
INDUSTRY OVERVIEW

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HEALTH AND WELLNESS MARKET IN CHINA

Overview

China was the second largest healthcare market globally in terms of total healthcare expenditure in 2020. According to Frost & Sullivan, the total healthcare expenditure in China increased from RMB5.3 trillion in 2017 to RMB7.6 trillion in 2021, representing a CAGR of 9.5%. The rapid increase in the total healthcare expenditure in China will continue in the future and is expected to reach approximately RMB11.0 trillion and RMB16.3 trillion by 2025 and 2030, respectively, representing a CAGR of 9.9% from 2021 to 2025 and a CAGR of 8.0% from 2025 to 2030.

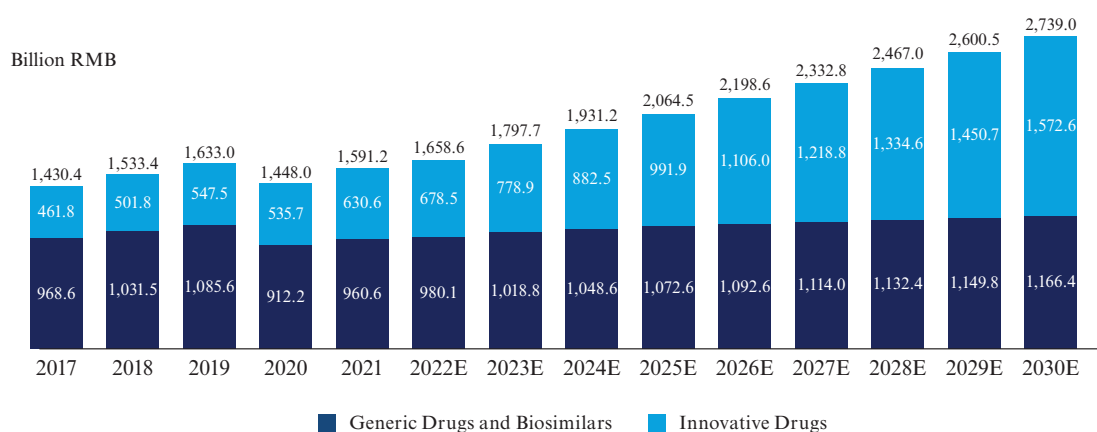
China’s pharmaceutical and medical device market also expanded in line with the growth of the total healthcare expenditure. According to Frost & Sullivan, the size of pharmaceutical market in China increased from RMB1.4 trillion in 2017 to RMB1.6 trillion in 2021, representing a CAGR of 2.7%, and the size of medical device market increased from RMB370.0 billion in 2016 to RMB729.8 billion in 2020, representing a CAGR of 18.5%. Both the pharmaceutical market and the medical device market are expected to grow further, reaching RMB2.1 trillion and RMB1.2 trillion, respectively, by 2025 and RMB2.7 trillion and RMB1.7 trillion, respectively, in 2030.

As a result of the growth of China’s pharmaceutical and medical device companies, the continuous breakthroughs in research and development, the increasing clinical demand, the improved payment capacity, as well as the favorable policies that promote pharmaceutical

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innovation, brought huge opportunities for the overall biopharmaceutical industry, paving the way for future development. The table below sets forth the breakdown of China’s pharmaceutical market by generic drugs and biosimilars and innovative drugs:

CAGR	Generic Drugs and Biosimilars	Innovative Drugs	Total
2017–2021	-0.2%	8.1%	2.7%
2021–2025E	2.8%	12.0%	6.7%
2025E–2030E	1.7%	9.7%	5.8%



Source: Frost & Sullivan Report

Nevertheless, under the background of cost control and the price reductions, the intense competition in the commercialization of new drugs, and insufficient marketing resources of local biotech companies brought new challenges for the biopharmaceutical industry as well as the health and wellness market in China.

Growth Drivers

According to Frost & Sullivan, growth of China’s health and wellness market has been driven by the following factors:

- Increasing Aging Population and Chronic Disease.** The population aged 65 and above increased rapidly in China at a CAGR of 6.1% from 2017 to 2021. According to the NBSC, individuals aged 65 and above reached 200.6 million in 2021. The number of individuals aged 65 and above is expected to reach 247.1 million and 317.6 million by 2025 and 2030, respectively. With more aging population in China, there will be a higher population base for chronic diseases, driving up the growth of the health and wellness market.

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- ***Favorable Government Policy.*** China has adopted various policies aiming to promote China’s health and wellness market, such as, among others, policies encouraging the innovation and development of pharmaceutical and medical device companies and policies optimizing the structure of the healthcare system and the medical security system. Furthermore, the reforms on “Hierarchical Diagnosis and Treatment” (分級診療) motivate primary hospitals to enhance their infrastructure and encourage physicians at such hospitals to improve their skills and medical knowledge so as to meet the growing needs of patients. The release of the “Medical Representative Registration System” (醫藥代表登記備案管理辦法) regulates and facilitates the process of drugs and medical devices entering into hospitals, under the general background of digitalization and the gradually proven value of academic-based marketing. Moreover, reforms on volume-based procurement decrease the overall profit of medical products, compelling pharmaceutical and medical device companies to commercialize their products in an efficient manner. As such, although a number of innovative drugs and medical devices have been launched under such favorable policies, it still takes time and money to commercialize and market such medical products, prompting pharmaceutical and medical device companies to find an efficient and cost-effective approach to promote and commercialize their innovative drugs and medical devices.
- ***Advocacy on Rational Use of Drugs and Medical Devices.*** Unlike conventional “one fits all” treatment, rational use of drugs and medical devices is increasingly advocated because it allows physicians to select and customize treatment to achieve potentially best outcomes in terms of safety, effectiveness and affordability. To better realize the rational use of drugs and medical devices, the way to keep complete and accurate records of patients’ information has received increasing attention. As a good way to keep good records of patients, digitalization is expected to be applied more widely in the healthcare services, thereby driving the market forward.
- ***Advancement of Digital Technology.*** The development of science and technology promotes the integration of medical services with emerging digital technologies. As the technical basis of the digital healthcare service market, digital technologies such as big data, cloud storage and AI enhance the quality of the healthcare. With improved healthcare service quality, more patients are encouraged to seek digital healthcare services, therefore promoting the healthcare market.

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Future Trends

According to Frost & Sullivan, the following are the future trends of China’s health and wellness market:

- ***Digital Transformation and Increasing Regulatory Support for Digitalization.*** Digital transformation of the healthcare market includes three main stages — data generation, data analysis and data decision-making. In the data generation stage, customer data is only aggregated as records to use as a reference for subsequent marketing. At the data analysis stage, customer data is further analyzed to provide meaningful insights on the marketing process. At the decision-making stage, digitalization is no longer a tool for marketing solutions, but to connect all digital tools to provide customers with targeted services. For instance, physician platforms could utilize big data to accurately profile physicians, assisting pharmaceutical and medical device companies in efficiently promoting drugs and medical devices. More and more pharmaceutical and medical device companies are demanding data decision-making such that the physician platform that could provide data decision-making support is likely to dominate the future physician platform service markets. Affected by the development of science and technology, the encouragement of national policies, and the growth of clinical demand, the healthcare market in China, especially the healthcare marketing market, is showing a trend of digital transformation. Digital technology, despite its utility, has inbuilt drawbacks such as lower transparency and lower security. It is expected that the digital healthcare service market will be subject to more regulations promulgated by the government to regulate the industry practice in the future. This, together with regulations that promote digitalization, would accelerate the development of the digital healthcare market.
- ***EBM to VBM.*** Evidence-based medicine (EBM), which has gained popularity in recent years, could be regarded as a medical approach that emphasizes the application of well-designed and well-executed research and medical evidence to optimize the clinical decision-making and minimize the uncertainty of clinical examination. Influenced by various factors such as aging population, shortage of medical resources, unmet clinical needs and raising health awareness, the healthcare industry uncovered that relying solely on best research evidence to make the optimum clinical decision is not sufficient, leading to the transition from EBM to value-based medicine (VBM). Apart from EBM’s well-designed research and objective results based on best medical evidence available, VBM also takes patient’s life expectation and the cost of treatment into consideration, supporting the clinical decision-making process and further boosting the healthcare market.

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- ***Two-way Mutual Promotion between Physician Resources and Physician Platform.*** Currently, the medical resources in China are distributed unevenly, leading to excessive working hours of physicians in higher level hospitals. Whereas for physicians in primary healthcare institutions, career development could still be limited due to the lack of resources and most up-to-date medical knowledge. Under such circumstances, physicians tend to seek a more convenient and efficient approach to acquire academic knowledge, which could drive the growth of physician platforms. Physician platforms could provide physicians with basic, advanced, and expanded medical support services, which are comprehensive enough to meet the needs of physicians at different stages of their careers, including, but not limited to, reducing medical risks, enriching medical knowledge, improving medical capabilities and career promotion, expanding industry connections, producing academic achievements, and enhancing the public influence and industry influence. In the future, it is expected that platforms with abundant physician resources could enhance the connection between physicians, medical institutions, pharmaceutical practitioners, and professionals in life science, further improving the quality of healthcare.

DIGITAL HEALTHCARE MARKETING SERVICE MARKET

Overview of Digital Healthcare Marketing

Healthcare marketing helps pharmaceutical and medical device companies promote sales by enabling healthcare professionals to better understand the characteristics of medical products. Within healthcare marketing, digital healthcare marketing is an emerging marketing method based on multiple channels such as telephone, SMS, email, social media and other channels to achieve precision marketing and data-driven marketing results. Furthermore, there is an increasing focus on academic-based digital detailing to raise physicians’ awareness and understanding of specific drugs and medical devices and assist with physicians’ prescription decisions. As a result, a digital marketing model that can incorporate high-quality clinical and scientific research output is likely to dominate the future digital healthcare marketing market.

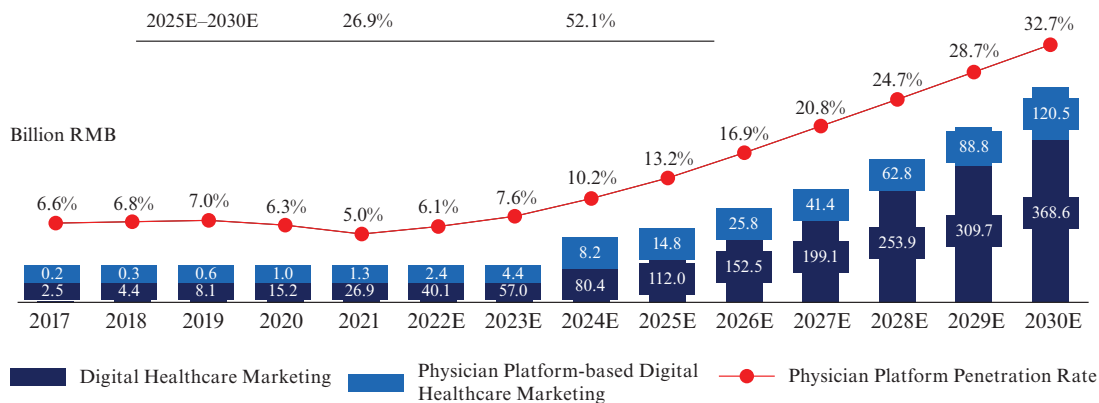
Market Opportunity

Healthcare marketing can be further divided into traditional marketing by medical representatives and digital healthcare marketing. Centralized and volume-based procurement system, increasing competition resulted from the spurt of innovative drugs and medical devices, and restrictions on offline marketing due to the COVID-19 pandemic, together with the rapid development of digital technology, compel pharmaceutical and medical device companies to search for a cost-effective marketing solution to commercialize their medical products. As a result, the digital healthcare marketing market in China increased from RMB2.5 billion in 2017 to RMB26.9 billion in 2021, reaching a CAGR of 80.3%, and such market is expected to grow further reaching RMB112.0 billion and RMB368.6 billion, respectively, by 2025 and 2030, representing a CAGR of 42.9% from 2021 to 2025 and a CAGR of 26.9% from 2025 to 2030. Within the digital healthcare marketing market, the market for physician platform-based digital healthcare marketing

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increased from RMB0.2 billion in 2017 to RMB1.3 billion in 2021, reaching a CAGR of 68.1%, and such market is expected to grow further reaching RMB14.8 billion and RMB120.5 billion, respectively, by 2025 and 2030, representing a CAGR of 82.4% from 2021 to 2025 and a CAGR of 52.1% from 2025 to 2030. The table below sets forth the market size of digital healthcare marketing market and physician platform-based digital healthcare marketing market and the penetration rate of physician platform-based digital healthcare marketing:

CAGR	Digital Healthcare Marketing	Physician Platform-based Digital Healthcare Marketing
2017–2021	80.3%	68.1%
2021–2025E	42.9%	82.4%
2025E–2030E	26.9%	52.1%



Source: Frost & Sullivan Report

Competitive Landscape

The market for digital healthcare marketing is an emerging market, and there are approximately 200 participants with varying business models in China. As the market for digital healthcare marketing is relatively small as compared to the overall market for healthcare marketing, even large players in this market represent a small fraction of the overall healthcare marketing market in China. Nevertheless, China’s digital healthcare marketing market is intensively competitive. In view of the important role physicians play in the medical ecology, it is expected that the penetration rate of platforms with abundant physician resources could grow rapidly. Furthermore, physician users on one platform may also register accounts on other physician platforms. As such, players in this market need to compete fiercely to attract, engage and retain physician users.

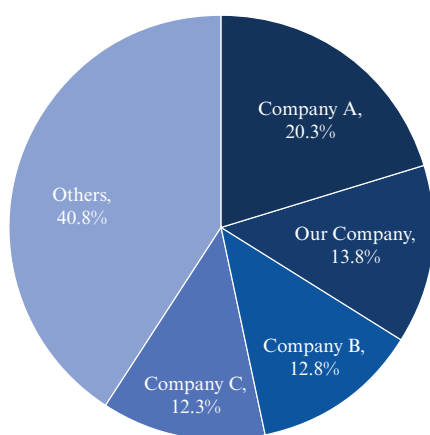
We believe that we can compete effectively with other players in the digital healthcare marketing market due to our large and experienced physician user base and advanced digital technologies, which allows us to reach a wider group of physicians more efficiently and helps pharmaceutical and medical device companies achieve better return on marketing spending. During the Track Record Period, our customers for precision omni-channel marketing solutions included all of the top 20 global pharmaceutical and medical device companies in 2021 in terms of revenue, 82% of the top 50 global pharmaceutical and medical device companies in 2021 in terms of revenue, 50% of the innovative drug

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companies listed on the STAR Market pursuant to the fifth set of listing standards as of December 31, 2021 and 43% of the biotech companies listed on the Hong Kong Stock Exchange pursuant to Chapter 18A of the Listing Rules as of December 31, 2021.

The following diagram sets forth the market share and ranking of the physician platform-based digital healthcare marketing market in China in 2021:

Million RMB



Company	Revenue	Share
Company A	270.9	20.3%
Our Company	184.1	13.8%
Company B	171.0	12.8%
Company C	164.9	12.3%
Others	544.9	40.8%
Total	1,335.7	100.0%

Source: Frost & Sullivan Report

Growth Drivers

The growth of digital healthcare marketing is primarily driven by the following factors:

- Growing Demand from Pharmaceutical and Medical Device Companies.** Reduced margins driven by policy initiatives and payer cost controls are compelling pharmaceutical and medical device companies to upgrade their traditional marketing methods to improve efficiency. Moreover, pharmaceutical and medical device companies will need to develop academic medical contents and product promotion capabilities that are more appealing to their target physicians in order to meet their digital marketing needs. Due to the cost and the market participants’ inexperience in the transition, the demand for third-party digital marketing services is expected to continue to grow.
- Growing Number of Physician Users.** The physician community has been profoundly affected by the rapidly evolving Internet industry and healthcare system reforms in China. Connections between patients and physicians, resulting in a demanding work schedule for physicians and an increased need for efficient access to latest medical knowledge information, have driven up the number of the physician audience to sign up for various digital platforms to access medical knowledge information. The physician platform that better understands the various demands of physicians could be more attractive to physician users, further facilitating the development of digital healthcare marketing services.

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- ***Need for Academic-based Digital Marketing.*** Physicians are required to keep abreast of the most cutting-edge medical developments in order to provide patients with efficient treatment, and this drives the development of academic-based digital marketing. As such, digital marketing providers who can better address the interest, background and clinical needs of physicians through academic medical contents are likely to dominate the future digital healthcare marketing market.
- ***Growing Need for Novel Therapeutics.*** The increasing challenges of health problems are driving patients to seek better treatment. On the digital platforms, physicians can have access to a large variety of scientific knowledge on medical products and learn about the most recent therapeutics which cater to patients’ needs. Therefore, with the continuously growing patients’ needs for novel therapeutics, physicians are increasingly demanding a digital marketing service that can inform them about such novel therapeutics. As such, the demand for third-party digital marketing services is expected to grow.

Future Trends

According to Frost & Sullivan, the following are future trends of the digital healthcare marketing market in China:

- ***Focus on Academic-Based Digital Marketing.*** As a result of healthcare industry reforms, pharmaceutical and medical device companies are in need of evidence-based solutions in delivering their product information to physicians’ communities. Academic medical contents are especially relevant given they can provide more background information on the underlying disease or potential cures for physicians, as well as make physicians more informed about cutting-edge medical information. Furthermore, with the development of big data technology, the professional academic contents can more efficiently reach the target physician audience who are interested in learning such professional academic medical contents in their field of expertise, satisfying their research or career development needs. As such, digital marketing campaigns that have proven ability to efficiently integrate and disseminate academic-based materials could be acclaimed among both physicians and pharmaceutical and medical device companies.
- ***Growing Penetration of Platform-based Digital Marketing.*** Platform-based digital marketing service providers possess abundant physician resources, solid academic backgrounds and advanced digital technologies, which could provide a wide range of services to various stakeholders involved in medical ecology. Thus, it is expected that the penetration rate of platform-based digital marketing could continue to rise in the future, further promoting the integration of healthcare and digital technology.

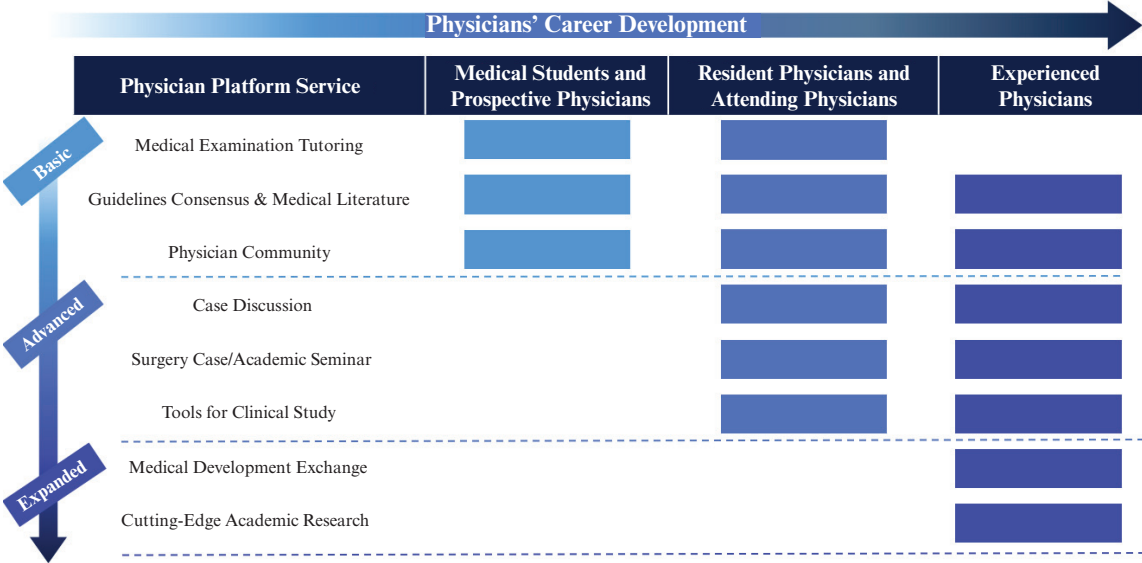
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- **Big Data Driven.** Big data, AI algorithms and other technologies have made the sharing of information more rapid, intelligent and efficient. The combination of new technological means with traditional medical information has greatly broadened the application of data. At the same time, the large amount of physicians’ behavioral data accumulated by third-party physician platforms can also be analyzed through big data to obtain a more accurate portrait of physicians, thus better serving the physician users and marketing needs of pharmaceutical and medical device companies.
- **Increasing Industry Concentration.** The market for digital healthcare marketing remains in its early stage in China. However, in recent years, many information platforms with a sizable physician user base have expanded their business to digital marketing services. In the future, with the standardization and specialization of digital marketing services, leading platforms in this industry are expected to make up a large market share in the digital healthcare marketing market.

PHYSICIAN PLATFORM SERVICE IN CHINA

Overview of Physician Platform Service

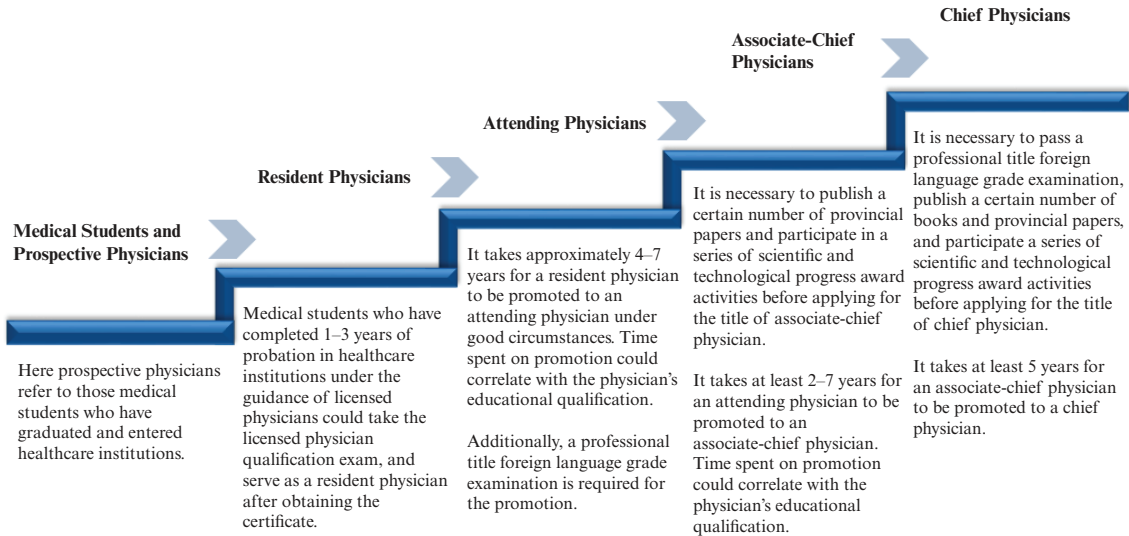
A physician platform is a professional social network for physicians, medical institutions, pharmaceutical practitioners, and professionals in life science, supporting communication and pooling expertise, cutting-edge research, and other information in the fields of healthcare and life science. Physician platforms could provide physicians with basic, advanced and expanded medical support services, which are comprehensive enough to meet the needs of physicians at different stages of their careers, including, but not limited to, reducing medical risks, enriching knowledge, improving medical capabilities, promoting career development, expanding industry connections, producing academic achievements, and enhancing the public influence and industry influence.



Source: Frost & Sullivan Report

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The career development of physicians takes a lot of time to accumulate medical knowledge and experience. In terms of career development lifespan, physicians need to go through various different stages in China, that can be roughly divided into resident physicians, attending physicians, associate-chief physicians and chief physicians. The diagram set forth below illustrates the career development stages of physicians in China. The time spent indicated in each career development stage is the minimum threshold under the assumption that every qualification standard is able to be managed and completed smoothly. It is highly possible that a physician’s title remains to be associate-chief upon retirement, considering the limited number of available posts for chief physicians in China.



Source: Frost & Sullivan Report

Value of Physician in Healthcare Industry

Physicians are connected to all major parties in the healthcare and wellness market, such as patients, enterprises, hospitals and payers. At the core of medical ecology, experienced physicians have a strong influence on all major parties involved in the medical ecology and physician platform that is rich in physician resources strengthens the connection between physicians and all major parties. According to Frost & Sullivan, experienced physicians, primarily physicians with the title of associate-chief physician and above, represent 18.0% of the total number of physicians in China as of December 31, 2021.

- **Other Physicians.** The diagnostic and therapeutic habit and research methodology of experienced physicians could have a great impact and serve as guidance on other physicians.
- **Hospitals.** Hospitals can enhance recognition and trust among patients by having a talent pool of experienced physicians due to such physicians’ higher industry influence.

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- **Patients.** Experienced physicians play a more important role in the prevention, diagnosis, treatment and rehabilitation of diseases, which results in high diagnosis and treatment efficiency and leads to a stronger patient-physician connection.
- **Pharmaceutical and Medical Device Companies.** Although all physicians have prescription power, some drugs, especially innovative drugs, are generally prescribed only by experienced physicians. Therefore, they play a decisive role in guiding patients’ medication and adjusting prescriptions. Academic-based promotional efforts made by pharmaceutical and medical device companies among experienced physicians may result in an increase in application of the underlying medical products.
- **Payers.** Experienced physicians could promote the rational drug use, which reduces payers’ costs. Furthermore, experienced physicians can provide payers with valuable information on pharmaceutical industry trends and the necessary information in order to promote comprehensive medical insurance coverage.

Furthermore, junior physicians, such as resident doctors, are playing an increasingly important role in the overall medical ecology. Addressing such physicians’ needs are crucial for the development of the healthcare industry.

Market Opportunities

The number of physicians in China increased from 3.4 million in 2017 to 4.3 million in 2021, representing a CAGR of 5.9%, and is expected grow further. Despite the growing number of physicians in China, the physician platforms in China that address physicians’ comprehensive needs are still in the early stage of commercialization and development cycle as compared to physician platforms in developed countries. For instance, the average revenue contribution per registered physician user reached approximately RMB94 for us and RMB89 for Company A, in 2020, according to Frost & Sullivan. In the meantime, in 2020, the average revenue contribution per registered physician user reached RMB1,735 and RMB793, respectively, for leading physician platforms in Japan and in the United States, respectively. As such, as compared to physician platforms in Japan and in the United States, there is sufficient room for physician platforms in China to further develop and commercialize and the average revenue contribution per registered physician in China is expected to grow further.

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Competitive Landscape

The physician platform service market in China is growing and evolving fast. A large number of players have stepped in the market and there are a number of potential new entrants. We believe that we can compete effectively with these players due to our large and experienced physician user base and research support capabilities, which enable us to address the lifelong research and learning needs of physicians. According to Frost & Sullivan, we operate one of the largest online professional physician platforms in China in terms of registered physician users and average MAU in 2021. The following tables set forth the services provided and number of registered physicians and average MAU of major physician platforms in China in 2021, as well as the number and percentage of users with the title of associate-chief physician and above of major physician platforms in China in 2020:

	Established	Number of Registered Physicians, 2021 (Million)	Average MAUs, 2021 (Million)	Services Provided			
				Medical Content & Tools	Clinical Evidence Collection	Academic-based Evidence Analysis	Evidence Dissemination and Application
Our Company	2012	2.6	2.5	×	×	×	×
Company A	2006	3.1	1.6	×	×		×
Company B	2000	3.0	1.2	×		×	×
Company C	2014	2.3	1.1	×			×
Company D	2011	1.9	0.4	×	×		×

	Number of Associate-Chief Physician and Above, 2020 (in thousands)	Percentage of Associate-Chief Physician and Above, 2020
Our Company	506	68.8%
Company A ⁽¹⁾	430	58.4%
Company B ⁽²⁾	400	54.4%
Company C ⁽³⁾	283	38.5%
Company D ⁽⁴⁾	279	37.9%

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Notes:

- (1) Company A is a professional medical information service and precision digital marketing service provider established in Beijing, providing precision marketing and corporate solutions, medical knowledge solutions and intelligent patient management solutions.
- (2) Company B is a digital medical health technology enterprise established in Harbin with rich professional knowledge and medical data accumulation, providing high-quality medical services including health knowledge popularization, online health consultation, health product e-commerce, academic exchanges, continuing education, medication guidance and career development.
- (3) Company C is a comprehensive platform established in Shanghai to support physicians’ career development, providing high-quality medical contents, practical medical tools, academic exchange platforms, and comprehensive solutions for digital marketing.
- (4) Company D is an Internet medical enterprise established in Beijing featuring digital tools, providing professional medical contents and clinical tools, case-based full-scenario marketing services and Internet hospital-related services.

Source: Frost & Sullivan Report

With respect to the medical knowledge services we offered under our physician platform solutions, we believe the medical knowledge services we offered are more attractive to physicians as compared to self-developed medical knowledge platforms of pharmaceutical and medical device companies, primarily because (i) unlike medical knowledge services offered by pharmaceutical and medical device companies that focus on their own products, the medical knowledge information we offered on our *MedSci* platform is more comprehensive and covers all major therapeutical areas and (ii) we believe the information we provided are regarded as more trustworthy in the eyes of physicians because we are a third-party medical knowledge information provider. In many cases, self-developed knowledge platforms of pharmaceutical and medical device companies provide links to materials on our *MedSci* platform for illustration and education purposes. As such, we do not believe we compete directly with the self-developed medical knowledge platforms of pharmaceutical and medical device companies and even if we do, we believe our platform has a competitive edge over such self-developed platforms by pharmaceutical and medical device companies.

Furthermore, the clinical study assistance services we offered as a part of our physician platform solutions are different from our RWS solutions primarily because while the sponsors of RWS are often pharmaceutical and medical device companies, the sponsors of IITs are physicians. Moreover, while RWS involves various parties such as hospitals, physicians and contract research associates in addition to pharmaceutical and medical device companies, our clinical study assistance services only serve the initiators, primarily physicians, during their self-initiated IITs or other non-registered clinical trials. As such, we optimize our clinical study assistance services for physicians based on the physicians’ specific demands and requests.

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REAL-WORLD STUDY SERVICE MARKET

Overview

RWS refers to the systematic collection of data generated from drugs and medical devices in real clinical settings and clinical application scenarios, and research using evidence-based medicine and clinical epidemiology methods. Randomized controlled trials (“RCT”), a common standard to evaluate the effectiveness and safety of treatment, is constrained by the limitations of trial design and the biased selection of patients. As a result, the trial samples may not be enough to reflect the real-world clinical practice. However, unlike RCT, RWS covers a wide range of factors in the clinic such that the data obtained provide a more comprehensive picture of the real-world effects of drugs and medical devices and help answer a wide range of clinical questions.

Although there is no mandatory requirement on when to conduct RWS, RWS can support drug and medical devices development and regulatory decision-making, as well as other scientific purposes, such as non-registration-based clinical decision-making. Regarding drug and medical device development and regulatory decision-making, RWS can provide (i) evidence on efficacy and safety for the commercialization of new medical products; (ii) evidence for changes to the instructions of commercialized products, including, among others, indication expansion of new products, dosing optimization, dosing regimens and routes of administration; and (iii) evidence for re-evaluation of commercialized products. Generally, RWS could support drug and medical device regulatory decision-making, covering multiple links such as pre-market clinical development and post-market evaluation, providing safety and efficacy evidence for the products. For instance, real-world evidence could act as an external control of a single-arm clinical trial for rare diseases and life-threatening diseases that lack effective treatments.

It is noted that the use of real-world evidence for the purpose of drug and medical device registration and indication expansion requires sufficient communication with the drug and medical device review department to ensure that both parties reach a consensus on the use of real-world evidence and conducting real-world research. As regulatory policies for clinical trials keep evolving and become more reasonable for study designs under different clinical scenarios and development purposes, the scope of real-world research will be wider in the future. To be clear, RWS, as a clinical research method during recent years, is not able to replace the role of RCT as the mainstream clinical research method, but as a supplement to help resolve limitations of RCT.

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Market Opportunity

RWS could reflect the effect of drugs and medical devices in real clinical practice, which could contribute to the acceleration of their commercialization process, safety and efficacy evaluation of drugs and medical devices, expansion of indications and efficient marketing. As a result of such benefits brought by RWS, China’s RWS market grew rapidly from RMB0.02 billion in 2017 to RMB0.7 billion in 2021, with a CAGR of 142.5%. The RWS market in China is expected to continue its growth trend to reach RMB7.4 billion and RMB42.8 billion, respectively, by 2025 and 2030, with a CAGR of 77.3% from 2021 to 2025 and a CAGR of 42.1% from 2025 to 2030.

Competitive Landscape

According to Frost & Sullivan, currently, there are three main types of players in the RWS market in China, namely, physician platform-based RWS, CRO-based RWS and big data-based RWS. The table below summarizes the key differences of different RWS players.

Pre-Research	Physician Platform-Based RWS	CRO-Based RWS	Big Data-Based RWS
Study Protocol	• Demand-based study protocol design	• Demand-based study protocol design	• Patient data-based study protocol design
Database	• Electronic Data Capture System	• Electronic Data Capture System	• Electronic Data Capture System
Ethical Review	• Assisting in ethical review	• Assisting in ethical review	• Assisting in ethical review
Project Management			
Patient Recruitment	• Recruiting patients with the support of abundant physician resources in a time-efficient and cost-efficient manner	• Recruiting patients at exorbitant expense	• Recruiting matched team members and patients via omni-channel
Site Options	• Site options based on physician resource	• Site options based on prior cooperation and internal BD list	• Site options based on limited cooperation-established hospitals
Project Execution	• Project execution under the surveillance of professional academic team	• Project execution supported by CRA Data collection supported by CRC from SM companies	• Self-owned CRC team for data collection
Data Transaction	• AI supported data collection, ensuring both quality and cost control	• Data collection supported by CRC from SMO companies and data management ran by DM team of the CRO company	• Direct data transaction from HIS of each site to data base through specific port
Research Results			
Data Management	• Data quality control and query management	• Data quality control and query management	• Data Processing and Polishing
Data Analysis	• Analysis of Research Results	• Analysis of Research Results	• Ongoing Patient Data Collection and Analysis
Research Output	• Article polishing, editing and transaction support	• Solutions for real-world evidence formation, drug commercialization, and indication extension	• Commercialization solutions based on research findings and market conditions

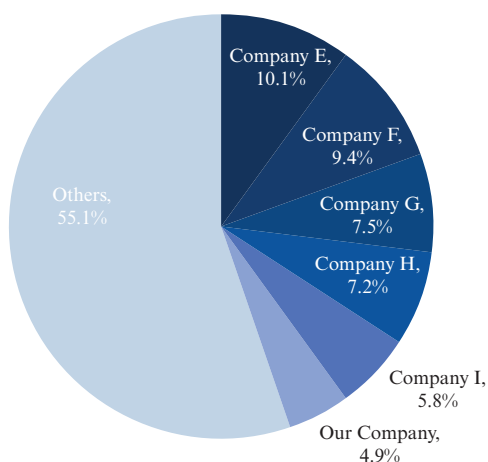
Source: Frost & Sullivan Report

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Physician platform-based RWS, CRO-based RWS and big data-based RWS are classified based on the advantages and characteristics of these companies at a business start-up stage. With the development of the industry, physician platform-based RWS, CRO-based RWS and big data-based RWS are gradually realizing wider service coverage and making up for their respective shortcomings. The following table sets forth the top six market players of the RWS service market in China in terms of revenue in 2021:

Breakdown of China RWS Market, 2021

Million RMB



Company	Revenue	Share
Company E ⁽¹⁾	75.5	10.1%
Company F ⁽²⁾	70.3	9.4%
Company G ⁽³⁾	56.0	7.5%
Company H ⁽⁴⁾	54.1	7.2%
Company I ⁽⁵⁾	43.2	5.8%
Our Company	36.6	4.9%
Others	411.6	55.1%
Total	747.3	100.0%

Source: Frost & Sullivan Report

Notes:

- (1) Company E is an advanced data-driven and AI-enabled healthcare technology company established in Beijing focusing on critical diseases, providing continuous patient care solutions, AI diagnosis and treatment, patient management services, RWS services, clinical trial matching services and data insights services.
- (2) Company F is a comprehensive company serving the combined industries of health information technology and clinical research established in Durham, North Carolina, U.S., providing advanced analytics, technology solutions, and clinical research services.
- (3) Company G is a healthcare big data solution provider established in Beijing, providing data processing and application solutions, analytics-driven clinical development, real-world evidence-based research, digital commercialization solutions, physicians’ research and management tools, and insurance technology and disease management solutions.
- (4) Company H is a computing and big data technology-based digital solutions provider established in Jiaxing, providing a wide range of products and services including clinical research, pharmacovigilance, and pharmaceutical marketing.
- (5) Company I is a comprehensive big data-driven service platform established in Beijing, providing general and specialist disease diagnosis and treatment services, pharmacy-related services, health insurance-related services, healthcare data services, and new drug clinical trial services.

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Although the three main types of players could all provide support during the whole life cycle of RWS, the physician platform-based RWS could offer customers the most flexible, selective and cost-efficient solutions. For instance, in terms of site options, the sites provided by big data-based RWS companies are relatively fixed, which could not provide diversified and flexible options and could not satisfy the specific needs of customers. CRO-based RWS companies can provide corresponding site options according to the needs of customers, but it could take a lot of time and labor cost in the process of site negotiation. The physician platform-based RWS companies have abundant physician resources, which directly contribute to linking to the site that is truly suitable for the situations of customers' RWS in a short time and at a lower labor costs. As such, physician platform-based RWS could provide their customers with the most suitable hospital choices to conduct clinical trials, which is supported by the strong physician resources accumulated over years. As such, according to Frost & Sullivan, physician platform-based RWS is expected to play a more important role in the RWS market in China in the future.

However, RWS still suffers from limitations. For instance, whether real-world evidence can fully support pharmaceutical and medical device development and regulatory decisions depends on various factors such as data sources, data standards, data quality, data sharing, and data infrastructure. Incomplete underlying data may not meet the criteria for statistical analysis and could not be used further. Furthermore, real-world evidence can act as an important part of the evidence for pharmaceutical and medical device regulatory decision-making in order to form a complete data chain in support of regulatory decision-making, which compels the scope of real-world evidence to be adjusted in time according to the actual situation. Currently, there remains no clear scope of application for real-world evidence. Last but not least, real-world evidence is mainly generated through fully analyzing real-world data with causal inference, which involves complex models, assumptions, and the application of artificial intelligence, leading to comparatively high requirements for relevant research analysts.

Growth Drivers and Future Trends

According to Frost & Sullivan, the following are growth drivers and future trends of RWS market in China:

- ***Improved Decision-Making Capability.*** Influenced by the increasing clinical needs and driven by national policy support, RWS is expected to be more widely used in clinical trials of drugs and medical devices in the future, playing a key role in the generation of clinical solutions. Furthermore, the real-world evidence generated by RWS can provide ideas for development of the healthcare industry, such as innovative drug research and development. Additionally, the real-world evidence could further be integrated with patient value to improve the clinical decision-making for drugs and medical devices.
- ***Increasing Demand for Medical Evidence.*** The medical products need medical evidence not only before the commercialization stage, but also during the commercialization stage to support the continuous output of medical evidence development. Meanwhile, as medical product homogenization intensifies, it is

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necessary to find subtle differences among the products of the same class to benefit a larger patient community. RWS can generate valuable real-world evidence to support medical evidence development, alleviate concerns over medical product homogenization and benefit patients. Furthermore, the update to the National Reimbursement Drug List has created an urgent need for pharmaceutical and medical device companies to communicate the latest medical evidence with physicians in primary healthcare institutions.

- ***Growing Patient Demand.*** With the aging population, the needs of patients for drugs and medical devices are increasing. However, research on efficacy and safety data of new medical products takes a lot of time. RWS can save time for clinical trials of new medical products, speed up the launch of new drugs and medical devices, and benefit patients. Additionally, real-world evidence can effectively support the expansion of drug indications and adapted populations to meet patient needs. As a result, the demand for RWS is expected to increase.
- ***Address Shortcomings of RCT.*** At present, RCTs are used to evaluate the effectiveness and safety of drugs and medical devices, but the trials have strict restrictions on the test contents and test subjects, and cannot reflect the real clinical situation. Real-world research can make up for the limitations of RCT research and further help carry forward clinical research. For instance, in terms of rare diseases and life-threatening diseases, traditional RCTs have relatively high conditions for clinically enrolled patients, and the number of patients who meet the inclusion criteria is small. Compared to RCTs, RWS has fewer restrictions on patient enrollment conditions, age, and medication regimens, which could utilize the combination of prospective and retrospective researches to avoid conducting the randomized controlled trials of critical patients with rare diseases or life-threatening diseases, conforming to the ethics standards. Therefore, RWS can widely cover possible problems in clinical practice, provide evidence support for the safety and efficacy of drugs and medical devices, and promote efficient and rational use of drugs and medical devices by physicians.
- ***Empower Pharmaceutical and Medical Device Companies.*** Pharmaceutical and medical device companies need to invest significant time and money in the research and development of new drugs and medical devices, while RWS can save time and money spent on recruiting qualified patients, reduce time spent in clinical trials, and speed up the clinical trial process. Moreover, RWS can link research institutions with healthcare enterprises to reduce investment in marketing through real-world evidence of drug’s safety and efficacy.

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DIGITAL CHRONIC DISEASE MANAGEMENT AND DIGITAL THERAPY

Failure to adhere to prescribed medication regimens is one of the main reasons that patients do not achieve the expected outcomes from their treatments. Digital chronic disease management provides patients with more convenient access to reliable healthcare information, which offers patients a more direct and effective communication channel with physicians. As such, digital chronic disease management has enormous market potentials. According to Frost & Sullivan, the digital chronic disease management market in China increased from RMB73.6 billion in 2017 to RMB240.4 billion in 2021, at a CAGR of 34.4%. Such market is expected to reach RMB824.9 billion and RMB2,040.9 billion, respectively, by 2025 and 2030, representing a CAGR of 36.1% from 2021 to 2025 and a CAGR of 19.9% from 2025 to 2030.

The digital therapy programs are useful in chronic disease management. Through digital therapy programs, physicians can better understand their patients’ clinical needs and manage their treatments, facilitating communication and achieving better treatment outcomes. As such, the digital therapy market is expected to continuously grow in the future.

SOURCE OF INFORMATION

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