
Research Paper

STRATEGIES ON HEALTHY URBAN PLANNING & CONSTRUCTION FOR CHALLENGES OF RAPID URBANIZATION IN CHINA

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Abstract

In the past 40 years, China has experienced the largest and fastest urbanization development in the world. The infrastructure, urban environment and medical services of cities have been improved significantly. The health impacts are manifested in the decrease of the incidence of infectious diseases and the significant increase of the life span of residents. However, the development of urbanization in China has also created many problems, including the increasing pollution of urban environment such as air, water and soil, the disorderly spread of urban construction land, the fragmentation of natural ecological environment, dense population, traffic congestion and so on. With the process of urbanization and motorization, the lifestyle of urban population has changed, and the disease spectrum and the sequence of death causes have changed. Chronic non-communicable diseases have replaced acute infectious diseases and become the primary threat to urban public health. According to the data published by the famous medical journal The LANCET on China's health care, the economic losses caused by five major non-communicable diseases (ischemic heart disease, cerebrovascular disease, diabetes mellitus, breast cancer and chronic obstructive pulmonary disease) will reach US\$23 trillion between 2012 and 2030, more than twice the total GDP of China in 2015 (US\$11.7 trillion).

Therefore, China proposes to implement the strategy of "Healthy China" and develop the policy of "integrating health into ten thousand strategies". Integrate health into the whole process of urban and rural planning, construction and governance to form a healthy, equitable and accessible production and living environment. China is building healthy cities through the above four strategies.

The main strategies from national system design to local planning are as follows.

First of all, the top-level design of the country. There are two main points: one point, the formulation of the Healthy China 2030 Plan determines the first batch of 38 pilot healthy cities and practices the strategy of healthy city planning; the other point, formulate and implement the national health city policy and issue the National Healthy City. The evaluation index system evaluates the development of

local work from five aspects: environment, society, service, crowd and culture, finds out the weak links in the work in time, and constantly improves the quality of healthy city construction.

Secondly, the reform of territorial spatial planning. In order to adapt to the rapid development of urbanization, China urban plan promote the reform of spatial planning system, change the layout of spatial planning into the fine management of space, and promote the sustainable development of cities. To delimit the boundary line of urban development and the red line of urban ecological protection and limit the disorderly spread of urban development as the requirements of space control. The bottom line of urban environmental quality and resource utilization are studied as capacity control and environmental access requirements. The grid management of urban built environment and natural environment is carried out, and the hierarchical and classified management unit is determined.

Thirdly, the practice of special planning for local health and medical distribution facilities. In order to embody the equity of health services, including health equity, equity of health services utilization and equity of health resources distribution. For the elderly population, vulnerable groups and patients with chronic diseases, the layout of community health care facilities and intelligent medical treatment are combined to facilitate the "last kilometer" service of health care.

Finally, urban repair and ecological restoration design are carried out. From the perspective of people-oriented, on the basis of studying the comfortable construction of urban physical environment, human behavior and the characteristics of human needs, to tackle "urban diseases" and make up for "urban shortboard".

China is building healthy cities through the above four strategies. Committed to the realization of a constantly developing natural and social environment, and can continue to expand social resources, so that people can enjoy life and give full play to their potential to support each other in the city.

Keywords

the strategy of "Healthy China", national system design, territorial spatial planning, integrating health, intelligent medical treatment, urban repair and ecological restoration design

China's rapid urbanization has brought great challenges to the urban environment. Therefore, China proposes to implement the strategy of "Healthy China" and integrate the concept of health into national strategies such as top-level policy design, territorial space planning reform, smart city big data, urban repair and ecological restoration design.

In the past 40 years, China has experienced the largest and fastest urbanization development in the world. The infrastructure, urban environment and medical services of cities have been improved significantly. The health impacts are manifested in the decrease of the incidence of infectious diseases and the significant increase of the life span of residents. However, the development of urbanization in China has also created many problems, including the increasing pollution of urban environment such as air, water and soil, the disorderly spread of urban construction land, the fragmentation of natural ecological environment, dense population, traffic congestion and so on. With the process of urbanization and motorization, the lifestyle of urban population has changed, and the disease spectrum and the sequence of death causes have changed. Chronic non-communicable diseases have replaced acute infectious diseases and become the primary threat to urban public health.

According to a study on The burden of disease in China published by The prestigious medical journal The LANCET, from 1990 to 2017, The mortality rate of chronic non-communicable diseases has increased significantly in The past three decades, and The top five causes of premature death are stroke, ischemic heart disease, lung cancer, chronic obstructive pulmonary disease (COPD) and liver cancer. This has been accompanied by continued declines in maternal and child mortality. High blood pressure, smoking, salty diets and outdoor air pollution are the top four risk factors for death and loss of life in 2017. The shift in China is largely the result of economic growth and improved education, and is closely linked to the development and effective implementation of China's national action plan for communicable diseases. The study found that people in China's eastern cities, coastal areas and wealthy provinces are generally healthier than those in rural and poor areas in the west. And a set of medical and health data research data show that during 2012 to 2030 in China, five major noncommunicable diseases (ischemic heart disease, cerebrovascular disease, diabetes, breast cancer and chronic obstructive pulmonary disease) caused economic losses will amount to \$23 trillion, is China's GDP in 2015, more than two times (\$11.7 trillion). China is also facing a severe aging population. As the average population ages, age-related diseases, such as musculoskeletal diseases, impose increasingly severe economic and medical burdens on individuals, families and the government. In addition, a growing number of working-age people spend most of their time in office environments, leading to an increase in the incidence of lower back and neck pain, suggesting that policies are needed to prevent this occupational hazard, and that improvements in tobacco consumption, high-salt diets, air pollution and other problems remain slow.

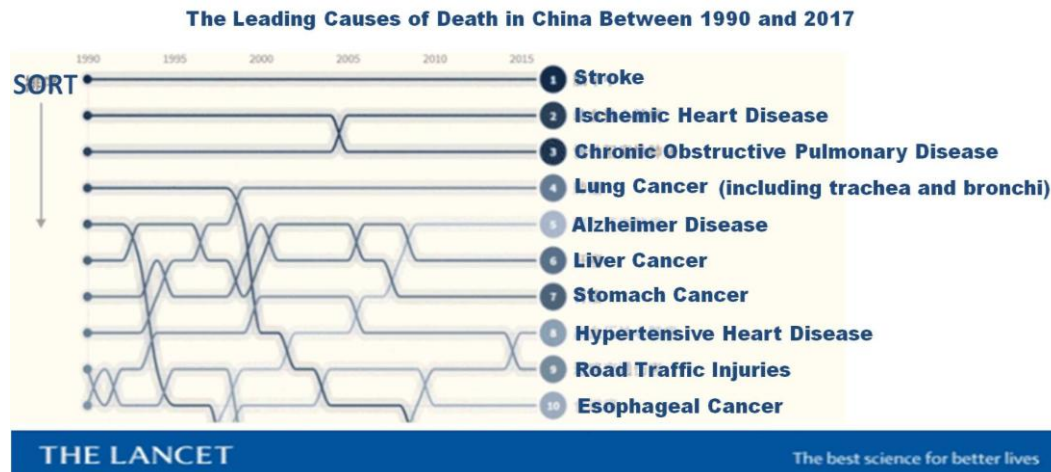


Figure 1 The leading causes of death in China (1990-2017)

Take cardiovascular and cerebrovascular diseases as an example to study the impact of urban environment on human health. There are many reasons for the difference of cardiovascular mortality, but the reasons are external and internal, which are mainly attributed to the environment and lifestyle. The incidence of cardiovascular and cerebrovascular diseases increases year by year, which is not only related to the improvement of diagnosis level, but also closely related to the aggravation of air pollution and the acceleration of lifestyle pace in recent years. According to data from the Chinese center for disease control and prevention, the number of deaths from various diseases attributed to outdoor air pollution was analyzed. The results showed that the threat of major cardiovascular and cerebrovascular diseases caused by haze was higher than that of lung cancer. The data showed that the amount of coal burned and the concentration of fine particles (PM_{2.5}) in the air were positively correlated with the death from coronary heart disease and cerebrovascular disease, among which the amount of coal burned and PM_{2.5} concentration in northeast and north China were higher than those in other regions. Dust and harmful gases in the air (such as carbon monoxide and sulfur dioxide) not only increase the burden of the respiratory system, but also seriously affect the function of the cardiovascular system, destroy the function of the cardiovascular endothelial system, and promote the occurrence of atherosclerosis and myocardial infarction.

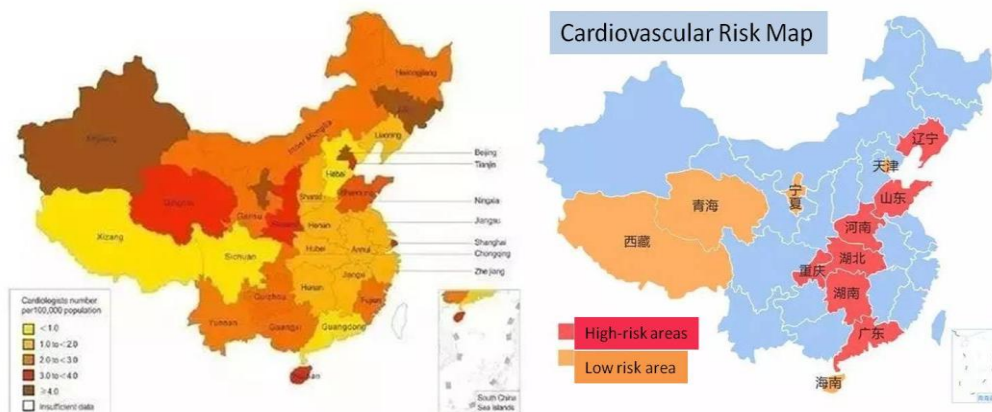


Figure 2 Cardiovascular risk map

Therefore, China proposes to implement the strategy of "Healthy China" and develop the policy of "integrating health into ten thousand strategies". Integrate health into the whole process of urban and rural planning, construction and governance to form a healthy, equitable and accessible production and living environment. The main strategies from national system design to local planning are as follows.

1. First of all, the top-level design of the country

There are two main points: one point, the formulation of the Healthy China 2030 Plan determines the first batch of 38 pilot healthy cities and practices the strategy of healthy city planning; the other point, formulate and implement the national health city policy and issue the National Healthy City. The evaluation index system evaluates the development of local work from five aspects: environment, society, service, crowd and culture, finds out the weak links in the work in time, and constantly improves the quality of healthy city construction.

1.1 Main strategy on "Healthy China 2030" Program Outline

In order to build a healthy China and improve people's health, China has launched a healthy China strategy: the outline of the "healthy China 2030" plan. Industrialization, urbanization, population aging, disease, ecological environment and lifestyle changes, etc., to maintain and promote health brings a series of new challenges, health service supply insufficient overall and the contradiction between the growing demand is still outstanding, health development and coordination of economic and social development needs to be enhanced, needs to solve the relationship between health as a whole from the national strategic level important and long-term problems. National health is the fundamental goal of building a healthy China. Based on the two focus points of the whole population and the whole life cycle, provide fair and accessible, systematic and continuous health services, and achieve a higher level of universal health. The main strategic content of urban planning includes four parts: popularization of healthy life, optimization of health services, construction of healthy environment and development of health industry. Including optimization of health services, improve the health care, construction of health environment, development of health industry related to urban planning and construction sector specific strategies are: to improve the physical quality, strengthening the universal public health services in-depth development, strengthen the key crowd health services, health movement, strengthen the environmental problems affecting health management, perfecting the system, development of health service of new forms of public safety.

Main strategic contents	Major planning strategies
Promoting healthy living	◎ Improve the physical fitness of the whole people: improve the public health service system
Optimizing health services	◎ Strengthening public health services that cover all the people: promoting equal access to basic public services and health: ◎ Provide high-quality and efficient medical services: improve the medical and health service system, such as the layout and planning of urban medical and health facilities. We will strengthen health services for key population groups, such as promoting healthy : aging and planning the layout of old-age care facilities. Such as maintaining the health of the disabled, such as barrier-free urban planning
Building a healthy environment	◎ Further carry out health campaign: strengthen the comprehensive improvement of urban and rural environmental health, build healthy cities and healthy villages and towns: ◎ We will intensify efforts to deal with environmental problems affecting health: we will carry out prevention and control of air, water and soil pollution, implement a plan to discharge all industrial pollution sources to standards, and establish and improve systems for monitoring, investigating and assessing environmental and health risks: ◎ Improve the public safety system: promote road traffic safety, improve emergency response capacity
Develop health industry	◎ New types of health services: Internet health services, TCM health tourism, health culture and medical tourism, health culture and sports medical rehabilitation, and health service clusters

Figure 3 Main strategic contents of Healthy China 2030

1.2 National healthy city evaluation index system

The national healthy city evaluation index system includes 5 first-level indicators, 20 second-level indicators and 42 third-level indicators, which can objectively reflect the overall progress of the construction of healthy cities in various regions. Taking into account China's vast territory, large population and uneven development of the national conditions, a healthy city construction should follow the basic requirements. When building healthy cities, local governments should, on the one hand, work in accordance with these indicators, and on the other hand, solve and improve prominent local health problems and their influencing factors based on the characteristics of each city, so as to carry out the construction of healthy cities as a whole.

2. Secondly, the reform of territorial spatial planning

After 40 years of exploration, great achievements have been made in China's urbanization development. At the same time, this stage is also a stage of "crossing the river by feeling the stones", and we need to constantly summarize experience and gain and loss. Therefore, in order to adapt to the changes brought by the rapid development of urbanization, China has promoted the reform of the spatial planning system, from spatial planning layout to spatial refinement governance, and promoted the sustainable development of cities. China has the following sectoral planning sequences: economic and social planning sequences, urban and rural construction planning sequences, land and resources planning sequences, regional development planning sequences, ecological and environmental protection planning sequences and so on. Among them, there are 23 ecological and resource and environment constraint plans, and 68 development and construction plans. In order to better unify these plans, avoid waste and protect the ecological environment, the state studies to define the boundary line of urban development, the red line of urban ecological protection, and limit the disorderly spread of urban development as space control requirements based on the "evaluation of resource and environment carrying capacity" and "evaluation of the suitability of land space development". Study the bottom line of urban environmental quality and the upper limit of resource utilization, as capacity control and environmental access requirements. Grid management of urban built environment and natural environment, and determine the classification of management units.

2.1 "Double Evaluation"

The "double evaluation" is "resource and environment carrying capacity evaluation" and "land space development suitability evaluation". Land space planning is an important basis and means for macro-control of rational development, utilization and governance of land, and an effective way to regulate the relationship between development and resources and environment. As the basis of national spatial planning, "double evaluation" needs to meet the inherent requirements of "necessity", "utility" and "usability" put forward by national spatial planning, and fully support the compilation of national spatial planning. "Double evaluation" is the essence of the regional resources and environment characteristics of cognitive tools and methods, finally exports should strengthen the conclusion of the analysis, respectively to form "bearing pressure - carrying capacity - bearing potential" and "problem

and to partition pattern - risk identification -" development potential analysis conclusions of three levels, increase support to space planning.

2.2 Designation of "Three Zones & Three Lines"

"Three districts and three lines" : according to three types of urban space, agricultural space and ecological space, three control lines, namely urban development boundary, permanent basic farmland protection red line and ecological protection red line, are drawn respectively. "Three zones" (three types of Spaces) refer to the urban space: the land space whose main function is the production and living of urban residents, including the urban construction space, the industrial and mining construction space and the development and construction space of some township governments; Agricultural space: the land space that takes agricultural production and rural residents' life as the main function and bears the functions of agricultural production and rural life, mainly including permanent basic farmland, general farmland and other agricultural production land and rural living land like villages. Ecological space: the land space with natural properties that provides ecological services or products as the main function, including forests, grasslands, wetlands, rivers, lakes, beaches, wasteland, desert, etc. The "third line" (three control lines) refers to the red line of ecological protection: it is an area with special important ecological functions within the scope of ecological space that must be strictly protected by force, and it is the bottom line and lifeline of safeguarding and maintaining national ecological security. Red line for protection of permanent basic farmland: refers to the space boundary of farmland that may not be occupied or developed and needs permanent protection according to the demand of population and social and economic development for agricultural products in a certain period of time. Urban development boundary: within a certain period of time, the regional spatial boundary that can be used for urban development and concentrated construction, including the existing urban built-up area, the optimized development area and the areas that must be planned and controlled due to the needs of urban construction and development.

3. Thirdly, the practice of special planning for local health and medical distribution facilities

Data can change lives, everyone believes. Buy goods on the Internet, use mobile phone SMS to quickly pick up goods; How far is the bus to wait, open the location prediction distance; Through the wireless hospital system, you can register for free...As part of smart cities, these once utopian visions are becoming reality. In April 2018, China successively promulgated the "about promoting the development of" health "Internet + opinions on the further" Internet + medical health "for the convenience of benefit the people activities notice and other documents, from the policy level vigorously promote the construction of" Internet + medical health ", promote the growth of the health care market, for the people provides the omni-directional, the whole cycle to reflect health service fairness of health services including health services, health services and utilization of fairness and equity of health resources distribution. For the elderly, vulnerable groups and patients with chronic diseases, we will

combine the layout of community health and medical facilities with the smart medical treatment with big data to facilitate the "last kilometer" of health and medical services.

Medical care is about every family, and nothing can stop people from yearning for intelligent medical care. In 2019, with the beginning of the first year of 5G, smart medicine gradually turns many "impossible" into "possible", and its coverage of universal benefits becomes broader, deeper and more possible. The layout of local health and medical facilities will be combined with smart medicine, including AI follow-up system for patients, Internet hospital, remote specialized medical service, "smart hospital", "cloud mastery" of medical data, 120 emergency command system, etc.

4. Finally, urban repair and ecological restoration design are carried out

From the perspective of people-oriented, on the basis of studying the comfortable construction of urban physical environment, human behavior and the characteristics of human needs, to tackle "urban diseases" and make up for "urban shortboard".

4.1 Urban Repair

Urban repair is to avoid demolition and construction as much as possible and promote organic renewal. We should not only protect the original texture, but also allow the construction to happen. Urban repair is a new thing in theory and practice, and its positive significance is mainly reflected in the following aspects: first, it is conducive to the gradual urban renewal and transformation; Second, it is conducive to sustainable urban development; Third, it is conducive to the protection and continuation of famous cities and ancient towns; Fourth, is advantageous to the environment renovation and the city image beautification. In a word, urban repair is a new concept of urban design and a renewal method of urban construction put forward during the period of urban development from extensional expansion to concentric development. City repair, is around the "let the people in the city life more convenient, more comfortable, more beautiful" goal, USES the good method for urban planning and design concept, system, progressive, targeted way, constantly improve the quality of urban public services, improve the condition of municipal infrastructure, the excavation and protect the city history and culture and the social network, make the space of city function system and its carrying a place of repair, make up and improve the comprehensive system, make cities more livable, more dynamic. The measures for improving the physical environment should adjust measures to local conditions, can include demolition of illegal construction, control and guide the urban space morphology and skyline, the color of city and architecture, city night view lighting, urban greening landscape, outdoor billboards and so on many measures, gradually make urban and landscape environment harmony, improve the inner quality of urban physical environment, show the features of city in the form of whole space.

4.2 Ecological Restoration

"Ecological restoration" refers to the restoration of the original ecological functions of the ecosystem, such as soil and water conservation, microclimate regulation, biodiversity

maintenance, and development and utilization, with the help of appropriate artificial measures, by making use of nature's self-healing ability. Ecological restoration is not to restore the ecosystem to its original state, but to restore and improve the function of the ecosystem through restoration. Ecological restoration, is "to create good living environment as the central goal", aims to make damage to the structure and function of urban ecosystem restoration to the front of the interference of the natural condition, on the one hand, the city development to minimize the interference of ecosystem, on the other hand, through a series of means to restore the self adjusting functions of urban ecological system, make its gradually have the ability to overcome and eliminate outside interference, especially when changes in the external conditions still have to build a new balanced ability, promoting the ecological system in the process of dynamic constantly adjust and balance. Due to the high self-regulation capacity of the ecosystem and a large number of feedback mechanisms, the complexity and long-term nature of ecological restoration are obvious. In the face of the destruction of the ecological environment, we should first stop on the urban ecological system in mountains, rivers, coast, destruction of wetlands, vegetation, soil, adjustment of urban land use pattern, start from the local ecological elements to repair, in a planned way step by step to promote the ecological elements of the occupied "reclamation", gradually recovery, reconstruction and improve urban ecosystem self-regulation function.

China is building healthy cities through the above four strategies. Committed to the realization of a constantly developing natural and social environment, and can continue to expand social resources, so that people can enjoy life and give full play to their potential to support each other in the city.