

# Analysis of the Prospects and Development of China's Online Healthcare Industry: Opportunities and Challenges

By

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Submitted to the MIT Sloan School of Management in Partial Fulfillment of the Requirements  
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## **Abstract**

With the rapid development of the internet and technology, the healthcare industry has undergone a significant transformation in recent years. The online healthcare industry, in particular, has emerged as a promising sector in China, providing a convenient and accessible way for people to access medical services and information.

To analyze the online healthcare industry in China, this thesis will employ two widely used frameworks: PESTEL analysis and Porter's five forces analysis. Furthermore, the thesis will select three major players in the online healthcare industry in China, namely AliHealth, Ping'an Healthcare, and JDHealth, to conduct a detailed analysis of the competition landscape of Online healthcare industry in China. The analysis will cover various aspects such as business models, product and service offerings, number of active users, and financial status using multiple metrics. Finally, the thesis will discuss the risks, challenges, and potential solutions in this industry.

**Thesis Supervisor:** Simon Johnson

**Title:** Ronald A. Kurtz (1954) Professor of Entrepreneurship

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## **1.Introduction**

Online healthcare industry has been growing rapidly in China in recent years, driven by advancements in technology and increasing demand for convenient and accessible medical services. With the COVID-19 pandemic accelerating the shift towards digital healthcare, the industry is poised for further growth.

One of the key opportunities in the online healthcare industry is the ability to reach a wider patient base through virtual consultations and remote monitoring. This is particularly crucial in China given the medical resources are severely insufficient and disproportionately distributed. By utilizing online healthcare services, patients can receive medical advice and treatment from the comfort of their own homes, saving time and reducing the need for in-person visits. This is particularly beneficial for those living in rural or remote areas with limited access to healthcare facilities.

Another advantage of the online healthcare industry is the ability to collect and analyze vast amounts of data. This data can be used to improve patient outcomes, develop personalized treatment plans, and reduce healthcare costs. Additionally, the use of AI and machine learning technologies can improve the accuracy of diagnoses and treatment recommendations.

However, the online healthcare industry also faces several challenges. One of the biggest challenges is ensuring the security and privacy of patient data. With sensitive medical information being shared online, there is a risk of data breaches and unauthorized access. In addition, there are concerns about the quality and accuracy of medical advice provided online, and the potential for misdiagnosis or inappropriate treatment.

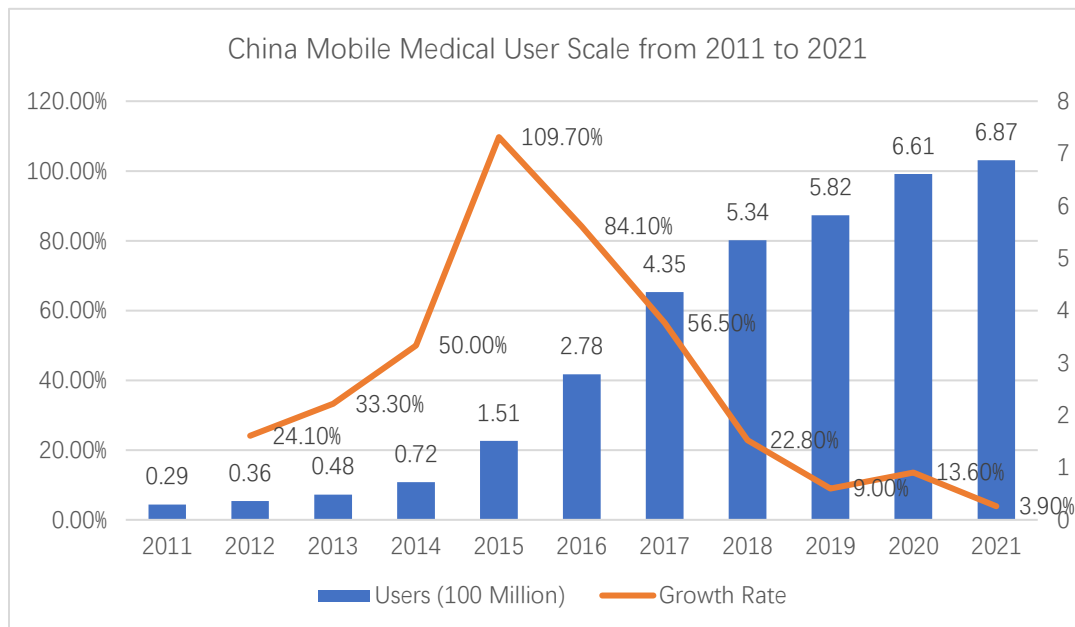
The thesis will discuss the prospects and development of China’s online healthcare industry based on PESTEL, Porter’s Five Forces Model analysis, analyze the competition landscape of China’s online healthcare industry, raise some of the challenges and concerns facing this industry and propose potential solutions.

## 2. China’s Online Healthcare Industry Analysis

### 2.1 PESTEL Analysis

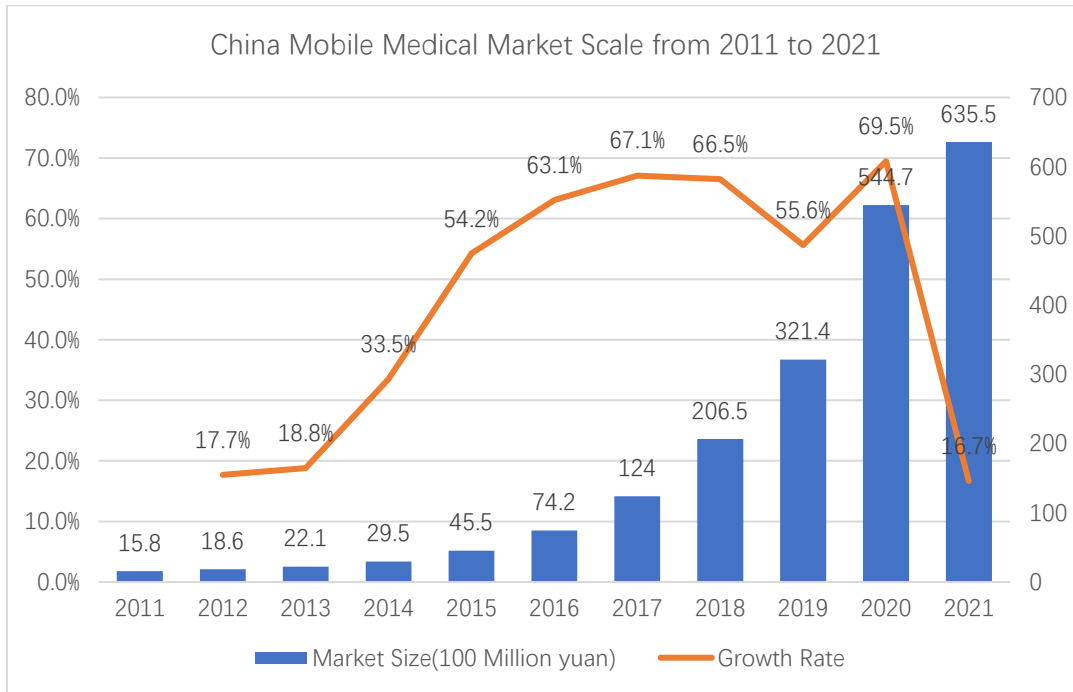
According to statistics from iiMedia Research, the size of the Online Healthcare market in China reached nearly 55 billion RMB (\$8.1 billion) in 2020, with a user base of 660 million.

Exhibit 2.1: China Mobile Medical User Scale from 2011 to 2021



Data Source: iiMedia

Exhibit 2.2: China Mobile Medical Market Scale from 2011 to 2021



Data Source: iiMedia

### 2.1.1 Political Factor

The online healthcare industry in China has seen significant growth in recent years, thanks to the country's favorable political environment. In 2016, the Communist Party of China (CPC) and the State Council (SC) jointly issued “Healthy China 2030”, which outlines the blueprint and action plan for the construction of a healthy China over the next 15 years, proposing to regulate and promote Internet Plus Healthcare (IPHC) services, and innovate the IPHC service model[1]. This shows that the Chinese government has been supportive of the development of online healthcare, recognizing its potential to improve the accessibility and quality of healthcare services.

One of the key legal documents that support the online healthcare industry is the "Telemedicine Management Regulations," which was issued by the National Health Commission in 2018. The regulations define telemedicine services as the use of



information and communication technologies to provide healthcare services, including medical consultation, diagnosis, treatment, and follow-up services. The regulations also set out the requirements for telemedicine practitioners, platforms, and institutions, and establish the legal liability of telemedicine service providers.

Another important legal development is the "Internet Hospital Management Measures," which was released in 2018 by the National Health Commission and other relevant government agencies. The measures allow qualified hospitals to establish online platforms to provide medical consultation, diagnosis, treatment, and other healthcare services to patients remotely. The measures also require internet hospitals to comply with various requirements, including licensing, qualification, technical standards, and data protection.

We can see that the Chinese government has been gradually recognizing the positive role of online healthcare services in improving the efficiency of diagnosis and treatment at multiple levels, increasing the income of doctors, and promoting the inclusiveness and accessibility of high-quality medical resources. However, with the continuous development and innovation of the online healthcare industry, the risks of doctor-patient relationships, medication safety, information security, and privacy protection are also increasing. That said, the government is also constantly refining management methods to regulate the long-term development of the industry.

### 2.1.2 Economic Factor

According to data from the National Bureau of Statistics, China's GDP exceeded one hundred trillion yuan (\$15 trillion) for the first time in 2020, and per capita GDP reached 72,447 yuan (roughly \$11000). The disposable income of Chinese nationals continues to increase, and in the past five years, the growth rate of disposable income for rural residents has been higher than that of urban residents, further boosting the overall consumption capacity of the nation. The proportion of healthcare expenditure in the

total fiscal expenditure is 7.2%, and the per capita healthcare expenditure is 1,843 yuan (roughly \$300). Healthcare expenditure is the fifth largest expenditure item for Chinese residents. Online healthcare, with its characteristics of information sharing, connecting, and inclusiveness, plays an active role in implementing the hierarchical diagnosis and treatment emphasized in China's healthcare reform and reducing the indirect costs of patients, especially those from remote areas frequently visiting clinics and hospitals.

### 2.1.3 Social Factor

The development of the internet healthcare industry is driven by prominent social issues of population aging and concentrated medical resources. First is aging. According to data from the National Bureau of Statistics, as of the end of 2019, the number of elderly people aged 60 and above in China had reached 254 million, accounting for 18.1% of the total population, and the number of elderly people aged 65 and above had reached 176 million, accounting for 12.6% of the total population. The elderly are susceptible to chronic diseases, with an average of 2-3 diseases per person. Internet healthcare, combined with wearable smart medical devices, can play a prominent role in post-diagnosis management of chronic diseases, hence there is huge potential for development.

Second is the issue of concentrated medical resources. Difficulty and high cost to access high-quality medical treatment is one of China's widely recognized problems. This is mainly due to the fact that high-quality medical and pharmaceutical resources are concentrated in large public hospitals in Tier 1 and Tier 2 cities, which reflects a serious urban-rural polarization, and the challenges for high-quality medical resources to reach rural and remote communities. However, by leveraging the technologies of the internet, big data, and AI, an online healthcare platform can be created for doctors, patients, and other service providers to break down the information barrier. And thus the scope of high-quality medical resources can be extended to more people, and healthcare can be made universal and accessible as well.

#### 2.1.4 Technological Factor

The development of various technologies is also boosting the booming of online healthcare industry. One key technology that has enabled online healthcare services is telemedicine, which allows patients to consult with doctors remotely via video conferencing, phone calls, or messaging apps. This technology has been particularly useful during the COVID-19 pandemic, as it allows patients to receive medical care without risking exposure to the virus in crowded waiting rooms.

Other technologies include wearable devices that can monitor a patient's vital signs and health metrics, such as heart rate, blood pressure, and blood sugar levels. These devices can transmit data to healthcare providers in real time, allowing doctors to monitor patients remotely and intervene when necessary.

Artificial intelligence (AI) is another technology that is playing a significant role in the online healthcare industry. The era of AI is inevitable and has already been broadly applied to the healthcare area in China. The government has been encouraging the application of medical big data since 2015 as well as rolling out policies dealing with artificial intelligence development in the healthcare industry[1]. AI-powered tools can analyze large volumes of medical data to identify patterns and trends that may be difficult for human doctors to detect. This technology can also help doctors make more accurate diagnoses and develop personalized treatment plans based on a patient's unique medical history and health profile.

Finally, blockchain technology is also expected to be a game-changer for the online healthcare industry. Blockchain can help ensure the privacy and security of patient data, as well as enable secure and efficient sharing of medical records between healthcare providers. This can help reduce administrative overhead and improve the speed and accuracy of diagnoses and treatment plans.

Overall, the development of these technologies is expected to drive significant growth in the online healthcare industry in the years to come. As more patients become comfortable with remote consultations and the use of digital health tools, a shift towards more personalized and accessible healthcare that is available to patients anytime, anywhere is expected to be seen.

#### 2.1.5 Environmental Factor

The outbreak of Covid-19 has highlighted the importance of online healthcare services. As the pandemic continues to spread in China, traditional healthcare systems are being stretched to their limits, with limited resources and personnel struggling to keep up with the ever-increasing demand for medical attention. In such a scenario, online healthcare services have become crucial in providing patients with timely access to medical advice, consultations, and treatment without the risk of exposing themselves or others to the virus.

Online healthcare services offer several benefits over traditional healthcare systems, particularly during the Covid-19 pandemic. First and foremost, they allow patients to receive medical attention from the comfort of their homes, reducing the need for unnecessary travel and physical contact with others. This helps to minimize the spread of the virus while ensuring that patients receive the care they need. Compared with 2019, the utilization of online consultations increased in 2020. The monthly average online consultations increased by 90.06%[3].

#### 2.1.6 Legal Factor

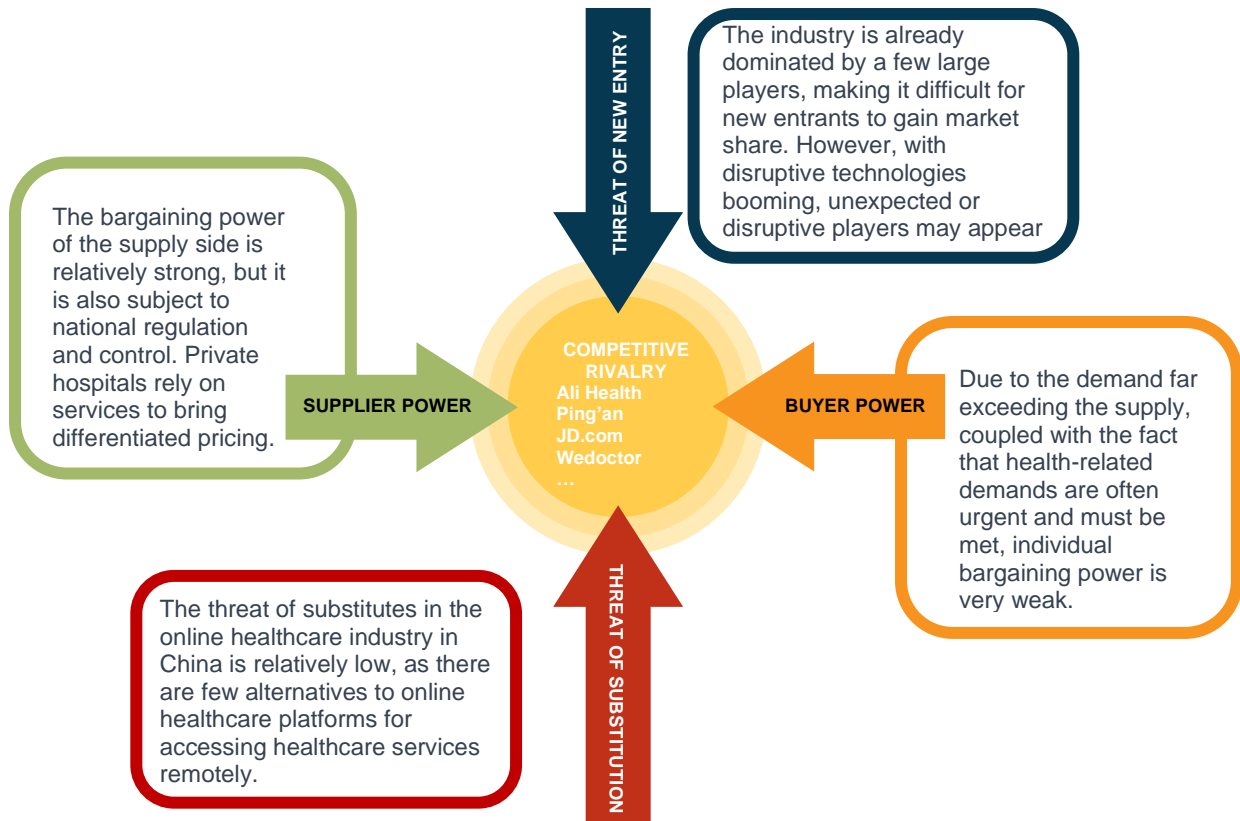
In China, a series of legal instruments that support the development of online healthcare have been introduced, such as the "Medical Device Supervision and Administration Regulations" and the "Cybersecurity Law." These laws and regulations create a legal framework for the development and operation of online healthcare

platforms and services, ensuring the safety and security of patients' personal information and medical data.

Although the government's attitude towards online healthcare has shifted gradually from cautious to open, the legal environment for online healthcare has also been relaxed to some extent. However, it should be noted that laws and regulations related to online healthcare industry still face considerable uncertainties and risks. At the moment, it is still hard to guarantee good performance for enterprises within this area, especially under the circumstances that the industrial policies and laws might fall short of expectations.

## 2.2 Porter Five Forces Analysis

**Exhibit 2.3: Porter Five Forces Analysis at a glance**



### 2.2.1 Buyer Power

With an aging population and growing middle class, there is high demand for online healthcare services in China. Currently, the domestic medical demand is far from being met by public hospitals, private hospitals, and other medical institutions. This means that patients are willing to pay a premium for quality online healthcare services and may be less likely to negotiate for better prices or services. User demand includes:

- Medical consultations: the need for outpatient visits for acute illnesses;
- Chronic disease management: long-term attention, examination, medication, and other management processes for chronic diseases;
- Physical examination needs: regular physical examination needs based on health care and disease prevention;
- Health management: scientific management processes for individual health conditions.

The demand in rural areas has far from being fully met. The coverage and level of medical services provided by rural hospitals cannot meet the medical needs, resulting in patients from rural areas needing to seek medical treatment at urban hospitals, further exacerbating the scarcity of hospital resources.

Bargaining power of buyers: Weak given the demand for medical and health services from users far exceeds the supply

### 2.2.2 Supplier Power

The current healthcare resources are facing problems of supply shortage and poor patient experience, which exacerbate doctor-patient relationships and give rise to some irregular private medical institutions.

- Public hospitals: From Tier 1 and Tier 2 public hospitals to small clinics, there is a supply-demand gap in the number of doctors, beds, and other resources. The hierarchical diagnosis and treatment system has not yet achieved optimum distribution.
- Community hospitals: China is vigorously developing medical treatment in communities to handle minor and chronic illnesses.
- Private hospitals: Provide specialized medical treatment and attract customers with better services at higher prices, but the quality is uneven.
- Online healthcare platforms: With the rapid development and application of the mobile internet, as well as the launch of new technologies such as 5G and cloud computing, online healthcare platforms are favored by users.

In a broad sense, online healthcare services encompass all aspects of diagnosis and treatment, prescription, medication, and medical insurance. The parties involved include hospitals, pharmaceutical companies, medical insurance bureaus, digital platforms, etc. In a narrow sense, online healthcare mainly refers to consultation, remote diagnosis, and treatment. Online platform providers usually cooperate with hospitals to establish online hospitals to provide remote diagnosis and treatment services. The scope of services is continuously expanding, from core services such as online clinics and remote diagnosis to extended services such as "Mobile Health" (management of chronic diseases), etc.

Online healthcare services can be divided into three levels:

Information level. This level mainly involves the transmission and integration of basic information through online platforms. The services at this level mainly relate to the transmission of non-core medical information, including providing health information, guiding referrals, making appointments, and disease consultations.

Diagnosis and treatment level. This level involves more core medical services, including remote diagnosis and treatment and online clinics.

Extended services level. This level involves the fields of chronic disease management, family doctors, physical examinations, nursing, and other related services.

Bargaining power of suppliers: Relatively strong due to the limited availability and high demand at the moment. But it is also subject to national regulation and control. Going forward, as the market grows and competition increases, the bargaining power of suppliers is likely to decrease.

### 2.2.3 Threat of New Entry

Potential new entrants to the online healthcare industry might include:

Insurance companies: launching diagnosis and treatment plans and integrating with insurance services;

Technology companies and cloud service providers: offering more efficient and customized diagnosis and treatment services based on emerging technologies.

Threat of new entrants: Online healthcare industry in China is highly regulated and requires significant capital investment, making it difficult for new entrants to compete. Additionally, there are already established players in the market such as Alibaba Health and Ping An Good Doctor. Therefore, the threat of new entrants is relatively low at the moment. However, disruptive technologies such as AI and ML may foster more advanced solutions and hence generate unexpected new players in the future.



## 2.2.4 Threat of Substitutes

Substitutes may include:

Private clinics: Patients can go to small private clinics to address their health issues when their medical needs are not met through online platforms.

Pharmacies: Minor issues can be addressed with simple advice provided by pharmacy consultants when purchasing medication.

Threat of substitutes: Traditional healthcare services, such as visiting a doctor in person, remain a significant substitute for online healthcare services. However, as the online healthcare industry in China grows and technology advances, the threat of substitutes is expected to decrease.

## 2.2.5 Competitive Rivalry

Competition in the online healthcare industry in China is intense, with established players such as AliHealth, Ping An Good Doctor, JD Health, Tencent-backed WeDoctor and many others. Additionally, traditional healthcare providers such as hospitals and clinics are also entering the online healthcare market, increasing competition. Big players are investing heavily in technology and marketing to gain an edge. As the industry continues to grow and evolve, consolidation and partnerships are likely to occur in order to strengthen market positions and expand services. Therefore, competitive rivalry is high in the online healthcare industry in China.

## 2.3 China Online Healthcare Industry Forecast

### 2.3.1 Supply-Demand Imbalance further exacerbating

Statistical data indicates that the trend of aging population in China is further exacerbating:

- On May 11th, 2021, the National Bureau of Statistics released the main data of the seventh national population census, which showed a slowed population growth. The population increased by 72.06 million in ten years, with a growth rate of 5.38%, an average annual growth rate of 0.53%, which decreased 0.04 percentage points compared to the average annual growth rate of 0.57% from 2000 to 2010. The data indicates that China's population has continued to maintain a low-growth trend in the past decade.
- According to this census, the population aged 0-14 accounted for 17.95%, which increased by 1.35 percentage points compared to the 2010 census; the population aged 60 and above accounted for 18.70%, which increased by 5.44 percentage points compared to the 2010 census, among which the population aged 65 and above accounted for 13.50%, which increased by 4.63 percentage points compared to the 8.87% of the 2010 census.
- The change in China's population age structure shows that with the rapid development of China's economy and society, the significant improvement in people's living standards and healthcare, and the low fertility rate that has been maintained for a long time, the aging process is further accelerating.

With this trend going on, the following changes will likely occur in healthcare demand:

- As the aging problem exacerbates, healthcare demand will further expand, and the gap between supply and demand will continue to widen.

- The development of chronic disease management and online diagnosis and treatment is imminent, and efficiency improvement based on emerging technologies is the general trend.

Additionally, for patients, besides healthcare needs, well-being plays a vital role in healthcare management. Online healthcare, different from offline channels, provides patients with an online platform for peer communication. Communication with people on an online healthcare platform could make up the healthcare information gap; in addition, patients also satisfy their psychological needs[4]. Thus, peer communication, which acts as a word of mouth effect, will further promote the usage of online healthcare platform and strengthen the demand too.

### 2.3.2 Diagnosis and treatment more personalizing

A study results indicated that online doctor–patient interactions have a significant positive effect on perceived benefits and individual subjectivity. Second, the quality of online healthcare services has a significant positive effect on the effective experience and perceived trust[5]. Going forward, big data, AI, cloud computing, and other technologies will bring about the development of more personalized diagnosis and treatment, improve the specificity and quality of medical services, and lower the cost and ensure the safety of medical services.

- Genetic sequencing: The development of biological science and big data technology has brought hope for disease attribution and prevention through genetic sequencing.
- Personalized medication: Different individuals have different tolerance levels for medication, and the dosage should vary from person to person. However, in the past, there has been a lack of sufficient statistical scale and predictive algorithm capabilities. Today, the development of big data and artificial intelligence is

expected to greatly promote the development of personalized diagnosis and treatment plans based on patient characteristics and historical treatment effectiveness data feedback.

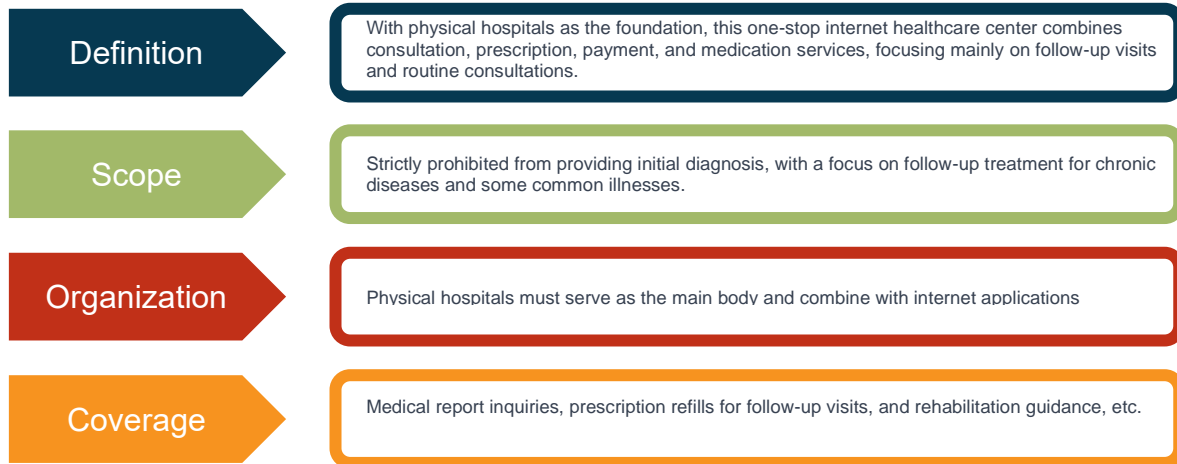
- Real-time dynamic personalized diagnosis and treatment plans: Customized diagnosis and treatment plans can be output for patients based on individual patient characteristics and big data analysis. Customized treatment recommendations and methods can be tailored based on personal health history.

### **3. Online Healthcare Business Models**

#### **3.1 Internet + Hospitals**

An internet hospital is an online model of a physical hospital. According to the "Administrative Measures for Internet Hospitals (Trial)" issued by the National Health Commission in July 2018, internet hospitals must have a physical medical institution as offline support, and the departments and medical subjects that internet hospitals can carry out must not exceed the scope of the subject areas of the physical medical institution they rely on. Internet hospitals can provide follow-up consultations for chronic and common illnesses, issue electronic prescriptions, but cannot provide initial diagnosis. In fact, such forms of online–offline service integration also benefits providers in terms of total demand and professional reputation[6].

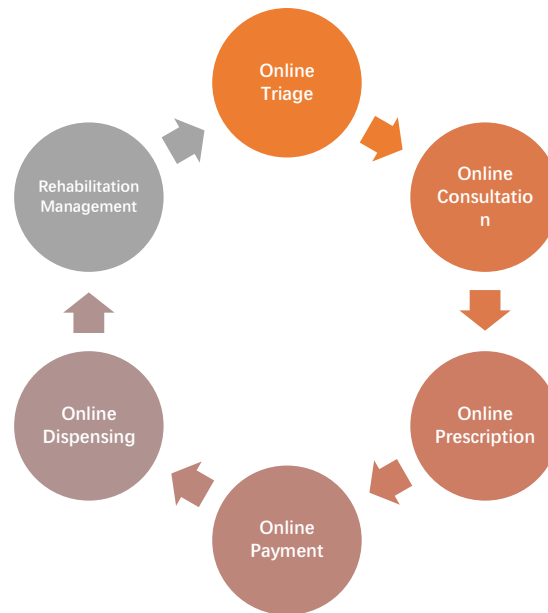
### Exhibit 3.1: The Connotation of Internet Hospital



Source: *Administrative Measures for Internet Hospitals (Trial)*

The diagnosis and treatment process of an internet hospital includes online triage, online consultation, online prescription, online payment, online dispensing, and rehabilitation management. Compared to offline medical treatment, internet hospitals eliminate the need for queuing for registration, waiting for consultation, queuing for payment, and queuing for medication, greatly improving the patient experience. For patients who need offline medical services such as laboratory tests and surgery, internet hospitals can provide online appointment services.

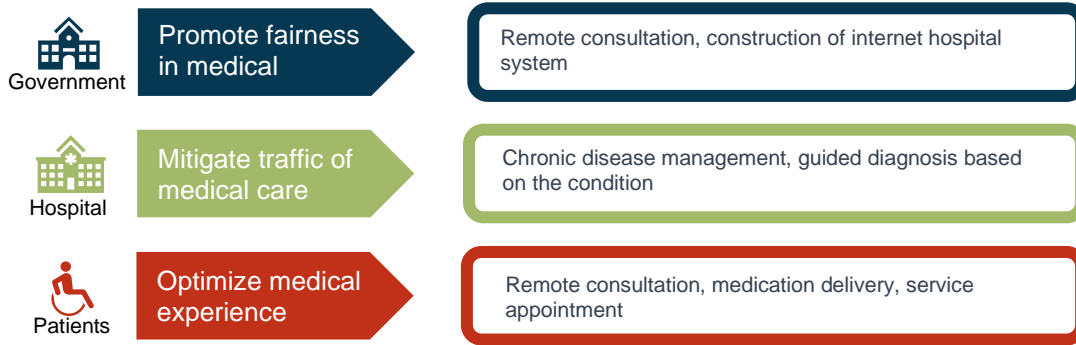
Exhibit 3.2: The Diagnosis and Treatment Process of an Internet Hospital



*Data Source: DBDATA.CN*

The significance of internet hospitals is that Internet hospitals decrease the importance of geographical factors. On the one hand, it shows that the medical resources of the platform are of sufficient quality to believe, weakening the user's preference for developed cities. On the other hand, it also shows that Online Healthcare has overcome the geographical factors to a certain extent and realized the remote redistribution of medical resources by using the Internet[7]. For the government, remote consultations through the internet for critically ill patients in primary hospitals optimize the utilization efficiency of medical resources and promote medical fairness. For hospitals, solving the needs of patients with chronic and minor illnesses efficiently through the internet reduces the pressure of patient flow in physical hospitals. For patients, internet medical treatment greatly saves time and improves the medical experience.

### Exhibit 3.3: The Significance of Internet Hospitals



Data Source: DBDATA.CN

### 3.2 Internet + Online Diagnosis Platform

#### Online Diagnosis Platform vs. Online Hospitals

There is a fundamental difference between Internet-based online diagnosis platforms and Online hospitals. The former mainly meets the needs of consumer healthcare, while the latter is an extension of serious medical services.

#### Exhibit 3.4: Difference between Online Diagnosis Platform and Online Hospitals

	Online Hospitals	Online Diagnosis Platform
<b>Type</b>	Serious Medical Services	Consumer Healthcare
<b>Items</b>	Registration and consultation, Remote medical care, Appointment for diagnosis and treatment, Purchase of prescription drugs	Medical consultation, Health examination, Rehabilitation, Personal health management, Maternal and child care
<b>Definition</b>	Taking medical institutions as the main body, using technologies to expand services in time and space, and using online hospitals as an auxiliary to medical institutions	Online medical consultation platforms created by companies, supporting qualified third-party organizations to build Internet-based information platforms and provide remote medical information consultation services
<b>Doctors</b>	Doctors hired by hospitals	Doctors hired by companies + External Doctors

<b>Objective</b>	The extension of offline hospitals, helps to alleviate traffic pressure on the hospital and facilitates the patient's medical experience	Profit-oriented, addresses patient needs
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*Data Source: Kantar Consulting, DBDATA.CN*

A study finds that the nationwide prevalence of online dual practice in China reaches at least 16.5% in 2020, and it is more common among senior public hospital doctors. Chinese public hospital doctors mainly use small pockets of time during working hours and after-hours to render services on the online platforms. The five most commonly cited motivations for their engagement in online dual practice are efficiency improvement, personal control, career development, financial rewards and serving the patients[8]. This also boosts the development of online diagnosis platform. However, the business model of Online Diagnosis platforms is quite different from that of Online hospitals. Due to policy constraints, Online Diagnosis platforms can only provide health consultation services, but are not allowed to provide diagnosis and treatment services or issue prescriptions. Therefore, Online Diagnosis platforms have to generate revenue by redirecting traffic to e-commerce businesses.

### 3.3 Internet + Online Medication

The drug sales market is steadily growing, and online drug sales are catching up. According to the "China Pharmaceutical Market Panorama" released by IQVIA, the overall scale of China's pharmaceutical market reached 1.35 trillion yuan in 2017, of which retail terminals accounted for 18.2%. The compound annual growth rate of China's overall pharmaceutical market is expected to be 6-9% in the next three years. According to the "China Drug Retail Market Consumption Trends Report" released by JD Health and China Health Information, from 2013 to 2017, the scale of physical drugstores increased from 187 billion yuan to 269 billion yuan, with a compound annual growth rate of 9.52%. During the same period, the scale of online drugstores increased from 1.2 billion yuan to 6.1 billion yuan, with a compound annual growth rate of 50.2%.



The proportion of non-prescription drug sales in physical drugstores fell below 50% for the first time in 2017, indicating that online drug retailing is meeting the growing demand for purchasing drugs.

Medical O2O platforms are generally divided into self-operated and platform-based models, which have high requirements for drugstore density, logistics efficiency, drug types, and medical consultation services. Self-operated companies build their own stores and technologies for operation and distribution. Platform-based companies on the other hand, use their existing e-commerce platforms to attract users and allocate orders to partner drugstores based on geographic location, utilizing delivery personnel shared among the platform.

### 3.4 Internet + Medical Insurance

Overall, the development of the business model for “Internet + medical insurance” is still in the early exploration stage. The development of the business model depends on the level of openness of local policies. Yinchuan, Ningxia for example, has provided a favorable policy environment for Online healthcare and is currently the largest gathering place for Online hospitals in China. It is also an experimental field for Internet medical insurance payments.

Ningxia Yinchuan was the first to launch internet medical insurance payments.

According to Xinhua News, as early as March 2017, Yinchuan established the connection between internet hospital medical expenses and personal medical insurance accounts.

According to the latest "Internet Hospital Medical Insurance Personal Account and Outpatient Overall Management Measures (Trial)" issued by Yinchuan City, individuals who participate in urban employee medical insurance can use their personal medical insurance account funds to pay for medical expenses generated from online registration and medical treatment in internet hospitals.

### 3.5 Internet + Online Family Doctors

In China, especially in some remote areas, high-quality medical resources are scarce, Online family doctors can efficiently divert offline consultation volume and provide quality medical services by leveraging online healthcare platforms. An analysis showed that nondisease-specific consultations and moderate health problems accounted for the majority of online visits to Ping An Good Doctor, one of the largest online healthcare service provider in China. This indicated that online health services played a similar role as family doctors[9]. The positive feedback received from most users showed that online family doctors would be their preferred option in many circumstances.

In 2018, the number of medical visits in China reached a new high, with the majority of hospital consultations concentrated in tertiary hospitals. From January to November 2018, the total number of medical visits in national medical institutions reached 7.54 billion, a year-on-year increase of 3.2%, of which hospital visits reached 2.63 billion, a year-on-year increase of 5.1%. According to hospital level, tertiary hospitals saw 134,000 visits, a year-on-year increase of 7.4%; secondary hospitals saw 96,000 visits, a year-on-year increase of 2.4%; primary hospitals saw 16,000 visits, a year-on-year increase of 0.2%; and non-classified hospitals saw 17,000 visits, a year-on-year increase of 8.3%.

### 3.6 Conclusion

The current business model for Online healthcare, whether in terms of diagnosis and treatment, medication, insurance, or health management, is centered around decentralizing medical resources. Decentralization refers to the transfer of medical resources from large central hospitals to online healthcare platforms and other medical facilities, in order to address the structural inadequacies of medical resources. This decentralization can be divided into two circumstances:

- 1) Decentralization of physical locations: This has given rise to the emergence of business models such as tiered diagnosis and treatment, remote diagnosis and treatment, and family doctors;
- 2) Decentralization of service resources: This has given rise to business models such as online consultations and medications.

From a profitability perspective, internet + medicine is currently the most advanced business model. In order for internet hospitals to achieve profitability at scale, a balance needs to be struck between supply and demand. This requires ensuring a good diagnosis and treatment service experience, addressing issues related to pricing and supply of diagnosis and treatment services, as well as distribution of benefits to doctors and healthcare providers. However, currently, most internet hospitals are limited by policy pricing controls, which weakens their motivation to move online. On the other hand, internet consultation platforms are still in the early stage of customer acquisition and often provide free consultation services, relying on revenue generated through the sale of medication.

In the evolution of internet healthcare business models, policies have played an important role. From the policies that have been clarified, the liberalization of access to medical e-commerce, the standardization of fees for internet hospitals, the opening up of internet hospital integration with medical insurance payments, and the outflow of prescriptions have all driven progress in the internet healthcare industry. Currently, the development of online healthcare is still constrained by various factors, such as unclear regulations surrounding doctors working at multiple practice sites, medical insurance payments, the application of medical data, online sales of prescription drugs, and the implementation of electronic prescriptions, which may only be tested in pilot areas.

Under the impact of the COVID-19 epidemic, Hangzhou, Shanghai, and other cities have begun piloting the integration of online healthcare with medical insurance payments.

The pandemic has objectively accelerated the maturity of online healthcare policies and that further refinement of these policies in the future is expected to foster the emergence of more diverse business models.

## **4. Competition Landscape**

The online healthcare industry in China has been rapidly growing in recent years, with AliHealth, Ping'an Healthcare, and JDHealth emerging as three of the major players in the field. These three companies are publicly traded and have a strong focus on providing online healthcare services to consumers.

To gain a better understanding of the competition landscape, we will select AliHealth, Ping'an Healthcare, and JDHealth as representatives of the industry and perform a detailed analysis of the three companies. By analyzing their strengths and weaknesses, we hope to gain insights into the key factors driving success in this industry.

Through looking at the competition landscape as a whole, we can gain a more comprehensive understanding of the industry and identify potential opportunities for growth and development.

### **4.1 Alibaba Health**

#### **4.1.1 Company Introduction**

Alibaba Health Information Technology Limited, also known as AliHealth, is a subsidiary of Alibaba Group, one of the world's largest e-commerce companies based in China. Alibaba Health is a healthcare technology company that provides online healthcare services, healthcare products, and healthcare solutions to individuals, healthcare providers, and pharmaceutical companies.

AliHealth's services include online pharmacy services, medical consultations, health management and wellness services, and healthcare supply chain management. The company also operates a healthcare-focused e-commerce platform that offers a wide range of healthcare products, including over-the-counter drugs, medical equipment, and health supplements.

#### 4.1.2 Financial Analysis

##### 4.1.2.1 Active Users

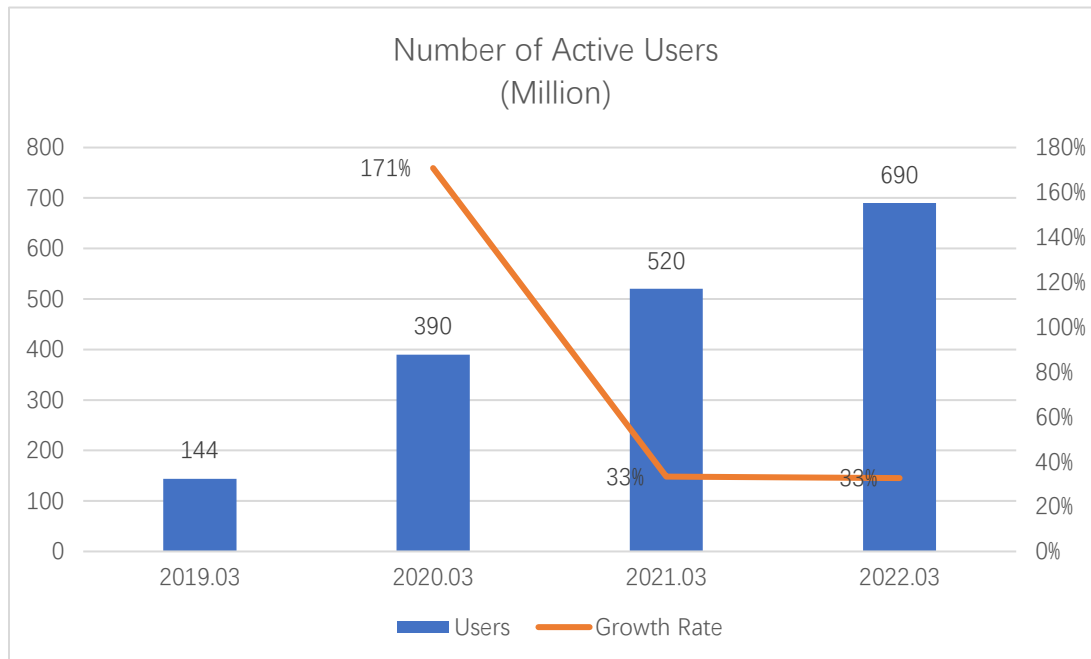
The steady increase in the number of active users on the AliHealth platform is a testament to the company's success in delivering convenient, accessible, and high-quality healthcare services and products to its users. With 144 million active users in 2019, AliHealth already had a significant presence in the online healthcare market. However, in 2020, the number of active users surged to 390 million, indicating a massive growth of more than 170%. This increase can be attributed to a growing awareness of the importance of healthcare, especially amid the COVID-19 pandemic, and the convenience of using online platforms to access healthcare services and products.

In 2021, the number of active users on the AliHealth platform reached 520 million, indicating a further increase of 33% from the previous year. This growth can be attributed to the company's continued efforts to expand its services and product offerings, including launching new healthcare services and partnerships with healthcare providers and pharmaceutical companies.

Looking forward, the number of active users on the AliHealth platform is expected to continue to grow. As of March 2022, the number of active users has reach 690 million, which marks another significant milestone in the company's growth trajectory. The continued growth of the AliHealth platform is likely to be driven by the company's commitment to innovation, its ability to provide high-quality healthcare services and

products, and its efforts to create a more accessible and efficient healthcare ecosystem for its users.

Exhibit 4.1: Number of Active Users on AliHealth Platform



Data Source: AliHealth financial reports from 2019 to 2022<sup>1</sup>

#### 4.1.2.2 Revenue

AliHealth has shown significant growth over the past five years, as evidenced by its revenue and gross profit rate figures. In 2018, the company's revenue was ¥2.44 billion (approximately \$370 million USD), with a gross profit rate of 26.73%. The following year, in 2019, AliHealth's revenue more than doubled to ¥5.10 billion (approximately \$780 million USD), while the gross profit rate slightly decreased to 26.12%.

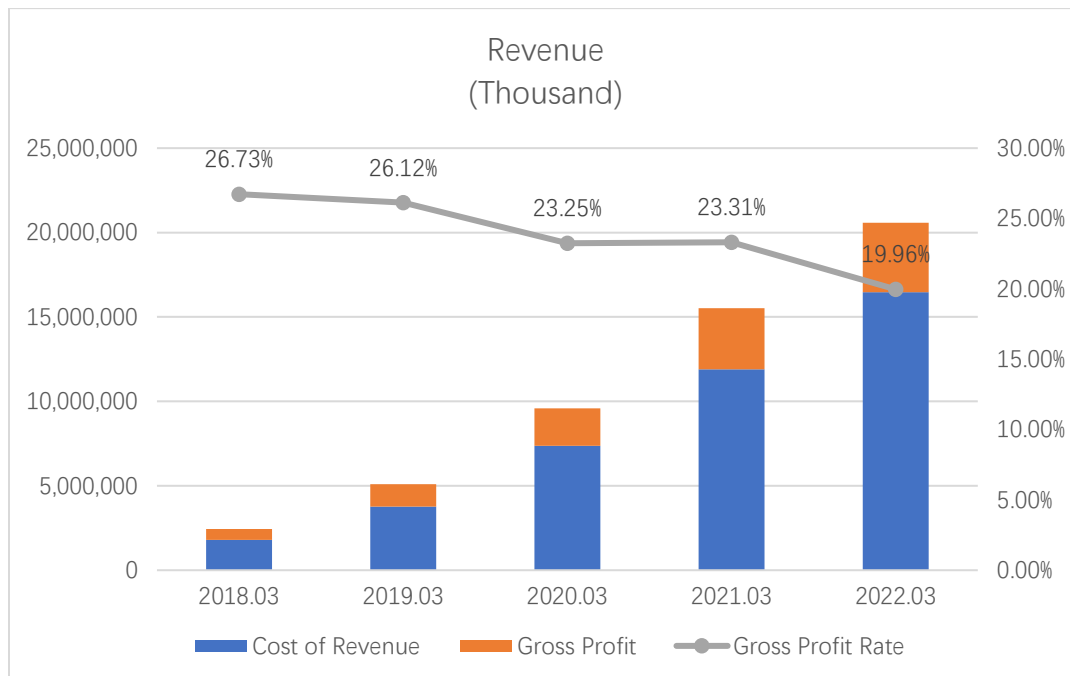
In 2020, the company continued to experience growth, with total revenue reaching ¥9.60 billion (approximately \$1.5 billion USD). However, the gross profit rate decreased

<sup>1</sup> The fiscal year of AliHealth is from January to December

to 23.25%, indicating increased competition and operational costs. In 2021, Alihealth's revenue continued to increase significantly, reaching ¥15.52 billion (approximately \$2.4 billion USD), with a gross profit rate of 23.31%.

However, the company experienced a slight decline in its gross profit rate in 2022, which decreased to 19.96%. Despite this, AliHealth's revenue for the year was still impressive, reaching ¥20.58 billion (approximately \$3.1 billion USD). These revenue and gross profit rate figures demonstrate that AliHealth has successfully navigated the competitive Online healthcare industry and continued to experience growth over the past five years.

Exhibit 4.2: Revenue of AliHealth from FY 2018 to 2022



Data Source: AliHealth financial reports from 2019 to 2022

#### 4.1.2.3 Expense Structure

AliHealth has a well-structured expense model that includes operating expenses, selling and marketing expenses, administrative expenses, and product development expenses.

Of these, operating expenses and selling and marketing expenses are the two main contributors, both taking up roughly 10% of the revenue in fiscal year 2022.

From 2018 to 2022, AliHealth's expense structure has undergone some notable changes. Operating expenses and administrative expenses have been declining over this period, which indicates better management and cost control measures implemented by the company. This trend suggests that AliHealth has been able to streamline its operations and optimize its resources, resulting in more efficient and effective business practices.

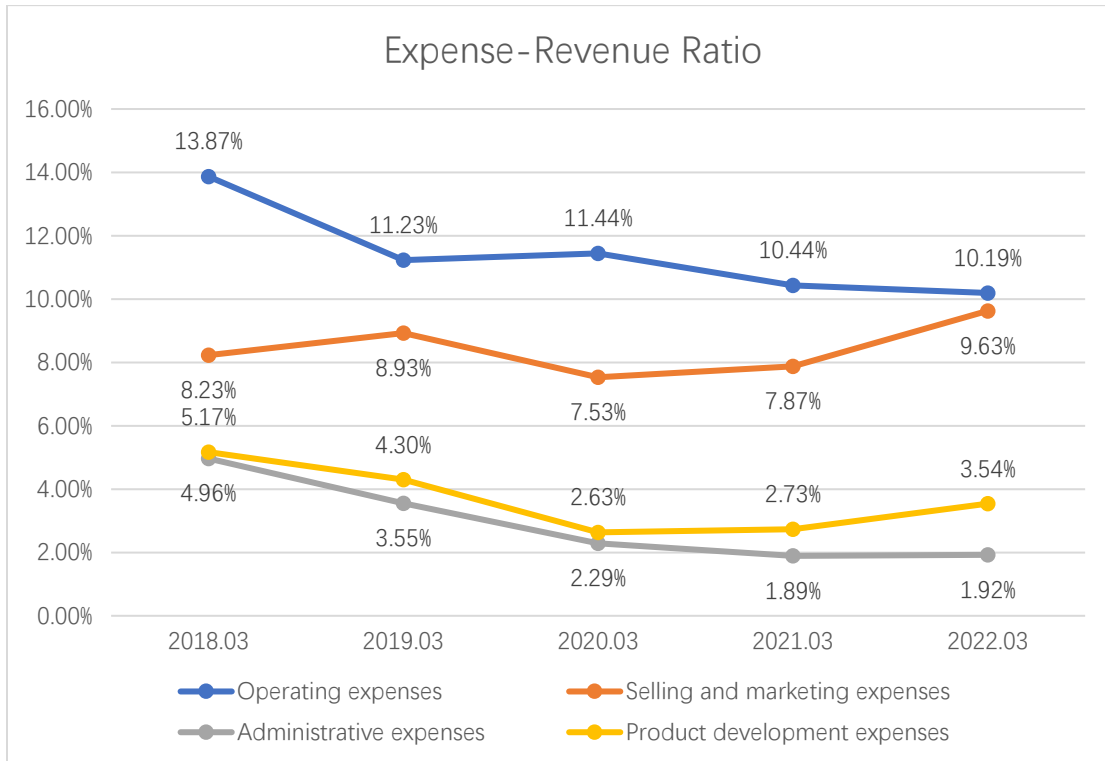
However, the increasing trend in selling and marketing expenses indicates a more intensive competition environment for the company. To remain competitive and maintain its market share, AliHealth has had to increase its advertising and promotional efforts, resulting in higher selling and marketing expenses.

Finally, the decrease in product development expenses indicates that AliHealth's product offerings have reached maturity, and the company is now focused on optimizing its existing products rather than investing in new ones. This trend suggests that AliHealth has achieved a stable position in the market and is focusing on optimizing its operations and improving profitability.

In summary, AliHealth's expense structure reflects the company's competitive environment, strategic priorities, and financial performance. While the company has seen declines in some areas, it has also taken steps to improve efficiency and better manage costs, positioning itself for continued success in the healthcare technology industry.



Exhibit 4.3: Expense-Revenue Ratio of AliHealth from FY 2018 to 2022



Data Source: AliHealth financial reports from 2019 to 2022

#### 4.1.2.4 Free Cash Flow Margin

Free cash flow (FCF) represents the cash that a company generates, or loses, after netting out its COGS, operating, and capital expenses, and adding back non-cash expenses. The reason why FCF is so important for SaaS companies is that SaaS companies typically require significant upfront investments in research and development and marketing to acquire customers, in other words, they are burning cash. Free cash flow limits the amount of runway that a SaaS company has. For cases in which businesses are generating cash, free cash flow is capital that can be either reinvested in the business to catalyze additional growth or doled out to shareholders as returns. Free cash flow determines profitability. As such, FCF margin, which is the measure of cash flow divided by revenue, can be considered an indicator to reflect the

performance of a SaaS company. A good approximate to calculate Free cash flow is as follows:

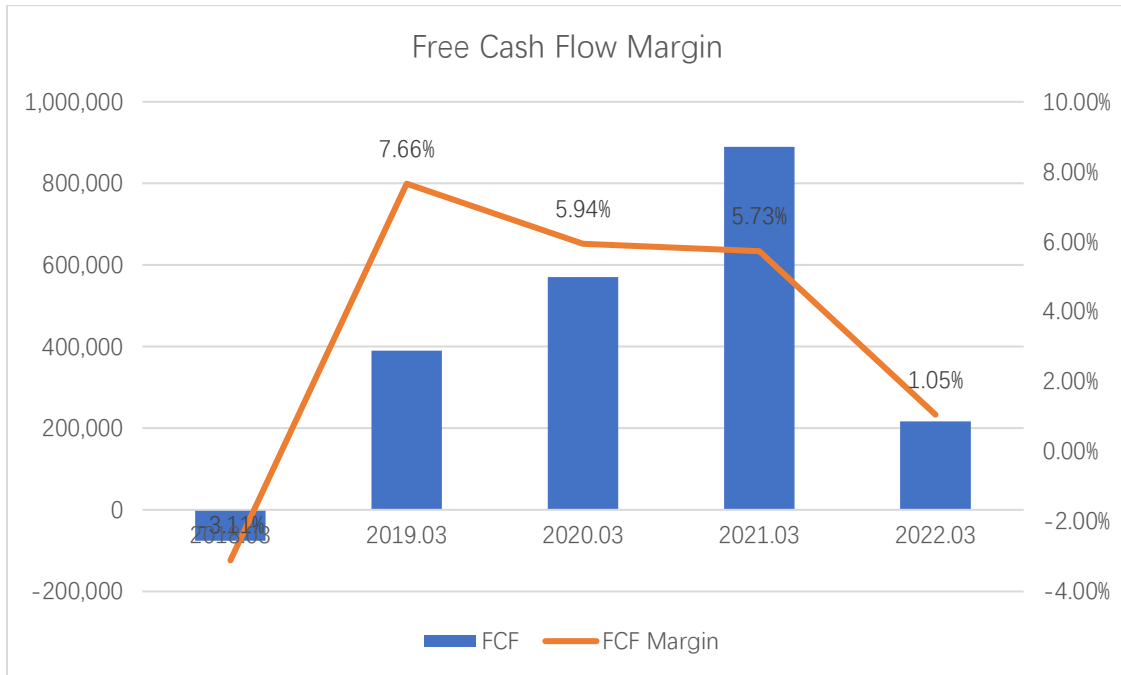
$$\text{FCF} = \text{Operating cash flows} - \text{capex(PP\&E, Intangible Assets, etc.)}$$

In 2018, the company's free cash flow was negative, with a value of ¥-76 million, and a corresponding free cash flow margin of -3.11%. However, the company's performance improved in the following years, with free cash flow increasing to ¥390 million in 2019 and ¥570 million in 2020, and corresponding free cash flow margins of 7.66% and 5.94% respectively.

In 2021, AliHealth's free cash flow increased further to ¥890 million, with a free cash flow margin of 5.73%. However, in 2022, the company's free cash flow declined to ¥217 million, with a corresponding free cash flow margin of 1.05%. The increasing trend in free cash flow from 2018 to 2021 indicates that AliHealth has been generating more cash from its operations, which is a positive sign.

However, the decline in free cash flow in 2022 suggests that the company may be adopting a more aggressive sales strategy, possibly due to weak consumer spending caused by the COVID-19 pandemic. This may be reflected in a lower free cash flow margin as the company invests more in its business to maintain growth. Overall, AliHealth's free cash flow performance shows that the company has been able to generate cash from its operations, which is a good sign for its financial health, although we should monitor the company's sales strategy in the coming years to assess its impact on free cash flow.

Exhibit 4.4: Free Cash Flow Margin of AliHealth from FY 2018 to 2022



Calculated using data on AliHealth financial reports from 2019 to 2022

#### 4.1.2.5 Efficiency Score

We can also look at the cash consumption of AliHealth relative to the revenue that it generates, which is what the efficiency score indicates. Efficiency score can be defined as FCF margin of ARR (Annual Recurring Revenue) plus ARR year-over-year growth rate<sup>2</sup>—as such it helps to show the tradeoffs between growth and profitability[10].

$$\text{Efficiency Score} = \text{FCF margin of revenue} + \text{revenue YoY Growth Rate}$$

AliHealth's efficiency score has been declining significantly over the past five years, from 1.16 to 0.34. This indicates that the company has become less efficient at generating revenue from its invested capital. The decreasing trend in efficiency score can be

<sup>2</sup> In this case, total revenue is used instead as ARR is not disclosed in company's financial reports.

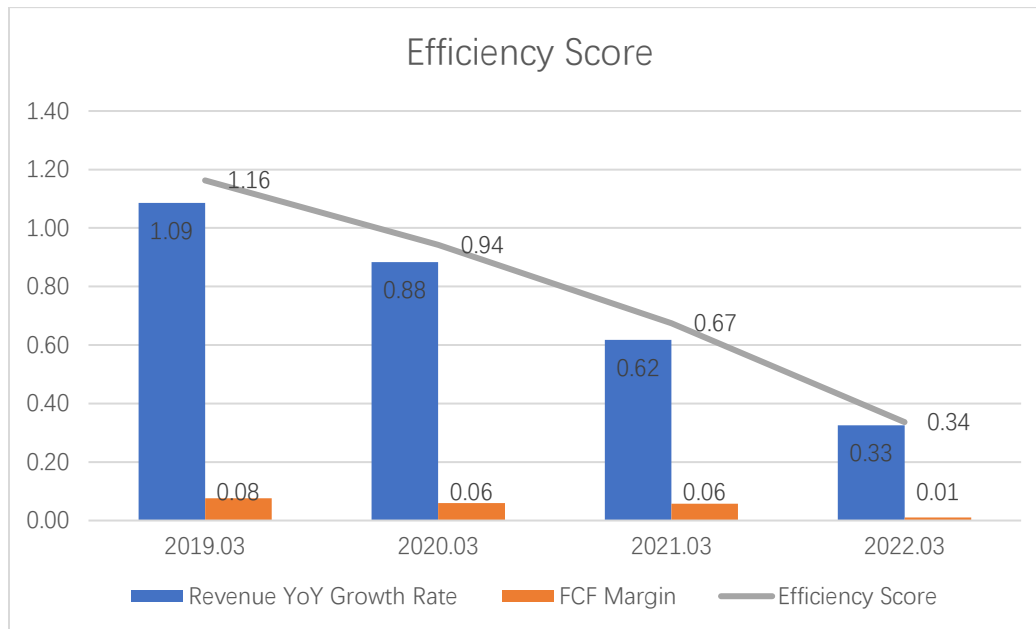
attributed to the declining revenue growth rate and free cash flow margin of the company.

The declining revenue growth rate and free cash flow margin are a reflection of the intense competition in the online healthcare industry, as AliHealth competes with numerous other players such as JDHealth, and Ping'an Healthcare to capture market share. In order to maintain growth and remain competitive, AliHealth has been spending more on investments, which has led to lower investment efficiency.

While the short-term impact of this declining efficiency score may not be significant, it could become a concern for the company's long-term development. As the online healthcare market approaches saturation, it may become more difficult for AliHealth to generate the same level of revenue growth it has experienced in the past. This, combined with decreasing investment efficiency, could impact the company's ability to achieve sustainable growth in the future.

Overall, AliHealth's declining efficiency score should be a concern, as it may suggest that the company is facing greater challenges in maintaining its market position and profitability. The company's performance should be monitored closely in the coming years to assess its ability to adapt to changing market conditions and maintain long-term growth.

Exhibit 4.5: Efficiency Score of AliHealth from FY 2019 to 2022



Calculated using data on AliHealth financial reports from 2019 to 2022

#### 4.1.2.6 Cash Conversion Score (CCS)

The Cash Conversion Score (CCS) is another metric that can be used to evaluate whether or not the capital that SaaS companies raise and consume is generating a meaningful return. CCS can be defined as the ratio of the ARR to total capital invested into a company minus cash<sup>3</sup>, the Cash Conversion Score is effectively the return-on-investment of each dollar ever invested into a company. Besides, the Cash Conversion Score will be helpful when looking at return on invested capital (ROIC) in a way that correlates to long-term value too[11].

$$\text{Cash Conversion Score} = \text{Current Revenue} / (\text{Total Capital Raised To Date} - \text{Cash})$$

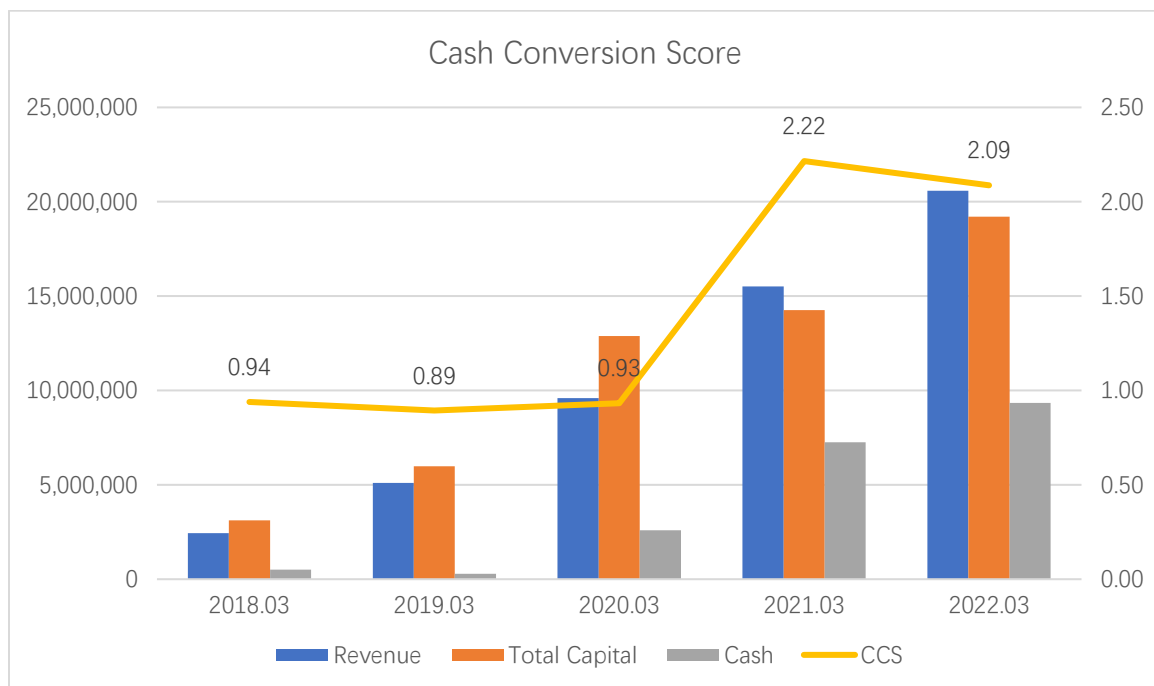
Or

$$\text{Cash Conversion Score} = \text{Current Revenue} / (\text{Equity} + \text{Debt} - \text{Cash})$$

<sup>3</sup> Total revenue is used instead in the calculations as ARR is not disclosed in the financial reports.

AliHealth has seen a significant improvement in its Cash Conversion Score in 2021, jumping from below 1.0 to above 2.0., which indicates a significant improvement in the company's efficiency in consuming cash within the organization. A Cash Conversion Score of above 2.0 means that one dollar of investment into the business yields more than 2 dollars of revenue, which is a clear indication of AliHealth's profitability and ability to generate free cash flow. This trend may also signal that AliHealth is improving its operational efficiency and streamlining its processes, which could lead to further cost savings and revenue growth in the future and bode well for the company's profitability and long-term growth prospects.

Exhibit 4.6: Cash Conversion Score of AliHealth from FY 2019 to 2022



Calculated using data on AliHealth financial reports from 2019 to 2022

### 4.1.3 SWOT Analysis

#### 4.1.3.1 Strength

Firstly, AliHealth boasts of the largest user base in the industry and has the most extensive network of healthcare providers and services. With a mature business model that has been in operation for several years, AliHealth has built a strong reputation for providing high-quality services to its users, and this has contributed to the steady growth of its user base.

One of the significant strengths of AliHealth is its ability to generate positive free cash flow consistently. Over the past five years, AliHealth has been able to support its operations using cash generated from its own business, and this has contributed to the company's financial stability. This financial strength has also enabled AliHealth to invest in expanding its business operations, thereby consolidating its position as a market leader.

Furthermore, AliHealth's cash conversion score has been steadily increasing since 2021, indicating that the company's investment efficiency is improving. This is a positive sign that AliHealth is focused on making every dollar well spent, and this approach is likely to lead to higher profitability and financial stability in the long term.

#### 4.1.3.2 Weakness

Despite being a major player in the online healthcare industry in China, AliHealth also has some weaknesses that could potentially affect its long-term growth and sustainability.

One significant weakness is the declining revenue growth and gross profit rate over the past five years. This trend is concerning as it suggests that AliHealth may be struggling to expand its user base and generate sustainable revenue streams. Moreover, the gross profit rate declining indicates that AliHealth is experiencing higher costs of goods sold,

which could be due to increased competition in the industry or other operational inefficiencies.

While AliHealth has a large user base, the conversion rate of ordinary users to paid users has not been as high as expected. This means that although there are many users accessing the platform, the revenue generated from paying users may not be sufficient to sustain the business in the long run. This challenge highlights the need for AliHealth to focus on strategies that will increase the conversion rate and generate more revenue from its user base.

Another weakness of AliHealth is its declining efficiency score, which is a combination of revenue growth rate and free cash flow margin. This trend indicates that the company is becoming less efficient in generating revenue and managing cash flows. This could be a significant challenge for the sustainability of the business, particularly if the trend continues.

As AliHealth continues to grow, there is a risk that it may become less agile and less able to innovate. This could be due to bureaucracy and increased bureaucracy that typically accompanies larger organizations. This is a potential weakness that AliHealth will need to mitigate by ensuring that it maintains a culture of innovation and continues to invest in research and development.

#### 4.1.3.3 Opportunity

AliHealth also has several opportunities that could support its long-term growth and success in the online healthcare industry in China.

One of the most significant opportunities is AliHealth's large user base, which provides a solid foundation for expanding its revenue streams. As AliHealth continues to develop its platform and offer new services, it has the potential to generate more revenue from



its existing user base. Additionally, the large user base can also attract potential partners, which can help AliHealth to expand its market share and increase its revenue streams.

Another opportunity for AliHealth is the strong and growing demand for online healthcare services. With the continued growth of internet usage and the increasing adoption of digital healthcare solutions, AliHealth is well-positioned to capitalize on this trend and expand its presence in the market.

AliHealth can also leverage its own resources and e-commerce platform to increase traffic to its healthcare platform and further expand its presence in the market. For example, AliHealth can integrate its healthcare services with Alibaba's e-commerce platform to offer more convenient and accessible healthcare services to its users. This strategy can help AliHealth to reach a wider audience and generate more revenue.

Moreover, AliHealth can leverage its technology and data capabilities to offer personalized and targeted healthcare services to its users. By leveraging artificial intelligence and other advanced technologies, AliHealth can offer customized healthcare solutions that meet the unique needs of each individual user. This approach can help AliHealth to differentiate itself from its competitors and strengthen its market position.

#### 4.1.3.4 Threat

One of the biggest threats to AliHealth is the increasing competition in the market. As new players continue to enter the market, AliHealth may find it more difficult to attract and retain users, especially in the face of competition from established players with strong brand recognition and marketing capabilities. This increased competition can also lead to pricing pressure and reduced profitability, which can further impact AliHealth's financial performance.

Another threat to AliHealth is the relatively low selling and marketing expenses, which may indicate that AliHealth is not offering competitive rewards for their online doctors. This can lead to a lower quality of doctors on the platform, which can ultimately impact the user experience and drive users away from the platform. Other established players like Ping'an Healthcare may offer more attractive rewards to their doctors, which can further exacerbate this issue for AliHealth.

Furthermore, AliHealth's free cash flow has been declining dramatically in 2022, which is also a warning sign if it is not done intentionally. This decline can indicate a potential liquidity issue and may limit AliHealth's ability to invest in growth initiatives or respond to unexpected challenges or opportunities.

## 4.2 Ping'an Healthcare

### 4.2.1 Company Introduction

Ping'an Healthcare is a revolutionary healthcare technology company that has been making waves since its introduction. Founded in 2014, Ping'an Healthcare has quickly become one of the most innovative and forward-thinking healthcare companies in China.

The company's mission is to improve healthcare accessibility and quality through the use of advanced technologies such as artificial intelligence, big data, and cloud computing. Ping'an Healthcare provides a range of services including online consultations, telemedicine, and medical insurance.

One of the key features of Ping'an Healthcare is its AI-powered medical diagnosis system, which has been shown to be highly accurate in identifying a range of medical conditions. This system can analyze medical images, laboratory test results, and other health-related data to provide a quick and accurate diagnosis.

Ping'an Healthcare has also introduced a range of innovative services such as remote monitoring for chronic conditions and health management programs that use wearable devices and other technologies to help patients manage their health more effectively.

Overall, Ping'an Healthcare is a company that is at the forefront of the healthcare industry, using advanced technologies to improve healthcare outcomes and make healthcare more accessible to people around the world. Its innovative services and cutting-edge technology are changing the way we approach healthcare, and it is likely to continue to have a significant impact on the industry in the years to come.

## 4.2.2 Financial Analysis

### 4.2.2.1 Active Users

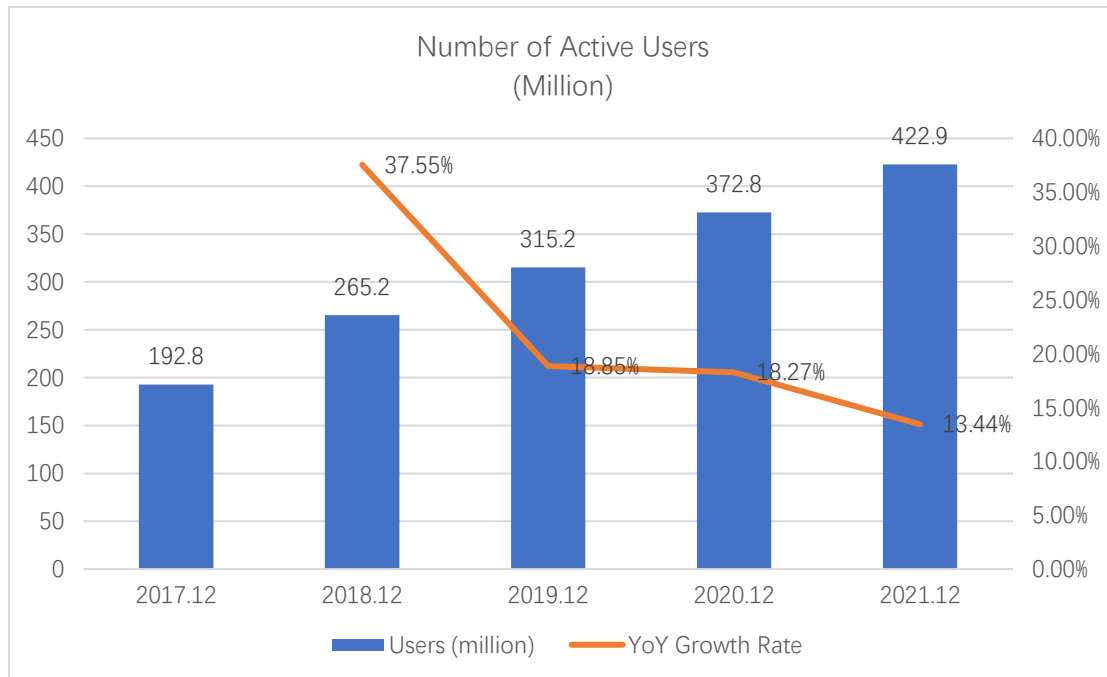
Over the past five years, Ping'an Healthcare has experienced a tremendous growth in its active user base, with a significant increase every year. In 2017, the company reported having 192.8 million active users, a number that steadily increased to 265.2 million in 2018. This represented a growth of approximately 37% year-on-year.

In 2019, Ping'an Healthcare's active user base reached 315.2 million, a further increase of almost 19% from the previous year. This growth continued into 2020, with the company reporting an impressive 372.8 million active users. This represented a growth of approximately 18.2% from the previous year, and a remarkable 93.3% growth from the 2017 figures.

Ping'an Healthcare's user base continued to expand in 2021, reaching 422.9 million active users. This represented a growth of approximately 13.4% year-on-year, and an astounding 119.4% growth from the company's active user base in 2017.

This impressive growth in active users for Ping'an Healthcare can be attributed to the company's innovative services, its use of advanced technologies, and its commitment to improving healthcare outcomes for people in China. By providing access to online consultations, telemedicine, and medical insurance, as well as its AI-powered medical diagnosis system, remote monitoring, and health management programs, Ping'an Healthcare has become a trusted provider of healthcare services for millions of people. As the company continues to expand its reach and enhance its services, it is likely that its active user base will continue to grow in the years to come.

Exhibit 4.7: Number of Active Users on Ping'an Healthcare Platform



Data Source: Ping'an Healthcare financial reports from 2018 to 2021<sup>4</sup>

<sup>4</sup> The fiscal year of Ping'an Healthcare is from April to March

#### 4.2.2.2 Revenue

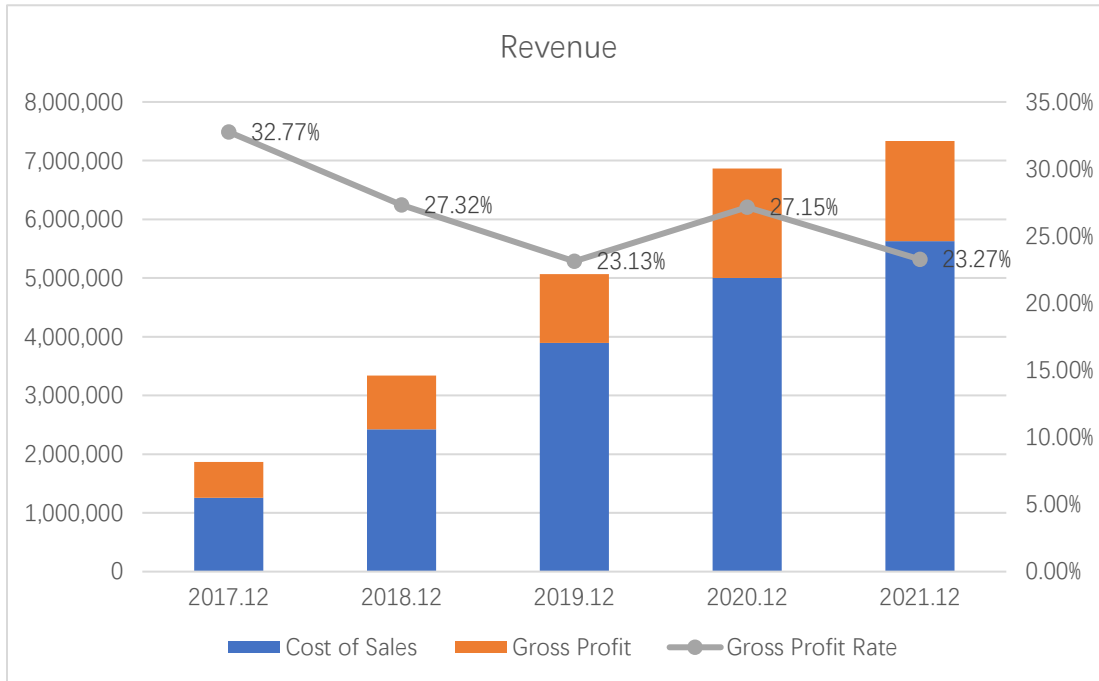
Ping'an Healthcare has experienced fluctuating revenue growth and gross profit rates over the past five years. In 2017, the company's revenue was approximately ¥1.86 billion (\$287.5 million USD) with a gross profit rate of 32.77%. The following year, Ping'an Healthcare's revenue increased to approximately ¥3.34 billion (\$515.4 million USD), but its gross profit rate decreased to 27.32%.

In 2019, Ping'an Healthcare continued to expand its services and offerings, resulting in a revenue of approximately ¥5.07 billion (\$781 million USD) - an increase of over 50% from the previous year. However, its gross profit rate dropped again to 23.13%.

Despite the challenges faced in 2019, Ping'an Healthcare's revenue grew again in 2020 to approximately ¥6.87 billion (\$1.06 billion USD) with a gross profit rate of 27.15%. In 2021, the company's revenue continued to increase to approximately ¥7.33 billion (\$1.13 billion USD), but its gross profit rate declined once more to 23.27%.

These changes in revenue and gross profit rate reflect Ping'an Healthcare's focus on growth and innovation in the highly competitive healthcare technology market in China. Although the decrease in gross profit rate is a concern, the company's strong revenue growth signals potential for future success. As Ping'an Healthcare continues to expand and innovate, it will need to navigate challenges in the market while leveraging its strengths to maintain its position as a leader in the online healthcare industry.

Exhibit 4.8: Revenue of Ping'an Healthcare from FY 2017 to 2021



Data Source: Ping'an Healthcare financial reports from 2018 to 2021

#### 4.2.2.3 Expense Structure

Ping'an Healthcare's expense structure can be analyzed through two main expenses: selling and marketing expenses and administrative expenses. These two expenses can be found on the company's financial statement, and in 2017, they both took up roughly 38% of the revenue, which is a significant portion of the company's income.

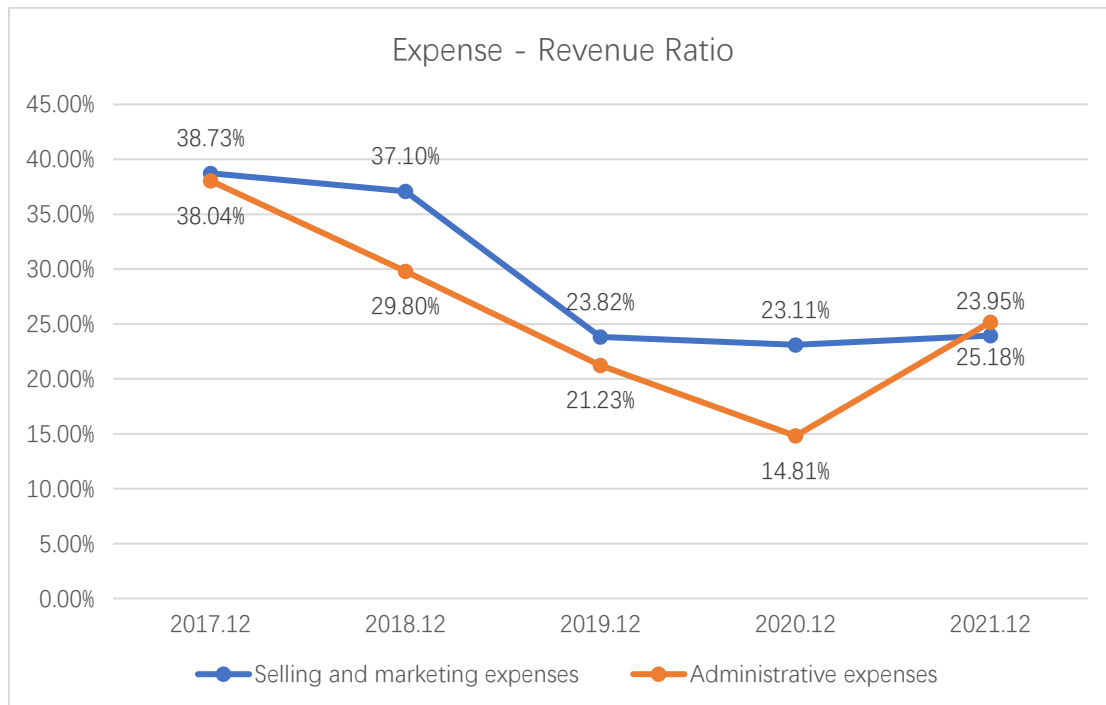
However, both expenses have been declining from 2017 to 2020, indicating that Ping'an Healthcare has been implementing cost-cutting measures while maintaining its revenue growth. Specifically, selling and marketing expenses decreased from 38% in 2017 to 23.11% in 2020, while administrative expenses decreased from 38% in 2017 to 14.81% in 2020.

In 2021, the trend of declining expenses was disrupted, with administrative expenses increasing significantly from 14.81% in 2020 to 25.18% in 2021. This increase could be

attributed to various factors, such as the expansion of the company's operations or investment in new products and services. On the other hand, selling and marketing expenses increased slightly from 23.11% in 2020 to 23.95% in 2021, which also indicates that Ping'an Healthcare is paying online physicians more to retain them on the platform.

It is essential to note that selling and marketing expenses are essential to Ping'an Healthcare's growth as they help the company promote its products and services to potential customers. On the other hand, administrative expenses are necessary for the smooth operation of the company's business. While cost-cutting measures can be beneficial for the company's financial health, it is essential to balance the reduction of expenses with the need for continued investment in essential business functions.

Exhibit 4.9: Expense – Revenue Ratio of Ping'an Healthcare from FY 2017 to 2021



Data Source: Ping'an Healthcare financial reports from 2018 to 2021

#### 4.2.2.4 Free Cash Flow Margin

Ping'an Healthcare has had negative free cash flow over the past five years, which indicates that the company is still not generating enough cash to support its own business. This can be attributed to the fact that Ping'an has consumed a large amount of money for product development, go-to-market strategies, and administrative needs.

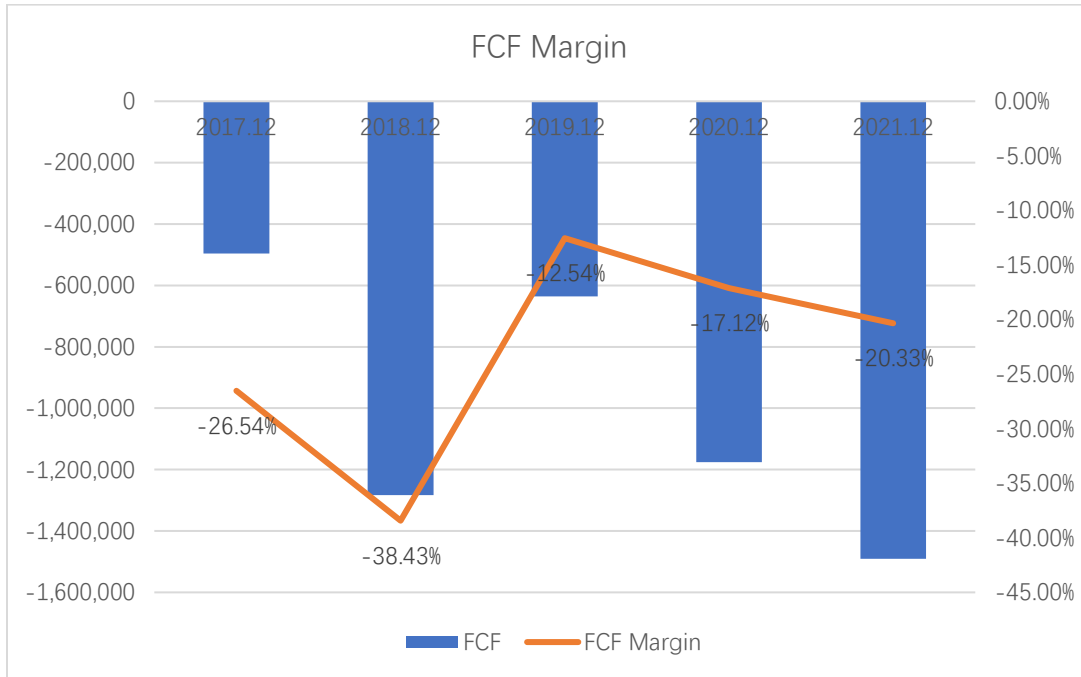
Ping'an Healthcare performed well from 2018 to 2019, Free cash flow margin jumped significantly from -38.43% to -12.54%. But since then, the company's free cash flow margin has continued to decline steadily. This trend may reflect a more competitive market, as Ping'an competes with other healthcare companies to capture market share. The same thing also happens to AliHealth. As the market reaches saturation, investment efficiency may also be slightly lower, which could contribute to the declining free cash flow margin.

The declining free cash flow margin of Ping'an Healthcare should raise caution, as it may indicate that the company is facing greater challenges in generating cash from its operations. While the company has invested heavily in product development and go-to-market strategies, these investments may not be translating into sustainable cash flow generation.

Overall, Ping'an Healthcare's negative free cash flow and declining free cash flow margin suggest that the company is still facing significant challenges in generating cash from its operations.



Exhibit 4.10: FCF Margin of Ping'an Healthcare from FY 2017 to 2021



Calculated using data on Ping'an Healthcare financial reports from FY 2018 to 2021

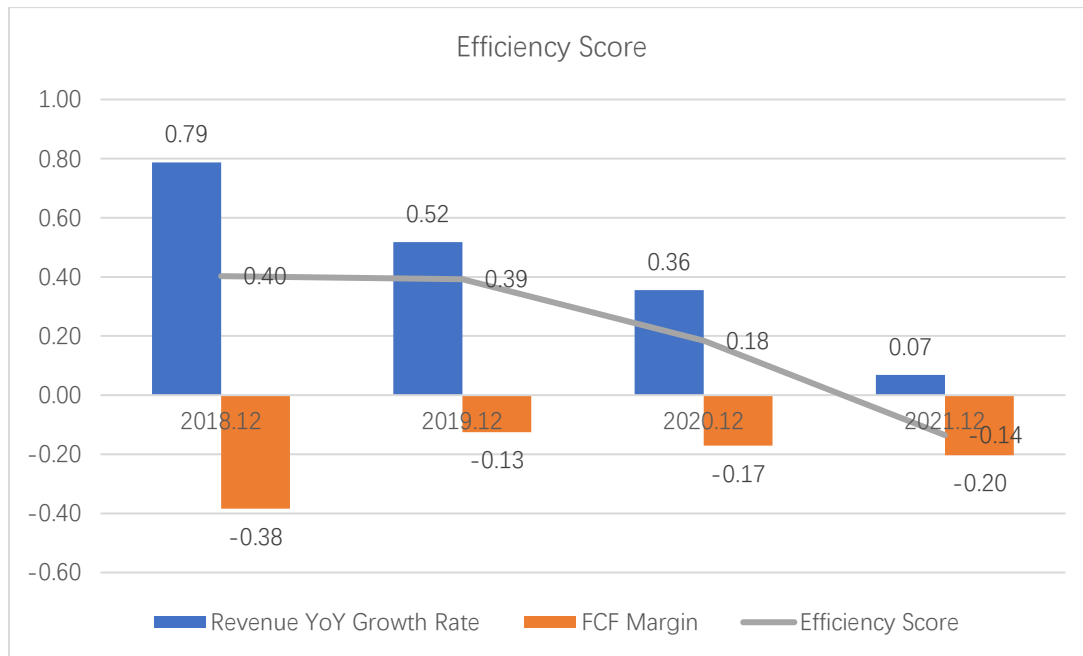
#### 4.2.2.5 Efficiency Score

Ping'an Healthcare's efficiency score remained relatively stable at around 0.40 during 2018 and 2019. However, the score began to decline in 2020, dropping to approximately 0.18 in 2021. This decrease can be attributed to a slower revenue growth rate and a slight drop in free cash flow margin for the company.

In 2021, Ping'an Healthcare faced severe challenges as its efficiency score dropped significantly to -0.20. The main reason for this drop was the dramatic decrease in revenue growth rate from 0.36 in 2020 to 0.07 in 2021. This suggests that Ping'an Healthcare is facing strong competition in the online healthcare industry as well as the impact of weaker consumer spending, and may be struggling to maintain its market position and generate sustainable growth.

The declining efficiency score of Ping'an Healthcare is a cause for concern, as it may indicate that the company is facing challenges in generating revenue from its invested capital. This trend may also suggest that Ping'an Healthcare is facing challenges in adapting to changing market conditions, such as increasing competition and a slower growth rate in the online healthcare industry in China.

Exhibit 4.11: Efficiency Score of Ping'an Healthcare from FY 2018 to 2021



*Calculated using data on Ping'an Healthcare financial reports from FY 2018 to 2021*

#### 4.2.2.6 Cash Conversion Score (CCS)

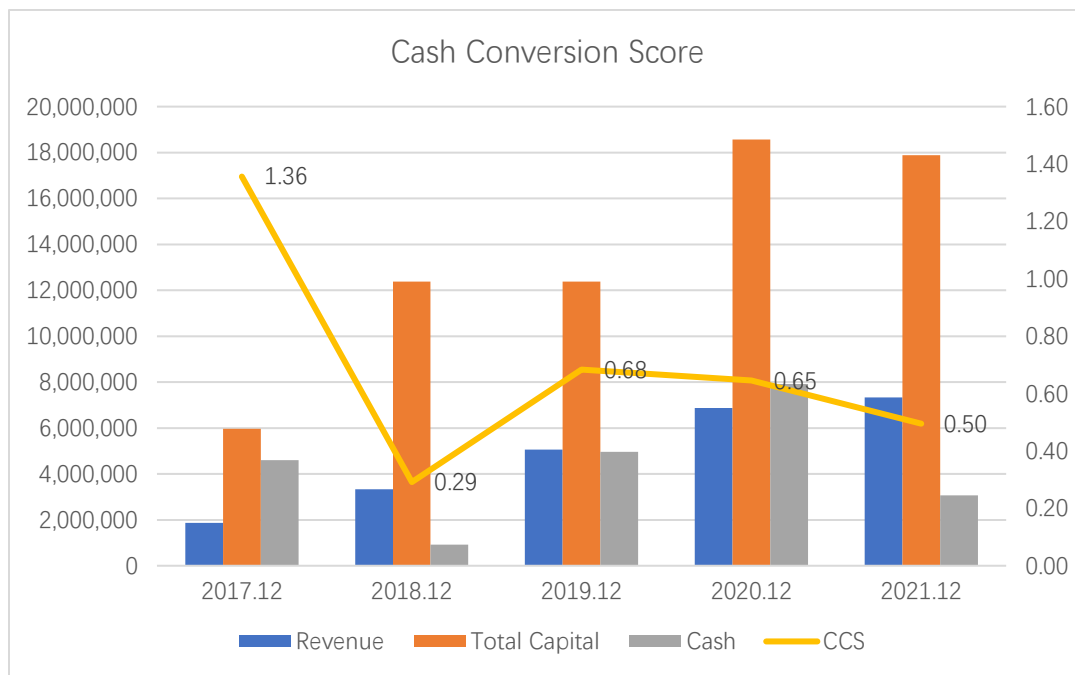
Ping'an Healthcare's Cash Conversion Score has been on a steady decline since 2019, dropping from 0.68 to 0.50. This downward trend indicates that, despite raising a significant amount of money, the company's investment efficiency may not be meeting its expectations. This trend is also reflective of the increasingly intense competition within the online healthcare industry, which is becoming increasingly saturated.

In order to improve its Cash Conversion Score, Ping'an Healthcare will need to take steps to expand its paying user base and revenue streams while also controlling its

expenses. By doing so, the company may have a chance to increase its investment efficiency and better compete in the crowded online healthcare marketplace.

While the declining Cash Conversion Score may be cause for concern, Ping'an Healthcare still has a large user base and a good reputation in China. By taking a strategic approach to cost control and revenue expansion, the company is still able to position itself for long-term success and continued growth in the online healthcare space.

Exhibit 4.12: Cash Conversion Score of Ping'an Healthcare from FY 2018 to 2021



*Calculated using data on Ping'an Healthcare financial reports from FY 2018 to 2021*

## 4.2.3 SWOT Analysis

### 4.2.3.1 Strength

Firstly, Ping'an Healthcare, with its high-quality medical services, has gained widespread recognition in the market and its traffic has grown strongly. During the epidemic, the company responded quickly and saw a surge in online traffic, with a total of over 1.11 billion visits to the platform during the epidemic peak period, and the number of new user registrations on the APP main site was 10 times that before the epidemic. After the epidemic, online traffic returned to normal but still maintained a strong growth trend. As of 2021, the platform's cumulative registered users increased by 13.4% YoY to 422.9 million, with a cumulative consultation volume of 1.27 billion, up 26.4% YoY, and user satisfaction with online consultation remained stable at 97%.

Secondly, Ping'an Healthcare's superior business model has established competitive barriers through long-term investment in the medical and health sector and technological empowerment of healthcare, which has given Ping'an Group a dominant position compared to other insurance companies. Compared with other online healthcare platforms, Ping'an Healthcare uses online medical services as a traffic entry point and connects "social insurance, commercial insurance, users, medical care, and hospitals" through its four business segments to establish a competitive edge.

Thirdly, Ping'an Healthcare relies on its independently developed AI technology to perform the first step of diagnostic analysis on patients at the beginning, then refers them to specialist doctors to achieve precise triage of medical services[12]. The company has also developed a doctor's workbench to assist doctors in improving service efficiency with the help of AI doctor assistants. As of 2021, the company has accumulated over 1.27 billion consultation data, which is conducive to further refining the accuracy of AI technology.

#### 4.2.3.2 Weakness

Firstly, Ping'an Healthcare currently has a high dependence on Ping An Group, with limited ability to expand on its own. According to the prospectus, from 2015 to 2017, Ping An Group's total revenue was ¥ 225 million (80.91%), ¥249 million (41.45%), and ¥866 million (46.35%), respectively. In 2018, the company provided products and services worth ¥1.284 billion to the group, accounting for a high proportion of the company's total revenue at 38.47%. In 2019, the company provided products and services worth ¥2.249 billion to the group, accounting for a high proportion of 44.38%, nearly 50%. The proportion in 2019 increased by 5.91% compared to 2018, further deepening the company's dependence on the group. If there is a disagreement between the two parties' interests in the future, it will still cause serious damage to the company's revenue situation.

Secondly, Ping'an Healthcare's expense ratio is relatively high. From 2017 to 2021, the sales expense ratio of Ping'an Healthcare was 38.73%, 37.10%, 23.82%, 23.11%, and 23.95% respectively, while the management expense ratio was 38.04%, 29.80%, 21.23%, 14.81% and 25.81%, respectively. Compared with its competitors, the ratio is relatively high, and although it shows an overall downward trend, the company's management level still needs to be further improved.

Thirdly, Ping'an Healthcare's internal development of the intelligent auxiliary diagnosis and treatment system, AI Doctor, has made slow progress, and with the rapid increase in online consultation volume, it cannot effectively help its own team of doctors provide high-quality diagnostic and treatment services, which lowers user trust in the company's brand.

#### 4.2.3.3 Opportunity

Firstly, in 2018, the State Council issued the "Opinions on Promoting the Development of Internet + Medical and Health", and in June 2019, the country first clarified that internet medical care can be included in medical insurance payments. The gradual implementation of policies has a great driving effect on the development of internet health and medical care.

Second, the rapidly iterating 5G, big data, cloud computing, and artificial intelligence technologies have created favorable conditions for the development of internet medical care, making various models such as Internet + hospitals, online consultation platforms, medicine, medical insurance, and health services possible.

Third, multiple factors such as changes in population structure and the increasing prevalence of chronic diseases have led to an increase in personal health management needs, and the prospects for the medical and health consumer market are promising. China's population is expected to grow at a CAGR of 0.3% and 0.3% from 2019-2024 and 2024-2030, respectively. By 2030, the population aged 65 and above is expected to reach 309.3 million people, accounting for 21.5% of the total population (12.6% in 2019). Considering that the elderly population generally has greater demand for medication and disease management, the shift in population structure will generate significant demand for health products and medical and health services.

#### 4.2.3.4 Threat

Firstly, industry competition is intensifying. With the entry of giants such as AliHealth and JDHealth, the competition in the industry where Ping'an Healthcare operates has become more intense. Competitors have certain advantages in terms of operating resources, customer coverage, and market penetration. The significant increase in industry competition may have a negative impact on Ping'an Healthcare's business prospects.

Secondly, policies and regulations related to the online healthcare industry are still being developed and perfected, and there is considerable uncertainty and policy risk as policies may fall short of expectations. Due to changes in future regulatory environments, Ping'an Healthcare may need to make significant strategic adjustments, which may affect established development plans.

Thirdly, Ping'an Healthcare has had negative free cash flow over the past five years. This trend has only continued to worsen, and it poses a significant risk to the company's long-term viability. Negative free cash flow means that Ping'an Healthcare is unable to generate sufficient cash from its operations to support its business activities, including investments in new technologies and facilities, research and development, and marketing and advertising campaigns. This lack of self-sustainability is a significant concern for the company, as it may be forced to rely on external sources of funding, such as debt or equity financing, which can be expensive and increase the company's financial risk.

## 4.3 JDHealth

### 4.3.1 Company Introduction

JD Health is a subsidiary of JD.com, one of China's largest e-commerce platforms. JDHealth is a leading online healthcare platform that offers a wide range of products and services, including medical consultations, prescription drug delivery, and health management tools.

JDHealth was founded in 2017. Despite starting later than its competitors, JDHealth has quickly gained momentum and established itself as a major player in the online healthcare industry. Today, JDHealth is one of the three leading providers of online healthcare services in China, alongside AliHealth and Ping'an Healthcare. With its strong focus on innovation and customer satisfaction, JDHealth has quickly gained the trust and loyalty of millions of customers across the country. Now JDHealth is the largest retail pharmacy in China, sitting on more than 15% of the total market share and growing on average four times as fast as its competitors[13]. As the online healthcare industry continues to grow and evolve, JDHealth is well-positioned to continue to play a major role in shaping the future of healthcare in China and beyond.

### 4.3.2 Financial Analysis

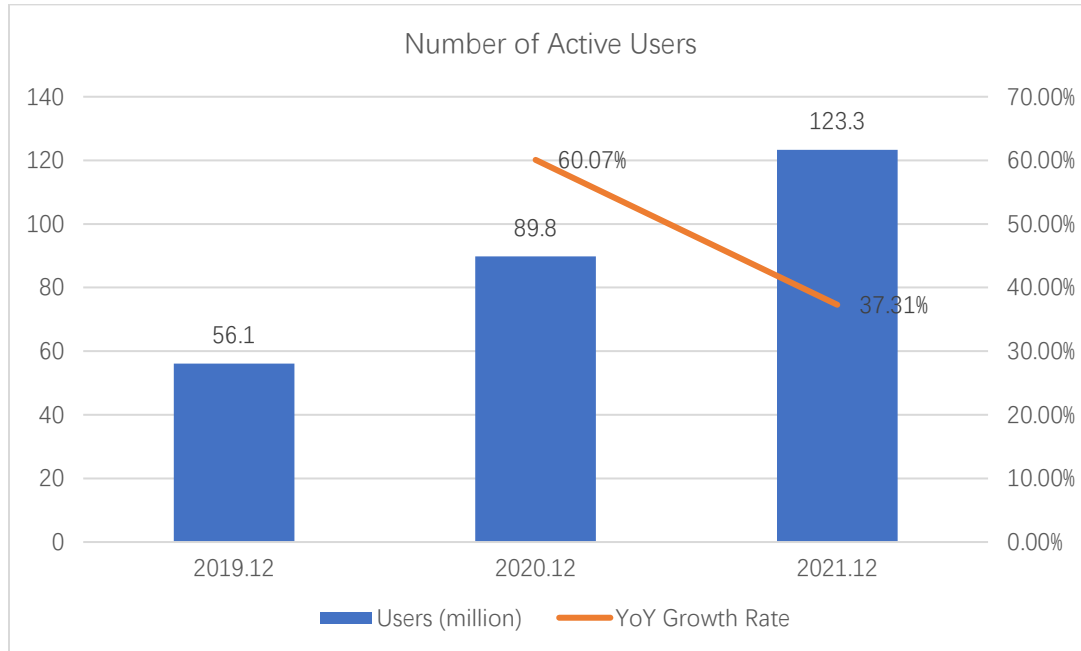
#### 4.3.2.1 Active Users

JDHealth has quickly emerged as a major player in the online healthcare industry since its founding in 2019, gaining a large number of active users in a relatively short period of time. In 2020, the number of active users on the platform reached 89.8 million, representing a remarkable 60% increase from its founding year. The impressive growth continued into 2021, with the number of active users growing to 123.3 million, a 37% increase from the previous year.



While JDHealth's user base is still relatively small compared to the likes of AliHealth and Ping'an Healthcare, its rapid growth and strong momentum make it a potential threat to the established giants in the market.

Exhibit 4.13: Number of Active Users from FY 2019 to 2021



Data Source: JDHealth financial reports from 2019 to 2021

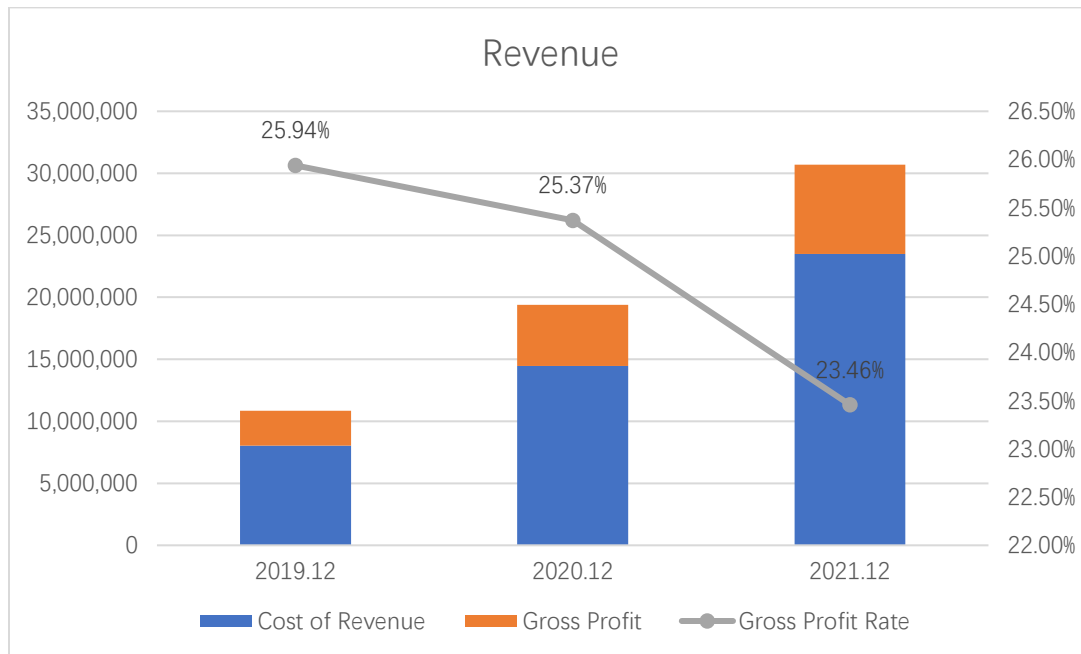
#### 4.3.2.2 Revenue

JDHealth has achieved impressive revenue growth in recent years, with revenue increasing rapidly from 2019 to 2021. In 2019, JDHealth's revenue was ¥10.8 billion, with a gross profit rate of 25.94%. The following year, JDHealth's revenue grew significantly to ¥19.4 billion, increasing by 79.2%, while maintaining a stable gross profit rate of 25.37%. In 2021, JDHealth's revenue jumped to ¥30.7 billion, another 58.4% increase, but the gross profit rate dipped slightly to 23.76%.

Overall, JDHealth's revenue growth over the past two years has been remarkable, while the gross profit rate has remained relatively stable. It is worth noting that the dip in gross profit rate in 2021 is not unique to JDHealth, and can also be observed in its competitors AliHealth and Ping'an Healthcare. As the online healthcare industry in China

and beyond continues to grow and evolve, it is likely that all major players in the market will face similar challenges and fluctuations in revenue and profitability.

Exhibit 4.14: Revenue of JDHealth from FY 2019 to 2021



Data Source: JDHealth financial reports from 2019 to 2021

#### 4.3.2.3 Expense Structure

Over the past three years, the company's expense structure has remained relatively stable in some areas while experiencing significant growth in others.

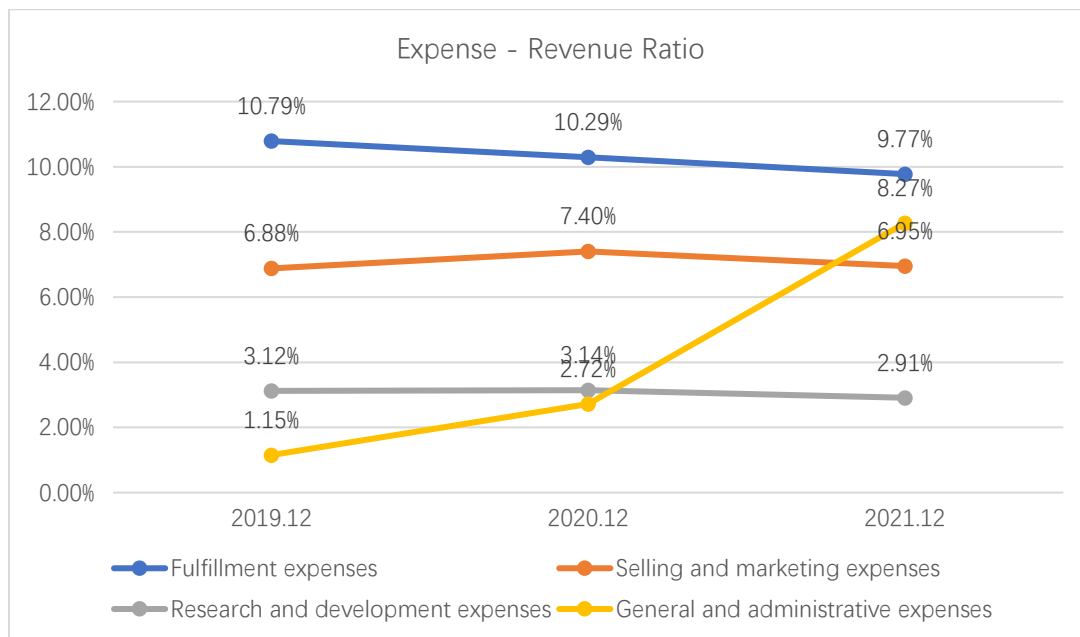
Fulfilling expenses, which include the cost of delivering products and services to customers, have remained consistent over the past three years. This indicates that JDHealth has been able to manage its fulfillment costs effectively and maintain operational efficiency.

Similarly, the company's selling and marketing expenses have also remained stable. This indicates that JDHealth has been able to maintain its market position and customer base without incurring excessive costs in sales and marketing.

However, research and development expenses have also remained stable. This indicates that JDHealth has not significantly increased its investment in research and development activities, which may limit its ability to innovate and stay ahead of its competitors in the long run.

On the other hand, general and administrative expenses have seen a tremendous growth from 2.72% in 2020 to 8.27% in 2021. This is a significant increase and worth noting. These expenses include the cost of management and administrative functions, such as salaries and benefits for employees, rent, and other administrative expenses. It is essential to keep an eye on this trend as such a significant growth in this area may impact the company's profitability in the future.

Exhibit 4.15: Expense-Revenue Ratio of JDHealth from FY 2019 to 2021



Data Source: JDHealth financial reports from 2019 to 2021

#### 4.3.2.4 Free Cash Flow Margin

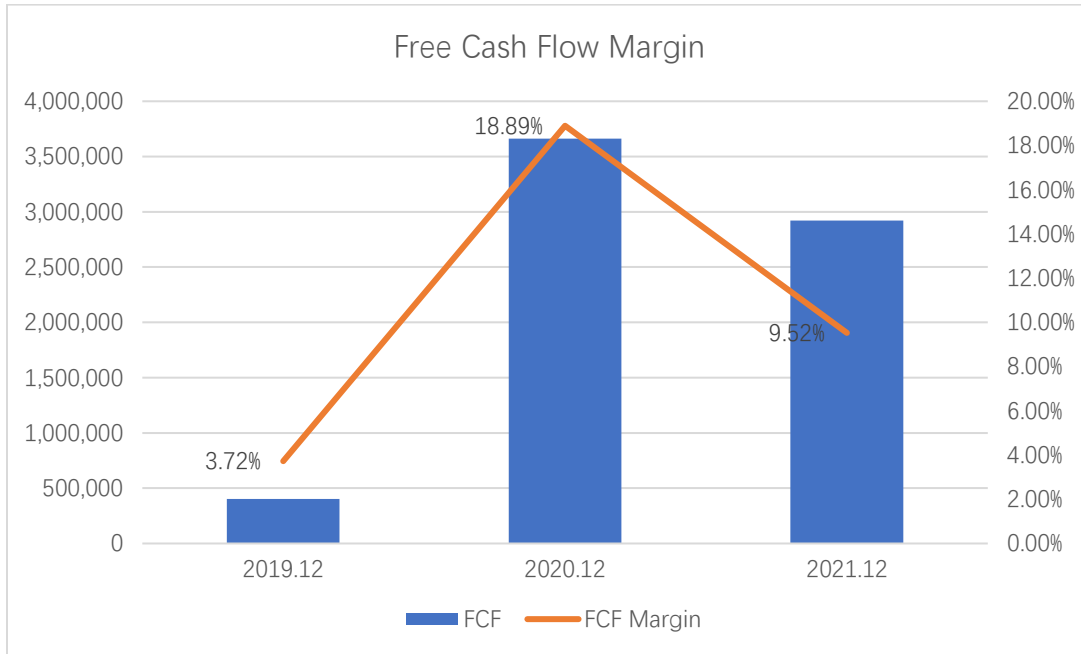
Since its founding, the company has maintained a solid free cash flow margin, which indicates that it generates significant cash flows from its operations after accounting for

capital expenditures. This free cash flow margin is a crucial indicator of a company's financial health and is an essential metric for investors to consider when assessing the sustainability of a company's business model.

Despite the economic downturn and weak consumer spending in 2021, JDHealth's free cash flow margin remains quite impressive. In fact, the company has maintained a free cash flow margin as high as 9.52%, which is a testament to the company's ability to generate significant cash flows from its operations. This is even more impressive given the challenging business environment that JDHealth faced during this time.

A good free cash flow margin is a clear indication that JDHealth's business is sustainable and profitable from a long-term perspective. This margin enables JDHealth to reinvest in its operations, develop new technologies, and pay dividends to shareholders. JDHealth's solid free cash flow margin is a positive sign, as it suggests that the company's business model is robust and has the potential for long-term success.

Exhibit 4.16: Free Cash Flow Margin of JDHealth from FY 2019 to 2021



Calculated using data on JDHealth financial reports from FY 2019 to 2021

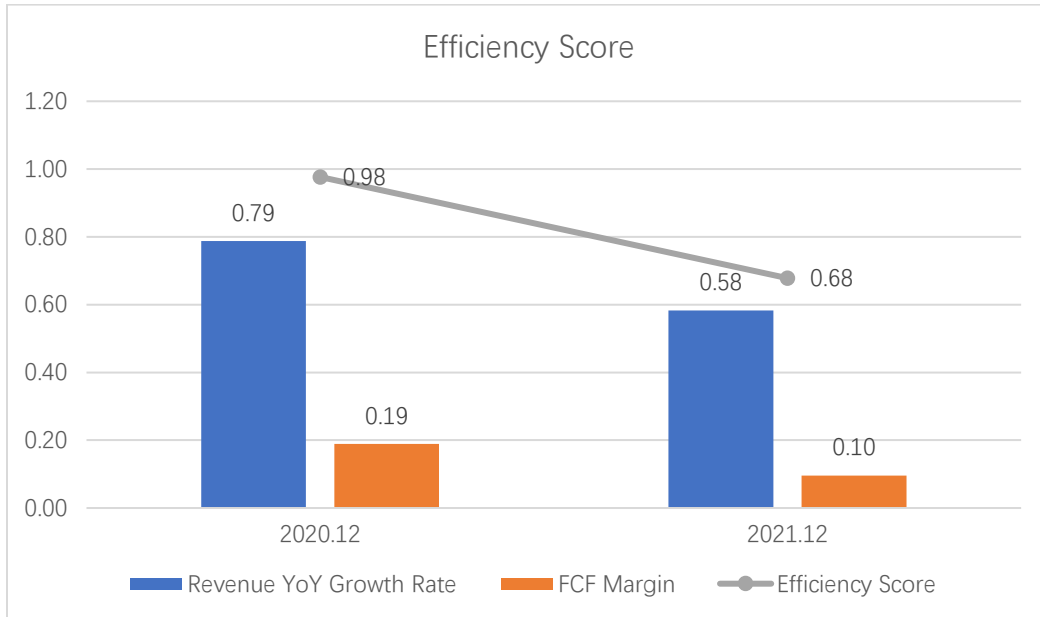
#### 4.3.2.5 Efficiency Score

JDHealth's rapid growth in revenue and solid free cash flow margin have resulted in a highly impressive efficiency score since its founding in 2019. The company has been able to grow rapidly while maintaining a low cash burn rate, which is an excellent sign.

In contrast, Ping'an Healthcare, one of JDHealth's main competitors, has a significantly higher cash burn rate, indicating that the company is spending more cash than it generates. This can be a warning sign as it suggests that the company's business model may not be sustainable in the long run.

JDHealth's impressive efficiency score highlights the company's ability to balance growth with operational efficiency. The company's strong free cash flow margin is a key factor in this efficiency, allowing the company to reinvest in its operations and pursue growth opportunities without overspending.

Exhibit 4.17: Efficiency Score of JDHealth from FY 2020 to 2021



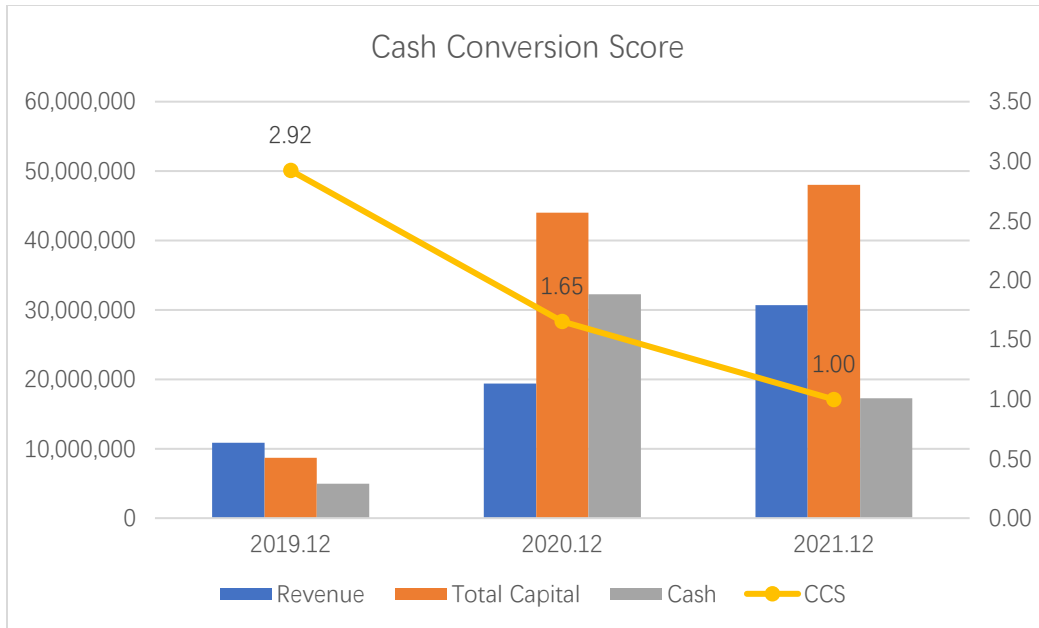
Calculated using data on JDHealth financial reports from FY 2019 to 2021

#### 4.3.2.6 Cash Conversion Score (CCS)

Overall, JDHealth's cash conversion score is impressive, indicating that the company's investment efficiency is high. Although the score has been declining, it is still higher than its competitors and maintains a good momentum. This suggests that JDHealth is utilizing its resources effectively and generating great revenue streams and positive cash flows from its operations.

JDHealth's success in achieving a high cash conversion score can be attributed to its fast user acquisition, good management ability, and expense control. The company has been able to spend every penny efficiently, resulting in a high Cash Conversion Score. This is a testament to the company's ability to manage its resources effectively and generate positive returns.

Exhibit 4.18: Cash Conversion Score of JDHealth from FY 2019 to 2021



*Calculated using data on JDHealth financial reports from FY 2019 to 2021*

### 4.3.3 SWOT Analysis

#### 4.3.3.1 Strength

Firstly, JDHealth's user base has grown rapidly over the past two years, with 60.07% growth in 2020 and 37.31% growth in 2021, indicating strong momentum in its business growth. This significant increase in user numbers highlights the company's ability to provide a high-quality and reliable online healthcare service to its customers.

Secondly, JDHealth has a very strong free cash flow, which means it is able to support its own business using cash generated by itself in a sustainable way. This gives the company greater financial flexibility and the ability to invest in new growth opportunities.

Thirdly, JDHealth's cash conversion score is very healthy, indicating that the company's investment efficiency is at a high level. This allows JDHealth to make strategic investments in areas that will drive long-term growth and profitability.

Fourthly, JDHealth's business model is very focused on online medication, which positions the company to perform exceptionally well in this segment. JDHealth's extensive supply chain network and logistics expertise enable it to provide fast and reliable delivery of medications to its customers.

#### 4.3.3.2 Weakness

One of the most pressing issues is the drop in JDHealth's gross profit rate in 2021, primarily caused by a significant increase in general and administrative expenses. This trend could negatively impact the company's profitability in the future, potentially leading to a decline in investor confidence.

Moreover, JDHealth's efficiency score has also experienced a considerable decline recently, despite remaining the highest among the three leading healthcare companies. This drop in efficiency is due to a decrease in both revenue growth and free cash flow margin, which may serve as an early warning sign of future issues. These factors could lead to a slowdown in the company's expansion and hinder its ability to compete with other players in the market.

Another weakness that JDHealth faces is its focus on online medication only. While the company has established a strong position in this niche market, it may be vulnerable in terms of risk diversification and further revenue expansion. This lack of diversification could limit the company's growth potential in the long run, particularly if the online medication market becomes saturated or regulatory changes limit its scope.

#### 4.3.3.3 Opportunity

Firstly, the company benefits from a favorable social and political environment that facilitates its growth. The Chinese government is actively promoting the development of



the healthcare industry and has implemented policies that encourage the use of digital healthcare services. This environment is supportive of JDHealth's operations, and the company is well-placed to capitalize on these trends.

Secondly, online purchase of drugs has become more and more common in China as mobile payment evolves, and relevant regulations are being perfected. JDHealth has a significant advantage in this regard, as it is a well established player particularly in the online medication market. The company's expertise and experience in the sector enable it to provide a high-quality online purchasing experience for customers, which is likely to drive its growth further.

Thirdly, JDHealth's ability to offer a faster and better delivery service by leveraging its digital supply chain capabilities offered by JD.com is another key opportunity for the company. JDHealth can leverage JD.com's extensive logistics network and delivery capabilities to provide customers with an efficient and seamless delivery experience. This advantage sets JDHealth apart from its competitors and is likely to drive further customer adoption and loyalty.

#### 4.3.3.4 Threat

Firstly, as mentioned above, the competition in the online healthcare market is becoming more and more intense. New players are entering the market, while existing giants are repositioning themselves to stay ahead. This trend could lead to increased competition and pricing pressures, which could negatively impact JDHealth's profitability.

Secondly, JDHealth's cash conversion score has declined significantly from 2.92 in 2019 to 1.00 in 2021, indicating that as its total capital increases, the investment efficiency decreases considerably. This trend is a severe issue that JDHealth must attach high importance immediately because it could lead to lower returns on investment and

eventually strain on its cash flow. If the company is unable to generate sufficient cash flow to fund its operations and investments, it could face difficulty in raising capital and expanding its business in the future.

Thirdly, JDHealth is growing very fast in terms of its user base and revenue, but the administrative expense is also increasing dramatically. This trend indicates that there may be some management issues that could impact or hinder the future growth of the company. It is essential for JDHealth to maintain a balance between growth and cost management to ensure long-term sustainability.

#### 4.4 Conclusion

Exhibit 4.19: A comprehensive comparison of the three companies

<b>Company</b>	<b>AliHealth</b>	<b>Ping’an Healthcare</b>	<b>JDHealth</b>
Market Value (2023.03.23)	\$10.6 Billion	\$3 Billion	\$25.28 Billion
<b>Business Comparison</b>			
Position	Medical and health ecosystem with online healthcare service as the core	Medical and health ecosystem with medical e-commerce and new retail business as the breakthrough	Medical and health ecosystem with medical and health e-commerce as the core
Business Model	Sales of medical and health products and services + Consumer healthcare + Online healthcare service	Online healthcare service+ Consumer healthcare + Healthcare marketplace + Online health management	Medical and healthcare e-commerce + Online healthcare + Smart healthcare solutions
Profit Model	Sales of medical and healthcare products +	Online consultation fee + Annual subscription	Sales of medical and healthcare products +

	Sales of consumer healthcare products + Online consultation fee	fee + Sales of healthcare services and products + Advertisement	Sales of consumer healthcare products
<b>Financial and Operational data Comparison</b>			
Active Users	690 Million	422.9 Million	123.3 Million
Total Asset	\$2.82 Billion	\$2.63 Billion	\$7.06 Billion
Revenue	\$3.03 Billion	\$1.08 Billion	\$4.51 Billion
Net profit rate	-1.29%	-20.99%	-3.50%
FCF Margin	1.05%	-20.33%	9.52%
Efficiency Score	0.34	-0.14	0.68
Cash Conversion Score	2.09	0.50	1.00

Firstly, AliHealth, Ping'an Healthcare, and JDHealth are the three major players in the online healthcare industry in China. These three companies have different focuses and strengths, but they are all competing for the same market share. AliHealth is the most mature company among the three, with the largest user base. The company offers a broad range of services, including online consultation, medication delivery, and health management, making it a one-stop shop for consumers' healthcare needs. Ping'an Healthcare has an aggressive strategy, investing heavily in hiring good doctors and providing quality online healthcare services to gain more users. The company also offers a wide range of services, including online consultation, healthcare product marketplace, and other online hospital services. JDHealth, on the other hand, only focuses on the online sales of medical and healthcare products and does not provide online consultation services. Providing online consultation service can be very costly for online healthcare providers. Both AliHealth and Ping'an Healthcare offer free online consultation services at the very beginning in order to attract users. However, a study shows that offering a free service to establish social relationships may not be an effective tool to increase sales because a 100% increase in prosocial behavior leads to

only an approximately 5% increase in paid consultations, with only 30.2% of it explained by an increase in the number of followers[14]. This also explains why JDHealth is not providing online healthcare services.

Secondly, despite the differences in focus, all three companies are experiencing intense competition in the market. The gross profit rate and efficiency score of all three companies are showing a downward trend, indicating that competition is becoming more intense, and the companies are facing challenges in maintaining profitability. This trend is likely to continue as more players enter the market.

Thirdly, all three companies have a negative net profit, which indicates that they are still burning cash to compete for the market. Among the three, Ping'an Healthcare is the most aggressive, investing heavily in marketing and promotion to gain more users. However, this strategy has yet to translate into profitability, and the company is still struggling to turn a profit. Whereas AliHealth and JDHealth are showing good signs of future profitability, with a strong focus on improving operational efficiency and expanding their product offerings.

Exhibit 4.20: Turnover days of AliHealth

<b>TURNOVER DAYS</b>	<b>INVENTORIES</b>	<b>RECEIVABLES</b>	<b>PAYABLES</b>	<b>CASH</b>
<b>2019.03</b>	50	16	59	<b>7</b>
<b>2020.03</b>	44	13	68	<b>-10</b>
<b>2021.03</b>	41	7	67	<b>-19</b>
<b>2022.03</b>	33	7	66	<b>-26</b>

*Calculated using data on AliHealth financial reports from FY 2019 to 2022*

Exhibit 4.21: Turnover days of Ping'an Healthcare

<b>TURNOVER DAYS</b>	<b>INVENTORIES</b>	<b>RECEIVABLES</b>	<b>PAYABLES</b>	<b>CASH</b>
<b>2018.12</b>	3	48	207	<b>-156</b>
<b>2019.12</b>	5	38	151	<b>-107</b>
<b>2020.12</b>	8	45	131	<b>-78</b>

<b>2021.12</b>	18	64	144	<b>-62</b>
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*Calculated using data on Ping'an Healthcare financial reports from FY 2018 to 2021*

Exhibit 4.22: Turnover days of JDHealth

<b>TURNOVER DAYS</b>	<b>INVENTORIES</b>	<b>RECEIVABLES</b>	<b>PAYABLES</b>	<b>CASH</b>
<b>2020.12</b>	37	1	42	<b>-3</b>
<b>2021.12</b>	37	3	64	<b>-25</b>

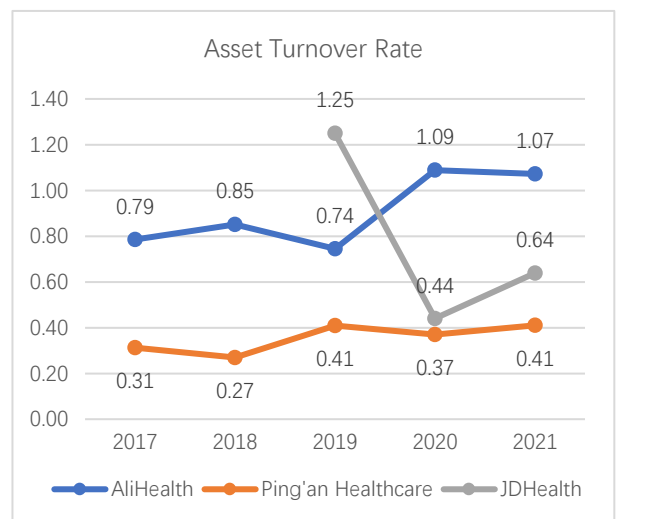
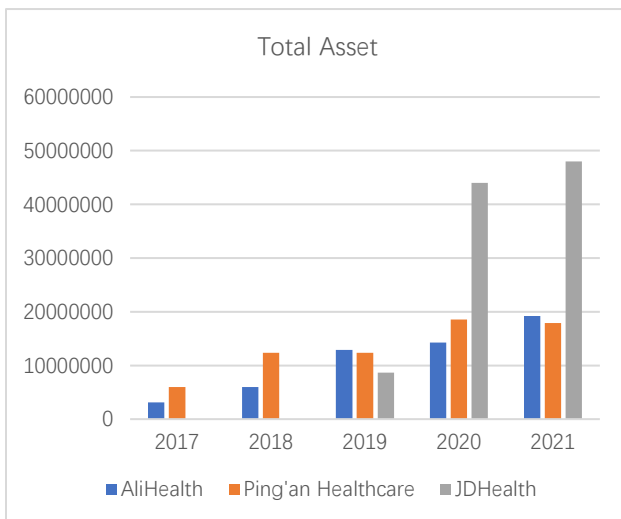
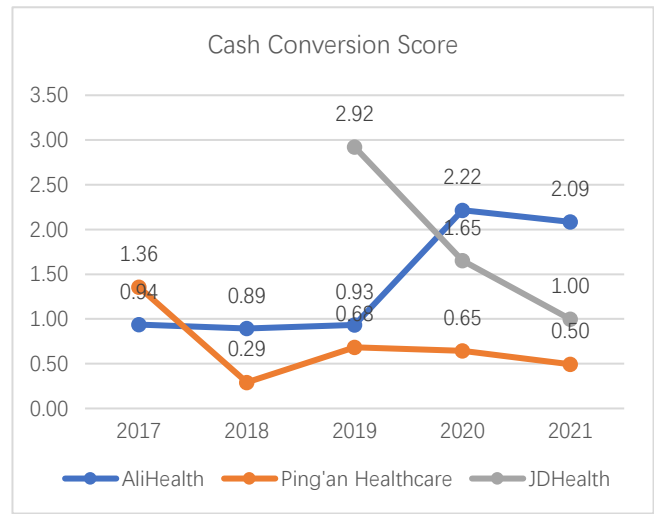
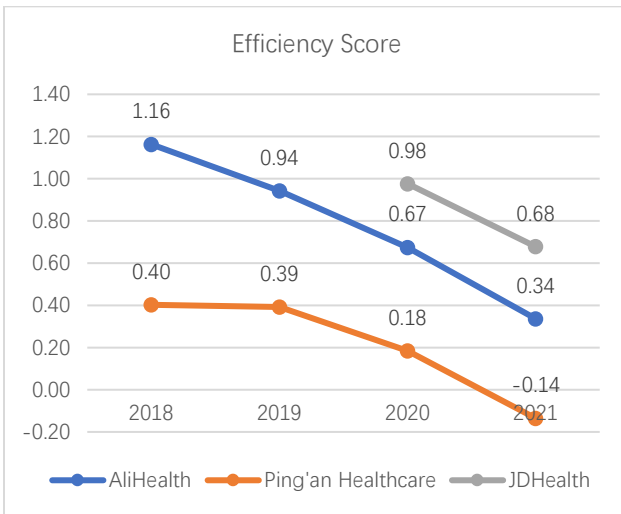
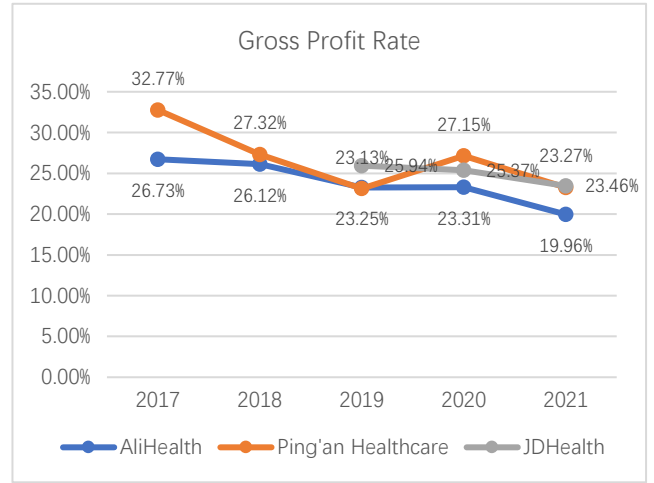
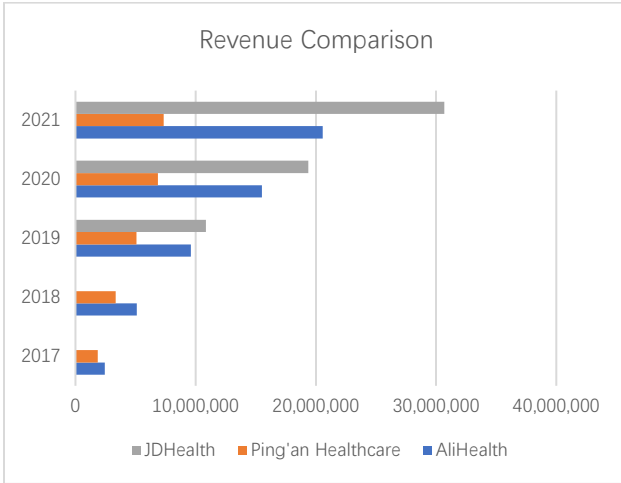
*Calculated using data on JDHealth financial reports from FY 2019 to 2021*

Interestingly, all three of these companies have negative cash turnover days, indicating that they are able to generate cash from their operations before paying their suppliers. This is a strong indicator that their working capital is very affluent and they are able to fund their operations using their own cash flows.

The negative cash turnover days are primarily attributed to longer payables turnover days and shorter receivables turnover days. This implies that all three companies have stronger bargaining powers both upstream (with their suppliers) and downstream (with their customers).

Overall, the online healthcare industry in China is highly competitive, with AliHealth, Ping'an Healthcare, and JDHealth as the major players. These companies have different strengths and strategies, but they are all facing challenges in maintaining profitability and attracting and retaining users in a highly competitive market. As the industry continues to grow, new players are likely to enter the market, making competition even more intense.

Exhibit 4.23: Comparisons of various financial indicators



## 5. Risk, Challenges, and Potential Solutions

### 5.1 Risk and Challenges

There are several risks and challenges posing the online healthcare industry in China. Some of the significant risks and challenges include:

**Regulatory Risks:** The online healthcare industry in China is heavily regulated, and companies operating in this sector must comply with a range of regulations and standards set by the government. The regulatory environment is constantly changing, and companies must keep up with the latest regulations to avoid fines or penalties.

**Privacy and Security Risks:** Online healthcare companies deal with sensitive personal and medical information, making data privacy and security a significant concern. Companies must take measures to protect their users' information, including implementing robust security protocols and complying with data protection regulations.

**Trust Risks:** Ensuring the quality of medical products and services is critical in the healthcare industry. Online Doctor-Patient-Communication occurs outside the hospital environment and without the image of the doctor's persona. Although it increases the discourse power of patients, it could also reduce the authority of doctors and lead patients to distrust the diagnoses of doctors[15]. Online healthcare companies must ensure that the doctors and services they provide meet the required quality standards to avoid trust issues or even negative impacts on users' health and safety.

**Technology Risks:** Online healthcare companies rely heavily on technology, making them vulnerable to cyber threats, system failures, and other technology-related risks. These risks can impact a company's ability to deliver services, compromise user data, and damage the company's reputation.

**Doctor Risks:** Online healthcare platforms require a large number of doctors with a range of specialized medical expertise. Currently, using online healthcare platforms to find a doctor results in lower patient satisfaction (both with the treatment effect and with service attitude) after the patient had seen a doctor than other information sources. Attracting and retaining good doctors can be a significant challenge in this industry.

**Financial Risks:** Online healthcare companies face significant financial risks, including managing cash flow, maintaining profitability, and securing funding for growth and expansion. Most of the companies in online healthcare industry are still having a negative profit and burning cash in order to keep the business up and running. Companies must carefully manage their finances to avoid cash flow issues or financial distress going forward.

In summary, the online healthcare industry in China faces a range of risks and challenges, including regulatory, privacy and security, trust, technology, doctor, and financial risks. Companies operating in this sector must take steps to mitigate these risks and challenges to succeed in this highly competitive and rapidly evolving industry.

## 5.2 Potential Solutions

There are several potential solutions to the risks and challenges facing the online healthcare industry in China.

**Regulatory Compliance:** Companies must invest in legal and regulatory expertise to ensure compliance with the latest regulations and standards. This includes building strong relationships with regulators and monitoring the regulatory environment closely.



**Privacy and Security:** Although patients are concerned about the risk of using the platform, particularly the possible leakage of medical privacy information, they probably still choose online healthcare platforms to seek medical services[16]. With the increasing competition amongst online health service providers, good privacy protection can help them achieve a relative advantage. Online Healthcare service providers can implement robust security protocols, including encryption and firewalls, to protect users' personal and medical information. Additionally, they can comply with data protection regulations and provide transparent and user-friendly privacy policies to build trust with users.

**Trust:** Trust plays a central role in a user's adoption of online healthcare services. Furthermore, trust in online healthcare services can be further divided into two dimensions as follows: capacity trust and integrity trust. Online healthcare service providers that want to attract more users must build user trust on both capacity and integrity dimensions. In other words, the platform must send signals to users that online doctors not only have enough knowledge, skills, and experience to address complex medical encounters but also follow consistent rules that are suitable for the patients[17].

**Technology:** Companies can invest in robust IT infrastructure, including backup and disaster recovery systems, to minimize the impact of cyber threats and system failures. In addition, the introduction of digital twin technology into the field of healthcare management is of great significance to online healthcare platforms in the digital age[18]. For example, digital twin can be used to monitor the health status of patients remotely, allowing healthcare providers to detect potential issues and provide timely interventions.

**Doctors:** According to a study, satisfaction level from popular doctors is significantly lower than that from non-popular doctors for patients who seek doctors, especially through online information. Thus, patients should attempt to break the “bandwagon

effect” and choose a doctor that meets their needs. In addition, from the perspective of the Online Healthcare platform, the recommendation system can be used to increase the exposure of low-popular doctors, so that patients can also filter by region, gender, specialty, etc., and find doctors that are more suitable for them[19]. Besides, in order to promote physician altruism, the online platform should consider encouraging patients to provide more verbal appreciation instead of simple star ratings whenever possible. Moreover, platform designers could try to incorporate external rewards to physicians that are more informational than controlling too[20].

Financial: Companies can manage their financial risks by maintaining adequate cash reserves, optimizing their revenue and cost structures, and exploring funding options such as venture capital or strategic partnerships.

Despite the risks and challenges, China's online healthcare industry is poised for significant growth and innovation, driven by the country's large population, rapid technological development, and growing demand for accessible and affordable healthcare services. Companies can position themselves for huge success in this rapidly evolving industry if they are able to manage the risks and challenges well.

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