching 'war'.

In a series of quick reflexes, the city accelerated the digitisation of critical public administrative operations. A list of protective actions to limit contamination within and outside the refugee camps having intense population density in and around the city was taken. The closure was introduced at all the places where mass gatherings were possible in the city, like malls, educational institutions, weddings, etc. The city also introduced a reduction of 40 per cent in rent of private businesses. Many corporates of Greece, such as Grimaldi Group, donated millions of euros to purchase medical equipment and COVID test kits. Additionally, with the help of European funds and private donations, all schools nationwide were provided with tablets and laptops by the Education Ministry of Greece.

According to data from John Hopkins University, Athens was proportionately five times more effective in limiting the mortality rates than Berlin. Experts believe that the possible reasons included not only early measures taken by Athens but also the fact that the citizens eagerly complied with the lockdown and other restrictions because they found the government warnings that the health care system might not cope with being all too credible. The public health system of Greece has been ravaged by years of austerity mandated under the International Monetary Fund and the European Union bailout conditions.

The government also began daily television broadcasts, every day at 6 PM, informing the public about the latest development in the situation, warning citizens that the weak healthcare system of the nation meant that early implementation of harsh, preventative measures was essential to save lives, even if it meant compromising on the recently cured

economy of Greece. The authorities gave equal importance to communications strategy as it gave to the early measures.

The city's authorities moved quickly in bringing experts from all sectors together to protect marginalised communities. They knew that strict restrictions on movement and markets would heavily impact vulnerable groups living in the city, who would face isolation and disruption, lack of treatment and rehabilitation services, and reduced access to social programmes. These groups were also at higher risk of contracting COVID-19 and developing a more severe case of infection due to higher rates of non-communicable diseases.

During the pandemic, city authorities of Athens partnered with Hellenic Liver Patients Association to strengthen the support in providing marginalised communities with essential supplies and health information, with the help of funding from the Partnership for Healthy Cities. Under this programme, trained staff and volunteers distributed food, water, masks, sanitisers, and information on COVID-19 to the homeless, sex workers, migrants, refugees, etc. The city's officials often say that the informational flyers provided people with life-saving public health advice on ways to protect themselves and others around them from COVID-19 infection. Athens also created temporary housing facilities for more than 400 people affected by homelessness amidst the lockdown.

The municipality of Athens changed their manner of support, and relatively more meals were distributed inside of shelters and reception centres than on the streets. Looking at the increase in hungry people, organisations like Steps Greece and many others swelled up their meal distribution during the lockdown. O Allos Anthropos, a social kitchen in Athens, increased its food production tenfold, from 200 to 2000 meals per day. The Syrian-Greek Youth Forum partnered with it to produce a thousand more meals, which they distributed across the city amidst the coronavirus wave.

From the diverse population of residents of Athens, people distributed raw and cooked food throughout the lockdown, and individuals and groups formed neighbourhood solidarity networks and made protective gear for first responders, neighbours, and the poor. NGOs partnered with seamstresses and designers to train their volunteers in making masks in line with European public health guidelines. By the end of the spring lockdown, masks made by these NGOs in thousands had successfully reached hospitals, refugee camps and the people on the streets.

Kostas Bakoyannis, Mayor of Athens, said that these harsh times had taught them that the best outcome always comes with collaboration and consistent efforts. When a city and civil society make joined efforts, the result is more than fruitful, because together they can create a safer umbrella for marginalised populations. Marianna Trias, WHO representative for Greece, had said that WHO continues its support towards Greece with advocacy and evidence-based policy guidance for COVID-19. She believed that the approach of 'Whole-of-society' taken in Athens ensured no one was left behind. It amplified the best of social norms while creating a new positive normal that minimises stigma and discrimination.

## Case Study - INDONESIAN CITIES

### Mitigating social, economic impact of pandemic

Indonesian cities promoted better resilience and sustainability during the combat against the pandemic. The thrust to promote resilience was in addition to prevention, social and economic measures taken to negate the effects of the pandemic on citizens and city systems. There are six innovative approaches and best practices from Indonesian cities that any city can replicate. These include social safety net, economic stimulus and incentives, basic services delivery improvement, local community empowerment, economic relaxation strategy, and advancing collaboration and information system.

Bengkulu City had a unique approach to social safety net by guaranteeing food security for the community by utilising idle land and yards as food-growing land. The city government collaborated with the Military District Command (Kodim), which is in line with the role of the Indonesian Armed Forces (TNI-AD) in supporting food security. As part of its economic stimulus, the city waived off the water bills of the middle and lower class of society during the pandemic period. This incentive was given from March 2020 to February 2021.

Several Indonesian city governments improved their essential health services by utilising telemedicine platforms. It helped in reaching out to the remote areas where health services were difficult to get to. It also proved helpful in reducing the infection rate in black (uncontrolled infection rate) and red (high infection rate) zone areas. Jambi City, Maluku Province, DKI Jakarta Province, and East Java Province are pioneers in mainstreaming this approach.

Many cities encouraged the collective work of communities. In Central Java Province, the governor encouraged community collaboration with the "Jogo tonggo" program that focuses on the early identification, prevention, and reduction effort in facing COVID-19 spreading at the local level. They also monitored local activities that potentially contribute to the COVID-19 case surge.

Regarding economic relaxation, the best practice comes from Semarang City. To control the financial loss of small businesses during the pandemic, the city government collaborated with an online platform, the Tumbasin.id, to provide essentials to citizens. Through this platform, citizens can easily connect with the local market trader and order their daily needs. The order is delivered to the citizens by utilising the existing online transport system. By doing this, Semarang City fostered local economic activity to improve the city's financial condition gradually.

To address the increasing number of gender-based violence during the COVID-19 pandemic, the Provincial Government of East Java – through the Office of Women Empowerment, Child Protection, and Population Control (DP3AK) –employed several preventive and management measures. The local government formed the Community Counselling Desk for Family Welfare (Desel Pangkas) in cooperation with the Indonesian Psychological Association (Himpsti), the Teachers Association of the Republic of Indonesia ( PGRI), the National Population and Family Planning Board (BKKBN), and the Women and Child Protection Regional Technical Executive Unit (UPTD PPA).

Desel Pangkas provide online and offline consultations to the public on social issues ranging from family problems to violence against children and women. Other services include the provision of information on family resilience and child psychology therapy. To follow through with Domestic Violence (KDRT) and gender-based violence cases, Desel Pangkas has worked closely with hospitals and the local police to ensure victims' recovery. The DP3AK has also implemented a

preventive measure by disseminating information on family resilience to the general public through podcasts, a smartphone game application, and family-themed stories.

A best practice regarding collaboration and information system improvement came from Bogor. During the pandemic, Bogor City Government developed a crowd-funding platform to help those who lost their income during the pandemic and were not registered as beneficiaries of the social safety net program of the central government, the provincial government, or the Bogor City Government itself. The platform reconnected donors, and boosted the solidarity among the rich and the poor in the city, and helped the city regain its confidence in facing COVID-19.

## Case Study – WUHAN, CHINA

### Complete isolation of Wuhan city saved the rest of China

The city of Wuhan was the epicentre of the COVID-19 pandemic in China. Late in 2019, Chinese authorities were slow to react to the initial reports of a mystery illness circulating in Wuhan, which led to COVID-19 spreading to countries worldwide. But once China recognised that there was a problem, the government was quick and strict in its steps. On January 23, two days before the Chinese New Year, around 11 million people in Wuhan were put under tight quarantine. Face masks and social distancing were made mandatory in the city. After few days, cities and provinces surrounding the city of Wuhan were also put under lockdown, thus bringing the lives of around 56 million people to a sudden halt.

Before declaring lockdown in Wuhan, Chinese authorities undertook a series of steps to minimise the spread of the SARS-CoV-2 infection from thereon. All intra-state, along with all the inter-state bus services, were terminated. Entertainment centres, along with non-essential shops, were closed, and a ban was imposed on all public gatherings. But, by this time, the virus was already widespread in the city, which caused the sudden outbreak of the disease in late January and early February 2020. This led to a shortage of doctors, health workers, personal protective equipment kits, ventilators, sanitisers, gloves, and masks.

Provinces of China that were unaffected by the virus sent medical relief teams to Hubei. The city's treatment capacity was boosted by the 346 medical teams and 42,000 medical staff from other provinces who volunteered to travel there between January 24 and March 8. Realising the severity of the infection and the outbreak, two COVID-19 specialised hospitals, fully equipped with 5G systems, advanced medical facilities, and 2000 beds, were built in the city within ten days. Simultaneously, authorities established 16 makeshift hospitals separately to treat COVID-19 infected people with mild symptoms.

At the time, China faced an unprecedented situation where it had to choose between economic development or people's lives. Choosing the lives of its people, China, under the command of its President Xi Jinping, imposed harsh restrictions and rigid enforcement to contain the virus. Lockdown was initially imposed in Hubei province, of which Wuhan is the capital, and then later, the whole country was put under partial lockdown. But, the city of Wuhan remained in the strictest lockdown for eleven weeks.

According to data released by Johns Hopkins University, the number of new COVID-19 cases in China were above the 5000 mark in January and February 2020. However, after the lockdown, a sharp decrease in new cases was recorded, and it had reached less than 100 new cases of infection by April 2020. Choosing people's lives over the economy, yet again, China prolonged the lockdown. Consequently, not a single day was seen from April 2020 to January 2021, when the total number of new COVID-19 cases across the nation crossed the 500 mark. In a report, the World Health Organisation even congratulated China on its unique and unprecedented public health response that effectively reversed the trend of escalating cases in the nation.

In Wuhan, the fight against the pandemic was done in two phases –isolation and monitor. Government officials, doctors, healthcare workers, volunteers were all on the frontline, trying to prevent COVID-19 from engulfing the whole nation and its people. In a unique strategy, patients were divided into four groups – those with severe disease symptoms, those who have confirmed coronavirus patients with mild symptoms, suspected cases, and those who had come in contact with confirmed coronavirus patients. Authorities and volunteers ensured that severe cases were admitted to the leading hospitals, confirmed cases with mild symptoms were sent to the temporary/makeshift hospitals, and suspected cases and persons who had come in contact with COVID-19 patients were put under quarantine in local hotels.

Wuhan gambled on letting people come out and help as volunteers, but the experiment paid off, and they soon became an essential part of the city's fight against the virus. Volunteers in Wuhan joined local committee members, taking up all kinds of responsibilities, including arranging free and safe transportation for the doctors and nurses, supplying essential drugs and food to the people in quarantine, providing assistance in the transportation of various relief materials to the people trapped in the city at multiple locations, helping residents to buy food and medicine, caring for the elderly who were unable to move, and feeding street animals.

A model assessment of measures taken by Chinese authorities established that Wuhan's early isolation and intercity travel bans to reduce contact between people prevented cases from increasing by 67-fold. Otherwise, there would have been nearly 8 million cases by the end of February 2020.

## Case Study - DAEJEON CITY, SOUTH KOREA

### Effective tracking, tracing and treating kept infection low

Daejeon, known as the Silicon Valley of Korea, reported its first confirmed case of COVID-19 on February 21, 2020; almost after one-month, South Korea reported its first confirmed case on January 20. The city, with a population of about 1.5 million people, serves as a hub of transportation as it is located in the central region of South Korea, Daejeon. It is also home to private and public research institutes, centres and science parks.

In the early months of the virus outbreak, like any other city globally, the city was learning about the contagion daily and facing new challenges every other day. Citizens were curious, facing difficulty in finding a mask. It was a lack of supply that caused a shortage of demand. The city, later on, took strategic decisions to ensure the availability of masks for the public. The local government banned the export of facemasks overseas and issued orders for procuring 80 per cent of its production as a public sales outlet. It also operated a joint inspection team with the FairTrade Commission and the Food-Drug Administration to crack down on unfair trading practices such as hoarding and price-fixing to stabilise the health products market.

When the situation started worsening in some areas, the government upgraded its infectious disease crisis alert level to a "serious" level since April 23, 2020. There has also been a "drive-through" that allows people to get inspected without getting off the car. It was also quick to inform the current situation through regular briefings and spread the information about the situation through disaster text messages. Daejeon Metropolitan Express Transit Corp. (DJET) Disaster Response Division led Company-wide support for onsite cleaning and disinfection, with sterilisation of susceptible areas detected through big data analysis and put up a banner to reassure people using urban railroads.

Daejeon Metropolitan City Authority provided information about the movements of the infected people so that people who came in contact with the infected person can be tracked and quarantined to stop the spread of the virus further. The city government also issued self-quarantine rules for the infected persons and their family members. It was mentioned that if the infected person violates the rules, s/he could be fined 30,00,000 won (approximately 2500 USD). The quarantined persons were provided medical assistance by attaching them to a local health centre and a medical officer who called them twice a day to know the health condition.

The local economy plummeted in the wake of the pandemic and lockdown measures. Shops, department stores became noticeably quiet. To provide relief to local businesses, under the recognition of an economic emergency, the city took financial measures to revitalise the local economy. Within the first half of the year, the city assured to use 3 trillion won, 65 per cent of the consumption and investment sector budget, make full use of reserve funds and various funds to support quarantine, and draw up an emergency supplementary budget for the economy of the working class. The city sought win-win

measures for small businesses owned by public institutions, including reducing service fees and a grace period of six months.

Using these initiatives, the city managed to mitigate the negative impacts of the contagion and save lives. The city was able to keep the total number of infected persons to 1645 that came to approximately 1110 per 100,000 people. It is among the lowest case per million population as the USA has reported 96,000, and even South Korea has reported over 2100 cases per million.



## Chapter 5

# Conclusion

- 1) Integrate efforts to address health, economic, social and environmental issues holistically, not in silos
- 2) Build social security net locally
- 3) Decentralise decision making
- 4) Address gender issues during pandemic
- 5) Capacity building of LGs for technology integration and prompt policymaking
- 6) Accelerate efforts for localising SDGs for sustainable future
- 7) Enable Knowledge sharing and global collaboration among cities

## LGs Need to Rise to Resilience

The devastating impacts of Covid-19 on cities have impelled urban local governments worldwide to rethink urban governance and planning. Cities have always been vulnerable to pandemics because of a large number of people living in proximity, but the challenge in the 21st century has become prominent because the majority of the world population is now urban resident. Covid-19 has indeed brought to the fore the issue of urban vulnerability to pandemics. The ongoing health crisis could have halted the engines of growth and present us with a unique chance to comprehend how cities can be made pandemic resilient for mitigating the effects of the pandemic on their citizens, services and systems.

As COVID-19 shows, pandemics throw complex social, economical and systematic challenges. Well-oiled governance is needed to respond quickly and effectively. One cannot expect a system to work effectively in the worst of times if it was not functioning well in normal times. If LGs are vying to become pandemic-resilient, they have to improve their management and governance, the capacity of their workforce, develop the ability to utilise resources optimally, have good coordination with national governments and other agencies, and above all, have proactive leadership and community engagement system.

This requires investment in improving the capacity of local government officials to have efficient policy response systems. It could be done by encouraging local officials to update their skills and knowledge and connecting with global knowledge platforms of LGAs.

Many media reports suggest that cities with formidable scientific and healthcare capacity stumbled mightily. Simultaneously, places with less capacity, including Mongolia, Thailand and Senegal, have kept people healthy and the economy running. But, it does not mean that cities need not build a formidable healthcare system. There are multiple dimensions of the pandemic response, and every aspect has not been studied.

The report has explored the impact of COVID-19 on health systems, economy, access to basic amenities such as housing, water, sanitation and hygiene, livelihood, and the achievement of global goals. The report also looks into policy actions in response to the pandemic. Based on the secondary data research analysis, the recommendations encapsulate how governments across the regions, across the tiers, can bolster preparedness strategies to build city resilience and be advised to reshape urban policies to respond to pandemics in an inclusive, equitable, and resilient manner.

This report tried to shed light on the underlying patterns and dynamics of pandemics, their effects on different sections of society, the best case studies from cities worldwide, the significance of having strong local governments, and imperatives of government's timely response. After evaluating and analysing various aspects of pandemic management in cities worldwide, the report presents a seven-point solution for Local Governments to build sturdy and robust local resilience.

### 1. Integrate efforts to address health, economic, social and environmental issues holistically, not in silos

Local governments are the first respondents to the pandemics. **It becomes essential to make LGs ready, robust and resourceful to provide instant respite to local citizens.** The Pandemic like Covid-19 not just endangers the health and lives of the people but also negatively impacts the

local urban economy, which has spiral effects on social, environmental, and economic aspects. Generally, national governments take centre stage in pandemic management in framing policies and announcing social protection measures. But it is the responsibility of the local or sub-national governments to effectively implement them to save people at the bottom of the pyramid.

Economic shock, an excess burden on healthcare facilities, lack of awareness in public and challenge in delivering basic necessities to marginal societies are common problems that LGs need to face while dealing with the pandemic. Since LGs are the closest governments to the local community, it gives them an edge to respond quickly and effectively and establish better communication with the public and all local development agencies to mitigate the impacts of the crisis to the lowest. For this, **LGs must develop a mechanism where all the agencies working in the jurisdiction must collaborate and work in cohesion to enlarge their reach and impact. It will help elected representatives of LGs to understand the challenges and channelise resources for optimal utilisation.**

## 2. Build social security net locally

**Building social security net for local citizens is a prerequisite to making a city pandemic-resilient.** The cities with a sturdy social security net can manage the pandemic and its after-effects competently. It also helps in providing a bridge to faster recovery of households, communities, and urban economy.

In the absence of any urban welfare strategy in place, many cities witnessed a mass exodus of migrant workers. They found themselves in the middle of nowhere after losing their livelihoods after countries announced lockdown. A majority of cities did not have any solution available, and they look towards the national government for help. During the Covid19, it was observed that the measures taken by the national governments were too late, too little.

**LGs must set aside some financial provision to make a short-term decision to create a social security net for the people in need during emergencies.** The assistance from the central governments can be supplemented later on to lessen the economic fallout impacts. Many cities ensured food access for the worst affected and vulnerable populations by providing food parcels, prepared meals, food vouchers or direct financial support. These initiatives complemented national government assistance to reach those needing food aids instantly. In Wuhan, neighbourhoods closed during lockdown were provided with food by groups of volunteers who organised food purchasing, with large volumes of food delivered using repurposed city buses. Quito has also adopted Wuhan's approach of mobile food hubs, using municipal buses to facilitate food access. Kampala (Uganda) launched a door-to-door delivery service to provide maize flour and beans to vulnerable people. Milan established ten hubs to deliver food to vulnerable people, feeding 100,000 people per week. The city has also hired furloughed employees from educational cooperatives and transport companies for packing and delivering food to vulnerable groups.

## 3. Decentralise decision making

COVID-19 highlights the critical role local governments' play as front-line responders in crisis response, recovery and rebuilding. The pandemic like situation demands immediate and localised custom actions for having efficacy in combating the crisis. At the beginning of the crisis, most of the policy decisions came from national governments with little or no involvement of

local governments. City leaders remained clueless about how to react and implement policies and gather required resources.

One of the significant learning from combating pandemic is that there is an immediate need to build institutional resilience through coordinated or joint policy responses and devolve adequate power to LGs to meet the critical challenges posed by the pandemic. In many situations, the third tier of government must take up the mantle, reach out to the local community, hear their problems, and frame city-specific policies. It is to be noted that the experience of the Ebola outbreak in West Africa between 2014 and 2016 spotlighted that top-down quarantine was unsuccessful till local leaders were engaged.

The multidimensional effects of the pandemic require both short and medium-term policy responses. To frame such policies to suit the local context, local governments must be strengthened. Most countries have a clear division of functions between national and local governments, but the LGs in many countries still have inadequate administrative and financial authority.

The nations have elaborate national disaster preparedness plans, but the Covid-19 reiterates the need of having city disaster management plans. It requires amplifying the participatory role of local governments in strengthening emergency management systems. With their knowledge of local dynamics and topography, LGs can quickly identify vulnerable pockets and respond to challenges quickly as they arise. In addition to this, LGs should also devise their emergency response plan and create adequate revenue coffer. For example, most cities faced the challenge of the inadequate number of ventilators at the beginning of the crisis. Cities with strong financial resources and reliable revenue stream could quickly buy ventilators during this pandemic instead of waiting for central or state governments' assistance.

#### 4. Address gender issues during pandemic

Covid-19 affected the men and women differently not because the virus was gender-biased but because of the existing systematic inequalities. In addition to the excess burden of healthcare on women, they also suffered increased domestic violence and abuse cases. The UN Women declared it a Shadow Pandemic. A study suggests that women's jobs have been 1.8 times more vulnerable to being lost in the pandemic than men's. Many cities acknowledged the issues and rolled out women-specific policies. Some cities facilitated child care centres, launched a special helpline for women and provided financial assistance.

For example, London's city government has invested 3 million pounds to “re-skill” and “up-skill” women for better-paying jobs. Mexico City issues 50,000 loans to small business, and almost two-third went to helping women. To combat domestic violence, Mexico City constituted a group of 100 female lawyers to help women file complaints of domestic abuse and provide free legal advice.

While framing policies and action plans along with national and state governments and multilateral organisations for becoming pandemic-proof, local governments must acknowledge that women have always played a critical role in resolving any health crisis and must include a gender perspective in their pandemic-response policies. The pandemic lessons shall not go to waste, and city leaders and LGs must build back an equal urban world.

### 5. Capacity building of LGs for technology integration and prompt policymaking

In response to Covid-19, cities and local governments worldwide learnt to use new tools and technologies to tackle pandemic and associated challenges. Some cities were quick in adapting technological tools because of having earlier exposure and experience of using them, while others trained their workforce. The crisis underlined the significance of having access to technology and proper training program assistance from their peers and other institutions.

**Integrating technological measures and policy reforms played a critical role in emergency responses. LGs must formalise such a mechanism of technology integration and training of their officials and elected representatives to face evolving challenges.** The pandemic has spotlighted the requirement of digital governance and monitoring system. Many LGs have already started using these technologies, but it is essential to repurpose or continue to use these technologies once a COVID-19 vaccine is widely available. Such an initiative will indeed aid in building resilience at the local level.

Many issues came to the forefront while using these technologies. The rapid and rushed expansion of COVID-19 of digital technologies may entail negative long-term impacts on digital rights and other spheres of local governance. LGs must build a profound understanding of the positive and negative aspects of the technologies and tools they use and take their citizens in confidence. It presents an opening for policy-makers and national governments to look into legal implications, ethical aspect, and practical implementation under time pressure. Many issues related to digital surveillance has come to the fore and need immediate redressal. For this, LGs will also have to equip themselves with technological knowledge to understand the intricacies of technology and their social implications and build a skilled workforce for effective implementation. The role of LGs is also essential in raising the issues of local communities relating to technological performance and address them adequately in new policies for using technologies.

### 6. Accelerate efforts for localising SDGs for sustainable future

The pandemic has reversed the gains made in the last few years in achieving many Sustainable Development Goals. Since a majority of 169 targets depend on the contributions of sub-national governments, LGs need to redesign their strategies to achieve the goals within the schedule timeline. **Building local resilience and achieving SDGs are intertwined in a way that both cannot be achieved without the other.** As local governments have proved to be critical in managing the pandemic, their role will be crucial in managing long-term social and economic impacts and enabling a sustainable response to and recovery from COVID-19.

The ongoing health crisis and its devastating socio-economic impacts on the most vulnerable communities have made it more critical to localise the SDGs. LGs have to improve their governance and management systems in immediate crisis response, such as disease containment and emergency relief operations. Many of these tasks are already the responsibility of LGs in many countries. For example, in Afghanistan, LGs are in charge of ‘food and in-kind’ relief and promote water, sanitation, and hygiene practices to prevent the spread of COVID-19. In the Republic of Korea, local governments monitored the transmission of the disease and kept the public informed.

Another area in which the cities can learn from their peers in the Asia Pacific is Voluntary Local and Subnational Reviews. Suwon, Republic of Korea; Shimokawa, Toyama, Hamamatsu, and Kitsakyusho in Japan; Taipei and New Taipei in Taipei, China; Cauayan City in the Philippines; and Deqing in the People’s Republic of China have already initiated this. In addition to Voluntary National Reviews, local reviews are critical in the process of achieving SDGs.

Scaling up SDG localisation requires adequate financial resources, enhanced local governance, and multi-stakeholder and partnership collaboration. There are various challenges for LGs, but many could be addressed by building local resilience for disasters and pandemics.

## 7. Enable Knowledge sharing and global collaboration among cities

Corona has taught us that cities can manage any emergency capably provided they respond in a responsible and coordinated fashion. If cities can learn from their peers and shape their policies quickly, they can prepare themselves better and reduce the sufferings of citizens. In March 2020, cities in the Czech Republic, Hungary, and Bulgaria learnt from the experiences of their western neighbours and imposed restrictions before community transmission became widespread. They largely avoided the death tolls many western European countries experienced in the first wave.

Exiting the pandemic requires national, regional and global cooperation and real-time sharing of learning. There is a need to establish platforms for city-to-city relations. Cities need to forge partnerships and become part of functional LGAs in the region to share knowledge and resources in emergencies. To address the issues of the COVID-19 pandemic and empower local governments in Asia Pacific to combat these issues efficiently, the United Cities and Local Government Asia-Pacific (UCLG ASPAC) organised a series of Web-Share during the pandemic. The Web-Shares covered a range of local response issues to regional, international collaborations, Sustainable Development Goals, disparity and inclusivity. A host of experts shared their experiences and viewpoints on the issues related to tackling the pandemic. Local leaders were able to access available knowledge, best practices and quickly learn from the experiences of their peers, as sharing knowledge and experience accelerated learning and facilitated rapid policy response.

Global collaboration and regular dialogue among city leaders enable framing of collective response and help the cities overcome their limitations in access to resources or a skilled workforce in a domain. Friendly relations between cities can help address common challenges, frame an immediate response to emergencies and also build long-term urban resilience. Cities have tackled challenges together, and the collective actions have always led to early breakthroughs and advances, which wouldn’t be possible in time if local governments have marched alone. It is true, together, cities can build back a greener, sustainable and resilient future fast.

## Reference

<sup>1</sup> Data Source: UN Population Division

<sup>2</sup> Air travel down 60 per cent, as airline industry losses top \$370 billion: ICAO. UN News. Retrieved from <https://news.un.org/en/story/2021/01/1082302> on March 25, 2021.

<sup>3</sup>Nicholas LePan. The History of Pandemics. Retrieved from <https://www.visualcapitalist.com/history-of-pandemics-deadliest/> on March 25, 2021.

<sup>4</sup> Data Source: Visual Capitalist

<sup>5</sup>Jessica Pearce Rotondi. 5 Hard-Earned Lessons from Pandemics of the Past. Retrieved from <https://www.history.com/news/pandemics-lessons> on March 25, 2021.

<sup>6</sup>Not just IAS and police, India's Covid-19 fight must use panchayats and municipalities too <https://theprint.in/opinion/ias-police-india-covid19-fight-panchayats-municipalities/391730/>

<sup>7</sup> Data Source: Thinkglobalhealth.org

<sup>8</sup> WHO Director-General's opening remarks at the media briefing on COVID-19 – 11 March 2020. Retrieved from <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020> on March 25, 2021.

<sup>9</sup>The Hindu. The Pandemic Notebook. 2021. Page 9.

<sup>10</sup>Nahiduzzamanet. al,What does the global pandemic COVID-19 teach us? Some reflections. Journal of Urban Management. Volume 9, Issue 3, September 2020

<sup>11</sup>Global Policy. GP-ORF Series. 2020. Observer Research Foundation.

<sup>12</sup>Sarah L Dalglisha. COVID-19 gives the lie to global health expertise. Lancet. 11-17 April, 2020. Elsevier Public Health Emergency Collection.

<sup>13</sup> Policy Brief: Covid19 in an Urban World. United Nations. July 2020.

<sup>14</sup>Qualls, N. L. et al. Community mitigation guidelines to prevent pandemic influenza – United States, 2017. MMWR Recomm.

<sup>15</sup>Hussain, A., White Paper. 2020. Stringency in policy responses to Covid-19 pandemic and social distancing behavior in selected countries

<sup>16</sup>Ibid.

<sup>17</sup> COVID-19 government response tracker. University of Oxford. Retrieved from <https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker> on March 30, 2020

<sup>18</sup> Ibid.

<sup>19</sup>Thomas Hale. What we learned from tracking every COVID-19 policy in the world. Retrieved from <https://www.downtoearth.org.in/blog/governance/what-we-learned-from-tracking-every-covid-19-policy-in-the-world-76154> on March 30, 2021

<sup>20</sup> Anupam Nanda, University of Manchester. Sustainable cities after COVID-19. Retrieved from <https://cosmosmagazine.com/earth/sustainability/sustainable-cities-after-covid-19/> on March 25, 2021.

<sup>21</sup> Can Barcelona provide the blueprint for green cities after COVID-19? World Economic Forum. Retrieved from <https://www.weforum.org/agenda/2020/12/sustainable-cities-covid-19-barcelona-green-zones-coronavirus> on March 30, 2021.

<sup>22</sup> Cities Prepare for Green Initiatives Post-Coronavirus. EPO. Retrieved from <https://eponline.com/Articles/2020/05/19/Cities-Prepare-for-Green-Initiatives-PostCoronavirus.aspx?Page=2> on March 30, 2021

<sup>23</sup>Reuters. "China Cuts Key Rate for Second Time This Year, More Easing Likely." Retrieved on March 29, 2021.

<sup>24</sup>South China Morning Post. "Coronavirus: China trying vouchers to boost consumer spending, but effort modest compared to HK, US," Retrieved on March 30, 2021.

- <sup>25</sup>Wall Street Journal. "China's Stimulus Strategy Faces New Test in Coronavirus," Retrieved on March 30, 2021.
- <sup>26</sup>Nikkei Asian Review. "China leans on auto subsidies to jump-start post-virus economy," Retrieved on March 30, 2021
- <sup>27</sup>Wall Street Journal. "A \$100 Billion Breather: China Banks Give Borrowers a Coronavirus Debt Holiday," Accessed May 12, 2020
- <sup>28</sup>S&P Global Market Intelligence. "China asks banks to up lending, relief to small business despite rising defaults," Accessed Retrieved on March 29, 2021.
- <sup>29</sup> Fiscal policies to address the covid-19 pandemic. Report: Fiscal monitor: policies for the recovery. IMF. October 2020.
- <sup>30</sup>Ibid.
- <sup>31</sup>Social protection responses to COVID-19 in Asia and the Pacific: The story so far and future considerations. International Labour Organization.
- <sup>32</sup>Critical Frontier: Leveraging Technology to Combat COVID-19. White Paper. World Economic Forum. July 2020.
- <sup>33</sup>Harry Kretchmer.8 ways entrepreneurs are fighting COVID-19. Retrieved from <https://www.weforum.org/agenda/2020/06/8-technology-entrepreneurs-fighting-covid-19/> Retrieved on March 30, 2021
- <sup>34</sup> Immunizing the public against misinformation. WHO. Retrieved from <https://www.who.int/news-room/feature-stories/detail/immunizing-the-public-against-misinformation> on March 25, 2021.
- <sup>35</sup> AI vs Coronavirus: The Use of AI in the Fight against the Coronavirus Pandemic. 2021. Tech Mahindra.
- <sup>36</sup> COVID-19: Human development on course to decline this year for the first time since 1990. UNDP Retrieved from <http://hdr.undp.org/en/content/covid-19-human-development-course-decline-year-first-time-1990> on March 30, 2021.
- <sup>37</sup> Covid-19 and SDGs: How the 'roadmap for humanity' could be changed by a pandemic. UNDP. <https://feature.undp.org/covid-19-and-the-sdgs/#:~:text=This%20year%20they%20have%20received,be%20dealt%20with%20in%20isolation.>
- <sup>38</sup> Impact of COVID-19 on the Sustainable Development Goals. Retrieved from <https://sdgintegration.undp.org/accelerating-development-progressduring-covid-19> on April 3, 2021.
- <sup>39</sup> SDG Integration. UNDP. Retrieved from <https://sdgintegration.undp.org/accelerating-development-progressduring-covid-19> on April 2, 2021.
- <sup>40</sup> Assessing impact of COVID-19 on the Sustainable Development Goals. UNDP and the Pardee Center for International Futures at the University of Denver.
- <sup>41</sup> COVID-19 shifts forecast on the global goal to end extreme poverty. United Nations. Retrieved from <https://unstats.un.org/sdgs/report/2020/goal-01> on April , 2021.
- <sup>42</sup> Ibid.(iv)
- <sup>43</sup> Will the COVID-19 pandemic threaten the SDGs? September 1, 2020. The Lancet Journal of Public Health.
- <sup>44</sup> Ibid. (i)
- <sup>45</sup> SDG Indicators. <https://unstats.un.org/sdgs/report/2020/Goal-03/>
- <sup>46</sup> Ibid.
- <sup>47</sup> Ashley Dawson, Extreme Cities (London: Verso, 2017), 133
- <sup>48</sup> Reimagining Urban Spaces for Community Connections and Climate Resiliency 35 and Alistair Hunt and PualWatkiss., "Climate change impacts and adaptation in cities: a review of the literature," Climatic Change 104, (2011): 15, <https://doi.org/10.1007/s10584-010-9975-6>
- <sup>49</sup> Jeff Goodell, The Water Will Come (New York: Little, Brown and Company, 2017), 59.
- <sup>50</sup> Sustainable Development Goals Report. 2020. United Nations
- <sup>51</sup> Rethinking cities in the post Covid19 World. Observer Research Foundation. 2020
- <sup>52</sup> Road to redemption for countries, cities. Cover Story. May 2020. Urban Update.
- <sup>53</sup> Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development. UN. Retrieved from <https://unstats.un.org/sdgs/report/2020/goal-17/> on April 3, 2021.
- <sup>54</sup> Opening remarks at virtual press encounter. Retrieved from <https://www.un.org/sg/en/content/sg/speeches/2020-03-31/remarks-launch-of-report-the-socio-economic-impacts-of-covid-19> on March 30, 2021

## Reference for Case Study:

1. Xiaolin Xu et al. 12 March 2020. 6 lessons from China's Zhejiang Province and Hangzhou on how countries can prevent and rebound from an epidemic like COVID-19. Retrieved from - <https://www.weforum.org/agenda/2020/03/coronavirus-covid-19-hangzhou-zhejiang-government-response/>
2. MengYuanDiao et al. 5 March 2020. The novel coronavirus (COVID-19) infection in Hangzhou: An experience to share. Retrieved from -<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7200845/>
3. Wu Huixin. 2 June 2020. Hangzhou does its part to battle epidemic. Retrieved from- <https://www.shine.cn/feature/wellness/2002061401/>
4. Jilan Liu. April 02, 2020. Deployment of Health IT in China's Fight Against the COVID-19 Pandemic. Retrieved from- <https://www.itnonline.com/article/deployment-health-it-china%E2%80%99s-fight-against-covid-19-pandemic>
5. RodionEbbighausen. 16.04.2020. How Vietnam is winning its 'war' on coronavirus. Retrieved from - <https://www.dw.com/en/how-vietnam-is-winning-its-war-on-coronavirus/a-52929967>
6. Todd Pollack et al. 5 March 2021. Emerging COVID-19 success story: Vietnam's commitment to containment. Retrieved from -<https://ourworldindata.org/covid-exemplar-vietnam>
7. SD Pradhan.10 March 2021. Vietnam's successful handling of multiple waves of Coronavirus attack. Retrieved from- <https://timesofindia.indiatimes.com/blogs/ChanakyaCode/vietnams-successful-handling-of-multiple-waves-of-coronavirus-attack/>
8. Tran Le Thuy. 20 October 2020. Vietnam is fighting Covid without pitting economic growth against public health. Retrieved from-<https://www.theguardian.com/commentisfree/2020/oct/20/vietnam-covid-economic-growth-public-health-coronavirus>
9. Sen Nguyen.September 2020. Vietnam's Pandemic Success Is a Lesson for the World. Retrieved from- [https://www.globalasia.org/v15no3/cover/vietnams-pandemic-success-is-a-lesson-for-the-world\\_sen-nguyen](https://www.globalasia.org/v15no3/cover/vietnams-pandemic-success-is-a-lesson-for-the-world_sen-nguyen)
10. Izmir Metropolitan Municipality. 2020. Maskmatic Application has started in Metro Stations of Izmir. Retrieved from- <https://www.citiesforglobalhealth.org/sites/default/files/documents/2020-04/A%20Big%20Innovation%20from%20Izmir.pdf>
11. BanuCakir. 10 June 2020. COVID-19 in Turkey: Lessons Learned. Retrieved from - <https://pubmed.ncbi.nlm.nih.gov/32538025/>
12. Katie Nadworny. 16 October 2020. Turkey has been contact tracing for a century. Retrieved from- <https://www.nationalgeographic.com/science/article/coronavirus-turkey-contact-tracing-century-old-world-lessons-authoritarian-peril>
13. Izmir Metropolitan Municipality. 2020. COVID-19 Resilience Action Plan from Izmir. Retrieved from- <https://www.citiesforglobalhealth.org/sites/default/files/documents/2020-06/Resilience%20Action%20Plan%20of%20Izmir.pdf>
14. Katy Gillett. 24 March 2020. How Bahrain is leading from the front on coronavirus containment. Retrieved from- <https://www.thenationalnews.com/world/gcc/how-bahrain-is-leading-from-the-front-on-coronavirus-containment-1.996771>
15. Daniel Hoffman. 17 June 2020. Lessons From Bahrain's Response to COVID-19. Retrieved from- <https://www.belfercenter.org/publication/lessons-bahrains-response-covid-19>
16. Mara Sanfelici. 1 July 2020. The Italian Response to the COVID-19 Crisis: Lessons Learned and Future Direction in Social Development. Retrieved from - <https://journals.sagepub.com/doi/full/10.1177/2516602620936037>
17. Morning FUTURE. 20 April 2020. The 100,000 volunteers on the front line during the emergency - and the recovery - in Italy. Retrieved from- <https://www.morningfuture.com/en/article/2020/04/20/volunteers-covid-coronavirus-emergency/902/>
18. YleniaGostoli.18 March 2020. Coronavirus in Italy: Solidarity in the time of disease. Retrieved from- <https://www.dw.com/en/coronavirus-in-italy-solidarity-in-the-time-of-disease/a-52823023>
19. The Local. 25 May 2020. Italy seeks 60,000 volunteers to enforce coronavirus rules. Retrieved from - <https://www.thelocal.it/20200525/italy-seeks-60000-volunteers-to-enforce-coronavirus-rules/>
20. YounesBahri. n.d.COVID-19 in Algeria: Responses and Future Outlook. Retrieved from- <https://nesa-center.org/covid-19-in-algeria-responses-and-future-outlook/>
21. Allison Moss. 29 July 2020. 5 Facts about Healthcare in Algeria. Retrieved from - <https://borgenproject.org/healthcare-in-algeria/>
22. Algeria - Measures in response to COVID-19. 14 August 2020. Retrieved from - <https://home.kpmg/xx/en/home/insights/2020/04/algeria-government-and-institution-measures-in-response-to-covid.html>

23. Abdullah Algaissi et al. 2 April 2020. Preparedness and Response to COVID-19 in Saudi Arabia: Lessons Learned from MERS-CoV. Retrieved from - <https://www.preprints.org/manuscript/202004.0018/v1>
24. Jennifer Bell. 22 March 2021. Lessons from MERS fight helped Saudi protect health workers during COVID-19: Study. Retrieved from- <https://english.alarabiya.net/coronavirus/2021/03/22/Coronavirus-Lessons-from-MERS-fight-helped-Saudi-protect-health-workers-during-COVID-19-Study->
25. Abdullah A.Algaissi. June 2020. Preparedness and response to COVID-19 in Saudi Arabia: Building on MERS experience. Retrieved from- <https://www.sciencedirect.com/science/article/pii/S1876034120304664>
26. Ma Danmeng. 21 March 2020. In Depth: How Shanghai showed China how to deal with coronavirus. Retrieved from- <https://asia.nikkei.com/Spotlight/Caixin/In-Depth-How-Shanghai-showed-China-how-to-deal-with-coronavirus>
27. Jan Fransen et al. 13 July 2020. How the city of Shanghai coped with COVID-19. Retrieved from - <https://www.ihs.nl/en/news/how-city-shanghai-coped-covid-19>
28. World Health Organisation. 31 August 2020. Athens protects vulnerable communities during COVID-19. Retrieved from- <https://www.who.int/news-room/feature-stories/detail/athens-protects-vulnerable-communities-during-covid-19>
29. Sharon Jacobs. 21 November 2020. How a legacy of crises inspired Greeks' compassionate response to COVID-19. Retrieved from- <https://www.nationalgeographic.com/history/article/legacy-crisis-inspired-greece-compassionate-response-covid-19>
30. Stella Ladi. 17 April 2020. Greece: despite a decade of health cuts, coronavirus death rates appear comparatively low. Retrieved from-<https://theconversation.com/greece-despite-a-decade-of-health-cuts-coronavirus-death-rates-appear-comparatively-low-136293>
31. Billy Perrigo et al. 23 April 2020. Greece Has an Elderly Population and a Fragile Economy. How Has It Escaped the Worst of the Coronavirus So Far? Retrieved from- <https://time.com/5824836/greece-coronavirus/>
32. Bai Lianlei. 11 April 2020. How China overcame the Covid-19 pandemic. Retrieved from- <https://www.orfonline.org/expert-speak/how-china-overcame-the-covid-19-pandemic-64442/>
33. Andreas Illmer et al. 22 January 2021. Wuhan lockdown: A year of China's fight against the Covid pandemic. Retrieved from- <https://www.bbc.com/news/world-asia-china-55628488>
34. Liyiyu. 28 June 2020. How Wuhan controlled Covid-19. Retrieved from- <https://indianexpress.com/article/opinion/columns/coronavirus-covid-19-wuhan-china-liyiyu-6480376/>
35. Fighting Against COVID-19. Brief Countermeasures Report of Daejeon Metropolitan Express Transit Corp.(DJET), April 2020
36. What local governments need to know? Case Study from Daejeon City, South Korea. March 2020. UCLG ASPAC
37. Fighting COVID-19 while Sustaining Collective Work Towards SDG and Better Local Cooperation. UCLG ASPAC
38. Best practices responses in local governments. UCLG ASPAC



# BUILDING RESILIENCE AND COPING MECHANISM FOR PANDEMICS

A study on local governments' response to Covid-19 and  
roadmap for resilient future

UCLG ASPAC

Jakarta's City Hall Complex Building H, 21 th Floor  
Jl. Medan Merdeka Selatan No.8-9 Jakarta 10110, Indonesia  
Tel. (62-21) 389 01801, Fax. (62-21) 389 01802

 <https://uclg-aspac.org/brlc/>  UCLG ASPAC  @uclgaspac  @uclgaspac