

THE POTENTIAL OF THE SHENZHEN HEALTHCARE INDUSTRY

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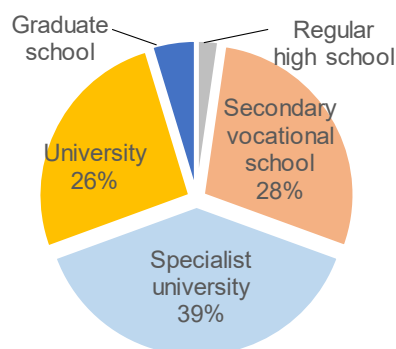
SUMMARY

- While living standards in China have greatly improved, many challenges remain in the healthcare sector. Chief among these are (1) the rapid growth of lifestyle-related diseases, which now afflict approximately 300 million people, (2) the concentration of patients in large urban hospitals due to the quantitative and qualitative shortage of human resources (uneven distribution of medical resources), and (3) the burgeoning cost of healthcare that is growing towards a double-digit percentage of the GDP.
- As a common solution to these issues, the Chinese government is focusing on the transformation of medical data (DX). Shenzhen-based DX companies are responding by utilizing their strengths in their respective areas of expertise (Tencent is using the data on its 1.1 billion WeChat users, Ping An Insurance is making use of the world's largest insurance customer base and platform, and BGI is using genetic analysis technology).
- Shenzhen has the potential to become the wellspring of the healthcare DX model and the stage of its social implementation.

CHALLENGES IN THE CHINESE HEALTHCARE SECTOR

The first challenge facing the Chinese healthcare sector is the rapid growth of lifestyle-related diseases caused by, among other things, improvements in living standards. According to an announcement by the WHO in 2016, the number of people suffering from lifestyle-related diseases in China reached approximately 300 million. This marked a 23% increase over the 2003 figure, representing an average annual increase of 8.7%. In particular, the prevalence of such diseases is high among people aged 65 and older, and according to a progress report by the Chinese Center for Disease Control and Prevention, lifestyle-related diseases accounted for 86.6% of all deaths in China in 2015.

The second challenge is the tardiness in developing a healthcare services system. China is facing a problem with the human resources supply from both quantitative and qualitative perspectives. With 1.6 physicians per 1,000 people, China lags behind in the availability of physicians compared to Japan, (2.5 per 1,000), the US (2.6 per 1,000), and the UK (2.6 per 1,000) (World Medical Markets Fact Book). Moreover, licensed physicians include people ranging from high school graduates to university graduates (Figure 1), and due to the large differences in technical level, people have little faith in small and medium-sized clinics and tend to go to large hospitals for even minor illnesses. As a result, large hospitals lack the capacity to provide healthcare services, doctors have only five to eight minutes for each consultation, and severely ill patients receive inadequate treatment. Because public hospitals have been the mainstay of healthcare in China, the lack of service-mindedness toward patients has contributed to the dissatisfaction of hospitals. Although the number of clinics is being expanded to address this situation, according to China's National Health Commission, there were 253,000 clinic-based doctors in 2017, nearly 50,000 short of the government's target of 300,000 by 2020.

Figure 1: Educational level of Chinese healthcare professionals (2015)

Source: Created by MGSSI based on the China Statistical Yearbook on Industries

The third challenge is the burgeoning cost of healthcare, which is already a serious problem in the advanced countries, is projected to emerge in China. While 1.3 billion people, more than 95% of the population, are covered by China's basic health insurance, healthcare costs have reached over 6% of GDP (National Health Commission). Although this is lower than in the advanced countries, where healthcare costs exceed 10% of the GDP, it is clearly on the rise and may become a major issue in the future. The government has made it a major target of its healthcare reforms to curb the rise in healthcare costs resulting from inefficiencies, such as the over-prescription of drugs and excessive diagnostic testing. However, management know-how has been lacking, particularly in public hospitals, and it is believed that a variety of inefficiencies have stacked up.

As a common solution to these issues, the Chinese government is focusing on healthcare DX (the use of medical data and AI). The "Healthy China 2030" plan announced in October 2016 mentions the application of big data in the healthcare field, and in September 2018, the National Health Commission produced detailed guidelines promoting online medical consultations, remote healthcare management, and the integration of medical data.

THE SHENZHEN MODEL OF HEALTHCARE DX

In addition to public policy responses, companies are also vitalizing their efforts. Companies in Shenzhen, a city that has been attracting attention as a business creation hotspot in recent years, are promoting healthcare DX with the aim of solving problems in the healthcare sector through the introduction and use of digital technology, and creating a major trend.

Shenzhen is also known as a center for the bio/medical device industry, as evidenced by the fact that it was recognized as one of China's first national bio-industry bases in 2005. The Greater Bay Area development initiative (official name: Guangdong-Hong Kong-Macao Greater Bay Area development plan), announced in February 2019, is a regional innovation strategy aimed at developing the area by integrating the Hong Kong and Macao Special Administrative Regions and nine cities in Guangdong, including Guangzhou and Shenzhen. It is clearly intended to strengthen the bio/medical device industry through integration with Hong Kong.

As the healthcare industry continues to evolve in this way, three companies headquartered in Shenzhen, Tencent, Ping An Insurance, and BGI, are all regarded as leaders in healthcare DX.

TENCENT

Tencent is seeking to make use of the digital technology cultivated for WeChat, its SNS service that already has a user base of 1.1 billion people in China and has become an important lifestyle infrastructure, to improve customer satisfaction in healthcare services, ameliorate lifestyle-related diseases, and integrate regional medical data. This is an effort by Tencent to add the healthcare sector as a new offering to its service menu for its enormous 1.1 billion customer base. For example, as shown in Figure 2, using WeChat as the entry point, patients can receive online support at various stages of the smart hospital process. By improving the efficiency

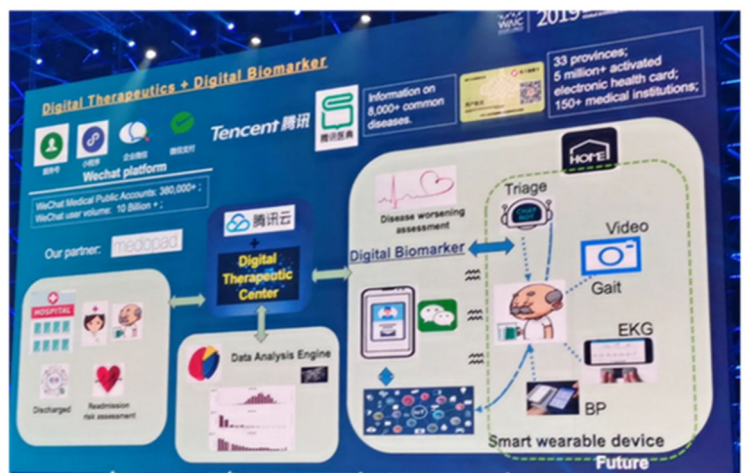
through the use of WeChat, Tencent helps both doctors and patients save time and resolve uneven distribution of medical resources. By promoting this platform, Tencent is aiming to establish collaboration between local hospitals that have, until now, been cut off from each other because of the different systems they use.

Figure 2: Tencent’s Smart Hospital Full Process Service

Patient action	Tencent’s solution	Advantages of service	
		Doctors	Patients
① Search for doctor	Smart guidance · Referral to doctor · Appointment	· Direct advertising · Customer acquisition	· Saves time and efforts
② Preliminary examination	Smart preliminary examination · Preliminary evaluation of condition · Recording of health condition	· More efficient consultations	· Supports the recognition of conditions
③ Consultation	(Doctor’s Consultation) · Diagnosis support services, including part of image analysis	· Prevention of misdiagnosis · Efficiency improvement	· Proper diagnosis benefits
④ Payment	Smart payment · Consultation fee · Insurance fee	· More efficient accounting · Improved profitability	· Saves time · Improved efficiency · Reduced costs
⑤ Purchase of medication	Issuing prescriptions · Cooperation with pharmacies · Receiving/delivering medication	· Streamlining prescription issuance process	· Saves time · Reduces the burden of visiting a pharmacy
⑥ Follow-up	Online follow-up examination · Communication with doctor · O2O integration	· Provision of proper consultations · Improved efficiency	· Benefits from proper consultation · Reduces time for visiting hospital

Source: Prepared by MGSSI based on interviews with Tencent healthcare personnel

Tencent is also aiming to develop services that leverage its ability to obtain information on its 1.1 billion patients by using WeChat and its expansive ecosystem. One such initiative is the development of an app based on the “Digital Drug” concept. The app acquires biological information and various sets of behavioral data from patients and promotes behavioral changes that have a beneficial effect on patient health, thereby helping to eliminate lifestyle-related diseases. If this concept of providing personal health management via an app is used by just one percent of Tencent’s 1.1 billion customers, which amounts to over ten million subscribers, and since it would become a digital version of a cohort study so to speak, it can contribute to a long-term reduction in healthcare costs. Tencent has also already begun gathering offline medical information through investments in the Trusted Doctors and We Doctor clinic chains, setting the stage for future O2O integration. As an extension of this, if Tencent is considering entering the hospital business in the future, it will be able to provide evidence-based healthcare using the data obtained through its app. In China, where the logic of the supply side (hospitals) has predominated, a shift toward patient-centered healthcare services is expected, and this is likely to be a valuable initiative for developing a patient information infrastructure.



Tencent’s vision of digital healthcare management (“digital drug”) of the future (Tencent presentation at the World Artificial Intelligence Conference held in Shanghai in August 2019/photographed by the author)

PING AN INSURANCE

Ping An Insurance is one of the world's largest insurance companies, and prides itself on being the market leader in China's online healthcare industry. Through its online healthcare app, Ping An Good Doctor (290 million users), the company is seeking to expand the number of customers for its main business of insurance. Ping An has positioned its app as a leading channel for customer contact; it directly hires its own team of doctors (approximately 1,000 doctors), possesses online hospital accreditation, and is expanding its services, including the sale of prescription drugs online. Although the content of these services themselves can be said to be similar to those of Tencent, the difference is that Tencent's intention is to expand the services it provides to its existing customer base, whereas Ping An aims to expand the customer base for its existing insurance business. Ping An Good Doctor's vision is to provide "a family doctor for every family," and create both "an electronic health record for each person" and "a health insurance plan for everyone." The aim of the Chinese government is to move to a system where daily healthcare management is conducted by family doctors, and family doctors refer patients to large hospitals in the case of serious illnesses. Ping An's initiative accords with this aim as a practical adjustment function of the patient-doctor supply and demand through online teleconsultation. By linking online consultations with treatments at hospitals, people will be able to consult a doctor online free of charge before having to actually go to a hospital, thereby avoiding unnecessary hospital visits. In this way, large hospitals will be able to provide more medical resources, and conduct proper examinations on many more seriously ill patients.

This system will also contribute to reducing medical costs by having online family doctors manage the health of users, which will help prevent and manage lifestyle-related diseases. Although this attempt by Ping An Good Doctor to create a portal in the Chinese healthcare market has been in the red for four consecutive years, this is not seen as problematic since the initiative is currently in the "data acquisition" stage. Ping An is creating a cycle wherein users' medical and their health-related behavioral data obtained via the app are analyzed using AI, leading to improvements in the service, which will attract more users, and, in turn, expand the amount of data acquired. According to the published data, the number of Ping An Good Doctor consultations per day grew to 535,000 in 2018, a year-on-year increase of 45.4%. In 2019, the company established a joint venture with SoftBank to enter the Japanese market, and is aiming to play a part in functioning the patient-doctor supply and demand adjustment in Japan as well in the future.

BGI

BGI is pursuing the advancement of healthcare technology, both in terms of treatment and prevention, based on genetic analysis technology. Prediction of the risk of contracting leukemia and other cancers through genetic analysis has been attracting much attention in China, and over 40 companies, mostly venture companies, already provide such services. Technological innovation in genetic analysis has progressed steadily. While the first generation of analysis equipment took 12 years to analyze a single person's gene sequence at a cost of US\$3 billion, this was reduced to six months and US\$100,000 for the second generation, and to a single day and US\$100 for the third generation. In 2013, BGI acquired the ability to produce genetic analysis equipment through its acquisition of the US company Complete Genomics.

BGI is a leader in the field of genetic analysis in China. Its vision is to provide effective and inexpensive healthcare solutions for everyone, and its mission is to promote the development of advanced life science tools for the healthcare industry of the future. Along with this philosophy, BGI is particularly focused on the field of prenatal diagnosis in partnership with Shenzhen and cities in Hebei, Anhui, and Hunan provinces, and has provided low-cost testing services to 4.4 million people to date, with 26,000 of whom were found to have abnormalities. In particular, in Shenzhen where BGI is headquartered, this diagnosis has become essentially free, as fully funded by the city since 2017 (this service costs about JPY 100,000 in Hong Kong and JPY 200,000 in Japan), and at approximately 70%, the percentage of expectant mothers undergoing examination in the city is the highest in China. In this way, by providing inexpensive testing services and giving a large number of people the opportunity to undergo examination, BGI can be considered to be taking a step forward in the challenge to combat genetic illnesses.

The genetic analysis equipment that MGI, BGI's manufacturing arm, develops is currently second only to the world's leading manufacturer Illumina of the US. Through the sale of genetic analysis equipment, BGI has become a magnet for information in the field, including close sharing of information on the progress and issues in research being conducted in various countries. The company established close international relationships at a conference it hosted at the end of October 2019, in which globally leading researchers from the US, Europe, and elsewhere participated, as well as national research institutes from the emerging markets of ASEAN, India, and Africa. BGI is operating the China National GeneBank established in Shenzhen in 2016, and is proceeding with this national project aimed at conducting genetic analysis of 100 million people by 2030.

Genetic analysis has the potential to significantly change how healthcare is delivered, and there is little doubt that BGI will be at the center of development in China in this field going forward.

SHENZHEN'S POTENTIAL

Shenzhen is not just a wellspring of the healthcare DX model, it also has the potential to become the stage on which its social implementation takes place.

The concept of a regional integrated care model has already launched through a partnership between the city's Luohu Hospital Group, the Chinese University of Hong Kong Shenzhen Branch, and Tencent. The Chinese University of Hong Kong Shenzhen Branch recruits professors from other universities who are advanced in the field of AI, it has been designated as a big data laboratory in Shenzhen, and has started gathering together a group of top-class personnel.

In August 2019, the Chinese Communist Party and the State Council designated Shenzhen as a "Pilot Demonstration Area of Socialism with Chinese Characteristics." By giving more discretionary power to the special economic zone of Shenzhen, China plans to make the city a model for all industries in other Chinese cities, and to develop it into the world's most advanced city. The government has stated its aims to create a first-class international healthcare service, establish innovative medical science institutes, and create bioinformatics platforms and is strongly backing Shenzhen as a stage of social implementation to take place in the medical and biotechnology fields.

Until now, Shenzhen, which emerged as a migrant city only 40 years ago, was faced with a shortage of resources in the healthcare sector. For top-class, talented people who move to Shenzhen, having a high-quality living standard for their families is a concern, and the level of the healthcare system is a particularly important point. It has been a long-held aspiration of the Shenzhen municipal government to provide an advanced healthcare system, and it is reflected in the policy to "create a first-class international healthcare system." In July 2019, the Shenzhen municipal government reached an agreement with the Chinese University of Hong Kong to establish a medical school and affiliated hospital in Shenzhen. In December, the establishment of a new hospital in partnership with Harvard University and Massachusetts General Hospital was announced, and the city is moving towards acquiring world-class medical resources.

Shenzhen has attracted domestic and foreign companies and talented young people, and now, by coordinating these policies with university research activities and corporate activities, it is envisaged that the city will promote the origination and social implementation of healthcare DX at a world-leading speed, and going forward, its digital healthcare system is expected to attract even greater attention overseas as well.