

# The Impact of the Coronavirus on Chinese Pharmaceutical Industry

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## ABSTRACT

The outbreak of the new crown pneumonia epidemic has brought impact and changes to the lives of all people. It also puts forward higher requirements on the production capacity and creativity of Chinese pharmaceutical industry. Under the epidemic, the development of Chinese pharmaceutical industry is facing good opportunities and ushered in bright prospects. But it is undeniable that there are still some problems and challenges that need to be resolved. A simple analysis of the current situation and development opportunities of Chinese pharmaceutical industry is carried out. Some problems and challenges in its development process are explored, and some relevant countermeasures are put forward to promote the healthy and rapid development of Chinese pharmaceutical industry.

**Keywords:** China, coronavirus, Pharmaceutical industry

## 1. INTRODUCTION

Medicine is closely related to people's health, so the development of the pharmaceutical industry has always been concerned by the society. Especially with the outbreak of the new crown epidemic this year, the attention of all sectors of society to the pharmaceutical industry has increased significantly.

Looking at the impact of the epidemic on the pharmaceutical industry, there are both positive and negative impacts. The epidemic has promoted the introduction of a series of systems, mechanisms and systems, and has also presented new opportunities and challenges to the pharmaceutical industry. Good opportunities for development need to be firmly grasped, correctly responding to the challenges and solving some existing problems in order to promote the healthy and rapid development of Chinese pharmaceutical industry and effectively protect the health of the people.

## 2. THE CURRENT SITUATION OF CHINA'S PHARMACEUTICAL INDUSTRY

### 2.1. International Market Positioning

At present, China has become the world's largest producer and exporter of APIs (active pharmaceutical ingredients)[1], the world's second largest OTC drug market, and the world's third largest pharmaceutical

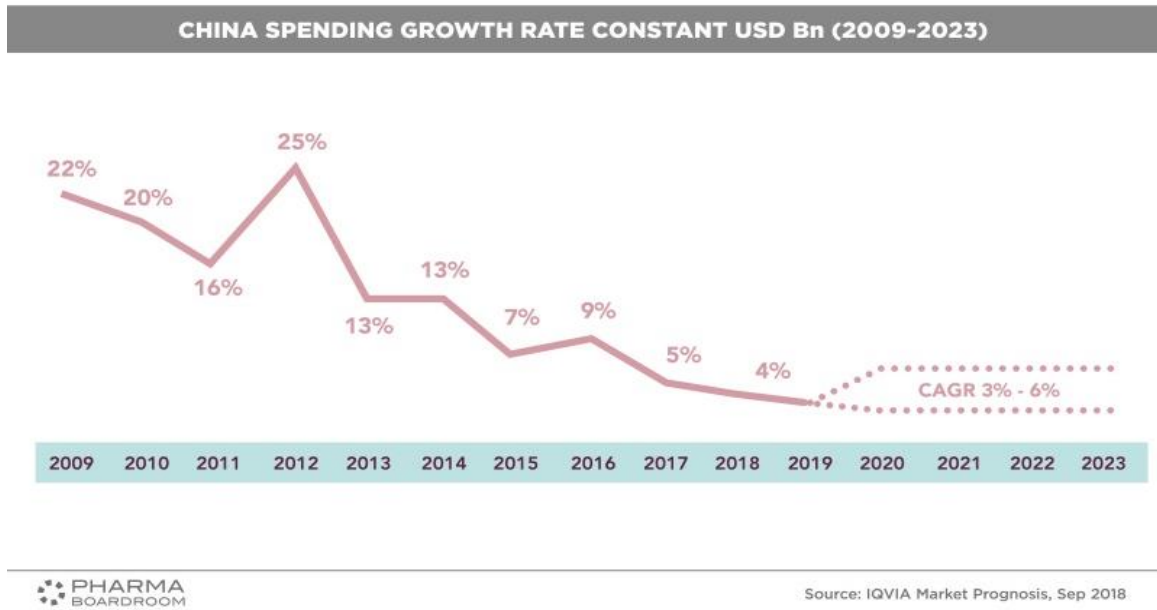
market. China produces more than 1,500 types of APIs (more than 2,000 types are produced globally). The market size of overall number of APIs accounts for more than one-third of the world, and the entire global pharmaceutical industry is very dependent on China. At the same time, the global pharmaceutical industry market has the following characteristics: the development of the pharmaceutical industry in developed countries is relatively slow, while it is relatively rapid in emerging countries. In 2018, the growth rate of the top five European markets in developed and mature markets has dropped to 1-4%, and the overall growth rate of Japan is expected to be 3-0%. The size of the entire emerging pharmaceutical market will reach 286 billion dollars with a growth rate of 6.9%, and the 2019 Outlook Report of IQVIA predicts that by 2023, the overall scale of emerging markets will reach 355 -385 billion dollars with a compound annual growth rate of 5-8%, exceeding the global average growth rate. Here, it is important to note that in 2018 China's total medical expenditure reached 137 billion dollars[1], accounting for almost half of the new emerging market. However, the development of China's pharmaceutical industry is still among the new nations. Due to the lack of core technology, China has long been among the major pharmaceutical countries but not a medical power nation.

## 2.2. Analysis of the operation of the pharmaceutical industry

In 2019, Chinese pharmaceutical industry vigorously implements the Healthy China 2030 strategy and comprehensively promotes high-quality development. The overall operating situation is obviously improving. The main economic indicators such as industrial added value and main business income have maintained rapid growth, and continue to play leading role in all industries.

### 2.2.1. The total output value

The total output value of China's seven major pharmaceutical industries during the "Eleventh Five-Year Plan" period reached a compound growth rate of 23.32%. Since entering the "Twelfth Five-Year Plan", the total output value of the pharmaceutical industry has maintained a rapid growth trend. In 2019, the total output value of China's pharmaceutical industry has reached 2.5 trillion yuan, and it is expected that the scale of output value will continue to grow in 2020.



**Figure 1.** China Spending Growth Rate Constant USD Bn (2009-2023)[2]

### 2.2.2. Sales output value

From January to December 2019, the operating income of China's pharmaceutical industry reached 2390.86 billion yuan, a year-on-year increase of 7.4%, and the industry realized a total profit of 311.95 billion yuan, a year-on-year increase of 5.9%. The compound annual growth rate in the next five years (2019-2023) is about 8.53%, and it is predicted that by 2023, the total sales revenue of China's pharmaceutical manufacturing industry will reach 3931.3 billion yuan.

### 2.2.3. Total profit

The profitability of the pharmaceutical industry continues to be stable, and the gross profit margin increases. From January to December 2019, the gross profit margin of China's pharmaceutical industry was 43.5%.[3] With the gradual improvement of China's pharmaceutical patent system, the global pharmaceutical market is continuing to shift from mature Western markets to Emerging markets in Asia. At the same time, the growth focus of the global pharmaceutical consumer market has shifted from mainstream markets such as

Europe and the United States to emerging countries, which has brought sustained profit growth to China's pharmaceutical industry.

## 2.3. Development of Chinese Pharmaceutical Manufacturing Industry

As mentioned above, although China's pharmaceutical industry is large in scale, China is still only a big pharmaceutical country, and there is still a big gap compared with a strong pharmaceutical country. The main reason is that the overall level of China's pharmaceutical industry is still in the middle and low-end stages. In terms of innovation, the overall innovation capabilities of pharmaceutical manufacturing companies are insufficient.

First of all, in terms of technology, medical products are mainly generic drugs with low technical content. The manufacturers of general medicines are mostly small and medium-sized enterprises that lack financial strength, research and development capabilities, and marketing networks. Compared with new drugs and specialty drugs, their technical content is low, and their added value is also very low. On the whole, China's pharmaceutical level is still significantly lower than the

international advanced level. At the same time, because China's pharmaceutical industry does not master the core technology, the technology content of Chinese pharmaceutical industry is low, and the pharmaceutical manufacturing industry has not yet multiplied by corresponding industry standards, and its competitiveness in the international market is relatively low.

Secondly, in terms of independent intellectual property rights, China's preparations are backward in production and mainly imitate foreign new drugs, lacking independent intellectual property rights. Therefore, Chinese pharmaceutical companies should strengthen their awareness of independent innovation and produce drugs with independent intellectual property rights.

Finally, the size of the enterprises in China's pharmaceutical manufacturing industry is generally relatively small, and the products are mostly the same. Pharmaceutical manufacturing enterprises often don't pay attention to scientific research investment and talent training. The above-mentioned reasons have created the current development of China's pharmaceutical manufacturing industry.

### 3. THE DEVELOPMENT OF CHINA'S PHARMACEUTICAL INDUSTRY UNDER THE NOVEL CORONAVIRUS EPIDEMIC

#### 3.1. Market Demand Expansion for Medical Devices

The epidemic stimulates the development of the pharmaceutical industry. Affected by the epidemic, the residents' demand for certain medical products and medical services has been stimulated and increased,

especially the demand for intensified antiviral drugs, antibacterial drugs, Chinese patent medicines, and medical protective equipment such as masks, disinfectants, ventilators, and oxygen generators. The data has shown that Alibaba International Station has supplied 12 types of medical protective equipment such as masks, protective suits, and thermometers. The demand for epidemic prevention materials in March was compared with last year that the growth rate has tripled over the same period and has exceeded 300% in Europe.

In terms of medical services, the outbreak of epidemic has increased the demand for Internet medical consultation, pharmaceutical distribution, and pharmaceutical retail. At present, China's total health expenditure accounts for 6.4% in GDP. There is still a large gap in medical and health investment compared with developed countries. In the long term, the outbreak of epidemic has exposed the insufficient construction of the medical and health system, and the subsequent government will continue to increase investment in medical and health services, especially the prevention of infectious diseases.

The export of medical products has soared. With the spread of the epidemic, some medical device companies have received orders from Europe, North America, Latin America and other countries. For example, the infrared temperature thermometer equipment produced by Andon Health Co., Ltd. has been used on overseas e-commerce platforms. The sales amount is more than 4,000 units; The scales of a cross-border medical device trading platform in Beijing reached more than 60 million yuan in March, which is equivalent to the annual sales of last year.[4]

countries	Donations or exports
The United States	China exports 17,000 ventilators to New York
Japan	China has donated 2,000 testing kits to Japan
South Korea	Guangzhou has donated 200 infrared thermometers to Incheon
Pakistan	In early February, the Chinese government sent an emergency shipment of 1,000 COVID-19 test kits to Pakistan On March 9, China assisted Pakistan with 14,000 copies of the COVID-19 test kit
Iran	The Chinese Embassy in Iran donated 5,000 nucleic acid testing kits
Italy	In March, China sent teams of volunteer experts to Italy many times, carrying ventilators, monitors, defibrillators and other ICU equipment, protective equipment such as masks and protective suits, antiviral agents, ECMO, plasma of ordinary people and plasma of people who have recovered from the virus to support Italy's fight against the epidemic
North Macedonia	200 ventilators
namibia	1000 sets of test kits from China have arrived
Other countries	Donate or export COVID-19 test kits

Figure 2. Analysis on the impact of Covid-19 on medical Devices in 2020[4]

The price of medical products has soared. Affected by the relationship between supply and demand, the prices of some medical devices have been rising, and there is even a phenomenon of driving up prices.

### **3.2. Policy Support from Local Governments**

Although the epidemic has stimulated market demand, it has a certain negative impact on the industrial chain of the pharmaceutical industry and all production entities. For example, the management efficiency of enterprises has been greatly reduced, the expansion of outlets has been delayed, and marketing has been forced to slow down. Branding was forced to adjust, etc., therefore, local governments also gave timely policy support.

#### *3.2.1. Financial support*

Various governments and regions have different support policies, but they will actively encourage financial institutions to make use of innovative financial instruments and increase investment in biomedical enterprises or institutions in this city, and promote the development of local bio-pharmaceutical industry and create a development index of biomedical enterprise. At the same time, it also supports high-quality biomedical companies to make full use of domestic and foreign multi-level capital markets for listing and financing, and expand direct financing channels.

#### *3.2.2. Service and system support*

Bio-pharmaceutical industry as a High-precision fields, especially rely on the entire industrial ecological resources. It is difficult for a single company to build all the experimental environments, so it depends on the support of the government. Local governments establish various technical innovation centers, industrial innovation centers and other professional service institutions. Special funds are allocated for relevant medical institutions to carry out major industrial project introduction, incubator cultivation and other works. In addition, the government will also encourage the integration of industry, education, research and medicine, that is, the theme of medical structure will be encouraged. A certain percentage of funding should be provided based on the total investment of the project, in conjunction with universities and colleges, innovative companies, and public copper to build a medical big data clinical research application center, a precision learning research center, and a clinical application teacher center.

#### *3.2.3. Supporting policies for innovative drugs and devices*

The threshold and risk for innovation of drugs and devices is higher and the period of operating cycle is longer, therefore, more policy supports are carried out in the field of medicine and equipment, which are also the most needed by enterprises. So, the local government will give the R&D subsidy support to these enterprises when they are in clinical phases I, II, and III, as well as after starting or completing it.

#### *3.2.4. Supporting policies for the introduction of medical talents.*

Talents are the foundation of industrial development, and local governments have introduced supportive policies for the introduction of talents, such as: settlement subsidies, salary subsidies, commission subsidies, talent recruitment incentives, housing subsidies, and contribution incentives, talent settlement, medical security, spouse employment. children's education can be said to provide comprehensive measures for the local life of medical talents to attract high-end talents and ensure the development of the pharmaceutical industry.

### **3.3. Challenges**

#### *3.3.1 Insufficient innovation capabilities*

The pharmaceutical industry has the characteristics of "high investment, high risk, long period of operating cycle, and high return". The low investment in research and development and insufficient innovation capabilities have always been key issues that plague the development of China's pharmaceutical industry, resulting in China's pharmaceutical industry being large but not strong enough for a long time and facing difficulty to satisfy the demand of Chinese residents for high-quality drugs. According to statistics, the research and development expenses of large international pharmaceutical companies generally account for 15%-20% of sales revenue, while the average ratio of R&D investment to sales revenue of Chinese pharmaceutical companies is about 2% -3%, which is low level[5].

#### *3.3.2. The serious homogeneity competition*

China's pharmaceutical industry still has the problem of low concentration and scattered enterprises. According to the data of the National Bureau of Statistics, as of April 2020, China's pharmaceutical manufacturing enterprises have reached 7,342, but the large-scale enterprises with core competitiveness are few[5]. Most companies focus on generic drugs with relatively mature production and low technical

requirements. Weak research and development capabilities and serious product homogeneity lead to serious market competition. With the improvement of medicine and the reform of the medicine registration review system, large foreign pharmaceutical companies have gradually increased their development and investment in the Chinese market. The time that products to be launched may gradually be shortened, which has further intensified competition in the domestic pharmaceutical industry.

### *3.3.3. Falling prices*

In January 2019, the State Council of the People's Republic of China issued the "National Organization for the Centralized Procurement and Use of Drugs Pilot Program"[6]. China arranges 4 municipalities and 7 key cities as pilots to select generic drugs corresponding to generic drugs that have passed the quality and efficacy consistency evaluation. Pilot varieties carry out the national volume-based procurement pilot work, and the core is volume -for-price, money-for-price, reduction of drug prices and medical insurance control fees. After several subsequent expansions, the volume-based procurement policy has been gradually extended to the whole country. The types of drugs have also increased. Judging from the results of previous bids, the prices of shortlisted and selected drugs have dropped significantly. With the gradual expansion of the volume-based procurement of drugs, the overall price level of China's drug market will significantly decline. Due to the winning bidders will gain a larger market, the share will have an adverse impact on the profitability of pharmaceutical companies that have not won the bid.

### *3.3.4. Rising costs*

On May 14, 2020, the China Food and Drug Administration issued the "Announcement on Carrying out the Quality and Efficacy Consistency Evaluation of Chemical Injection Generic Drugs"[7], requiring that the marketed chemical injection generic drugs are not consistent with the quality and efficacy of the original drug varieties approved in principle, which need to carry out the consistency evaluation. The introduction of national policies will help improve the quality of China's generic drugs and better meet the people's drug needs. At the same time, a large amount of research and development is required for consistency evaluation, the implementation of this policy will correspondingly increase the R&D and operating costs of generic drug companies.

### *3.3.5. Regional constraints*

With the adjustment and standardization of the national pharmaceutical industry policy, high cost of research, high elimination rates, and long period of

development cycles are inevitable trends in the drug research and development process. In the foreseeable future, the R&D costs of Chinese and foreign drugs will become increasingly the same. However, in terms of preparations, the overseas market share of China's pharmaceutical industry is seriously inconsistent with the proportion of the GDP and population. The result of the low market share is that the high R&D expenses can only be shared by domestic profits. It is impossible to truly export drugs abroad on a large scale and share the cost in the global market. Therefore, research and development under the dual pressure of drug prices and costs is a dilemma.

At the same time, the technical equipment of China's pharmaceutical industry is also difficult to keep up with the pace of industrial development, and there are few technical equipment tailored to technology. In this situation, even with advanced technology and new product technology, it is difficult to manufacture good products. In order to solve the problem of technological upgrading and transformation of China's pharmaceutical industry, it is necessary to invest in new technologies, new drugs and new equipment at the same time. This three overlapping R&D and innovation pressures pose a huge challenge to China's pharmaceutical industry as a whole.

## **4. SUGGESTIONS**

### ***4.1. Increasing R&D Investment And Improving Independent Innovation Capabilities***

The performance of independent innovation in China's pharmaceutical industry is not commensurate with its status in the international market, and the lack of innovation capabilities has become the main influencing factor restricting the competitiveness of China's pharmaceutical industry. Therefore, on the one hand, the country must increase research and development in the pharmaceutical industry investment, vigorously develop medical science and technology, and accelerate technological innovation in the pharmaceutical industry. On the other hand, pharmaceutical companies must strive to improve their independent innovation capabilities, vigorously promote the research and development of new drugs, promote the upgrading of medical devices, reduce repetitive production, and strive to improve the added value of medicine products, thereby promoting the development and innovation of China's pharmaceutical industry.

### ***4.2. Adjusting the Pharmaceutical Industry Structure and Promoting Optimization And Upgrading***

Due to overcapacity and idle capacity, the profitability of pharmaceutical companies has been reduced, and the healthy development of China's

pharmaceutical industry has been hindered. Therefore, the structure of the pharmaceutical industry should be adjusted to promptly eliminate outdated production enterprises with high energy consumption and high pollution, and those enterprises should be eliminated with high cost and less competitive. Besides, encouraging the concentration of pharmaceutical production to high-quality enterprises, cultivate large-scale enterprise groups could be taken into consideration. Also, it is essential to promote the optimization of the structure of pharmaceutical enterprises, thereby adjusting the structure of China's pharmaceutical industry and promoting the optimization and upgrading of the structure, and then expanding profitability and promoting the sustainable development of China's pharmaceutical industry. At the same time, it is necessary to actively implement an innovation-driven development strategy, focusing on the transformation, upgrading, quality and efficiency of the enterprise with active guidance, policy support, innovation with a new generation of biomedicine as a breakthrough. Optimized services have driven huge and strong changes in China's pharmaceutical industry.

#### ***4.3. Speed Up the Establishment And Improvement of Management Laws And Regulations for the Pharmaceutical Industry***

The state should speed up the establishment and improvement of management laws and regulations for the pharmaceutical industry, regulate the management behavior of pharmaceutical companies, and resolutely crack down on various illegal activities, so as to improve the management level of pharmaceutical companies. Pharmaceutical company managers should strictly abide by laws and regulations and strive to improve their own quality and management level, ensuring that economic activities are carried out within the scope of laws and regulations, promoting the healthy and sustainable development of China's pharmaceutical industry.

## **5. CONCLUSION**

Coronavirus epidemic is having a major effect on Chinese manufacturing in the short-term, but the long-term effects remain uncertain as the virus continues to have a global impact. It could be predicted that the short-term impact on Chinese manufacturing industry is relatively large, whilst the medium and long-term impact will be more limited. Besides, Chinese pharmaceutical industry is facing great challenges, especially facing the coronavirus epidemic.

## **ACKNOWLEDGMENT**

I would like to thank all the instructors for the feedback on earlier versions of this paper. Thanks to Olivia Sun for the guidance and feedback throughout the review process.

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