

The health system and its role in crisis management - China case study-

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Abstract:

This study aims to highlight the effective role of effective health systems in crisis management under the Corona pandemic, and the study found China's digital health strategies to combat the global epidemic, provided different uses from China's digital health strategy, provided a context for how artificial intelligence and ict support health care and the needs of citizens of the world's largest country in terms of population, and also found that the success of the Chinese health system in managing the Corona pandemic crisis was primarily based on existing modern and advanced technologies. Mainly on artificial intelligence, in the end the study recommended the need to place health system programs in the priorities of planned government programs, due to their direct impact on development plans, as well as the need to adopt modern and advanced techniques based on artificial intelligence in the health sector.

Keywords: Health Systems, Crisis Management, Corona Pandemic, Chinese Experience.

JEL Classification: M1; J24; H83; I15.

Introduction

The Corona pandemic (Coved-19) has become a major threat to most health systems around the world, as the growing demand for health facilities and health care workers threatens to burden some of these systems and their inability to operate effectively, hence the need for more attention to health systems in light of the sudden health crises of the Corona pandemic that the world is witnessing today, where many advanced health systems such as Italy, France and Spain have failed. And so on.

- **The Problematic:** Through the above, the problematic features of this study are highlighted as follows:

What is the effective role of health systems in crisis management? What is the reality of the Chinese experience in the corona pandemic?

- **Sub-questions:** From the previous problem, several sub-questions can be asked, including the following:

- What are health systems?
- What is crisis management?

What are the most important initiatives undertaken by the Chinese health system in the face of the Corona pandemic?

- **The Importance of the study:** The importance of the study lies in addressing the health issue, which is of great importance within the circle of global opinion concerns in the context of the Corona pandemic, while highlighting the reality of this from the Chinese experience.

- **The objectives of the study:** The core objectives of this study can be summarized as follows:

- Learn about the concept of health systems and crisis management;
- Highlighting the most important measures taken by the Chinese health system in the face of the Corona pandemic.

- **Methodology of the study:** This study was based on the descriptive analytical approach by explaining the various theory related to the variables of the study, as well as exposure to the most important initiatives taken by the Chinese health system in the face of the Corona pandemic.

1- Terminology of study:

1-1- Health system: A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health.

This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is, therefore, more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behavior change programmes; vector-control campaigns; health insurance organizations; occupational health and safety legislation. (Encyclopedia, 2020)

as such healthcare system can be defined as the method by which healthcare is financed, organized, and delivered to a population. It includes issues of access (for whom and to which services), expenditures, and resources (healthcare workers and facilities). The goal of a healthcare system is to enhance the health of the population in the most effective manner possible in light of a society's available resources and competing needs. By the beginning of the twenty-first century access to healthcare had come to be regarded by most countries and the United Nations as a special good that is necessary either as a matter of or pursuant to basic human rights. An examination of healthcare systems therefore includes consideration of the ways in which a particular system addresses commonly held values (ENCYCLOPEDIA.com, 2020).

1-2- Crisis Management: Crisis management is the identification of threats to an organization and its stakeholders, and the methods used by the organization to deal with these threats. Due to the unpredictability of global events, organizations must be able to cope with the potential for drastic changes in the way they conduct business. Crisis management often requires decisions to be made within a short time frame, and often after an event has already taken place. In order to reduce uncertainty in the event of a crisis, organizations often create a crisis management plan (Hayes, 2019).

Crisis management is a series of functions or processes that help to identify study and forecast crisis issues, and to derive specific means that would enable organizations to prevent or cope with a crisis. It involves the systematic attempt to prevent organizational crises and/or to manage any that occur (MANAGER).

1-3- About Corona Virus: Coronaviruses were first discovered in the 1930s when an acute respiratory infection of domesticated chickens was shown to be caused by infectious bronchitis virus (IBV), Arthur Schalk and

M.C. Hawn described in 1931 a new respiratory infection of chickens in North Dakota. The infection of new-born chicks was characterized by gasping and listlessness. The chicks' mortality rate was 40–90%, Fred Baudette and Charles Hudson six years later successfully isolated and cultivated the infectious bronchitis virus which caused the disease, In the 1940s, two more animal coronaviruses, mouse hepatitis virus (MHV) and transmissible gastroenteritis virus (TGEV), were isolated, It was not realized at the time that these three different viruses were related.

Human coronaviruses were discovered in the 1960s, They were isolated using two different methods in the United Kingdom and the United States, E.C. Kendall, Malcom Byone, and David Tyrrell working at the Common Cold Unit of the British Medical Research Council in 1960 isolated from a boy a novel common cold virus B814, The virus was not able to be cultivated using standard techniques which had successfully cultivated rhinoviruses, adenoviruses and other known common cold viruses. In 1965, Tyrrell and Byone successfully cultivated the novel virus by serially passing it through organ culture of human embryonic trachea, The new cultivating method was introduced to the lab by Bertil Hoon, The isolated virus when intranasally inoculated into volunteers caused a cold and was inactivated by ether which indicated it had a lipid envelope, Around the same time, Dorothy Hamre and John Procknow at the University of Chicago isolated a novel cold virus 229E from medical students, which they grew in kidney tissue culture. The novel virus 229E, like the virus strain B814, when inoculated into volunteers caused a cold and was inactivated by ether.

Transmission electron micrograph of organ cultured coronavirus OC43, The two novel strains B814 and 229E were subsequently imaged by electron microscopy in 1967 by Scottish virologist June Almeida at St. Thomas Hospital in London, Almeida through electron microscopy was able to show that B814 and 229E were morphologically related by their distinctive club-like spikes. Not only were they related with each other, but they were morphologically related to infectious bronchitis virus (IBV), A research group at the National Institute of Health the same year was able to isolate another member of this new group of viruses using organ culture and named

the virus strain OC43 (OC for organ culture), Like B814, 229E, and IBV, the novel cold virus OC43 had distinctive club-like spikes when observed with the electron microscope.

The IBV-like novel cold viruses were soon shown to be also morphologically related to the mouse hepatitis virus, This new group of IBV-like viruses came to be known as coronaviruses after their distinctive morphological appearance, Human coronavirus 229E and human coronavirus OC43 continued to be studied in subsequent decades, The coronavirus strain B814 was lost. It is not known which present human coronavirus it was, Other human coronaviruses have since been identified, including SARS-CoV in 2003, HCoV NL63 in 2004, HCoV HKU1 in 2005, MERS-CoV in 2012, and SARS-CoV-2 in 2019, There have also been a large number of animal coronaviruses identified since the 1960s (Encyclopedia, 2020).

2- China's digital health strategies against the global pandemic:

Digital health technologies are critical tools in the ongoing fight against the global COVID-19 pandemic.

Artificial Intelligence (AI), big data, 5G and robotics can provide valuable and innovative solutions for patient treatment, frontline protection, risk reduction, communications and improved quality of living under lockdown as the world continues to battle the COVID-19 pandemic.

2-1- Critical tools in the fight against COVID-19: Last week's AI for Good webinar, '[COVID-19: China's digital health strategies against the global pandemic](#),' presented different use cases from China's digital health strategy, and provided context for how AI and information and communication technologies (ICT) has supported healthcare and citizen needs for the world's most populous nation.

Following the start of the COVID-19 outbreak in January 2020, China implemented a wide-reaching strategy to control and contain the virus.

"With various available technologies, we [ICT engineers] can actually play a very positive supporting role in fighting the current virus," said Shan Xu, an engineer in the Smart Health Department at the China Academy of Information and Communications Technology (CAICT).

She spoke about "magical combinations" in which technology can provide innovative solutions for medical requirements. These include using

AI and big data to support risk assessments through case tracking and modelling, or increasing the efficiency in diagnosis and treatment of patients through 5G-enabled telemedicine.

2-2- Strategies to combat COVID-19 using AI: AI has played a large role in China's digital health strategies and Ms Xu pointed to several activities undertaken by different players in China, including assisting COVID-19 diagnosis, vaccine development, public screening and individual risk assessment.

She also explained how AI-enabled research and development is being used to support the development of a COVID-19 vaccine in a shorter time frame. One example Ms Xu gave was the Global Health Drug Discovery Institute (GHDDI) working with Alibaba Cloud to develop R&D platforms using AI and big data. [Alibaba Cloud](#) is providing AI computing power to support a large amount of data analysis, large-scale literature screening and scientific super-computing work.

AI can also play a huge role in assistive diagnosis. Using a medical knowledge atlas and deep learning algorithm, the system developed by [Nankai University and Inference Technology](#) can process dozens of high-resolution CAT scans, rapidly screening large quantities of case data in seconds, thereby dramatically reducing the time needed to reach a diagnosis. The results are in line with those of a chief hospital physician.

"We want to share reproducible experience for other countries and we realize the importance of the monitoring and evaluation of the effectiveness of different digital health cases," Ms Xu said.

But digital health strategies come in many forms. China has deployed robots to provide support to frontline health workers in the field. [Medical robots at Wuhan Thunder Mountain Hospital](#) can disinfect hospital wards, measure patient's temperature and distribute medical supplies, reducing the workload of medical staff and the risk of cross infection.

"We can also see the applications of robots in our daily life before the outbreak, but during this very special period, the role of the robots has been greatly amplified and also recognized by the public," Ms Xu said.

2-3- Internet resilience and capacity in China: "Our goal is to transform technology into capabilities for continuous work, study and life, and also

pandemic prevention,” said Yuan Zhang, Director of Machine Vision Standardization and Strategy at China Telecom.

She explained that China Telecom’s infrastructure was built to withstand the demands faced by COVID-19. It includes over one million 4G base stations, 75,000 5G base stations and 170 million broadband subscribers, she said. Despite a 22.61 per cent increase in daily broadband network traffic, “the peak level of data consumption did not come close to the limit of the network,” Ms Zhang said.

As such, the quality of service did not drop, thanks to the bandwidth of the network backbone.

“China has advantages in Optical Access Networks and fibre to the home deployment; the persistent effort to build the network has paid off,” Ms Zhang said.

2-4- Putting health on the cloud: One of China Telecom’s main roles was to support the sudden and increased demand for remote applications, and transforming technology capabilities to enable continuous work and study while supporting epidemic prevention during the pandemic for tens of thousands of households, required speed and agility, said Zhang.

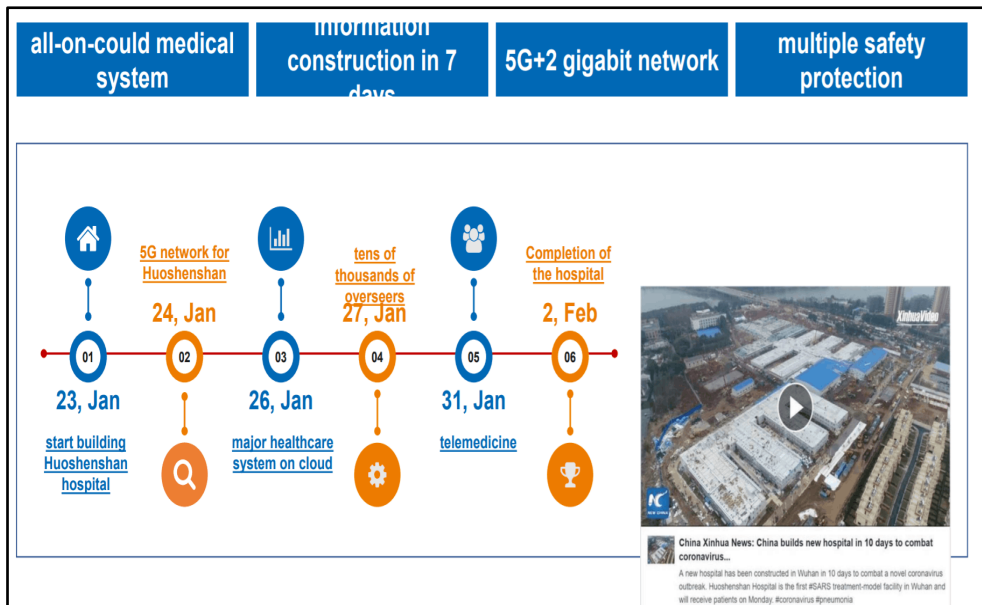
China Telecom saw a dramatic increase in demand for remote applications. They launched over 70 new applications for different regions and industries to serve these new requirements, and their cloud conferencing service had over 700,000 users one month after their launch.

But nowhere was this application more quickly implemented than at the Huoshenshan Hospital in Wuhan, China, which is famed for being built in 10 days to help combat the COVID-19 outbreak, and was deployed with an ‘all-on-cloud’ medical system.

“The whole [hospital] construction took 10 days, but we only took three days to deploy the network and cloud resources,” Ms Zhang said.

Figure number (01): How China was able to build a hospital in 10 days during the Corona pandemic

The health system and its role in crisis management
- China case study-



Source: (Encyclopedia, 2020)

Systems on the cloud included hospital and laboratory information, as well as administrative information systems, such as financial management and customer service.

Putting this data on the cloud reduced local maintenance and vastly accelerated its deployment – and importantly, it is a solution that can be easily replicated. As such, Yuang highlighted that creating uniformed interface and data format solutions could be a potential area for standardization (ITU, 2020).

3- China's use of Artificial Intelligence for COVID-19: So far China is known to have more than 3200 fatal cases owing to the Covid-19 epidemic. Currently, this infection has engulfed almost the entire world. Although, this infection began at China, but it was a Canadian AI (Artificial Intelligence) start-up based at Toronto that had spotted this infection first. BlueDot is an AI-based infectious disease surveillance system. This platform searches the world 24 by 7, for any possible largescale disease, spread. Platforms like this use various new and emerging technologies like AI, Big Data and Machine Learning. This agency got the indication of the possible pandemic around December 30, 2019. The company did alert their clients about a cluster of “unusual pneumonia” found around a market in

Wuhan. Nine days after this, the World Health Organization issued their alert about the emergence of a novel coronavirus. BlueDot's has a good track record and is known to have made predictions about the Zika (2016) and Ebola (2014) in the past.

China was possibly less prepared to timely predict the possible outbreak of a pandemic, however subsequently, they are found using AI and other technologies in a big way to control the threat.

At present, AI and associated technologies are not fully developed technologies. AI is actually much far away from imitating human intelligence. However, still, these technologies at the present level of their development cycle are found proving useful. These AI-based platforms are doing a significant amount of data crunching of the entire health, food, poultry, fisheries and tourism sectors. Subsequently, based on custom-made algorithms they are drawing inferences. Today, data science and machine learning are two important tools which are known to helping the fight against Covid-19.

At present, various tech giants and start-ups are burning midnight 'ampere' to fight with the Covid-19 threat. In China, the technology leaders like Alibaba, Baidu and Huawei are working with the government agencies to nullify this threat. Alibaba is using specific applications like the CT Image Analytics Solutions in mass testing. AI-based mathematical modelling are used for predicting the probability of different pneumonia types. Techniques like the lung segmentation methods, which are normally used for identifying the exact region of interest for infection assessment, are known to be almost 60 times faster than human detection and are in use. Also, platforms like the Epidemic Prediction Solution play an important role to map specific epidemic characteristics of the virus. Alibaba Cloud is running a virus genome sequencing application which is helping to diagnose new coronavirus cases within a few hours. The company claims that this is five times faster method than the existing other methods.

A Chinese company famous for providing China's version of GPS (satellite-based navigation) called Baidu is using specific AI technologies like the Computer Vision algorithms that allow computers to understand and label images. Such technologies with the infrared sensors are put in use for creating peoples temperature profiles (in just a few seconds) in public areas

like airports etc. Also, AI is helping to shorten the ‘events’ during drug research. The need of the hour is to have a drug as well as vaccine ready for use in the shortest possible time. Particularly, in case of vaccines, if the existing norms are followed towards the production and testing then it may take a few years’ time to bring the vaccine in the market. Today, AI is helping to speed up this process for Covid-19.

Coronavirus being a highly contagious virus is proving hazardous even for the medical community. Here various robotic systems are finding greater utility. The unmanned aerial vehicles (UAVs) are put in use for the transport of medical samples and quarantine material. In addition, there are robotic systems (Drones) capable of undertaking policing activities and are offering assistance to ensure quarantine compliance. Pandemics are known to generate psychological problems too. Technologies like AI could be of much use not only for monitoring the behaviour of the virus, but also that of humans. At present, they are getting used for pattern generation and assessment to understand human behaviour and response.

Today, China is fighting the Covid-19 challenge by using new technologies like AI. For the last few years, there has been a much of debate in regards to the ethical and moral aspects of AI. The basic issue has always been whether AI should be used in the field of medicine ‘to take life and death decisions’? Since the number of Covid-19 infected patients is too large, it is becoming difficult to provide human attention to everyone. Today, AI can decide a good patient and a bad (the one whose chances of survival are less) patient. Obviously, there would be a decision dilemma for the doctor in regards to whom to treat first.

All in all, the present Chinese response to Covid-19 it appears to be majorly based on technologies like the AI and various other data science technologies. However, the same technologies are also putting them in an ‘ethical quandary’ (Lele, 2020).

4- How the Coronavirus Will Transform Healthcare in China: For the past two months, the campaign to control, diagnose and treat the novel coronavirus has been a taxing struggle. Stretching China’s healthcare system further than the 2003 SARS epidemic, the fast-moving and deadly

COVID-19 has resulted in overcrowded hospitals where medical personnel have worked tirelessly to provide care.

Beyond the direct effects of the virus, the epidemic has taken a toll on normal healthcare activities. As other patients avoid highly contagious hospital facilities, and resources are diverted to fight the epidemic, regular medical services have crawled to a standstill. The Chinese Medical Association has delayed all academic meetings scheduled before April. And healthcare companies whose major businesses are not directly related to the epidemic could take a hit in the first quarter.

When the coronavirus outbreak wanes, what will China's healthcare industry look like? While lessons from SARS can provide guidance on how government entities, companies and consumers are likely to react, the implications of the coronavirus are far broader. In a healthcare system already in transition, we expect to see an acceleration in reform, digitalization and patient empowerment.

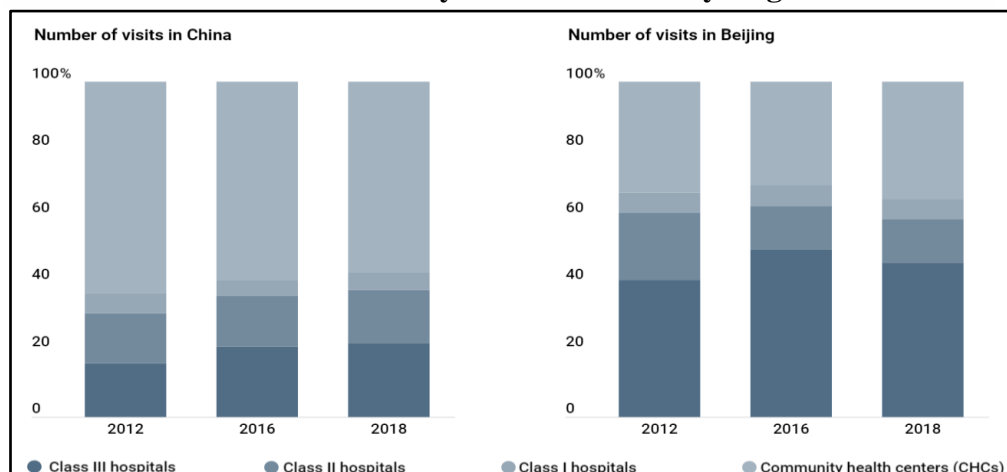
4-1- Reforming healthcare after the coronavirus: After the SARS epidemic, the Chinese government quickly launched an overhaul of the healthcare system to improve access to such things as services and high-quality supplies. It invested in systems for disease surveillance and reporting, as well as epidemic prevention and control. Centers for disease control were built across the country. And public insurance programs were vastly expanded to provide affordable care for the rural population.

Since then, the transformation has moved beyond the basics to focus on efficiency and quality. But the coronavirus outbreak exposed the remaining cracks in the nation's healthcare system. In the wake of COVID-19, we anticipate the government will once again institute sweeping reforms focused on access to high-quality care, cost management, product innovation and digitalization.

4-2- Access to quality care: China's tiered healthcare system—in which smaller community health centers (CHCs) and Class I institutions provide first-contact care, and larger Class II and III institutions provide specialist referral services—is designed to distribute patients based on need, freeing up resources at big, congested facilities. But implementation has been arduous. While Beijing and other cities have made some headway with

recent decreases in Class III visits, patients still habitually seek treatment from large hospitals (see Figure 02).

Figure number (02): Despite recent progress in major cities, China's tiered healthcare system is still in early stages



Source: (Chang, 2020)

Despite recent progress in major cities, China's tiered healthcare system is still in early stages.

In the fight against the coronavirus, CHCs, Class I and Class II hospitals have played an important role in identifying and preventing disease, and isolating patients. Of the 203 CHCs in Wuhan, the epicenter of the virus, 199 were designated for COVID-19 screening and triage. And the first group of patients admitted to Wuhan Jinyintan Hospital included referrals from Class II hospitals. At the same time, with a shortage of public healthcare resources, private facilities and third-party diagnosis and treatment services have provided much-needed relief.

However, only 10 of Wuhan's CHCs were prepared to admit and treat patients with coronavirus symptoms, emphasizing a gap in institutional capabilities. After the epidemic ebbs, the Chinese government will likely double-down on improving the quality and availability of CHCs, particularly in small cities, boosting the efficiency of entire healthcare system. Meanwhile, the high demand for specialization will continue. Hospitals will increasingly outsource to private and third-party institutions that have scale, technology and cost advantages.

4-3- Cost management: China has taken multiple measures to control healthcare costs and cut fees since the SARS epidemic, including centralizing procurement, buying drugs in bulk and implementing a two-invoice policy to eliminate layers of distributors.

But compared with SARS, the coronavirus will take a larger toll on China's economy and the healthcare system. SARS reduced China's GDP by approximately RMB 100 billion, whereas the coronavirus could cost as much as RMB 500 billion. During the recovery, the government will doubtlessly intensify cost and productivity efforts.

4-4- Product innovation: In December 2019, China's amended Drug Administration Law established the market-authorization-holder system, making it easier for pharma companies to bring new drugs to market. Other recent moves, such as fast-track approval for certain medical devices, have likewise paved the way for healthcare innovation. And while cutting the red tape encourages local companies to experiment with alternative medicine, China is also ramping up approvals on foreign drugs.

To find a treatment for COVID-19, Chinese health authorities are working with the US company Gilead Sciences to conduct trials of remdesivir, an antiviral drug, at hospitals in Wuhan. Meanwhile, China's contract research organizations (CROs) have been involved in the R&D of a preventative vaccine. But outside of coronavirus-related developments, pharma and medtech companies, CROs, and contract developing and manufacturing organizations (CDMOs) are grappling with significant delays to normal operations.

What does this mean for the future? China is likely to speed up approvals of medicine and medical devices. Some high-end products will achieve greater awareness and penetration. Leading pharma and medtech companies will further invest in innovation, from artificial intelligence (AI) to partnerships with emerging digital health organizations. CROs and CDMOs will have more buy-in from the government, pharma and medtech companies, and medical facilities. With additional support for R&D, contractors will play an elevated role in the next round of reforms.

4-5- Digitalization: Echoing a global, industrywide sentiment, the Chinese government has called for the integration of big data, artificial intelligence,

telemedicine, online pharma retail and more. But healthcare still lags behind other industries in the digital revolution.

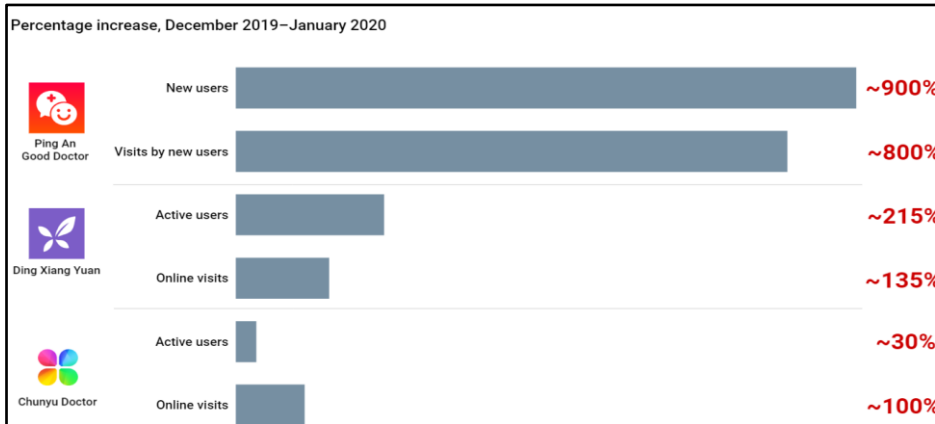
The coronavirus epidemic puts a glaring spotlight on the opportunities in digital. While some technologies, such as AI-enabled fever-detection devices, are being rolled out quickly in response to the outbreak, other developments, such as the widespread adoption of electronic medical records, could improve the system's efficiency and transparency in times of crisis.

To relieve current pain points and prepare for future epidemics, the digitalization of China's healthcare system needs to rapidly advance. Electronic records, digital prescriptions and other IT infrastructure will systematically track and analyze extensive patient data. AI and big data will eventually help hospitals reallocate scarce resources and improve diagnosis accuracy. These digital measures can break down silos between hospitals, pushing the tiered system forward.

4-5-1- A digital, patient-first future: Beyond systemwide reform, another force is quietly transforming healthcare in China. Although physically locked down in their homes, consumers have become more empowered decision makers. COVID-19 has spurred them to embrace innovative B2C delivery models, reshaping their traditional behavior. Even after government restrictions are lifted and virus fears subside, changes in patient attitudes toward online medical services, retail pharmacies and commercial health insurance will stick.

4-5-2- Online medical services: As the number of coronavirus cases climbs, China's online healthcare platforms are growing explosively. Trapped indoors, many patients are turning to Internet-based options for diagnosis and treatment. Ping An Good Doctor, a healthcare services platform, had a nearly 900% increase in new users from December 2019, before the World Health Organization identified the virus, to January 2020, when the virus spread across China (see Figure 03). The number of online users and visits also has surged at Ding Xiang Yuan, an online community for healthcare professionals, and Chunyu Doctor, a telemedicine platform.

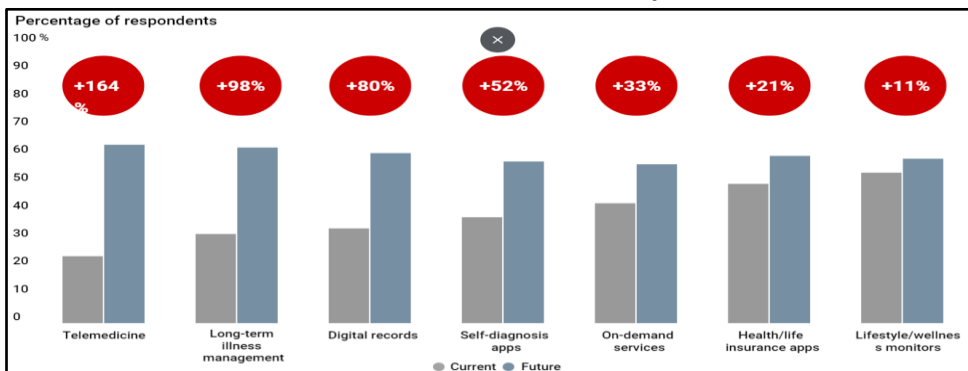
Figure number (03): Coronavirus has accelerated the growth of China's online medical platforms



Source: (Chang, 2020)

Prior to the outbreak, Chinese consumers typically visited physical institutions for their healthcare needs. Digital adoption was low: According to a Bain survey, only 24% of Chinese respondents had used telemedicine. However, 97% expressed interest in digital health services, if the costs were covered by an insurance provider or employer, and 64% expected to use telemedicine within the next five years (see Figure 3). If consumers develop digital habits and a greater willingness to pay for services during the epidemic, that timeline could be significantly shorter. Companies can expedite the move online by deepening their understanding of new user behavior and providing support in this time of need. In the long run, successful digital health companies will partner with offline providers to provide comprehensive care at scale.

Figure number (04): Chinese patients expect to use more digital services within the next five years



Source: (Chang, 2020)

4-6- Retail pharmacies

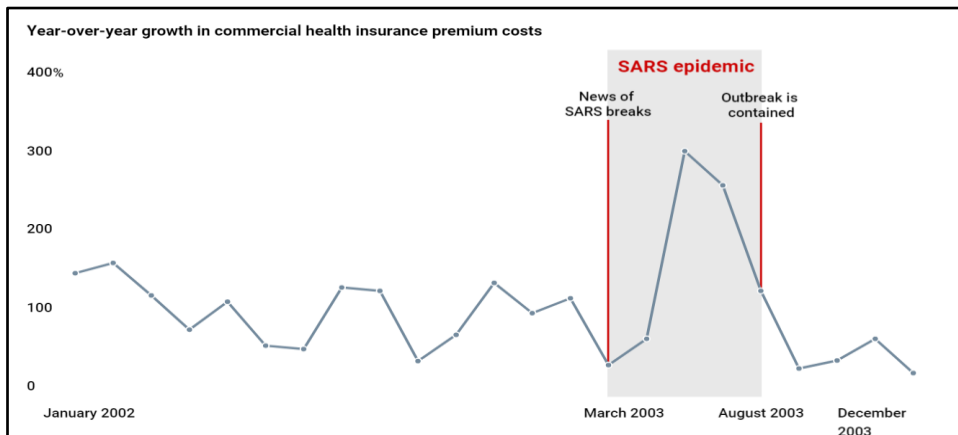
Attempting to avoid contamination and crowds at hospitals where they traditionally purchase drugs, Chinese consumers initially turned to retail pharmacies for prescription drugs, over-the-counter medicines and face masks. And as the outbreak escalated and lockdowns were enforced, more shoppers have relied on online channels.

While sales of medicines and related supplies are likely to drop sharply after the coronavirus threat ends, the overall demand for additional sales channels is unlikely to let up. As more drug sales move to retail pharmacies, large chains that use scale to their advantage will come out on top. Online retail pharmacies will collaborate with hospitals on e-prescription and online-to-offline delivery.

4-7- Commercial health insurance

Just 17 years ago, commercial health insurance was an emerging product in China. During the SARS outbreak—when many uninsured citizens had to pay out-of-pocket for medical expenses—commercial health insurance experienced a short-term boom (see Figure 04).

Figure number (05): The SARS outbreak fueled a short-lived boom in commercial health insurance



Source: (Chang, 2020)

Similar to the SARS epidemic, premium growth rates will return to normal after the coronavirus epidemic. But the public health crisis has put private insurance top-of-mind for many people. While most of the population is now covered by public insurance, the coverage is limited. In response,

several insurance companies have added virus coverage to their offerings. Epidemic-related concerns, coupled with the development of private healthcare and a growing range of digital services, will push more Chinese consumers to purchase private insurance. Leading commercial insurers will harness large hospital networks, digital capabilities and a wealth of analytics.

4-8- Next steps for healthcare companies: While general trends from the previous epidemic-induced reforms and current consumer behavior can illuminate a path ahead, many things remain uncertain. Local and multinational healthcare companies should size up the situation, act resolutely and be prepared to move quickly as opportunities and challenges present themselves. We recommend six steps as the industry moves forward.

4-8-1- Immediate actions:

- **Assess the impact of the epidemic:** Adjust annual business targets and budgets according to market conditions and future implications. Be sure to protect key competitive capabilities.

- **Join the fight against the epidemic and collaborate with government stakeholders:** Offer support to relevant government bodies, medical associations and the greater community through funds, products and research to prevent and control epidemics. Lay the foundation for partnerships to help improve the healthcare system in the long term.

- **Be ready for opportunities as well as challenges:** Identify the capabilities your business needs in order to become more resilient, and determine how you would acquire them if opportunities arise over the longer term.

4-8-2- Future actions (one to two years):

- **Manage costs for today and tomorrow:** Avoid aggressive cost-cutting in response to short-term effects of the epidemic. Instead, cautiously consider the best cost strategies for your business—those that will improve internal efficiency and benefit stakeholders. Invest savings to go deeper and wider in market coverage, developing a model can serve customers across a more robust tiered healthcare system.

Focus on product, service and business model innovation. Sustain a competitive advantage, make the most of regulatory tailwinds, and navigate

economic headwinds through several approaches to innovation, such as organic R&D and product launches, corporate venture capital arms or innovation incubators integration of enhanced digital services to existing products.

- **Accelerate digital initiatives:** Continuously develop digital capabilities through self-building, partnership or M&A. Use these capabilities to revamp patient and medical personnel experiences, while improving organizational transparency and efficiency. Finally, harness digital records and coordinate with other players to streamline processes across the healthcare system (Chang, 2020).

Conclusion

The advanced health systems have proved their effective role in managing crises, especially health, in the light of the Corona pandemic, which has ravaged the world, as it is the cornerstone and the machine for applying the concept of development in all its dimensions due to its role in maintaining human health, as the Chinese health system is a successful experiment in the face of the Corona crisis by relying heavily on information technology, communication and artificial intelligence.

- **Study results:** Through this study, a series of results were reached, the most important of which are:

- A health system consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is, therefore, more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behavior change programmes; vector-control campaigns; health insurance organizations; occupational health and safety legislation;

- Crisis management reflects a series of functions or processes that help identify and predict crisis study issues, and to derive specific means that will enable organizations to prevent or deal with a crisis. It involves a systematic attempt to prevent and/or manage any of these organizational crises;

- China's digital health strategies against the global epidemic have provided different uses from China's digital health strategy, and provided a context for how artificial intelligence and ICT support health care and the needs of citizens of the world's most populous country;
- The success of china's health system in managing the Corona pandemic crisis has relied primarily on modern and advanced technologies based mainly on artificial intelligence.
- **Study recommendations:** Through this study, a series of proposals were reached, the most important of which are:
 - The need to put health systems programs in the priorities of the government's planned programs due to their direct impact on development plans;
 - The need to adopt modern and advanced technologies based on artificial intelligence in the health sector;
 - The need to conclude international agreements with successful and developed countries in the field of health especially.

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