Chongqing Zhifei Biological Products Co., Ltd.

2021

First Half Business Performance

Chongqing Zhifei Biological Products Co., Ltd.

Board of Directors

August 2021

Important Notes

The main content and data of this report are from the 2021 interim report of Chongqing Zhifei Biological Products Co., Ltd. In case of any discrepancy between interpretations of the text, the Chinese version shall prevail.

I. Overview of Principal Business

(I) Company profile

Safeguarding life and delivering healthy outcomes. As an important global vaccine developer and supplier with mission and responsibility, Zhifei has committed to build a global immune barrier. The Company always adheres to its business principle "prioritizing social benefits over corporate profits" . It focuses on infectious disease prevention and control, innovative research and development, to serve the public, and to continuously contribute to a healthy China. With the development model featuring “technology + market” drivers and the coordinated development of diagnosis, prevention and treatment, the Company has bloomed into a large backbone enterprise that integrates R&D, production, sales, and import and export in the biological product industry.

During the reporting period, there was no material change in the principal business of the Company. As two material R&D and manufacture bases for Zhifei, Beijing Zhifei Lvzhu Biopharmaceutical Co., Ltd. ("Zhifei Lvzhu") and Anhui Zhifei Longcom Biopharmaceutical Co., Ltd. ("Zhifei Longcom") renewed their efforts to introduce new products against bacteria, viruses and tuberculosis. The parent company of Zhifei, as the main promoter, dedicated to diversifying vaccine products and providing more convenient and considerate services. Taking Zhifei Airport as the import and export channel, the Company also provides warehousing, customs clearance record, and batch release services for imported vaccines. In addition, the Company incubates and cultivates promising biotechnology and products through the Zhirui investment platform by equity investment, and ensures the layout of the mRNA technology platform through INNORNA by subscribing for equity interests.

Since its establishment, R&D and innovation are always its unwavering priorities. The Company has participated in more than 20 national, provincial and ministerial-level projects, including the “National High-tech R&D Program (863 Program)”, “Modern Medical Technology” project and major new drug innovation projects of the Ministry of Science and Technology as well as special new drug innovation projects of the State. While meeting the ever-changing needs of disease prevention and control, Zhifei attaches great importance to the diversity and convenience of product supply. It has an extensive marketing network covering 31 provinces, autonomous regions and municipalities,

more than 300 prefecture-level cities, more than 2,600 districts and counties, and more than 30,000 community-level health service points (township vaccination points and community clinics). After years of development and continuous team building, the Company has organically combined leading R&D technology with efficient marketing, forming a virtuous cycle oriented by market demand and driven by R&D and innovation, which provides important guarantee for achieving its business objectives. In the first half of 2021, the Company continued to maintain a stable growth. It recorded an operating income of RMB 13,171,478,498.15, representing an increase of 88.33% over the same period of the previous year and a net profit attributable to shareholders of the Company after deducting non-recurring gains and losses of RMB 5,502,863,352.27, representing an increase of 263.73% over the same period of the previous year.

(II) Major products and indication

As of the disclosure date of this report, a total of ten products had been launched and one product had obtained EMA approval. The Company offers a diverse range of products, such as vaccine products for preventing infectious diseases such as influenza, COVID-19, cervical cancer, pneumonia, rotavirus and drugs for the diagnosis, prevention and treatment of Tuberculosis, to the public including groups of infants, teenagers and adults. It effectively provides product support for the prevention and control of infectious diseases, and provides the nation with diversified options for disease protection. Details are as follows:

No.	Common Name	Trade Name	Function and Use / Indication
1	Group $ACYW_{135}$ Meningococcal Polysaccharide Vaccine	Menwayc®	Used to prevent the meningococcal meningitis caused by $ACYW_{135}$ meningococcal polysaccharide.
2	Meningococcal Group A and C Conjugate Vaccine	Mening A Con®	Used to prevent infectious diseases caused by meningococcal Group A and C, such as cerebrospinal meningitis and pneumonia.
3	Haemophilus Influenzae Type b Conjugate Vaccine	Xifeibei ®	Used to prevent invasive infections caused by Haemophilus influenzae Type b (including meningitis, pneumonia, septicemia, cellulitis, arthritis, epiglottitis, etc.).
4	Recombinant Novel Coronavirus Vaccine (CHO Cell)	Zifivax™	Used to prevent diseases caused by the novel coronavirus.

5	Recombinant Mycobacterium Tuberculosis Fusion Protein (EC)	Ekear®	Used to diagnose mycobacterium tuberculosis infection, and the results of the subcutaneous test are not affected by the BCG vaccine and can be used for clinical diagnosis of tuberculosis.
6	Mycobacterium Vaccae for Injection	Vaccae®	Used to prevent tuberculosis in the latent groups of infected people with mycobacterium tuberculosis; also used as a drug combination for the adjuvant tuberculosis chemotherapy.
7	Human Papillomavirus Quadrivalent (types 6, 11, 16, 18) Recombinant Vaccine	Gardasil®	Used to prevent the following diseases caused by high-risk HPV16/18: cervical cancer, grade 2 and grade 3 cervical intraepithelial neoplasis (CIN2/3) and adenocarcinoma in situ, and grade 1 cervical intraepithelial neoplasis (CIN1).
8	Human Papillomavirus 9-valent Vaccine, Recombinant	Gardasil 9®	Used to prevent the following diseases caused by HPV type contained in this product: cervical cancer caused by type HPV16, 18, 31, 33, 45, 52 and 58; precancerous lesions caused by HPV6, 11, 16, 18, 31, 33, 45, 52 and 58: cervical intraepithelial neoplasis (CIN2/3), cervical adenocarcinoma in situ (AIS), and cervical intraepithelial neoplasis (CIN1); persistent infections caused by type HPV6, 11, 16, 18, 31, 33, 45, 52 and 58.
9	Reassortant Rotavirus Vaccine, Live, Oral, Pentavalent (Vero Cell)	Rotateq®	Used to prevent the rotavirus gastroenteritis in infants caused by serum-type G1, G2, G3, G4 and G9.
10	Pneumovax 23 - Pneumococcal Vaccine, Polyvalent	Pneumovax®	Used to prevent the pneumococcal disease in the form of the capsulate bacteris contained in this vaccine.
11	Hepatitis A Vaccine (Human Diploid Cell), Inactivated	VAQTA®	Used to prevent diseases caused by the hepatitis A virus.

(III) Main business model

The Company has a complete industry chain and a mature business model. During the reporting period, there was no material change in the Company's business model, and the Company carried out production and sales in strict accordance with the Vaccine Administration Law and the Drug Administration Law. Vaccine products can be launched for sale in the market after production/procurement and obtaining the approval certificate from the State. Each province,

autonomous region and municipality procures the vaccines through the provincial public resources trading platform. The Company supplies the vaccines to disease prevention and control institutions according to the purchase contract.

II. Analysis of Principal Business

(I) Key accounting data and financial indicators

During the reporting period, key financial indicators are shown below:

	1H 2021	1H 2020	Increase/decrease over the same period of the previous year
Operating income (RMB)	13,171,478,498.15	6,993,723,184.63	88.33%
Net profit attributable to shareholders of the Company (RMB)	5,490,650,129.41	1,504,548,395.16	264.94%
Net profit attributable to shareholders of the Company after deducting non-recurring gains and losses (RMB)	5,502,863,352.27	1,512,916,034.38	263.73%
Net cash flows from operating activities (RMB)	6,530,824,685.45	400,058,881.35	1,532.47%
Basic earnings per share (RMB/share)	3.4317	0.9403	264.96%
Diluted earnings per share (RMB/share)	3.4317	0.9403	264.96%
Weighted average return on equity	49.94%	23.15%	26.79%
	As at the end of the reporting period	As of the end of the previous year	Increase/decrease at the end of the reporting period as compared with the end of the previous year
Total assets (RMB)	23,913,635,123.59	15,215,241,753.29	57.17%
Net assets attributable to shareholders of the Company (RMB)	13,739,314,588.68	8,248,664,459.27	66.56%

(II) Changes in key financial data

	1H 2021	1H 2020	Year-on-year increase/decrease	Reason for change
Operating income	13,171,478,498.15	6,993,723,184.63	88.33%	Mainly due to the increase in sales of proprietary products during the period
Operating cost	5,491,861,536.51	4,303,097,132.89	27.63%	
Selling expenses	778,102,841.81	429,413,887.96	81.20%	Mainly due to the strengthening of the building of the sales team and increased marketing efforts during the

				period
Administrative expenses	129,069,264.95	92,541,711.25	39.47%	Mainly due to the increase in management costs such as payroll during the period
Financial expenses	39,186,590.68	72,820,943.90	-46.19%	Mainly due to the decrease in interest expenses as a result of the decrease in borrowings during the period
Income tax expenses	887,689,506.60	258,899,480.00	242.87%	Mainly due to the increase in operating income during the period, resulting in an increase in total profit and a year-on-year increase in income tax expenses
Research and development investment	789,635,743.57	140,240,364.05	463.06%	Mainly due to the increase in R&D investment during the period
Net cash flows from operating activities	6,530,824,685.45	400,058,881.35	1,532.47%	Mainly due to the increase in sales receivables during the period
Net cash flows from investment activities	-1,052,111,964.86	-247,932,462.19	-324.35%	Mainly due to the increase in payment for equipment and projects
Net cash flows from financing activities	-1,808,976,779.59	-555,397,891.23	-225.71%	Mainly due to the decrease in short-term borrowings received during the period
Net increase in cash and cash equivalents	3,668,445,844.27	-402,357,695.80	1,011.74%	Mainly due to the increase in net cash flow from operating activities during the period

(III) Products or services accounting for more than 10%

	Operating income	Operating cost	Gross profit margin	Increase/decrease in operating income as compared with the same period of the previous year	Increase/decrease in operating cost as compared with the same period of the previous year	Increase/decrease in gross profit margin as compared with the same period of the previous year
By product or service						
Proprietary product – vaccines on the planned immunization	6,037,392,675.85	792,261,693.90	86.88%	1,474.67%	1,676.76%	-1.69%
Agent product – vaccines not on the planned immunization	7,116,633,846.37	4,697,509,205.82	33.99%	7.96%	10.37%	-4.06%

(IV) Analysis of assets and liabilities

	1H 2021		1H 2020		Increase/decrease in proportion	Explanations on significant changes
	Amount	Proportion of total assets	Amount	Proportion of total assets		
Monetary funds	5,094,478,167.90	21.30%	1,437,457,839.96	9.45%	11.85%	Mainly due to the increase in sales receivables during the period
Accounts receivable	8,755,792,169.52	36.61%	6,624,170,327.47	43.54%	-6.93%	Mainly due to the decrease in the proportion of accounts receivable as a result of the increase in total assets during the period
Inventory	4,837,846,061.61	20.23%	3,405,589,379.38	22.38%	-2.15%	
Investment properties	11,327,798.89	0.05%	11,720,960.89	0.08%	-0.03%	
Fixed assets	1,649,797,394.84	6.90%	1,480,235,222.89	9.73%	-2.83%	
Construction in progress	1,289,296,922.65	5.39%	906,486,675.55	5.96%	-0.57%	
Right-of-use assets	8,232,252.23	0.03%			0.03%	
Short-term borrowings	1,782,835,650.00	7.46%	2,873,987,838.27	18.89%	-11.43%	Mainly due to the decrease in short-term unsecured loans during the period
Lease liabilities	7,219,728.27	0.03%			0.03%	

III. Key Performance Drivers

(I) Industry policy guarantee and acceleration of R&D innovation

The official implementation of the Vaccine Administration Law legally strengthens the strategic and public welfare nature of vaccine products. The Vaccine Administration Law specifies that the State supports the development of new vaccines such as polyvalent vaccines and polyvaccines. The Vaccine Administration Law also encourages vaccine marketing licensors to increase investments in research and innovation, optimize production processes, improve quality and control, and advance vaccine technology.

The strong support of policies will be a robust driver for the rapid development of the industry. In recent years, the Company has intensified its R&D efforts and renewed its efforts to introduce new

products: The launch of Recombinant Mycobacterium Tuberculosis Fusion Protein (EC) and the approval of new indication for Mycobacterium Vaccae for Injection have established a "diagnosis-prevention-treatment" system for tuberculosis; the emergency use of Recombinant Novel Coronavirus Vaccine (CHO Cell) has contributed to infectious disease and control. The optimization of the process in respect of the dosage form and packaging of existing vaccine products provides an option to meet the diversified needs. Seizing opportunities and continuously innovating and improving products under the guidance of policies are the core driver for the Company to secure sustainable development and create value for society.

(II) Increasing awareness of disease prevention and increasing demand for vaccination

Since the outbreak of the COVID-19 pandemic, there has been a widespread concern over and discussion about the mutation and spread of the virus, the R&D of vaccines, vaccination, etc. around the world. The Press Conference of the Joint Prevention and Control Mechanism of the State Council acquaints the citizens with the whole process of pandemic prevention and control, such as virus transmission, vaccine development and vaccination, more systematically. While alleviating the phenomenon of "information pandemic" and "vaccine hesitation", the Press Conference objectively strengthens the public's awareness of infectious diseases, leads to the demand for vaccination of vaccine products and raises the attention to vaccines to prevent diseases other than the COVID-19. This creates a good atmosphere for vaccine companies to seize opportunities and seek development.

(III) Strengthening quality management to ensure the adequacy of vaccines

The Company has carried out production and operation activities by upholding the business philosophy "prioritizing social benefits over corporate profits". During the reporting period, to meet the new requirements on corporate development arising from the normalization of pandemic prevention and control and the increasingly urgent new demand of the public for vaccination, the Company accomplished the mission "safeguarding life, delivering healthy outcomes" by focusing on realizing business objectives and implementing plans. With the management playing an exemplary

role and performing careful operation and management, the Company strengthened product quality, improved the production of proprietary products and increased the procurement of agent products, striving to ensure the supply. While facilitating the prevention and control of infectious diseases, the Company strengthened the foundation of corporate development.

IV. Industry Development and Product R&D

(I) Industry overview

2021 is the first year for the "14th Five-Year Plan" and for coordinating pandemic prevention and control with economic and social development after major strategic results are achieved in fighting the pandemic. According to the National Bureau of Statistics, in the first half of the year, China's economy grew by 12.7% year on year, with an average growth of 5.3% in two years. The economy continued to recover steadily and registered a stable performance with good momentum for growth. According to the "14th Five-Year Plan" and the Outline, the comprehensive promotion of the construction of the Healthy China has been elevated to the status of national strategy. Resting on the current situation and focusing on long-term development goals, the biopharmaceutical industry, one of the industries that the State supports and develops with priority, will embrace greater opportunities and challenges.

Vaccination is the most economical and effective means of preventing and controlling infectious diseases, which can reduce medical and health expenditures and lighten the burden on families and society. However, the biological product industry is characterized by large investment, long cycles and high risks. With the further concentration brought by the raising industry standards and improving regulatory requirements, enterprises must stay true to technological innovation and accelerate product iteration and upgrading in competition.

According to the "World Preview 2020, Outlook to 2026" released by EvaluatePharma, the global vaccine market size in 2019 stood at approximately US$32.5 billion, with a market share of approximately 3.6% in the therapeutic area, ranking fourth. EvaluatePharma proposed a new forecast for the global vaccine market based on the original forecast that the market size would reach US$44.8

billion in 2024. By 2026, the global vaccine market will reach US$56.1 billion, demonstrating huge growth potential. The introduction of constantly emerging innovative vaccines will significantly facilitate the expansion of the global vaccine market.

Prevention and control of infectious diseases is important action to implement the Healthy China strategy. Under the pressure of the COVID-19 pandemic, vaccination continued to advance efficiently, and the international community has more confidence in fighting the pandemic and promoting development. The consumption of vaccines has increased sharply. Benefiting from the huge population base at home and abroad and the improvement of residents' awareness of disposable income and health, and the acceleration of the launch of blockbuster vaccine varieties and the upgrading of existing vaccine products, China's biological product industry is expected to usher in a sustainable and rapid growth in the long run.

(II) Product R&D

During the reporting period, there are 26 R&D projects in the pipeline, of which one project achieved phased progress. Details are as follows:

Projects Entering the Registration Process

No.	Drug Name	Registration Class	Major Functions	Registration Stage	Progress
1	Influenza Virus-split Vaccine	Preventive biologic products class 15	After vaccination, it can stimulate the body to produce anti-influenza virus immunity and is used to prevent influenza caused by the strain of virus.	Clinical trial	Clinical trial completed
2	Pneumovax 23 - Pneumococcal Vaccine, Polyvalent	Preventive biologic products class 9	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Clinical trial completed
3	ZF2001	Preventive biologic products class 1	Used to prevent diseases caused by the novel coronavirus.	Clinical trial	Phase III clinical trial in progress
4	15-Valent Pneumococcal Conjugate Vaccine	Preventive biologic products class 7	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Phase III clinical trial in progress

5	Lyophilized Rabies Vaccine for Human Use (MRC-5 Cell)	Preventive biologic products class 9	After vaccination, it can stimulate the body to produce anti-rabies virus immunity and is used to prevent rabies.	Clinical trial	Phase III clinical trial in progress
6	Lyophilized Rabies Vaccine for Human Use (Vero Cell)	Preventive biologic products class 15	After vaccination, it can stimulate the body to produce anti-rabies virus immunity and is used to prevent rabies.	Clinical trial	Phase III clinical trial in progress
7	Four-valent Influenza Virus-split Vaccine	Preventive biologic products class 15	After vaccination, it can stimulate the body to produce anti-influenza virus immunity and is used to prevent influenza caused by the strain of virus.	Clinical trial	Phase III clinical trial in progress
8	S. flexneri and S. Sonnei Bivalent Shigella Conjugate Vaccine	Preventive biologic products class 1	Used to prevent infectious diseases caused by Shigella.	Clinical trial	Clinical trial in progress
9	$ACYW_{135}$ Meningococcal Conjugate Vaccine	Preventive biologic products class 7	Used to prevent infectious diseases caused by meningococcus.	Clinical trial	Clinical trial in progress
10	Intestinal Virus Type 71 Inactivated Vaccine	Preventive biologic products class 1	Used to prevent diseases caused by EV71 infection.	Clinical trial	Clinical trial in progress
11	Lyophilized Recombinant Tuberculosis Vaccine (AEC/BC02)	Preventive biologic products class 1	Used to prevent tuberculosis in the latent groups of infected people with mycobacterium tuberculosis	Clinical trial	Clinical trial in progress
12	BCG	Preventive biologic products class 15	After vaccination, it enables the body to generate cellular immune responses. Used to prevent tuberculosis.	Clinical trial	Clinical trial in progress
13	BCG-PPD	Therapeutic biologic products class 15	Used for clinical ancillary diagnosis of tuberculosis, epidemiological survey of tuberculosis and monitoring of body immune response after BCG vaccination. In combination with an in vivo diagnostic reagent (Recombinant Mycobacterium Tuberculosis Fusion Protein (EC)) for identification purposes, it can be used to identify the groups not infected with tuberculosis that are not vaccinated or are negative	Clinical trial	Clinical trial in progress

			after vaccination by BCG, the groups not infected with tuberculosis that are positive after vaccination by BCG, and the groups infected with tuberculosis.		
14	Quadrivalent Recombinant Norovirus Vaccine (Pichia Pastoris)	Preventive biologic products class 1	After vaccination, it stimulates the body to produce anti-norovirus immunity, which is used to prevent acute gastroenteritis caused by norovirus infection.	Clinical trial	Clinical trial in progress
15	DPT vaccine (component)	Preventive biologic products class 4	Used to prevent diseases caused by pertussis, diphtheria and clostridium tetani.	Clinical trial	Clinical trial in progress
16	Inactivated Rotavirus Vaccine	Preventive biologic products class 1	Used to prevent diarrhea caused by rotavirus.	Clinical trial	Clinical trial in progress

Preclinical Project

No.	Product Name	Progress and Changes in the First Half of 2021	Expected Progress (2021-2022)	
1	Recombinant Hepatitis B Vaccine (Hansenula Polymorpha)	Preclinical study	Preclinical study	Preclinical study
2	Bivalent HFMD Vaccine	Preclinical study	Preclinical study	Clinical application
3	Bivalent Recombinant Rotavirus Vaccine (Pichia Pastoris)	Preclinical study	Preclinical study	Clinical application
4	Recombinant Zoster Vaccine (CHO cell)	Preclinical study	Preclinical study	Clinical application
5	Inactivated Japanese Encephalitis Vaccine	Preclinical study	Preclinical study	Clinical application
6	Therapeutic BCG Vaccine	Preclinical study	Preclinical study	Clinical application
7	Inactivated Varicella-zoster Virus Vaccine	Preclinical study	Preclinical study	Preclinical study
8	Respiratory Syncytial Virus (RSV) Vaccine	Preclinical study	Preclinical study	Preclinical study
9	Recombinant Group B Meningococcal Vaccine	Preclinical study	Preclinical study	Clinical application
10	Recombinant MERS Virus Vaccine	Preclinical study	Preclinical study	Preclinical study

The R&D projects on which phased achievements were made during the reporting period are as follows:

No.	Project Name	Approval Department	Stage	Time of Announcement	Certificate No.
1	Mycobacterium Vaccae for Injection	NMPA	Drug registration certificate	June 16, 2021	Certificate No.: 2021S00620

(III) Product release and approval

Products sold by the Company and released during the reporting period are as follows:

1. Proprietary product

Manufacturer	Product Name	Number of Released and Approved Products in the First Half of 2021	Number of Released and Approved Products in the First Half of 2020	Growth Rate (%)
Zhifei Lvzhu	$ACYW_{135}$ polysaccharide	4,013,266	1,794,278	123.67
	AC conjugate vaccine	3,155,690	1,466,956	115.12
	Hib vaccine	0	1,113,848	-100.00

2. Agent product

Manufacturer	Product Name	Number of Released and Approved Products in the First Half of 2021	Number of Released and Approved Products in the First Half of 2020	Growth Rate (%)
MSD	Tetravalent HPV vaccine	3,045,995	3,664,398	-16.88
	9-valent HPV vaccine	1,939,924	2,159,778	-10.18
	Pentavalent rotavirus vaccine	3,773,249	2,169,913	73.89
	23-valent pneumonia vaccine	490,569	0	100.00
	Inactivated hepatitis A vaccine	0	0	-

V. Core Competitiveness Analysis

(I) Industry-leading R&D strength

Since its establishment, the Company has been attaching great importance to the creation and improvement of R&D and innovation capabilities, and promoted long-term and stable development with continuous capital and personnel investment and matrix layout relying on diversified development platforms.

1. Continued to invest in improving technology layout and facilitated matrix development with platforms

R&D innovation has always been the source of the Company's development. Over the past 20 years, the Company has gradually enriched the technology layout through the continuous investment in research and development, steadily-cultivated R&D team, and acute industry strategic vision. In the second quarter of 2021, the Company had a total of 448 R&D personnel, and an R&D investment of RMB 790 million in the first half of 2021, providing talent reserve and capital guarantee for the Company's R&D innovation. At present, the Company has established various R&D platforms such as the polysaccharide and polysaccharide-conjugate technology platform for bacterial vaccines, inactivated technology platform for viral vaccines, recombinant DNA technology platform and component technology platform, and actively deployed cutting-edge development platforms such as mRNA and new multivalent technology platform. The gradual expansion of the R&D platform has promoted the synergy of the R&D matrix and accelerated the progress of various projects.

Relying on the two R&D and production bases of Zhifei Lvzhu and Zhifei Longcom, the Company steadily facilitated the progress of each project in the R&D pipeline. Currently, the Company has 26 projects in clinical trials and pre-clinical research, which cover human vaccine and biological product projects for preventing infectious diseases such as tuberculosis, pneumonia, meningitis, influenza and rabies, which are rich in reserve, with a clear structure and reasonable gradient, forming a product matrix featuring product synergy and industry competitiveness.

Matrix	Project
Tuberculosis product matrix	Listed: Recombinant Mycobacterium Tuberculosis Fusion Protein (EC), and Mycobacterium Vaccae for Injection; Projects under research and development: Lyophilized Recombinant Tuberculosis Vaccine (AEC/BC02), BCG for Injection, and BCG pure protein derivatives

Rabies vaccine matrix	Projects under research and development: Lyophilized Rabies Vaccine for Human Use (MRC-5 Cell) and Lyophilized Rabies Vaccine for Human Use (Vero Cell)
Respiratory virus vaccine matrix	Projects under research and development: Recombinant Novel Coronavirus Vaccine (CHO Cell), Four-valent Influenza Virus-split Vaccine, Influenza Virus-split Vaccine, and Respiratory Syncytial Virus (RSV) Vaccine
Pneumonia vaccine matrix	Projects under research and development: 15-Valent Pneumococcal Conjugate Vaccine, and 23-Valent Pneumococcal Polysaccharide Vaccine
Gastrointestinal disease vaccine matrix	Projects under research and development: S. flexneri and S. Sonnei Bivalent Shigella Conjugate Vaccine, Intestinal Virus Type 71 Inactivated Vaccine, Quadrivalent Recombinant Norovirus Vaccine (Pichia Pastoris), Bivalent HFMD Vaccine, Inactivated Rotavirus Vaccine, and Bivalent Recombinant Rotavirus Vaccine (Pichia Pastoris)
Meningitis Vaccine Matrix	Projects under research and development: Group $ACYW_{135}$ Meningococcal Conjugate Vaccine, and Recombinant Group B Meningococcal Vaccine
Note: The above matrices do not cover all projects under research and development of the Company. For details of the R&D progress, please refer to relevant R&D projects in this report.	

In addition, the Company continued to strengthen patent management and obtained a total of 30 patents as at the end of the Reporting Period, which further expanded the Company's intellectual property protection system.

Name	Patent/Application No.
A polysaccharide-protein conjugate vaccine	ZL02159032.X
Lyophilized Mycobacterium Vaccae Preparation (Vacccae) and its Preparation Method and Use	ZL200310106212.X
An immunoadjuvant and vaccine containing such adjuvant	ZL200410033878.1
Multivalent Bacterial Capsule Polysaccharide-protein Conjugate Vaccine	ZL200510083042.7
Typhoid and Paratyphoid Outer Membrane Protein Vaccine	ZL200610111684.8
Rabies-split Vaccine for Human Use	ZL200610152928.7
Meningococcal Multivalent Conjugate Vaccine	ZL200710007045.1
Meningococcal Diphtheria Conjugate Vaccine	ZL200810087598.7
Method for Preparing Specific Polysaccharide	ZL200910236407.3
Tuberculosis Subunit Vaccine with Compound Adjuvant	ZL201010107449.X
Gram-negative Bacterial Vaccine and Preparation Method Thereof	ZL201010239120.9
Method for detecting content of each monovalent polysaccharide in multivalent polysaccharide or multivalent protein mixture	ZL201010534104.2
HFMD Vaccine	ZL201010127032.X
Tumor antigenic polypeptide and its use as a tumor vaccine	ZL201310320965.4
Shigella Multivalent Conjugate Vaccine	ZL201410176080.6
Preparation Method of Haemophilus Influenzae Type b Conjugate Vaccine	ZL201410413100.7
Recombinant Tubercle Bacillus ESAT6-CFP10 Fusion Protein and Preparation Method Thereof	ZL201510617780.9
Hansenula Polymorpha Specific Expression Vector Construction Method and Method for Enhancing Expression Quantity of Hepatitis B Surface Antigen on Hansenula Polymorpha	ZL201610137206.8
Construction of Eukaryotic Hansenula Engineering Bacterium Containing Recombinant Hepatitis B	ZL201610137245.8

Virus Gene and Production Method of Hepatitis B Surface Antigen	
Method for Detecting Specific Saccharide Content of Various Types of Multivalent Pneumococcal Conjugate Vaccine	ZL201610563165.9
Group B Meningococcal Recombinant Chimeric Protein Vaccine and Preparation Method Thereof	ZL201711073721.5
Varicella Virus Inactivated Vaccine for Humans and Preparation Method Thereof	ZL201710297864.8
Purification Process of Type B Haemophilus Polysaccharide	ZL201811352089.2
Group B Meningococcal fHBP A Subfamily Monoclonal Antibody and Preparation Method Thereof	ZL201810599591.7
Group B Meningococcal fHBP B Antibody and Preparation Method Thereof	ZL201810599759.4
A Microfluidic Chip for Realizing PCR and a Bacterial Detection Device for Real-time PCR	ZL201620742561.3
Escherichia Coli Petri Dish for Easy Observation	ZL201720292200.8
Cell Petri Dish	ZL201820055263.6
Automatic Nucleic Acid Molecular Hybridization Instrument	ZL2018200958160
Glass Slide Cleaning Device for Gene Detection	ZL201820535622.8

Technological innovation and breakthrough serves as the foundation of the Company's development, which has been implemented into the Company's operation and management. Since the Company's listing in 2010, its accumulated revenue of proprietary products has exceeded RMB 13 billion. While providing health protection to the public, the self-developed products have also laid a foundation for the Company's R&D investment, promoted the interaction between technology and the market, thus creating a virtuous cycle.

2. Focused on the future and planned for industrial development

The Company built new and cutting-edge technology platforms in various forms, and explored the future technology development direction of the industry with ambition. The Company invested in INNORNA for mRNA technology and continued to deepen the cooperation between both parties in terms of financing and technology. Compared with conventional drug development technologies, mRNA technology has its advantages in vaccine development, oncology treatment, etc. The Company will further deepen the cooperation with INNORNA and promote the mRNA technology to facilitate disease prevention and control.

At the same time, the Company made arrangements in big biology field through Zhirui Investment. It incubated and nurtured promising preventive and therapeutic biological technologies and products in equity investment, targeting investment in preventive and therapeutic drugs for cancer, metabolic diseases, neurodegenerative diseases, cardiovascular diseases, and autoimmune diseases,

which is conducive to the sustainable development of the Company in the biopharmaceutical field.

(II) Well-established marketing system

The dual-drive model "technology + market" is the core driver for the development of the Company. The Company has gradually established a virtuous cycle mechanism with mutual promotion and mutual transformation between R&D and market, which has accelerated the conversion of science innovation to the commercialization. The well developed model has accelerated the delivery of our innovations to the patients who need them, and has provided strong support for the protection of people's health.

1. Constantly improving and refining the marketing team

The Company has been focusing on the preliminary formulation, actual implementation and follow-up of market strategies. It also stresses the construction of the marketing team and the cultivation and reserve of market talents. Through continuous standardized operation and management, the Company has established a professional team of personnel, which can realize synergies through multi-level linkage. In terms of staff assessment, the Company emphasizes fair competition, continuously optimizes and improves the performance mechanism, cultivates new talent teams, and fully stimulates the enthusiasm of each market team.

2. Marketing network with wide and deep coverage

The Company's marketing network has covered 31 provinces, autonomous regions and municipalities, more than 300 prefecture-level cities, more than 2,600 districts and counties, and more than 30,000 county-level health service sites (township vaccination sites and community clinics), providing them with continuous, fast and comprehensive quality services, which guaranteed the promotion and sales of the Company's products. The all-round and integrated business model enables the Company to quickly integrate platform resources according to market conditions. While strengthening cost efficiency, it strengthens risk control, providing strong support and guarantee for the long-term sustainable development of the Company.

(III) Standardized operation and management

Committed to the principle "prioritizing social benefits over corporate profits", the Company

has always given priority to standardization, quality, integrity and discipline. For two decades since its establishment, the Company has strictly monitored the whole process of the industrial chain including R&D, production and operation, and implemented the concept of "compliance and responsibility" throughout each process, ensuring the compliance of the Company's products and services from the source so as to guarantee the long-term sound development of the Company.

1. Stringent product production and quality control system

Relying on the two R&D production bases in Beijing and Anhui, the Company can develop and manufacture biological products on a large scale. As high-tech enterprises, the two R&D manufacture bases have first-class domestic vaccine production plants and equipment, and are staffed with professional, meticulous and dedicated production teams. At the same time, Zhifei has established long-term and stable cooperation with a number of excellent domestic and overseas suppliers to further ensure the production and supply of products.

The Company introduces advanced quality management concepts and establishes a comprehensive quality management system. In actual production, the Company carries out quality control in all aspects related to products, and strictly controls every steps such as purchase of raw materials, production, inspection, release and sales of products, so as to ensure the safety, effectiveness and traceability of the Company's products. Zhifei has also established a strict quality and safety mechanism, risk management and control mechanism and adverse reaction monitoring system. Since the first batch of products of the Company got the approval in 2008, the passing rate of the batch release of proprietary products of the Company has maintained at 100%, indicating a high level in the industry.

2. Professional management team

The core management team of the Company consists of professionals with a wealth of experience in operation and management. They give full play to their professional quality, shares industry insights, performs relevant responsibilities, earnestly participates in the Company's operation and management activities, and actively provides advice and suggestions, to promote the healthy and sustainable development of the Company. Meanwhile, the management team of the

Company strictly abides by laws and regulations. Up to now, there has been no illegal reduction of shareholding or illegal operation of shares. Focusing on the Zhifei culture, the Company attracts talents, gathers talents and retains talents with shared values. With a diversified and long-term incentive mechanism, the Company continues to build a high-quality and professional talent team with courage to develop and strive for the Company, and builds the core strength of the Zhifei.

VI. Risks and Countermeasures

(I) Policy risk

The pharmaceutical industry is one of the key prioritized industries in China and is highly regulated. Relevant policies and regulations have been delivered and implemented in recent years. Zhifei strictly implemented various systems in accordance with the Vaccine Administration Law and gradually improved its management, with the aim of enhancing its operation efficiency. However, with the rapid development of the economic society and increasingly stringent regulations, the subsequent policies may bring different changes in and have an impact on the production, sales and circulation of the Company. The Company will pay close attention to the changes in policies and make timely adjustments to its business strategies to comply with the applicable regulations and regulatory requirements. Zhifei has adhered to standardized operation. And our management team has profound professional knowledge and forward-looking thinking, which can help us to handle and responds to crises effectively when industry events occur and industrial policies are adjusted.

(II) Nonperforming debts

With the expansion of the Company's sales scale and business, especially after the implementation of the "one invoice system" reform on the sales of non-EPI vaccines, the Company's vaccine products are directly supplied to district and county-level disease control centers after bidding and procurement, contributing to a gradual increase in the Company's accounts receivable. As the implementation of industry policies has entered the normal stage, the Company strengthens the risk control before vaccine sales, follows up the performance of contracts during the process and enhances the effectiveness of communication after the event to minimize risks of nonperforming debts.

(III) Talent management risk

As of the end of 2021 Q2, the number of the sales staff reached 2,508. The large sales team is conducive to the implementation of the Company's business plans, sales of products and the improvement of corporate economic benefits. However, with the expansion of the Company's sales scale and staffing optimization, the increasing number of staff poses certain risks to the management of the Company. The Company strongly advocates the talent selection principle of "prioritizing integrity over capability", and integrated corporate culture into employee induction training and daily management to ensure the stability and standardization of the team.

(IV) Risks of adverse reaction

Adverse reactions of vaccination refer to the adverse drug reactions that have damage to the human's body and functions of the subject during or after the standardized vaccination without fault of relevant parties. With the facilitation of vaccination and the improvement of national awareness of disease prevention, the scope and quantity of vaccination products are also gradually increasing, and there is a possibility of adverse reaction risks. Strictly complying with the requirements of laws and regulations, the Company has established a complete production and circulation chain, created a comprehensive sales and after-sales service system, and built a compliant and efficient emergency response mechanism. Moreover, Zhifei has purchased commercial insurance for all vaccine products on sale, and striven to minimize the risk of adverse reaction by improving the prevention and treatment mechanism.

(V) Risk of hesitation to vaccination

As one of the world's top ten health threats in 2019 by the World Health Organization, the unwillingness or refusal of vaccination ("hesitation to vaccination") may reverse the progress of vaccination against preventable diseases, and may cause a downturn in sales in the vaccine industry for a certain period of time, thereby affecting the Company's performance. For a long time, the Company has consistently and continuously adhered to standardized operation, continued to invest in the academic promotion of vaccine value, actively participated in the popularization of vaccine knowledge and the cultivation of vaccination notification and demand, and promoted the public's

rational awareness of vaccination.