# Deloitte.

德勤



Internet Hospitals in China:
The new step into digital
healthcare

MAKING AN
IMPACT THAT
MATTERS
since 1845

The internet is changing our lives irreversibly and integrating with every industry sector at a rapid pace. The medical industry, which is closely related to public livelihoods, is undergoing unprecedented changes. In October 2016, the *2030 Health China Planning Outline* released by the Central Committee of the Communist Party of China stated that the goal is to raise the overall health level of the Chinese people. Within this, the Chinese medical industry is required to transform from offering "health care" to "health services" and move towards future smart health care. In 2015, the Chinese medical information system entered the internet era, forging a critical framework for further smart medical development.

Online hospitals are typically offshoots of offline medical organizations. The combination of the internet and healthcare will drive the medical industry's transformation into a "health services provider" from a "health care supplier", distributing resources equally and enhancing efficiency.

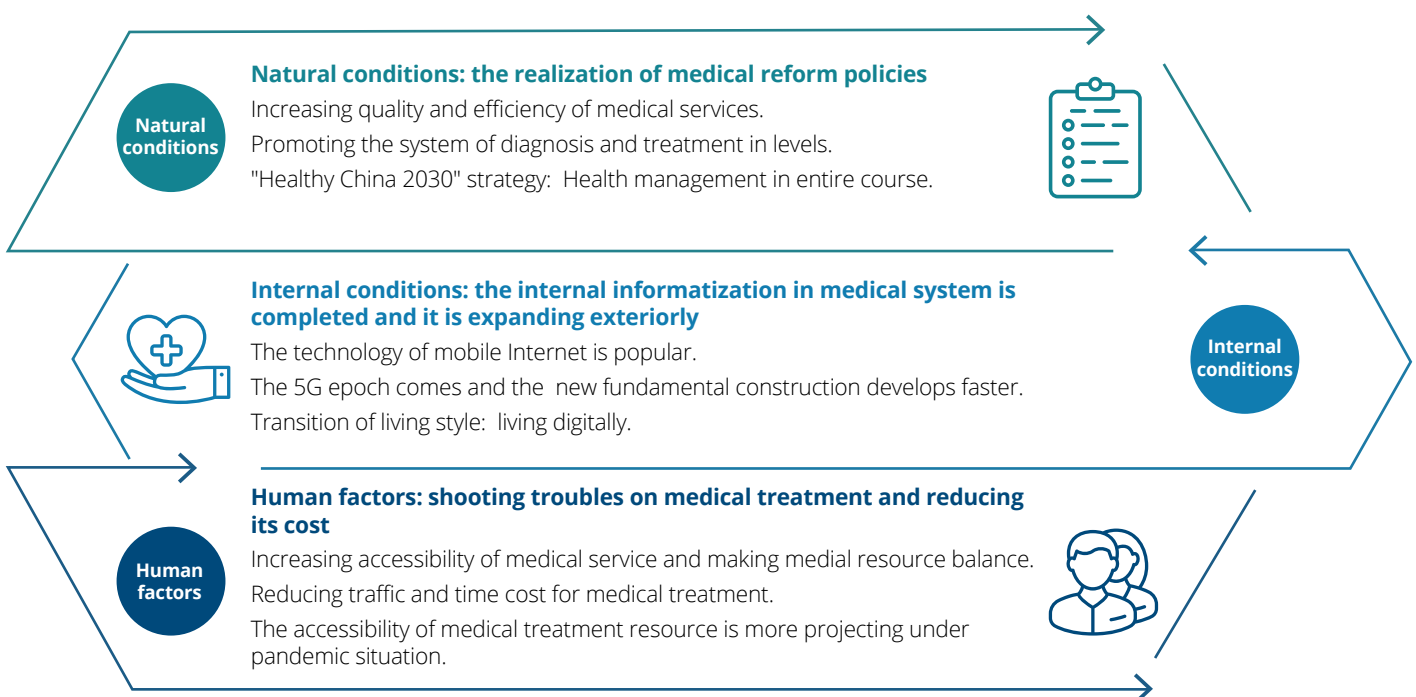# The trend towards internet hospitals is underway

Online hospitals are entering a new era of bold development with favorable timing, a conducive environment, and greater public and practitioner acceptance.

The timing is favorable because online hospitals are now well placed to drive the implementation of sector reforms designed to improve medical service quality and efficiency, advance the establishment of level-to-level diagnosis and treatment systems and the overall health management system, and accelerate the realization of the Healthy China 2030 blueprint.

The so-called conducive environment is that the basic informatinalization within hospitals has been completed and the process is now actively extended outwards. The widespread use of mobile internet in China, increasing public adoption of "digital life", and the emphasis in the 2020 governmental work report on hastening the construction of 5G networks and new infrastructure are going to further accelerate online hospital construction.

Meanwhile, the public has gradually accepted online diagnosis and treatment, with a surge in awareness since the emergence of COVID-19.

During the pandemic, patients have benefited from online diagnosis, door-to-door delivery, online payment and other services that meet their needs. People are more aware of online diagnosis and treatment, and it is becoming increasingly habitual. As for practitioners, hospitals and doctors become less conservative and are actively promoting online services. The pandemic has exposed the inaccessibility of medical resources, and online hospitals are now seen as a critical, effective channel for easing pressure on medical services and gradually reducing costs.

**Natural conditions: the realization of medical reform policies**
Increasing quality and efficiency of medical services.
Promoting the system of diagnosis and treatment in levels.
"Healthy China 2030" strategy:  Health management in entire course.

**Natural conditions**

**Internal conditions: the internal informatization in medical system is completed and it is expanding exteriorly**
The technology of mobile Internet is popular.
The 5G epoch comes and the  new fundamental construction develops faster.
Transition of living style:  living digitally.

**Internal conditions**

**Human factors: shooting troubles on medical treatment and reducing its cost**
Increasing accessibility of medical service and making medial resource balance.
Reducing traffic and time cost for medical treatment.
The accessibility of medical treatment resource is more projecting under pandemic situation.

**Human factors**

# COVID-19 fueling the expansion of internet hospital market

In 2020, the COVID-19 pandemic blocked offline medical diagnosis and treatment channels, putting pressure on medical resources. According to official data, the pandemic prompted 38.2% year-on-year and 45.7% month-on-month declines in medical and healthcare visits in February 2020, and the number of discharged patients fell 35.6% year-on-year and 47.7% month-on-month (excluding Hubei Province) [1].

The Chinese government has issued a series of online hospital-related policies designed to enhance medical services and promote market development in past few years, and during the pandemic things were accelerated as said online hospitals bore substantial responsibility for healthcare provision[2].

- In October 2016, the Healthy China 2030 blueprint, which emphasizes "Internet + Medical Services", became a national strategic priority.

- The opinions on *Promoting "Internet + Healthcare" Development* issued by the State Council in April 2018, and the *Online Hospital Administrative Measures (Trial)* promulgated three months later, fast-tracked the development of online hospitals. They emphasized the core role of "offline medical organizations" in providing online hospital services and established online hospitals' legal status and regulations.

- In August 2019, the *Drug Administration Law of the People's Republic of China* was revised, ending the prohibition of direct online sales of prescription drugs.

- In September 2019, policies on medical insurance were set out in the *Opinions on Completing "Internet +" Medical Service Pricing and Medical Insurance Payment Policies.*

- In March 2020, the *Opinions on Promoting "Internet+" Medical Insurance Services During the Period of Preventing and Controlling the Coronavirus Pandemic* clarified measures to promote direct payment for medicines prescribed from designated retail drugstores and online medical insurance, and was officially implemented. Online services to diagnose and treat common and chronic diseases for return visiting patients under medical insurance coverage by qualified online healthcare organizations has been included in the scope of local medical insurance funds, according to related rules.

- In March 2020, the *Opinions on Deepening Reformation of the Medical Security System* gave support for innovative development of "Internet+ Healthcare" and other service models, and gave the green light to electronic prescriptions issued by online medical organizations and direct online medical insurance settlement for diagnosis, treatment and medicine provision.

- In September 2020, in its *Opinions on Speeding Up the Development of New Type Consumption with New Industry Dynamics and New Modes*, the general office of the State Council pointed out that online and offline consumption should be promoted and dynamically combined to further boost new dynamics and models in various segments of consumption. It advocated active development of healthcare service via internet with great promotion in appointment for diagnosis/treatment by period, online diagnosis/treatment, online transfer of electronic prescriptions and drug distribution, etc.



---

[1]Data from National Health Commission of China;
http://www.nhc.gov.cn/mohwsbwstjxxzx/s7967/202004/e800dde2406f44999df8a47e6cfb3ddf.shtml
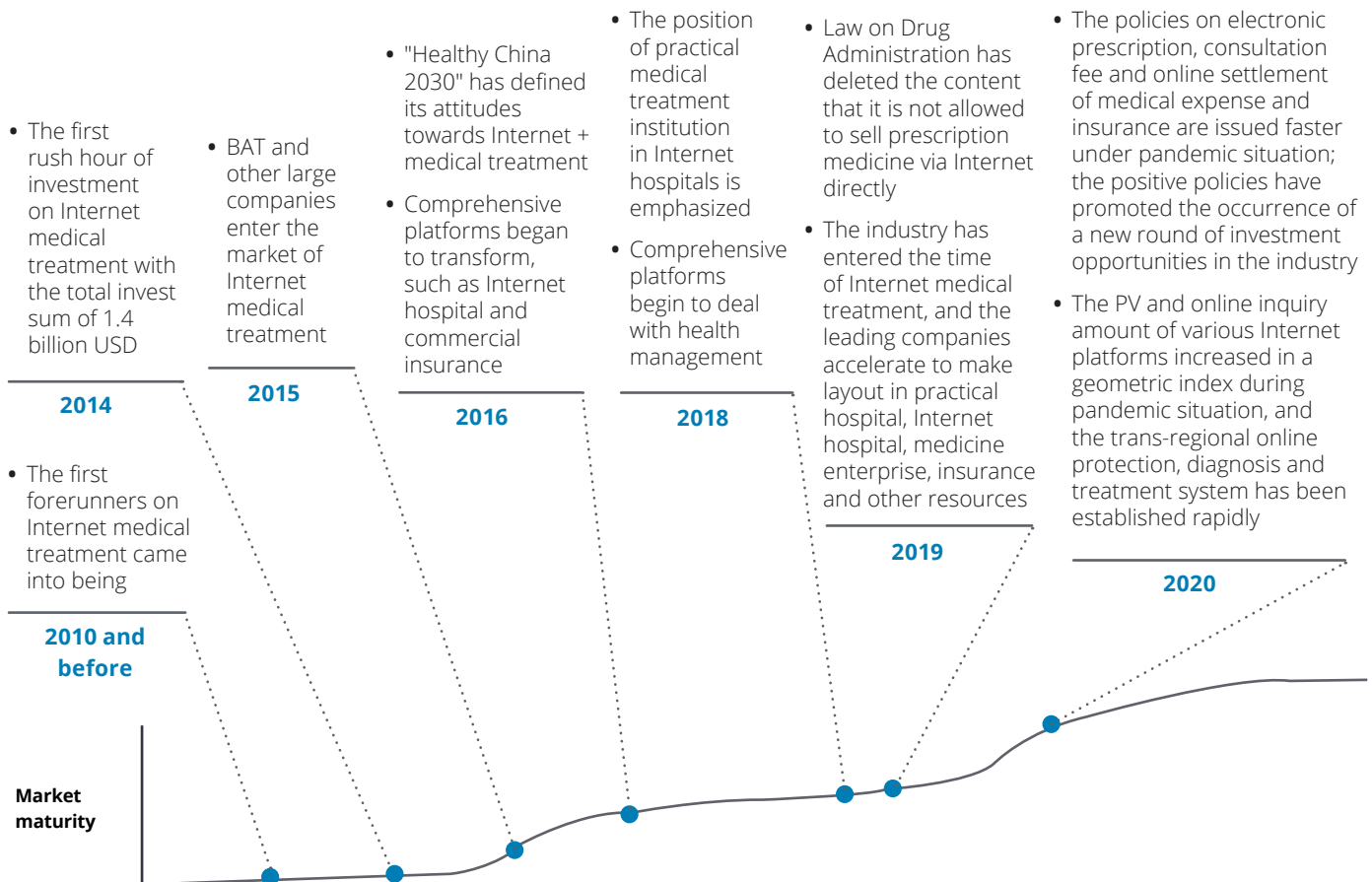[2]Public online policy information, summarized by Deloitte.

5

- On November 2, 2020, in the *Opinions on Actively Promoting "Internet+" Medical Insurance Payment*, the National Healthcare Security Administration pointed out that designated medical organizations can provide qualified "Internet+" medical revisit services and charge for these based on general outpatient consultation prices in public hospitals. It also stated that medicine expenses should be paid subject to medical insurance payment standards and policies.

According to the National Health Commission, online consultations increased 20-fold year-on-year during the COVID-19. Media reports indicate Wuhan University People's Hospital was granted permission to operate its Cloud Consultation services in just one day, making this the first online hospital to obtain an online consultation qualification in Hubei Province. Through review and approval, the General Hospital of Tianjin Medical University added a respiratory medicine department to its online hospital in just 11 minutes[3].

Since the pandemic, policies have been introduced to promote online sales of prescription drug and realized medical insurance payouts to online hospitals, a major move to open up the online hospital ecosystem and form a complete closed online loop from consultation and prescription, to settlement and medicine delivery. The online medical services, which once stagnated but now back in the spotlight again, has become the frontline in the fight against the COVID-19 and may have entered its golden age.

**Figure 1: The timeline for the development of Internet health care platforms in China**
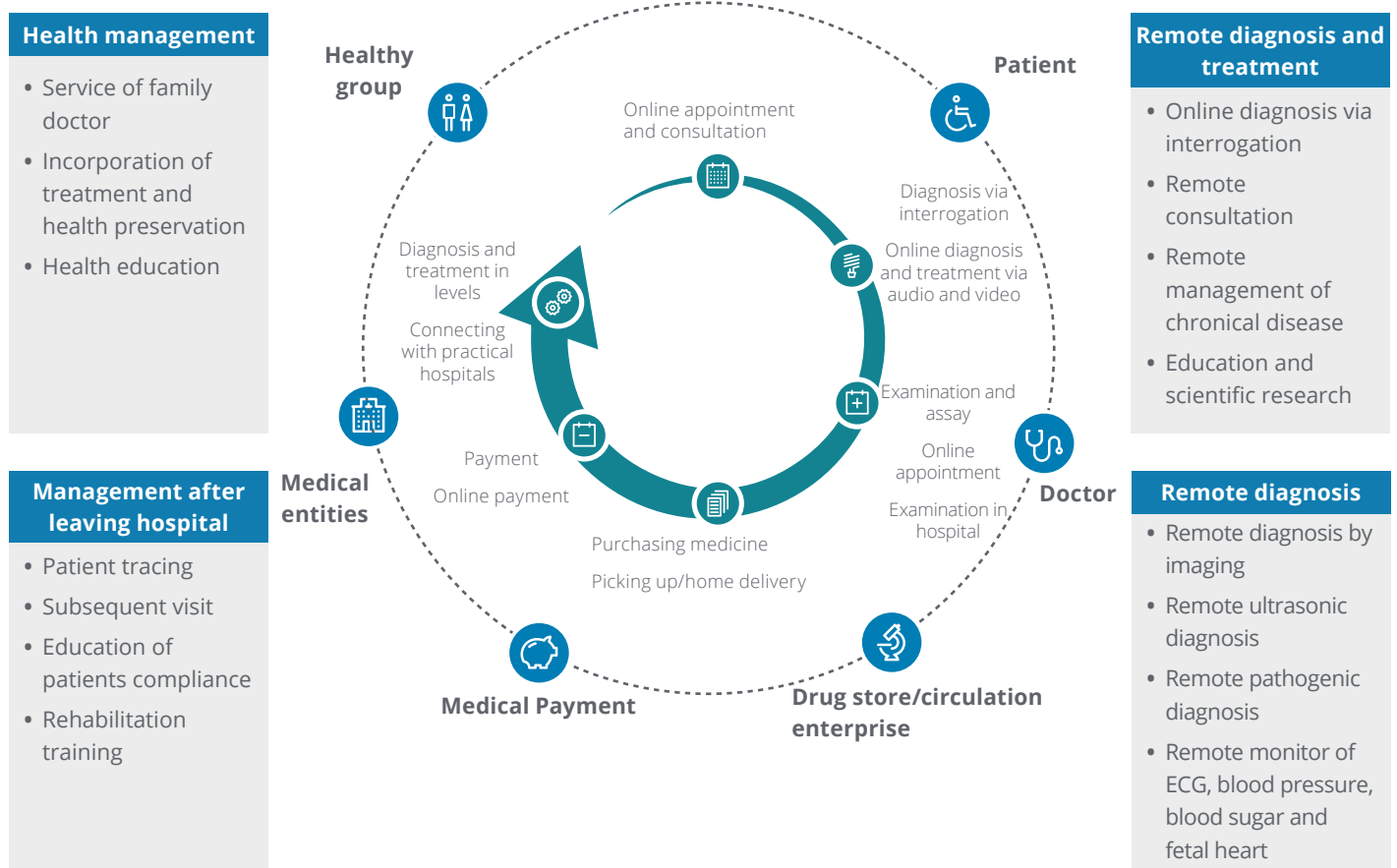


- The first rush hour of investment on Internet medical treatment with the total invest sum of 1.4 billion USD

**2014**

- The first forerunners on Internet medical treatment came into being

**2010 and before**

- BAT and other large companies enter the market of Internet medical treatment

**2015**

- "Healthy China 2030" has defined its attitudes towards Internet + medical treatment
- Comprehensive platforms began to transform, such as Internet hospital and commercial insurance

**2016**

- The position of practical medical treatment institution in Internet hospitals is emphasized
- Comprehensive platforms begin to deal with health management

**2018**

- Law on Drug Administration has deleted the content that it is not allowed to sell prescription medicine via Internet directly
- The industry has entered the time of Internet medical treatment, and the leading companies accelerate to make layout in practical hospital, Internet hospital, medicine enterprise, insurance and other resources

**2019**

- The policies on electronic prescription, consultation fee and online settlement of medical expense and insurance are issued faster under pandemic situation; the positive policies have promoted the occurrence of a new round of investment opportunities in the industry
- The PV and online inquiry amount of various Internet platforms increased in a geometric index during pandemic situation, and the trans-regional online protection, diagnosis and treatment system has been established rapidly

**2020**

**Market maturity**

# The internet hospital ecosystem and operating models

## Internet hospital service ecosystem

Online medical treatment mainly consists of four types of services: online consultation and treatment, online diagnosis, follow-up treatment and health management. According to the policies of internet hospital management, internet hospitals are only allowed to provide patients with family doctor contract services and subsequent diagnosis for common diseases and chronic diseases. The patients are segmented online based on the diagnosis type: for patients who required a face-to-face diagnosis (subsequent diagnosis for uncommon diseases and non-chronic disease), the offline outpatient and examination will be arranged online through the smart scheduling system, doctors will then be assigned for the treatment, prescription and create case report for the initial treatment (1st time) to facilitate follow-up patient management and subsequent diagnosis at the internet hospitals. On the other hand, for patients who are not required for a face-to-face consultation, electronic prescriptions can be issued directly online, and after the online prescription is reviewed, the drug distribution will be apportioned to designated drugstores then patients can choose a home delivery or pick-up at a drugstore nearby. This process forms a closed loop of online medical services from consultation and prescription, to payment, delivery and health management.

## Figure 2: The situation of services of Internet hospital



**Health management**
- Service of family doctor
- Incorporation of treatment and health preservation
- Health education

**Management after leaving hospital**
- Patient tracing
- Subsequent visit
- Education of patients compliance
- Rehabilitation training

**Remote diagnosis and treatment**
- Online diagnosis via interrogation
- Remote consultation
- Remote management of chronical disease
- Education and scientific research

**Remote diagnosis**
- Remote diagnosis by imaging
- Remote ultrasonic diagnosis
- Remote pathogenic diagnosis
- Remote monitor of ECG, blood pressure, blood sugar and fetal heart

Healthy group

Patient

Online appointment and consultation

Diagnosis via interrogation

Online diagnosis and treatment via audio and video

Examination and assay

Online appointment

Examination in hospital

Doctor

Diagnosis and treatment in levels

Connecting with practical hospitals

Payment

Online payment

Purchasing medicine

Picking up/home delivery

Medical entities

Medical Payment

Drug store/circulation enterprise

Source: Deloitte Analysis

7

## Internet hospital operating models

Internet hospitals have two main operation modes:

- "Hospital + internet" (associated online hospitals under the offline medical institutions)

- "Internet + hospital" (independent online hospitals affiliated to medical institutions)

In its *2020 Online Hospital Report*, Vcbeat VBR pointed out that with the opening of the online prescription medicine market and implementation of online hospital policies, since 2019 the construction of online hospitals has accelerated, and due to the impact of medical resources, policy support and approval procedures, "hospital + internet" mode has become the most adopted one in China, with the exception of online hospitals in Hainan and Ningxia.

**Figure 3: The number of internet hospitals opened**
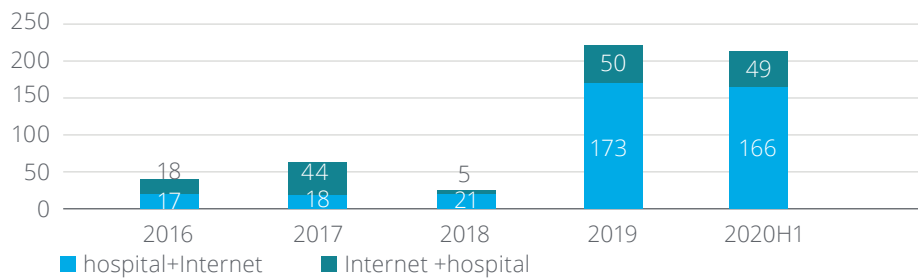


Note: from the recent news report, there were around 900 i-Hospitals licensed in China as of October 2020.
Source: *2020 Online Hospital Report* by Vcbeat VBR

Deloitte compares two types of Internet hospitals according to the operating model as below:

| Dimension | Hospital + internet | Internet + hospital |
| --- | --- | --- |
| **Goals** | Expanded consultation and treatment | Attracting new patient groups |
| **Profit model** | Online consultation and treatment | Online drug sales and health management |
| **Staffing** | Offline hospital medical staff | Doctors work at multiple institutions |
| **Patient focus** | Offline hospital patients | Platform recruitment |
| **Pricing** | Government-set pricing for public hospitals; private hospitals set own pricing | Set own pricing |
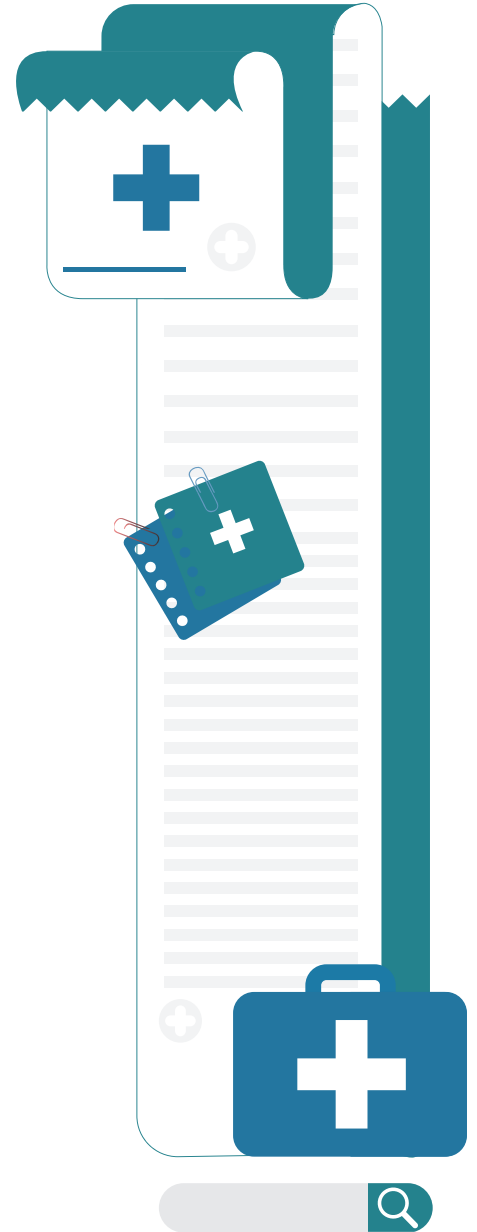
**Figure 4: An evaluation of the two types of online hospitals**
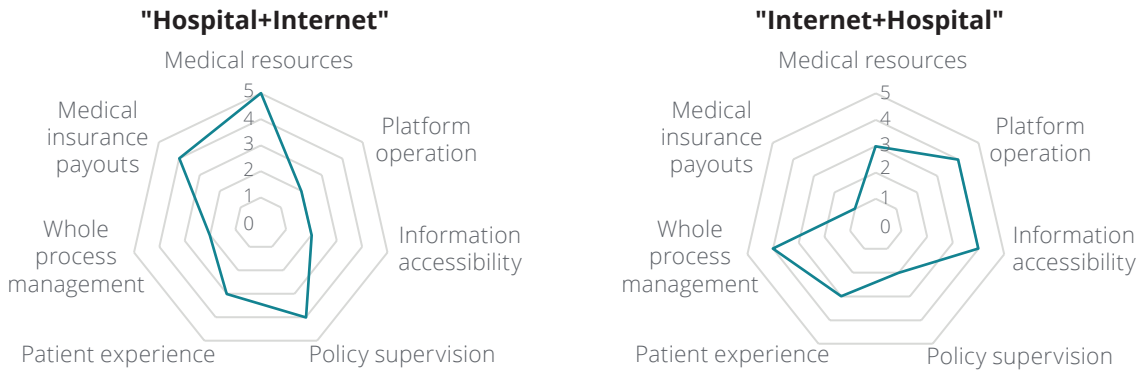


Source: Deloitte Analysis

Both "Hospital + Internet" mode and "Internet + Hospital" mode have their own respective advantages and disadvantages across multiple sectors: medical resources (medical service staff and patients etc.), technical strength and competency in online platform operating, accessibility to width and depth of medical information, completeness of regulatory affairs, patients' experiences and full process (including pre-diagnosis and post-diagnosis management), and the adoption of national health insurance (NHI) etc. However, no matter which mode is used, the internet hospital cannot operate independently without an offline hospital. The nature of internet hospital is the medical services management.

"Hospital + internet" operators have accumulated substantial experience in medical resources, policies and NHI supports, quality management and patient safety, yet how to effectively adopt these online is the issue needed to be solved right away. On the other hand, as of "Internet + hospital" mode operators are usually commercial instead of medical organizations, they are better at platform operation and user attraction yet the service types

are usually limited to only health information, prescription renewal and drug re-purchases for common and chronic diseases, and these internet hospitals are heavily dependent on offline hospitals and multi-point practitioners for their medical resources. In addition, as "internet + hospital" mode involved crossover operation by multiple parties, it makes the medical regulation compliance more complex and important, and more attention should be paid to online practice management in order to advance the further development in this mode.

With policy encouragement in the internet hospital establishment to offline hospitals, more offline hospitals are starting to establish online medical facilities to extend medical services online and form a large network of hospitals under the "hospital + internet" mode. However, many offline hospitals, especially tertiary public hospitals, already operate at full capacity and difficult to allocate more resources to operate online facilities. In addition, it is difficult to achieve the reform of the overall service mode with a single breakpoint and the trend is still towards to joint operation as a group.

The strongest advantages of the "Internet + Hospital" mode are the online business operating, innovation capability, and its partnership in ecological chain. However, since the policies specify the necessity of the offline hospital involvement in internet hospital operation, the market access threshold in this mode has become further higher; in addition, with more and more offline hospitals start to launch their own internet hospital, it has led to the loss of patient and doctor resources.

Hence, the ideal approach would be the integration and deep combination between the two modes. It would open the internet to offline hospitals, allowing them to use it for channel expansion. Meanwhile, it would also allow medical resources to be amassed, transforming medical service processes, extending the medical ecosystem, boosting consultation and treatment, enhancing industrial innovation and reform, supporting the equal distribution of medical resources, boosting medical service efficiency, and eventually realizing Healthy China 2030's goal of improving health across the population.

# Internet hospital development boosted by capital

## Online hospital policy and investment/fundraising are highly correlated

The medical industry is highly policy-oriented. A comparison of investment/fundraising and internet hospital policies shows the latter's direct impact on the former. Internet hospitals went through an embryotic and explorative stage from 2000 to 2014 before a surge in the number of sector investments and fundraisings from 11 in 2013 to 38 in 2015. However, the pace of investment and fundraising slowed again in 2016 and 2017 due to the central government's stance on the online medical industry, including stronger regulation and management of internet hospitals, was uncertain. This prompted an industry reshuffling, with several organizations and enterprises transforming, and holding a wait-and-see attitude.

However, starting in 2018, the online medical related policies has become clear and open on the industry to encourage and support the industrial development. This prompted another surge in investment and fundraising with a three-fold increase in 2017 from the previous year. Ping An HealthKonnect, for example, has raised USD1.15 billion in 2018 to achieve a valuation of USD8.8 billion, joining the list of China's unicorn companies.

The emergence of the coronavirus pandemic at the beginning of 2020 accelerated the boom in internet hospital market deve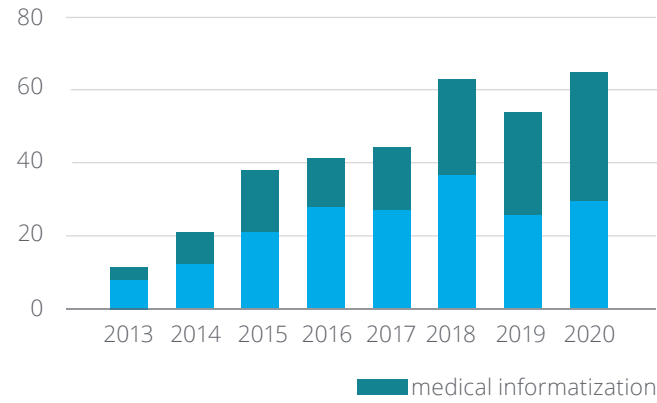lopment, and the central government soon issued policies to support its development including measures on treatment, medicines and insurance. This prompted investment and fundraising to rise from 2019's level in quantity and scale. As of end of 2020, even factoring in a pause of March to May at the height of the pandemic, with a series of policy announcements and changes in patients' online medical habits, the market investment has outpaced 2019 to reach over RMB30 billion. In 2020, JD Health has raised USD0.83 billion in 2020 to achieve a valuation of USD30 billion, and listed on the Hong Kong Stock market on December 8, 2020, with a total market value of about HKD295.5 billion. It is reported that JD Health raised a net fund of HKD26.457 billion from Hong Kong IPO.

**Figure 5: The policies on medical treatment digitalization and scale of investment and financing in 2013-2020**
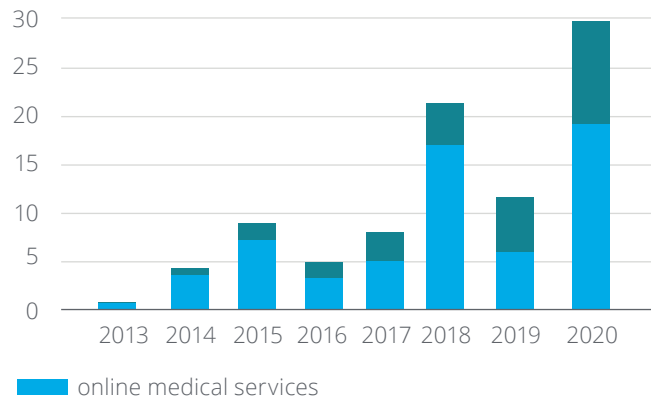
| Initial occurrence and exploration 2000-2014 | Exploration and reshuffling 2015-2017 | Expansion and breakthrough 2018 - 2020 |
|---|---|---|

**2014**
**The Internet medical dealer was firstly allowed to sell prescription medicine with prescription provided**

- In 2014, *The Management Methods on Supervision and Operation of Drug and Medicine on Internet* allowed to sell prescription medicine with prescription provided.
- In 2014, *The Opinions on Promoting the Remote Medical Treatment Services of Medical Institutes* confirmed the importance of remote medical treatment.

**2016**
**Internet medical treatment was cited in national strategy for the first time**

- In *The Syllabus of "Healthy China 2030" Plan* released by the State Council in 2016, the Internet medical treatment was cited in the national strategy for the first time.

**2017**
**The state reinforced the supervision and management of Internet medical treatment**

- In 2017, *The Regulation on the Management of Application of Electronic Medical Record (Trial)* regulated that **the medical institute should regulate the application management of electronic medical record.**
- *The Notification on Reinforcing the Supervision of Transaction of Medicine and Medical Apparatus on Internet* released by the State Council in 2017 stated that, Food and Drug Administration will not accept the application for the approval of the industry of Internet medicine transaction and service (the third party) since September 29, 2017.

**2019**
**The reimbursement of Internet medical treatment with medical insurance should be managed in levels in provincial regions**

- In 2019, the newly revised *The People's Republic of China's Law on Drug Administration* has released the restriction on online sales of prescription medicine.
- In 2019, *The Instructive Opinion on Consummating the Policies on the Price of Medical Service and Payment with Medical Insurance Based on Internet* released by National Bureau of Medical Insurance has defined that the price of medical service is managed in levels inprovincial regions.

**2020**
**The pandemic situation promoted the development of the service mode of Internet+ medical service and realization of the detailed policies on payment**

- Some supportive policies were released in March, 2020 and **the Internet medical insurance was realized officially, and the electronic prescrption and the online settlement of treatment expense and medical expense were allowed.**
- On November 2, *The Instructive Opinions on Active Promotion of Internet+ Medical Treatment Services and Payment with Medical Insurance* was released by the National Bureau of Medical Insurance, and **the standards for payment with medical treatment and supportive policies have been defined.**



fundraisings scale (billion RMB)      ----- fundraising number

Source: Summary of information on IT JUZI.COM

**Figure 6: Number of investments/fundraisings**



**Figure 7: Scale of investments/fundraisings (Billion RMB)**



■ medical informatization ■ online medical services

Source: IT JUZI.COM, Deloitte Analysis

The investment/financing in medical informatization is growing steadily regardless of in events number and funding size; while the online medical services, including medical service platforms, e-business, e-services and other sub-industries, are highly affected by the policies. And in 2020, with the incentives from policy and online medical awareness, the scale of informatization investment doubled. Although the number of investment events seems equal, the investment size in the online medical services is much bigger than in the

informatization . This may be due to the continuous reforming and changing in the operation mode of ecosystem, which is still a Blue Ocean for investment. In this ecosystem, the ones who has strong medical resources or innovative operation mode will seem attractive to capitals.

Mid and late-stage investment in digital healthcare has given rise to several unicorns. According to *2019 China Unicorn Report* issued by China Evergrande Research Institute, healthcare industry is the fourth

largest unicorn industry; 14 companies belong to healthcare industry among 162 unicorn companies with valuation more than 1 billion US dollars, where 10 companies are related to digital healthcare and mainly in the fields of online medical services and big data of gene etc. These unicorns have the potential to go public, and Shanghai's Science and Technology Innovation Board may further encourage those considering a listing.

**Table 1: China's medical and healthcare unicorns (2019)**

| Name | Sector | Valuation (Billion USD) |
| --- | --- | --- |
| We Doctor Group | Online hospital | 6.5 |
| United Imaging | Medical Informationalization | 6.4 |
| Henlius | Drug R&D | 3.3 |
| Genova | Drug R&D | 2.7 |
| Mingma Technology | Gene big data | 2.0 |
| haodf.com | Online hospital | 1.5 |
| chunyuyisheng.com | Online hospital | 1.4 |
| miaoshou.com | Online hospital | 1.3 |
| Medlinker | Online hospital | 1.1 |
| IMAB | Drug R&D | 1.0 |
| Novogene | Gene big data | 1.0 |
| Helian Health | Online hospital | 1.0 |
| WWW.DXY.CN | Online hospital | 1.0 |
| iCarbonX | Health management | 1.0 |

Source: Evergrande Research Institute; Deloitte Research

More visibly, according to the list of *Healthcare Unicorns in Chinese New Economy 2020* issued by IT Juzi, 50% are engaged in the online medical service among 26 medical unicorn companies, where JD Health, Ping An HealthKonnect, and WeDoctor are ranking top places in the list, and based on this fact, we can see that the online medical services is a highly attractive field for investment. With constant policy development, more communication and links between participants in the internet hospital

ecosystem, at the same time, a large number of investments and fundraisings may come in, and the sector is set to welcome more unicorns in future with perhaps even some industry titans.

**Pharma companies establishing new internet hospitals**
Under the circumstances where volume-based procurement (VBP) becomes common across the country, the enhancement in separation between treatment and drug, and a

stricter control over the national health insurance expense, pharmaceutical companies are deploying their online healthcare business and capturing the online retail market. This is becoming an alternative distribution channel for non-bid-winning drugs and self-paid drugs on retail market. As the national policies support online drugs retailing, especially the drugs sales terminal for chronic diseases is gradually transfer to outside the hospitals, it is driving an increase of the sales terminal for prescription drugs and enriching the

diversity of settings for residents to purchase drugs, and eventually bringing new opportunities for pharmaceutical companies.

For originator manufacturers that are heavily impacted by the VBP implication, they are exploring the new market in retail channels after held back in hospital channel. Patients used to visit doctors and purchase drugs at large public hospitals; as separation between treatment and drug is achieved, prescriptions gradually outflow from hospitals and the settings

for patients to purchase drugs also changed accordingly. Three new settings for purchase drugs will appear in the future – through offline retail pharmacy; through online pharmacies; some chronic diseases patients may choose to continue the medication as per the doctor's advice at higher-level hospitals after diagnosed by family doctors at primary medical institutions. In addition, the online medical service has provided pharmaceutical companies a more direct and accurate opportunity for patient education. Meanwhile, it also helps to raise brand

awareness as well as drive online consumption through the close loop of online medical business.

According Deloitte's report, *How pharma companies can address the retail market transformations in China*, the online retail market penetration is expected to increase to around 30.8% in China by 2028, with a market size of about RMB177 billion.

| **Main policies** | **Scenario of online application** | **Modes of pharmaceutical enterprise participation** |
|---|---|---|
| VBP covers the whole country | Online direct purchasing | • Adjusting business structure and setting up new businesses of Internet medical treatment service |
| The separation between hospital and drugstore is deepened | Online diagnosis by interrogation | • Residing in Bo'ao Development Zone and accelerating the innovative products and plans to enter the platform in development zone |
| The expense of medical insurance is strictly controlled | Online subsequent visit | • Establishing Internet Hospital partnering with ecosystem players, exploring new modes of chronic disease management |
| | | • Creating the picking-up/home delivery services, and realizing the last-mile delivery along with many Internet hospitals |

Source: Deloitte's report *How pharma companies can address the retail market transformations in China,* and public information

# Issues and solutions for internet hospitals

**1. New internet hospitals increasingly homogenized with unclear core value**

Public medical institutions are still occupying the leading position in the comprehensive medicine, while private hospitals focus more on specialized and rehabilitation medicine, as well as health management. Driven by the internet hospital trend, many offline hospitals, platforms and enterprises have seized the internet hospital market, causing new internet hospitals sprung up. However, as most of these internet hospitals all mainly provide online consultation service, leading to a serious homogenization problem.

Internet hospitals cannot operate independently without an offline hospital. They have to specify the core value of internet hospitals that cooperate with various offline hospitals, and establish different operation strategies and service model according to the characteristics of different hospital types then to offer a more suitable services to patients.

There are three common value propositions shared by internet hospitals set by different offline hospitals:

- Value 1: Platform expansion and upgrading to improve medical efficiency. Reduce the cost of users to obtain information through the network and technology, to create a seamless patient experience and cost-saving for both hospitals and patients.

- Value 2: Medical service process reorganization, optimization, and extension. Improve the efficiency of doctor-patient matching through process reorganization; utilize health management and medical knowledge platform to create virtual community communications to optimize self-health management process; establish health archives and track patients' health status continuously to provide a full-cycle service of post-treatment health management.

- Value 3: To realize the value of doctors through multiple channels, to serve patients through the whole process, and to reconstruct the doctor-patient ecology.

**Table 2: Different types of online hospitals established by offline hospitals**

| Type of offline hospital | Unique value points |
|---|---|
| **Platform-type internet hospital** | **Full implementation of the value of the platform and services** |
| **Medical institution with VIP service**<br>• **Commercial insurance as major payer**<br>• **Works either public or private** | **Expand the service breadth and depth of customer lifetime value (CLV) based services of the institutions**<br>• Realize hospital services derived from existing in-hospital treatment to full patient care including disease prevention, treatment, rehabilitation and health management<br>• Optimize patient-centered service awareness and operation mode in hospitals |
| **"Leader type" 3-A public hospital** | **Establish performance assessment benchmark for level three hospitals standard**<br>• Improve patient medication procedure and improve the patient satisfaction<br>• Optimize revenue and expenditure structure, reduce single disease treatment cost, and improve operational efficiency<br>• Instruct and test the rational use of drugs to improve medical quality |
| **Leading local hospital** | **Strengthen the position of the "central" institution in hierarchical diagnosis and treatment**<br>• Improve the service capability of medical professionals and enhance the organization sustainability<br>• Optimize revenue and expenditure structure, reduce single disease treatment cost, and improve operational efficiency<br>• Improve chronic disease management service capabilities |
| **Primary medical institution** | **Strengthen the chronic disease management capability**<br>• Optimize the chronic disease management process, improve management efficiency and quality<br>• Reduce single disease treatment cost, and improve operational efficiency |

**2.The profit model is still immature. Although most of internet hospitals are still at a loss, the implementation of national health insurance (NHI) policy is conductive to building a stable and sustainable profit model**

According to statics on the revenue of 83 online hospitals from the Institute of Health Sciences in 2019, 89.6% has generated revenue with relatively weak revenue capability. For internet hospitals that have success in making profit, their profitability is relatively weak. Among all, over 50% of internet hospital are still at a loss, and only 13.5% of internet hospitals are making profit of more than RMB1 million[4].

The main revenue of internet hospitals is composed of four sectors including online consultations, prescriptions renewal, medical equipment and healthcare consumption, and derived consumption from the physical examinations, aesthetic medicine, and rehabilitation. The NHI fund is the most common payment method in the medical industry, the best way to attract patients, as well promote commercial insurance and self-payment to accelerate the internet-transforming. Once then online healthcare NHI payment related polices are successfully implemented, it will bring considerable incremental market for chronic disease drugs repurchase, online treatment, and medical service extension platform to the entire online healthcare market. Starting from the four sectors, the new closed loop of online healthcare operation will be completed, build up a stable and sustainable profit model for internet hospitals.

| Sections of operation and profiting | Trends in future |
|---|---|
| 01 Diagnosis via interrogation and consultation | Currently the diagnosis via interrogation is still mainly realized in hospitals, however, the amortization of diagnosis via interrogation will be a profiting points along with more opening policies in future |
| 02 Renew of prescription medicine | It is predicted in 2028, the scale of online drug retail will exceed 50 billion RMB, and the Internet hospitals can cooperate with e-business of medicine to attract the customers from practical DTP drug stores |
| 03 OTC, health care products and medical apparatus | When the scale effect is formed in Internet hospitals, it will be more advantageous for health management for patients and the viscosity and rate of repetitive purchasing of patients will be increased |
| 04 Extending application of individual medical treatment | The Internet hospital has promoted the demands of individual consumption on medical treatment, the crossing sales will extend the industrial and the health management of patients will be energized |

Although the current online consultation market share only accounts for approximately 6% of the entire consultation market, with the release of online sales of prescription drugs, the implementation of NHI docking policies, the gradual introduction of commercial insurance, the change of individual online healthcare consumption awareness, and the extension of the medical service chain, we predict that the internet hospital market penetration rate will reach 30% in the future and the internet hospital market size will usher in a market size of RMB500 billion in 2025.

With the help of more open-door policies, advanced technology, and comprehensive platform management solutions in the future, internet hospital will be used to improve "pre-diagnosis" capability and further improving "post-diagnosis" remote service and follow-ups capabilities, where as to create internet hospitals that able to cover individual full-range and full-cycle health management, which is also an important manifestation of the value of the internet hospitals.

**3. The "siphon effect" of large public 3A hospitals may aggravate imbalance in medical services; but a proper planning and arrangement will be crucial to promoting the construction of medical alliance and medical community**

To large public 3-A hospitals, the most direct role of internet hospital is to divert

return patients online and improve the efficiency of hospital medication. Yet, there are some voices questioning that this may further increase the siphonic effect of large hospitals from the industry, which is contrary to hierarchical diagnosis and treatment as well may cause the continuous expansion of excellent hospitals through online medical services, aggravating medical imbalance between different regions. Coming with the internet hospital trend, more and more large hospitals have set up their own internet hospitals separately; while level-two hospitals and community centers becoming weaker and marginalized.

However, in practice, hospitals generally require the return patients should be the offline patients with initial treatment of the hospital, and they cannot shift to any other large hospitals anytime and anywhere. At the same time, the internet hospitals of large 3A hospitals are usually not only for follow-up treatment and prescription renewal, but also include a series of telemedicine services to instruct lower-level hospitals, therefore, these internet hospitals may not necessarily "siphon" patients. Doctors are always the core resources in medical

industry, and the public hospitals have natural advantages in this aspect and are expected to be the dominant force to create internet hospitals of the new round. Hence, it is critical to make good use of the advantages of internet hospitals to realize information interconnection and to further promote the construction of the national medical alliance and medical community. The future model of internet hospitals should be a comprehensive platform integrates doctor platform, patient platform, and ecological platform. The integration of medical alliance and medical community, regional coordination and integration have become one of the trends of internet hospitals. Public hospitals, private hospitals, and online platforms are promising.

Take the internet hospital of Children's Hospital of Shanghai as an example. It has make a good use of its industry-leading excellent pediatric medical resources, cooperates with Health and Family Planning Commissions of Jing'an district, Putuo district, Jiading district, and Changning district to form a joint internet hospital with 16 district medical institutions under its jurisdiction. It is the first multi-district collaborative and

co-operation pediatric medical alliance in the city. Utilizing the internet to carry out co-telemedicine, consultation, two-way referral remote teaching, etc., to play the role of the internet in driving regional medical alliance.

WeDoctor has established an online healthcare platform-based network of centered regional medical alliances in the grassroots area to improve the efficiency and extension capability of the use of premium medical resources; use cloud technology to realize the sharing of patient medical record information, inspection and examination information, and prescription information. The medical professionals from 3-A hospitals empower the doctors of primary medical institutions through the cloud platform of the internet hospital to conduct consultation and diagnosis, jointly to provide MDT service for intractable diseases, improve the accuracy and scientificity of the diagnosis.

We expect, with the release of the supportive policies of internet hospitals, the current limitation may be breakthrough, and the application of high-techs, such as big data analysis, AI, 5G, etc., will empower the establishment and optimization of regional medical information systems to form an efficient and safe information sharing mechanism among medical institutions under the alliance. Meanwhile, private hospitals should embrace the internet and strengthen cooperation with technology companies to establish technological advantages to explore opportunities in the construction of telemedicine collaborative network and develop their own features, to realize the effective sharing of medical resources in the region as "replacement model" to provide a full-range and full-cycle healthcare service.

**Figure 8: WeDoctor has established regional Internet medical treatment alliance**
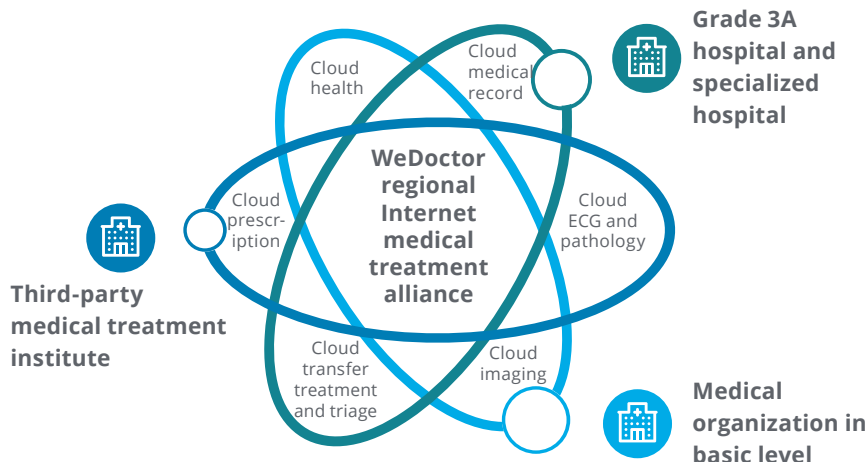


Source: Public data and Deloitte interviews

## 4. Lack of unified, executable internet hospital management regulations

The risk points of internet hospitals have not only those in the operation of the traditional hospitals, but also new risk points from internet hospitals including electronic prescriptions, information security, NHI reimbursement, pharmacy administration, etc. External risk such as data sharing with partners are also increasing.

- **E-prescription and medical record risk:** At present, the repurchase of drugs for common diseases and chronic diseases requires e-prescriptions. The doctors contracted on the platforms can issue prescription to users after the telemedicine, yet there are also some users who may ask for e-prescription after a simple description of symptoms and hard to guarantee the patients' medication. Therefore, the establishment of e-medical record and e-prescription is the key to alleviating the risks of internet hospitals.

- **Information security risks:** Information exchange and security risk prevention and control are the bottom line of internet hospital operations. Among them, patient health and diagnosis and treatment data management are faced with the dual risks of information and medical security. A targeted risk control plan should be established to ensure support for online diagnosis and treatment, as well protect patient privacy to prevent data theft. At the same time of data intercommunication and mutual recognition, seek the balance between information security and

### E-prescription regulation

- Ensure all telemedicine and e-prescriptions come with reliable electronic signatures from physicians and prescriptions are valid on the day. The prescriptions can only take effect after reviewed and signed with pharmacists' electronic signature. Each prescription should not exceed five medicines, and traditional Chinese medicine and western medicines should be prescribed separately.

- Internet hospitals are not allowed to prescribe narcotic drugs, psychotropic drugs, and other drugs with high medication risk and other special management regulation

- The prescription should be reviewed by pharmacists personally based on "four checks and ten confirms", and should not be falsely reviewed in the name of the pharmacist through technical means

- Do not link any income of the physicians' to the amount of prescribed drugs, and prohibit online drug rebate and online prescription statistics activity

open utilization. The data generated by internet hospitals related medical services should be traceable throughout the entire process, data should be kept confidential to ensure the protection of patients' personal privacy and the safety of medical treatment. According to the current management requirements, it is necessary to establish a security protection system based on the basic requirements of Level 3 Classified Protection on Network 2.0, a special personnel should be assigned to be responsible for the maintenance of internet hospital information system, e-medical record management and

### Electronic medical record regulation

- Electronic medical records are the most important medical documents. How to provide authentic, effective, legally recognized outpatient medical records is particularly critical to record online medical information

- Standardize electronic medical record documentation and storage regulations. The electronic medical records of internet hospitals can reference to outpatient medical record. The basic contents includes basic patient information, disease summary, any laboratory examinations, any medical imaging examinations, and other auxiliary examination materials

- Establish an electronic medical record system, including identity authentication, e-signature, creditable timestamps, traces throughout the entire process, and traceability; to ensure safety, effectiveness, and standardization

other technical services; adopt the digital technology certified by legal third-party electronic certification service agencies to realize the electronic real name authentication required in online diagnosis and treatment as well to interface with the upgraded internet medical supervision platform. In addition, must strictly control the cooperation agreements with third-party collaborative partners and clarify responsibility supervision.
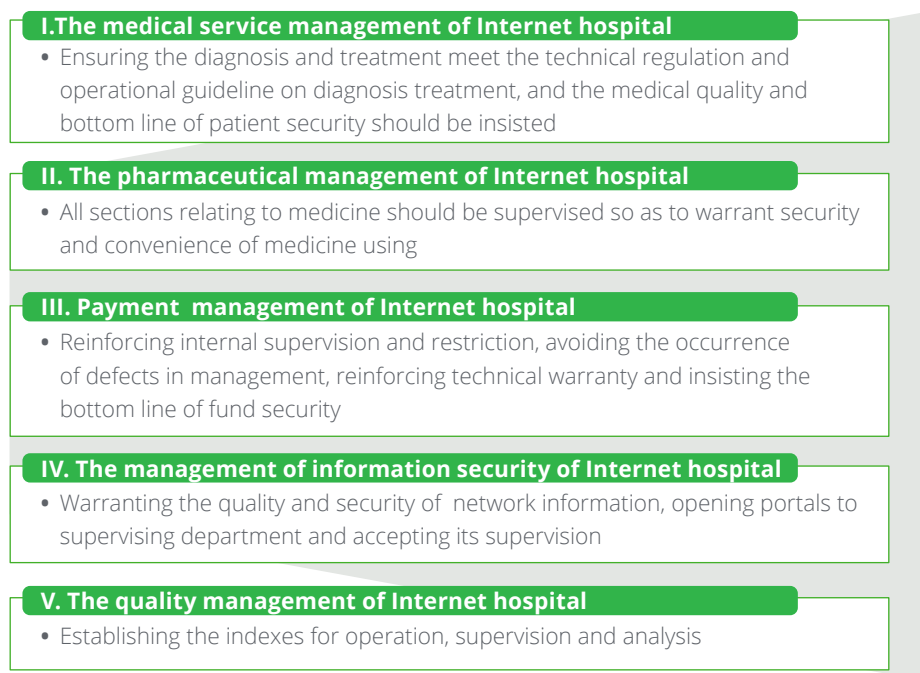
• **NHI reimbursement risk:** As the online NHI reimbursement is still at an exploratory stage, the online healthcare still unable to completely replace the functions of offline hospitals and pharmacies. However, with the gradual release and implementation of online NHI reimbursement related policies for internet hospitals, we predict that the process of NHI docking, prescription supervision, expense control will gradually be advanced.

• **Pharmacy administration risk:** One is the risk of lacking of compliance supervision related regulations on the e-commerce promotion of prescription drugs which may result in overdose or abuse of drugs by patients. The other one is how to supervise the quality of online purchased drugs, how to protect own interests and rights when encountering counterfeit or inferior drugs, and how to clarify the responsibilities among all involved parties, all of these should be clarified and refine platform traceable responsibilities. Therefore, a complete complain-handling mechanism should be established, and when ever encountered any events of serious consequences such as medical service adverse events and medication adverse events, services should be stopped immediately and reported in accordance.

The internet hospitals business platform offers services including medical services, health services, diagnosis and treatment services, collaborative services, nursing services, and third-party collaboration services. It involved all aspects of internet platform management yet still lacks a unified and effective management system in place. The successful operation of internet hospitals not only relies on the utilization of advanced technology, but also requires a comprehensive management systems. To operate smoothly and reduce risks, internet hospitals should establish an internet hospital management systems based on their own characteristics to manage their business including medical service management, pharmacy administration management, hospital payment management, information security management, and quality management, which helps to the online and offline integration to achieve in-depth combination of medical ecosystem.

**Figure 9: The management system of Internet hospital**



**I.The medical service management of Internet hospital**
• Ensuring the diagnosis and treatment meet the technical regulation and operational guideline on diagnosis treatment, and the medical quality and bottom line of patient security should be insisted

**II. The pharmaceutical management of Internet hospital**
• All sections relating to medicine should be supervised so as to warrant security and convenience of medicine using

**III. Payment management of Internet hospital**
• Reinforcing internal supervision and restriction, avoiding the occurrence of defects in management, reinforcing technical warranty and insisting the bottom line of fund security

**IV. The management of information security of Internet hospital**
• Warranting the quality and security of network information, opening portals to supervising department and accepting its supervision

**V. The quality management of Internet hospital**
• Establishing the indexes for operation, supervision and analysis

Hospitalization service

Health service

Diagnosis and treatment service

Cooperation service

Nursery service

Cooperation with the third party

**Business application platform**

## 5. The management of doctors and patients urgently needs to be optimized and to improve efficiency

### Doctor resources and management

The doctor resources in internet hospitals mainly come from physicians at offline hospitals, direct recruitment, and online practice at multiple institutions. However, high-quality doctors are still scarce resources, both online and offline. How to attract and retain high-quality doctors is a key issue in internet hospital operation. In realizing the value of doctors, internet hospitals can not only help doctors increase their income and build personal images, but also manage patient more efficiently with technologies, and identify intractable disease more specifically to enrich their clinical research and practices.

Internet hospital doctors implement a filing system, which is different from practice at multiple institutions. They only need to apply to the filing to the regulatory platform. However, in the process of introducing medical and health personnel, strict screening standards and evaluation systems must be established to ensure the quality of medical services.

Here we have listed some pain points of internet hospital doctor management:

- Mixing qualified and unqualified doctors
- Busy daily medical duties with limited energy
- Difficult to control online time and failure to perform diagnosis and treatment on time
- Cumbersome process for online diagnosis and treatment, and complicated functions of doctor's interface
- The accuracy for online diagnosis and treatment, service attitude, etc.
- Patient privacy security

To address these pain points, formulating an effective online medical practitioner management mechanism is the core of the internet hospital medical service management. Internet hospitals should clarify the rights and obligations of contracted physicians, pharmacists, and other professionals in terms of medical services, information security, privacy protection, medical risk and responsibility sharing through the agreement, contracts, etc., and participate in medical liability insurance for both hospital and physicians. Design a more convenient and user-friendly online operation process, and use AI and other high-tech technologies to empower doctors. Promote the performance appraisal system and resignation mechanism, take necessary actions and punishment measures for doctors' issues popped in diagnosis and treatment services, including interviews, warnings, suspension of access rights, and permanent closure of accounts, etc.; to establish a diagnosis and treatment service information reporting mechanism that report regularly to the health administration department.。

### Patient source and management

Internet hospitals have various patients' sources, but the key to patient management is to online-offline matching and patient relationship maintenance.

Online diagnosis and treatment should follow the principle of "online-offline consistency", the online diagnosis and treatment process must be consistent with offline. Although the current internet hospitals only allow follow-up visits for common and chronic diseases, health management focused on treatment but neglects disease prevention is a weakness in China's medical system. China has a large population of chronic disease; hypertension, heart disease, diabetes, obstructive emphysema, HBV, and chronic kidney disease are the chronic diseases with large number of patients. We believe that the future implementation of internet hospitals should focus more on the unmet needs in chronic disease management, health management, serious illness rehabilitation, community rehabilitation, and elderly care, etc. They should also connect more expert resources through the internet hospital platform to improve the accessibility of medical services; establish patient medication and follow-up management records to increase doctor-patient

attachment and contact frequency; utilize the online payment and distribution systems to get through the last mile of drug delivery; establish the patient education platform to build up the doctor-patient relationship with trust, professionalism, and long-term contact, and becomes an important cut point that influences users' subsequent medical and health consumption (visiting a doctor, purchasing drugs, etc.), hence, the commercial value of health management in internet hospitals is enormous.

**6. The development of internet hospitals still faces many other challenges.** Policy-related challenges including difficulty in defining chronic and common diseases, doctors practice at multiple institutions, NHI reimbursement connection, etc. Tech-related challenges including inability of the ecological chain to achieve interconnection; the low cross-regional coordination degree, the limited utilize efficiency of telemedicine, etc. However, with the continuously release of open-door policies and regulations as well the advancing technological development, the challenges mentioned above will be eventually solved smoothly and form a true panoramic model of the future internet hospital.

**Figure 10: The source of patients of Internet hospitals**
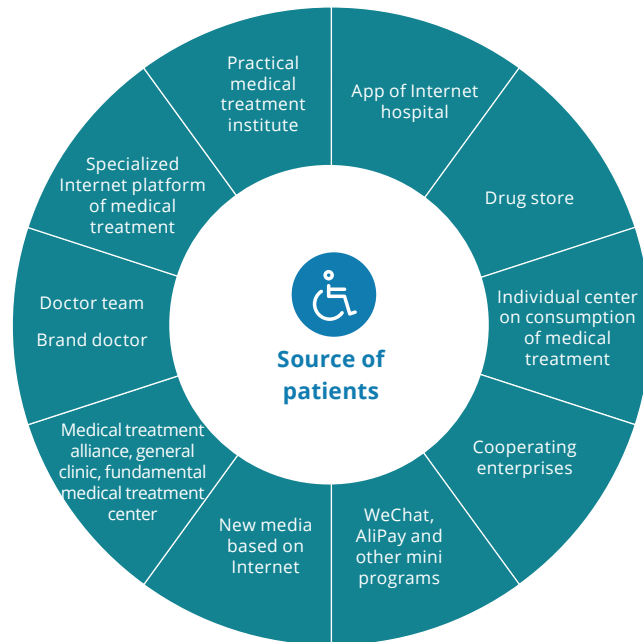


**Figure 11: The routine of management of chronicle disease patients via Internet hospital**
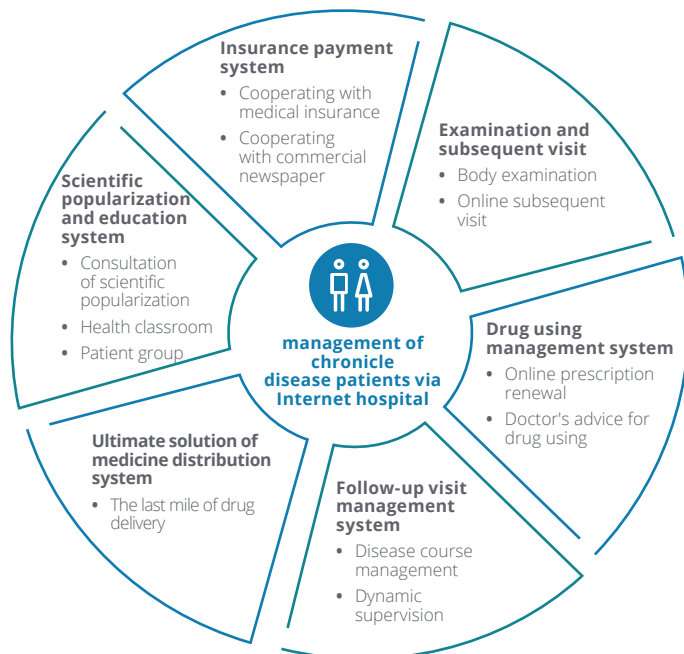
# A panorama of the future of internet hospitals

Internet + healthcare is now a key national strategy, with more internet hospital regulations becoming clearer, local governments are starting to embrace internet hospitals. Third-party internet hospital platforms are more likely to adopt "internet + hospital" mode, whereas offline hospitals more into "hospital + internet" mode, no better and worse and both eventually reach the same goals.

The internet hospitals are set to create an internet-based closed loop covering treatment, drugs and insurance, which is an online Health Maintenance Organization (HMO) model. Compared to traditional HMOs, an online cloud-HMO no longer restricted by geographical coverage and able to utilize limited medical resources to cover more user groups. This will have a significant impact for

reducing the medical expenses and resource waste – on of the core values of smart healthcare. It extends the business to the full-lifecycle of people and gradually creates a medical service full process closed loop of "patient education + clinical + treatment + payment + health management".

**Figure 12: The panoramic mode of Internet hospital in future**
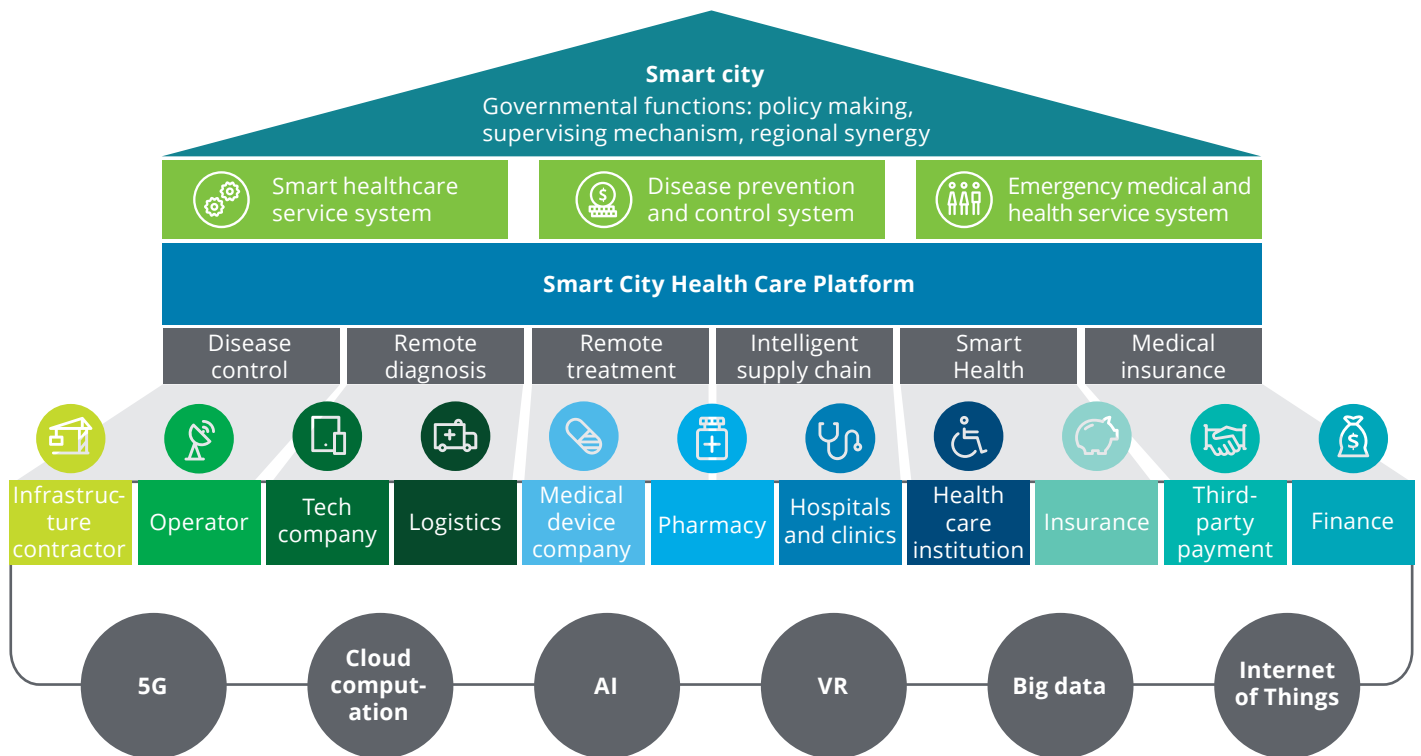
Under a future smart city framework, we envision that the government will lead the formulation of medical security policies and regulatory systems, coordinate regional resources, establish regional disease prevention systems, upgrade the regional emergency medical and healthcare systems, and deepen the smart medical service systems to protect the medical health of the residents. These three  systems are supported by the smart city medical security platforms in the region, which provide a series of urban medical security services, including disease prevention and control information, remote diagnosis and treatment, intelligent distribution of drugs and equipment, intelligent rehabilitation and maintenance, direct NHI payment , etc. The establishment of a smart city medical security platforms

requires the government to connect all parties in the entire ecosystem in the region, including infrastructure service providers, telecommunication operators, tech-companies, logistics companies, pharmaceutical and medical equipment companies, retail pharmacies, hospitals and clinics at all levels, rehabilitation and maintenance centers, insurance companies (including NHI, commercial insurance and charity funds), third-party payment platforms, and financial institutions and fintechs; and comply with the"new infrastructure" policy and guidance, build an overall smart medical system and move towards Healthy China 2030 with 5G, cloud computing, AI, big data, virtual reality, IoT, and other high-tech empowerment.

# Conclusion

With the online economy development, mindsets and business models changing due to COVID-19, new infrastructure construction and sharply growing demand for hospital transformation, it is now the time for internet hospitals to enter a rapid growing.

In the next 10 years, we foresee the health care industry will undergo an unprecedented transformation with radical innovation and changes to the nature of services and processes, evolving from traditional medical service to smart health management. We also look forward to the influx of more and more cross-industry leaders, not only pharmaceutical and healthcare enterprises, but also scientific and technological innovation players. With the support from government, all the players are expected to collaborate within the entire ecosystem, and together to build the future of health.

# Contact

**Yvonne Wu**
**Risk Advisory Leader**
Deloitte Asia Pacific and China LSHC Industry
Tel: +86 21 6141 1570
Email: yvwu@deloitte.com.cn

**Jill Zhu**
**Senior Manager**
Deloitte China Risk Advisory
Tel: +86 21 2316 6091
Email: jilzhu@deloitte.com.cn

# China LSHC Industry Leadership Team

**Jens Ewert**
**Industry Leader**
China Life Sciences & Health Care
jensewert@deloitte.com.cn

**Bill Yang**
**Financial Advisory Leader**
China Life Sciences & Health Care
bilyang@deloitte.com.cn

**Lawrence Jin**
**Audit & Assurance Leader**
China Life Sciences & Health Care
lawrjin@deloitte.com.cn

**Yvonne Wu**
**Risk Advisory Leader**
China Life Sciences & Health Care
yvwu@deloitte.com.cn

**Andrew Yu**
**Consulting Leader**
China Life Sciences & Health Care
andryu@deloitte.com.cn

**James Zhao**
**Tax & Legal Leader**
China Life Sciences & Health Care
jazhao@deloitte.com.cn

# Office locations

**Beijing**
12/F China Life Financial Center
No. 23 Zhenzhi Road
Chaoyang District
Beijing 100026, PRC
Tel: +86 10 8520 7788
Fax: +86 10 6508 8781

**Changsha**
20/F Tower 3, HC International Plaza
No. 109 Furong Road North
Kaifu District
Changsha 410008, PRC
Tel: +86 731 8522 8790
Fax: +86 731 8522 8230

**Chengdu**
17/F China Overseas
International Center Block F
No.365 Jiaozi Avenue
Chengdu 610041, PRC
Tel: +86 28 6789 8188
Fax: +86 28 6317 3500

**Chongqing**
43/F World Financial Center
188 Minzu Road
Yuzhong District
Chongqing 400010, PRC
Tel: +86 23 8823 1888
Fax: +86 23 8857 0978

**Dalian**
15/F Senmao Building
147 Zhongshan Road
Dalian 116011, PRC
Tel: +86 411 8371 2888
Fax: +86 411 8360 3297

**Guangzhou**
26/F Yuexiu Financial Tower
28 Pearl River East Road
Guangzhou 510623, PRC
Tel: +86 20 8396 9228
Fax: +86 20 3888 0121

**Hangzhou**
Room 1206
East Building, Central Plaza
No.9 Feiyunjiang Road
Shangcheng District
Hangzhou 310008, PRC
Tel: +86 571 8972 7688
Fax: +86 571 8779 7915

**Harbin**
Room 1618
Development Zone Mansion
368 Changjiang Road
Nangang District
Harbin 150090, PRC
Tel: +86 451 8586 0060
Fax: +86 451 8586 0056

**Hefei**
Room 1201 Tower A Hua Bang ICC Building
No.190 Qian Shan Road
Government and Cultural
New Development District
Hefei 230601, PRC
Tel: +86 551 6585 5927
Fax: +86 551 6585 5687

**Hong Kong**
35/F One Pacific Place
88 Queensway
Hong Kong
Tel: +852 2852 1600
Fax: +852 2541 1911

**Jinan**
Units 2802-2804, 28/F
China Overseas Plaza Office
No. 6636, 2nd Ring South Road
Shizhong District
Jinan 250000, PRC
Tel: +86 531 8973 5800
Fax: +86 531 8973 5811

**Macau**
19/F The Macau Square Apartment H-L
43-53A Av. do Infante D. Henrique
Macau
Tel: +853 2871 2998
Fax: +853 2871 3033

**Mongolia**
15/F, ICC Tower, Jamiyan-Gun Street
1st Khoroo, Sukhbaatar District
14240-0025 Ulaanbaatar, Mongolia
Tel: +976 7010 0450
Fax: +976 7013 0450

**Nanjing**
40/F Nanjing One IFC
347 Jiangdong Middle Road
Jianye District
Nanjing 210019, PRC
Tel: +86 25 5790 8880
Fax: +86 25 8691 8776

**Ningbo**
Room 1702 Marriott Center
No.168 Heyi Road
Haishu District
Ningbo 315000, PRC
Tel: +86 574 8768 3928
Fax: +86 574 8707 4131

**Sanya**
Floor 16, Lanhaihuating Plaza
(Sanya Huaxia Insurance Center)
No. 279, Xinfeng street
Jiyang District
Sanya 572099, PRC
Tel: +86 898 8861 5558
Fax: +86 898 8861 0723

**Shanghai**
30/F Bund Center
222 Yan An Road East
Shanghai 200002, PRC
Tel: +86 21 6141 8888
Fax: +86 21 6335 0003

**Shenyang**
Unit 3605-3606,
Forum 66 Office Tower 1
No. 1-1 Qingnian Avenue
Shenhe District
Shenyang 110063, PRC
Tel: +86 24 6785 4068
Fax: +86 24 6785 4067

**Shenzhen**
9/F China Resources Building
5001 Shennan Road East
Shenzhen 518010, PRC
Tel: +86 755 8246 3255
Fax: +86 755 8246 3186

**Suzhou**
24/F Office Tower A, Building 58
Suzhou Center
58 Su Xiu Road, Industrial Park
Suzhou 215021, PRC
Tel: +86 512 6289 1238
Fax: +86 512 6762 3338 / 3318

**Tianjin**
45/F Metropolitan Tower
183 Nanjing Road
Heping District
Tianjin 300051, PRC
Tel: +86 22 2320 6688
Fax: +86 22 8312 6099

**Wuhan**
Unit 1, 49/F
New World International Trade Tower
568 Jianshe Avenue
Wuhan 430000, PRC
Tel: +86 27 8526 6618
Fax: +86 27 8526 7032

**Xiamen**
Unit E, 26/F International Plaza
8 Lujiang Road, Siming District
Xiamen 361001, PRC
Tel: +86 592 2107 298
Fax: +86 592 2107 259

**Xi' an**
Room 5104A, 51F Block A
Greenland Center
9 Jinye Road, High-tech Zone
Xi'an 710065, PRC
Tel: +86 29 8114 0201
Fax: +86 29 8114 0205

**Zhengzhou**
Unit 5A10, Block 8, Kailin Center
No.51 Jinshui East Road
Zhengdong New District
Zhengzhou 450018, PRC
Tel: +86 371 8897 3700
Fax: +86 371 8897 3710

**MAKING AN IMPACT THAT MATTERS** *since 1845*

This is printed on environmentally friendly paper