Chongqing Zhifei Biological Products Co., Ltd.

2022

First Half Business Performance

Chongqing Zhifei Biological Products Co., Ltd.

Board of Directors

Augest 2022

Important Notes

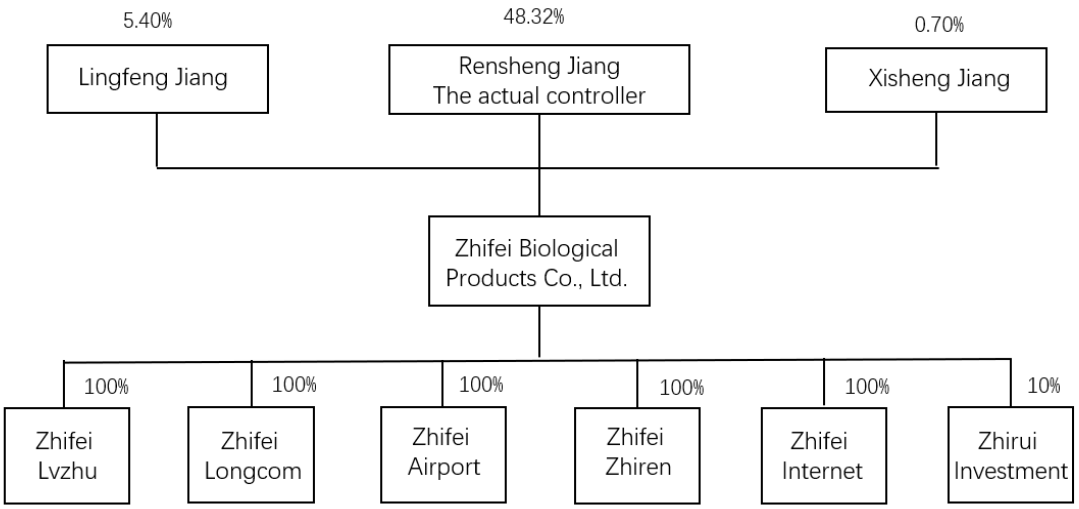
The main content and data of this report are from the 2022 interim report of Chongqing Zhifei Biological Products Co., Ltd. In case of any discrepancy between interpretations of the text, the Chinese version shall prevail.

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. For two decades, the Company 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 now developed into an international, full-industry chain high-tech bio-pharmaceutical enterprise integrating R&D, production, sales, distribution, import and export of vaccines and biological products.

In 2021, there was no material change in the principal business of the Company. The organization chart of the company is as follows.



Beijing Zhifei Lvzhu Biopharmaceutical Co., Ltd. ("Zhifei Lvzhu") and Anhui Zhifei Longcom Biopharmaceutical Co., Ltd. ("Zhifei Longcom") continuously bring forth new breakthrough to introduce new products against bacteria, viruses and tuberculosis. The parent company, Zhifei, as the main distributor dedicated to diversifying vaccine products and providing more convenient and considerate services. Taking Zhifei Airport as the import and export channel, the Company also

provided warehousing, customs clearance record, and batch release services for imported vaccines. In addition, the Company incubated and cultivated promising biotechnology and products through the Zhirui investment platform by equity investment, and invested in the mRNA technology platform INNORNA.

(II) Major products and indication

A total of eleven products had been launched, of which one product got conditional marketing approval. The Company offers a diverse range of products, including vaccine products for preventing infectious diseases such as meningitis, COVID-19, cervical cancer, pneumonia, rotavirus and drugs for the diagnosis, prevention and treatment of tuberculosis, to the population including groups of infants, adolescent 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.	Generic 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 AC Con	Used to prevent infectious diseases caused by meningococcal Group A and C, (including cerebrospinal meningitis and pneumonia, etc.)
3	Haemophilus Influenzae Type b Conjugate Vaccine	Xifeibei ®	Used to prevent infesctious diseases caused by Haemophilus influenzae Type b (including meningitis, pneumonia, septicemia, cellulitis, arthritis, epiglottitis, etc.).
4	Recombinant COVID-19 Vaccine (CHO Cell)	Zifivax®	Used to prevent COVID-19 caused by SARS-CoV-2 .
5	Recombinant Mycobacterium Tuberculosis Fusion Protein (EC)	C-TST ™	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	Recombinant Human	Gardasil®	Used to prevent the following diseases caused by high-risk

	Papillomavirus Quadrivalent (Types 6, 11,16,18) Vaccine		HPV16/18: Cervical cancer, Cervical intraepithelial neoplasis (CIN) grade 2 and grade 3 , cervical adenocarcinoma in situ, Cervical intraepithelial neoplasis (CIN) grade 1.
8	Recombinant Human Papillomavirus 9-Valent (Types 6, 11, 16, 18, 31, 33, 45, 52, 58) Vaccine	Gardasil 9	Used to prevent the following diseases: cervical cancer caused by type HPV types 16, 18, 31, 33, 45, 52 and 58; Precancerous or dysplastic lesions caused by HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58, Cervical intraepithelial neoplasia (CIN) grade 2/3 and cervical adenocarcinoma in situ (AIS), Cervical intraepithelial neoplasia (CIN) grade 1, 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 always conducted R&D, production and sales activities in strict compliance with the Law of the People's Republic of China on Vaccine Administration (hereinafter referred to as the "Vaccine Administration Law"), the Law of the People's Republic of China on Drug Administration (hereinafter referred to as the "Drug Administration Law") and Regulations on the Administration of Vaccine Production and Circulation and other applicable laws and regulations. Adhering to independent R&D innovation principle, the Company has continuously transformed its R&D achievements into manufacturing and. It also cooperated on development program with leading R&D institutions and scientific research institutes. Thus the Company built a R&D model mainly based on independent innovation and complemented by industry-university-research cooperation.

Innovative R&D, product upgrading and new product launches have continued to inject new vitality into the Company's development, meeting the health needs of the people.

The Company's production model is market-oriented. Applying this principle, the production department schedules production according to the sales plan of the marketing department. It develops production plan based on market needs while maintaining moderate inventory levels. The Company conducts production and inspection activities in accordance with approved production processes and quality control standards and also strictly complies with the Vaccine Administration Law, the Drug Administration Law and Regulations on the Administration of Vaccine Production and Circulation and other applicable laws to ensure that the entire production process meets the requirements of the Good Manufacturing Practice of Medical Products. The quality management department strictly supervises and controls product quality, and the Company's entire production quality management system guarantees that the entire product process continues to satisfy legal requirements.

The Company organizes academic promotion meetings and activities by its professional marketing team and adopts the direct sales model to enable its vaccines and anti-tuberculosis products to cover corporate end-users. The Company's vaccines are only available for sale after they are manufactured/imported and have obtained a national batch release and approval certificate. When the vaccines are procured by provinces, autonomous regions, and municipalities directly through the provincial public resource trading platforms, the Company will distribute vaccines to disease prevention and control institutions in accordance with the procurement contracts.

II. Analysis of Principal Business

(I) Key accounting data and financial indicators

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

	2022 1H	2021 1H	Increase/decrease over the same period of the previous year
Operating income (RMB)	18,353,747,808.66	13,171,478,498.15	39.34%
Net profit attributable to shareholders of the Company	3,729,017,351.47	5,490,650,129.41	-32.08%

(RMB)			
Net profit attributable to shareholders of the Company after deducting non-recurring gains and losses (RMB)	3,709,003,748.02	5,502,863,352.27	-32.60%
Net cash flows from operating activities (RMB)	-1,380,303,201.53	6,530,824,685.45	-121.14%
Basic earnings per share (RMB/share)	2.3306	3.4317	-32.09%
Diluted earnings per share (RMB/share)	2.3306	3.4317	-32.09%
Weighted average return on equity	19.26%	49.94%	-30.68%
	2022 1H	2021 1H	Increase/decrease over the same period of the previous year
Total assets (RMB)	34,681,033,452.78	30,047,323,465.36	15.42%
Net assets attributable to shareholders of the Company (RMB)	20,426,230,263.30	17,657,212,911.83	15.68%

(II) Changes in key financial data

	Reporting period	Same period of the previous year	Year-on-year increase/decrease	Reason for change
Operating income	18,353,747,808.66	13,171,478,498.15	39.34%	Mainly due to continued sales growth during the period
Operating cost	12,213,671,041.18	5,491,861,536.51	122.40%	Mainly due to the increase in sales revenue and change in sales structure during the period
Selling expenses	950,667,816.84	778,102,841.81	22.18%	
Administrative expenses	171,699,446.88	129,069,264.95	33.03%	Mainly due to the increase in employee compensation, depreciation and amortization and other costs during the period
Financial expenses	6,921,587.24	39,186,590.68	-82.34%	Mainly due to the increase in interest income and decrease in interest expense for the period
Income tax expenses	624,109,627.79	887,689,506.60	-29.69%	
Research and development investment	518,129,488.03	789,635,743.57	-34.38%	Mainly due to the increase in R&D investment as a result of the global multi-

				center clinical trial of the Covid-19 vaccine in the same period of the previous year
Net cash flows from operating activities	-1,380,303,201.53	6,530,824,685.45	-121.14%	Mainly due to the increase in payment for goods purchased during the period
Net cash flows from investment activities	-813,506,033.66	-1,052,111,964.86	22.68%	
Net cash flows from financing activities	1,281,439,414.97	-1,808,976,779.59	170.84%	Mainly due to the increase in short-term loans received and the decrease in short-term loans returned during the period
Net increase in cash and cash equivalents	-903,413,938.75	3,668,445,844.27	-124.63%	Mainly due to the increase in payments for goods in 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 and TB products	1,667,130,982.58	246,373,394.93	85.22%	-72.40%	-68.91%	-1.91%
Agent product– vaccines	16,684,461,950.25	11,966,823,118.39	28.28%	134.44%	154.75%	-16.80%

(IV) Analysis of assets and liabilities

	As at the end of the reporting period		End of the previous year		Increase/decrease in proportion	Explanations on significant changes
	Amount	Proportion of total assets	Amount	Proportion of total assets		
Monetary funds	3,378,576,757.75	9.74%	4,307,751,548.35	14.34%	-4.60%	Mainly due to the increase in payments for goods in the period

Accounts receivable	17,916,754,020.79	51.66%	12,867,543,957.77	42.82%	8.84%	Mainly due to the increase in sales revenue for the period
Inventory	7,151,757,225.00	20.62%	7,385,396,274.99	24.58%	-3.96%	Mainly due to the increase in total assets during the period resulting in a decrease in the proportion of inventories
Investment properties	10,541,474.94	0.03%	10,934,636.91	0.04%	-0.01%	
Fixed assets	2,294,716,152.17	6.62%	1,718,614,087.38	5.72%	0.90%	
Construction in progress	1,740,536,116.71	5.02%	1,824,933,243.40	6.07%	-1.05%	
Right-of-use assets	45,335,830.41	0.13%	13,649,613.93	0.05%	0.08%	
Short-term borrowings	2,698,195,693.57	7.78%	568,858,956.43	1.89%	5.89%	Mainly due to the increase in short-term bank credit facilities during the period
Long-term borrowings		0.00%	236,412,360.31	0.79%	-0.79%	
Lease liabilities	38,030,879.03	0.11%	12,240,480.90	0.04%	0.07%	

III. Overview of the Company's Operations

In the first half of 2022, the company closely followed the pulse of innovation and transformation of pharmaceutical enterprises to achieve new high-quality development, and responded to the national call of "life comes first" to protect people's health, and put social benefits and protection of life in the first place with all staffs. The company keeps focusing on the vaccine industry, optimizing resource allocation, making every effort to ensure the R&D progress and production supply of the products under research, continuously increasing R&D investment, innovating R&D technology, and making continuous efforts around the company's business development goals. Zhifei continuously implements the development model featuring "technology + market" to achieve continuous growth of the company's main business.

In the first half of 2022, the company achieved operating revenue of 18.354 billion yuan, an increase of 39.34% compared with the same period of the previous year, and net profit attributable to owners of the parent company of 3.729 billion yuan, a decrease of 32.08% compared with the same

period of the previous year. With the implementation of a nationwide vaccination program of the covid-19, China's Covid-19 vaccine full vaccination rate reached nearly 90% according to public information in July this year. But the prevention and control of the pandemic are still facing new threats brought by the constantly mutated variants, and the demand for Covid-19 vaccine has also ushered in new changes. During the reporting period, the sales of the company's first-generation vaccine Recombinant COVID-19 Vaccine (CHO Cell) (Zifivax) decreased significantly compared with the same period last year. However, the company's research and development for upgrading the covid-19 vaccine accelerated, and the company's conventional products (except Zifivax) business growth remained strong, and the operating income of proprietary products excluding the Covid-19 vaccine was RMB 920 million, an increase of 25.95% compared with the same period last year. In the first half of 2022, the company's main performance drivers were as follows.

(I) Consolidate R&D and insist on innovation

Since 2022, the domestic and international business environment has remained complex and volatile. The global pandemic rebounding due to the variant strain of the Covid-19 and the local pandemic involving many provinces across the country caused certain impacts on economic consumption, logistics, and transportation. In February 2022, with the approval of the joint prevention and control mechanism of the State Council, the National Health Commission started to deploy sequential booster vaccination, and Zifivax was approved as a sequential (heterologous) booster for the inactivated Covid-19 vaccine. And in March 2022, the company received Conditional Marketing Approval for Zifivax in China, providing more product options for people to receive booster immunization, and a safe and efficient solution to deal with the pandemic.

In the face of the continuous outbreak of the local epidemic, the company has been doing its best to produce and supply vaccines with quality and quantity despite all difficulties. At the same time, to deal with the variants of Covid-19 with faster mutation and stronger transmission, the company has been paying close attention and actively carrying out relevant research and scientific research with the strong support of the government. The company is exploring various technical routes such as recombinant protein and mRNA to expedite the upgrading of the Covid-19 vaccine products (including multivalent vaccine and combination vaccine against the Omicron variant), and the studies have shown more positive results so far.

We are developing a second-generation vaccine, ZF2202 (Omicron-Delta chimeric vaccine),

based on the development platform of the Recombinant Covid-19 Vaccine (CHO Cell), which is currently conditionally marketed. Preliminary studies have demonstrated the safety and efficacy of the second-generation vaccine, as it has a higher neutralizing antibody titer against the current mainstream Omicron BA.4/5 variant. With the mission of meeting people's needs and creating social benefits, the company will continue to contribute to the prevention and control of the Covid-19 pandemic with its R&D strengths.

"Life First, All People Act, Share Health, End TB." As China is a country with a high disease burden of latent TB infection, screening and preventive treatment for latently infected people is an important step in moving forward to reduce the incidence of TB and to prevent and treat the disease. It is also a key player in achieving the global strategic goal of "Ending the TB Epidemic" by 2035. The importance of actively exploring new models of TB latent infection screening and preventive treatment was also demonstrated by the successful holding of the inaugural meeting of the TB Latent Infection Prevention and Control Branch of the China Anti-TB Association and the first academic forum on "Latent Infection Prevention and Control, Helping to End TB" in July this year. The company's tuberculosis product Recombinant Mycobacterium Tuberculosis Fusion Protein (EC) (C-TST) is used for the diagnosis of Mycobacterium tuberculosis infection. And the product Mycobacterium Vaccae for Injection (Vaccae®) is used to prevent tuberculosis disease in people with latent Mycobacterium tuberculosis infection, and can also be used as a combination drug for the adjuvant treatment of tuberculosis chemotherapy. These two products together build a "screening - prevention - treatment" system for tuberculosis infection.

The company's self-developed products have been listed in more than 87% of the provincial units in mainland China. As new technology and method to further curb the TB epidemic and promote the construction of a healthy China, the academic promotion of the company's TB products has achieved positive progress and results. The company has a relatively comprehensive strategy of tuberculosis products and is committed to making the concept of "screening for latent infection, strengthening preventive intervention, and controlling the incidence of tuberculosis" deeply rooted in people's minds. With the promotion and use of the products, the company expects to assume more corporate responsibility for TB prevention and treatment.

Scientific innovation and technological breakthroughs are the main arteries for the development of biopharmaceutical companies. During the reporting period, the company persisted on independent

innovation, actively advanced the progress of R&D, further consolidated its foundation and technical capability, and several products under development achieved clinical stage progress.

Recombinant COVID-19 Vaccine (CHO Cell) was approved for conditional marketing and as a sequential booster shot.

Application for manufacturing registration of 23-valent pneumococcal polysaccharide vaccine was accepted.

lyophilized human rabies vaccine (MRC-5 Cell) and quadrivalent influenza virus cleavage vaccine received the summary report of phase III clinical trial.

Zhifei always follows the epidemic trend of infectious diseases closely, persists on strengthening R&D technology, constantly improves product portfolio, and contributes to disease prevention and control, with outstanding R&D efficiency and innovative achievements. As of the end of the reporting period, there were 28 independent R&D projects, among which 15 projects were in clinical trial and registration application stage, as follows.

Projects Entering the Registration Process

No.	Drug Name	Registration Class	Major Functions	Registration Stage	Progress
1	Pneumovax 23 - Pneumococcal Vaccine, Polyvalent	Prophylactic biologic products class 9	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Drug registration review and approval
2	Lyophilized Rabies Vaccine for Human Use (MRC-5 Cell)	Prophylactic 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	Clinical trial completed
3	Four-valent Influenza Virus-split Vaccine	Prophylactic 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
4	Influenza Virus-split Vaccine	Prophylactic 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
5	15-Valent Pneumococcal Conjugate Vaccine	Prophylactic biologic products class 7	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Phase III clinical trial in progress
6	Lyophilized Rabies	Prophylactic	After vaccination, it can stimulate the	Clinical	Phase III clinical trial

	Vaccine for Human Use (Vero Cell)	biologic products class 15	body to produce anti-rabies virus immunity and is used to prevent rabies.	trial	in progress
7	S. flexneri and S. sonnei Bivalent Shigella Conjugate Vaccine	Prophylactic biologic products class 1	Used to prevent infectious diseases caused by Shigella.	Clinical trial	Phase III clinical trial in progress
8	$ACYW_{135}$ Meningococcal Conjugate Vaccine	Prophylactic biologic products class 7	Used to prevent infectious diseases caused by meningococcus.	Clinical trial	Phase III clinical trial in progress
9	Intestinal Virus Type 71 Inactivated Vaccine	Prophylactic biologic products class 1	Used to prevent diseases caused by EV71 infection.	Clinical trial	Phase II clinical trial in progress
10	Lyophilized Recombinant Tuberculosis Vaccine (AEC/BC02)	Prophylactic biologic products class 1	Used to prevent tuberculosis in the latent groups of infected people with mycobacterium tuberculosis	Clinical trial	Phase II clinical trial in progress
11	Quadrivalent Recombinant Norovirus Vaccine (Pichia Pastoris)	Prophylactic 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	Phase II clinical trial in progress
12	BCG	Prophylactic biologic products class 15	After vaccination, it enables the body to generate cellular immune responses. Used to prevent tuberculosis.	Clinical trial	Phase I 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 after vaccination by BCG, the groups not infected with tuberculosis that are positive after vaccination by BCG, and the groups infected with tuberculosis.	Clinical trial	Phase I clinical trial in progress

14	DPT vaccine (component)	Prophylactic biologic products class 4	Used to prevent diseases caused by pertussis, diphtheria and clostridium tetani.	Clinical trial	Phase I clinical trial in progress
15	Inactivated Rotavirus Vaccine	Prophylactic biologic products class 1	Used to prevent diarrhea caused by rotavirus.	Clinical trial	Phase I clinical trial in progress

Preclinical Project

No.	Product Name	Progress and Changes in 2021	Expected Progress (2022-2023)	
1	Recombinant Hepatitis B Vaccine (Hansenula Polymorpha)	Preclinical study	Preclinical study	IND
2	Bivalent HFMD Vaccine	Preclinical study	Preclinical study	IND
3	Bivalent Recombinant Rotavirus Vaccine (Pichia Pastoris)	Preclinical study	Preclinical study	IND
4	Recombinant Zoster Vaccine (CHO cell)	Preclinical study	Clinical application	Clinical trial
5	Inactivated Japanese Encephalitis Vaccine	Preclinical study	Preclinical study	IND
6	Therapeutic BCG Vaccine	Preclinical study	Preclinical study	IND
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	Clinical application	Clinical trial
10	Recombinant MERS Virus Vaccine	Preclinical study	Preclinical study	Preclinical study
11	DPT-based Combination Vaccine	Preclinical study	Preclinical study	IND
12	Pentavalent Meningococcal Conjugate Vaccine	Preclinical study	Preclinical study	IND
13	Multivalent Pneumococcal Conjugate Vaccine	Preclinical study	Preclinical study	IND

(II) Cultivating market and creating value

The Company persistently cultivates vaccine market all along, and its high-quality development is largely driven by those marketing penetration achievements. During the reporting period, the Company continuously adheres to market-oriented principle. The widely-distributed professional sales team promotes company's R&D achievements into market, which builds the solid foundation of our annual business objectives. At the end of June, the total number of staff was 5077, including

2959 sales staff. As of the disclosure date of this report, the sales team has expanded to 3190 people with a 25.49% year-on-year increase to provide sufficient human resources to serve market timely, precisely and deeply. The country adheres to dynamic zero-COVID policy. While implementing regular pandemic prevention measures under dynamic zero-COVID policy, the Company innovated and conducted academic meetings in various forms both online and offline. Meanwhile, through training and meetings, the Company continuously strengthened the promotion skills and service awareness of sales team, improved the quality of academic meeting promotion, and laid a foundation for market channel development, market operation and service enhancement. In addition, the Company has made efforts to meet the people's health needs and contribute in preventing infectious diseases, thus serving the public and creating social benefits.

The Company's vaccine products are marketed and sold in strict compliance with the requirements of the relevant national laws and regulations after the batch release approval.

1. Proprietary product

Manufacturer	Product Name	Number of Released and Approved Products in the First Half of 2022 (Dose)	Number of Released and Approved Products in the First Half of 2021 (Dose)	Growth Rate (%)
Zhifei Lvzhu	$ACYW_{135}$ polysaccharide vaccine	1,761,547	4,013,266	-56.11
	AC conjugate vaccine	2,903,009	3,155,690	-8.01
	AC polysaccharide vaccine	608,503	0	100.00

2. Agent product

Manufacturer	Product Name	Number of Released and Approved Products in the First Half of 2022 (Dose)	Number of Released and Approved Products in the First Half of 2021 (Dose)	Growth Rate (%)
MSD	Quadrivalent HPV vaccine	4,876,778	3,045,995	60.10
	9-valent HPV vaccine	9,298,758	1,939,924	379.34
	Pentavalent rotavirus vaccine	4,864,045	3,773,249	28.91
	23-valent pneumonia vaccine	1,021,823	490,569	108.29
	Inactivated hepatitis A	126,933	0	100.00

	vaccine			

(III) Compliance management and quality first

The Company always adheres to the "keeping compliance in mind and putting responsibility into action" principle and commits to developing a first-class quality system that is scientific, compliant, and can be improved continuously. The Company conducted production and operation activities following "prioritizing social benefits over corporate profits" and in strict accordance with the laws and regulations including the Vaccine Administration Law, the Regulations on the Release and Approval of Biological Products, and the Biosafety Law. In 2022, given the new requirements for corporate development under the regular pandemic prevention period and new needs from the general public in vaccination, the Company continuously improved its compliance policy, strengthened personnel training, monitored project risks, and developed a compliance control system integrating prevention, monitoring, and punishment. Meanwhile, in active response to the latest national and industry compliance policies, the Company continuously enhanced compliance monitoring efforts and continued to improve its risk control capabilities.

Advancing toward the mission of "safeguarding life and delivering healthy outcomes", the Company has continuously strengthened the awareness of legal and compliant operations based on its business objectives and plans. The Company strengthens quality control over the whole product life cycle to deliver quality products and provide professional service to our clients.

(IV) International cooperation and sharing opportunities

The Company actively develops global partnerships and deeply promotes international cooperation to implement international development and commercialization strategies. The international multi-regional phase III clinical trial of Zifivax was performed at 31 clinical centers across Uzbekistan, Indonesia, Pakistan, and Ecuador and one additional center in China. On May 2022, the clinical trial results were officially published in the New England Journal of Medicine, one of the international leading medical academic journals. The study showed that Zifivax had good safety and efficacy after full vaccination, and also indicated good immune persistency of the vaccine. To enhance the accessibility and affordability of its Covid-19 Vaccine, the Company committed to the WHO Emergency Use Listing qualification to help achieve a fair distribution of vaccines and facilitate the construction of a global immune barrier. Moreover, positive movement was made in

international drug registration and commercial cooperation for Zifivax and other self-developed products.

To meet the national demand for disease prevention, the Company has continued to develop more excellent products with its partners through technological innovation. With the introduction of innovative products, the Company expects to enhance vaccine recognition and vaccination rates through market promotion.

IV. Analysis of Core Competitiveness

(I) Excellent R&D strength

The Company has always focused on developing and improving its R&D and innovation capabilities. Over the past two decades, through continuous capital investment, the Company has built a professional and efficient research team and constructed a hierarchical, systematic and forward-looking matrix layout. With diversified and innovative development platform as well as deep understanding of industry development, the Company achieves high-quality development.

1. Strengthening the foundation of innovation through continuous investment in R&D

R&D, innovation and technological breakthroughs are the core drivers of the Company's development. Since its establishment, the Company has driven its development with R&D and innovation, continuously broadened its presence in emerging technologies through diversified approaches to strengthen its independent R&D capabilities. Furthermore, the Company has accelerated technical cooperation, and attached importance to technology introduction to continuously improve in-house and collaborative innovation capabilities, and promote the transformation of technological innovation into greater benefits. By the end of the reporting period, the company had 647 R&D personnel, and the R&D investment in the first half of 2022 reached RMB 518 million, which accounts for 31.08% of the company's sales revenue of independent products, providing sufficient talent reserve and financial guarantee for the company's independent R&D innovation.

At present, the Company has built several vaccine R&D platforms covering a wide range of vaccine development pathways, including the polysaccharide and polysaccharide conjugate vaccine

technology platform, component technology platform, inactivated vaccine technology platform, genetic recombination technology platform, mRNA vaccine technology platform, adenovirus vector vaccine technology platform, human diploid cell line technology platform, novel multiplex polyvalent technology platform, and novel adjuvant technology platform. A gradually expanding network of R&D platforms strongly promotes the synergistic development of the R&D matrix, and effectively motivates the progress of each R&D project.

2. Facilitating matrix development with three major R&D bases

The Company has built three major R&D and manufacture bases, namely Zhifei Lvzhu, Zhifei Longcom, and Zhirui Biopharmaceutical Industrial Park, to speed up the R&D and registration of high-quality self-developed products and promote the long-term sustainable development of the Company. With the support of Zhifei Lvzhu and Zhifei Longcom, the Company has steadily advanced R&D pipeline to keep well-positioned in the industry competition. By leveraging the resources of the Zhirui Biopharmaceutical Industrial Park, the Company has continuously deepened its presence in the comprehensive biological field, incubated and developed preventive and therapeutic biotechnologies and products, and promoted the continuous improvement of its R&D capabilities.

Currently, there are 28 projects in development, including 15 in clinical trial stage or applications for registration. A well-structured and sufficient pool of projects has formed a product matrix with synergistic effects, further boosting the Company's competitiveness in the industry.

Matrix	Projects under research
Tuberculosis product matrix	Lyophilized Recombinant Tuberculosis Vaccine (AEC/BC02), BCG Vaccine for Intradermal Injection, and BCG-PPD.
Rabies vaccine matrix	Lyophilized Rabies Vaccine for Human Use (MRC-5 Cell), and Lyophilized Rabies Vaccine for Human Use (Vero Cell).
Respiratory virus vaccine matrix	Four-valent Influenza Virus-split Vaccine, Influenza Virus-split Vaccine, and Respiratory Syncytial Virus (RSV) Vaccine.
Pneumococcal vaccine matrix	15-Valent Pneumococcal Conjugate Vaccine, Pneumovax 23 - Pneumococcal Vaccine, and Multivalent Pneumococcal Conjugate Vaccine.
Enteric disease vaccine matrix	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).
Meningococcal vaccine matrix	$ACYW_{135}$ Meningococcal Conjugate Vaccine, Recombinant Meningococcal Group B Vaccine, and Pentavalent Meningococcal Conjugate Vaccine
Note: The above matrices do not cover all of the Company's projects under research. Further information on the R&D progress, please refer to the relevant section of this report.	

In addition, the Company continued to strengthen patent management and obtained a total of 40 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 Virus Gene and Production Method of Hepatitis B Surface Antigen	ZL201610137245.8
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

Method for purifying shigella dysenteriae specific polysaccharide	ZL202010416157.8
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
Nucleic acid extraction instrument	ZL201820095810.3
Subunit coronavirus vaccine for dimerization-based receptor binding domains	ZL201511021535.8
System with feed liquid reaction and ultrafiltration effects	ZL202122293408.0
Method for preparing pneumococcal capsular polysaccharide by viscosity control	ZL201811232369.X
Preparation method of inactivated rotavirus (RV) vaccine	ZL201910445069.8
Vaccine and combination medicine for preventing tuberculosis, method for preparing vaccine and application	ZL201810902885.2
Method of detecting molecular weight of pneumococcal capsular poly-saccharides	ZL201911008923.0
Preparation method and application of recombinant novel coronavirus NCP-RBD protein expressed by CHO cells	ZL202110950803.3
Combined vaccine for respiratory syncytial virus infection	ZL202010863764.9

Since its listing in 2010, the Company has realized a revenue of more than RMB 18.4 billion from proprietary products on a cumulative basis, paving the way for investment in R&D to further increase our competitiveness and promote commercialization of launched products.

(II) Mature and standardized marketing

The Company has built a development model featuring "technology + market", under which the good complementarity between R&D advancements and commercial achievements results in a circular mechanism of mutual promotion and transformation. Moreover, the Company has accelerated the process of product development and registration to deliver more products to meet the national needs of disease prevention. The Company is on its way toward “the dreams of health, biology, Zhifei and China”.

1. Constantly building an industry-leading marketing network

The company attaches importance to the development of marketing strategies and the construction of marketing teams. While consolidating the foundation of marketing team operation and management, the Company continues to optimize market paths, refine market services and enhance resource integration. An all-round and integrated business model strengthens risk control

capabilities while boosting cost efficiency. The Company pays attention to the demonstration, formulation, implementation and feedback for the sales promotion strategy. The Company constantly improves its team management model and flexibly adjusts its sales strategy to respond to market changes to maintain a strong position.

2. Wide-ranging marketing network

In 2021, the Company set up a professional marketing team of nearly 3,000 members, and established a marketing network covering more than 30,000 points of vaccination (POV) in more than 300 cities and more than 2,600 districts and counties across 31 provinces, autonomous regions and municipalities directly under the central government. The marketing team continues to provide professional, meticulous and comprehensive services to our clients, which helps us to achieve our business objectives.

(III) Professional and efficient business management

Over the past two decades, by adhering to the business principle of "prioritizing social benefits over corporate profits", the Company has put quality, standards, disciplines and integrity in the first place, and practiced the idea of "keeping compliance in mind and putting responsibility into action" in all aspects of R&D, production, promotion, sales and distribution.

1. Strict production quality control system

With the capabilities of large-scale production, standardized quality control, specialized commercial development, and domestic first-class industrialization, the Company has established a strict quality management system, and has actively improved its production and quality control capabilities according to international standards. In actual production, we strictly control every step of raw material procurement, manufacture, inspection, release and sales to ensure the safety, effectiveness and traceability of our products. We have developed a strict quality and safety mechanism, a risk control mechanism and an adverse reaction monitoring system.

The Company's subsidiaries, Zhifei Lvzhu and Zhifei Longcom, are two major manufacture and R&D bases equipped with modern equipment for production as well as professional and dedicated production teams. Meanwhile, the Company has established long-term and stable cooperation with a

number of outstanding domestic and international suppliers. Since 2008, when the first batch of its products were released and approved, the Company has maintained a 100% release and approval rate for its proprietary products.

2. Professional and experienced management team

We believe talents are critical for the development of a company. Our core management personnel have extensive management and industry experience as well as in-depth insights into disease prevention and control. The stable, professional, and efficient management team supports the Company's operation and management activities. Following the blueprint set by the management team, the Company actively responds to market changes, continuously strengthens its innovation capabilities and core competitiveness.

Focusing on the Zhifei's mission and culture, the Company attracts, unites and retains people with shared aspiration and ambition for innovation and biology. The Company implements a diversified incentive mechanism, a sound benefit sharing mechanism and a stable talent development strategy, which further provides talent support for its long-term sustainable development.

V. 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 manufacture and sales of the products. 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 respond 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

By the end of the first half of 2022, the number of the sales staff reached 2,959. 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. Meanwhile, the company adopts a rich and diversified incentive system and benefit sharing mechanism to revitalize the vitality and motivation of the team.

(IV) Risks of AEFI

AEFI (Adverse Events After Immunization) refers to the adverse 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 distribution chain, created a comprehensive sales and pharmacovigilance system. 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 vaccine hesitancy

Despite the fact that vaccines are the most cost-effective way to prevent and control infectious diseases, "vaccine hesitancy" still affects vaccine acceptance. Reluctance or refusal to receive vaccines may reverse the progress made in vaccines for preventable diseases and may reduce the prosperity of the vaccine industry for a period of time, thus 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.