Chongqing Zhifei Biological Products Co., Ltd.

2022

Full Year Business Performance

Chongqing Zhifei Biological Products Co., Ltd.

Board of Directors

March 2023

Important Notes

The main content and data of this report are from the 2022 annual 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

Zhifei is an international, full-industry chain high-tech bio-pharmaceutical enterprise integrating R&D, production, sales, distribution, import and export of vaccines and biological products. As an important global vaccine developer and supplier with mission and responsibility, for two decades, the Company always adheres to its business principle "prioritizing social benefits over corporate profits" and focuses on infectious disease prevention and control. With the development model featuring “technology&market” drivers, the coordinated development of diagnosis, prevention and treatment, and the innovative research and development, the Company continuously completes its “prevention before disease, treatment after disease” business layout, to serve the public, and to contribute to a healthy China.

In 2021, there was no material change in the principal business of the Company. 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.

(II) Major products and indication

As of the disclosure date of this report, a total of eleven products had been launched, of which one product got conditional approval. The Company offers a diverse range of products, including 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	Group A and Group C Meningococcal Polysaccharide Vaccine	Mengnake	prevent epidemic cerebrospinal meningitis caused by Neisseria meningitidis group A and C
5	Recombinant Novel Coronavirus Vaccine (CHO Cell)	Zifivax™	Used to prevent diseases caused by Covid-19.
6	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.
7	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.
8	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).
9	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.
10	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.
11	Pneumovax 23 - Pneumococcal Vaccine, Polyvalent	Pneumovax	Used to prevent the pneumococcal disease in the form of the capsulate bacteris contained in this vaccine.
12	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. The Company adheres to innovation-driven development through independent R&D, carries out cooperative R&D with leading R&D institutions, academies of sciences, etc., and engages in investment and incubation targeting cutting-edge technologies, hence the innovation strategy of "prioritizing independent R&D over cooperative R&D as well as investment and incubation." The breakthroughs in scientific research are successfully transformed into innovation outcomes so as to satisfy people's health needs through technological innovation, product iteration, and launch of new products, and to revitalize the Company’s development

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	2021	Increase/decrease of the current year compared to the previous year	2010
Operating income (RMB)	38,264,011,331.74	30,652,415,906.61	24.83%	15,190,366,231.21
Net profit attributable to shareholders of the Company (RMB)	7,538,999,697.34	10,208,548,452.56	-26.15%	3,301,326,830.15
Net profit attributable to shareholders of the Company after deducting non-recurring gains and losses (RMB)	7,509,900,188.61	10,184,137,871.79	-26.26%	3,322,905,479.75
Net cash flows from operating activities (RMB)	1,989,033,105.26	8,507,591,817.35	-76.62%	3,496,688,940.12
Basic earnings per share (RMB/share)	4.7119	6.3803	-26.15%	2.0633
Diluted earnings per share	4.7119	6.3803	-26.15%	2.0633

(RMB/share)				
Weighted average return on equity	36.13%	78.01%	-41.88%	46.29%
	As at the end of 2022	As at the end of 2021	Increase/decrease of the current year compared to the previous year	As at the end of 2010
Total assets (RMB)	38,003,733,941.95	30,047,323,465.36	26.48%	15,215,241,753.29
Net assets attributable to shareholders of the Company (RMB)	24,236,212,609.17	17,657,212,911.83	37.26%	8,248,664,459.27

(II) Key financial indicators by quarter

	First quarter	Second Quarter	Third Quarter	Fourth Quarter
Operating income (RMB)	8,841,150,250.19	9,512,597,558.47	9,469,539,012.34	10,440,724,510.74
Net profit attributable to shareholders of the Company (RMB)	1,922,756,886.80	1,806,260,464.67	1,878,137,901.60	1,931,844,444.27
Net profit attributable to shareholders of the Company after deducting non-recurring gains and losses (RMB)	1,895,759,612.77	1,813,244,135.25	1,881,140,995.85	1,919,755,444.74
Net cash flows from operating activities (RMB)	-3,316,743,954.40	1,936,440,752.87	2,369,528,998.54	999,807,308.25

(III) Breakdown of recurring profit or loss items and amounts

Item	Amount in 2022	Amount in 2021	Amount in 2020
Profit or loss on disposal of non-current assets (including the write-off portion of the provision for asset impairment)	-86,111.55	-1,643,198.23	-4,568.29
Government subsidies included in current profit or loss (excluding those closely related to the Company's normal business operations, which are granted continuously in fixed amounts or quantities in accordance with certain standards and in compliance with national policies)	71,589,204.49	101,045,331.47	27,189,563.57
Profit or loss on debt restructuring		-852,169.20	-783,943.30
Profit or loss from changes in the fair value of financial assets and liabilities held for trading, and investment income from the disposal of financial assets and liabilities for trading and available-for-sale financial assets, except for effective hedging activities related to the Company's normal business operations		-5,625,856.85	-12,574,514.90
Other non-operating income and expenses other than those mentioned above	-40,279,514.52	-66,383,696.92	-40,230,227.90

Other profit or loss items that meet the definition of non-recurring profit or loss	2,997,843.19	2,025,026.70	935,922.13
Less: Amount affected by income tax	5,121,912.88	4,154,856.20	-3,889,119.09
Total	29,099,508.73	24,410,580.77	-21,578,649.60

III. MANAGEMENT DISCUSSION AND ANALYSIS

(I) Overview

In the process of the global economic recovery, challenges and opportunities are reshaping the world and impacting the whole bio-pharmaceutical industry. In 2022, society and enterprises were confronted with unexpected risks and challenges due to the ongoing geopolitical conflicts and convoluted macroeconomic conditions. Throughout the year, the Company's entire management and staff rallied against all odds in accordance with the business principle of "prioritizing social benefits over corporate profits," and under the leadership of the Board of Directors. Our development model emphasized "technology & market" drivers to achieve the development objectives are faithfully applied, which enabled the Company to seize opportunities to achieve new heights.

During the reporting period, the Company posted RMB38,264,011,331.74 in operating income, representing a 24.83% year-on-year (YoY) increase. Net profit attributable to shareholders of the Company reached RMB7,538,999,697.34, a 26.15% YoY decrease. Net profit attributable to shareholders of the Company after deducting non-recurring gains and losses amounted to RMB7,509,900,188.61, down 26.26% YoY. During the year, conditioned by objective factors, the market demands and the competitive landscape for some of the Company's products witnessed considerable changes, resulting in a notable decline in sales compared to the previous year. Nonetheless, in the wake of people's growing health awareness and vaccination voluntariness, the market for non-NIP (non-National Immunization Program) vaccines further expanded, and its potential was constantly inspired. In 2022, the Company was remarkably rewarded for promotion and sales of regular products, securing an operating income of RMB1.76 billion in regular independent products, a 35.82% YoY increase.

During the reporting period, the main driving factors for the business performance of the Company include:

1. Focusing on R&D to expedite product innovation

Always attentive to the spreading trends of domestic and overseas infectious diseases, the Company keeps abreast of the latest developments of industry-leading technology and persistently expedites product innovation through matrix-based layouts and platform-based technological breakthroughs, in a move to fully meet people's health needs. In 2022, the Company's R&D investment reached RMB1.1 billion, accounting for about 33.89% of revenue from independent products, representing a 36.78% YoY increase. The number of R&D employees grew to 807, a 42.58% YoY increase. Thanks to the increase in R&D investment and the enhancing of team building, the Company is stoked with abundant energies in consolidating and promoting R&D innovation.

During the reporting period, the Company actively responded to the enactment of national policies and the implementation of vaccination programs, and left no stone unturned to fulfill the work of product R&D, manufacturing, and supply. In February 2022, the Recombinant COVID-19 Vaccine (CHO Cell) (Zifivax), an independent development product of the Company, was officially approved in China as a subsequent booster dose of inactivated COVID-19 vaccines. In March 2022, it received conditional marketing approval as the first homegrown Recombinant COVID-19 Vaccine (CHO Cell). In December 2022, Zifivax was officially approved as the second booster dose of inactivated COVID-19 vaccines. And it was also approved as prime immunization for population aged 3–17, thus Zifivax was suitable for populations over 3. Meanwhile, people over 18 who are fully vaccinated with Zhifei's Recombinant COVID-19 Vaccine (CHO Cell) for at least six months can be administered to another booster shot of Homologous booster. As Zifivax gets approved to cover more populations and various occasions, people gain access to diversified alternatives, laying solid groundwork for marketing Zifivax.

During the reporting period, in response to new variants of COVID-19, the Company ramped up R&D and upgraded its vaccine products by genetic recombinant technology, mRNA, and other

technological routes. In 2022, the Company initiated the international clinical trial for the second generation of COVID-19 vaccine (Omicron-Delta chimeric vaccine) in Uzbekistan and advanced R&D of upgraded products, including the new generation of Recombinant COVID-19 Vaccine (CHO Cell) developed after the spread of Omicron BA.4/5 sub-variants, the mRNA-based broad-spectrum COVID-19 vaccine, and the combined vaccine targeting both COVID-19 and influenza viruses. Adhering to the principle of "putting people and their lives first," the Company takes as its mission to meet people's needs and contribute to society.

The Company endeavors to fulfill the work of product R&D for the sake of improved technical strengths and R&D effectiveness. During the reporting period, the Company made remarkable progress in several R&D programs. Its application for the production and registration of 23-valent pneumococcal polysaccharide vaccine was under NDA review. The summary reports for the phase-III clinical trials of lyophilized rabies vaccine for human use (MRC-5 cell) and quadrivalent influenza virus-split vaccine were finished. Recombinant group B meningococcal vaccine (colon bacillus) was approved for clinical trail.

During the reporting period, the Company continued to ameliorate the methods of product launches and foster independent product development to meet people's galloping health needs and match the product upgrading followed by breakthroughs in industrial technology. As of the end of the reporting period, the Company held a sum of 28 independent development programs in pipeline, among which 16 were under clinical trials or application for registration. Further information is given as below:

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	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Drug registration review and approval
2	Lyophilized Rabies Vaccine for Human Use	Prophylactic biologic	After vaccination, it can stimulate the body to produce anti-rabies virus immunity and is	Clinical trial	Clinical trial completed
3	Quadrivalent Influenza Virus-split Vaccine	Prophylactic biologic products class	After vaccination, it can stimulate the body to produce anti-influenza virus immunity and is used to prevent influenza caused by the strain	Clinical trial	Clinical trial completed

No.	Drug Name	Registration Class	Major Functions	Registration Stage	Progress
4	Influenza Virus-split Vaccine	Prophylactic biologic	After vaccination, it can stimulate the body to produce anti-influenza virus immunity and is	Clinical trial	Clinical trial completed
5	15-Valent Pneumococcal	Prophylactic biologic	Used to prevent infectious diseases caused by streptococcus pneumoniae.	Clinical trial	Phase III clinical trial in progress
6	Lyophilized Rabies Vaccine for Human Use	Prophylactic biologic	After vaccination, it can stimulate the body to produce anti-rabies virus immunity and is	Clinical trial	Phase III clinical trial in progress
7	S. flexneri and S. sonnei Bivalent Shigella	Prophylactic biologic	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	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	Used to prevent diseases caused by EV71 infection.	Clinical trial	Phase II clinical trial in progress
10	Lyophilized Recombinant	Prophylactic biologic	Used to prevent tuberculosis in the latent groups of infected people with	Clinical trial	Phase II clinical trial in progress
11	Quadrivalent Recombinant Norovirus	Prophylactic biologic	After vaccination, it stimulates the body to produce anti-norovirus immunity, which is	Clinical trial	Phase II clinical trial in progress
12	BCG	Prophylactic biologic	After vaccination, it enables the body to generate cellular immune responses. Used to	Clinical trial	Phase I clinical trial in progress
13	BCG-PPD	Therapeutic biologic	Used for clinical ancillary diagnosis of tuberculosis, epidemiological survey of	Clinical trial	Phase I clinical trial in progress
14	DPT vaccine (component)	Prophylactic biologic products class	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	Used to prevent diarrhea caused by rotavirus.	Clinical trial	Phase I clinical trial in progress
16	Recombinant Group B Meningococcal Vaccine	Prophylactic biologic	Used to prevent infectious diseases caused by meningococcus.	Clinical trial	Phase I clinical trial in preparation

Preclinical Project

No.	Product Name	Progress and Changes in	Expected Progress (2022-2023)	
1	Recombinant Hepatitis B Vaccine	Preclinical study	Preclinical study	Preclinical study
2	Bivalent HFMD Vaccine	Preclinical study	Preclinical study	Clinical Application
3	Bivalent Recombinant Rotavirus Vaccine	Preclinical study	Preclinical study	Clinical Application
4	Recombinant Zoster Vaccine (CHO cell)	Preclinical study	Clinical Application	Clinical Trial
5	Inactivated Japanese Encephalitis Vaccine	Preclinical study	Preclinical study	Clinical Application
6	Therapeutic BCG Vaccine	Clinical Application	Clinical Approval	Clinical Trial
7	Inactivated Varicella-zoster Virus Vaccine	Preclinical study	Preclinical study	Clinical Application

No.	Product Name	Progress and Changes in	Expected Progress (2022-2023)	
8	Respiratory Syncytial Virus (RSV)	Preclinical study	Preclinical study	Preclinical study
9	Recombinant MERS Virus Vaccine	Preclinical study	Preclinical study	Preclinical study
10	DPT-based Combination Vaccine	Preclinical study	Clinical Application	Clinical Trial
11	Pentavalent Meningococcal Conjugate	Preclinical study	Preclinical study	Clinical Application
12	Multivalent Pneumococcal Conjugate	Preclinical study	Preclinical study	Clinical Application

Note: The above disclosed projects under development do not include Covid-19 vaccine candidates.

2. Improving marketing through considerate operations

In exploiting market potentials, the Company features its refined and precise management of markets. The Company focuses on introducing new talents and refines talent cultivation and assessment mechanisms. The Company improves the capabilities of integrating and flexibly dealing with information on end-users and market trends, which contributes to distinctive attainments in marketing and the Company's further high-quality development.

During the reporting period, the Company faithfully applied the national policy on sequential immunization, and the marketing team launched nationwide promotional activities capitalizing on the advantages of the sales network, scale, and professionalism. In this way, the Company's outstanding services and its impressive product Zifivax gained wide recognition. Despite pressure and challenges, the Company, as always, fulfills the work of manufacturing and supplying vaccines, offering quality products and multi-faceted services to the public.

During the reporting period, the Company paid close attention to the national undertakings of tuberculosis (TB) prevention and treatment. Practical actions were taken in response to the slogan of "Invest To End TB. Save Lives." (which was the theme of World TB Day 2022), thus contributing to the building of national non-TB community and the termination of global TB prevalence. During the year, the Company made great strides in market access and promotion of independent developed-products Vaccae and Ekear. Currently, over 90% provincial public institutions in the Chinese mainland have bidden for these products via online platforms. The WHO issued the latest versions of consolidated guidelines on TB and operational handbook on

tuberculosis in September 2022. In these documents, the recombinant Mycobacterium tuberculosis fusion protein (EC) independently developed by the Company is recommended for diagnosing TB as the only enlisted domestic tuberculosis-specific antigen-based reagent for screening TB infection. Ekear was successfully included in China's medical insurance program in January 2023, which enables more populations to benefit from Ekear. The vulnerable populations can be more easily screened for Mycobacterium tuberculosis infection, and the Company will exploit the synergy of its anti-tuberculosis product matrix.

The Company continues to strengthen marketing team building, improve the business performance of regular products, and fortify the cooperative relationship with business partners. As of the end of the reporting period, sales staff reached 3,359, a 19.24% YoY increase, ensuring that the Company's market-oriented services are rendered to end-users in a timely and targeted manner.

During the reporting period, the Company's vaccines were made available for sale only after they had obtained a national batch release and approval certificate in strict compliance with applicable laws and regulations of the People's Republic of China. The details of batch releases of Company's for-sale vaccines during the reporting period are presented as below:

1. Proprietary product

Manufacturer	Product Name	Number of Released and Approved Products in 2022 (Dose)	Number of Released and Approved Products in 2022 (Dose)	Growth Rate (%)
Zhifei Lvzhu	ACYW135 polysaccharide vaccine	4,215,743	6,952,244	-39.36
	AC conjugate vaccine	6,856,777	3,867,093	77.31
	Hib vaccine	1,583,216	3,104,995	-49.01
	AC polysaccharide vaccine	1,073,622	223,098	381.23

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	Tetravalent HPV vaccine	14,028,431	8,802,500	59.37
	9-valent HPV vaccine	15,477,232	10,206,168	51.65
	Pentavalent rotavirus vaccine	8,826,330	7,308,624	20.77
	23-valent pneumonia vaccine	1,021,823	1,475,653	-30.75
	Inactivated hepatitis A vaccine	613,082	807,151	-24.04

3. Quality first and compliance management

Since its listing, the Company has always adhered to the principle of "keeping compliance in mind and putting responsibility into action" and continued to build a first-class quality management system that features scientism and compliance while advancing with the times. In strict compliance with the Vaccine Administration Law, the Drug Administration Law, the Provisions for the Lot Release of Biological Products, and other applicable laws and regulations, the Company adheres to the business principle of "prioritizing social benefits over corporate profits" in its production and operating activities.

During the reporting period, the Company faithfully implemented the measures in the new phase and fully exploited its strengths as a vaccine R&D enterprise to ensure the production, storage, and supply of vaccines and other salable products. The Company thereby answered people's pressing needs for vaccination and served national policies aimed at protecting the people's life and health to the greatest extent possible.

The Company has developed the sound governance framework and institutional system to solidify the foundation for corporate governance and fully protect the lawful rights and interests of shareholders, clients, employees, etc. The Company emphasizes compliance operations and builds a compliance management framework that consists of decision-making, management, and executive sectors. The Company attaches great importance to compliance operations and sets up a compliance management framework consisting of decision-making, management, and executive levels. The Company continues to revise compliance policies, strengthen training and publicity, and monitor project risks, forming a compliance management system covering prevention, monitoring, and punishment. Meanwhile, it remains responsive to the latest government and industry compliance policies, strengthens compliance monitoring, and constantly improves its risk prevention capabilities. The Company persistently fulfills its mission of "safeguarding life and delivering healthy outcomes" and adheres to the core values of "quality first." Based on its business objectives and annual plans, it ensures compliance in operations in a bid to provide quality products and professional services. With its original aspiration and corporate credibility in mind, the Company

strengthens quality management throughout the lifespan of products, in the quest for an honest and responsible corporate brand.

4. Sharing development opportunities in international cooperation

The Company fully exploits its potentials for independent innovation and actively fosters the global partnership. It is committed to deeper international collaboration while practicing the development strategy of global operations and the product strategy of overseas marketing. Science respects no borders. The Company and its partners collaborate to deal with individuals' health concerns and improve the living conditions of mankind. It strains to satisfy people's requirements for disease prevention, provide quality products driven by technological innovation, and promote vaccine acceptance and coverage through marketing. It brings in and also exports quality products so the vaccines can benefit more people at home and aboard.

During the reporting period, the Company applied for WHO procedure and overseas registration of Zifivax with the intention of fostering vaccine accessibility and affordability and ensuring the fairness of vaccine distribution. The WHO-EUL verification is the strategic prerequisite for the vaccine coverage of global market. To propel the verification, the Company aligned with the requirements set out in WHO documents and overseas laws, regulations, and technical guidelines in terms of quality management system, verification techniques, examination measures, etc. The Company refined the quality management document system in pursuit of complete process, acceptable standards, and appropriate approaches, improved the recording of production and examination, and provided training for employees according to the new system of documents. Zhifei Longcom passed muster on site in terms of the COVID-19 vaccine WHO EUL verification in October 2022. The WHO chief inspector spoke highly of the Company, and the relevant assignments are well under way. Zifivax has received marketing approval from Uzbekistan and Kenya, emergency use authorization from Indonesia and Colombia, and conditional market approval from Belarus. Going forward, the Company will dig out opportunities of international medicine registration and business cooperation for more products.

II. Business Analysis

(I) Composition of Operating Income

1. Overview of Operating Income

Unit：RMB

	2022		2021		Year-on-year increase or decrease
	Amount	As a percentage of operating income	Amount	As a percentage of operating income	
Total operating income	38,264,011,331.74	100%	30,652,415,906.61	100%	24.83%
By industry					
Biological	38,260,160,010.26	99.99%	30,628,958,674.52	99.92%	24.91%
Others	3,851,321.48	0.01%	23,457,232.09	0.08%	-83.58%
By category					
Proprietary	3,285,457,349.98	8.59%	9,697,480,143.81	31.64%	-66.12%
Agent products	34,974,702,660.28	91.40%	20,931,478,530.71	68.28%	67.09%
Others	3,851,321.48	0.01%	23,457,232.09	0.08%	-83.58%
By region					
Northeast China	1,437,448,947.12	3.76%	890,420,461.18	2.90%	61.43%
North China	4,045,316,306.18	10.57%	4,695,279,774.24	15.32%	-13.84%
Northwest China	1,636,550,452.09	4.28%	1,106,754,079.81	3.61%	47.87%
Central China	5,592,099,013.52	14.61%	4,773,032,920.95	15.57%	17.16%
East China	12,986,971,292.06	33.94%	9,545,517,145.04	31.15%	36.05%
Southwest China	5,038,751,258.30	13.17%	4,118,610,388.48	13.44%	22.34%
South China	7,527,337,215.94	19.67%	4,359,780,775.46	14.22%	72.65%
Export	-463,153.47	0.00%	1,163,020,361.45	3.79%	-100.04%

2. Industries, products, regions, and sales models that account for more than 10% of the Company's operating income or profit

Unit：RMB

	Operating income	Operating cost	Gross margin	Year-on-year increase or decrease in operating income	Year-on-year increase or decrease in operating cost	Year-on-year increase or decrease in gross margin
By industry						
Biological products	38,260,160,010.26	25,393,779,839.64	33.63%	24.91%	62.62%	-31.40%
By category						
Proprietary products	3,285,457,349.98	444,075,635.81	86.48%	-66.12%	-53.66%	-4.04%

Agent products	34,974,702,660.28	24,949,704,203.83	28.66%	67.09%	70.22%	-4.40%
By region						
Northeast China	1,437,448,947.12	989,372,967.24	31.17%	61.44%	93.15%	-26.61%
North China	4,043,438,759.45	2,686,362,854.76	33.56%	-13.85%	21.54%	-36.57%
Northwest China	1,636,550,452.09	1,091,655,253.75	33.30%	47.87%	70.23%	-20.83%
Central China	5,592,099,013.52	3,551,841,881.99	36.48%	17.16%	67.79%	-34.45%
East China	12,986,124,629.11	8,814,274,979.81	32.13%	36.05%	64.30%	-26.64%
Southwest China	5,038,733,258.30	3,256,526,211.12	35.37%	22.35%	65.61%	-32.31%
South China	7,526,228,104.14	4,995,999,035.29	33.62%	73.49%	86.43%	-12.04%
Export	-463,153.47	7,746,655.69	-	-100.04%	-93.74%	-

3. The Company's Income from physical sales

By industry	Item	Unit	2022	2021	Year-on-year Increase
Biological products	Sales volume	dose	158,556,423	284,180,087	-44.21%
	Production volume	dose	107,133,135	289,950,244	-63.05%
	Inventory	dose	39,916,823	53,573,357	-25.49%

4. Composition of operating costs

Unit：RMB

By category	Item	2022		2021		Year-on-year increase or decrease
		Amount	As a percentage of operating costs	Amount	As a percentage of operating costs	
Proprietary biological products	Where, direct	172,924,206.61	0.69%	166,300,296.49	1.06%	3.98%
	Direct labor	68,565,756.18	0.27%	105,430,010.65	0.67%	-34.97%
	Manufacturing	166,047,031.95	0.65%	641,537,075.04	4.11%	-74.12%
	Shipping costs	36,538,641.07	0.14%	44,992,699.18	0.29%	-18.79%
	Subtotal	444,075,635.81	1.75%	958,260,081.36	6.13%	-53.66%
Agent biological products	Where,	24,845,001,806.83	97.83%	14,575,294,222.20	93.31%	70.46%
	Shipping costs	104,702,397.00	0.41%	81,810,894.50	0.52%	27.98%
	Subtotal	24,949,704,203.83	98.24%	14,657,105,116.70	93.83%	70.22%
Others	Others	1,719,920.92	0.01%	6,435,835.02	0.04%	-73.28%
Total		25,395,499,760.56	100.00%	15,621,801,033.08	100.00%	62.56%

(II) Expenses

Unit：RMB

	2022	2021	Year-on-year increase or decrease	Description of significant changes
Selling expenses	2,235,236,669.22	1,834,807,366.30	21.82%	Mainly as a result of strengthening the sales team and increasing market promotion efforts in 2022
Overhead expenses	374,126,245.27	300,195,513.05	24.63%	Mainly due to the increase in employee compensation, depreciation and amortization, and other costs in 2022
Financial expenses	13,798,317.84	21,821,270.29	-36.77%	Mainly due to the increase in interest income and the decrease in interest expenses in 2022
R&D expenses	854,161,335.34	552,625,543.34	54.56%	Mainly due to the increase in investment in R&D projects in 2022

(III) Investments in R&D

1. The Company's R&D personnel

	2022	2021	Change ratio
Number of R&D personnel	807	566	42.58%
Number of R&D personnel as a percentage of total staff	14.07%	11.79%	2.28%
Educational background of R&D personnel			
PhD	350	228	53.51%
Master	446	332	34.34%
Bachelor and below	11	6	83.33%
Age composition of R&D personnel			
Under 30 years old	578	336	72.02%
Between 30 and 40 years old	190	199	-4.52%
Over 40 years old	39	31	25.81%

2. The Company's amount of R&D investment and the percentage of R&D investment over operating income in the past three years

	2022	2021	2020
Amount of R&D investment (RMB)	1,113,371,642.56	813,971,655.07	480,550,074.99
Percentage of R&D investment over	2.91%	2.66%	3.16%
Amount of capitalization of R&D	33.89%	8.39%	40.02%
Percentage of capitalization of R&D	259,210,307.22	261,346,111.73	180,899,724.78
Percentage of capitalization of R&D	23.28%	32.11%	37.64%
Amount of R&D investment (RMB)	3.44%	2.56%	5.48%

3. Cashflow

Item	2022	2021	Year-on-year increase or decrease	Description of significant changes
Subtotal cash inflow from operating activities	31,370,285,593.40	25,468,301,329.83	23.17%	Mainly due to the increase in sales and payments received from sales in 2022
Subtotal cash outflow from operating activities	29,381,252,488.14	16,960,709,512.48	73.23%	Mainly due to the increase in payments for procurement of agent products in 2022
Net cash flows from operating activities	1,989,033,105.26	8,507,591,817.35	-76.62%	Mainly due to the increase in sales volume in 2022
Subtotal cash inflow from investing activities	646,784.96	501,793,935.27	-99.87%	Mainly due to no cash management business in 2022
Subtotal cash outflow from investing activities	1,498,601,683.66	2,521,130,952.23	-40.56%	Mainly due to the decrease in payments for equipment and construction in 2022
Net cash flows from investing activities	-1,497,954,898.70	-2,019,337,016.96	25.82%	Mainly due to the decrease in payments for equipment and construction in 2022
Subtotal cash inflow from financing activities	5,516,548,948.79	2,682,429,814.10	105.65%	Mainly due to the increase in short-term loans received in 2022
Subtotal cash outflow from financing activities	7,689,196,338.38	6,272,341,051.80	22.59%	Mainly due to the increase in short-term loans repaid in 2022
Net cash flows from financing activities	-2,172,647,389.59	-3,589,911,237.70	39.48%	Mainly due to the increase in short-term loans received in 2022
Net increase in cash and cash equivalents	-1,664,011,893.96	2,888,682,246.32	-157.60%	Mainly due to the increase in payments for procurement of agent products in 2022

4. Analysis of assets and liabilities

	End of 2022		Early 2021		Percentage increase/ decrease	Description of significant changes
	Amount	As a percentage of total assets	Amount	As a percentage of total assets		
Monetary funds	2,622,063,766.18	6.90%	4,307,751,548.35	14.34%	-7.44%	Mainly due to the increase in payments received from sales in 2022
Accounts receivable	20,613,901,100.57	54.24%	12,867,543,957.77	42.82%	11.42%	Mainly due to the increase in sales volume in 2022
Inventory	8,020,470,692.08	21.10%	7,385,396,274.99	24.58%	-3.48%	Mainly due to the increase in total assets in 2022
Investment	10,148,312.97	0.03%	10,934,636.91	0.04%	-0.01%	
Fixed assets	2,818,504,522.48	7.42%	1,718,614,087.38	5.72%	1.70%	
Construction in	1,835,672,164.88	4.83%	1,824,933,243.40	6.07%	-1.24%	

Right-of-use	39,495,224.75	0.10%	13,649,613.93	0.05%	0.05%	
Short-term	1,784,915,900.00	4.70%	568,858,956.43	1.89%	2.81%	
Long-term	210,642,031.86	0.55%	236,412,360.31	0.79%	-0.24%	
Lease liabilities	27,764,877.22	0.07%	12,240,480.90	0.04%	0.03%	

5. Analysis of major companies in which the Company holds shares or controlling shares

Unit:RMB

Company name	Company type	Principal business	Registered capital	Total assets	Net assets	Operating income	Operating profit	Net profit
Beijing Zhifei Lvzhu Biopharmaceutical Co., Ltd.	Subsidiary	Biological products	1,332,156,900.00	4,321,871,780.11	3,301,320,625.73	1,626,347,676.80	448,922,782.74	437,679,198.78
Anhui Zhifei Longcom Biopharmaceutical Co., Ltd.	Subsidiary	Biological products	765,000,000.00	4,893,763,288.08	2,616,093,816.01	1,661,673,928.54	442,525,813.10	447,963,124.07

III. Analysis of Core Competitiveness

(I) Delving into innovation-driven R&D

Technological innovation and breakthroughs are the mainstay of any burgeoning biopharmaceutical company, as well as the only path to its effective growth. In the process of product layout, the Company adheres to the innovation strategy of "putting independent R&D at the core, conducting cooperative R&D as a backup, engaging in investment and incubation as a supplement" and the program development principle of "project sourcing internationalization, target selection precision, project development pipelining, and production localization." The Company continues to strengthen independent development, expand technological cooperation, and foster innovation. As technological innovation brings about more profits, the Company's product R&D will take off on all fronts and evolve into greater core competitiveness.

1. Promoting network-based independent R&D

The Company has three research and production centers, namely, Beijing Zhifei Lvzhu Biopharmaceutical Co., Ltd., Anhui Zhifei Longcom Biopharmaceutical Co., Ltd., and Chongqing ZhiRui Biopharmaceutical Industrial Park. Based on them, the Company continues to facilitate R&D, registration, and listing of quality independent products. Relying on Zhifei Lvzhu and Zhifei

Longcom, the Company makes steady progress in product R&D, especially in the field of disease prevention. On the back of ZhiRui Biopharmaceutical Industrial Park, the Company designs and creates biological technology and products earmarked for disease prevention and treatment through its broadened networks of biological verticals, with the intention of strengthening its R&D capabilities.

The Company has erected nine technology R&D platforms to include various development routes of vaccines. These emerging platforms grease the wheels of the coordinated construction of R&D matrices, ensuring that all R&D programs progress with effectiveness.

R&D Platforms		
Polysaccharide and polysaccharide conjugate vaccine technology platform	Genetic recombination technology platform	Inactivated vaccine technology platform
Multipathogen and multivalent vaccine technology platform	mRNA vaccine technology platform	Novel adjuvant technology platform
Human diploid cell line technology platform	Adenovirus vector vaccine technology platform	Outer membrane vesicle (OMV) technology platform

The Company holds 28 development programs in pipeline, of which 16 programs are in clinical trial stage or applications for registration. With manifest structures and an ample reserve, they form eight major product matrices featuring synergy, which furthers the Company's core competitiveness.

Matrices	**Programs under development**
Meningococcal vaccine matrix	Group $ACYW_{135}$meningococcal conjugate vaccine, recombinant group B meningococcal vaccine (colon bacillus), and pentavalent meningococcal conjugate vaccine.
Pneumococcal vaccine matrix	15-valent pneumococcal conjugate vaccine, pneumovax 23 - pneumococcal vaccine, polyvalent, and multivalent pneumococcal conjugate vaccine.
Enterovirus vaccine matrix	S. flexneri and S. sonnei Bivalent Shigella conjugate vaccine against dysentery, inactivated enterovirus type 71 vaccine, quadrivalent recombinant norovirus vaccine (pichia pastoris), bivalent HFMD vaccine, inactivated rotavirus vaccine, and bivalent recombinant rotavirus vaccine (pichia pastoris).
Tuberculosis product matrix	Lyophilized recombinant tuberculosis vaccine (AEC/BC02), BCG vaccine for intradermal injection, and purified protein derivative of BCG (BCG-PPD).

Matrices	Programs under development
Multipathogen vaccine matrix	DPT vaccine (component) and DPT-based combination vaccine.
Emerging infectious disease vaccine matrix	Recombinant MERS virus vaccine and COVID-19 vaccines.
Adult vaccine matrix	Influenza virus-split vaccine, quadrivalent influenza virus-split vaccine, lyophilized rabies vaccine for human use (MRC-5 cell), lyophilized rabies vaccine for human use (Vero cell), recombinant zoster vaccine (CHO cell), and respiratory syncytial virus (RSV) vaccine.
Upgraded vaccine	Inactivated Japanese encephalitis vaccine and inactivated varicella-zoster virus vaccine.
Note: The aforesaid matrices do not include all the programs under development, and details of R&D situation are shown in the relevant contents on R&D programs in this report.	

The Company values patent management and tries to accelerate the process of patent application and registration. Thus far the Company has acquired a total of 42 patents and continued to improve its system for protecting intellectual property rights.

2. Cooperative R&D for technological breakthroughs

Progress in biological technology rests on theoretical innovation and technological practices. The Company keeps abreast of the trends of infectious diseases and pushes for the integration of technology and industry. The Company creates a cooperative and communicative platform composed of businesses, universities, and research institutes, maintaining corporate development as the central task under the direction of market demands. It partners with a cohort of industrial institutions and scientific research platforms to address threats to human health.

The Company actively engages in academic communications on scientific research. Its research department has successively published 47 academic papers on *The Lancet*, the *New England Journal of Medicine*, and other medical journals since 2019, in a move to share its experience in cutting-edge R&D and clinical research. The Company collaborates with over 20 research institutes such as the Institute of Microbiology, Chinese Academy of Sciences (IMCAS) and the National Clinical Research Center for Infectious Diseases to carry out joint clinical research and academic communications on innovative vaccines, TB prevention and treatment, and other programs.

The Company continues to facilitate joint R&D programs to create more channels for a rich harvest of technology. To better cope with new variants of the COVID-19 virus, Zhifei Longcom and the IMCAS jointly developed a new generation of recombinant COVID-19 vaccine based on the cooperative experience in the conditionally listed Recombinant COVID-19 Vaccine (CHO Cell). The international clinical trial for Omicron-Delta chimeric COVID-19 vaccine was launched in Uzbekistan in November 2022. Zhifei Lvzhu announced that it had signed the Vaccine Development and License Agreement with Intravacc, a company based in the Netherlands in April 2022. The two sides would collaborate to develop a novel pertussis vaccine produced in reference to Intravacc's vaccine patent technology and design multipathogen and multivalent vaccines following the existing DPT vaccines.

3. Investment and incubation in greater health field

The Company incubates and cultivates promising biotechnology and products used for disease prevention and treatment through the ZhiRui Investment platform by equity investment to expand the coverage of its health business. Principally targeting the fields such as tumors, metabolic diseases, cardiovascular diseases, autoimmune diseases, and neurodegenerative diseases, ZhiRui Investment continues to build top-tier research teams to achieve R&D and industrialization of cutting-end biopharmaceuticals and biotechnology. After steady strides in recent years, ZhiRui Investment has invested in 13 companies, and built various research and production platforms such as monoclonal antibodies, the cellular therapy, and diabetes-targeted biopharmaceuticals, as well as a national center for translational medicine. Meanwhile, dozens of R&D programs are well under way, and several products including Class I new drugs step into the phase of clinical trials.

(II) Channel construction and market services

The Company forms a virtuous cycle through a development model featuring "technology & market" drivers, where marketing and R&D efforts are mutually enhancing. In the process of realizing the market value of products, the Company always has regard to clients' requirements while keeping track of market demands and changes. The Company maintains an improved model of marketing and management to increase the overall efficiency of marketing efforts.

The Company highly emphasizes the construction of marketing networks, in a move to make the professional and considerate services of marketing staff accessible to more regions. As such, more people will benefit from the Company's quality vaccines. The Company extends its provincial-level marketing networks to 31 provincial-level regions, over 2,600 administrative districts and counties, and over 30,000 primary-level health centers through line management. By catering for the public and markets, the Company continues to invigorate its products and satisfy clients with well-pleasing services that help create value.

The Company is committed to building industry-leading marketing teams and continues to ameliorate the systems of marketing and services based on years of marketing experience under its belt. So far the Company is staffed by over 3,300 employees, and the services and professionalism of marketing personnel are continuously strengthened through training. The Company continues to improve the service system for clients, maintains convenient channels for communication, makes timely responses to clients' inquiries and proposals, and keeps close track of market demands. Meanwhile, the Company applies its medical professionalism to diversified scholar communications and promotional activities. By disseminating the value of vaccines and relevant stories via academic meetings, the Company endeavors to realize the product value of preventing infectious diseases in favor of the public and social benefits.

（III）Quality first and product management

The Company adheres to the core values of "product first" and persistently pursues quality products and professional services by improving quality management throughout the lifespan of products. The Company has built a sound quality management system specifying quality-related highlights and responsibilities across different phases such as product R&D, material inspection, manufacturing, procurement, transport, storage, sales, and listing management. In all phases, the standardized and strict management procedures are put in place to ensure traceability of all recorded operations. This also guarantees its quality management system is sound, stable, and endurable.

The Company is capable of mass production, standardized quality control, and commercial development. The Company possesses industry-leading capacity of industrialization in China, and

strives for improved productivity and quality control under international standards. Zhifei Lvzhu and Zhifei Longcom, two major research and production centers of the Company, are equipped with modern factories and devices used for vaccine production, as well as the specialized production staff with a strong sense of responsibility. Meanwhile, the Company seals lasting and stable relationships with reliable suppliers at home and aboard to guarantee the manufacturing and supply of products. Since the first batch of lot releases was approved in 2008, the independently developed products of the Company have all been successfully verified.

(IV) Professional management and talent enablement

The Company's core management is characterized by experienced talents with glittering careers and deep insights into disease prevention and control. In reference to the business performance, trends of industrial development, and market demands, the management staff remains stable, professional, and effective when presenting the development strategy suited to the status quo of the Company on a timely and purposeful basis.

The Company always adheres to the business principle of "prioritizing social benefits over corporate profits." Over the past two decades, the Company has cultivated unique corporate culture, in which "Six Firsts, Six Seconds" is considered as its corporate values. The Company's corporate culture plays a pivotal role in attracting, pooling, and retaining talents with shared values. The Company's sustainable development entails adequate staffing under the direction of multi-faceted incentive policies, the sound benefit sharing mechanism, and the stable talent cultivation strategy. As of the end of the reporting period, there were 5,735 employees, an increase of 935 (19.48%) over 2021. To acknowledge the contributions made by devoted employees, the Company makes an active attempt to offer employees with shares. Since the Company went public,it has carried out three employee stock ownership plans to share the fruits of corporate development with employees. This effectively enhances employees' motivation and ensures the future development of the Company.

VI. Prospects for future development of the company

I. Industry Situation and Trends

As the most efficacious and cost-effective vehicle for preventing and controlling infectious diseases, vaccination is acknowledged as the Public Health Prevention Service (PHPS) program given precedence by many countries. Vaccine plays an important role in preventing infection, transmission after infection, severe conditions, deaths, etc. As public awareness of immunization enhanced, the popularization of vaccine will be accelerated, and the development and application of innovative technology will be boosted as well. According to relevant reports by Frost & Sullivan, the global market size of vaccines for human use surged from about USD27.7 billion in 2017 to about USD46 billion in 2021, with a CAGR of 13.5%. As more innovative vaccines are developed and approved in the future, the amount is expected to reach USD83.1 billion in 2025 and USD131 billion in 2030. The global vaccine market is swelling at a good clip, driven by growing public health awareness, requirements for infectious disease prevention and treatment and levels of consumption.

The Chinese market is abundant in health demands. As the levels of citizens' income and consumption grow, the public is increasingly health-conscious, and demands for vaccination correspondingly rise. In the past, vaccination was mainly targeted at preventing infantile diseases in contrast with lower coverage of vaccine for adults. When the non-NIP vaccines such as HPV vaccine get more known to the public, it is generally acknowledged that vaccination helps prevent diseases. Frost & Sullivan predicts that the size of China’s vaccine market will exceed RMB340 billion in 2030, growing at a CAGR of 15.95% during the 2020–2030 period. This equates to faster growth than the global size and promising development trend. China's considerable population base provides sufficient space for the development of vaccination. In view of the people's growing attention to vaccination, the improvement in the public health system, mounting aging stress, and increasing immunized populations, the penetration of non-NIP vaccine market will progressively rise, and the vaccine market is expected to further expand.

The per capita expense in China’s vaccine market is much lower than that in developed countries. Higher levels of personal consumption and R&D innovation will certainly lead to a

burgeoning vaccine industry, and the enormous potentials of the vaccine market will be further tapped into in the future. As domestic vaccine companies progress in R&D, more homegrown innovative vaccines will be approved in batches. The vaccine shifts from univalent to polyvalent and from unipathogen to multipathogen can better meet the public's needs for vaccines, expand the populations applicable to vaccines, and help exploit the growth potential of the market.

II. Development Strategies and Plans for the Company

(I) Future development strategies of the Company

The Company is committed to establishing itself as an industry-leading Chinese biopharmaceutical company dedicated to disease prevention and treatment. The Company belongs to the industry of biological products, a sector of medicine production. The industry has become a focal point for the latest batch of biopharmaceutical and health-oriented businesses, as well as a key areas in China's strategic industrial layout. Driven by various factors including increasing health awareness of the public, greater ability in payment, and macropolicies such as the 14th Five-Year Plan for the Pharmaceutical Industry and Biological Economy, end-users continue to extend demands, and the size of industry expands quickly, bringing the biopharmaceutical industry into a new round of rapid development. The Company will seize opportunities to facilitate interactions between technological innovation and marketing. In the settings of industry reshaping, the Company must focus on its principal business while replacing weaknesses with strengths to pave a self-supporting path to high-quality development.

1. Maintaining competitiveness in principal business

Since its first foray into the biopharmaceutical industry, the Company has been concentrating on preventive biopharmaceuticals and developing its principal business with pooled resources to achieve operational excellence. In recent years, the Company has emerged as a leading biopharmaceutical company in China. To consolidate its competitiveness and leadership, the Company will adhere to the development model featuring "technology & market" drivers, foster innovation through independent development and team building, and further improve corporate governance.

2. Expanding industrial networks with open-mindedness and aspiration

In order to achieve greater prosperity, the Company lays out its investment programs across wider medical verticals. Currently, the Company leverages its Zhirui Investment platform to incubate a range of innovative products designed for preventing and treating tumors, metabolic diseases, cardiovascular diseases, and autoimmune diseases. The Company believes that investment in cutting-edge innovative technology and development of promising innovative products will expedite sustainable development, as well as coordinated development of considerable scale in China's biopharmaceutical industry.

3. Benchmarking against first-class enterprises and expanding into international markets

As its biopharmaceutical industry has yet to be fully internationalized, China is working to align industrial regulation with international standards. There are plentiful business opportunities in international markets. Benchmarking against global pharmaceutical giants, the Company will redouble efforts in global operations and continue to strengthen its core abilities in quality control, overseas registration, commercial cooperation, and other fields. The Company seeks more exchanges and collaborations with the WHO, the Bill & Melinda Gates Foundation, and other international organizations, in the quest for more fruits of international communication in the upcoming five or ten years.

(II) Operating objectives for 2023

1. Package of measures to lay innovative foundations

To further innovation and relevant accomplishments, the Company will adhere to the innovation strategy of "putting independent R&D at the core, conducting cooperative R&D as a backup, engaging in investment and incubation as a supplement" and optimize platform-based support and distinctive product launches. In 2023, the products in the final phases of clinical trial, such as lyophilized rabies vaccine for human use (MRC-5 cell) and quadrivalent influenza virus-split vaccine, are expected to be approved. Several highly promising preclinical programs are expected to be officially introduced into clinical trials. Continued progress will be made in R&D pipeline activity overall. In strict compliance with the Measures for R&D Management and Reward

of Scientific Research Programs, the Company will facilitate the whole cycle of management and improve the mechanism of R&D rewards to increase enthusiasm for innovation.

2. Shouldering responsibility of quality control

The promulgation of the revised Vaccine Administration Law of the People's Republic of China marks a new development stage of the vaccine industry "with strictness and innovation." All the biopharmaceutical companies should shoulder the corporate responsibility of strict control over product quality. Adhering to the principle of "quality first," the Company will strive to fulfill the objective of having all lot releases approved in strict compliance with relevant laws, regulations, and industrial standards. Strict quality management will be implemented in every phase of the production process, including primary materials, production, quality checks, circulation control, and after-sale management. In 2023, the Company will continue to promote product quality by means of training, cultural undertakings, and overall management. In the wake of the implementation of the Good Pharmacovigilance Practice (GVP) and other provisions, the Company will continuously embrace cutting-edge concepts and improve internal systems. The Company will regulate the pharmacovigilance activities throughout the lifespan of products to ensure judicious use of medicine by the public.

3. Improving services and market operations

Marketing is the mainstay of the Company that underpins its development. Steady market operations with honesty and compliance enable the Company to embrace opportunities and foster growth. The Company adjusts its marketing strategies and optimizes the allocation of resources based on market demands, forming a multi-tiered marketing mode. In 2023, the Company will actively carry out academic communications and public outreach programs to promote its independently developed products, especially the TB-targeted products. Meanwhile, the Company will continue to collaborate with MSD on the import and promotion of HPV vaccine, pentavalent rotavirus vaccine, etc. in order to market franchised products.

4. Bringing together talents and enhancing team building

Talents form the bedrock of corporate growth. Only by attracting more aspiring talents with shared ambition can the Company keep on thriving. In the wake of the Company's soaring staffing level in recent years, it is imperative that the Company should improve the mechanisms of talent cultivation, incentives, and corporate cultural undertakings to fulfill the work of staff management. In 2023, the Company will adhere to the core recruitment values of "maintaining fairness in talent selection" and continue to practice the recruitment policy featuring open-mindedness, fairness, and diversification. The Company will continuously refine the promotion and incentive systems for talents to create ample space for their growth. In cultivating a new generation of talents, the Company strives to build a team of high-caliber talents with solid expertise and vast experience in the pharmaceutical and biological fields.

5. Strengthening modern governance through considerate management

Any company that intends to maintain competitiveness and a leading position in fluctuating markets must be adept at upgrading themselves and improving corporate governance to coordinate social contributions and business profits. In pursuing high-quality development, the Company should strengthen its capabilities in innovation, products, services, and brand visibility. The Company will, as always, keep abreast of industrial trends and further organize layouts in 2023. In addition, the Company will foster good governance of business while maintaining compliance and honesty in operations, in a move to increase business profits and overall competitiveness. Meanwhile, the Company will push forward the construction of ESG system and perform social responsibilities to further its sustainable development.

6. Rooting in China and exploiting global opportunities

Implementing the global strategy is a major driving force for the Company to foster business profits, competitiveness, and influence. As China's economy, biopharmaceutical industry, and innovation capacity grow stronger, Chinese companies should be determined and confident in developing into first-class companies in the world and taking bold steps to stand out in the fierce global and domestic competition. In 2023, the Company will fully and faithfully apply the global strategy and make new explorations in overseas R&D, production, and commercial cooperation. In

promoting product verification by the WHO and overseas registration, the Company will explore a more effective and consistent cooperative mode of overseas business, and strive to make fresh contributions to global health programs as a Chinese company.

VII. 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, the sales volume of both and agent product increases continuously, and thus contributes to a gradual increase in the Company's accounts receivable. As the implementation of industry policies has entered the normal stage, the Company implement industry policies timely, 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 2022, the number of the sales staff exceeded 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

Depite vaccination is the most economic and effective way to prevent infectious diseases, 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.