

## INDUSTRY OVERVIEW

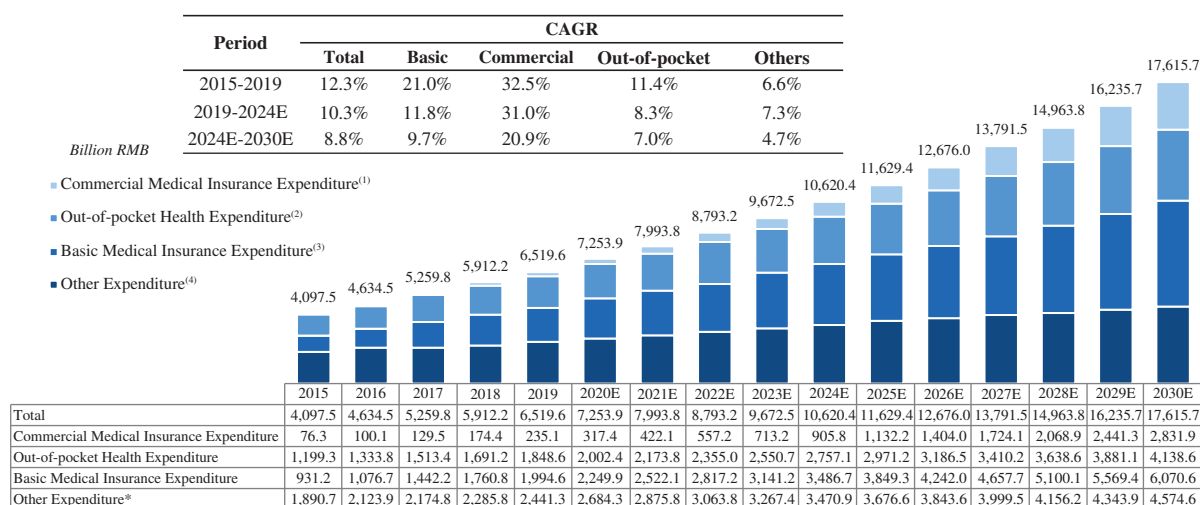
The information and statistics set out in this section and other sections of this Document were extracted from different official government publications, available sources from public market research and other sources from independent suppliers. In addition, we engaged Frost & Sullivan in preparing the Frost & Sullivan Report, an independent industry report in respect of the [REDACTED]. We believe that the sources of the information in this section and other sections of this Document are appropriate sources for such information, and we have taken reasonable care in extracting and reproducing such information. Frost & Sullivan has informed us that the Frost & Sullivan Report has taken into consideration the impact of COVID-19 outbreak, and we have no reason to believe that such information is false or misleading or that any fact has been omitted that would render such information false or misleading. The information from official and non-official sources has not been independently verified by us, the [REDACTED], Joint Sponsors, [REDACTED], any of the [REDACTED], any of their respective directors and advisers, or any other persons or parties involved in the [REDACTED], save for Frost & Sullivan, and no representation is given as to its accuracy. Accordingly, the information from official and non-official sources contained herein may not be accurate and should not be unduly relied upon. Our Directors confirm that, after making reasonable enquiries, there is no adverse change in the market information since the date of the Frost & Sullivan Report that would qualify, contradict or have a material impact on the information in this section.

## CHINA’S HEALTHCARE SERVICE MARKET

### Overview of Healthcare Expenditure in China

China’s healthcare expenditure increased from approximately RMB4,097.5 billion in 2015 to RMB6,519.6 billion in 2019 at a CAGR of 12.3%, and is expected to further grow to RMB10,620.4 billion in 2024, representing a CAGR of 10.3%, and is expected to grow to RMB17,615.7 billion in 2030 at a CAGR of 8.8% from 2024 to 2030. In 2019, China ranked the second in terms of total healthcare expenditure in the world.

### Breakdown of China Total Healthcare Expenditure, 2015-2030E



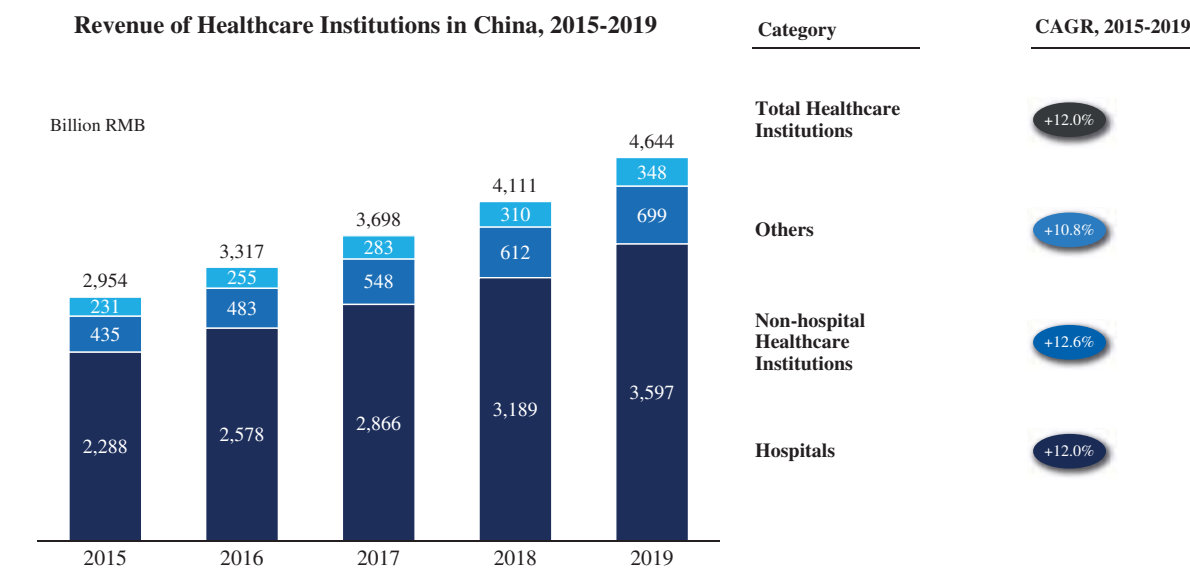
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Note:

- (1) Commercial medical insurance expenditures are expenditures paid by commercial health insurance which is provided and administered by non-governmental entities.
- (2) Out-of-pocket payments are expenditures borne directly by a patient where insurance does not cover the full cost of the health good or service, including cost-sharing, self-medication and other expenditure paid directly by private households.
- (3) Basic medical insurance expenditures are expenditures paid by national medical insurance.
- (4) Other expenditure are government health expenditures, including non-basic medical insurance expenditures and social medical expenditures, social donation assistance, and administrative fee income.

Source: Frost & Sullivan analysis

Currently, hospitals play the most important role in China’s healthcare services industry, with hospitals’ revenue taking 77.5% of the market share among the entire healthcare institution market in China in 2019. Among the healthcare providers in China, hospitals also contributed and are expected to contribute the majority of the revenues. The size of hospital industry by revenue increased from RMB2,288 billion in 2015 to RMB3,597 billion in 2019, representing a CAGR of 12.0% from 2015 to 2019. The significant size and rapid growth rate of hospitals in China are conducive to the growth of China’s independent clinical laboratory (“ICL”) market, as ICLs collaborate closely with and support hospitals, and provide them with a wide range of testing services that they are not capable of conducting in-house. The following chart shows the evolution of the revenue composition of China’s healthcare institutions from 2015 to 2019.



Source: NHC, Frost & Sullivan analysis

### Public Hospitals and Private Hospitals

Among the hospitals in China, public hospitals are the main healthcare services providers currently, but private hospitals have been growing rapidly in recent years and are expected to play an increasingly important role in the healthcare services sector in the future. From 2015 to 2019, the total number of private hospitals increased from 14,518 to 22,424, representing a CAGR of 11.5%, while the total number of public hospitals decreased from 13,069 to 11,930 during the same period, and is estimated to continue to decrease in the near future.

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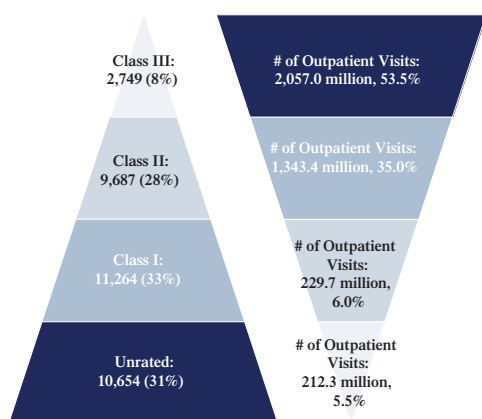
Because public hospitals handle the majority of patient visits, they are the main source of clinical testing in China. Hospitals typically conduct routine tests in-house. Esoteric tests, however, are generally outsourced to private or independent clinical labs because public hospitals cannot process the sheer volume of tests in China and generally only offer 100 to 1,000 testing items, which do not include complex esoteric tests, depending on the class of the hospitals. The Chinese government has introduced various policies and reform measures to reduce the workload of labs in public hospitals. Meanwhile, with the increase of middle-income population and expansion of public insurance coverage to services provided in private facilities, the number of private hospitals and the number of patients visiting private hospitals have increased. Similar to public hospitals, private hospitals generally conduct routine tests in-house but may also outsource the testing to public hospitals and third-party service providers, especially to independent labs for esoteric tests. Patients in private hospitals are also willing to pay for a premium for clinical tests with advanced technology, many of which are esoteric tests.

### *Classification of Hospitals*

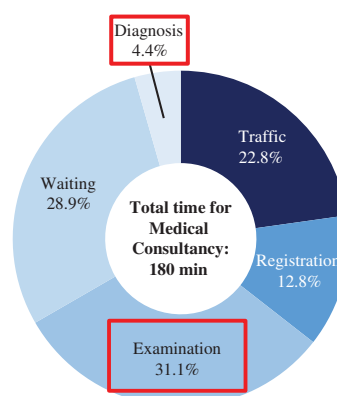
Hospitals in China are categorized into three classes, namely Class I hospitals, Class II hospitals and Class III hospitals, with Class III being the highest tier. As of end of 2019, there are 2,749 Class III hospitals, 9,687 Class II hospitals, 11,264 Class I hospitals and 10,654 unrated hospitals in China.

China’s medical resources are concentrated in Class III hospitals, and these Class III hospitals receive an disproportionate number of patient visits as patients usually prefer to seek healthcare services from them. In 2019, the 2,749 Class III hospitals in China received 2,057.0 million outpatient visits, while the 10,654 unrated hospitals received only 212.3 million outpatient visits. The limited number of Class III hospitals creates a large mismatch of medical resource and diagnosis demands. Class III hospitals generate the largest demand for esoteric testing in terms of total volume and the number of specialty fields. However, most Class III hospitals are not well-equipped to handle the huge demand for esoteric testing services in-house and thus have to outsource at least a portion of their testing services to ICLs. Due to the scarcity of the medical resources in China, effective diagnosis time only accounts for 4.4% (8 minutes) in the total time a patient on average spend in the consultation process. The following chart illustrates the inversion of medical resources and diagnostics demand, as well as the time spent in a consultation process in China.

**Imbalance of Medical Resource and Diagnosis Demand, 2019**



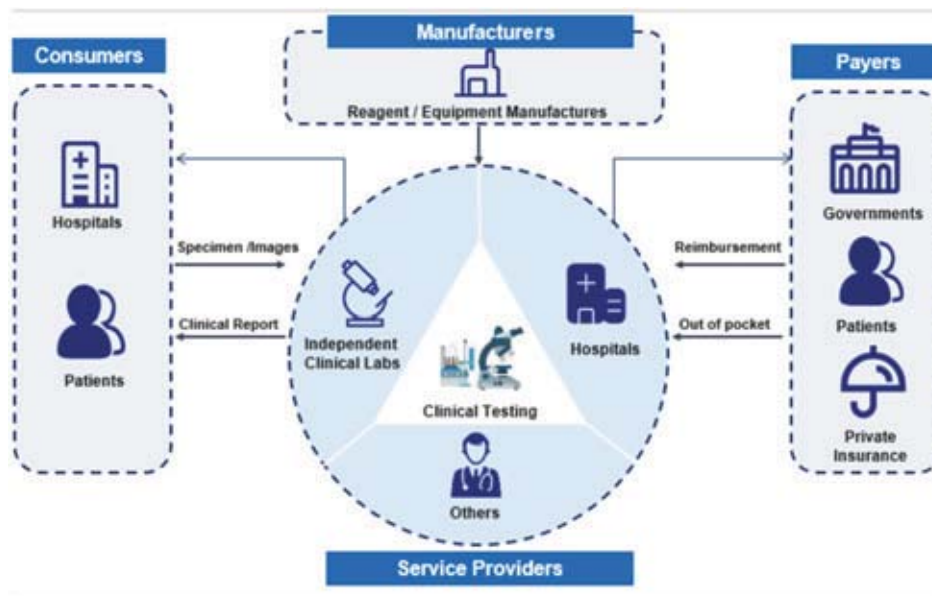
**Time Structure for a Diagnosis Process, 2019**



Source: NHC, Frost & Sullivan Analysis

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### THE INDEPENDENT CLINICAL LABORATORY MARKET

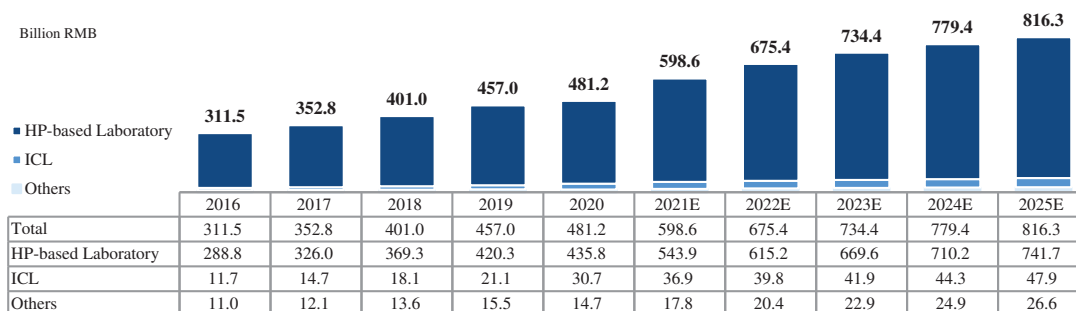


Source: Frost & Sullivan analysis

Clinical testing refers to a group of medical tests carried out in a qualified laboratory equipped with comprehensive laboratory medicine and instruments. Clinical testing helps physicians in the decision-making process by providing information on the patients’ health condition. Clinical testing also assists pharmaceutical and biotech companies, in the drug or vaccine development process. Clinical testing service is generally provided by three types of providers, namely hospital-based laboratories, independent clinical laboratories (the “ICL”), and other institutions such as nursing homes and non-hospital healthcare institutions. Hospital-based laboratories currently serve as the largest category of clinical testing service provider in China, who generally provides routine testing. ICLs, such as the Company, generally provide more complex tests. The following chart shows the market size and growth rate of China’s clinical testing market from 2016 to 2025.

Breakdown of China Clinical Testing Market by Service Providers, 2016-2025E

	CAGR	HP-based Laboratory	ICL	Others	Total
2016-2020		10.8%	27.2%	7.5%	11.5%
2020-2025E		11.2%	9.3%	12.6%	11.2%



Note: HP-based: Hospital-based.

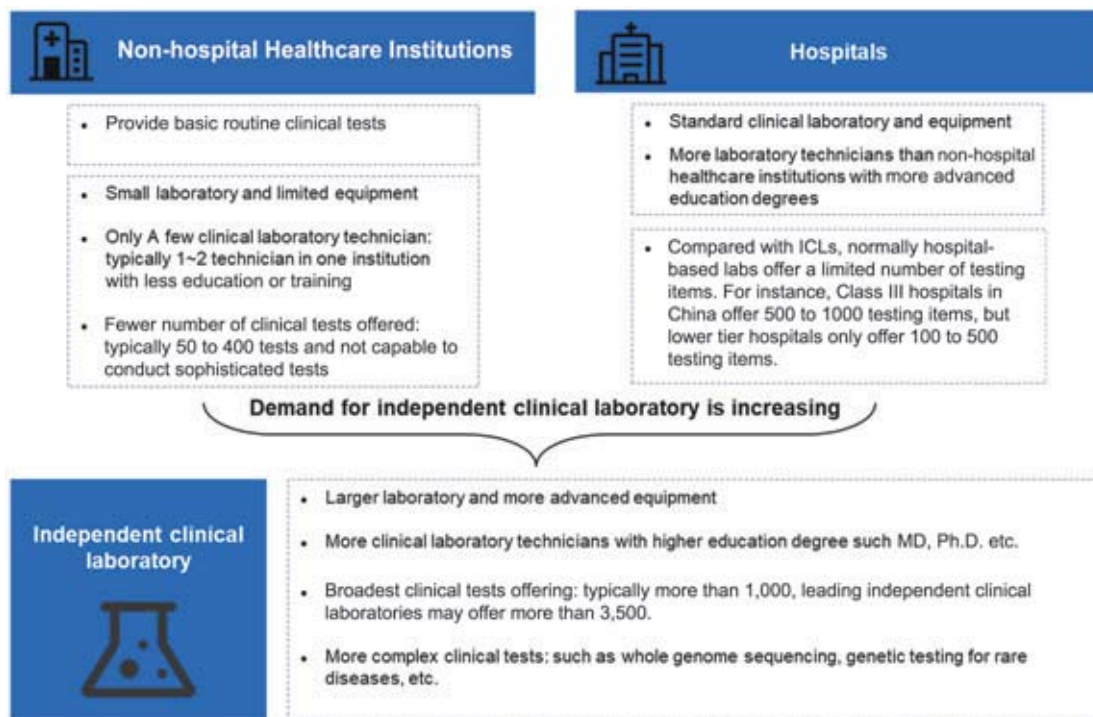
Source: Frost & Sullivan analysis

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ICLs refer to the third party medical institutions that provide clinical testing services. ICLs operate with relevant legal or professional qualifications under the permission of applicable health administrative departments, and/or professional bodies. ICLs engage in clinical testing or pathological diagnosis services, and is subject to corresponding medical liabilities independently. ICLs provide information related to the diagnosis and treatment of diseases through clinical testing of specimens from human bodies. Such clinical testing includes clinical blood and body fluid testing, biochemical testing, immunological testing, microbiological examination, cyto-molecular genetic examination and pathological examination. Compared to other clinical testing institutions, ICLs generally have larger laboratories and more advanced equipment and experienced technicians and offer more testing items. ICLs in China typically offer more than 1,000 testing items, with leading ICLs providing more than 3,500 testing items, while Class III hospitals can offer only 500 to 1,000 testing items and typical non-hospital healthcare institutions offer only around 400 basic testing items.

Below is a chart summarizing the features of major market players in China who provide clinical testing services.

### Market Players in China Who Provide Clinical Testing

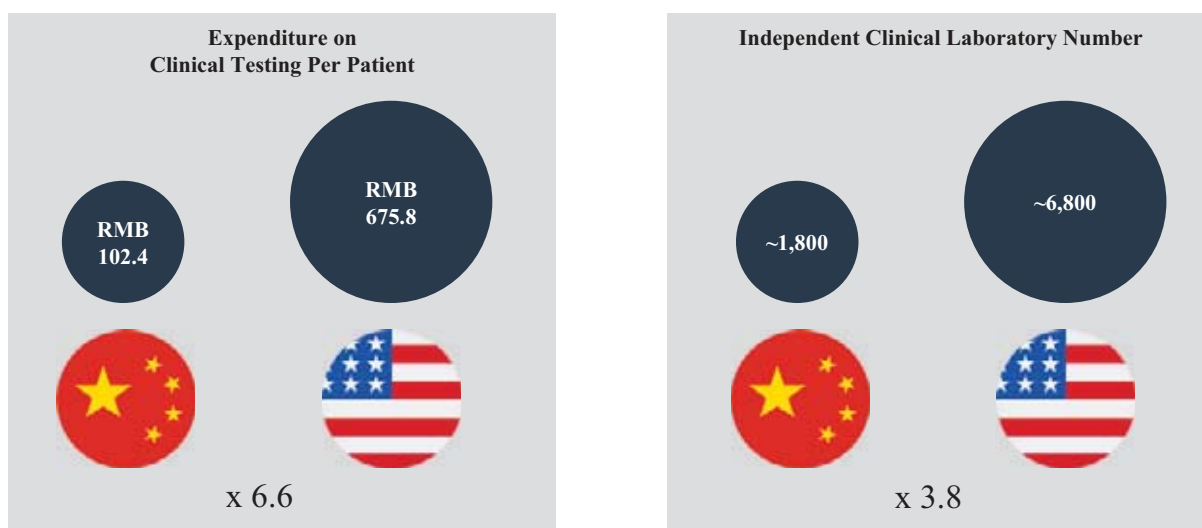


Source: Frost & Sullivan analysis

### Comparison between China and Global ICL Markets

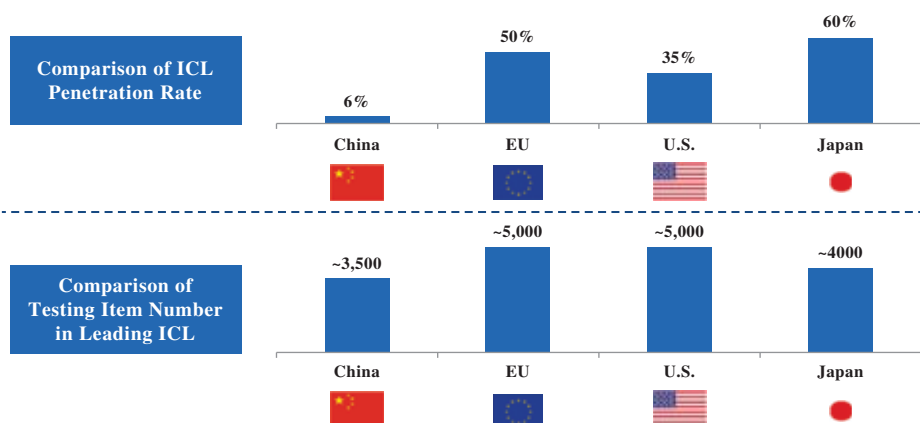
As of the end of 2020, there were more than 1,800 ICLs in China, while there are approximately 6,800 ICLs in the United States. The expenditure on clinical testing per patient in 2020 is RMB102.4 in China, compared to the same expenditure of RMB675.8 in the United States. The following chart illustrates the comparison between ICL markets in China and the United States in terms of numbers of laboratories and average expenditure per patient as of the end of 2020.

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Source: NHC, Frost & Sullivan analysis

As of 2020, ICL only accounted for 6% of the clinical testing market in China, compared with 50% in the European Union, 35% in the United States, and 60% in Japan, indicating that the ICL industry is at very early stage in China and has significant growth potential. The following chart illustrates the comparison between ICL markets in China, EU, U.S. and Japan in terms of penetration rate and testing items as of 2020.



Note: ICL penetration rate is derived by dividing the ICL market size by the clinical testing market size

Source: Frost & Sullivan analysis

The market size of esoteric testing in South East Asia increased from US\$0.5 billion in 2016 to reach US\$0.9 billion in 2020 with a CAGR of 14.2% from 2016 to 2020. The market size of esoteric testing in South East Asia is expected to reach US\$2.1 billion in 2025, representing a CAGR of 17.8% from 2020 to 2025.

The market size of esoteric testing in Middle East increased from US\$0.8 billion in 2016 to reach US\$1.5 billion in 2020 with a CAGR of 17.9% from 2016 to 2020. The market size of esoteric testing in Middle East is expected to reach US\$2.5 billion in 2025, representing a CAGR of 10.4% from 2020 to 2025.

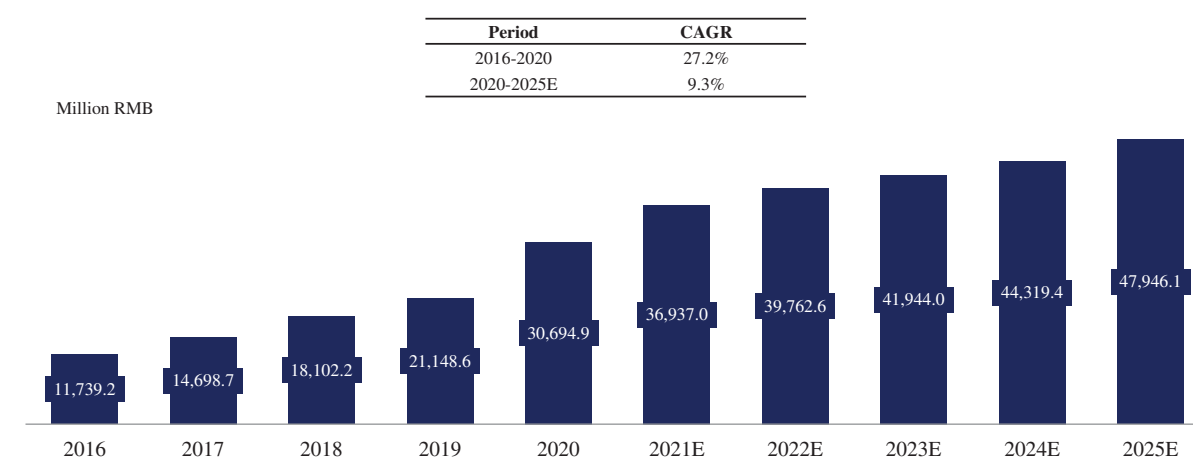


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### Market Size and Growth of the ICL Market

China’s ICL market expanded rapidly from RMB11,739.2 million in 2016 to RMB30,694.9 million in 2020 at a CAGR of 27.2%, and is expected to further increase to RMB47,946.1 million in 2025, representing a CAGR of 9.3%. The following chart shows the market size and growth rate of China’s ICL market from 2016 to 2025.

China ICL Market Size and Forecast, 2016-2025E



Source: Frost & Sullivan analysis

China’s ICL market consists of two types of testing services, namely routine testing and esoteric testing. Routine testing usually refers to the routine testing items on the Clinical Inspection Project List of Medical Institutions formulated by the National Health Commission, such as blood biochemistry, bodily fluid biochemistry and blood type check. Esoteric testing usually refers to the special testing items not listed in the Clinical Inspection Project List of Medical Institutions, such as the testing on Mycobacterium tuberculosis and hepatitis viruses.

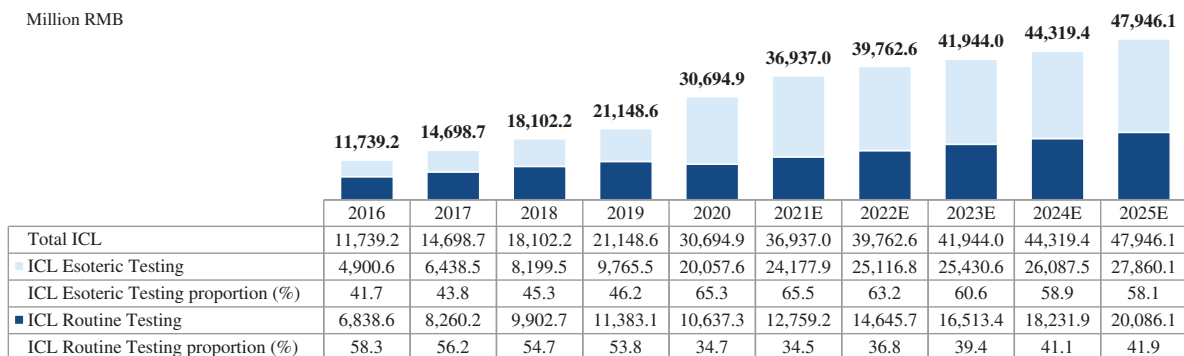
In recent years, China’s esoteric testing market grew significantly faster than the routine testing market. The size of China’s esoteric testing market increased from RMB4,900.6 million in 2016 to RMB20,057.6 million in 2020, representing a CAGR of 42.2% from 2016 to 2020, and is expected to further increase to RMB27,860.1 million in 2025, representing a CAGR of 6.8% from 2020 to 2025. In particular, the size of China’s esoteric testing market significantly increased 105.4% from RMB9,765.5 million in 2019 to RMB20,057.6 million in 2020, primarily due to the outbreak of COVID-19 pandemic, which led to the surge in COVID-19 testing categorized under esoteric testing. The size of China’s routine testing market increased from RMB6,838.6 million in 2016 to RMB10,637.3 million in 2020 at a CAGR of 11.7% from 2016 to 2020, and is expected to further increase to RMB20,086.1 million in 2025, representing a CAGR of 13.6% from 2020 to 2025. The following chart illustrates the market size and growth rate of China’s esoteric testing market and routine testing market from 2016 to 2025.

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### Breakdown of China ICL Market by Routine Testing and Esoteric Testing, 2016-2025E

Period, CAGR	ICL Esoteric Testing	ICL Routine Testing	Total
2016-2020	42.2%	11.7%	27.2%
2020-2025E	6.8%	13.6%	9.3%

Million RMB



Source: Frost & Sullivan analysis

### Key Growth Drivers of China’s ICL Market

The growth of China’s ICL market is, and is expected to continue to be, attributable to the following major factors.

- Unique Advantages of ICLs over Hospital-based Laboratories.* The ICLs enjoy various advantages over hospital-based laboratories. Firstly, the ICLs provide services to a wide range of hospitals with end customers of diverse backgrounds and demands. Secondly, the ICLs generally offer more testing items compared with hospital-based laboratories, which empower physicians with broad testing options. Thirdly, by offering large volume of testing services, the ICLs can achieve economies of scale, which leads to better cost efficiency for the hospitals. Fourthly, the ICLs are more flexible to utilize new technologies and equipment than hospital-based laboratories, and tend to be more active to improve its quality control and recruit industry experts, which promote operating efficiency for ICLs.
- Increasing End Customer Demands.* Due to the growing public health awareness and the aging population in China, there are increasing demand for clinical testing. At the same time, more accurate and technologically advanced services in the ICL industry are developed and introduced, including biochips, companion diagnostics, and microarrays. In addition, the medical insurance reimbursement system has been introduced to cover the examination fees for both inpatient and outpatient examinations. More testing item options developed are also gradually been covered by medical insurance, making them more affordable to the end customers.
- Outsourcing Demands from Public and Private Hospitals.* Currently, public hospitals in China are generally operating above their capacity. As a result, more and more public hospitals are outsourcing their clinical testing services to third party providers to reduce its burden caused by the overwhelming demand. More stringent cost control in both public and private hospitals also leads to the outsourcing of clinical tests.



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- *Favorable Policies.* The Chinese government has introduced a series of healthcare reforms in the past decade, including health insurance reforms, primary care reforms, hospital reforms, medications and public health reforms. Various laws, regulations and policies have been enacted to reshape the private sector of China’s clinical testing industry and facilitate more investments in the private sector of healthcare system, including in ICLs. For example, several regulatory authorities, including the NHC and the State Council, have strengthened medical insurance control measures in hospitals across China since 2012. As part of those measures, the standard price for hospital in-house testing has been further lowered by relevant authorities, incentivizing hospitals to outsource more testing services to ICLs. In 2015, the General Office of the State Council issued the Guiding Opinions of the General Office of the State Council on Promoting the Establishment of a Hierarchical Diagnosis and Treatment System, exploring the establishment of independent regional medical testing institutions, pathological diagnosis institutions and medical imaging inspection institutions to achieve regional resource sharing. The Guiding Opinions also seeks to strengthen medical quality control and promote mutual recognition of testing results between agencies, driving the growth of ICLs. In 2018, the NHC and the National Administration of Traditional Chinese Medicine jointly issued a notice to all provincial health commissions, reiterating the major points in the Guiding Opinions of the General Office of the State Council on Promoting the Establishment of a Hierarchical Diagnosis and Treatment System to push forward the establishment of hierarchical diagnosis and treatment system and the sharing of medical testing resources in each medical service zone, which will further promote the use of ICL services.

### **Key Successful Factor and Entry Barrier of China’s ICL Market**

The success of China’s ICL market players is mainly attributable to the following factors.

- *First-mover Advantages.* First movers in the ICL market enjoy benefits such as existing client relationship, distribution channel, and logistics network. In particular, clients in the ICL market normally do not switch ICL service providers. First movers also tend to have accumulated more operating experience, developed more testing items and are better-known in the market.
- *Advanced Technology Addressing Medical Demands.* Technology innovation serves as an important driver for ICLs to offer more testing items with better quality. Such services relying on advanced technology generally are of higher margins, therefore ICLs launched early can accumulate more investment in scientific research, which forms a technology barrier against new comers.
- *Ingrained Relationships with China’s Class III Hospitals Resulting in Better Market Reputation and Profitability.* Class III hospitals have more demand for ICL esoteric services compared to hospitals of lower tiers. Due to the high outpatient visit number in Class III hospitals, there is a significant demand for ICL testing, thereby generating large revenue and potentially higher profitability for ICLs that collaborate with Class III hospitals. The market perceives partnership with Class III hospitals as the hospitals’ trust and endorsement in the partnered ICLs, which in turn create a favorable market reputation for such ICLs.

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- *Integration across Esoteric Testing Value Chain Enhances Operating Efficiency.* Integrated industry chain helps ICLs to achieve economies of scale, thus increases their operating efficiency. The integrated industry chain, including both horizontal and vertical expansion, covers all the related services in the clinical laboratory market including health management, CRO and cold chain logistics. Leveraging such integration of value chain, the ICLs can provide a wider range of diagnostic tests as well as ancillary services.

The entry barriers of China’s ICL market mainly include the following factors.

- *Technological Barriers.* The development of ICLs requires sufficient research investment and operation experience. New technologies, including novel gene sequencing platform, automated lab system and better logistics system evolve rapidly and enjoy wider application in the ICL industry. As a result, new ICL market participants may encounter difficulties in developing diagnostics technology, cold-chain logistics, operation system and other technologies.
- *Relationships with Hospitals and Manufacturers.* Cooperations with hospitals and manufacturers are vital in the ICL market. It is difficult for new ICLs to establish new client relationships with hospitals. Hospitals normally do not change ICLs during their ordinary course of business because of the high switching cost given the need for short turnaround time, strict quality control and the amount of time, money and effort needed to customize testing services.
- *Economies of Scale.* Incumbent ICLs generally have a large network of laboratories and are able to lower their costs related to R&D, personnel training, storage and transportation. Large and existing ICLs also enjoy cost advantages in procuring logistics service, expanding distribution network and operating leverage.
- *Professional Team.* ICLs require professional and experienced team for both research and operation. New ICLs may face difficulties in recruiting appropriate talents.

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### THE INDEPENDENT ESOTERIC TESTING MARKET

Compared with routine testing, esoteric testing generally requires more sophisticated technology and equipment, and is performed by highly skilled laboratory professionals. The following chart illustrates some key differences between routine testing and esoteric testing.

	Routine testing	Esoteric testing
<b>Testing Items</b>	Usually listed in <i>List of Clinical Examination Items in Medical Institutions</i> <sup>(Note)</sup>	Testing complex that are generally not performed as part of routine testing
<b>Technology Platform</b>	Routine biochemistry, routine microbiology, routine immunology, etc.	Molecular diagnostics, protein chemistry, cellular immunology, advanced microbiology, etc.
<b>Requirement for Personnel</b>	Low; require limited skills from professionals	High; performed by more highly skilled professionals
<b>Features</b>	<ul style="list-style-type: none"> <li>• Homogeneous and standardized</li> <li>• Low market entry barriers</li> <li>• High automation</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively heterogeneous</li> <li>• High market entry barriers</li> <li>• Low automation</li> </ul>
<b>Profitability</b>	Low to medium	Medium to high
<b>Service Radius</b>	The region covered is relatively smaller	Can cover a larger region
<b>Major Service Provider</b>	Hospitals, ICLs, Co-constructed clinical laboratories	ICLs, Class III Hospitals
<b>Major Customers</b>	All classes of hospitals and non-hospital healthcare institutions	Hospitals of higher class

Source: Frost & Sullivan analysis

Note: The *List of Clinical Examination Items in Medical Institutions* was first issued by NHC (National Health Commission) in 2007 in order to meet the needs of standardized medical services and improve the quality of clinical testing in China. A total of 1,463 items are included in the latest version of the List updated in 2013, covering testing items of immunity/serology, body fluids/blood, biochemistry, molecular biology and cytogenetics.

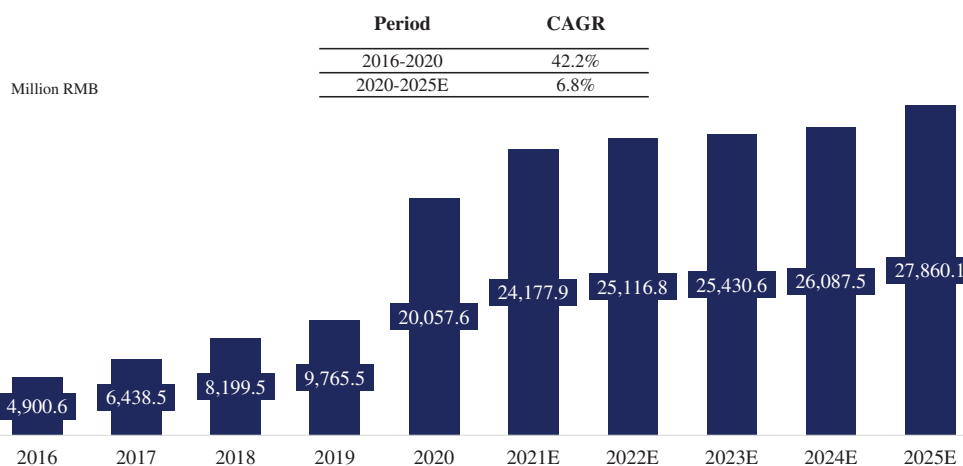
Esoteric testing has been recommended in increasing number of guidelines and expert consensus for various disease treatment. In the field of hematology, esoteric testing is recommended for diagnose and prognosis of hematological diseases for provision of a comprehensive analysis. In 2018, the *Chinese Anti-Cancer Association (CACA)* formulated *A Consensus of Chinese Experts on the Application of NGS in Hematological Tumors* (《二代测序技術在血液腫瘤中的應用中國專家共識》). The *2020 CSCO Guideline of Lymphoma* (《2020年CSCO淋巴瘤診療指南》) listed detecting clonal gene rearrangement of antigen receptor genes (IG, TCR) in lymphoma, non-random, type-related chromosomes and gene abnormalities as first level recommendation for the diagnose of AML, CLL, MZL and WM. In addition, in the field of cancer screening, there have been numerous guidelines and expert consensus formulated regarding early screening of cancer types of high prevalence since 2017. It is recommended in *Comprehensive Prevention and Control Guidelines for Cervical Cancer in China* (《中國宮頸癌綜合防治指南》) for female aged 25-65 to conduct cervical cytology every 3 year; in *Expert Consensus on Early Gastric Cancer Screening Process in China* (《中國早期胃癌篩查專家共識》) for adults aged older than 40 year old to conduct serum biomarker screening for gastric cancer when necessary. Therefore, with more treatment guidelines and expert consensus recommend esoteric testing for disease testing in order to achieve better understanding for diagnosis and treatment, esoteric testing is expected to be further utilized among healthcare institutions in China.

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### ICL Esoteric Testing Market in China and U.S.

China ICL esoteric testing market grew from RMB4,900.6 million in 2016 to RMB20,057.6 million in 2020, representing a CAGR of 42.2% from 2016 to 2020. It is expected to further grow to RMB27,860.1 million in 2025, representing a CAGR of 6.8% from 2020 to 2025.

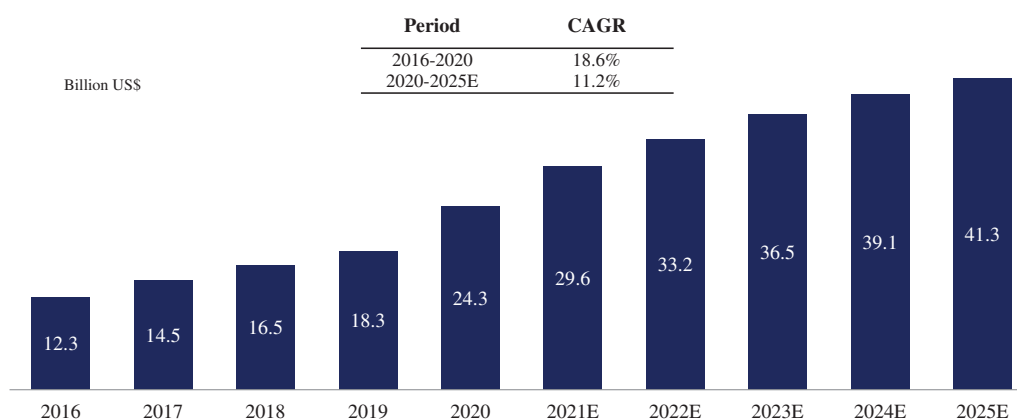
**China ICL Esoteric Testing Market Size and Forecast, 2016-2025E**



Source: Frost & Sullivan analysis

Compared to the U.S. market, which is more mature and sophisticated, China’s ICL esoteric testing market is still in its early stage in terms of market size but demonstrates strong growth momentum and convergence to the U.S. market in its relative scale. The market size of esoteric testing in the US increased from US\$12.3 billion in 2016 to reach US\$24.3 billion in 2020 with a CAGR of 18.6% from 2016 to 2020. The market size of esoteric testing in the US is expected to reach US\$41.3 billion in 2025, representing a CAGR of 11.2% from 2020 to 2025.

**US ICL Esoteric Testing Market Size and Forecast, 2016-2025E**



Source: Frost & Sullivan analysis

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### Application of Esoteric Testing

Using the latest technologies in molecular diagnostics, protein chemistry, cellular immunology and advanced microbiology, esoteric testing is particularly useful in disease diagnosis, identification of different subtypes of diseases and precision medicine eligibility evaluation, and pandemic diagnosis. In China, esoteric testing is mainly applied in six major specialty areas, including hematology, genetic diseases and rare diseases, infectious diseases, oncology, neurology and maternity-related diseases, with leading ICLs seeking to expand into more specialty areas.

There have been research advances in the application of precision medicine and/or personalized services combined in the use of esoteric testing. For instance, TMB testing has been widely applied among immunotherapy to predict its efficacy. Tumor mutational burden (TMB), defined as the total number of somatic mutations per coding area of a tumor genome, is an emerging clinical biomarker associated with response to immune checkpoint inhibitor (ICI) therapy. TMB was measured in mutations per mega base (mb), larger than 20 mutations/mb is considered to be high tumor mutational burden (TMB-H). Since the anti-cancer effect of immunotherapy mainly depends on the recognition of cancer specific antigen by immune cells, cancer patients who have more gene mutations will produce more antigens and be more likely to be recognized by immune cells. In other words, the higher the tumor mutational burden (TMB), the more the patients may benefit from immunotherapy. TMB may be an excellent biomarker to predict the effect of immunotherapy. Based on liquid biopsy technique, TMB in plasma is positively correlated with the efficacy of immune checkpoint inhibitors. In patients with NSCLC with TMB-H, the PFS of patients treated with immunotherapy was significantly higher than that of patients treated with chemotherapy. Detecting TMB condition by esoteric testing can predict the patients who are most likely to benefit from immunotherapy, and provide accurate personalized treatment according to the test results, which is of great significance to the pathogenesis of patients or their entire treatment life-cycle.

### *Case study: Application of Hematology Testing in Leukemia*

ICL hematology testing can help ensure the accuracy of the patients' leukemia type. Some tests can help determine how a patient might respond to certain treatments.

After a routine blood test, patients with abnormal results will be referred to an ICL for either a bone marrow test or a series of chromosome tests. The bone marrow test will be able to show the doctors the types of leukemia cells using either cytochemistry – a process of exposing cells to certain chemical stains (dyes) that react only with some types of leukemia cells, causing the cells in the specimen to change color seen under a microscope; or flow cytometry and immunohistochemistry – by treating samples of cells with certain proteins that adhere only to certain other proteins on the cells. The chromosome tests will be able to help the doctors identify certain leukemia subtypes, such as ALL, by detecting chromosome changes associated with such leukemia subtypes. The chromosome tests include Molecular cytogenetics, Fluorescent in situ hybridization (FISH), and Polymerase chain reaction (PCR).

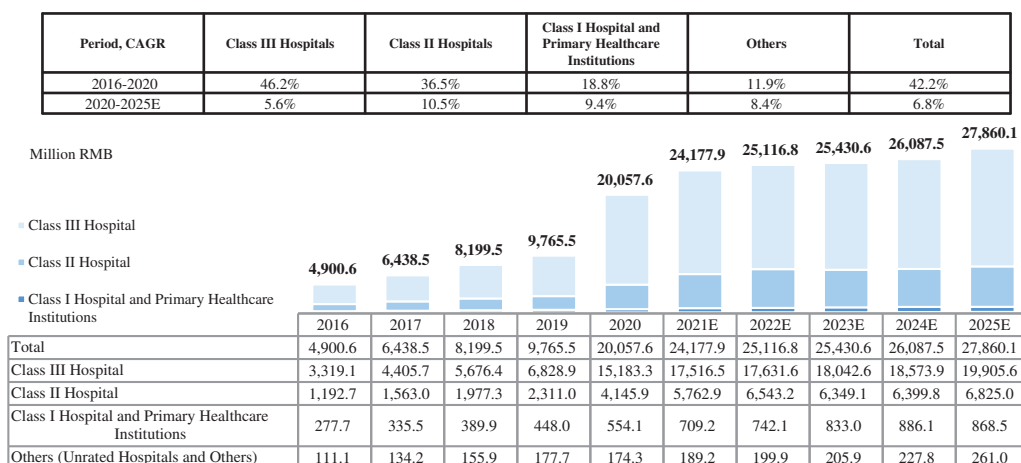
After the treatment, bone marrow test or chromosome tests can also help the doctors to determine the effectiveness of the treatment by detecting the presence of remaining leukemia cells in the bodies.

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### Esoteric Testing Market by Source of Income

Similar to the ICL market, China’s independent esoteric testing market generates majority of its revenue from Class III hospitals. In 2016, 67.7% of China’s esoteric testing revenue are generated from Class III hospitals, which increased to 75.7% in 2020 and the percentage is expected to decrease to 71.4% in 2025.

#### China Independent Esoteric Testing Market by Source, 2016-2025E



Source: Frost & Sullivan analysis

### Key Growth Drivers of China’s Independent Esoteric Testing Market

In addition to the growth drivers of China’s ICL market, the growth of China’s independent esoteric testing market is mainly attributable to the following factors.

- *Development of Clinical Practice.* With the increasing need for precision medicine, each step of the clinical practice – screening, diagnosis, treatment, prognosis and recovery – would require more use of esoteric tests.
- *Wider Application of Advanced Technology.* Due to rapid development in science and technology, various new esoteric methods will be introduced for more efficient and precise testing process.
- *Talent Recruitment and Retention.* It is expected that more talented experts and skilled professionals will join the healthcare industry, and they will make significant contribution to China’s independent esoteric testing industry.
- *Increasing Affordability of Medical Diagnosis.* From 2016 to 2020, the per capita disposable income increased from RMB23,821 to RMB32,189, representing a CAGR of 7.8%. With the increase of per capita disposable income, medical diagnosis and treatment have become more affordable. Additionally, there is an increasing expansion of the healthcare insurance coverage that extends to more advanced medical treatment, diagnosis and testing services. Such increased affordability will bring a huge increase of demand for high quality testing services, favoring the development of China’s independent esoteric testing market.



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- *Capital Investment.* China’s independent esoteric testing market is attracting increasingly more venture capital investment. With the support of capital funds, a number of market players in this industry are going through further business expansion.

### Entry Barriers of China’s Independent Esoteric Testing Market

In addition to the entry barriers of China’s ICL market, the entry barriers of the independent esoteric testing market in China include:

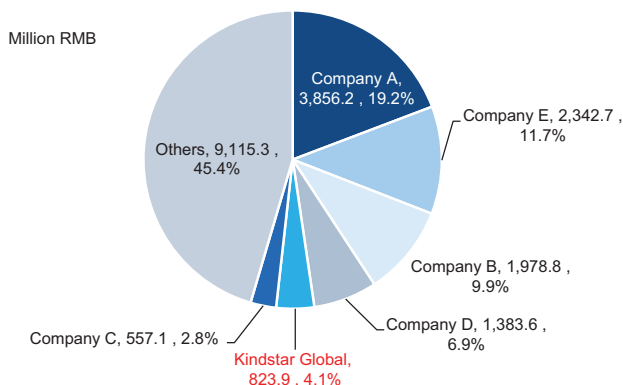
- *Professional Barrier.* As the complexity to operate the equipment for clinical testing, the technicians in the ICLs are subject to certain qualifications. Such qualified technicians are rare and popular on the market.
- *Financial Barrier.* The cost to initiate an esoteric testing business is relatively high, which include the cost to build up qualified laboratory, purchase advanced equipment and hire the professionals.
- *Marketing and Promotion.* Existing and successful ICLs generally have their own established marketing and promotion network, including organized academic-driven promotion campaigns that targets medical professionals, allowing them to maintain good relationships with key opinion leaders, as well as department heads and senior physicians in hospitals.

## COMPETITIVE LANDSCAPE IN OUR MARKETS

### Competitive Landscape of China’s ICL Esoteric Testing Market

In 2020, the Company had the largest market share in 2020 by revenue in the hematology esoteric testing market. The Company has the largest number of testing items among the ICL esoteric testing companies in China as of the end of 2020. In 2020, the Company ranked the fifth among both the total ICL testing market and the ICL esoteric testing companies in China in terms of revenue, respectively. The top six companies in the ICL esoteric testing market in China held a combined market share of 54.6% by revenue in 2020.

#### Major ICL Esoteric Testing Companies in China by Revenue, 2020

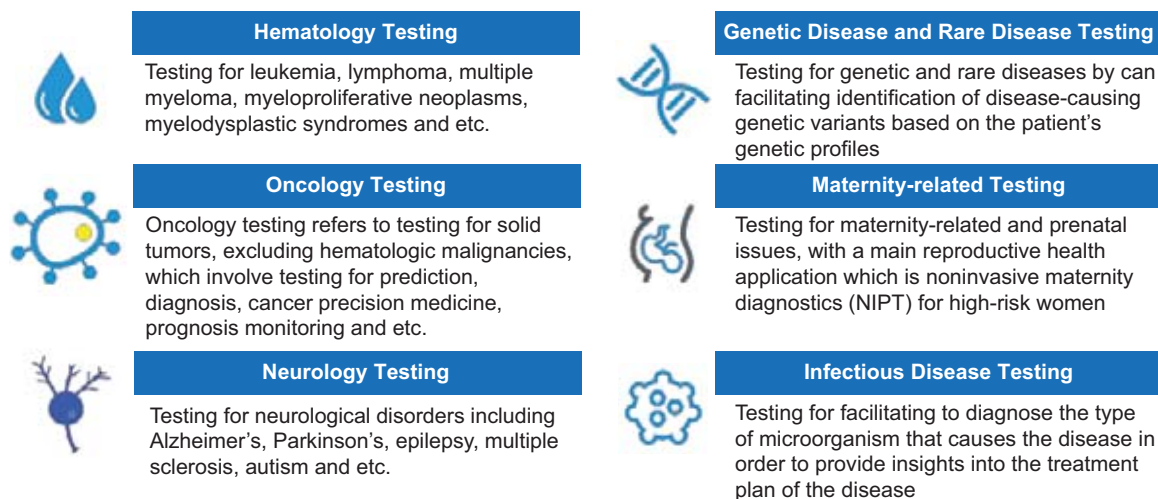


Source: Frost & Sullivan Analysis

## INDUSTRY OVERVIEW

### ICL Esoteric Testing Market by Specialty Areas

China’s ICL testing market mainly consists of six segments by specialty areas: (i) hematology testing; (ii) genetic disease and rare disease testing; (iii) infectious disease testing; (iv) oncology testing; (v) neurology testing; and (vi) maternity-related testing. Compared with the ICL market in the United States, which covers broader segments, such as dermatology testing and toxicology testing, the China ICL testing market still has growth potential in expanding the available specialty areas. The following chart illustrates the description of the main specialty areas in China.



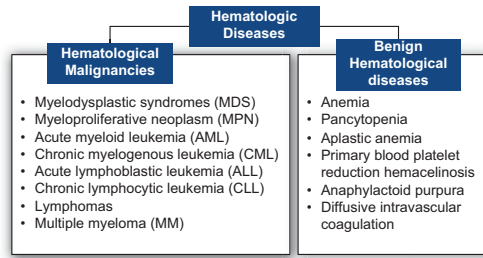
Source: Frost & Sullivan analysis

All the specialty areas listed above have seen rapid growth over the years and are expected to keep growing at double-digit CAGR ranging from 8.6% to 33.6% from 2016 to 2020 and expected CAGR ranging from 10.7% to 40.2% from 2020 to 2025. Out of the six specialty areas, four (hematology, infectious disease, oncology and maternity-related diseases) had a market size of at least RMB 1,000 million as of 2020. In 2020, hematology testing, neurology testing, infectious disease testing, genetic disease and rare disease testing, oncology testing and maternity-related testing accounted for 12.1%, 2.1%, 10.9%, 6.8%, 40.1% and 24.9% of the esoteric testing market (excluding COVID-19 testing), respectively.

### Hematology Testing

Hematologic diseases are disorders primarily affecting the blood and blood-forming organs, including rare genetic disorders, anemia, sickle cell disease and complications from chemotherapy or transfusions. Hematologic tests include tests on the blood, blood proteins and blood-producing organs. It facilitates the physicians to diagnose various types of hematologic diseases, including anemia, infection, hemophilia, blood-clotting disorders, and leukemia. The technology platforms involved in hematologic testing mainly include pathology platform, flow cytometry, molecular cytogenetics and molecular diagnostics. The following chart shows the major types of disease covered by hematologic testing.

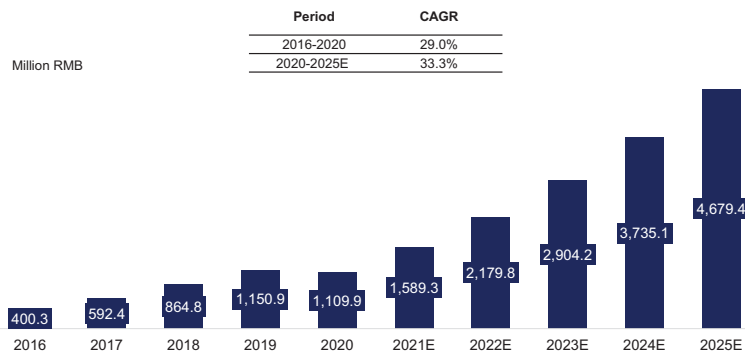
## INDUSTRY OVERVIEW



Source: Frost & Sullivan analysis

In 2020, China ICL hematologic testing market reached RMB1,109.9 million, compared to a market size of RMB400.3 million in 2016, representing a CAGR of 29.0% from 2016 to 2020. The market size is expected to rise to RMB4,679.4 million in 2025, representing a CAGR of 33.3% from 2020 to 2025.

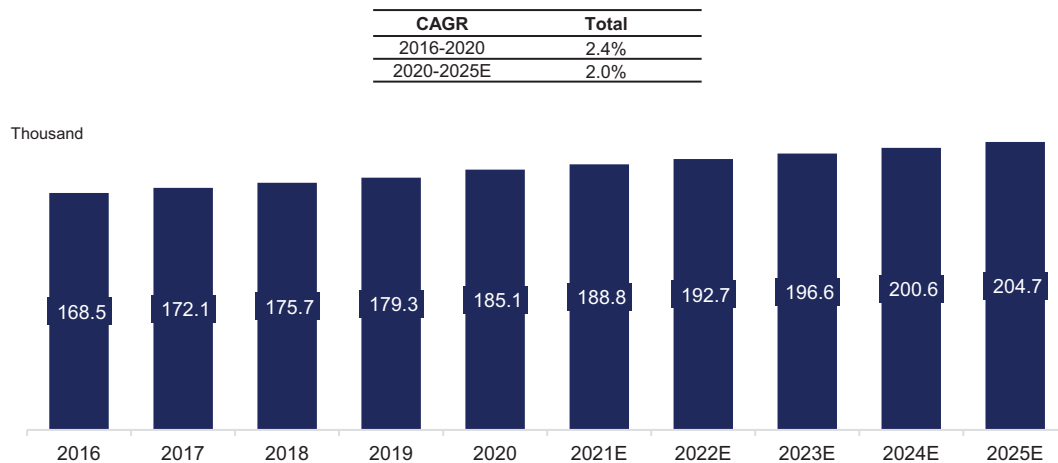
### China ICL Hematologic Testing Market Size and Forecast, 2016-2025E



Source: Frost & Sullivan Analysis

Lymphoma and leukemia are representative diseases under hematology testing. The incidence of lymphoma and leukemia in China grew from 168.5 thousand to 185.1 thousand during the period of 2016-2020, with a CAGR of 2.4%. In the future, the incidence of the two hematological diseases in China is projected to reach 204.7 thousand by 2025, with a CAGR of 2.0% from 2020 to 2025.

### Patient Size of Typical Diseases of Hematology Testing in China, 2016-2025E

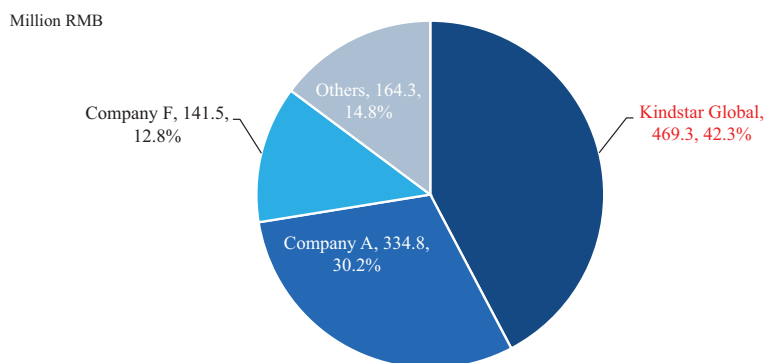


Source: Frost & Sullivan Analysis

## INDUSTRY OVERVIEW

Within this fast growing market in China, the top three companies accounted for 85.2% of the total hematologic testing market by revenue in China in 2020. The Company had the largest market share in 2020, contributing 42.3% or RMB469.3 million of the total market revenues.

**Breakdown of China ICL Hematology Testing Market by Companies, 2020**

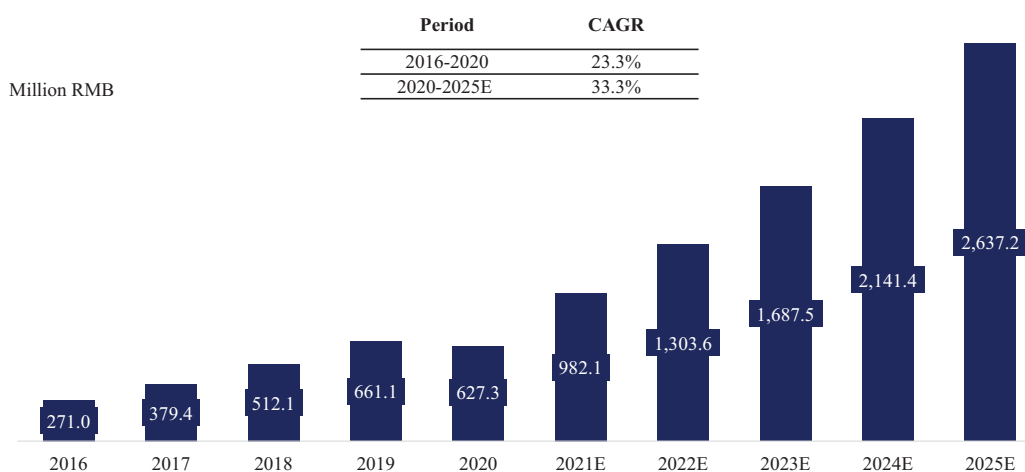


Source: Annual Report, Frost & Sullivan Analysis

### Genetic Disease and Rare Disease Testing

Genetic disease and rare disease testing can facilitate identification of disease-causing genetic variants. In 2020, China ICL genetic disease and rare disease testing market reached RMB627.3 million, compared to a market size of RMB271.0 million in 2016, representing a high CAGR of 23.3% from 2016 to 2020. The market size is expected to grow to RMB2,637.2 million in 2025, representing a CAGR of 33.3% from 2020 to 2025.

**China ICL Genetic Disease and Rare Disease Testing Market Size and Forecast, 2016-2025E**



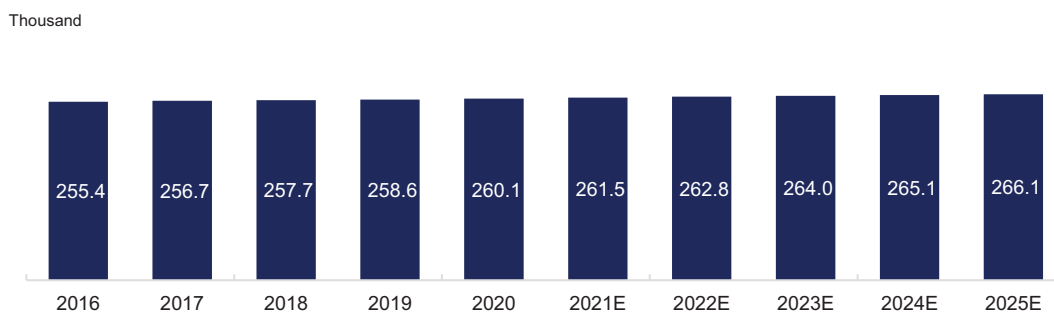
Source: Frost & Sullivan analysis

Typical diseases of genetic disease & rare disease testing include generalized myasthenia gravis and spinal muscular atrophy. The prevalence of these genetic diseases & rare diseases in China grew from 255.4 thousand to 260.1 thousand during the period of 2016-2020, with a CAGR of 0.5%. In the future, the prevalence of genetic disease & rare disease in China is projected to reach 266.1 thousand by 2025, with a CAGR of 0.5% from 2020 to 2025.

## INDUSTRY OVERVIEW

### Patient Size of Typical Diseases of Genetic Disease & Rare Disease Testing in China, 2016-2025E

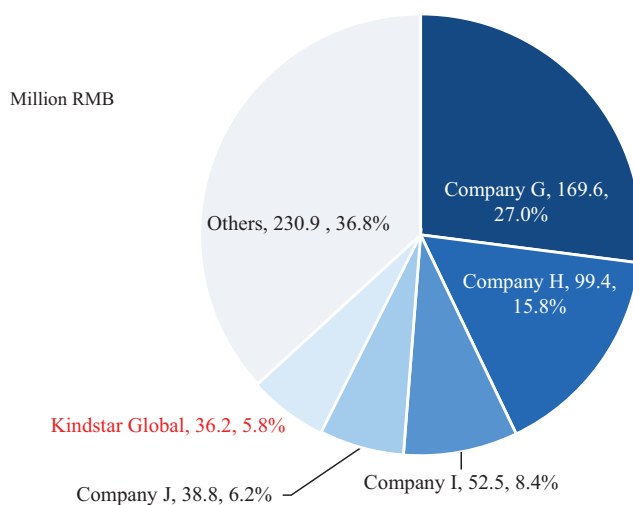
CAGR	Total
2016-2020	0.5%
2020-2025E	0.5%



Source: Frost & Sullivan Analysis

The top five companies accounted for 63.2% of the total genetic and rare diseases testing market in China by revenue in 2020. The Company had the fifth largest share in the market in 2020, accounting for 5.8% or RMB36.2 million of the total market revenue.

### Breakdown of China ICL Genetic Disease and Rare Disease Testing Market by Companies, 2020



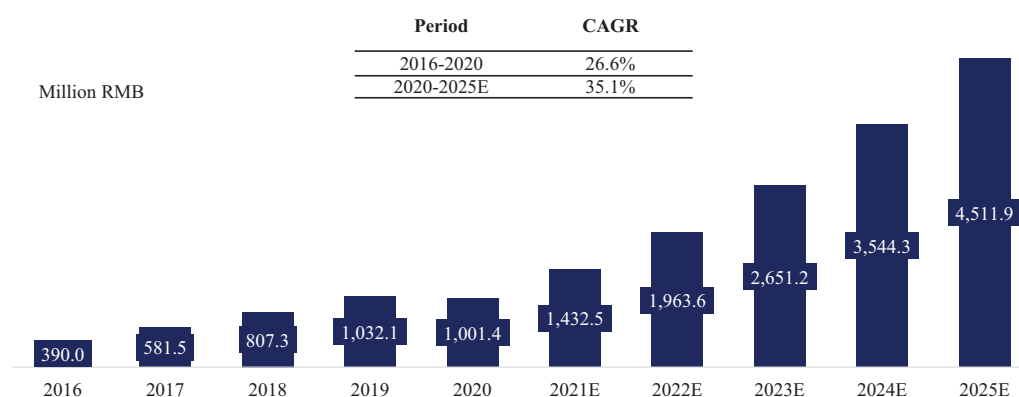
Source: Annual Report, Frost & Sullivan analysis

### Infectious Disease Testing

Infectious diseases are disorders caused by pathogens – such as bacteria, viruses, fungi or parasites. Infectious diseases tests include tests such as antibody tests, antigen tests, and nucleic acid – based tests. They can help to find the causes the infectious disease, providing insights into the treatment plan of the disease. In 2020, China ICL infectious disease testing market reached RMB1,001.4 million, compared to a market size of RMB390.0 million in 2016, representing a high CAGR of 26.6% from 2016 to 2020. Then it is expected to grow to RMB4,511.9 million in 2025, representing a CAGR of 35.1% from 2020 to 2025.

## INDUSTRY OVERVIEW

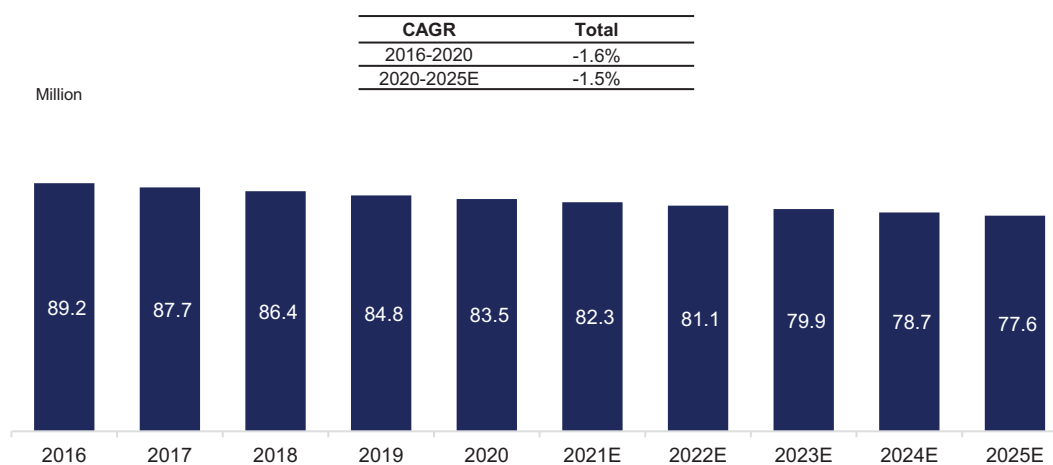
### China ICL Infectious Disease Testing Market Size and Forecast, 2016-2025E



Source: Frost & Sullivan Analysis

HBV, HCV, and HIV are representative diseases under infectious disease testing. The prevalence of these infectious diseases in China grew from 89.2 million to 83.5 million during the period of 2016-2020, with a CAGR of -1.6%. In the future, the prevalence of these infectious diseases in China is projected to reach 77.6 million by 2025, with a CAGR of -1.5% from 2020 to 2025.

### Patient Size of Typical Diseases of Infectious Disease in China, 2016-2025E



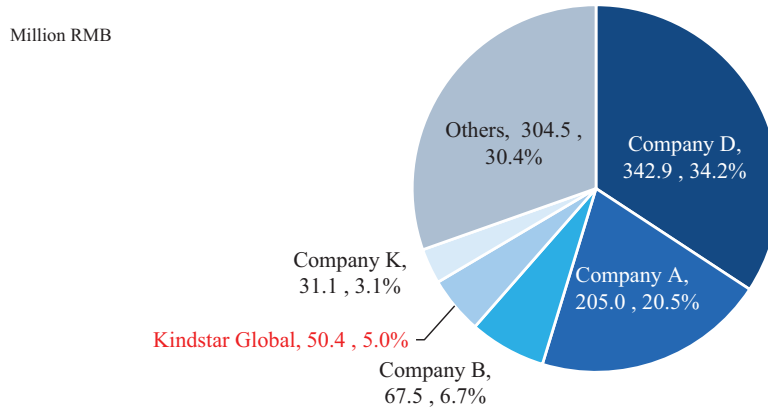
Source: Frost & Sullivan Analysis

Within this fast growing market in China, the largest five participants accounted for 69.6% of the total infectious disease market in China by revenue in 2020. The Company had the fourth largest share in the market in 2020, accounting for 5.0% or RMB50.4 million of the total market revenue.



## INDUSTRY OVERVIEW

### Breakdown of China ICL Infectious Disease Testing Market by Companies, 2020

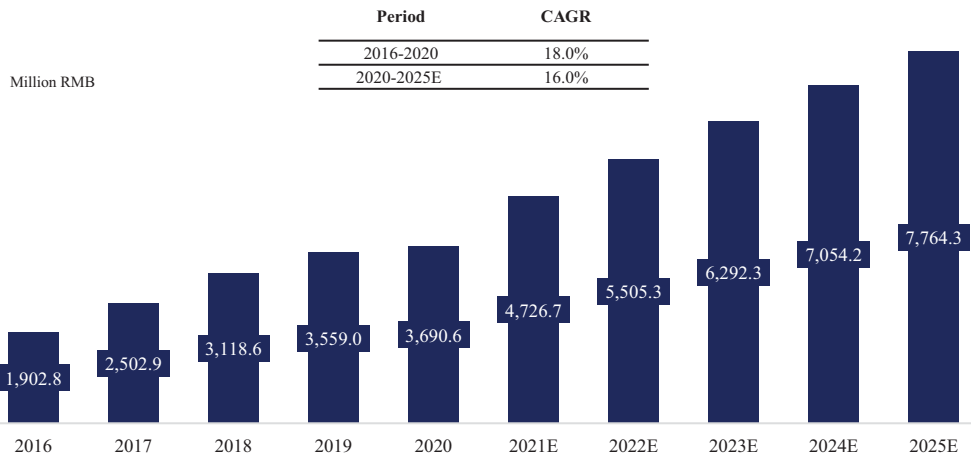


Source: Annual Report, Frost & Sullivan Analysis

### Oncology Testing

Oncology testing refers to testing for solid tumors, excluding hematologic malignancies, which involve testing for prediction, diagnosis, cancer precision medicine, prognosis monitoring and etc. In 2020, China ICL oncology testing market reached RMB3,690.6 million, compared to a market size of RMB1,902.8 million in 2016, representing a high CAGR of 18.0% from 2016 to 2020. Then it is expected to grow to RMB7,764.3 million in 2025, representing a CAGR of 16.0% from 2020 to 2025.

### China ICL Oncology Testing Market Size and Forecast, 2016-2025E

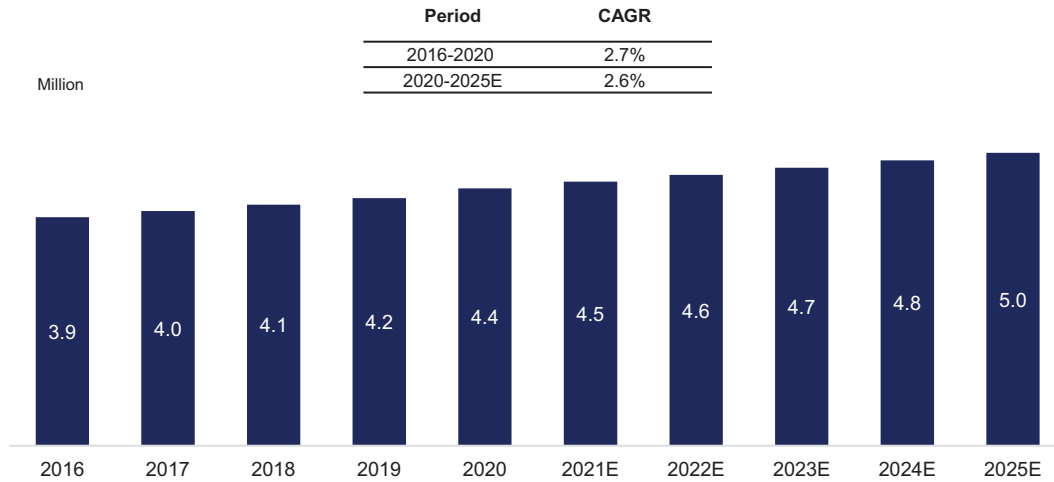


Source: Frost & Sullivan Analysis

Oncology Testing is mainly conducted on solid tumors. In 2020, the incidence for solid tumors in China reached 4.4 million, compared to 3.9 million in 2016, representing a CAGR of 2.7% from 2016 to 2020. It is expected to grow to 5.0 million in 2025, representing a CAGR of 2.6% from 2020 to 2025.

## INDUSTRY OVERVIEW

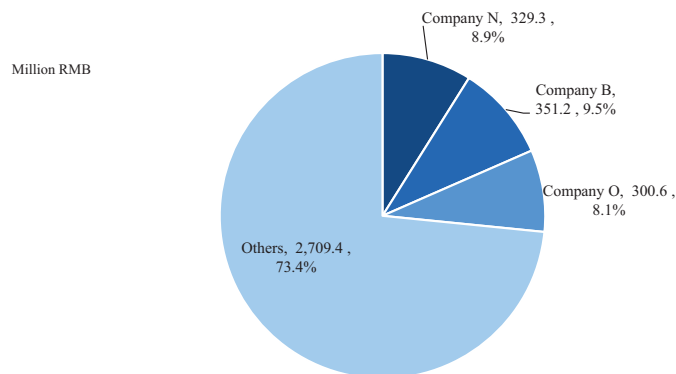
### Patient Size of Typical Diseases of Oncology Testing in China, 2016-2025E



Source: Frost & Sullivan analysis

Within the oncology testing market in China, the largest three participants accounted for 26.6% of the total market in China by revenue in 2020.

### Breakdown of China ICL Oncology Testing Market by Companies, 2020



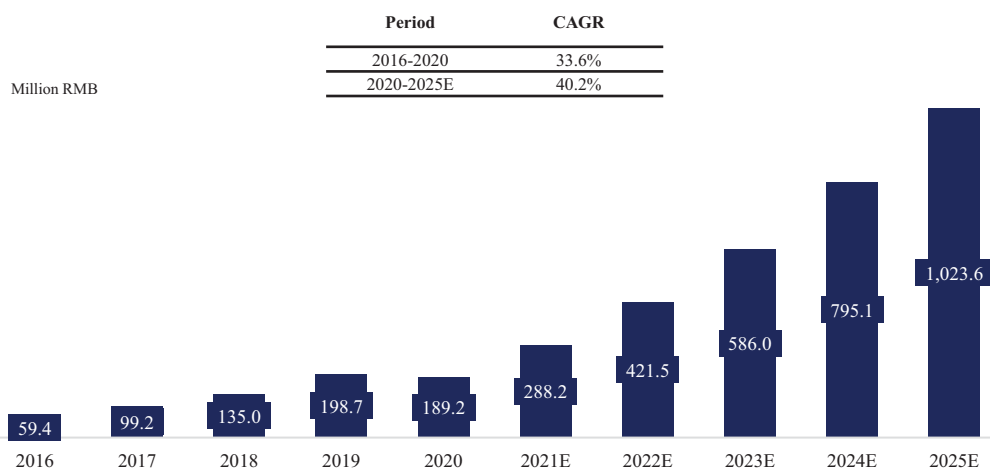
Source: Annual Report, Frost & Sullivan analysis

### Neurology Testing

Neurological disorders are diseases of the central and peripheral nervous system. Common disorder conditions include epilepsy, dementia, paraneoplastic disorders, multiple sclerosis and myasthenia gravis. In 2020, China ICL neurology testing market reached RMB189.2 million, compared to a market size of RMB59.4 million in 2016, representing a high CAGR of 33.6% from 2016 to 2020. Then it is expected to grow to RMB1,023.6 million in 2025, representing a CAGR of 40.2% from 2020 to 2025.

## INDUSTRY OVERVIEW

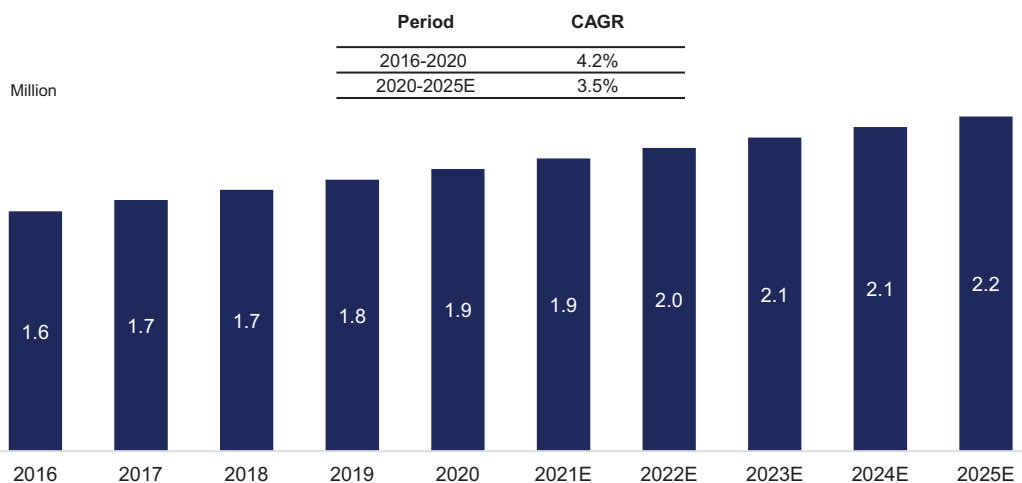
### China ICL Neurology Testing Market Size and Forecast, 2016-2025E



Source: Frost & Sullivan Analysis

Alzheimer’ disease is a representative disease under neurology testing. In 2020, the incidence for Alzheimer’s disease in China reached 1.9 million, compared to 1.6 million in 2016, representing a CAGR of 4.2% from 2016 to 2020. It is expected to grow to 2.2 million in 2025, representing a CAGR of 3.5% from 2020 to 2025.

### Patient Size of Typical Diseases of Neurology Testing in China, 2016-2025E

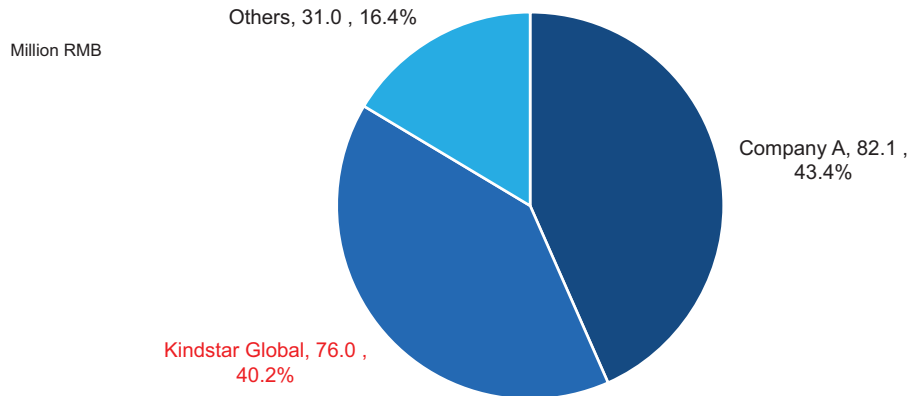


Source: Frost & Sullivan analysis

Within this fast growing market in China, there are only two companies leading neurology testing, accounting for 83.6% of the total neurology testing market in China by revenue in 2020. The Company had the second largest market share, accounting for 40.2% or RMB76.0 million of the total market revenue in 2020.

## INDUSTRY OVERVIEW

Breakdown of China ICL Neurology Testing Market by Companies, 2020

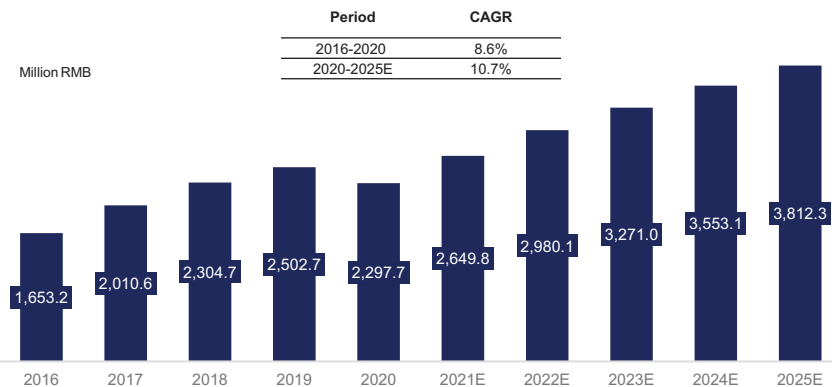


Source: Annual Report, Frost & Sullivan Analysis

### Maternity-related Testing

Maternity-related testing refers to the usage of blood (peripheral blood, cord blood), body fluids, or cells to test DNA to identify birth defects and receive early interventions. In 2020, China ICL maternity testing market reached RMB2,297.7 million, compared to a market size of RMB1,653.2 million in 2016, representing a CAGR of 8.6% from 2016 to 2020. Then it is expected to grow to RMB3,812.3 million in 2025, representing a CAGR of 10.7% from 2020 to 2025. Within the maternity testing market in China, the largest three participants accounted for 67.3% of the total market in China by revenue in 2020. Other players, including the Company, accounted for 32.7% of the total market in China by revenue in 2020. If excluding NIPT market and covid-19 testing market, which is a relatively developed, automated and consumer-driven testing service, the Company would rank second among the ICL esoteric testing companies in China in terms of revenue, accounting for 9.5% of the total China’s ICL esoteric testing market share.

China ICL Maternity Testing Market Size and Forecast, 2016-2025E



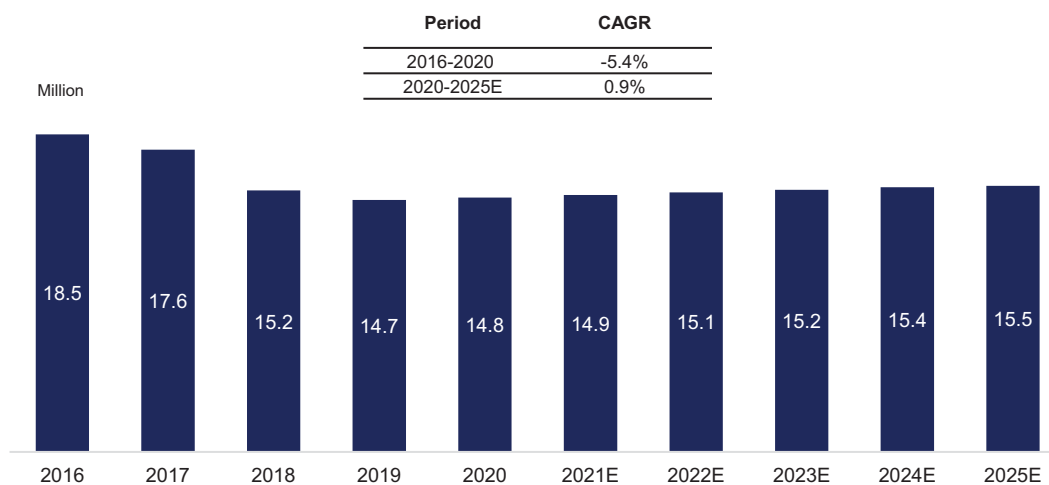
Source: Frost & Sullivan analysis

Maternity-related testing is mostly conducted on pregnant women, upon which the number of pregnant women is related to the number of new born babies. In 2020, the number of annual newborns in China is 14.8 million, compared to 18.5 million new born babies in 2016, representing a CAGR of -5.4%

## INDUSTRY OVERVIEW

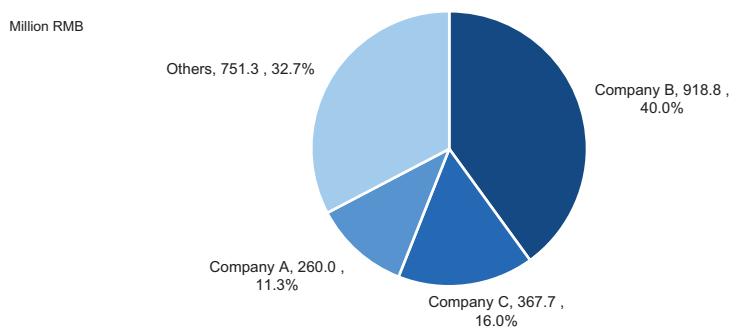
from 2016 to 2020. The number of new born in China is expected to steadily grow to 15.5 million in 2025, representing a CAGR of 0.9% from 2020 to 2025.

**Patients Size of Maternity-related Testing in China, 2016-2025E**



Source: Frost & Sullivan analysis

**Breakdown of China ICL Maternity-related Testing Market by Companies, 2020**



Source: Annual Report, Frost & Sullivan analysis

## RAW MATERIALS

Raw materials in the independent esoteric testing industry primarily include reagents. According to Frost & Sullivan, the unit price of reagents had been continuously decreasing since 2017. For example, the average market price of immunofixation electrophoresis reagent, which is widely used in hematology testing, decreased from approximately RMB79 per unit in 2017 to RMB72 per unit in 2020. Another example is tuberculosis specific T-cell detection kit/interferon gamma release assay (TB-IGRA), a reagent that is widely used in infectious disease testing, the average market price of which decreased from approximately RMB146 per unit in 2017 RMB96 per unit in 2020. Immunofixation electrophoresis reagent is mainly used in testing items including multiple myeloma testing bundle, and TB-IGRA is mainly used for tuberculous infection T cell test. The average shelf-life of these types of reagents is normally more than one year and they can be replaced by other products manufactured by other manufacturers. The price of the major raw materials in the independent esoteric testing industry is expected to show a relatively stable and

## **INDUSTRY OVERVIEW**

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slightly decreasing trend in the foreseeable future. A similar trend for the reagents is expected to be observed in US, South East Asia and Middle East.

### **REPORT COMMISSIONED BY FROST & SULLIVAN**

In connection with the [REDACTED], we have engaged Frost & Sullivan to conduct a detailed analysis and to prepare an industry report on the cancer screening market. Frost & Sullivan is an independent global market research and consulting company founded in 1961 and is based in the United States. Services provided by Frost & Sullivan include market assessments, competitive benchmarking, and strategic and market planning for a variety of industries.

We have included certain information from the Frost & Sullivan Report in this Document because we believe such information facilitates an understanding of the cancer screening market for potential [REDACTED]. Frost & Sullivan prepared its report based on its in-house database, independent third-party reports and publicly available data from reputable industry organizations. Where necessary, Frost & Sullivan contacts companies operating in the industry to gather and synthesize information in relation to the market, prices and other relevant information. Frost & Sullivan believes that the basic assumptions used in preparing the Frost & Sullivan Report, including those used to make future projections, are factual, correct and not misleading. Frost & Sullivan has independently analyzed the information, but the accuracy of the conclusions of its review largely relies on the accuracy of the information collected. Frost & Sullivan research may be affected by the accuracy of these assumptions and the choice of these primary and secondary sources.

We have agreed to pay Frost & Sullivan a fee of RMB700,000 for the preparation of the Frost & Sullivan Report. The payment of such amount was not contingent upon our successful [REDACTED] or on the content of the Frost & Sullivan Report. Except for the Frost & Sullivan Report, we did not commission any other industry report in connection with the [REDACTED]. We confirm that after taking reasonable care, there has been no adverse change in the market information since the date of the report prepared by Frost & Sullivan, which may qualify, contradict or have an impact on the information set forth in this section in any material respect.