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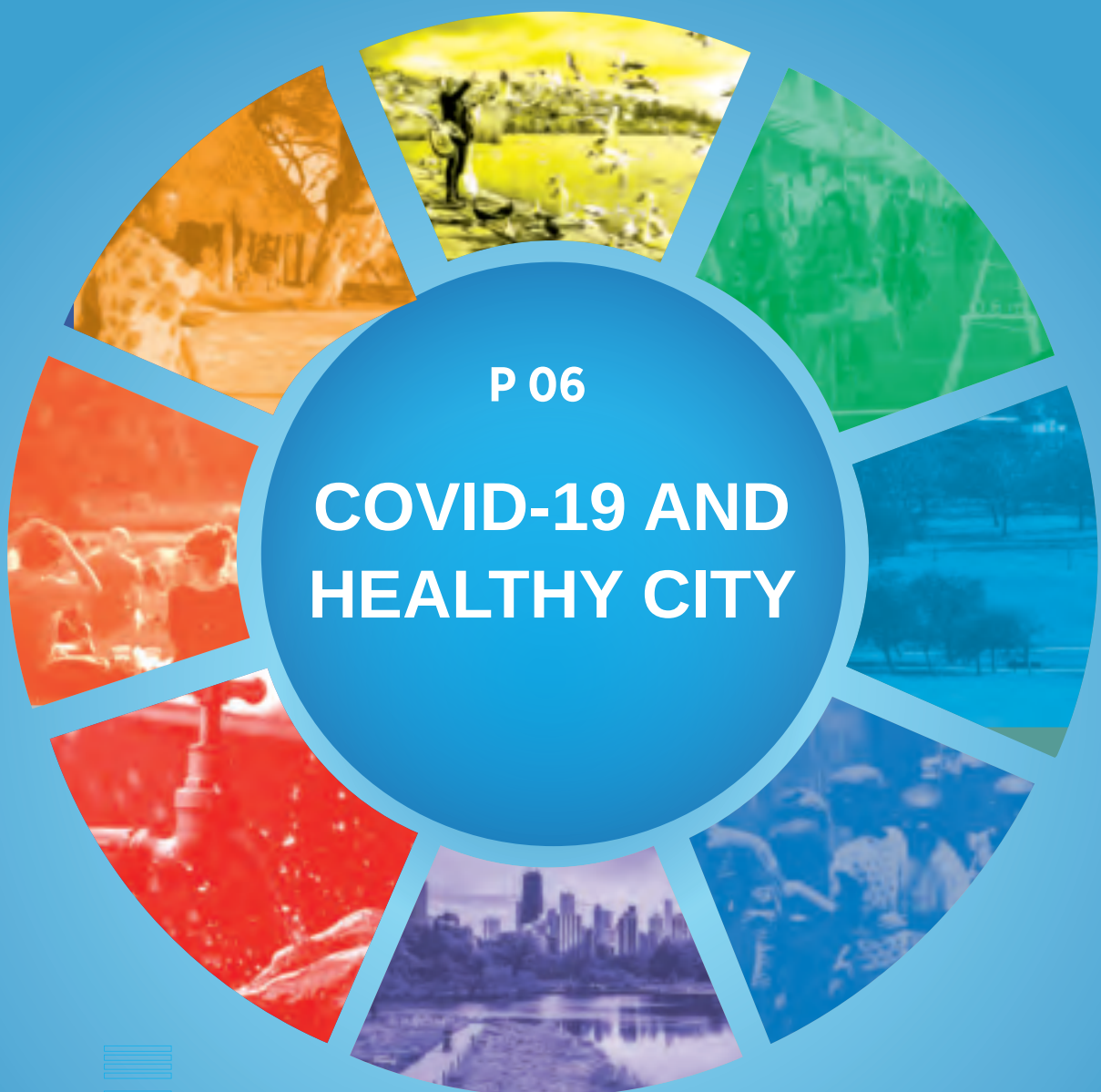

P 06

COVID-19 AND HEALTHY CITY

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United Nations
Office for South-South Cooperation

United Nations Office for South-South Cooperation

South-South and Triangular Cooperation among Maritime-Continental Silk Road Cities for Sustainable Development

In 2017, the United Nations Office for South-South Cooperation (UNOSSC) initiated the SSTC among Maritime-Continental Silk Road Cities for Sustainable Development Project (Cities Project). The Cities Project aims to promote SSTC at the city level taking advantage of the strategic opportunities offered by the "Belt and Road Initiative" (BRI) in advancing the Sustainable Development Goals (SDGs).

The Cities Project aligns its support with the engagement and ownership of local authorities and stakeholders. It is designed to provide streamlined services which include demand-driven needs assessment, capacity development, advisory and advocacy, knowledge and technology transfer, expertise and exchange, and implementation and co-financing. The overall objective is to support and incubate thematic and sectoral pilot projects.

By June 2020, close to 100 cities and institutions from Africa, Arab States, Asia and the Pacific, the Europe and the CIS regions, and Latin America have partnered with the Cities Project platform and network. China International Centre for Economic and Technical Exchanges (CICETE), United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO), United Nations World Tourism Organization (UNWTO), United Nations Capital Development Fund (UNCDF), UN-Habitat, World Food Programme (WFP), United Nations Volunteers programme (UNV) and Economic Community in West African States (ECOWAS), as well as other institutional partners from within and beyond the United Nations system are directly or indirectly supporting the Cities Project implementation.

SUSTAINABLE DEVELOPMENT GOALS

UN HABITAT
FOR A BETTER URBAN FUTURE

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COVID-19 and Healthy City

Healthy City: Governance and Epidemic Prevention

Wang Xingping (School of Architecture of Southeast University and Nanjing Urban Governance Research Institute), Shi Yu (from the School of Architecture of Southeast University)

COVID-19 has turned Wuhan into a ghost town, a city that should have been vibrant and teeming with people, revealing how fragile our societies and cities could be in the face of disasters. The outbreak of COVID-19, for which the World Health Organization (WHO) declared a Public Health Emergency of International Concern, is another wake-up call following the SARS epidemic for countries around the globe to recognize the crisis threatening the health of cities and for scholars of planning to go back to the very issue that they initially focused on which was public health. As COVID-19 rages across the world, we have to ask ourselves: what are the vulnerabilities in our urban building and development and how should we meet the new challenges emerging in the urban health and safety governance system and enhance the immunity of cities?

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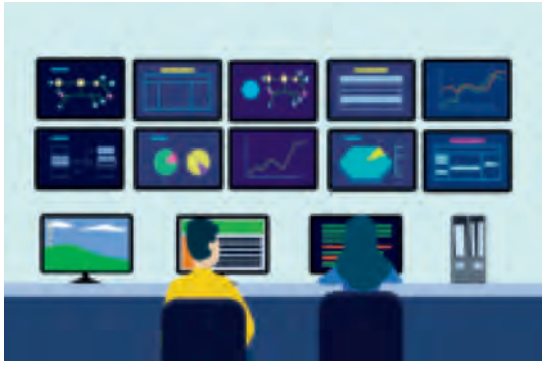

Vulnerabilities of cities and systems exposed by COVID-19

The COVID-19 epidemic that popped up out of the blue has not only paralyzed cities, but exposed some of the issues concerning the development, building, and governance of cities. On one hand, as cities shifted its highlight from public health to new public health and to healthy city, the focus of modern urban planning has gradually evolved from public health issues to the social, economic, and cultural aspects of a city. But recent years have seen more emphasis on the livability of a city and its job market and tourism when it comes to urban development, building, and governance, but clearly less on urban safety and health of urban residents, leading to COVID-19 outbreaks across cities. On the other, despite a well-established urban disaster prevention and mitigation system to tackle natural disasters in China, an urban emergency management system is still yet to be put in place to mitigate menaces to public health caused by complex social problems, resulting in a less-than-desired initial response to the COVID-19 outbreak and a dysfunctional system. Hence, filling the gaps is key to ensuring urban health and safety.

Enhancing immunity of cities: protection and prevention

China has ramped up efforts to build the so-called resilient cities to strengthen the capacity of urban ecosystems in resisting the impact of natural disasters, but how can we enhance such immunity against non-conventional disasters and unexpected epidemics?

2.

This requires a synergy between a comprehensive protection system that functions well in normal times and an epidemic prevention and control system that operates effectively as well during an epidemic. First of all, it's imperative to build and maintain a safety net that protects the health and safety of a city, which means a rational urban disaster prevention master plan shall be developed to make a city more flexible in responding to disasters incurred by complex social problems on one hand and a greenway system shall be taken into account in urban planning so that an urban natural purification system can be built to offer thorough solutions to any unanticipated incidents. Second, it's necessary to build a city-wide public health and emergency control system and put in place a prevention net that can be activated and function at any time when an epidemic breaks out in a city, including an urban medical treatment system, a system of epidemic prevention and control at the city, neighborhood, and community levels as well as the government, school, and business levels, and a system of law-based response to epidemic outbreaks that contributes to a law-based net that can deliver effective response.

In this feature, we present eight articles on the explorations and recommendations made by some international and domestic interdisciplinary scholars and experts in regards to the development and governance of healthy cities in a special epidemic with a focus on urban safety system, urban emergency management system, urban ventilation system, scientific definition of epidemic hotspots, and an appeal to global cooperation in tackling an epidemic in the case of an epidemic based on the reflections on COVID-19, urban governance and prevention measures and outlook on future planning. We hope they can strike a chord with our readers, and spark extensive attention to the governance, epidemic prevention and control, development and planning of healthy cities and in-depth research therein.

3.

1. Big data monitoring for anti-epidemic purpose Photo: Wu Dan

2. Jointly contributing to a healthy city Photo: Hai Luo

3. A livable city Photo: Nancy Bourque

Just in Case: Reflections on COVID-19 Epidemic

Hok-Lin Leung (School of Urban and Regional Planning of Queen's University)

1.

1. Man-made damage to natural environment Photo: Hai Luo

2.

COVID-19 will ultimately be a thing of the past, but there will also be much second-guessing as we leave it behind. The question is, why it broke out and spread? Yes, someone must have made wrong predictions or even have covered it up, and there were those who went so far as to make fortunes out of it. The day of reckoning would definitely come for those that deserve to be punished, but not for all as misjudgment can somehow be justified.

Advances in civilization have made our relations with the nature increasingly complicated, so much so that the nature (including ourselves as a species) is often subject to humans. Modern civilization is built on a belief that man can conquer nature. That is, if we want to eat better, we would put chemical fertilizers into the soil; if we want to live longer, we would put medicine into our body; if we want to go faster, we would dig up the planet to find fuel for our cars; and if we want to live in bigger houses, we would flatten hills and weed out woods. Everything we do is done at the sacrifice of Mother Nature. We keep up our exploitation until she really can't make any compromise, venting out her wrath in the form of viruses, wildfires, and deluges.

So it's fair to say that the advances in modern civilization are marked by faster and greater ecological imbalance, which explains why natural disasters have occurred more frequently and become more varied, serious, and unavoidable. If ecology has taught us anything, it is that every ecosystem has its unique upper and lower limits and it'd be destroyed if it goes beyond the limits. Hunters and the prey provide just a case in point, as the upper and lower limits of the number of these two species form an integral part of their coexistence.

The coexistence between humans and the nature is an enormous and exceedingly complicated ecosystem that consists of countless interconnected uncertain and unknown sub-ecosystems. So who possibly has the ability to correctly predict when and where a disaster would occur? Of course no one can come up with a better plan, but what is certain is that there's bound to be a day when a disaster strikes. And until it does, we have to make good preparations.

Coexisting with the nature is fundamentally different from conquering it. Conquest is about winning a fight, whereas coexistence is not about winning versus losing or success vs failure. Viruses are in constant change, and wildfires and storms can come at any time. In other words, we can only mitigate them, yet cannot eradicate them. Living together with Mother Nature is like playing poker with her. The key lies not in winning every game, which is impossible even for the best players, but in winning as much as you can when there is good luck and losing as less as you can when there is bad luck. You cannot control what you'll have in your hand, but you can definitely decide how to play the game. Similarly, don't take a chance with natural disasters, but do prepare to protect against them as they do occur.

The just-in-case plan is not about preparation, but about protection when something bad happens. It focuses on rebound, that is, a return to safety, which rests upon two things: the choice and the cost. More choices come with greater costs. It's just like buying lottery tickets. If you buy all of them, you would certainly win a prize. But the prize would be meaningless to you as you have paid more than you have won.

Planners can help people escape from disasters by using, structuring, and distributing city spaces to support epidemic prevention, firefighting, and flood control at the frontline. For example, it would be easier to have emergency vehicles running in checkerboard-like road networks, evacuate people in broader and proper public open spaces, and control the spread of infections with medium-sized water-wastewater transport and treatment systems.

Back to viruses. Throughout the evolution of the nature, viruses carry with them plant and animal genes to transfer and play a dominant role in the carbon and nutrient cycles. But what kind of a role do we play as humans in the evolution? This is something that we should contemplate on. Are we the masters of the Planet Earth or travelers that wouldn't stay for too long? Anyway, we have to learn to live with everything else on the planet, including viruses. We shall not irritate or despise them. And in particular in this self-centered civilization, we have to stay vigilant and respect everything else before we can enjoy harmony with them.

Making Cities Safer and More Resilient Against Epidemics

Zhai Guofang (Urban Safety and Development Research Center of Nanjing University, and School of Architecture and Urban Planning of Nanjing University)

1.

The COVID-19 epidemic is the second public health emergency of national concern following the SARS outbreak in 2003, leading to the lockdown of the megacity Wuhan, the first of its kind since the founding of the People's Republic of China, causing tremendous economic and social impact, and at the same time exposing the gaps in China's systems and mechanisms for preventing and controlling major epidemics and its public health emergency management system. This paper deals with possible solutions as to how to improve the response of the country to urban public security emergencies (including epidemic outbreaks) in terms of homeland space and urban safety systems.

Act according to circumstances, timing, and severity and take a coordinated approach to controlling urban risks

Urban safety is related to urban risks. By and large, urban risks refer to the possibility of occurrence of the incidents that urban residents wouldn't like to see occurring and the consequences incurred by their occurrence. And risks can escalate into public emergencies under certain circumstances. Hence, urban risks are the sources of public emergencies, and urban risks and public emergencies are presentations of unwelcome incidents in different stages of development.

Urban risks can be diverse, such as conventional risks that include natural disasters, infectious diseases, and fire, and new risks brought by new technologies that include nuclear plant leakage and cyber attack, as well as the grey rhino incident of the US subprime crisis in 2008 and the black swan incident of 911 in 2001. Emergencies can have an impact on villages, counties/cities, provinces, countries, and even the world, and their impact can be direct or indirect. They can affect people and the economy as well as the environment, politics, and society.

The concept of risks indicates that they are a matter of probability, which can be quantified. For example, a rainfall is said to be the greatest one in 5 or 100 years, which is essentially a probability. According to principles of probability, a probability can be infinitely small but can never reach zero, which means zero risk, or the absolute 100% safety, doesn't exist in theory.

So what levels of risks are tolerable or acceptable to us? This question touches upon the concept of risk acceptance. Risk acceptance can be simply classified into individual and social acceptance to risks. The former indi-

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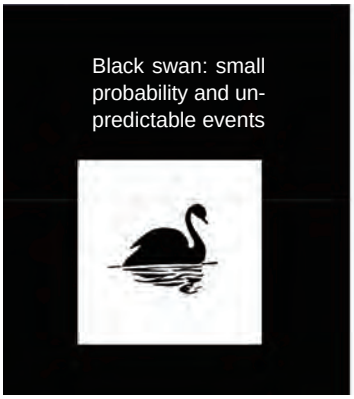

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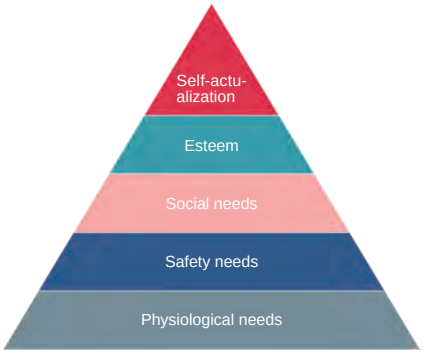
Grey rhino: highly-probable, predictable, and high-impact risks



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1. Epidemic prevention and control of community-level hospital Photo: Wu Dan

2. Everyone has a duty to contribute to epidemic prevention and control Photo: Hai Luo

3. Black swan and Grey rhino Photo: Shi Yu

4. Maslow's hierarchy of needs Photo: Wikimedia

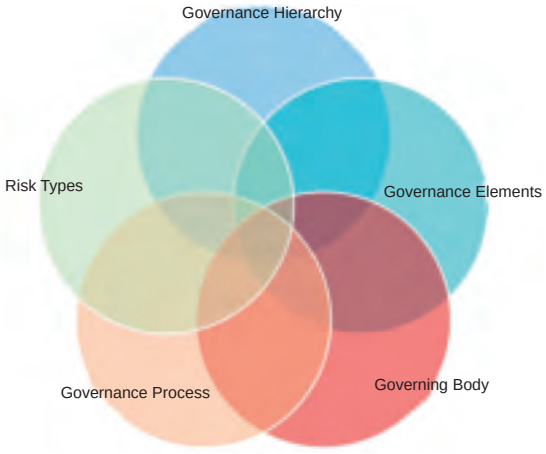
cates everyone's acceptance to a certain risk, whereas the latter explains the acceptance of the society as a whole to risks. Both individual and social risk acceptances can be affected by such factors as economic and social development, history, culture, risk levels (high, medium, or low) and attributes (natural or anthropogenic, known or unknown, etc.), and education. And unbearable risks would normally require control.

But reducing risks comes with cost, and with lower risk levels, the cost of reducing risks would normally go up, so would marginal cost. For example, according to the urban drainage system standard, the cost of changing from reducing the risk of a once-in-five-year rainfall to that of a once-in-six-year rainfall, is certainly greater than the cost of changing from reducing the risk of a once-a-year rainfall to that of a biennial rainfall. However, both individuals and the society have only limited resources (be it manpower, property, or materials), and it's impossible to use all resources to reduce risks. As Maslow's hierarchy of needs suggests, people have to meet the basic physical need for food, sleep, warmth and travel before considering the second-level need which is safety. Hence, we have to act according to circumstances, timing, and severity and take a coordinated approach to controlling urban risks.

Building a five-dimensional system for urban safety where the whole society can contribute to

The urban safety system is comprised of governance hierarchy, governance elements, risk types, governance process, and the governing body that are interconnected with one another. Governance hierarchy of the urban safety system is the same with China's administrative hierarchy, that is, the national, provincial, prefectural, county, town (neighborhood), and village (community) levels. If a safety incident has an impact beyond national borders, international organizations such as the World Health Organization and the United Nations would intervene. But the specific role of each level in mitigating specific risks shall be specified in laws and regulations.

Governance elements of the urban safety system generally include laws and regulations, technical standards, organizations, governance mechanisms, and information pertinent to urban safety management. The homeland space security (including urban safety) plans as risk governance, the emergency plans as guidelines to emergency management, and the post-disaster restoration and reconstruction plans, if approved by



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5. A five-dimensional system for urban safety where every member of the society participates Photo: Shi Yu

legislators, would become legal documents. Risks to the safety of a city include four types of public emergencies defined by the State Council: natural disasters, accidents, public health incidents, and social security incidents. Public emergencies such as natural disasters, if not responded to in time, would often incur secondary disasters and lead to multiple ones with the chain effect. Also, the known and unknown attributes of risks would directly affect control of public opinion and emergencies. COVID-19 is an emergency derived from unknown risks as the intermediate host of SARS-CoV-2 and its mechanism are still yet to be found. The governance process of the urban safety system consists of the pre-disaster phase of risk governance, the in-disaster phase of emergency rescue, and the post-disaster phase of restoration and reconstruction, involving scientific research in urban risks, risk evasion and mitigation, emergency control preparation, monitoring and early warning, emergency response, decision-making and command, and restoration and reconstruction. The three phases are interconnected, and it's easy to have secondary disasters should one of the three go awry. Hence, the general principle of urban safety governance focuses on precaution and prevention. The governing body of the urban safety system includes governments at all levels, the society, and individuals. The society is the combination of interpersonal relations. And families, neighborhoods, schools, associations, businesses, and communities are the building blocks of the society, but they play different roles in urban safety governance. Scientific governance of urban safety shall also follow the principle of government arrangement, expert contribution, departmental cooperation, public participation, and scientific decision-making.

Enhancing epidemic prevention and control as soon as possible

In view of the issues and vulnerabilities exposed during the COVID-19 epidemic, the lessons learnt are as follows:

1. Educate the public about risks and increase public awareness. With continued economic and social development in the modernization drive, risk types and situations have been changing, and the conventional society has evolved into a risk society. If our society doesn't have enough awareness of risks, especially the new risks such as SARS and COVID-19, there would be social panic and even turmoil once a disaster breaks out. Risk education can increase public awareness of risks and effectively reduce social panic in times of disasters which would make it easier to allocate more resources to respond.
2. Optimize governance system and increase administrative effectiveness. Communication and coordination did occur between provincial and prefectural authorities and the National Health Commission in the early stages of the epidemic, but the best window of opportunity for epidemic control was missed. As emergency management involves almost every department and requires collaboration, it's advised to set up a national public security management commission chaired by a national leader, functionally similar to Japan's Central Disaster Prevention Council, and to give more administrative power to the Chinese Center for Disease Control and Prevention.
3. Build more public health infrastructure and enhance emergency response to public health emergencies. Wuhan excels among Chinese cities in both the number of medical facilities and level, but it still lags behind cities in developed countries such as Singapore. While building more medical facilities, it's important as well to provide equal, universal, and easy access to basic public health services and have sufficient stockpile of medical protective supplies for emergency response. In addition, it's imperative to launch patriotic health and nationwide fitness campaigns as part of the efforts to build a healthy China.
4. Integrate multiple sources of information and resources and make more scientific decisions on emergency management. In an information-based society, countless information is produced every day. Information usually comes from multiple sources, including the government, the media, and the Internet. Information of different sources is of different quality, but all worth collecting and analyzing. The COVID-19 epidemic suggests that whether information is correct, disclosed, or disclosed in time can have a direct impact on the effectiveness of emergency management. Hence, it's advised to collect, integrate, and find information and resources with information technologies such as big data to improve scientific decision-making for emergency management.
5. Legislate urban public security planning and incorporate it into the homeland space planning as mandatory content. One of the goals for homeland space planning is to build a safe and harmonious homeland space structure. Previous planning for city clusters, metropolitan areas, and urban and rural areas seldom touched upon public security other than natural disasters and civil defense. Hence, it looks particularly urgent and important to legislate urban public security planning before any homeland space that is safe, resilient, and efficient can be possible.

Conclusion

The history of mankind is about constant struggles against natural disasters and plagues. Every natural disaster or plague resulted in varied readjustment to the regional, economic, social, and geographic space structures in a way that transformed our relations with the planet. The COVID-19 epidemic in 2020, has not only inflicted catastrophes on Hubei Province and its capital Wuhan and dealt a huge blow to China and the rest of the world, but taught us numerous lessons. Hope this paper can offer some inspiration for modernizing China's urban safety governance system and its capacity for governance.

1.

The Timing and Extent of Urban Spatial Management During the COVID-19 Outbreak

Wang Xingping (School of Architecture of Southeast University and Nanjing Urban Governance Research Institute), Zhang Dongye (School of Architecture of Southeast University)

2.

1. Wuhan, a city of heroes Photo: Hai Luo

2. The "1+8" urban circle with Wuhan at the center Photo: Shi Yu

Not long before the Spring Festival of the year of the mouse, COVID-19 descended on China, causing a joint response nationwide to the epidemic. A first-level response to major public health emergency was launched across the country, quarantining suspected cases with every possible means at the city and grassroots levels, and banning movement of the population. As the coronavirus spread around the globe, many countries also imposed lockdowns, albeit to varying degrees. China is now gradually recovering from the epidemic, with production resuming, schools reopening, and lockdown measures eased up or lifted. It may be too early to look back and assess the lockdowns, but just like mobile cabin hospi-

tals building, volunteers venturing out to help, and officials taking on new roles to combat the epidemic, they are worth reviewing for distilling lessons.

From lockdown to classification, haste was replaced with composure

Locking down cities or regions in the face of an emerging unknown infectious disease with no effective treatment is not something unprecedented, as it's well recorded in history. But isolating and blocking special areas with high density, gigantic scale, and powerful movement for a specific period of time would really be a daunting task.

Wuhan, the hardest-hit city in China, has long been well known as the main thoroughfare of nine provinces. It's the transport hub and central city in China's central region and the capital of Hubei Province, and one of the key transit areas during the country's Spring Festival travel rush. The cities in the "1+8" urban circle with Wuhan at the center are highly integrated and interconnected, with large numbers of people traveling between one another. As the migration data from Baidu suggested, of the 5 million people who left Wuhan before its lockdown on January 23rd 2020, 50.12% of them left for Xiaogan, Huangshi, Huanggang, Xianning, Ezhou, Xiantao, Qianjiang, and Tianmen. Such huge migration put mounting pressures upon the cities in epidemic prevention and control and sent shock waves across the whole province. But these cities don't have the advanced and major polyclinics and emergency medical facilities as Wuhan does. As the official website of Yaozh Data indicates, Wuhan is home to 31 Grade III Level A hospitals, whereas the eight cities in the urban circle of Wuhan have only 12 such hospitals in total, less than half of what Wuhan has. And the medical resources were unevenly allocated within the circle, resulting in substantial pressures on the eight cities in their combat against COVID-19 in its initial outbreak. Under these circumstances, the consequences would be inconceivable if the epidemic spread on a large scale. After prudent assessment of the Spring Festival travel rush and the development of the epidemic, Wuhan imposed urban space controls by locking down the entire city in a strenuous effort to curb the spread of the coronavirus. Stringent measures were taken to control the traffic and migration within the city: public transport systems such as buses and subways were all suspended, and airports and railways all shut down. In the meantime, from every province and city to every county, town, and village across the country, many border and space controls were introduced based on the boundary of administrative regions, such as disinfecting and ventilating every means of transportation, setting up checkpoints at entrances and exits of expressways and national highways, taking stringent epidemic prevention and control measures in communities and villages at the grassroots level, and quarantining households and buildings. These measures played a key part in containing the spread of COVID-19 and contributed to the current recovery seen across the country.

3.

3. Map of destinations people left for from Wuhan on January 23rd 2020 Photo: screenshot from Baidu Map

4. The "belated" spring Photo: Wu Dan

Lockdown that started in late January might be effective in stemming the spread of the epidemic, but it also brought some unexpected difficulties to the treatment of patients that had contracted COVID-19 in its initial outbreak. Many cities were unprepared for emergencies, as evidenced by inadequate and proximate medical or emergency facilities for combating any epidemics, making it hard to quarantine patients on the spot and treat them in time. And the abrupt lockdown put cities to a halt that led to limited internal resources and inaccessible external ones, exacerbating the conflict between hospitals and patients as well as supply and demand. From the perspective of communities, as the smallest units in the fight against the epidemic, communities should first of all voice the needs and difficulties of the patients in confined communities when an epidemic struck, so that both patients and suspected cases can be quarantined and treated. But the suspension of community services as a result of lockdowns made it difficult for many patients and suspected cases in isolation to get support from their communities. And to make matters worse, some communities and villages even went to extremes to combat COVID-19, such as cutting off roads, which disrupted the normal life of residents and prevented patients at home from being discovered, quarantined, and treated in time. Although these issues were finally resolved, we still have to reflect on the problems relating to urban building, operation, and emergency management exposed during the epidemic.

In mid February after the Lantern Festival, the epidemic was gradually on the wane while the economy and society were returning to normal. At a time when the pressures built upon businesses to resume production, how to balance lockdowns to contain the spread of the coronavirus and a gradual return to normality in cities to stimulate the economy became a very important question to reckon with. The central

government put forward the requirements of focusing on major tasks, coordinating multiple parties, issuing targeted guidance, and implementing targeted policies to different areas. In the *Guideline on Scientific Prevention and Control, Targeted Policy Implementation, and Classification in Response to COVID-19* issued by the Joint Prevention and Control Mechanism of the State Council, it's required to scientifically classify epidemic risk levels and specify classification-based epidemic prevention and control strategies based on comprehensive review of population and morbidity at the county/district level. Some coastal developed areas were the first to resume production, reduce risk levels, and ease lockdown restrictions. Epidemic prevention and control gradually evolved from the heavy-handed approach and the single target of forcible isolation and blockade to contain the spread such as lockdowns in the initial outbreak of the epidemic, to flexible approaches and diverse targets of classification-based governance, epidemic prevention and control, and economic recovery. It looks like the transformation from sweeping lockdowns to classification-based governance has proved to be effective in both preventing spread of the virus and promoting economic development, as fewer new cases have been reported and businesses have increasingly stepped up their production.

A classification-based lockdown: review is required

One cannot have a good life without health and freedom, but both can be lost if an epidemic erupts. Most of those in areas under lockdown or hunkering down at home can only look out of windows to visually enjoy the sunshine and the wonderful spring. Despite great advances in science and technology and increased accuracy in our prediction and judgment, we were still caught off guard time and again by some of the abruptly-emerging new threats beyond human comprehension, which is exactly what we're experiencing now and will remain so in the future as we can't possibly predict all risks or take precise and timely precautions. As such, we have to learn from our failures. Party organizations and governmental departments at all levels as well as frontline workers made various tentative spatial measures to prevent and control COVID-19, which became increasingly effective as the epidemic evolved. They need to be carefully reviewed, assessed, referenced as we gradually come out of COVID-19 to develop a spatial governance guide to epidemic prevention and control that can be invoked in time and flexibly adjusted.

The transformation from the initial heavy-handed lockdown to a classification-based lockdown, can be regarded, at least for now, as an important lesson for effective spatial governance. Some may think that Singapore's approach had less economic and social cost, but it simply can't be replicated in China given the sheer size of the country as opposed to a city state. The timing and extent of lockdown and classification are worth further reflection, including the appropriate timing of starting lockdown and its feasible duration, and the scale, scope, and type of a classification-based lockdown. Imposing time-phased and classified control of people and activities with different spaces as the units for governance based on administrative regions, and at the same time given cross-unit connection and regional joint epidemic prevention and control, mobilizing all forces across community networks to ensure both containment of COVID-19 spread and smooth economic reopening, would play a role in epidemic prevention and control in such a large country with massive migration and a dense population.

Of course, an effective response to an epidemic requires not only special measures such as lockdown, but the establishment of a classification-based system of diagnostic and treatment facilities with adequate stockpile, balanced distribution, and a jointly peacetime and wartime approach. From the perspective of community governance, it would have long-lasting positive effects to conduct professional training and emergency exercise for community residents and staff to really enable communities to function as the basic health units in the combat against an epidemic as it breaks out and as strong bulwarks for residents as they go into lockdown.

The sudden outbreak of COVID-19 and the extent to which it's had impact have made each and every one of us involved. There will certainly be various unpredictable and tricky new diseases to come, but the space we all live in will remain unchanged where everyone shares the same destiny. We cannot constantly live in a state of speculation and worry, but have to adopt an effective spatial governance strategy to confront any potential diseases head-on, which would at least help maintain social order and reduce panic and disconcertment. A rational, feasible, and operable-at-any-time spatial governance system for epidemic prevention and control with appropriate timing and extent of lockdown, would help us stay calm and composed. And this is where planners can contribute more of their expertise.

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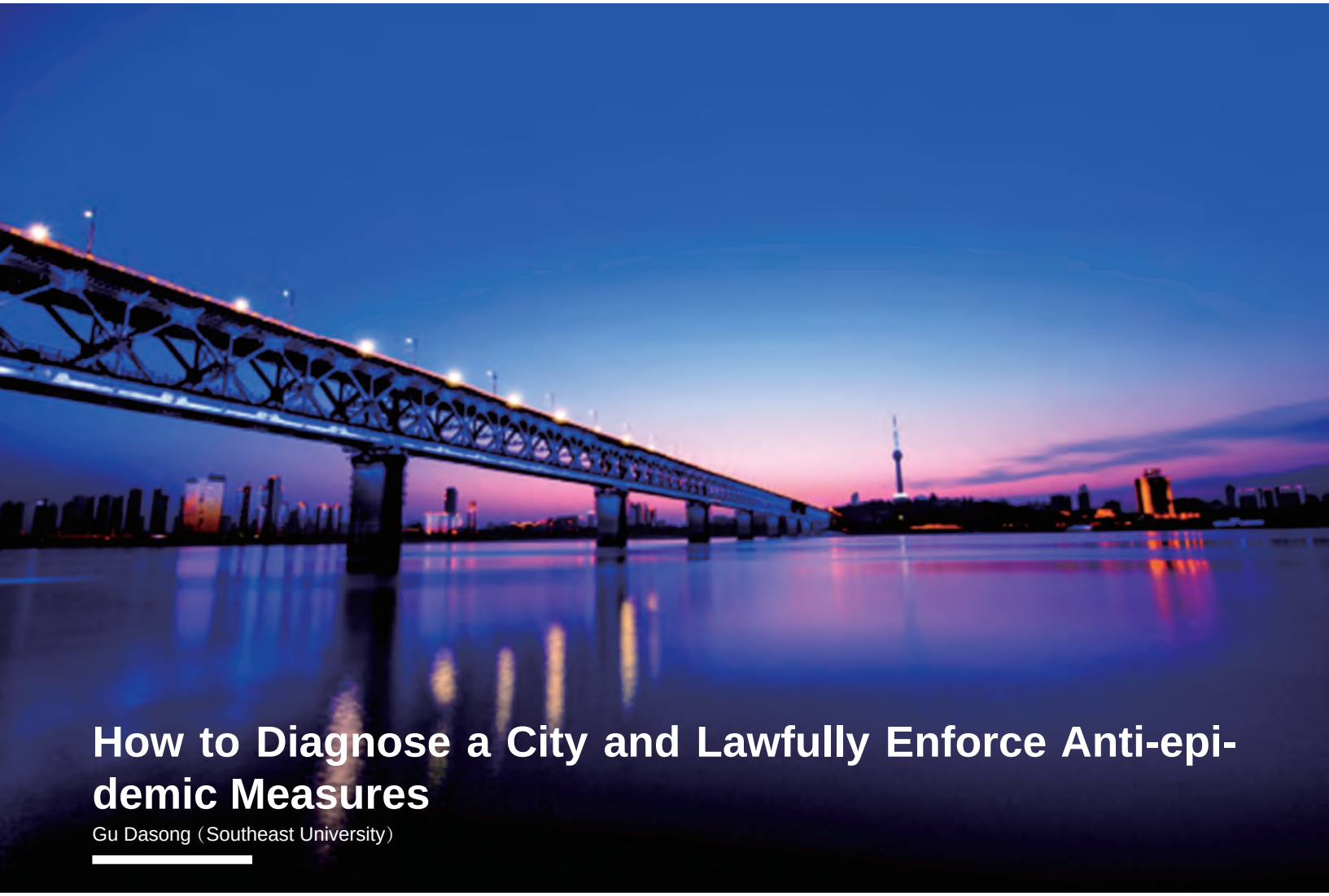

How to Diagnose a City and Lawfully Enforce Anti-epidemic Measures

Gu Dasong（Southeast University）

1.

"My city is sick, but I still love it." —— an excerpt from the lyrics of the song "Wuhaner" created by the people of Wuhan that has moved many people.

"This is my home and we're gonna protect it. The poem about the Yellow Crane Tower is familiar to every one of us in Wuhan. If it needs me someday, I would give a hand..." This reflects the strong side of the people of Wuhan in the face of a severe epidemic and has encouraged those heading from the rest of the country to help prevent and control the epidemic in Hubei.

However, it's not enough to combat the epidemic with just a song, as it also requires science and the rule of law. On February 5th 2020, shortly after the outbreak of the epidemic, the Central Commission on Comprehensively Promoting Law-Based Governance issued the *Opinions on Preventing and Controlling COVID-19 and Protecting the People*, where it's required to conduct epidemic prevention and control in accordance with laws and regulations, which greatly suppressed illegal acts, such as cutting off roads and sealing off doors of those returning from Hubei.

Many people had no idea what to do about an epidemic that broke out out of blue, as the laws that they used to follow often apply in normal times, which explains why there were still unlawful acts of epidemic prevention and control in multiple areas even though the central government had required law-based epidemic prevention and control, such as the self-declared "wartime regulation" in some places, which rendered the calls for scientific and law-based epidemic prevention and control useless.

As the COVID-19 crisis abates across the country, many started to appeal for production resumption nationwide. But local governments dealt with incoming population with varying approaches. Some governments defined "epidemic hotspots" at their discretion, causing people from the epidemic hotspots refused entry. And some introduced "passcode" with big data, but the problem was: for example, for the same person, his or her passcode was green, meaning he or she hadn't visited any places of high risk, but it could turn red the next day, which means he or she would be refused entry.

The greatest advantage of a law-based mentality and approach to epidemic prevention and control is that the public would be provided with the explicitness and uniformity of the rule of law. The problem with disrupted production resumption and refusal of entry lies in the lack of a law-based and scientific definition of epidemic hotspots that made it unlikely to offer a law-based guideline to cross-regional traffic flows.

From the perspective of urban governance, a law-based and scientific definition of epidemic hotspots in a city is tantamount to confirmation of an epidemic in the city, which means the authorities would declare that a certain area or the entire city is "sick" and would take measures such as quarantine, disinfection, and treatment to make it "recuperate" when they would rescind the declaration.

2.

Authorities legally entitled to define "epidemic hotspots"

There is a common sense in the medical community, which says "doctors cannot be self-treated." It's also true with the definition of epidemic hotspots, which, in a legal sense, originates from the requirement that says "nobody can be the judge for his or her own deeds".

As stipulated in Article 43 of China's *Law on Prevention and Treatment of Infectious Diseases*, when an infectious disease under Class A or B breaks out or prevails, local government at or above the county level may, subject to decision by the government at the next higher level, announce part or the whole of its administrative area as an epidemic hotspot, and the State Council may decide and announce areas across provinces, autonomous regions, and municipalities directly under the central government as epidemic hotspots. The procedure of reporting to the government at the next higher level for approval gives the right to decide on defining epidemic hotspots to the government at the next higher level, which is in line with the legal principle that no one can be the judge for his or her own deeds.

But just because of the reporting procedure, the right to report falls to the government that reports, which is similar to transferring the right to preliminary diagnosis to patients themselves in the medical treatment process, which to some extent would lead to the conundrum of one judging oneself. This partly explains why there's still not a law-based definition of epidemic hotspots in the system of the *Law on Prevention and Treatment of Infectious Diseases*.

Who should define "epidemic hotspots"?

As economic and social impact and preventative measures to be taken after an epidemic need to be taken into account, defining epidemic hotspots is supposed to be a responsibility of the government. That's why the government is given the right to report and the government at the next higher level to decide as enshrined in the *Law on Prevention and Treatment of Infectious Diseases*. But the government is not expert in either diagnosing diseases or identifying what type of infectious diseases they belong to, which has to be done by clinical and public health specialists. And in this sense, it would be a matter of science.

As specified in Article 40 of the *Law on Prevention and Treatment of Infectious Diseases*, when finding epidemic situation of infectious diseases or receiving reports on such situation, the disease prevention and control institutions shall make epidemiological investigation on the epidemic situation of infectious diseases and based on the findings after such investigation, put forth proposals for defining epidemic hotspots, offer sanitary treatment to the contaminated places, keep the persons in close contact under medical observation at designated places and take other necessary preventive measures, and propose plans for control of the epidemic situation to health administration departments. This gives disease prevention and control institutions the right to propose the definition of epidemic hotspots, which essentially reveals the trust of the legislature in the scientific capacity of professional institutions and their legal right to propose definition of epidemic hotspots.

Similar stipulations can also be found in the *Regulations on Public Health Emergencies* promulgated and entered into force in 2003. According to Article 26 of the Regulations, after an emergency occurred, health authorities

1. Wuhan Yangtze River Bridge Photo: Hai Luo

2. Everyone contributes his or her share to epidemic prevention control

3. Screenshot of a MV for the song "Wuhaner" Photo: Tan Xuan

2.

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4. Off limits Photo: Wu Dan

shall organize experts to conduct a comprehensive assessment to have a preliminary judgement of its type and propose the suggestion on whether or not to implement an emergency response plan. The suggestion specified in the Article shall also be understood as the conclusion put forward by experts based on their scientific expertise that shall be respected.

Instead of allowing two governments at different levels to have a comprehensive diagnosis of the economy and society, the existing *Law on Prevention and Treatment of Infectious Diseases* follows the basic legal principle of no one judging his or her own deeds by giving the right to decide the definition of epidemic hotspots to the government at the next higher level where an epidemic occurs and giving professional institutions the right to recommend the definition of epidemic hotspots, which reflects the combination of law and science. In this sense, the conundrum of giving the right to report the definition of epidemic hotspots to the government at the lower level would be solved if the right to report is taken as more of a formality rather than has any real effect. In other words, disease prevention and control institutions shall provide recommendations on definition of epidemic hotspots based on professional and independent research, and the government where an epidemic occurs shall coordinate with the government at the next higher level to launch the reporting procedure which however shall not cause any substantive alterations to the suggestion presented by professional institutions. Only with this can we have a clear division of responsibilities and a synergy between professional institutions and the government that help deliver a law-based and scientific response to any outbreaks of major infectious diseases.

Statutory force of defining epidemic hotspots

In China, declaring a city or a certain area of a city an epidemic hotspot, is similar to declaring to a patient diagnostic confirmation and the need for hospitalization. At this time, the patient needs to rest in bed and gets treated in hospital. Similarly, any city or any part of it declared an epidemic hotspot needs to be "hospitalized for treatment" as well. Hence, according to the *Law on Prevention and Treatment of Infectious Diseases*, declaring an epidemic hotspot, in a legal sense, implies imposed and self-imposed restrictions of what people can do.

Local governments at the county level or above can adopt the emergency measures within an epidemic hotspot specified in Article 42 of the *Law on Prevention and Treatment of Infectious Diseases*, and quarantine people, supplies, and means of transport coming in and out of the epidemic hotspot. Government of a province, an autonomous region, or a municipality directly under the central government can decide to seal off epidemic hotspots of Class A infectious diseases within its administrative region, but it has to be decided by the State Council to block epidemic hotspots within a large or medium-sized city, those spanning across provinces, autonomous regions or municipalities under the central government, or those whose blockade would lead to traffic disruptions of trunk roads or national border closures. Lifting blockade of epidemic hotspots has to be decided and declared by the same authorities that declared the blockade. This is an explicit legal requirement of restricting an epidemic hotspot following the declaration of defining the epidemic hotspot, which is two-fold: local governments at the county level or above can either adopt the measures specified in Article 42 of the *Law on Prevention and Treatment of Infectious Diseases* or impose blockade (also known as lockdown in a more informal way).

But an epidemic hotspot has to be declared before blockade can be imposed. As no cities including Wuhan hit hardest by COVID-19 have been declared epidemic hotspots, the stringent traffic controls imposed in Wuhan and other cities cannot be deemed blockade as specified in the *Law on Prevention and Treatment of Infectious Diseases*. And in a semantic sense, blockade literally indicates more of a seal-off imposed from the outside, that is, an imposed restriction, but the traffic controls introduced by the Wuhan Municipal Government (the Command Center for Epidemic Prevention and Control) were the kind of seal-off from inside out, namely a self-imposed restriction. As the two are significantly different, the traffic controls are not the legally-defined blockade.

The controls imposed by local authorities are not in accordance with the procedures to be followed after definition of epidemic hotspots as specified in the *Law on Prevention and Treatment of Infectious Diseases*, but in effect indicate what Article 49 of the *Emergency Response Law* specifies a series of emergency responses made by the government in execution of its duty following the outbreak of a public health incident, including swift control of sources of danger, marking dangerous zones, sealing off dangerous places, caution areas, and traffic controls.

In a nutshell, the *Law of Prevention and Treatment of Infectious Diseases* applies to increased controls following definition of epidemic hotspots, while the *Emergency Response Law* applies to emergency response based on the level of an emergency. Thanks to the gap between the two, it's been difficult to start defining epidemic hotspots, which has led to disrupted production resumption and refusal of entry. Going forward, lessons shall be learnt to identify the fundamental differences between the two laws and fill the gap by revising them.

Anti-epidemic Hospitals and Their Role in Epidemic Prevention and Treatment

Zhou Ying (School of Architecture of Southeast University), Cui Yifan (School of Architecture of Southeast University), Wen Jian (School of Architecture of Southeast University), Li Yidi (School of Architecture of Southeast University)

Why do we need anti-epidemic hospitals?

From SARS of 2003 to H1N1 of 2009, and from Ebola of 2014 to COVID-19 at the end of 2019, we've been somehow suffering frequent outbreaks of epidemics as the world's become increasingly globalized. As the aftershocks of COVID-19 are still felt across China, much of the world is grappling with it like riding on a roller coaster. The unknown origin of the epidemic has made every one of us increasingly perplexed and disconcerted. Who knows whether there would be another strike!

So what should we do? I've been haunted these days by images of lack of access to hospitalization and beds, and as a medical architect, I've also been thinking of solutions. At last I came up with a preliminary idea about building anti-epidemic hospitals. So what is an anti-epidemic hospital? It's not something as Xiaotangshan, a hospital in Beijing that was dedicated to treating patients of SARS during its outbreak, or Huoshenshan and Leishenshan either, two emergency specialty field hospitals built in response to COVID-19. It's actually a permanent general hospital (or its pneumology center relatively independent of it) that meets anti-epidemic standard and has a strong pneumology department. With sophisticated medical care that can be provided by the pneumology department, it's mostly dedicated to treating respiratory diseases in normal times and operates a fever clinic to prevent any epidemic outbreaks. But if an epidemic breaks out, it would be capable of swiftly transforming itself into a medical facility that can admit and treat far more patients than it normally does with just some simple approaches of transitioning from normality to epidemic control and rapid capacity expansion. In a word, an anti-epidemic hospital shall be able to meet medical needs in both normal times and the epidemic period in a way that is cost-effective.

But why not build as many hospitals for infectious diseases as possible? This is largely because people seldom pay a visit to such hospitals for respiratory diseases and it's normally very hard for hospitals with too few patients to offer sophisticated medical care techniques for respiratory diseases. Only with abundant practice in respiratory disease diagnosis, treatment, and nursing, can medical staff accumulate experience and develop instincts in effective treatment, and can they be more likely to have correct judgment even if in the face of unknown viruses. And again, with better medical care for respiratory diseases, anti-epidemic hospitals would have better epidemic prevention and control during an epidemic.

1.

1. Scientific epidemic prevention and control Photo: Hai Luo

What would be the proper size of an anti-epidemic hospital?

Many people in China prefer large hospitals for illnesses mild or serious owing to their entrenched belief that they are more plausibly trustworthy than small hospitals. But if an anti-epidemic hospital is too large, it would be far more likely to have cross-infections not only among patients but between patients and medical staff. And in a large hospital with many rooms, it would be more difficult to control atmospheric pressure differences between hygienic and contaminated zones and among different rooms, and it would hamper the efforts to prevent hospital-acquired infection. Also, many patients suffering other illnesses would be admitted to a large hospital during the outbreak of an epidemic, which makes it inappropriate to be used as the one dedicated to epidemic prevention and control. That said, a hospital too small would not be suitable to deal with an epidemic either, as it would require special medical equipment and air and sewage disposal and discharge facilities that can only be cost-effective in a large hospital, much less a community-level hospital proximate to a residential area.

Anti-epidemic hospitals, based on the author's research, can be classified into special and general ones. A special anti-epidemic hospital is a new polyclinic with a strong pneumology department and a capacity of roughly 1,000 beds, whilst a general anti-epidemic hospital can be an independent pneumology center rebuilt from a polyclinic in a way that best suits the need for epidemic prevention and control and provides up to 500 beds.

Where should an anti-epidemic hospital be built?

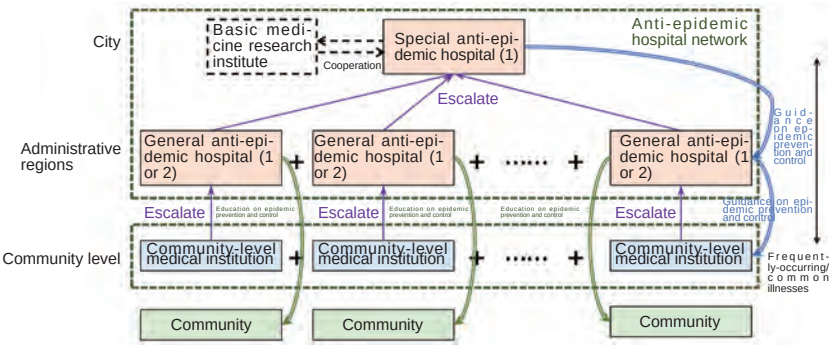
As some air, sewage, and waste may be contaminated in an anti-epidemic hospital during an epidemic, it would be better to build it in a place with no water sources and in a downward wind direction that is environmentally friendly. And there needs to be an open space outside an anti-epidemic hospital for medical rescue and medical capacity expansion that would not only help provide easier access to hospital for patients on one hand but would be conducive to epidemic prevention and control for the hospital. So what would be the best location for building such hospital? There are basically two types: one is an anti-epidemic hospital based on administrative regions, and the other based on the so-called "secondary medical care circle".

An anti-epidemic hospital based on administrative regions

Building an epidemic hospital based on administrative regions is the easiest way to do so. Take Wuhan for example, a special anti-epidemic hospital can be built within a city, with one or two general anti-epidemic hospitals built in each administrative region of the city, which looks easy to do. But if the land area, population size, and traffic condition vary widely from one administrative region to another, such approach wouldn't necessarily ensure equal access to hospital.

An anti-epidemic hospital based on the secondary medical care circle in a broader commuting and life circle

To provide equal access to medical facilities, Japan introduced the so-called medical care circle. Each of the 47 prefectures in Japan, except Hokkaido and Nagano, is seen as a tertiary medical care circle based on the country's medical care plan to provide advanced medical care. And each of the prefectures is comprised of several cities, towns and villages (collectively known as municipalities),



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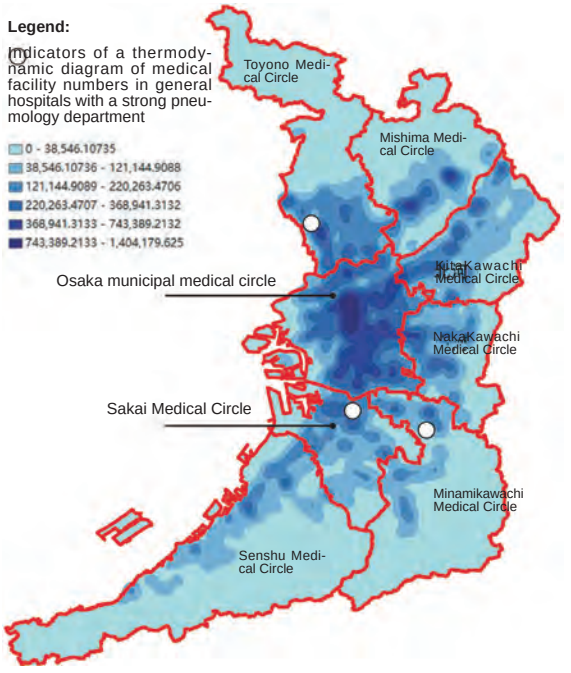
with each regarded as a primary medical care circle, to provide everyday medical care. Inpatient care, the most important part of Japan's medical care, is provided by its secondary medical care circles, which are based not on administrative regions, but largely on people's commuting and life circles that can better reflect the sphere of people's life and the close relations among municipalities.

Take Osaka as an example. It has an area of 1,894m^2 and a population of 8.8 million, with 33 cities, 9 towns, and 1 village. Based on 6 commuting and life circles as well as existing hospital distribution and the need for emergency medical service, Osaka is divided into 8 secondary medical care circles. The outpatient and inpatient visits of each secondary medical care circle are kept at around 80% respectively, which ensures equal access to medical care. Also, Osaka is home to 3 national or prefectural hospitals that provide medical service mostly for respiratory diseases, each of which is unique in terms of its medical service but none of which is located in the most populous and developed medical care circles.

Japan prefers to create various circles for their medical care planning, which is familiar to the planning community in China. Its secondary medical care circles may provide some inspiration for our attempt to select the best locations for anti-epidemic hospitals.

2. Layout of anti-epidemic hospitals based on administrative regions

3. Osaka prefecture's secondary medical care circle



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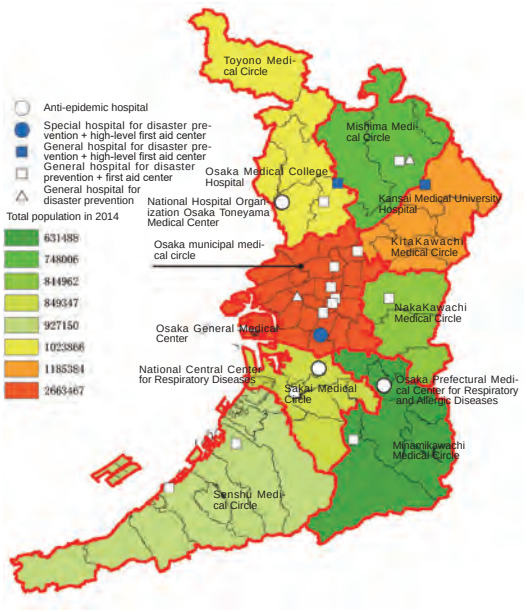
Connect anti-epidemic hospitals to make a network

A single anti-epidemic hospital wouldn't play much of a big role unless it's connected with one another via transport and information. Within a city, we can not only use anti-epidemic hospitals to admit and treat or transfer patients, but prevent and control an epidemic with epidemic developments reporting and anti-epidemic guidance and education between medical institutions. When an epidemic becomes so serious somewhere that hospitals there are too overwhelmed to take in more patients, the first priority is to evacuate and transfer the patients to anti-epidemic hospitals elsewhere with anti-epidemic cars, high-speed trains, airliners, and ships, rather than repurpose designated hospitals or build makeshift ones. To make it easier to transfer patients over a long distance during an epidemic, a special anti-epidemic hospital has to be in the vicinity of an airport or a high-speed train station. And there needs to be adequate outdoor open space in the neighborhood of an anti-epidemic hospital in store for any medical rescue or hospital capacity expansion during an epidemic.



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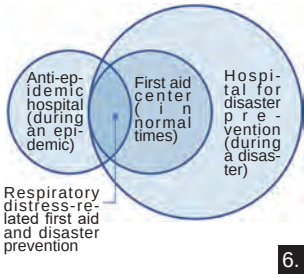

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4. Anti-epidemic hospital network

5. Trinity

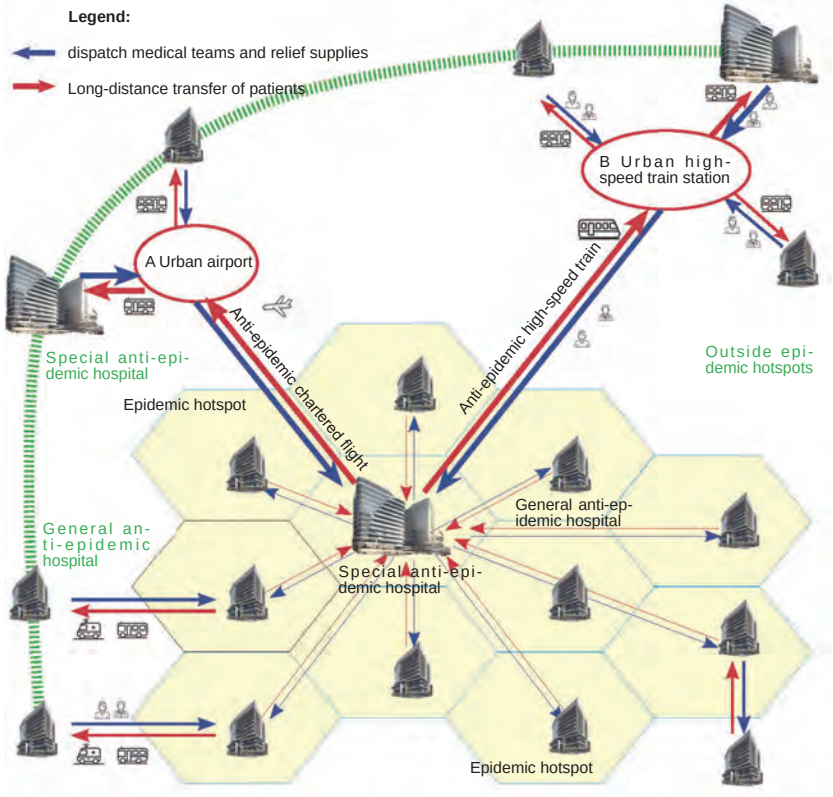
6. Distribution of first aid centers, anti-epidemic hospitals, and hospitals for disaster prevention in Osaka prefecture

A trinity that combines first aid, disaster prevention, and epidemic control

China is a country where natural disasters frequently occur, but its medical system of first aid and disaster prevention lags far behind its counterparts, which often leads to grave consequences once accidents or disasters occur. If anti-epidemic hospitals can be integrated with medical institutions for first aid and disaster prevention to form a comprehensive city-wide or even a regional system of medical institutions, then it would deliver the best possible outcomes and avoid any stopgap measures. So what specifically should we do? Let's first of all take a look at Japan's experience.

What Japan did was essentially selecting some of the hospitals for disaster prevention, which had sophisticated medical technologies, strong anti-seismic capacity, easy accessibility, huge stockpile of supplies, and adequate outdoor open space that would contribute to their disaster prevention should any disasters such as an earthquake occur. The requirements for a first aid center in Japan are even stricter, as the hospital it relies on shall be the one for disaster prevention and it shall have a comprehensive range of medical technologies required for providing medical services to save lives. In Japan, there is one anti-epidemic hospital for every 173,000 people, and one first aid center for every 400,000 to 500,000 people.

But there are no hospitals for infectious diseases in the country, let alone the anti-epidemic hospitals proposed in this article. As for China, the best-case scenario would be a trinity, involving anti-epidemic hospitals, first aid centers, and medical institutions for disaster prevention.



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Anti-epidemic hospitals go global

In a globalized world, no country can fight alone against a major epidemic once it breaks out. So we're obliged to introduce anti-epidemic hospitals to the world if they prove to be effective. We can build anti-epidemic hospitals on a certain island as we see fit off the coast in China's southeast, which provides medical services to residents on the island and its surrounding areas in normal times and takes in patients from cruise ships during an epidemic. In addition, China can also attempt to cooperate with local governments of countries along the Belt and Road and even in Africa and Latin America to build such hospitals that would not only help export our medical technologies but collect firsthand information about any local epidemics in a timely manner for early precaution. In other words, China shall make greater contribution to global health care and medical care.

1.

Creating Healthy Human Settlements Through Reasonable Ventilation

Cao Xiangming (School of Human Settlements and Civil Engineering of Xi'an Jiaotong University), Cai Juanjuan (The Administrative Committee of Xi'an Yanliang National Aviation Hi-Tech Industrial Base)

As COVID-19 has continued unabated since its outbreak in China, it's become increasingly urgent for city planners to think hard about how to build healthy and safe cities in addition to reviewing any risks and issues pertaining to urban public health and safety. The primary transmission route of COVID-19 is through close person-to-person contact and through direct contact with respiratory droplets generated when an infected person coughs or sneezes, but airborne transmission is possible as well. So urban ventilation would play a key role in preventing and controlling respiratory diseases. This article is about building urban ventilation corridors with a few recommendations proposed.

Group-based urban structure can effectively stem the outbreak and spread of epidemics

In the last few years, with urbanization gaining greater momentum in China, urban development has been on the fast track across cities at all levels, but at the same time, calm winds have become more frequent in cities and haze severe in big cities due to declining urban air quality. Given most of the cases of COVID-19 were reported in densely populated capital cities or big cities in provinces except Hubei, planners should think about an urban space structure that would be conducive to ventilation. The reason is that once a respiratory disease occurs, a well-ventilated urban environment can minimize

outdoor infections.

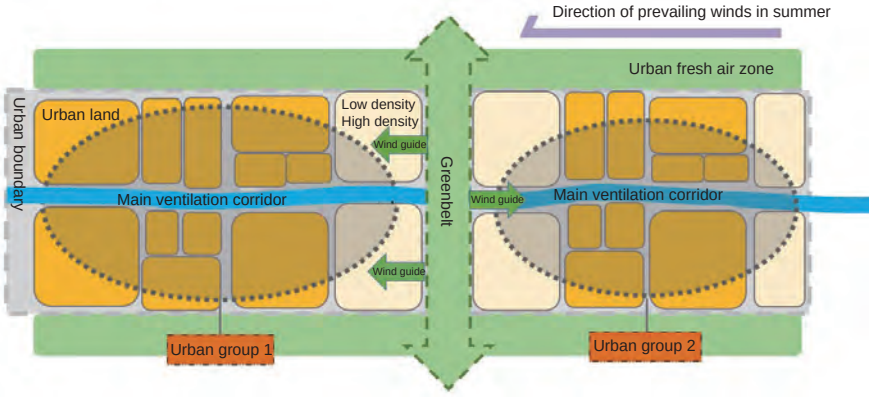
Greenbelts between groups are the lungs of a city

American architect Eliel Saarinen proposed the idea of organic decentralization as early as 1934. According to the concept, a city can be divided into areas used by different centralized points just like an organism, with each area forming a group and an interspace in between for “breathing”. In the 1950s, while making urban plans for Chandigarh of India, Le Corbusier proposed that the greenbelts running through residential areas of a city, like the lungs, can bring prevailing or local winds into the city to clean the air and reduce summertime temperatures. Hence, when it comes to urban space expansion, a group-based urban structure divided by greenbelts can be built to provide better ventilation.

Many cities in China have problems with ventilation. For example, plain-based cities often display a pattern of excessive sprawling, where the central areas extend with no interruption, making them badly-ventilated; and valley-based cities usually have weaker prevailing winds as they’re surrounded by mountains, making it hard for pollutants to spread and for air to circulate. Given the weak ventilation in these cities, the group-based structure, if adopted, would help their land for construction fully exposed to natural environment to increase airflow and allow more winds to get inside the cities. At the same time, it’s necessary to regulate land development in urban-rural fringe to allow its cool winds to blow into cities.

Each group can serve as a control unit under special circumstances

As a space structure that integrates urban and rural areas, the group pattern is a breakaway from the conventional pattern that the circle dominated by economic activities extends outward or expands axially, and focuses on ecological, economic, and social coordination and harmony. Greenbelts between groups shall fit in with natural environment, such as naturally-formed water or hills. Such urban structure can better cushion any epidemics, as each group, as a control unit, can effectively prevent epidemic transmission in between.



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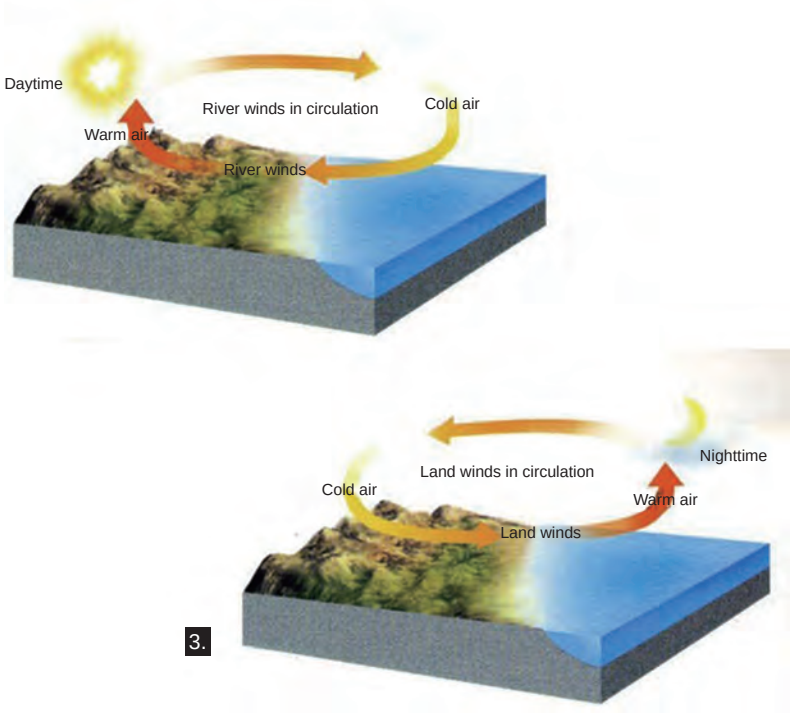
Each group has to be extended in the direction the wind blows

For an axially extended group in the upwind direction, its ventilation system shall function in concert with prevailing winds. For an axially extended group in the downwind direction, its internal spatial layout shall match local air circulation. Specifically, groups located downhill shall be put in line with the sphere of influence of valley wind and the time it blows, and groups close to riverbanks shall be put in line with the sphere of influence of river-land wind and the time it blows, to ensure good urban environment and air quality as well as ventilation of residential areas within each group. So in an epidemic outbreak, even if some residential buildings have to be quarantined in each residential area, better ventilation would reduce the risks that other residential units may face.

1. Urban ecospace Photo: Jude Joshua

2. Group-based urban spatial layout Photo: Cai Juanjuan

3. Diagram of river-land wind Reference: Liu Jiaping. Urban Environment Physics [M]. Beijing: China Architecture & Building Press, 2011.



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The “water + road” ventilation corridor system in cities

Many big cities in China, such as Hong Kong, Beijing, Wuhan, and Changsha, have conducted research in the ventilation corridor system. A ventilation corridor is usually comprised of large swathes of water, major roads in parallel with dominant winds, concentrated urban greenbelts, squares, land not used for construction, and low-rise building complexes, which connect with one another. It contributes to healthy development of cities, in that it can effectively enhance urban air circulation and reduce summertime urban heat island effect and urban pollutant concentration.

On one hand, prevailing winds are usually weaker in inland cities. On the other, urban air pollution would become increasingly prominent as cities expand. As valley and river-land winds can greatly improve urban wind environment due to the thermodynamic circulation created by mountains and rivers, guiding valley and river-land winds to provide better

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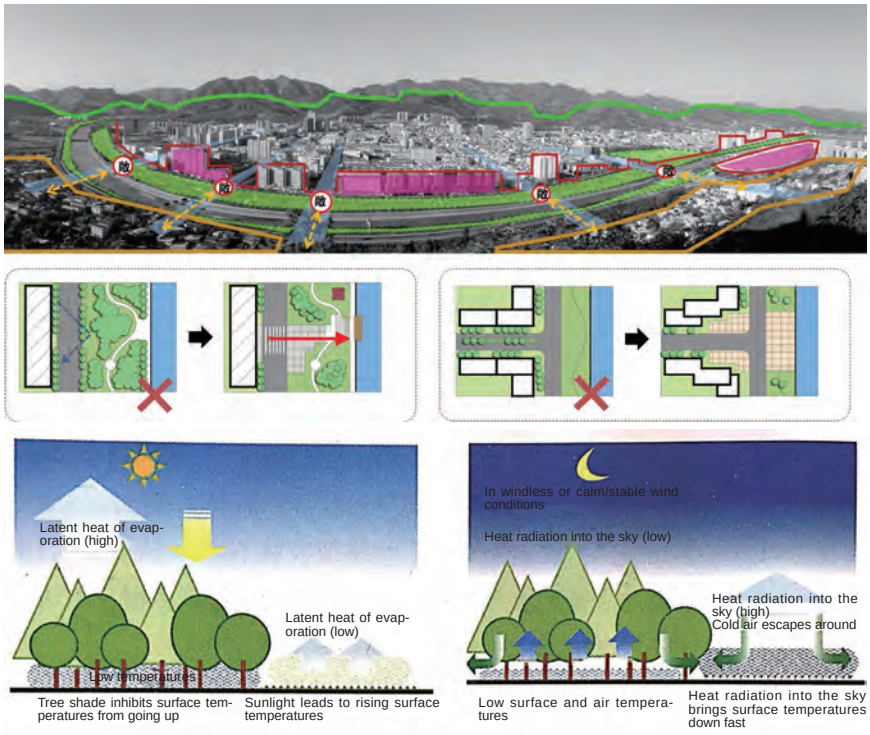

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ventilation in cities would be key to improving the wind environment of valley-based cities. As for cities with higher calm wind frequency, their major open space consists of linear channelized riverways and road space. Hence, effective use of linear space would be an important part of building ventilation corridors in such cities.

Water-based urban ventilation corridor

Development of all cities is closely related to water. As major air passages which makes them unique edges of a city and as major ventilation corridors for a city, riverways shall be developed on two fronts. On one hand, the blue lines for riverways as a sphere of protection shall be clearly drawn, green buffers on both sides of riverways extended, and riverside buildings terraced to allow space for ventilation corridors. On the other, the water in the riverways, which has a prominent advantage as the ecological cold source of cities in their temperature inversion, can be designated as important compensatory space for urban wind environment.

The full contact of a city with its rivers would contribute to the system of its ventilation corridors. So embedded installations for inducing air have to be built in riverbank zones to avoid the closed wall-type riverside layout. It's better to have a bell mouth layout for the buildings at the intersection between city roads and riverside roads, and buildings on both sides of an intersection shall be held back and terraced to create small space for open green space square, which would be conducive to urban landscaping and ventilation. The height and density of buildings in riverside zones shall be limited, to allow river-land wind to permeate concentrated construction areas of a city.

4. Diagram of guiding wind in riverside areas Photo: Cai Juanjuan

5. Diagram of forest-source wind Reference: Ren Chao. Urban Ventilation Assessment and Wind Corridor Plan [M]. Beijing: China Architecture & Building Press, 2016.

Urban road-based ventilation corridor

Urban road system provides the framework for urban development. When urban roads extend in the same direction prevailing winds blow, the roads can act not only as urban transport but as ventilation corridors, and the effectiveness of ventilation very much rests with the direction, width, and cross section of roads. For road-based ventilation corridors, widening motor vehicle lanes alone wouldn't make good ventilation. But it can be done, while building ventilation corridors based on major roads, by putting greenbelts of a certain width or green space parks with a certain area on both sides of the streets that can potentially become ventilation corridors and integrating multiple urban functions to make ventilation corridors environmentally-friendly and recreational. For example, for Tangyan Road, the 100-meter-wide boulevard built along the relics of the Tang Dynasty city wall in the city of Xi'an, the height of the building complexes on both sides shall be reasonably controlled, roof and vertical greening can be adopted to increase green coverage and improve local climate, and strip-style windward building complexes can be replaced with tower buildings.

Scale effect of ventilation corridor

According to research, a Level-1 ventilation corridor is usually comprised of such open space as rivers, lakes, and large belt-shaped parks running through the entire downtown of a city, which wouldn't provide desired ventilation unless its width reaches 80 to 150 meters; and a Level-2 ventilation corridor is built usually based on trunk roads and open space, which has to be at least 50 meters or so wide before there is any ventilation. For example, Xi'an is transforming its 100-meter-wide road-based greenbelts to make slack winds stronger.

Expand urban green space to allow green-source wind to come into play

As a unique green underlying surface in all sorts of urban land for construction, urban green space can effectively influence and improve urban local microclimate, playing a key part in enhancing overall quality of urban environment. On one hand, plants absorb carbon dioxide and release oxygen through photosynthesis, and on the other, they absorb a great deal of heat from the environment through transpiration which reduces ambient temperatures and increases humidity. As stretches of green space are out of step with temperature rise and fall of surrounding buildings, local winds moving at the speed of 1m/s, i.e. forest-source winds, would appear, blowing from green space to concentrated building areas, which helps make comfortable local environments in big cities in the state of calm winds on hot summer days.

The spread of respiratory diseases is closely related to urban air quality and circulation. As the lungs of cities, ventilation corridors help improve urban air quality, accelerate air circulation, cut off outdoor transmission routes of infectious diseases, and make people enjoy a greater sense of security and happiness outdoors. In the face of COVID-19, every planner shall have deeper reflections on urban spatial development patterns going forward.

Building Healthy Cities Through Innovative Planning

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While the whole country is making concerted efforts to fight against COVID-19, we also need to take a scientific and reasonable look at every aspect of the epidemic. As the World Health Organization (WHO) indicated in its report released in 2007, at least 39 new pathogens had been discovered worldwide since 1967, and a new infectious disease broke out in less than every two years on average. This is in effect the result of increasingly grave urban problems. With global urbanization, diversification of urban functions, emergence of megacities and high-density cities, and greater inter-city connectivity and mobility, hub-type cities have gradually become major transmission routes of infectious diseases and major targets for epidemic prevention. Hence, it's pressing to re-examine building healthy cities from the perspective of urban planning, develop innovative urban planning methodologies, and come up with strategies of epidemic prevention and control, which may present an important opportunity to transition from conventional planning.

Make cities healthy

As early as the mid-1980s, the WHO proposed the concept of healthy city and the vision of building healthy cities, and promoted building healthy cities as a global action strategy. In essence, cities provide space for people to live and work, and healthy city is an urban development pattern that takes into account society, economy, and every other aspect of a city with people's mental and physical health put at the center of urban planning, building, and management, a health promotion process in different areas and at different levels that the government mobilizes every citizen and social organization to be collectively committed to, and a process of creating the best environment for human settlement. Making cities healthy hinges upon scientific urban planning methodology and advanced urban management pattern.

Building healthy cities originated from Toronto, Canada, where progress was made in building healthy cities by developing healthy city plans and health management laws and regulations, taking public health safety measures, and encouraging the public to participate in urban health development, with health communities as the basic building blocks. It gained steam later in the US, Europe, Japan, Singapore, and Australia, where it gradually became an international action. International practices provide us with precious lessons in building healthy cities. For example, as a city keen on improving people's health and happiness through urban building projects, London developed a series of instruments of rapid assessment on health impact to have an overall evaluation over development projects and planning policies, which

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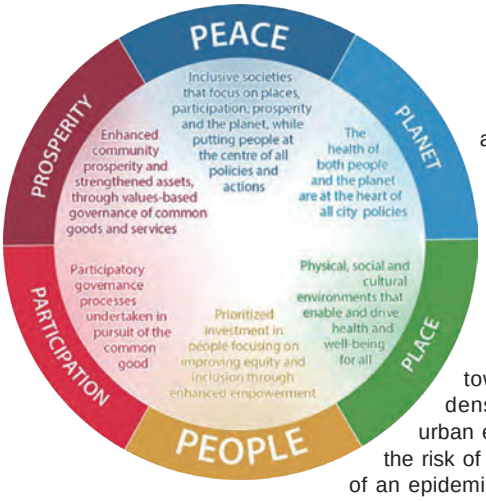
1. Health City Novena in Singapore
Photo: Singapore's Ministry of Health

played a significant role in promoting public and urban health; Vancouver came up with *A Healthy City for All: Vancouver's Healthy City Strategy 2014-2025*, where it's proposed to build Broadway Corridor for enhancements to public transit, improve the sidewalk design, and introduce a bike sharing programme as part of a package of measures it laid out for green travel, to ensure trips on foot, bike, and transit exceed 50%; and the Health City Novena under construction in Singapore, covering an area of 17 hectares and consisting of 13 buildings, will offer emergency treatment, medium and long-term nursing, and education & training, to evolve into the country's medical and commercial hub with a specialized, people-first, and market-based approach.

China's campaign for building hygienic cities in 1989 set the stage for developing healthy cities across the country. In 2016, as the *Healthy China 2030* strategy was implemented and the 9th Global Conference on Health Promotion held, China entered a brand new stage of healthy development of cities.

Challenges confronting healthy cities

As the history of global urbanization demonstrates, the 50% urbanization rate is the bottom line. Healthy development of urbanization will play a decisive role in China's sustainable development in the next 20 years, otherwise serious urban problems are likely to occur. Reasonable flow and efficient concentration of all sorts of elements are inevitable in the process of urbanization, and the transmission of infectious diseases relies not only on the neighborhood effect of space, but increasingly on connection



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and mobility of urban networks. As the transmission of viruses is greatly affected by the pattern, structure and functional layout of urban areas, and development level and coverage of urban networks, building healthy cities still presents an enormous challenge for China.

Excessive functions of the downtown of a city, its over-high population density, and excessive concentration of urban elements, would undoubtedly heighten the risk of virus transmission during the outbreak of an epidemic, exposing such problems as ambiguous functional partitioning among groups within a city, undefined inter-city cooperation boundaries, and deficient inter-regional horizontal coordination mechanism. Hence, it's imperative to re-examine the urban development pattern and explore more scientific development models and systems.

At a time when every minute counted in the battle against COVID-19 to save lives, Wuhan swiftly designed and built Huoshenshan and Leishenshan, two makeshift control centers, allowing patients to get treatment more rapidly and channeling more medical resources. It came as a stark reminder that we have to reserve spatial and strategic space for any future emergencies in planning homeland space to provide optimized emergency space should any disasters occur.

The outbreak of COVID-19 coincided with China's Spring Festival travel rush, a period when urban-rural migration usually reaches the peak. Many

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2. Vision of building healthy cities Photo: World Health Organization

3. Healthy cities in London, UK Photo: London Healthy Urban Development Unit

4. Cycle lane in Vancouver, Canada Photo: Vancouver City Planning Commission

5. Nature is like a mirror Photo: Pixabay

6. Toronto of Canada: origin of healthy cities Photo: Municipal Government of Toronto

7. Livable life Photo: Leah Kelley

villages took drastic lockdown measures to curb the spread of the coronavirus induced by imported COVID-19 cases, which would result in disrupted supply chains linking urban with rural areas as village roads are an integral part of a well-functioning society and the channels for the flow of resources. The key is to have unimpeded supply chains between urban and rural areas and reasonable deployment of resources rather than impose village lockdowns.

Lockdowns led to shortage of protective gear and of necessities of life, and traffic controls made it difficult for medical staff, patients, and workers at the grassroots level to get around, revealing a gap between current urban management and governance and what urbanization essentially requires. In other words, the relative static and fragmented management and governance pattern no longer satisfies the need of cities in modern times, necessitating the employment of intelligent technologies to improve urban management and governance.

COVID-19 has also exposed vulnerabilities of China's public health emergency response system and mechanism, such as lack of prior assessment on the capacity of designated hospitals for COVID-19 patients, forethought of ensuring receipt and distribution of medical supplies during emergency response, and overall consideration of any logistics and services needed in transport hubs or hard-hit areas in the wake of lockdown. There is a pressing need to enhance national and local emergency response systems to better cope with major public health emergencies of great complexity and strong impact.

Innovate to cope

Urban planning plays a vital role in prevention and control of infectious diseases. Specifically, at the macro level, we can shape urban form and development pattern with urbanization and large transport hubs, and at the meso and micro levels, we can reduce pollution exposure and guide evacuation with improved space design. As traditional planning has proved to underperform in quantitative analysis, we're in dire need of innovative planning to contribute to building healthy cities. Mathematical modeling would help city planners and managers carry out quantitative analysis and simulation of complex urban phenomena and processes from an urban system perspective and have an overall assessment on social, economic, and environmental impact posed by epidemics. Such an approach can play a part on the following fronts:

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First, build multi-center urban development structure. The advantage of a multi-center landscape lies in the fact that sub-centers can take on some of a city's functions and be functionally complementary with one another or with central business districts (CBDs), which helps reduce the pressure on downtown areas and deliver an efficient and livable urban form. Hence, it's advised to predict different development scenarios of urban multi-center groups and take into account all sorts of strategic planning combinations.

Second, set aside strategic space in planning. On one hand, it would optimize reserved strategic space for urban functions and provide some resilience for an intensive, efficient, and structurally-improved city to deal with any uncertainties of urban development; on the other, it would help meet any possible needs in the future with facilities for emergency response. Hence, it's advised to have a reasonable planning of the area and distribution of strategic space on a quantitative level to improve the overall allocation of land resources of a city.

Third, predict and diagnose the mobility of urban systems. Mobility not only helps spread epidemics, but contributes to epidemic prevention and control. On one hand, stemming migration is key to combating epidemics; on the other, transport system plays a significant role in disaster prevention and mitigation, as the timely delivery of anti-epidemic and medical supplies, cross-regional deployment of medical staff, and supply of daily necessities wouldn't be possible without mobility. Hence, it's advised to conduct a systemic quantitative analysis of urban population evacuation routes, proposals for allocating resources, the basic logistic system, and urban-rural supply chains.

Fourth, have a scientific assessment on the impact of spatial elements. Reasonable planning of urban spatial elements not only helps maintain coordination and operation of urban space and its basic functions, but at the same time would help prevent crisis from occurring and spreading and reduce unnecessary losses should any public contingencies occur. Hence, it's advised to have a scientific interpretation of the health of urban space, with which to have a comprehensive, real-time, and dynamic acquisition of data and information pertinent to urban spatial elements, carry out urban management and governance monitoring, analyze positive and negative effects of spatial elements on healthy cities, assess the coverage of public services and the equitable level of access to public services, conduct timely risk early warning of such issues as scarcity of resources, and make cities more capable of resisting threats.

Fifth, put in place an emergency response system. Prevention and control of infectious diseases has been rarely touched upon in existing urban disaster prevention and mitigation plans or medical and health care programmes. Hence, it's advised to categorize cities based on population size and levels of epidemic prevention and control, appeal for the move to incorporate epidemic prevention and control into a holistic urban disaster prevention and mitigation plan, and establish an emergency response system for urban public health emergencies.

Epidemic is like a mirror. While testing the adaptability and resilience of China's cities, it also signals the need for urban planning transition. We look forward to a significant role of planning in contributing to building a healthy China.

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Working Together: A Way to Defeat COVID-19 in the World's Cities

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1. Wearing a mask to stop COVID-19
Photo: Hai Luo

In January 2020, COVID-19 broke out in Wuhan and swept across China. The speed at which it spread, the infections it caused, and the difficulty in preventing and controlling it, went far beyond what people could possibly imagine. To curb the spread of the epidemic, China mobilized people from all walks of life in a concerted effort to combat it. Governments and organizations from the rest of the world and overseas Chinese nationals also offered donations and supplies to China in solidarity with the Chinese people to confront the epidemic. As of mid-March 2020, new reported cases of COVID-19 have fallen continuously in China, portending a victory in the battle against COVID-19. But at the same time, COVID-19 cases surged in the rest of the world. On March 12th, the World Health Organization (WHO) declared the novel coronavirus outbreak a global pandemic. On March 19th, the total confirmed cases of COVID-19 in the world except China passed 130,000, with the epicenter shifting from Asia to Europe and the US and more cases appearing in Africa and the Middle East. As COVID-19 spreads and transmits around the world threatening the entire human race, how to effectively prevent and control it has become a major problem that requires shared efforts of all countries to tackle.

Cities bear the brunt of epidemic transmission

According to epidemiological research, infectious diseases usually transmit through food and water, respiratory droplets, insects, and people-to-people contact. Large-scale migration, frequent contact, and a high degree of spatial proximity, have often made cities, which are the specific space for highly concentrated population, the epicenter of the outbreak and transmission of infectious diseases. For example, Athens, the ancient Greek city-state and the crown jewels of the world's urban development history, lost almost half of its population to a plague; and cholera, an infectious disease still required by the WHO to be quarantined, was just locally transmitted in India and Bangladesh prior to the 19th century, but soon started to get prevalent across the globe with the emergence of new industrial cities after the 19th century.

As central cities and city clusters have become the major spatial forms to incorporate elements of development, the emergence of megacities and explosive growth of cities have certainly exacerbated the risks of the outbreak of infectious diseases. And with deeper global integration, urban networks and transport networks have been formed around the world, and the global population has been migrating much more frequently and on a dramatically increased scale, making it possible for infectious diseases to break out worldwide on an unprecedented scale and at an unprecedented speed. For example, SARS, which broke out in 2003, spread to 32 countries and regions, with around 8,400 confirmed cases worldwide and a global death toll of about 900; H1N1 that appeared in 2009 quickly spread to over 200 countries in a very short period of time, causing more than 20 million infections and over 10,000 fatalities. So it's easy to see urban prevention and control of infectious diseases is key to mankind's fight against their spread.

Cities still play a crucial part in epidemic prevention and control

Countries have all responded to the call of the WHO by making interventions at the national level to prevent and control COVID-19. In addition to testing and treatment, they have made urban management and control an important part of their epidemic prevention and control endeavour. The urban management and control measures taken by countries at present can be classified into three types.

First, launching institutional emergency response to provide support for epidemic prevention and control. For example, South Korea raised its COVID-19 alert level to the highest on February 23rd 2020 and again declared "war" on the disease nationwide on March 3rd, placing all government agencies on a 24-hour emergency footing; and Japan passed a bill revising the *Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response* on March 13th, allowing the country to quickly go into a state of emergency and take any legally enforceable measures should COVID-19 spread fast across the country. Second, controlling urban migration to cut off transmission routes of the disease. The authorities in San Francisco declared a lockdown expected to go into effect from midnight March 16th and required its citizens to stay at home except for essential needs, where pharmacies, grocery stores, banks, gas stations, and basic public services would remain open, pubs and gyms would close temporarily, and restaurants would only provide takeout or delivery service; and Spain also went into lockdown on March 13th, where all of its people had to stay at home unless they had to buy food, go to hospital, or work, non-essential public places, such as commercial districts, museums, libraries, and restaurants, had to close, and traffic flows on public transit and private transport nationwide were restricted. Third, increasing urban medical facilities and supplies to treat and quarantine patients as quickly as possible. For example, in Iranian cities that were hit hardest by COVID-19, such as Tehran, Qom, and Yazd, local governments built 14 makeshift hospitals to treat COVID-19 patients in venues such as exhibition centers, providing over 2,000 beds; and Italy, whose hospitals had been short of beds and inundated with patients, managed to set up more than 300 makeshift inflatable tents outside of over 31 hospitals for shunting, screening, diagnosis, and quarantine.

The inherent conflict between urban development and epidemic transmission

A look back on the urban development history of several thousand years reveals that it's always been a priority for cities, which have long been hit hardest by natural disasters or public health emergencies, to enhance their resistance. As early as the 15th century, the outbreak of the Black Death triggered a joint concern among European cities for their infrastructure building and environmental governance and helped push the development of their water supply and drainage as well as waste disposal facilities. And as recently as the 1980s, the WHO proposed a global action strategy on healthy cities that stressed the need to put people's health at the center, build a social environment conducive to people's health and work from the perspective of urban planning, building, and management, and call on cities across the globe to develop healthy city plans and health management laws and regulations, adopt anti-pollution measures, and encourage citizens to participate in urban health development in a bid to make cities more resilient

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2. Global cooperation for win-win outcomes Photo: geralt

and better capable of responding to public health safety incidents. The strategy was recognized by the US, Europe, Japan, Singapore, China, and Australia, etc., which all get involved to implement it, and has evolved into an international city building campaign.

Cities across the world have done a lot of work in public health emergency response, in particular prevention and control of infectious diseases, but the global spread of COVID-19 and its prevention and control worldwide have indicated that both developing countries with weaker medical systems and the developed world with better urban governance capacity and systems have been crippled by the epidemic. The reason is that population concentration in cities is inherently in conflict with transmission of infectious diseases via the spatial neighborhood effect. From the perspective of development, building cities is aimed at driving reasonable flow and efficient aggregation of various elements, attracting huge capital and human inflow, expanding the scale and aggregation effects, offering more capital return, and providing more and better job opportunities, to create a positive cycle. From the perspective of prevention and control of infectious diseases, overpopulation, heterogenization and diversification of health conditions, and frequent exchanges and contacts, coupled with poor governance, outdated development perceptions, and deficient governance systems in some cities, have made the inherent conflict seemingly irreconcilable.

Meet challenges head-on with a shared urban response

How to reconcile urban development with transmission of infectious diseases, guide cities to build systems for preventing and controlling infectious diseases, and make cities better capable of responding to public health emergencies, is something that no city planner can possibly shun away from.

In the mid 18th century when smallpox was raging, English doctor Edward Jenner risked contracting the disease to develop the smallpox vaccination that finally put an end to the suffering of mankind, marking not only the official appearance of a vaccine but the start to apply science and technology to proactive prevention and control of infectious diseases. Today, in the face of the outbreak of a global pandemic, it is important to allow urban space allocation and urban building management to come into play for intervention, build more urban infrastructure and public service facilities, and improve public service systems. Also, in addition to medical and supply facilities, it's imperative to pay attention to and restrict urban over-congestion and ensure adequate public space in parks and squares. And it's necessary to take precautions by building urban emergency response systems for preventing and controlling infectious diseases, especially those for providing space for emergency use.

We ought to respect the law of urban development and have a moderate control of the scale of urban development, rather than solely focus on growth. In a world where we all share the weal and woe, no country can stand alone in the fight against viruses. Cities across the globe shall establish systems for disease information sharing and emergency coordination on a broader scale, increase assistance and cooperation in treatment and vaccine development, push for building a community of shared future for mankind, and protect our common interests and well-being.

UPSC

Urban Planning Society of China

As a national academic body and professional organization in the planning field, a member of the China Association for Science and Technology (CAST), a national first-level society of comprehensive reform and governance, and a 4A social organization under China's Ministry of Civil Affairs, the Urban Planning Society of China (UPSC) conducts international and domestic academic activities, promotes advanced technologies, participates in argumentation, counseling, and decision-making, editing and publishing academic journals, monographs, popular science readers, and other publications, provides continuing education opportunities for certified planners, joins international organizations on behalf of China and engages in international cooperation, safeguards the legitimate rights and interests of planners, and offers organizations and individuals commendation and award.

Over the past 63 years since the founding of UPSC, it's been committed to building and developing the urban-rural planning discipline, with a range of outcomes seen in promoting academic discipline development, prosperity and influence. It's evolved into the most important platform to lead healthy development of the planning discipline, playing a significantly indispensable role in encouraging innovation in the service industry, contributing to science-based decision-making of the government, and promoting international disciplinary communication.

UPSC has 5 working committees respectively on organization, youth, academic development, editing & publishing, and standardization, and 21 professional academic committees respectively on housing and community planning, regional planning and urban economy, landscape and environment planning and design, planning of well-known cities of historical and cultural significance, application of new urban planning technologies, planning of small cities and towns, foreign urban planning, engineering planning, urban design, urban ecological planning, urban security and disaster prevention planning, urban transport planning, urban planning history and theory, city imaging, general planning, planning implementation, mountain and urban-rural planning, rural planning and development, urban-rural governance and policy research, urban renewal, and detailed planning. And it has a secretariat, and communication, editorial, and consulting divisions.

UPSC is one of the world's five national planning organizations and the founders of the Planners for Climate Action (P4CA), a partner with the United Nations Human Settlements Programme (UN-Habitat), and an advisor to the World Bank. As China's official representative to the International Society of City and Regional Planners (ISOCARP), UPSC has signed memorandums of bilateral cooperation with planners of major countries and played an active part in global governance. Apart from China City Planning Review (and its Chinese version), it also publishes Phoenix's View on Cities, Human Settlements, Urban Transport of China, and Development of Small Cities & Towns.

Each year, UPSC organizes many academic workshops and exchanges, offers technical consulting for the decision-making of the government, publishes academic books and periodicals, engages in non-profit events, and provides continuing education for certified planners. The annual National Planning Conference is universally recognized in China's planning industry in terms of its influence, academic level, and participation. UPSC and its secondary organizations also hold dozens of academic events such as seminars, symposiums, forums, thesis contests, and planning and design contests of different kinds and scale on an annual basis. It has contributed important policy recommendations to the government for its decision-making in multiple areas including urbanization, planning legislation, planning management system, residential building, urban motorizations, historical and cultural heritage protection, technical standard of planning, democratic decision-making on planning, transformation of rural residents into urban ones, urban safety and disaster prevention, city planning, mountainous cities and towns, urban governance, industrial heritage protection, and development of a master plan to replace multiple plans.

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