

DEFINING THE FUTURE OF DIAGNOSTICS



REPORT
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Foreword



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The Indian diagnostics industry has emerged as a preferred play within the expanding healthcare landscape, driven by attractive margins and significant growth potential. With a market size of ~US\$ 13B in FY23, the domestic diagnostics industry is projected to grow at a CAGR of ~14% over the next five years. This growth trajectory will be fueled by rising factors such as the increasing prevalence of chronic diseases, growth in the geriatric population, rising demand for preventive tests, and government initiatives.

The diagnostics industry is marked by a high degree of fragmentation, with standalone centers accounting for 46%, followed by private hospital-based labs at 28% and national chains at only 6%. While this fragmentation presents challenges in terms of capabilities and scalability, it also offers opportunities for consolidation and the emergence of new business models.

Pathology contributes the majority share at ~58% with radiology accounting for the remaining ~42%, covering tests such as CT scans, MRI, nuclear imaging, and ultrasound scans.

This report analyzes the current state of the diagnostics market and the emerging key trends in the market. These include a) Digitalization and new-age technology, b) Consolidating and driving strategic M&A / inorganic acquisitions, c) Operational performance improvement and supply chain transformation, d) Emergence of economies of scale, e) Emergence of new clinical needs and development, f) Emergence of new business models, g) Rising insurance penetration, h) Evolving patient needs, i) Rising opportunity of the tier 2/3+ market, and j) Regulatory and government impact.

Our endeavor with this report is to understand, qualify, and quantify the impact that these trends will have on the Indian diagnostics market in the short to medium term.

At Praxis Global Alliance, we trust that our report will offer valuable insights into the key success factors driving growth in the Indian diagnostics industry, empowering you to seize the opportunities within this thriving sector.

Glossary of terms

Acronym

Description

Industry related

AMC	Annual Maintenance Contract
CBC	Complete Blood Count
CDSCO	Central Drugs Standard Control Organization
cfDNA	Cell-free DNA
CHC	Community Health Center
CMC	Comprehensive Maintenance Contract
CT Scan	Computed Tomography Scan
CTC	Circulating Tumor Cells
D2C	Direct to Customer
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
GDP	Gross Domestic Product
GH	Government Hospital
GHE	Government Healthcare Expenditure
GL	Government Lab
GP	General Physician
IPD	Inpatient Department
LIMS	Laboratory Information Management Systems
LPH	Large Private Hospital (>300 beds)
MPH	Medium Private Hospital (100–300 beds)
MRI	Magnetic Resonance Imaging
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCD	Non-Communicable Diseases
NCL	National Chain Lab
NGS	Next Generation Sequencing
NH	Nursing Home
NPPA	National Pharmaceutical Pricing Authority
OPD	Outpatient Department
PBMJAY	Ayushman Bharat Pradhan Mantri Jan Arogya Yojana
PHC	Primary Healthcare Center
POC	Point-Of-Care
PPP	Public-Private Partnership
RCL	Regional Chain Lab

Industry related	SAL	Standalone Lab
	SPH	Small Private Hospital (<100 beds)
	Sample	1 sample can be used to perform multiple tests
	Tier 1	All urban cities with more than 4M population
	Tier 2	All urban cities with 1-4M population
	Tier 3+	All urban cities with less than 1M population
	IVD	In Vitro Diagnostics
WHO	World Health Organization	
Units	B	Billion
	CAGR	Compounded Annual Growth Rate
	CY	Calendar Year (from 1 st January to 31 st December)
	FY	Fiscal Year (from 1 st April to 31 st March)
	INR	Indian Rupee
	K	Thousand
	M	Million
US\$	United States Dollar	

S. No.	Description
Exhibit 1.1	Indian healthcare ecosystem
Exhibit 1.2	Indian healthcare market
Exhibit 1.3	Key growth drivers for diagnostics sector in India
Exhibit 1.4	Healthcare delivery penetration
Exhibit 1.5	Diagnostic test penetration
Exhibit 1.6	Distribution of hospital resources
Exhibit 1.7	Pathology lab landscape
Exhibit 1.8	Government healthcare expenditure as a % of GDP in India
Exhibit 1.9	GDP per capita, PPP–India
Exhibit 1.10	GDP per capita, PPP vs government expenditure on healthcare
Exhibit 1.11	Age profile in India
Exhibit 1.12	Cause of death in India
Exhibit 1.13	Impact of COVID-19 on diagnostics market in India
Exhibit 2.1	Indian diagnostics market in FY23
Exhibit 2.2	Segmentation across Indian diagnostics market in FY23
Exhibit 2.3	Indian diagnostics market (pathology and radiology)
Exhibit 2.4	Customer segmentation in diagnostics market
Exhibit 2.5	Emerging trends in diagnostics market
Exhibit 3.1	Pathology market in India in FY23
Exhibit 3.2	Pathology market in India from FY23-28
Exhibit 3.3	Growth drivers of pathology market
Exhibit 3.4	Pathology lab landscape in India
Exhibit 3.5	Pathology market segmentation in India
Exhibit 3.6	Types of tests in pathology
Exhibit 3.7	Global pathology test prices (US\$)
Exhibit 4.1	Radiology market in India in FY23
Exhibit 4.2	Radiology market in India from FY23-28
Exhibit 4.3	Growth drivers for radiology market in India
Exhibit 4.4	Radiology lab landscape
Exhibit 4.5	Global radiology test prices (US\$)
Exhibit 5.1	Diagnostics equipment market size in India
Exhibit 5.2	Growth drivers for diagnostics equipment market in India
Exhibit 5.3	Distribution of installed base of pathology and radiology equipment across city tiers
Exhibit 5.4	Proposition to customers by different competitor segment
Exhibit 5.5	Tailwinds for diagnostics equipment market
Exhibit 5.6	Headwinds for diagnostics equipment market

S. No.	Description
Exhibit 6.1	New waves of opportunities in diagnostics
Exhibit 6.2.1	POC and rapid tests market
Exhibit 6.2.2	Key drivers for adoption of POC and rapid tests
Exhibit 6.3.1	Key M&A deals
Exhibit 6.3.2	M&A as a driving growth for national chains in India
Exhibit 6.3.3	EBITDA multiple of major players
Exhibit 6.4	Operational efficiency in diagnostics chains
Exhibit 6.5.1	EBITDA margin and cost structure of labs
Exhibit 6.5.2	Unit economics of a pathology lab
Exhibit 6.5.3	Unit economics of a radiology lab
Exhibit 6.5.4	Drivers for economies of scale
Exhibit 6.6.1	Microfluidics POC test market in India
Exhibit 6.6.2	Liquid biopsy test market in India
Exhibit 6.6.3	Genomics testing market in India
Exhibit 6.6.4	Key growth drivers for genomics testing market in India
Exhibit 6.6.5	Key investment from PE / VC firms in genomics space
Exhibit 6.6.6	Distribution of pathology test by type
Exhibit 6.6.7	Key drivers for preventive test in India
Exhibit 6.6.8	Opportunity in health management and wellness segments
Exhibit 6.7	Innovative business models in diagnostics value chain
Exhibit 6.8.1	Health insurance coverage
Exhibit 6.8.2	Individuals covered by health insurance by scheme type
Exhibit 6.9.1	Reasons for customers preferring home collection
Exhibit 6.9.2	Factors influencing customers choice for online healthcare platforms
Exhibit 6.10	Distribution of diagnostics labs in India
Exhibit 6.11.1	Number of government labs and hospital labs in India from CY23-27
Exhibit 6.11.2	PPP of national and regional chain labs with different state governments
Exhibit 6.11.3	Current manufacturing capability and future expansion plans for MNCs in India
Exhibit 6.11.4	Impact of Digital Personal Data Protection Act on diagnostic companies

01

INDIAN HEALTHCARE LANDSCAPE

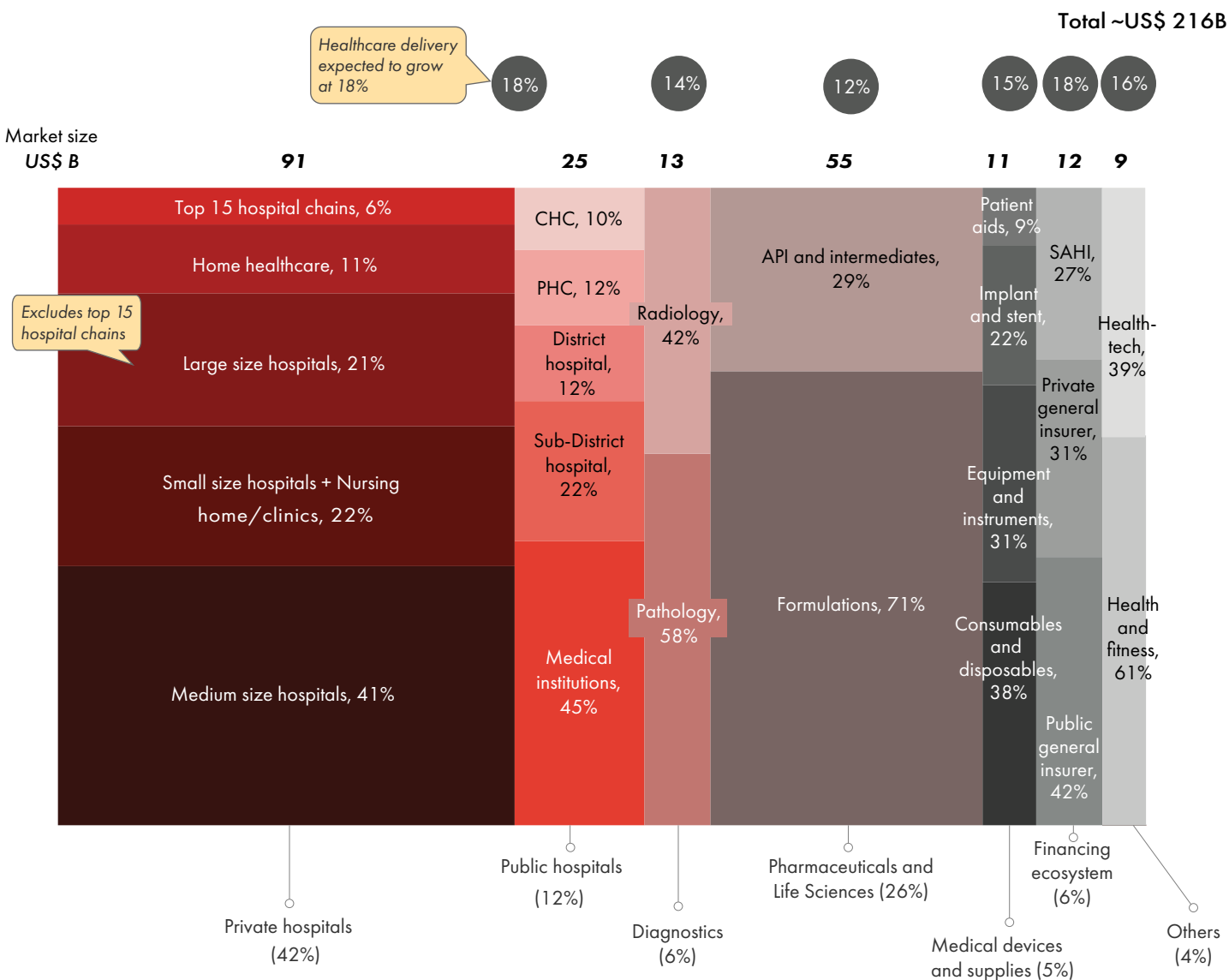


1.0 INDIAN HEALTHCARE LANDSCAPE

Exhibit 1.1

Indian healthcare ecosystem is a ~US\$ 216B market in FY23; diagnostics forms ~6% of the overall ecosystem

Indian healthcare ecosystem
(US\$ B, FY23)



Hospital type	Small + NH	Medium	Large	Large chains
Bed size	<100	100-300	>300	Top 15

xx% Growth CAGR FY23-28P

Note(s): SAHI: Standalone Health Insurers focus solely on health insurance products – Aditya Birla Health Insurance, Care Health Insurance, ManipalCigna Health Insurance, Niva Bupa Health Insurance, Star Health and Allied Insurance; the market for HealthTech includes telemedicine, personal health management products and services, remote diagnostics devices and healthcare IT; the market for health and fitness includes both the fitness trackers and health and wellness coaching segments

1.1 Overview

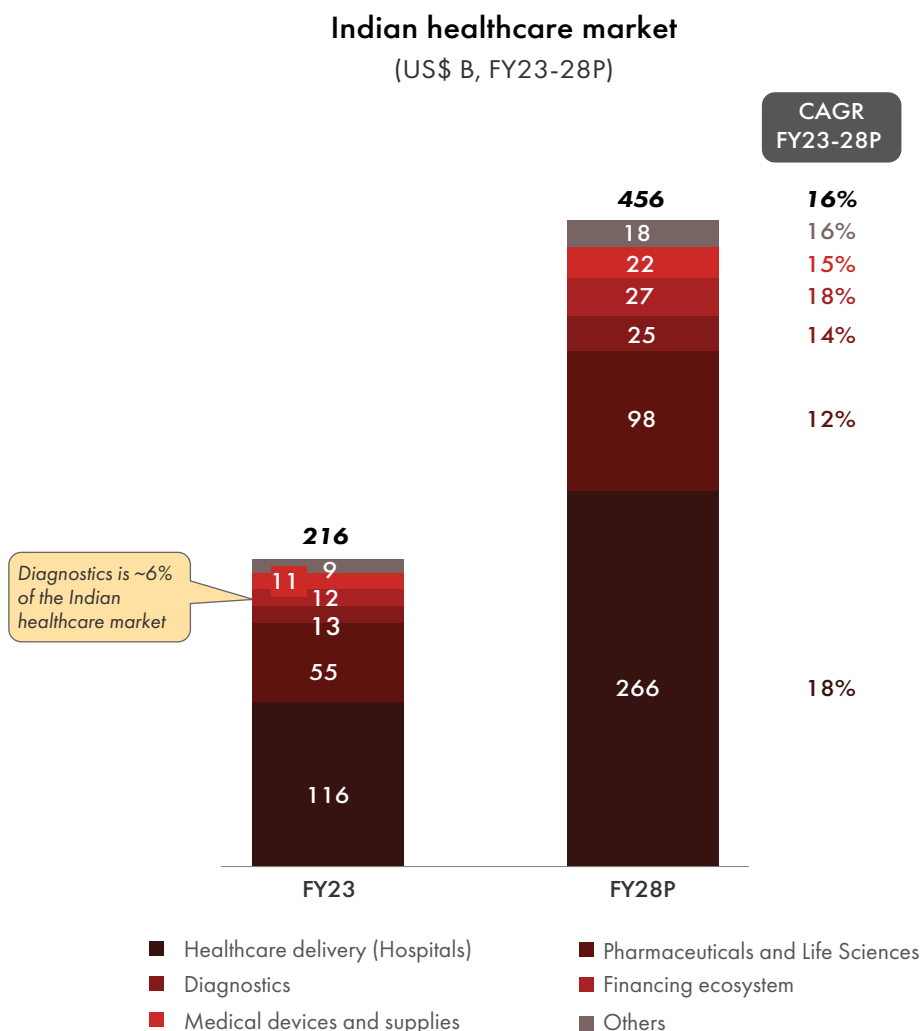
The Indian healthcare sector stands at the cusp of a transformative leap, with it being a formidable US\$ 216B market as of FY23. This sector, characterized by its dynamic growth potential and multifaceted components, is projected to grow to an estimated US\$ 456B by FY28, marking a CAGR of 16%. Within this vibrant ecosystem, diagnostics will play a pivotal role, representing ~6% of the market, and is anticipated to grow to a US\$ 25B industry by FY28.

1.2 Growth projections and market dynamics

Diagnostics, in particular, is expected to grow at a CAGR of 14%, reaching US\$ 25B by FY28. This growth is fuelled by an increase in life expectancy, a growing middle class, and higher penetration of govt. insurance schemes. Additionally, the demand-supply gap indicates a need for approximately 3M more beds to achieve the target of 3 beds per 1,000 people by CY25, suggesting substantial room for expansion.

Exhibit 1.2

Diagnostics is expected to grow at a CAGR of 14% to reach US\$ 25B by FY28








Note(s): Others includes health and fitness and HealthTech

1.3 Factors driving growth of diagnostics in India

- The aging population, susceptible to chronic diseases, fuels demand for diagnostic services, indicating a growing market for advanced tests
- NCDs persist as India's primary cause of death, propelling the demand for specialized diagnostic tests for early detection and management, contributing significantly to market growth
- The expanding middle class, with rising disposable incomes, increases affordability for advanced diagnostic tests. This demographic's awareness of preventive healthcare intensifies the demand for diagnostic services
- Increasing insurance penetration alleviates financial burdens for patients seeking diagnostic tests, boosting utilization rates. Government initiatives like AB-PMJAY further extend health insurance coverage, expanding the patient pool
- Technological advancements reshape the diagnostics landscape, enhancing convenience and accessibility. Innovations like telemedicine and home-based diagnostics broaden the reach of diagnostic services, particularly to remote or mobility-limited patients
- Doctors are prescribing more diagnostics tests for earlier disease detection, improved accuracy, and potential for better treatment options. Awareness is growing among patients, leading to increase in self preventive tests

Exhibit 1.3

Key growth drivers for diagnostics sector in India

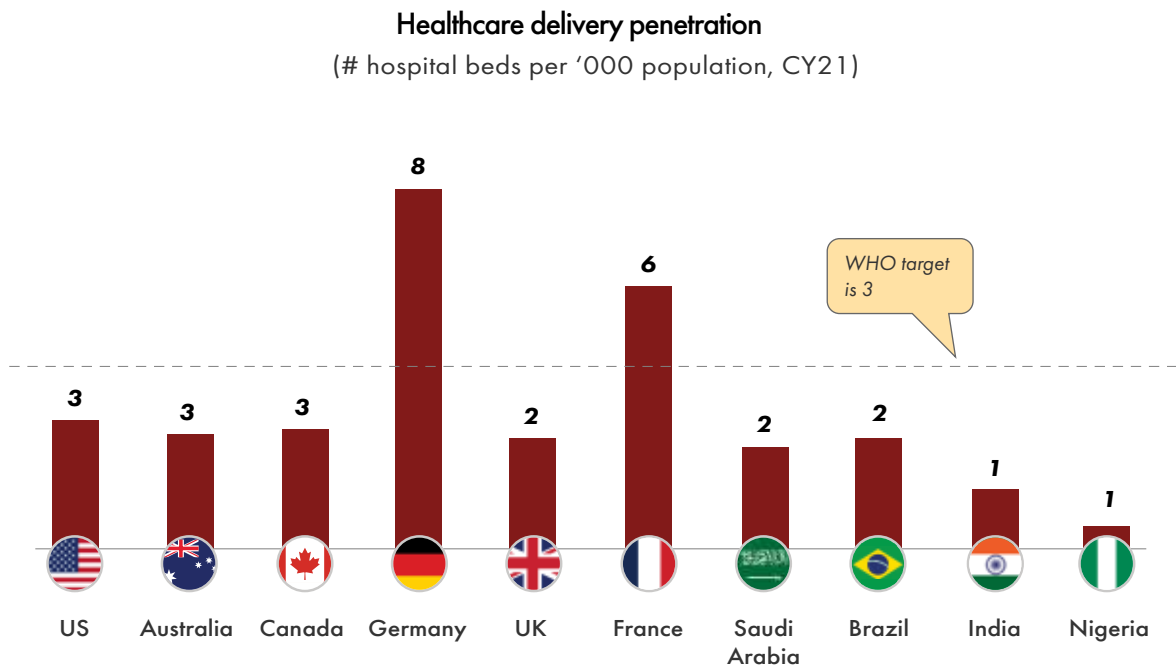
- 
 Geriatric population (60 years+) to surge from 10% to 13% by CY31, raising chronic disease risk and fueling demand for diagnostics
- 
 Shift in disease burden with share of NCDs in deaths to increase from ~66% in CY21 to ~74% by CY30
- 
 Growing middle class (~73M households to move into middle-class category in next 10 years) and rising incomes
- 
 Increasing private insurance penetration (increased to ~14% of the population) and favorable government schemes such as AB-PMJAY
- 
 Emergence of disruptive HealthTech players such as home healthcare, and remote diagnostic platforms, leveraging technology to improve healthcare coverage and accessibility

1.4 Healthcare penetration and comparison

India's healthcare infrastructure, when compared to established markets, shows significant underpenetration. For instance, the number of hospital beds per 1,000 population in India is well below the WHO target of 3, and diagnostic test penetration per capita is also considerably lower than in other leading countries, presenting opportunities for development.

Exhibit 1.4

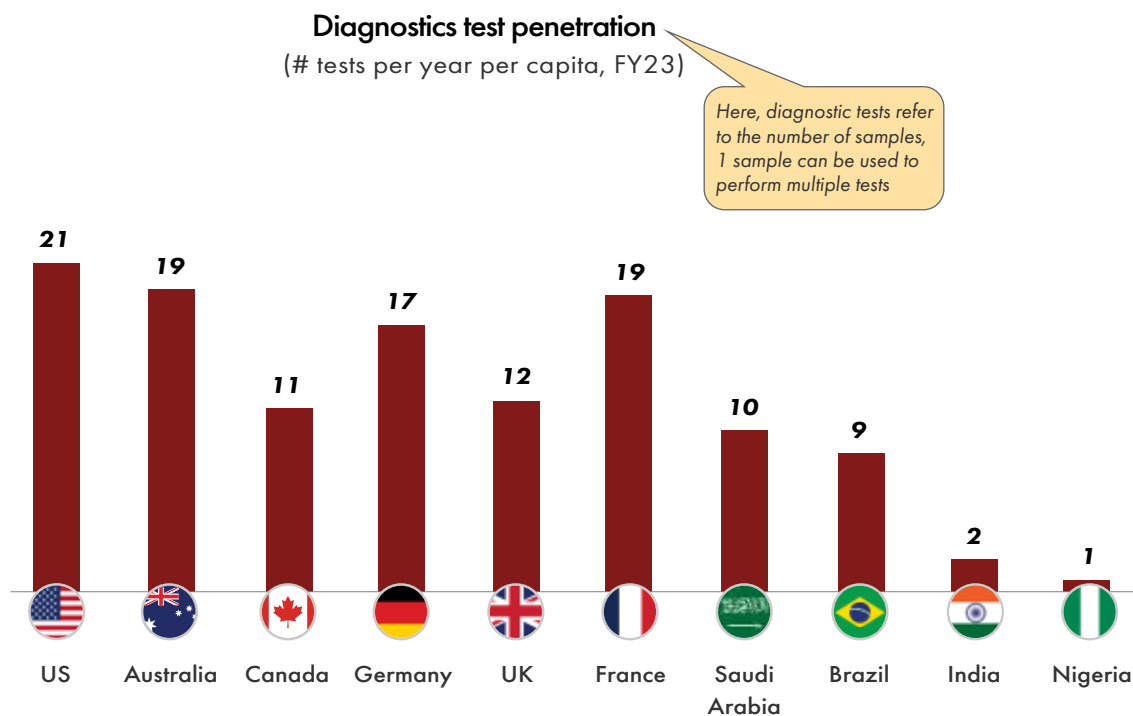
While established markets boast robust healthcare delivery, India remains a relatively nascent landscape



Note(s): Beds per 1,000 – countries' data as of CY21 except Saudi Arabia (CY19) and India (CY23)

Exhibit 1.5

Compared to other leading countries, diagnostics is significantly underpenetrated in India



Diagnostics market (US\$ B, FY23)

US	99	6	13	21	18	11	2	13	13	1
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1.5 Fragmented supply of healthcare facilities

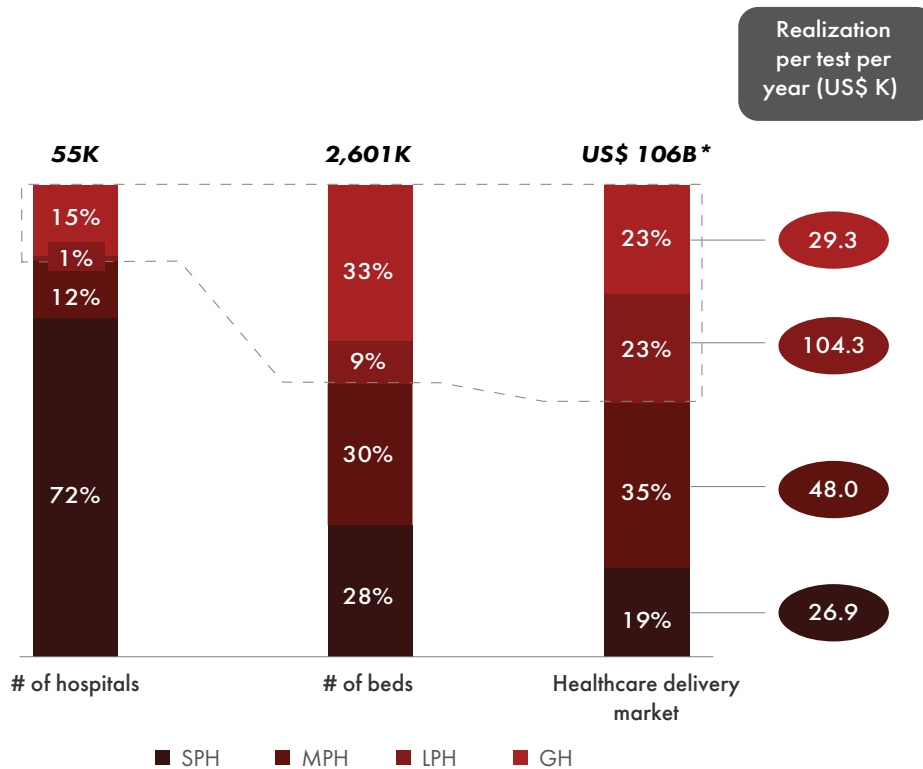
The supply of healthcare facilities in India is largely fragmented, with about 16% of healthcare facilities accounting for 42% of the bed capacity and 46% of the healthcare delivery market. The pathology lab landscape also reflects a similar pattern of concentration, with a small percentage of labs conducting a significant portion of tests and generating a substantial share of the market revenue.

Exhibit 1.6

~16% of the healthcare facilities account for ~42% of the bed capacity and ~46% of the healthcare delivery market

Distribution of hospital resources

(%, FY23)

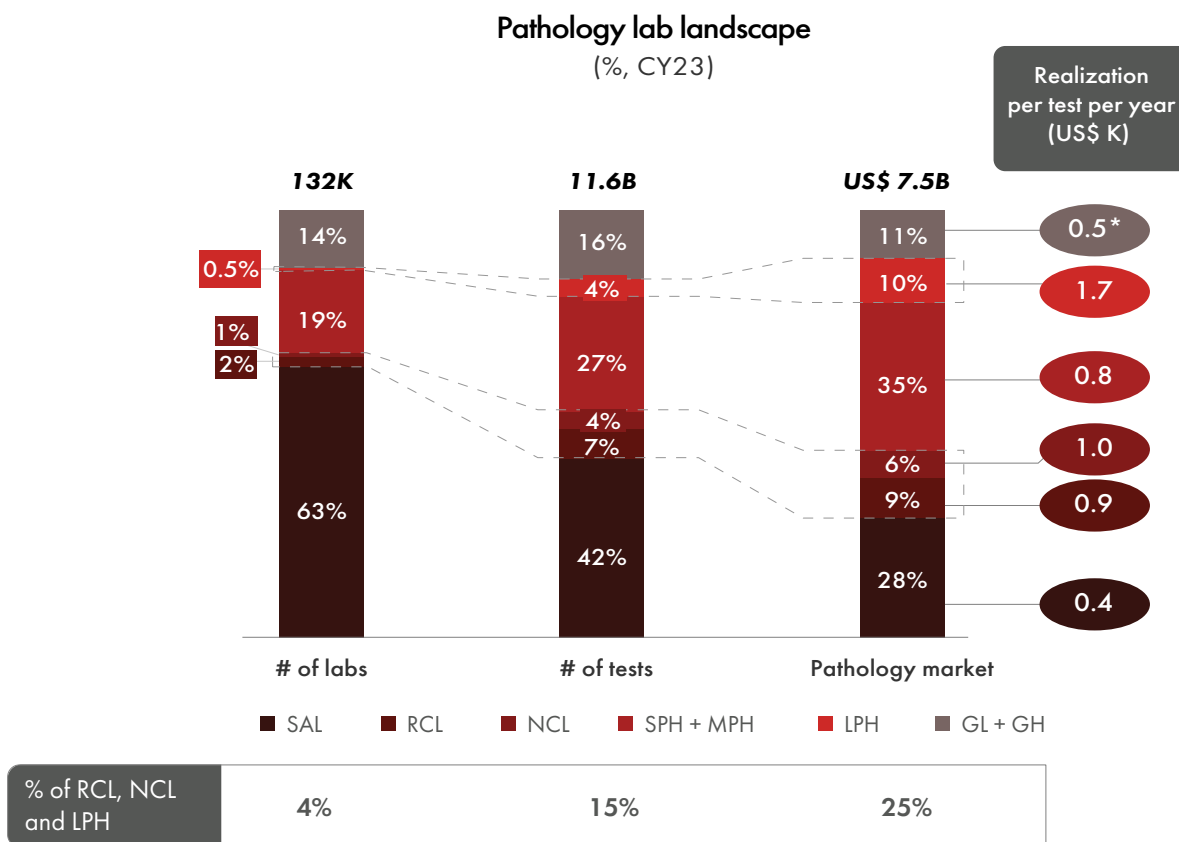


% of large/organized players	# of hospitals	# of beds	Healthcare delivery market
	16%	42%	46%

Note(s): *Includes medical institutions, sub-district hospital, district hospital, CHC and PHC; home healthcare is not included in healthcare delivery market

Exhibit 1.7

~4% of the pathology labs account for ~15% of the tests conducted and ~25% of the pathology market



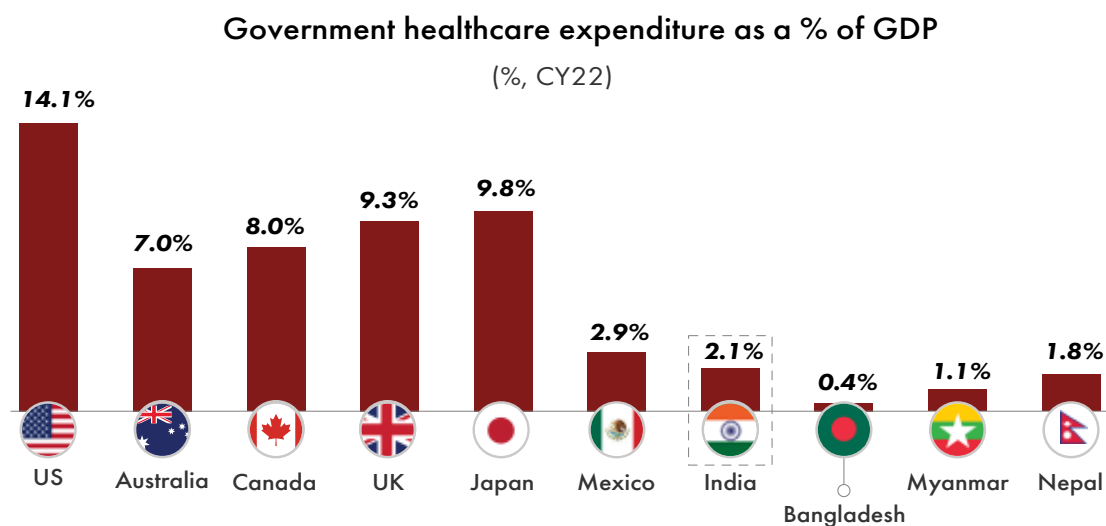
Note(s): GL and GH offer tests at subsidized rates, leading to low realization rates

1.6 Government Healthcare Expenditure

GHE as a percentage of GDP in India is lower compared to other countries. However, it is on an upward trajectory, with expectations to reach around 3.2% of GDP by FY33. This increase in GHE is anticipated to correlate with a rise in GDP per capita, indicating a positive outlook for government investment in healthcare.

Exhibit 1.8

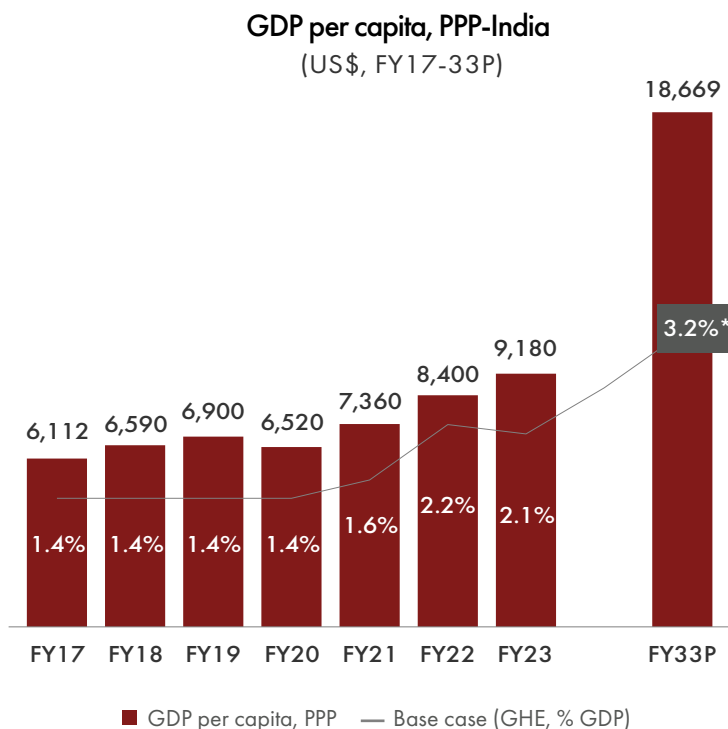
Government healthcare expenditure as a % of GDP in India is lower



Note(s): Data on government healthcare expenditure as a % of GDP of Bangladesh and Myanmar are of FY21 and that of India is for FY23

Exhibit 1.9

India's GHE as a % of GDP is rising steadily and is expected to reach ~3.2% by FY33

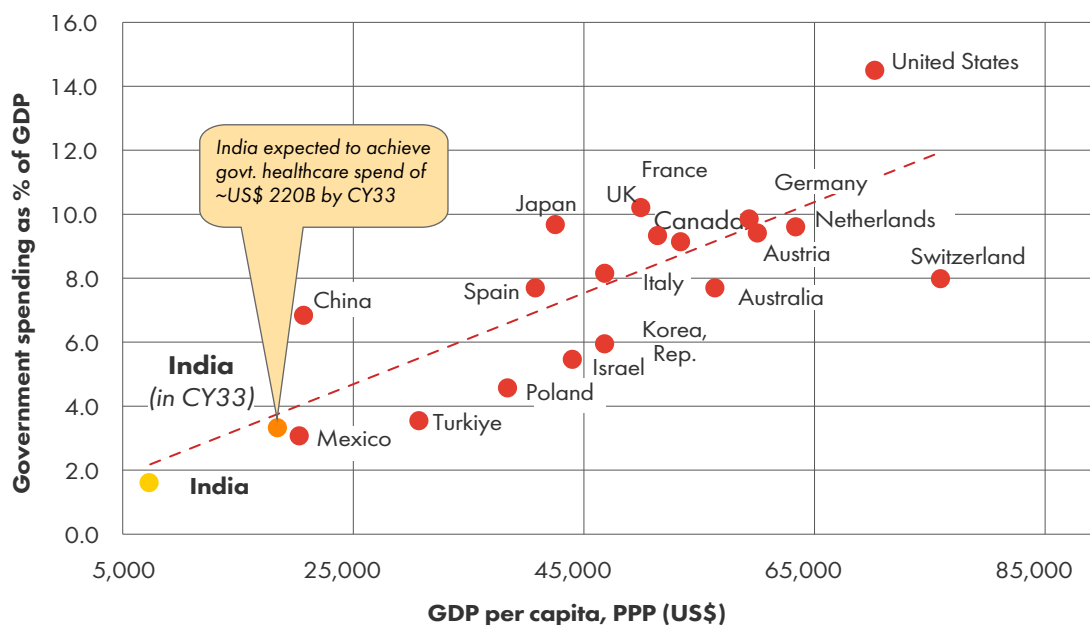


Note(s): Government health spent as percentage of GDP is without PPP conversion

Exhibit 1.10

GDP per capita, PPP and government expenditure on healthcare show a significant correlation

GDP per capita, PPP vs. Government expenditure on healthcare (CY21)



1.7 Demographic shifts and disease burden

India is experiencing demographic shifts with an aging population, where the share of individuals above 60 years of age is expected to reach about 13% by CY31. Concurrently, the burden of non-communicable diseases is rising, projected to account for ~74% of deaths by CY30. These trends underscore the growing demand for healthcare services

Exhibit 1.11

India has aging population; Share of population above 60 years of age is expected to reach ~13% by CY31

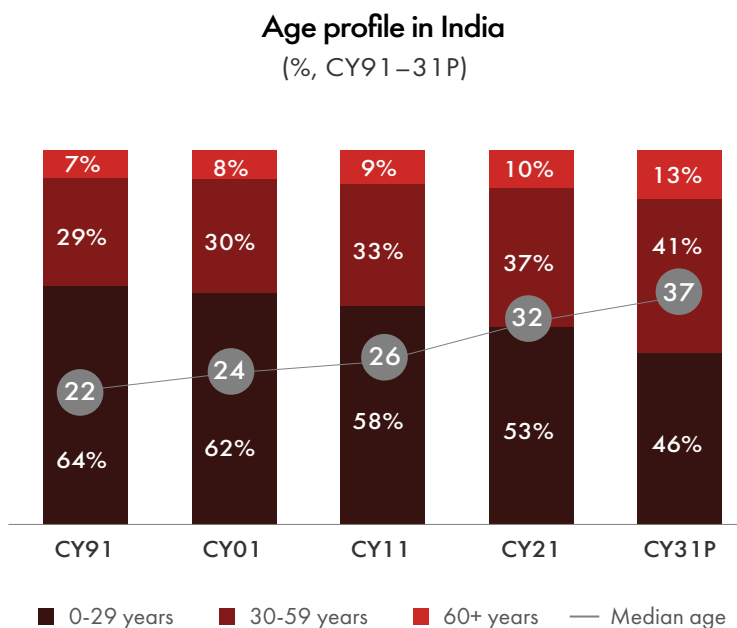
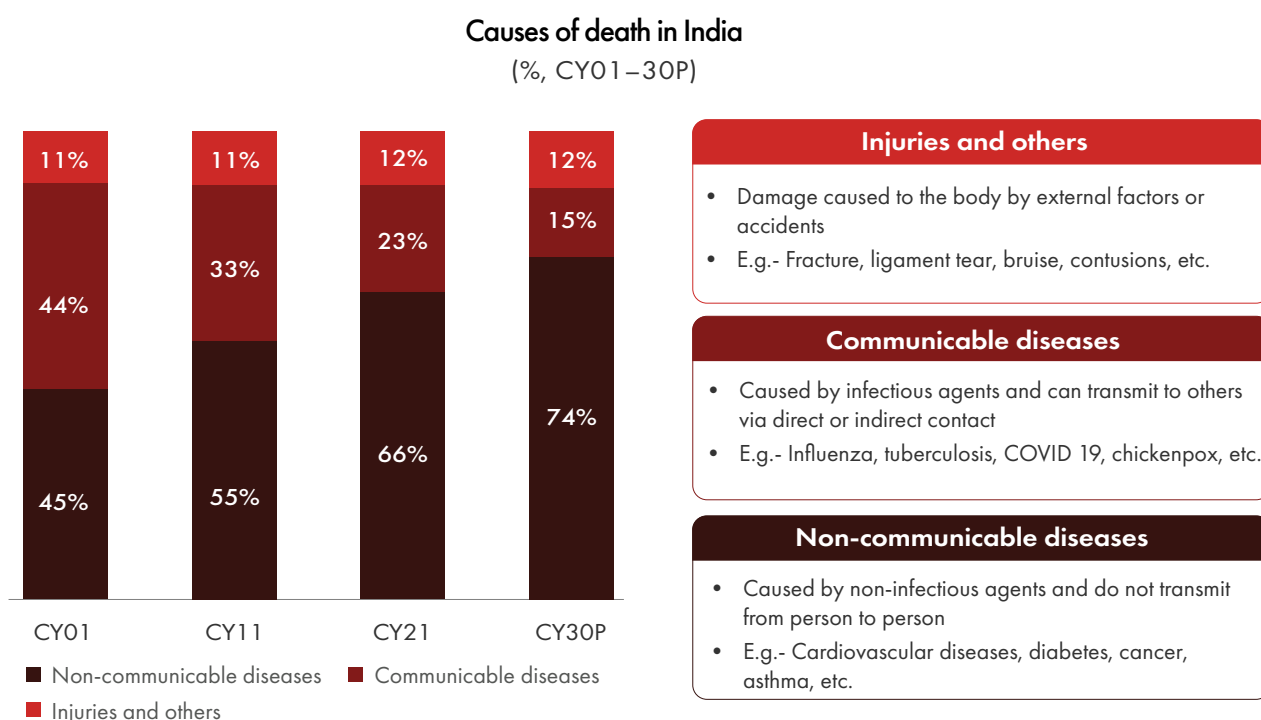


Exhibit 1.12

Share of non-communicable diseases in causes of death is expected to increase from ~66% in CY21 to ~74% by CY30

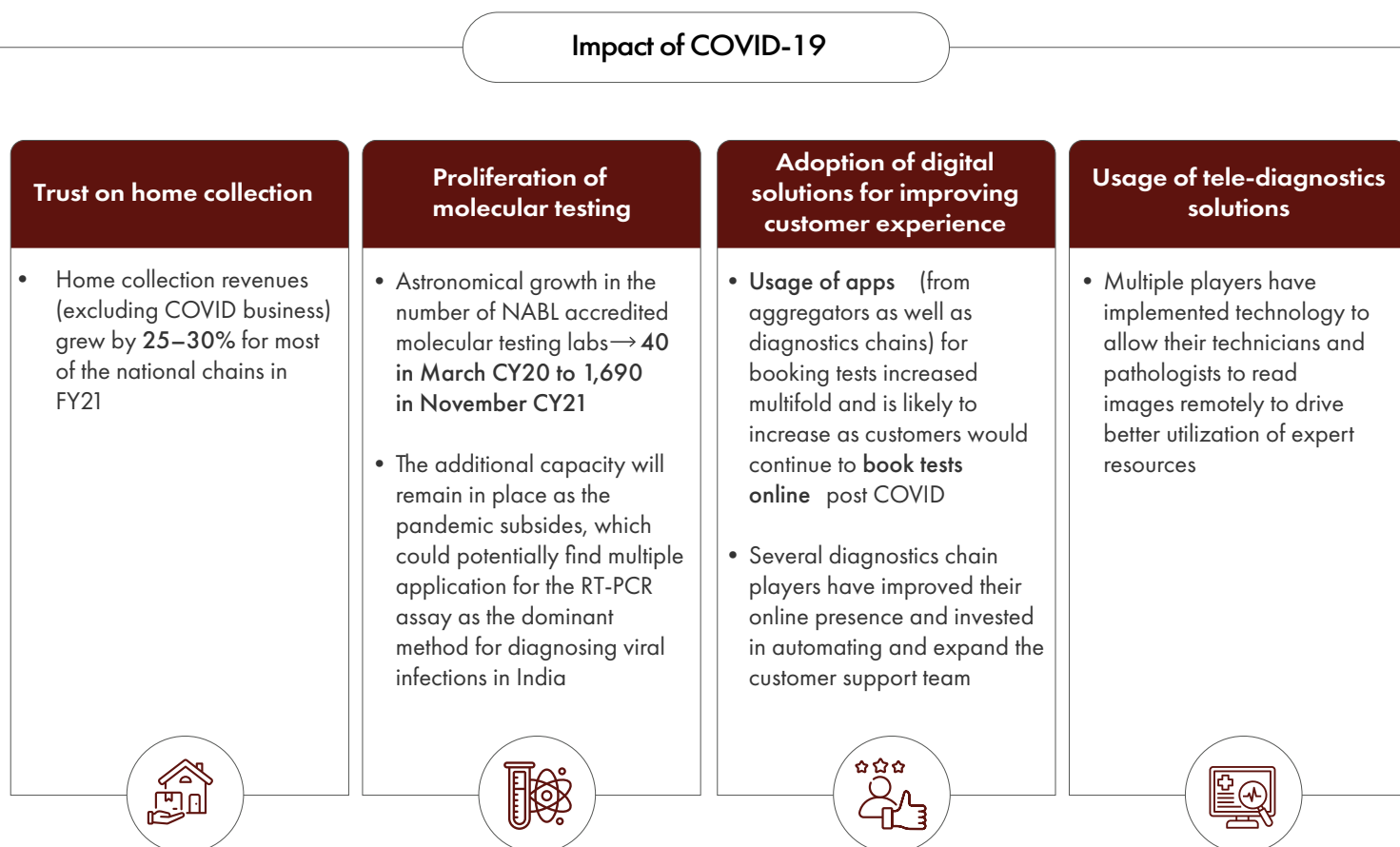


1.8 Long-term impacts of COVID-19 pandemic

The COVID-19 pandemic has reshaped the healthcare market, emphasizing home collection services, the proliferation of molecular testing, and the adoption of digital solutions. The pandemic has accelerated the growth of home collection revenues and the number of accredited molecular testing labs. It has also spurred the adoption of tele-diagnostics and online booking systems, which have persisted post-pandemic.

Exhibit 1.13

COVID-19 has also shaped the market in multiple ways – emphasis on home collection, rise of molecular testing for treatment and adoption of digital solutions



1.9 Conclusion

The Indian healthcare sector is poised for significant growth, driven by demographic changes, technological advancements, and increasing government expenditure. While challenges such as under-penetration and fragmentation exist, the market dynamics indicate a strong potential for development and expansion. The strategic focus on improving healthcare infrastructure, coupled with the adoption of digital health solutions, positions India to meet the rising demand for healthcare services in the coming years.

02

DIAGNOSTICS SECTOR IN INDIA



2.0 DIAGNOSTICS SECTOR IN INDIA

2.1 Overview

The diagnostics sector plays a crucial role in healthcare by providing tools and services to identify, monitor, and manage various medical conditions. The diagnostics sector is a dynamic and essential component of modern healthcare, playing a pivotal role in disease prevention, early detection, and effective management.

The Indian diagnostics market is ~US\$ 13B, as of FY23.

The diagnostics sector can be broadly divided into two main segments: pathology and radiology. Each segment focuses on different aspects of diagnostic testing and plays a crucial role in identifying and diagnosing various medical conditions, as illustrated in Exhibit 2.1

2.1.1 Introduction to pathology

The pathology market is a crucial component of the diagnostics industry that focuses on the study and diagnosis of diseases through the examination of tissues, cells, and body fluids. The pathology market is a US\$ 7.5B market and makes up 58% of the diagnostics market.

Exhibit 2.1 illustrates that clinical chemistry has the highest market share in the pathology market.

Other tests include hematology, immunoassay, molecular pathology tests, histopathology, urinalysis, and surgical pathology.

2.1.2 Introduction to radiology

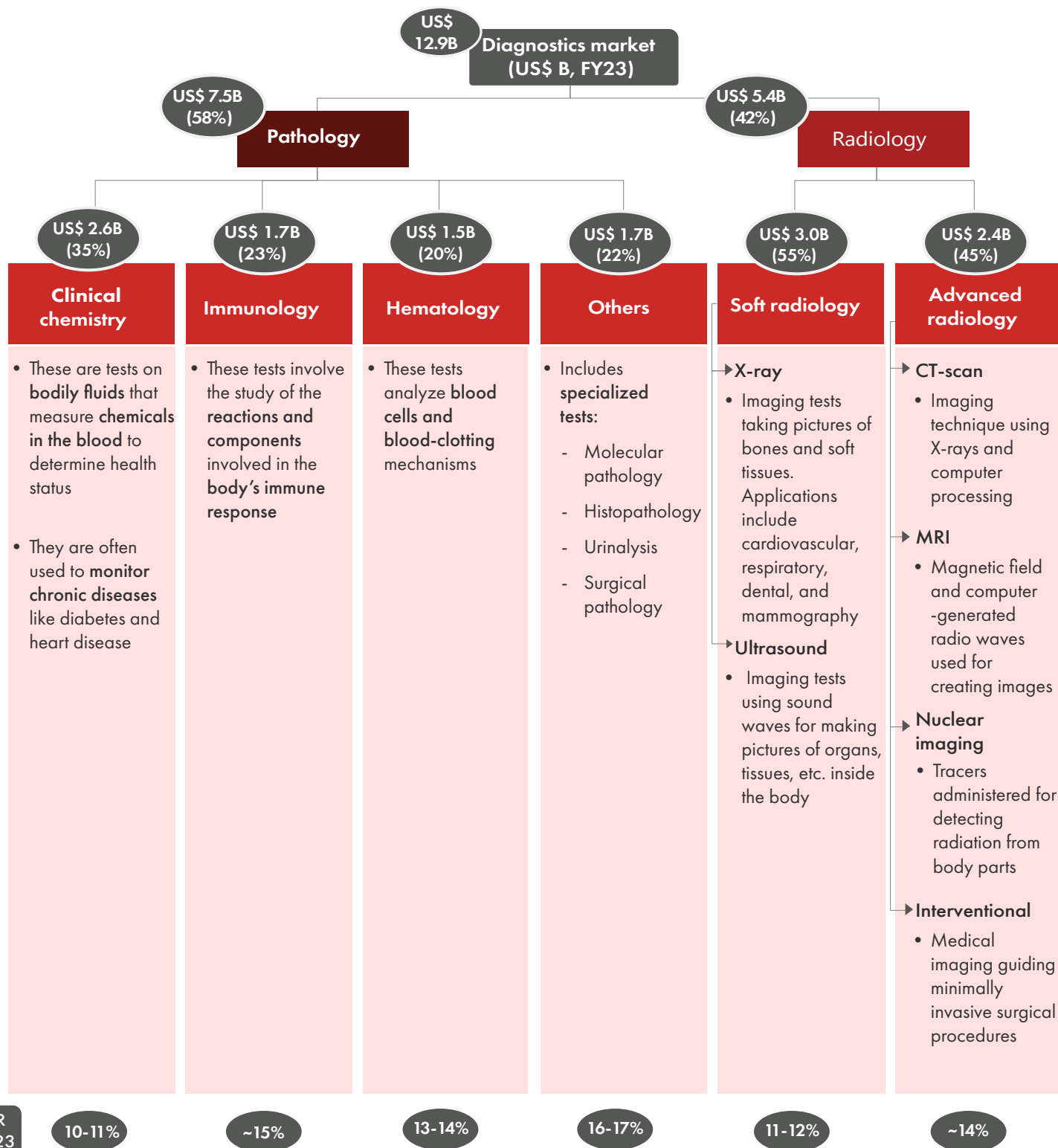
The radiology sector is a critical component of diagnostics that involves the use of medical imaging techniques to diagnose and treat diseases and injuries. Radiology encompasses a variety of imaging modalities that allow healthcare professionals to visualize the internal structures of the body. The market for radiology is a US\$ 5.4B market and makes up 42% of the diagnostics market.

The radiology market can be split into Soft Radiology (X-ray and Ultrasound) and Advanced Radiology (CT-Scan, MRI, Nuclear Imaging, and Interventional Radiology).



Exhibit 2.1

Indian diagnostics is a ~US\$ 13B market in FY23 with pathology forming ~60% of the market



2.2 Segmentation of diagnostics market

Exhibit 2.2 illustrates the various forms in which the diagnostics market can be split. Prescriptive diagnostic services make up 90% of the diagnostics sector, whereas healthcare solutions focusing on wellness and preventive diagnostic solutions form 10% of the market. More than 98% of the diagnostics market is offline, whereas only 2% of the market is online.

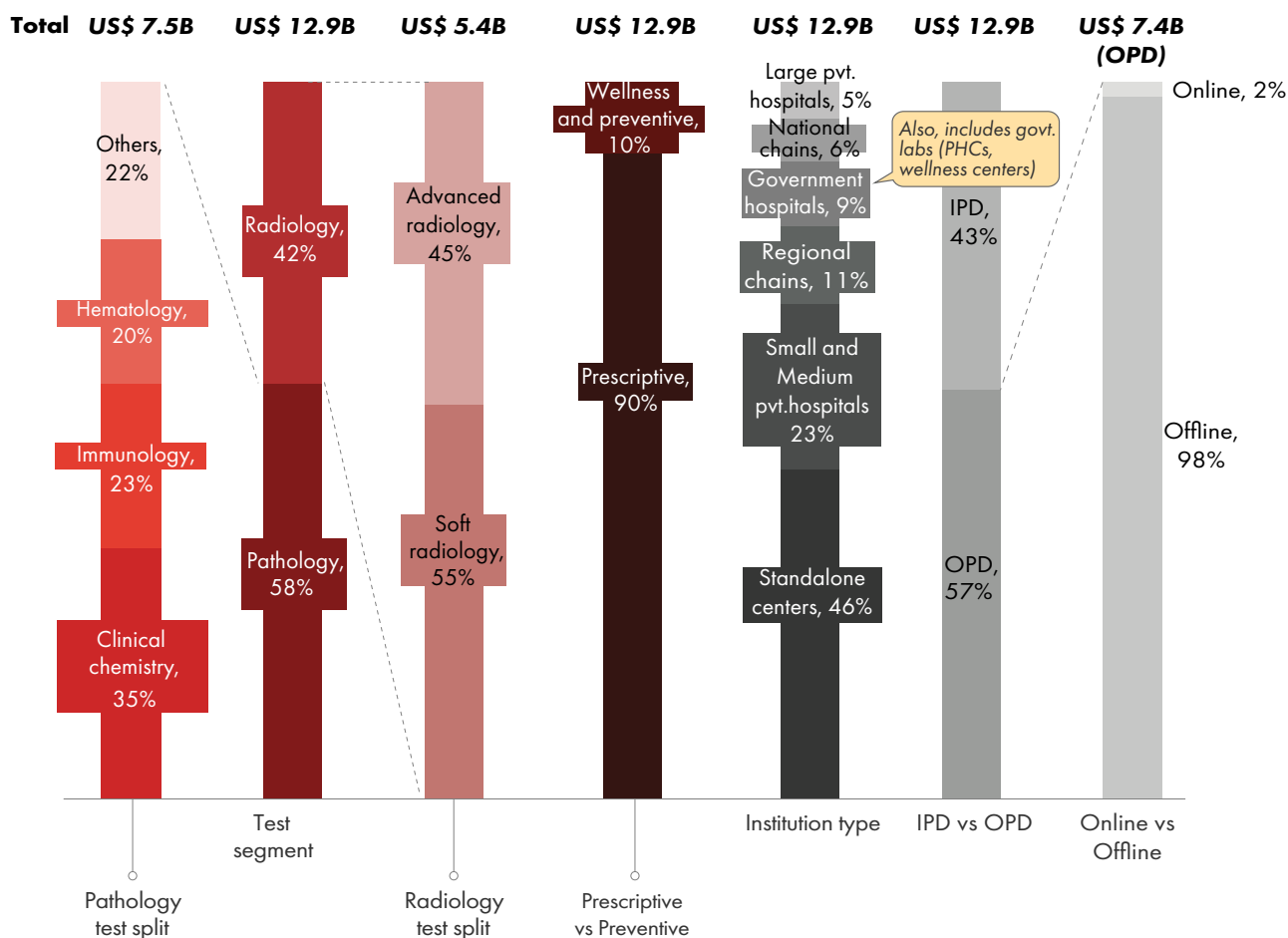
Outpatient department diagnostic services make up 57% of the market, and inpatient department diagnostics make up the remaining 43%.

Exhibit 2.2

Overall diagnostics market is largely unorganized

India diagnostics market

(%, FY23)



2.3 Growth of diagnostics sector in India

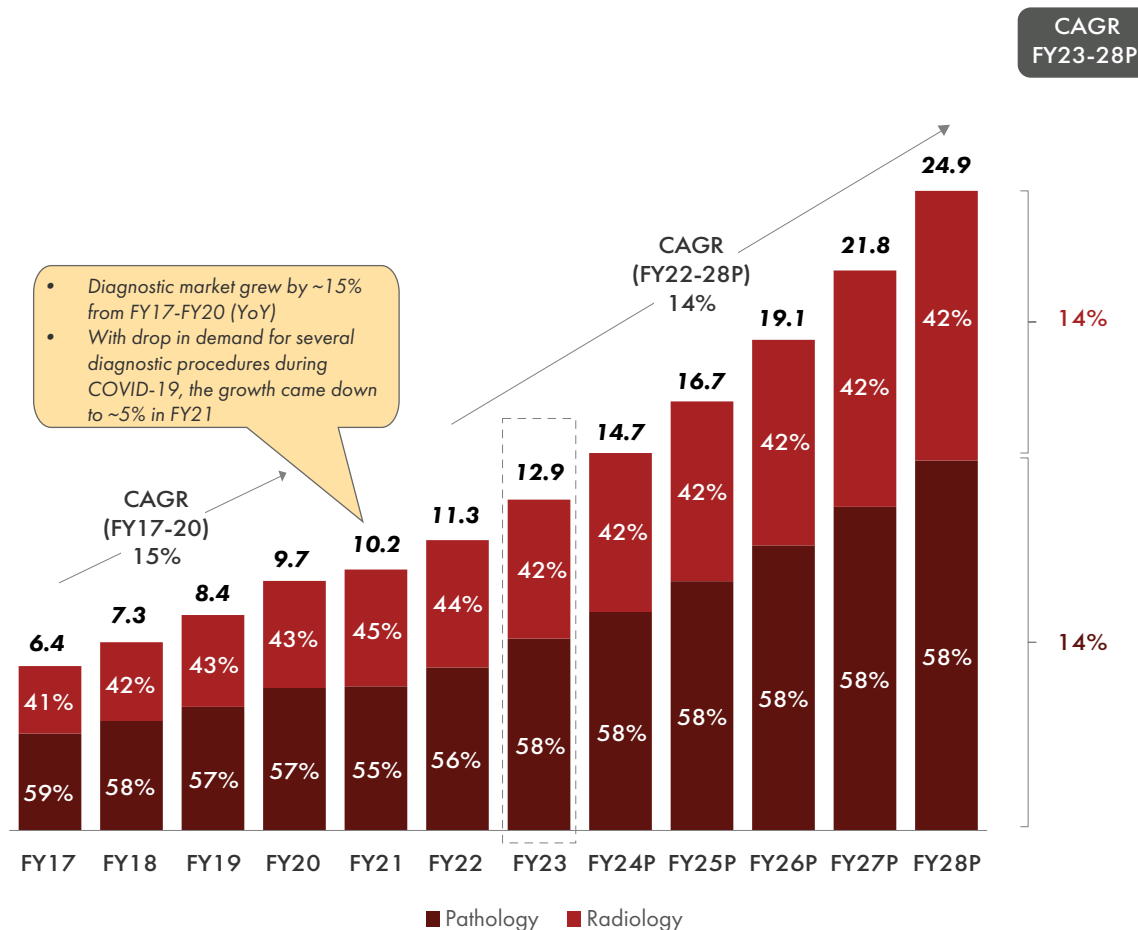
The diagnostics market has consistently exhibited a year-on-year growth rate of 14-15%, except in the post-pandemic period, as illustrated in Exhibit 2.3. This fall in growth rate is attributed to a decrease in demand for diagnostic procedures during the COVID-19 pandemic. The market is projected to grow at a CAGR of 14% in the next 5 years to reach ~US\$ 25B by FY28.

Exhibit 2.3

The market is expected to grow at a CAGR of ~14% to reach ~US\$ 25B by FY28

India diagnostics market (pathology and radiology)

(US\$ B, FY17–28P)



2.4 Diagnostic services providers

The diagnostics market comprises 3 types of providers—labs, private hospitals, and government (labs/hospitals)

2.4.1 Labs

Standalone lab centers, independent diagnostic centers operating on a small scale and usually owned and operated by a single entity, occupy the largest share of the market, as illustrated in Exhibit 2.2. They’re made up of unorganized players.

Regional and national diagnostic chain labs are diagnostic centers that have multiple branches across a region or nationwide. They make up 17% of the market.

2.4.2 Private hospitals






Small, medium and large private hospitals make up 28% of the market. The category includes both unorganized players and well-established industry giants.

2.4.3 Government labs and hospitals

Government labs are managed by government staff or under a PPP model to provide basic diagnostic services, often free of charge or at a nominal cost. Government hospitals provide a wide range of diagnostic services, often catering to a large patient population.

Exhibit 2.4

The overall market is largely fragmented with multiple types of providers

Customer segments	Description	Examples
Labs	Standalone labs <ul style="list-style-type: none"> Independent diagnostic centers operating on a small scale, usually owned and operated by a single entity Provide a range of diagnostic services, often specializing in certain areas They may collaborate with local healthcare providers for sample collection and report delivery 	Unorganized players
	Regional chain labs <ul style="list-style-type: none"> These are diagnostic centers that have multiple branches across a region or nationwide 	
	National chain labs <ul style="list-style-type: none"> They operate on a hub-and-spoke model, where samples collected at various centers (spokes) are sent to a central lab (hub) for processing Regional reference and national labs are highly automated They also offer home collection services for patient convenience 	
Private hospitals	Small and medium pvt. hospitals <ul style="list-style-type: none"> These are secondary care hospitals with less than 300 beds They have in-house labs to provide basic diagnostic services for their patients May also have facilities for more complex diagnostics, depending on the specialties offered by the hospital More complex diagnostics might be referred to larger hospitals or specialized diagnostic centers 	Unorganized players 
	Large pvt. hospitals <ul style="list-style-type: none"> These are tertiary care hospitals with more than 300 beds Their labs are often comprehensive diagnostic centers, offering a wide range of tests and specialized services They may also engage in research and development of new diagnostic techniques 	
Government	Labs/hospitals <ul style="list-style-type: none"> Government labs are located in PHCs and wellness centers, managed by government staff or under a Public-Private Partnership (PPP) model to provide basic diagnostic services, often free of charge or at a nominal cost Govt. hospitals provide a wide range of diagnostic services, often catering to a large patient population 	

2.5 Emerging trends

The diagnostics sector is witnessing transformational shifts. The future of the diagnostics sector holds several promising trends and advancements that are expected to transform the way diseases are diagnosed and managed.

2.5.1 Evolving patient behaviour

- **Convenience:** Patients are increasingly booking tests online and having them collected at home. This is due to the rise of online booking platforms and the convenience of not having to travel to a clinic or hospital
- **Reliability:** Patients are more likely to choose branded service providers, as they perceive them to be more reliable and trustworthy
- **Focus on preventive care:** There is a growing trend towards preventive care, as people are becoming more aware of the importance of staying healthy. This is leading to a rise in the use of self-tests and wellness tests
- **Improving experience:** Healthcare providers are focusing on improving the patient experience, as they know that this is a key factor in attracting and retaining patients. This includes offering attractive economics and personalized care

2.5.2 Shifting clinical needs and test types

- **Personalized medicine:** Genetic testing allows for precise treatments based on individual patient biology, improving therapeutic outcomes
- **POC tests:** Rapid diagnosis at the point of care enables faster treatment decisions, shortening recovery time and potentially improving long-term outcomes
- **Early cancer screening:** Early cancer screening has been instrumental in improving outcomes, with a substantial portion of cases being diagnosed at early stages
- **Functional medicine:** Holistic approach emphasizes identifying the root cause of disease rather than solely treating symptoms, offering potentially deeper solutions for chronic conditions
- **Specialized tests:** Precision medicine and molecular diagnostics yield highly specific insights into a patient's condition, aiding in targeted treatment planning

2.5.3 Rising competition

- **New market entrants:** Pharmaceutical companies, hospitals, telehealth providers, and online aggregators are entering the diagnostics market, driving innovation, and competitive pricing
- **Public investment:** The government is investing significantly in strengthening diagnostics capabilities in the public health network. This is making diagnostics more accessible and affordable for people in all parts of the country

2.5.4 Emerging business models

- **Asset light model:** Enhancing diagnostic services in tier 2/3+ cities through cost-effective infrastructure and access to advanced imaging technologies
- **Remote diagnostics:** Remote diagnostics involves evaluating a patient's health and providing diagnostic testing from a location outside the typical clinical setting. This can include a patient's home, a local CHC, or even a mobile clinic
- **Specialization across components of the diagnostic service:** One entity may focus on customer-facing elements, another on sample collection and logistics, and a third on lab processing
- **Payors and financing:** Rising health insurance penetration
- **Corporate wellness:** Corporates are increasingly offering curative and wellness services to their employees. This is leading to a growing demand for diagnostics services

2.5.5 Improving supply chain efficiency







- **Visibility:** Delivery management software is increasing the visibility of the diagnostics supply chain, which is improving patient satisfaction
- **Reliability and responsibility of supply chain:** Automation of the supply chain is improving the reliability of diagnostics services and reducing turnaround times

2.5.6 Fostering technology driven growth

- **Focus on improving customer experience:** Diagnostics companies are using digital tools to improve the customer experience, such as online booking and appointment scheduling
- **Use of AI systems:** AI systems are being used in image processing across radiology and pathology, which is improving the accuracy and efficiency of diagnoses
- **Robust IT system:** Diagnostics companies are investing in robust IT systems to streamline their operations and improve efficiency

Exhibit 2.5

Emerging trends: Overall, the diagnostics industry is witnessing transformational shifts

Trends	Brief description
 Evolving patient behaviour	<ul style="list-style-type: none"> • Convenience: Preference for online booking of tests and home collection • Reliability: Preference of customers towards branded service providers • Focus on preventive care: Rise in the proportion of self-tests, and wellness tests • Improving experience: Attractive economics as patient experience is the focus
 Shifting clinical needs and test types	<ul style="list-style-type: none"> • Personalized medicine: Incorporation of genomic testing in certain clinical areas (oncology, pre-natal, etc.) • POC tests for an earlier start of the right treatment • Cancer screening: Less than 20% cases are diagnosed before stage 3, have high survival rate • Functional medicine: Focuses on the root cause of the disease to reduce disease activity rather than acting only on the symptom • Specialized tests: Advancements and wider adoption of specialized tests like precision medicine,
 Rising competition	<ul style="list-style-type: none"> • Entry of players from allied industries: Pharmaceuticals, hospitals, telehealth service providers, online players aggregating and setting up own labs • Public investment: Government investing significantly in strengthening diagnostics capabilities in public health network
 Emerging business models	<ul style="list-style-type: none"> • Asset-light model: Asset-light radiology models are swiftly rising, reducing costs and expanding access to advanced imaging • Remote diagnostics: Incorporate telemedicine services • Payors and financing: Rising health insurance penetration • Corporate wellness: Corporates increasingly becoming benevolent, offering curative as well as wellness services
 Improving supply chain efficiency	<ul style="list-style-type: none"> • Visibility: Visibility has increased due to delivery management software (Real-time visibility of patient samples) • Reliability and responsibility of supply chain: With automation of the supply chain, reliability has increased, and TAT has decreased
 Fostering technology driven growth	<ul style="list-style-type: none"> • Digital patient journeys: Enhancing patient experience through digitalization, improving accessibility and convenience • AI in radiology and pathology: Enhancing image analysis for better diagnosis • Robust IT system for fulfillment layer: Seamless and efficient experience for patients and healthcare providers, ensuring smooth sample collection, logistics, and tracking

03

PATHOLOGY



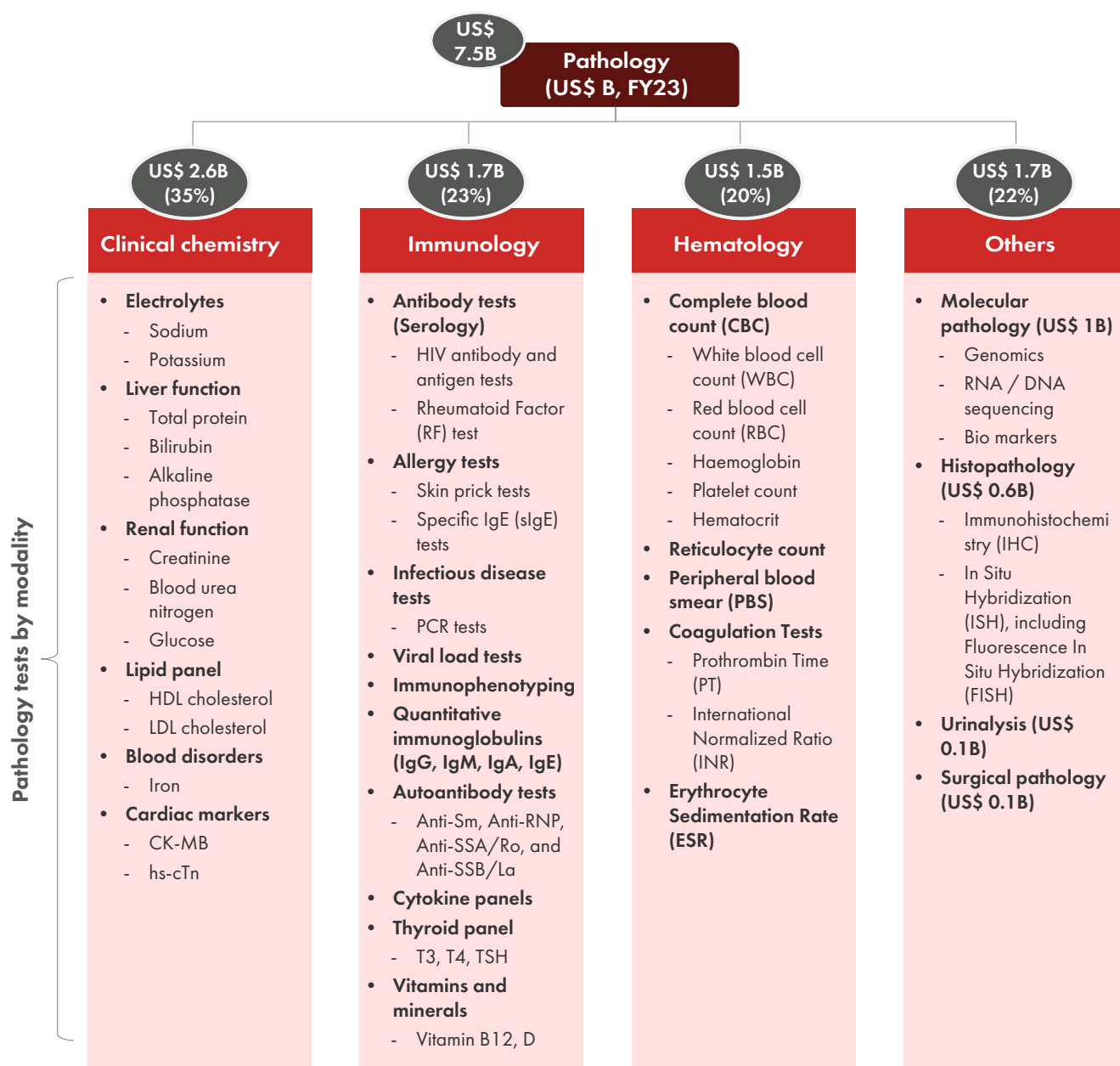
3.0 PATHOLOGY

The increasing prevalence of chronic diseases, infections, and lifestyle-related health problems highlights the importance of precise and prompt diagnosis. Consequently, there's been a surge in the demand for pathology services throughout India. Pathology encompasses a wide range of disciplines including clinical chemistry, hematology, immunology, molecular pathology, histopathology, and more. With growing awareness about healthcare services among the populace, the necessity for these diagnostic services only continues to grow.

3.1 Split of pathology market in India

Exhibit 3.1

Pathology is a ~US\$ 7.5B market in FY23; clinical chemistry (35%) has the largest share in pathology, followed by immunology (23%) and hematology (20%)



Note(s): Commonly undertaken tests have been listed; list of tests is not exhaustive

Clinical chemistry, immunology, and hematology collectively dominate about 80% of the pathology market, which is valued at ~US\$ 7.5B at the overall level. Clinical chemistry focuses on analyzing bodily fluids like blood and urine to assess various health aspects and diagnose diseases. It encompasses tests measuring electrolytes, enzymes, lipids, proteins, and glucose levels. These tests aid in evaluating organ function, metabolic processes, and detecting conditions such as diabetes, kidney disorders, liver diseases, and metabolic disorders.

Immunology, on the other hand, delves into the study of the immune system, responsible for defending the body against infections, diseases, and foreign substances. Immunology tests gauge the immune system's response to pathogens, allergens, and autoimmune disorders. Common tests include antibody tests, allergy tests, autoimmune tests, and infectious disease tests, aiding in diagnosing conditions like HIV/AIDS, autoimmune diseases, allergies, and immunodeficiency disorders.

Hematology tests, meanwhile, focus on assessing the cellular components of blood, including red blood cells, white blood cells, and platelets. Common tests such as CBC measure red blood cell count, white blood cell count, haemoglobin level, platelet count, and hematocrit level, offering crucial insights into various blood-related disorders.

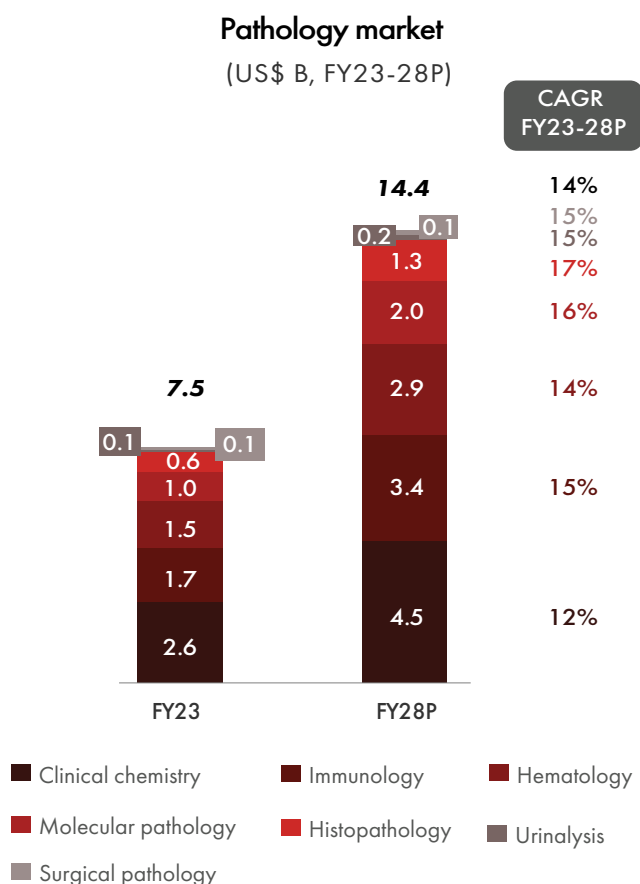
Other modalities in pathology include molecular biology, histopathology, urinalysis, and surgical pathology. Molecular biology provides insights into genetic predispositions and personalized treatment approaches. Histopathology examines tissue samples to diagnose diseases, particularly cancer. Urinalysis detects abnormalities indicative of various health conditions. Surgical pathology analyzes tissue specimens to guide treatment decisions and understand disease progression. These modalities complement each other for comprehensive diagnostics and improved patient care.

3.2 Pathology market

The pathology market is projected to reach ~US\$ 14.4B by FY28, with a CAGR of around 14%. Notably, molecular pathology and histopathology are anticipated to experience the highest CAGRs at 16% and 17%, respectively, while clinical chemistry is expected to grow at a rate of 12%.

Exhibit 3.2

The market is expected to grow at a CAGR of ~14% to exceed US\$ 14B by FY28



3.3 Growth drivers in the pathology market

Several factors are driving this growth, including the rise in chronic diseases, the increase in the geriatric population, and the growing demand for preventive tests. The prevalence of chronic diseases emphasizes the critical need for accurate diagnosis and treatment planning, while the uptick in infectious diseases heightens the demand for precise pathology services.

Moreover, the expansion of the geriatric population, prone to age-related illnesses, necessitates routine diagnostics. Specialized pathology services and enhanced geriatric facilities are becoming indispensable to addressing the demands of the senior population. By tailoring diagnostic support to the specific healthcare needs of older adults, these services significantly contribute to improving health outcomes and quality of life among seniors.

The growing awareness of preventive healthcare, coupled with government initiatives like AB-PMJAY and Pradhan Mantri Swasthya Suraksha Yojana aimed at enhancing healthcare facilities, further propels the demand for preventive tests. This proactive approach encourages individuals to prioritize preventive measures and undergo regular health screenings for the early detection and management of potential health issues.

Exhibit 3.3

Rising chronic diseases, geriatric population growth and rising demand for preventive tests are key drivers for growth

Growth driver	Brief description
Rising chronic diseases	<ul style="list-style-type: none"> Need for accurate diagnosis and treatment planning is being driven by the rise in chronic diseases Growing infectious diseases increase the demand for precise pathology services
Geriatric population growth	<ul style="list-style-type: none"> Aging demographic elevates vulnerability to age-related illnesses, driving demand for routine diagnostics Specialized pathology services and expanded geriatric care facilities are required to meet the demand of the senior population
Increasing demand for preventive tests	<ul style="list-style-type: none"> Growing awareness about the importance of preventive healthcare and regular health check-ups is encouraging more individuals
Government initiatives	<ul style="list-style-type: none"> Government initiatives such as AB-PMJAY, Pradhan Mantri Swasthya Suraksha Yojana etc. to improve healthcare facilities in cities

3.4 Pathology lab landscape

Standalone labs account for over 60% of the total labs in India, yet they generate the lowest average revenue per lab per year, around US\$ 25K. In contrast, labs within large private hospitals, comprising approximately 1% of the total, exhibit the highest average revenue per lab per year, ~US\$ 1,330K.

Moving forward, large private hospitals, national, and regional laboratory chains are anticipated to experience the highest CAGRs. Conversely, standalone labs are projected to have the lowest CAGR, ranging from 11% to 12%.

Exhibit 3.4

Pathology lab landscape in India is very fragmented with a total estimated of ~132K labs, more than 60% are standalone labs

	Labs			Private hospitals		Government	Total
	Standalone labs	Regional chain	National chain	Small/med pvt.	Large pvt.	Labs/hospitals	
Description	<ul style="list-style-type: none"> Single unit diagnostics centers Operate on a small scale 	<ul style="list-style-type: none"> Branded centers having footprint at regional/multi-regional/national level Usually operate through hub-and-spoke of collection centers and home collection model 		<ul style="list-style-type: none"> Labs in private secondary care hospitals (Up to 300 beds) Owned or a shop-in-shop model 	<ul style="list-style-type: none"> Labs in private tertiary care hospitals (More than 300 beds) Owned or a shop-in-shop model 	<ul style="list-style-type: none"> Labs in public hospitals (includes Defence, Railways, ESIC hospitals) Managed by govt. staff or under PPP model Includes PHCs 	
# labs (#, % share)	~84.0K (~63%)	~3.0K (~2%)	~1.3K (~1%)	~25.7K (~19%)	~0.6K (~1%)	~17.9K (~14%)	~132K
Average tests processed/day	~160 (70–1,500)	~750 (140–3,600)	~950 (670–3,700)	~340 (110–1,300)	~2,100 (1,600–4,500)	~290 (100–3,300)	
Average revenue per lab per year (US\$ K)	~25 (~15–310)	~230 (~30–760)	~380 (~160–900)	~100 (~30–350)	~1,330 (~550–1540)	~45 (~15–550)	
Market size CY23 (US\$ B, % share)	~2.1 (28%)	~0.7 (9%)	~0.5 (6%)	~2.6 (35%)	~0.8 (10%)	~0.8 (10%)	US\$ 7.5B
Growth forecast (CY23-28P CAGR)	11–12%	17–19%	18–20%	10–14%	17–19%	15–17%	~14%

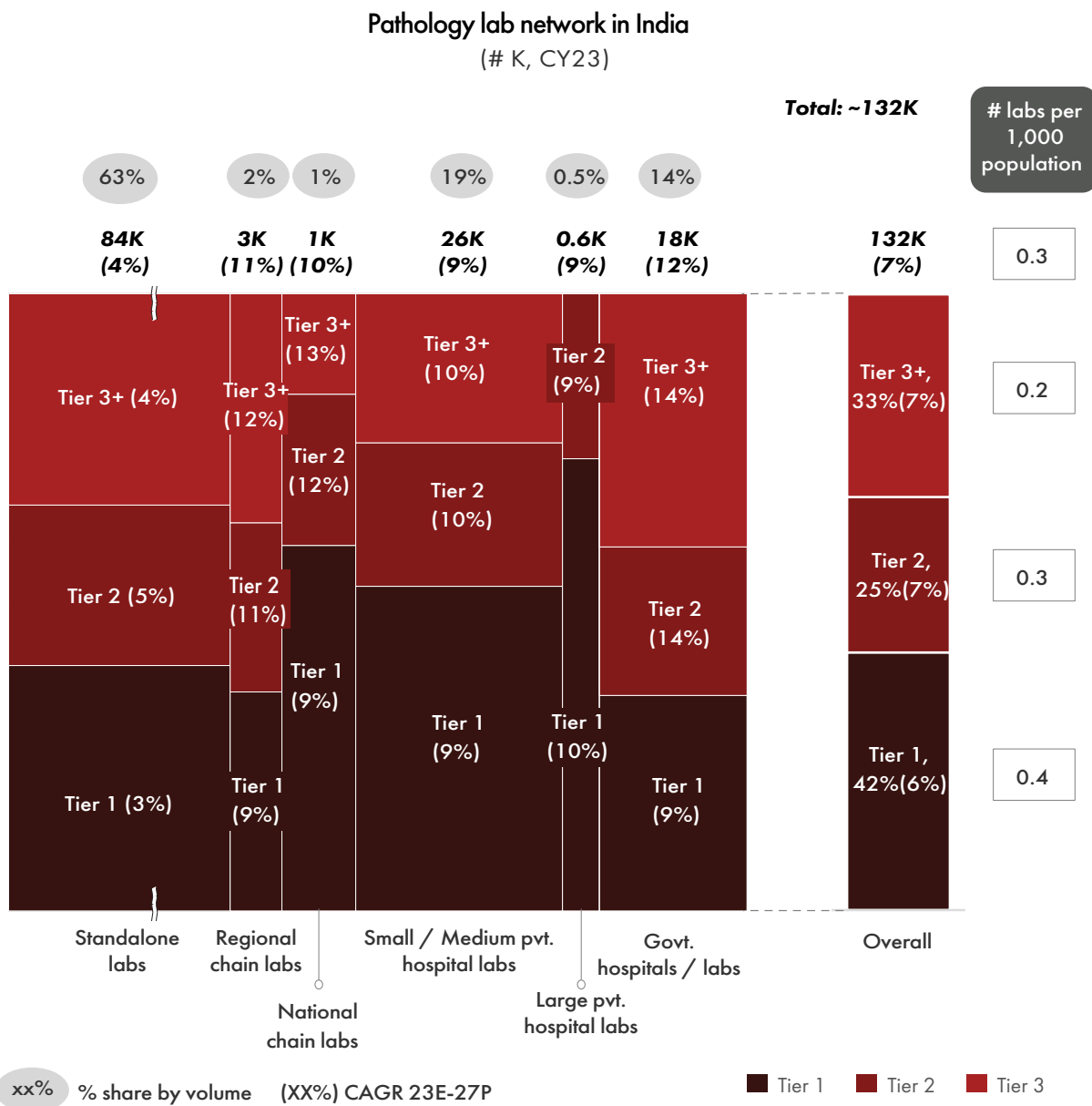
3.5 Split of labs across city tiers

Tier 1 and 2 cities encompass around 67% of India's total pathology network, indicating a significant concentration of laboratory facilities in these urban areas. This distribution highlights the disparity in access to diagnostic services across regions, with tier 1 and 2 cities having notably higher lab densities compared to others. To address this imbalance, the government is striving to expand laboratory presence beyond these urban centers, particularly targeting tier 3+ and rural areas. By implementing initiatives aimed at increasing lab numbers in these underserved regions, the government aims to improve healthcare accessibility and affordability nationwide, thereby promoting public health and enhancing healthcare outcomes.

In terms of volume, standalone labs form the majority of the labs with the largest share at 63%, followed by small/medium private hospital labs at 19%. Conversely, national chain labs and large private hospital labs hold the smallest shares, accounting for only 1% and 0.5%, respectively.

Exhibit 3.5

Lab footprint is mostly skewed towards tier 1 cities; govt. is trying to bridge the gap and increase presence



3.6 Rise of specialized tests

Specialized testing is experiencing significant growth. This trend highlights the rising demand for targeted diagnostics driven by several key factors.

Specialized tests are targeted investigations used for specific diagnoses, monitoring of particular conditions, and assessing specific markers or functions within patients.

An aging population, the integration of personalized medicine practices, and technological advancements in diagnostics are fuelling the expansion of the specialized testing market. This trajectory is likely to continue as healthcare providers increasingly require these tools to address complex health challenges.

The specialized testing segment positions diagnostics providers for accelerated growth and innovation. Investing in these capabilities will enhance overall service offerings, leading to improved patient outcomes and greater market differentiation.

Exhibit 3.6

Market has seen stabilization of routine tests; specialized tests are seeing faster growth and focus by operators

	Routine tests <i>Tests performed to assess the general health status of a patient</i>	Specialized tests <i>Targeted investigations used for specific diagnoses, monitoring of specific conditions, assessing specific markers or functions within patients</i>
Clinical chemistry	<ul style="list-style-type: none"> • Basic metabolic panel (BMP) • Lipid panel • Liver function test • Kidney function test (creatinine, blood urea nitrogen) • Lactate blood test • Uric acid • Serum protein test (albumin/globulin) • Electrolyte tests • Glucose tolerance 	<ul style="list-style-type: none"> • Therapeutic drug monitoring • Toxicology screening • Tests for tumor markers • Cardiac marker tests (troponin levels, creatine-kinase levels) • Microfluid POC
Immunoassay	<ul style="list-style-type: none"> • Allergy testing • Vitamin testing (B12, D, etc) • Protein (Ferritin, immunoglobulin (Igg, CSF) • Hepatitis B antigen tests • Hormones testing (thyroid, testosterone, cortisol, pregnancy hormone) 	<ul style="list-style-type: none"> • HIV tests • Infectious agent antigen detection tests • Auto-immune disease detection • Tests for tumor markers (e.g. prostate-specific antigen – PSA)
Hematology	<ul style="list-style-type: none"> • White blood and red blood cell count • Hemoglobin tests • Blood group test • Renal profiling • Platelet count • Hematocrit 	<ul style="list-style-type: none"> • Sickle cell anemia • Hemophilia • Coagulation studies (prothrombin time, thromboplastin time)
Histopathology		<ul style="list-style-type: none"> • Microscopy tests • Hematoxylin and Eosin (H&E) staining tests • Biopsy such as kidney biopsy, bone biopsy, skin biopsy, liver biopsy, etc. • Direct immunofluorescence test • Cytopathology • Immunohistochemistry • Fluorescence in situ hybridization (FISH)
Others	<ul style="list-style-type: none"> • Urine culture • C. Difficile Toxin A & B, Stool 	<ul style="list-style-type: none"> • Surgical pathology • Liquid biopsy • Molecular pathology tests • Genomics with RNA/DNA sequencing

Note(s): Commonly undertaken tests have been listed; List of tests is not exhaustive

3.7 Pathology test prices

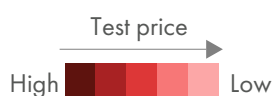
India's test prices are lower compared to those in developed countries, suggesting potential for future price realization improvement. As advancements in technology and healthcare infrastructure continue to progress in India, there exists an opportunity to enhance the value proposition of diagnostic tests while maintaining affordability and accessibility for patients. This potential for price realization improvement highlights the evolving landscape of healthcare economics and the need for sustainable strategies to optimize healthcare delivery and outcomes in India.

Diagnostic test pricing showcases significant geographical variations. India, Nigeria, and Indonesia maintain notably lower prices for common tests like liver function, thyroid assessment (TSH), Vitamin D screening, CBC, and urinalysis. In sharp contrast, the United States and the United Kingdom exhibit substantially higher prices for liver function and lipid profiling tests.

Exhibit 3.7

India's test prices are lower compared to developed countries, indicating room for future price realization improvement

Modality	Segment tests								
		India	United States	United Kingdom	Australia	Nigeria	Brazil	China	Indonesia
Clinical Chemistry	Liver function test (US\$)	4-10	160-212	160-204	115-131	4-8	10-18	8-28	4-5
	Lipid profiling (US\$)	4-12	128-200	55-289	130-195	5-6	5-11	17-21	6-10
	Kidney function test (US\$)	5-12	10-14	43-81	23-46	4-7	1-3	6-14	3-19
Immunoassay	Thyroid-TSH (US\$)	3-5	97-195	97-176	29-52	11-22	4-5	6-8	13-34
	25-Hydroxyvitamin D (US\$)	10-18	15-263	82-183	33-117	28-37	5-11	14-42	26-31
Hematology	Complete blood count (US\$)	4-6	46-125	50-70	11-25	3-5	2-5	2-4	6-40
Urinalysis	Urine (US\$)	1-4	30-250	25-38	53-69	2-3	2-4	3-6	2-8



04

RADIOLOGY



4.0 RADIOLOGY

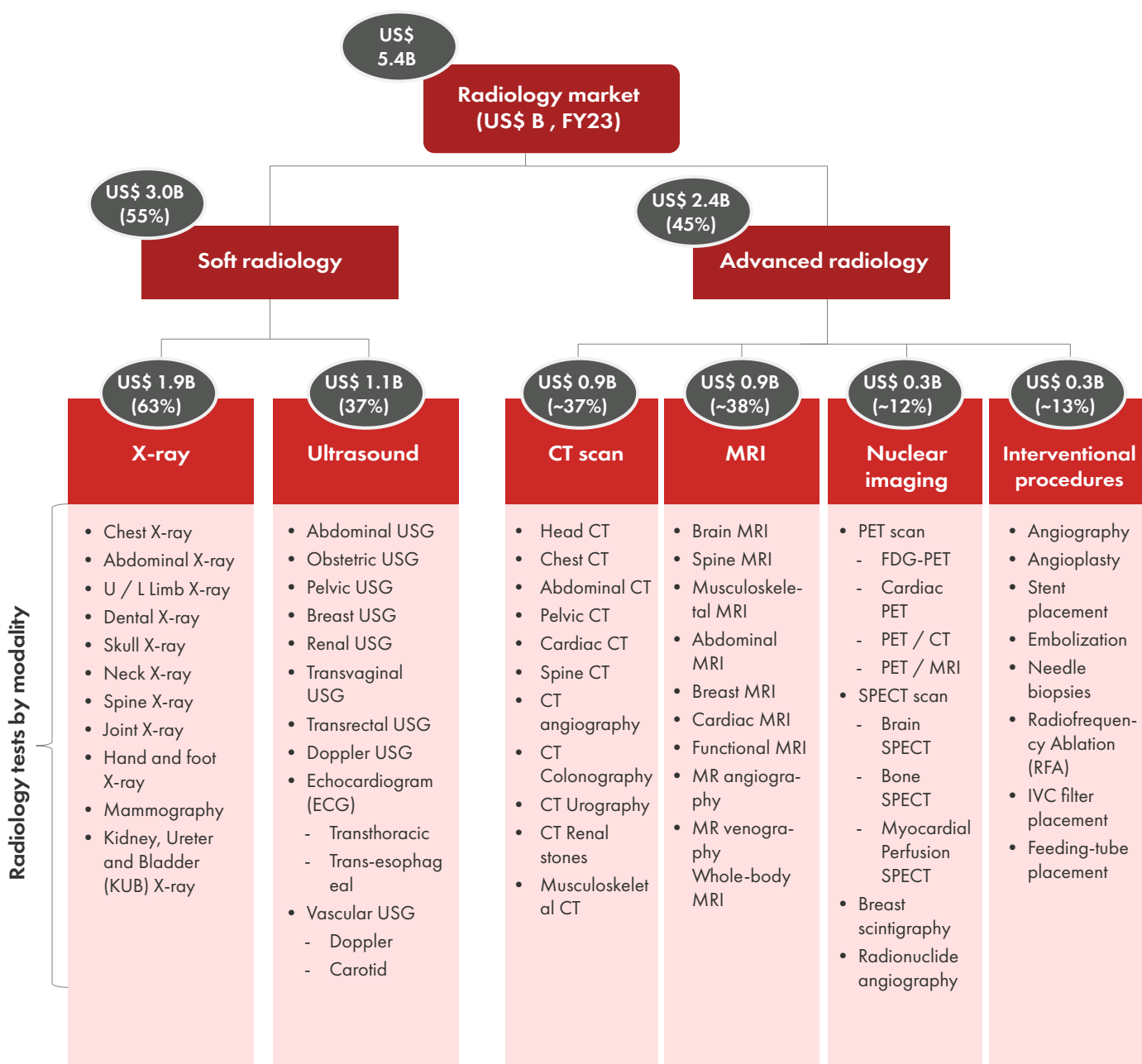
4.1 Introduction

The growing burden of complex diseases like cancers necessitates precise and timely diagnoses. This, coupled with rising health awareness, fuels the demand for non-invasive radiology services like X-rays, CT scans, and MRIs, playing a crucial role in early detection and diagnosis across India.

The market is divided into two segments: soft radiology and advanced radiology. Soft radiology accounts for 55% of the radiology market in FY23, while advanced radiology accounts for 45%. Soft radiology includes X-ray and ultrasound. Advanced radiology includes CT scans, MRIs, nuclear imaging and interventional procedures. Exhibit 4.1 illustrates a detailed snapshot of the radiology market.

Exhibit 4.1

Radiology is a US\$ 5.4B market in FY23; soft radiology (55%) has the largest share in radiology market, followed by advanced radiology (45%)



Note(s): Commonly undertaken tests have been listed; list of tests is not exhaustive

4.1.1 Soft radiology

Soft radiology encompasses the fundamental diagnostic imaging techniques used to visualize internal structures of the human body. It is primarily employed for routine screenings, initial assessments, and detection of common medical conditions such as fractures, infections, and organ abnormalities. It is characterized by its non-invasive nature, relatively low cost, and accessibility in clinical settings. Soft radiology plays a crucial role in facilitating timely diagnosis and guiding treatment decisions across various medical specialties, contributing to improved patient outcomes and quality of care.

4.1.2 Advanced radiology

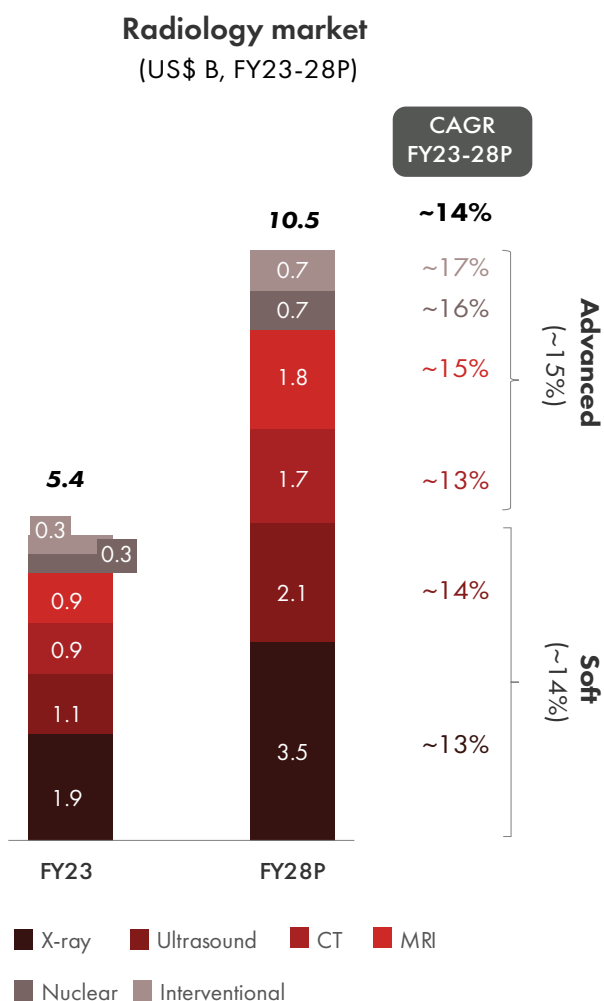
Advanced radiology refers to specialized imaging modalities and techniques that offer enhanced visualization and diagnostic capabilities beyond those of traditional soft radiology. Examples include magnetic resonance imaging (MRI), positron emission tomography (PET), nuclear medicine, and advanced CT imaging protocols. Advanced radiology provides detailed anatomical information, functional insights, and molecular imaging capabilities, enabling precise localization of pathology, assessment of disease progression, and treatment planning. These techniques often require specialized equipment, expertise, and interpretation skills. Advanced radiology plays a critical role in diagnosing complex medical conditions, monitoring treatment response, and guiding minimally invasive interventions, thereby improving patient care outcomes and advancing medical research.

4.2 Radiology market

The radiology market is a large and growing market, valued at US\$ 5.4B in FY23. The market is expected to grow at a CAGR of ~14% from FY23 to FY28, to reach a value of US\$ 10.5B, as illustrated in Exhibit 4.2.

Exhibit 4.2

Radiology market is expected to grow at a CAGR of ~14% to reach ~US\$ 11B by FY28



4.3 Growth drivers for radiology market

The radiology market is experiencing sustained growth driven by several prominent trends. Firstly, the rising incidence of complex medical conditions is driving the demand for radiology services, as the field plays a crucial role in early detection and precise diagnosis. Secondly, technological advancements, particularly in tele-radiology, have helped address the shortage of radiologists across India, especially in tier 2/3+ cities. Healthcare start-ups focusing on small towns are contributing to bringing technological innovations to the industry. Additionally, the tier 2/3+ markets offer lucrative opportunities due to lower real estate costs, salaries, and less competition, making them attractive to radiology players. Finally, government initiatives and public-private partnerships are expanding radiography services nationwide, bridging infrastructure and economic gaps to ensure increased accessibility to high-quality radiological treatments for all.

Exhibit 4.3

Growing disease complexity, technological advancements, and lucrative tier 2/3+ market are key drivers of growth

Growth driver	Brief description
Growing disease complexity	<ul style="list-style-type: none"> The increasing prevalence of complex medical conditions, requiring precise and timely diagnosis, is driving the growth of the radiology services market due to their effectiveness in early detection and accurate diagnostics
Technological advancements	<ul style="list-style-type: none"> Tele-radiology has resolved the radiologist shortage crisis especially in tier 2/3+ cities Healthcare start-ups focusing on small towns help bring technological advancements to the industry
Lucrative tier 2/3+ market	<ul style="list-style-type: none"> Attractive RoI (due to lower real estate costs and lower salaries) and lesser competition make tier 2/3+ cities attractive markets for radiology players
Government initiatives and PPPs	<ul style="list-style-type: none"> Government initiatives and public-private collaborations expand radiology pan India Bridging infrastructure and economic gaps ensures increased accessibility for high-quality radiological treatments

4.4 Radiology lab landscape

The Indian radiology market can be categorized into several segments, including standalone laboratories, regional chains, national chains, small and medium private hospitals, large private hospitals, and government hospitals and institutions, as illustrated in Exhibit 4.4

- Standalone laboratories**, while numerous with approximately 46,000 centers, tend to be small-scale operations with low patient volumes. Consequently, their market size constitutes only about 33% of the total market, amounting to ~US\$ 1.8B. It is projected that standalone labs will experience a CAGR of 11-13% over the next five years
- Regional chains**, comprising around 2,800 centers, are larger entities compared to standalone labs. They represent approximately 4% of the market, with a market size of roughly ~US\$0.2B. Regional chains are forecasted to grow at a CAGR of 17-19% over the next five years
- National chains**, constitute the largest and most well-equipped segment. Despite their prominence, they comprise only 3% of the total market, with a market size of around ~US\$ 0.2B. National chains are also expected to experience growth, with a projected CAGR of 17-19% over the next five years
- Small and medium private hospitals** typically operate their own in-house radiology laboratories. These hospitals contribute significantly to the market, accounting for approximately 31% of the total market, with a market size of about US\$ 1.7B. Radiology services within small and medium private hospitals are anticipated to grow at a CAGR of 11-14% over the next five years
- Large private hospitals and government hospitals** house the largest and most advanced radiology laboratories. They represent 29% of the total market, with a market size of ~US\$1.5B. However, radiology services within large private hospitals and government hospitals are expected to rise at a CAGR of 17-19% over the next five years

Exhibit 4.4

Radiology labs landscape is highly unorganized with estimated ~55K labs, of which over 80% are standalone

	Labs			Private hospitals		Government	Total
	Standalone labs	Regional chain	National chain	Small / med pvt. (standalone)	Large pvt. (chains)	Labs/hospitals	
Description	<ul style="list-style-type: none"> Standalone diagnostic labs with low patient volume Independent lab setups which primarily are a combination of one or more i.e., USG, X-ray, CT scans 	<ul style="list-style-type: none"> Diagnostics chains with good volume which primarily cater to all common type of imaging tests such as X-ray, CT scans (head, chest, abdomen etc.), MRI 		<ul style="list-style-type: none"> Standalone hospitals setup by established specialists which have own captive demand (>40%) patients, and specialized clinical needs 	<ul style="list-style-type: none"> Large medical centers serving variety of common and advanced clinical cases with medium to high patient volume 	<ul style="list-style-type: none"> Government hospitals with high volume, subsidized scan prices and most clinical needs 	
# centers	~46K (~83%)	~2.8K (~5%)	~1.1K (~2%)	~3.9K (~7%)	~1.7K (~3%)		55K
Average scans processed / day	~30 (10-40)	~40 (25-60)	~60 (30-100)	~90 (50-150)	~120 (80-250)		
Average revenue per centre per year (US\$ K)	~40 (~10-50)	~70 (~45-110)	~180 (~90-300)	~440 (~245-740)	~900 (~600-1,900)		
Market size CY23(US\$ B, % share)	~1.8 (~33%)	~0.2 (~4%)	~0.2 (~3%)	~1.7 (~31%)	~1.5 (~29%)		US\$ 5.4B
Growth forecast (CY23-28P CAGR)	~11-13%	~17-19%	~17-19%	~11-14%	~17-19%		~14%

4.5 Radiology test prices

There are notable disparities in the pricing of medical tests both across countries and within specific modalities and segments, as depicted in Exhibit 4.5. For example, a chest X-ray in Nigeria ranges from US\$ 3-6, while in India, it costs between US\$ 2-7. In developed countries like the United States, prices tend to be higher; for instance, a brain MRI in China ranges from US\$ 83-140, whereas in the United States, it can cost anywhere from US\$ 694-1,796.









These variations also exist within countries. In the United States, for instance, a chest X-ray can range from US\$ 105-285, with a full-body MRI being the most expensive test at US\$2,500-12,000.

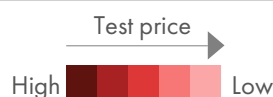
Additionally, CT scans are typically more affordable than MRIs, with a brain CT scan in India ranging from US \$12-37, compared to a brain MRI at US \$23-93.

It's important to note that the provided prices only reflect out-of-pocket expenses. In some countries, like the United States, there is health insurance to cover for the medical test costs. However, even with insurance coverage, patients may still face deductibles or co-pays for these tests.

Exhibit 4.5

India's radiology prices are lower compared to developed countries, indicating room for realization improvement in future

										
Modality	Segment tests	India	United States	United Kingdom	Australia*	Nigeria	Brazil	China	Indonesia	
Soft Radiology	X-ray (US\$)	Chest	2-7	110-285	105-235	16-62	3-6	10-13	14-55	10-18
		Dental	44-55	90-117	160-310	27-97	3-6	16-80	21-42	6-9
	Ultrasonography (US\$)	7-30	24-170	109-129	25-249	4-16	23-37	8-42	14-60	
Advanced Radiology	CT-scan (US\$)	Brain	12-37	316-817	355-755	22-160	31-44	24-90	28-83	102-161
		Chest	24-63	504-1,304	450-600	64-137	30-44	94-147	42-97	101-185
		Abdomen	66-154	600-1,554	400-670	64-137	34-44	94-147	139-416	163-236
	PET Scan (US\$)	75-340	1,300-4,600	2,038-3,162	0**	799-812	700-1,300	1,123-1,404	633-2,218	
	MRI (US\$)	Brain	23-93	694-1,796	200-1,500	49-156	32-44	20-55	83-139	227-245
		Cardiac	73-192	955-2,472	700-1,300	146-257	32-40	120-200	83-111	70-317
Full-body		274-499	2,500-12,000	1,295-1,800	700-900	160-640	200-400	416-1,390	81-626	



Note(s): *Radiology services receive financial support from Medicare, which covers either the full cost or a portion of the expenses associated with these tests; **Medicare provides complete financial support for PET scans, the prices mentioned are paid out-of-pocket expenses

05

DIAGNOSTICS EQUIPMENT MARKET IN INDIA



5.0 DIAGNOSTICS EQUIPMENT MARKET IN INDIA

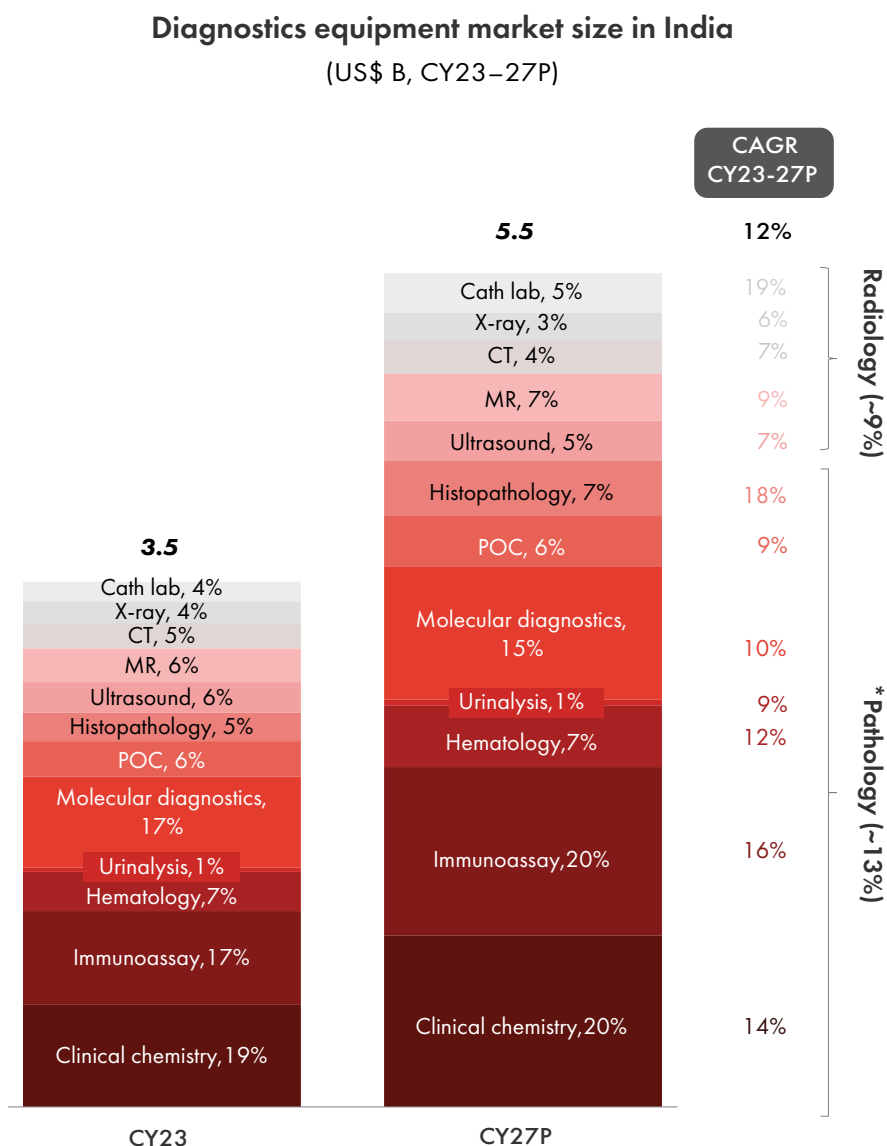
5.1 Introduction

The diagnostics equipment market involves the equipment and reagent of medical devices used in radiology and pathology. Radiology focuses on medical imaging, while pathology involves studying diseases through tissue and cell examination.

In India, this market is expected to grow significantly from ~US\$ 4B, with an overall expansion at a CAGR of 12% from CY23 to CY27, reaching a total value of ~US\$ 6B. The clinical and immunoassay segments are projected to be the largest, each with a market size of ~US\$ 1B in CY27. Other high-growth segments include clinical chemistry, immunoassay, and histopathology, with projected CAGRs of 14%, 16%, and 18%, respectively. However, the X-ray, CT, and MR segments are expected to experience slower growth, with CAGRs of 7%, 4%, and 9%, respectively, as illustrated in Exhibit 5.1.

Exhibit 5.1

Diagnostics equipment market in India is expected to reach ~US\$ 6B by CY27, growing at a CAGR of ~12%



Note(s): *Pathology medical equipment market includes both instrument and reagent

5.2 Growth drivers of diagnostics equipment market in India

- **Expansion of diagnostics labs in tier 2/3+ cities:** Decentralization and partnerships with small to medium-sized hospitals are propelling the growth of chain lab centers in tier 2/3+ cities. This initiative aims to enhance healthcare accessibility and diagnostic services in these regions, reinforcing medical infrastructure beyond major urban centers
- **Rising disposable income:** Increasing disposable incomes and broader insurance coverage are driving the demand for advanced medical treatments and devices. This trend indicates a growing capacity and willingness among individuals to access and afford state-of-the-art healthcare options, stimulating the expansion of the medical technology market
- **Increasing medical tourism:** The burgeoning medical tourism market, valued at over US\$ 7B in CY22, is attracting investments in advanced medical devices and services. This highlights the significance of cutting-edge healthcare offerings in attracting international patients and enhancing the competitiveness of medical tourism destinations
- **Rising prevalence of non-communicable diseases:** The escalating challenge of NCDs in India, projected to constitute 74% of the disease burden by CY30, is fuelling the demand for specialized medical devices. Innovative healthcare solutions are essential to effectively manage the growing prevalence of NCDs in the country
- **Aging population:** With the projected increase in the elderly population to 21% by CY50 and a growing trend towards homecare for chronic conditions, there is a demand for home-based medical equipment. This highlights the need for convenient healthcare solutions to support an aging population managing chronic health issues at home

Exhibit 5.2

Increasing diagnostic labs in tier 2 / 3+ cities, rising disposable income and increasing medical tourism are the key drivers

Growth driver	Brief description
Expansion of diagnostic lab in tier 2/3+ cities	<ul style="list-style-type: none"> • Expansion of chain lab centers in tier 2/3+ cities through decentralization and increase in small and medium hospitals
Rising disposable income	<ul style="list-style-type: none"> • Growing disposable incomes and broader insurance coverage are increasing the demand for advanced medical treatments and devices
Increasing medical tourism	<ul style="list-style-type: none"> • With medical tourism burgeoning to a market value of US\$ 7B+ in CY22, there is an uptick in investment for advanced medical devices and services
Rising spread of non-communicable diseases	<ul style="list-style-type: none"> • Escalating challenge of NCDs in India, constitute 74% of the disease burden by CY30, is spurring the need for specialized medical devices
Aging population	<ul style="list-style-type: none"> • Projected rise in the elderly population to 21% by CY50 (from 11% in CY22), and a trend towards homecare for chronic conditions, is driving the demand for home-based medical equipment

5.3 Installed base of diagnostics and IVD equipment

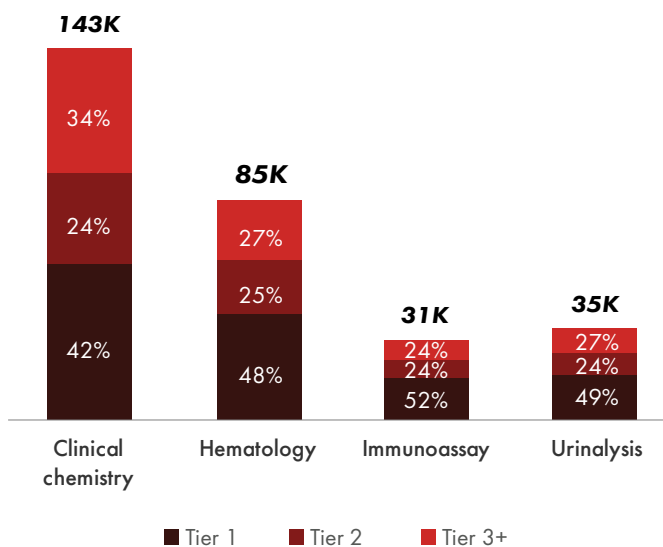
Tier 1 cities dominate the landscape of pathology equipment, holding the highest market share at 46%, likely due to their larger population and higher healthcare spending compared to other tiers. The penetration of clinical chemistry equipment is most pronounced in tier 1 cities, with 0.46 units per 1,000 population, more than double the rate observed in tier 3+ cities, which stands at 0.20 units per 1,000 population. This stark contrast emphasizes the higher accessibility and utilization of pathology equipment in tier 1 cities, reflecting the disparities in healthcare infrastructure and resources across different city tiers.

Furthermore, the penetration of radiology medical equipment is significantly lower in tier 2 cities compared to tier 1 cities. The penetration of X-ray imaging equipment is more pronounced in tier 1 cities, with 0.22 units per 1,000 population, as observed in tier 3+ cities, which stands at 0.21 units per 1,000 population. This disparity emphasizes the challenges in providing comprehensive radiological services in rural regions. A snapshot of the penetration levels has been depicted in Exhibit 5.3.

Exhibit 5.3

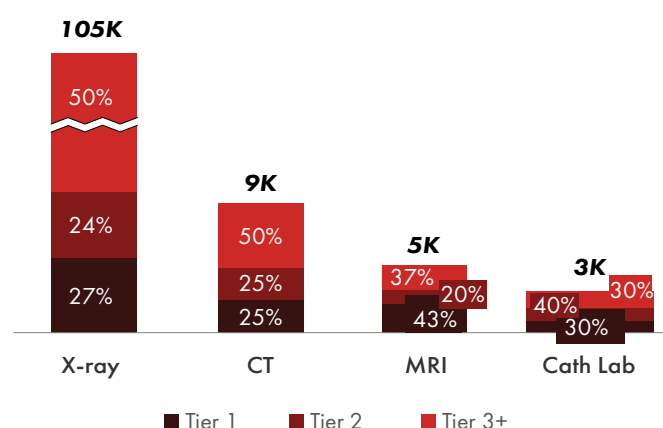
The equipment installation is very highly skewed towards tier 1 cities with <0.5x penetrations in tier 3 cities compared to tier 1

Distribution of installed base of pathology medical equipment across city tiers
(#, CY22)



Penetration per '000 population	Overall urban	0.29	0.17	0.06	0.07
	Tier 1	0.46	0.31	0.12	0.13
	Tier 2	0.31	0.19	0.07	0.08
	Tier 3+	0.20	0.09	0.03	0.04

Distribution of installed base of radiology medical equipment across city tiers
(#, CY23)



Penetration per '000 population	Overall urban	0.22	0.02	0.01	0.01
	Tier 1	0.22	0.02	0.02	0.01
	Tier 2	0.23	0.02	0.01	0.01
	Tier 3+	0.21	0.02	0.01	0.005




5.4 Market segmentation

The Indian medical equipment market comprises of three distinct segments, each offering a unique value proposition as illustrated in Exhibit 5.4.

- **Domestic players:** Focus on delivering high-quality products at competitive prices, with a deep understanding of local market needs and preferences. They have well-established distributor networks and sales teams, enabling broad outreach and efficient after-sales service, particularly in tier 2/3+ cities. Adaptable to Indian regulatory and compliance standards
- **Asian MNCs:** Provide a wide range of cost-effective yet sophisticated solutions, coupled with perceived high product quality like Japanese MNCs. Strong manufacturing capabilities ensure a consistent supply of high-quality products at scale. Emphasis on technological advancements, enhancing features like grayscale resolution and color doppler advancements
- **Western MNCs:** Prioritize strong brand reputation, technological leadership, and the ability to offer high-quality, performance-driven equipment. Preferred by customers seeking reliability and cutting-edge technology. Significant investment in research and development ensures ongoing enhancements. Expanding manufacturing presence in India to meet the rising demand

Exhibit 5.4

The market is highly competitive, with three segments playing, each having a different proposition

	Domestic players	Asian MNCs	Western MNCs
Proposition to customers	<ul style="list-style-type: none"> • Broad portfolio of products with a focus on low throughput solutions • Cost competitiveness due to lower manufacturing and distribution costs • Strong reach via established distributor network and sales team • Understanding of local market needs and preferences • Lower TAT for equipment servicing in tier 2 cities • Customization of products to suit specific regional requirements • Adaptability to regulatory and compliance standards in the domestic market 	<ul style="list-style-type: none"> • Wide product portfolios with cost-effective yet sophisticated solutions • Perceived high-quality of products, like Japanese MNCs preferred by customers • Strong service network established in tier 1 and 2 cities • Established strong manufacturing capabilities, ensuring high-quality products at scale • Focus on technological advancements, improving grayscale resolution and advancements in Color Doppler • Emergence as "value-for-money" brands offering MNC quality with superior service 	<ul style="list-style-type: none"> • Growth driven by strong brand reputation and recognition • Technology leadership, with ability to offer high-quality performance • Offer a wide range of IVD/imaging equipment catering to various healthcare needs • Robust brand strength attributed to low frequency of breakdowns • Focus on research and development for continuous improvement • Expanding manufacturing footprint with new production lines of CT scanners under the PLI scheme
Key players			

Note(s): PACS: Picture Archiving and Communication System

5.5 Tailwinds and headwinds in the market

5.5.1 Tailwinds

- **Aging population:** The elderly population, aged 60 and above, is projected to increase significantly from 11% in CY22 to an estimated 21% by CY50. This demographic shift highlights a rising need for diagnostics, reflecting increased demand for healthcare services and diagnostic solutions to address the unique medical challenges associated with an aging population
- **Technological advancements:** Ongoing technological innovations, including POC testing, digital pathology, and AI applications in diagnostics and imaging, are revolutionizing healthcare by improving speed, accuracy, and accessibility in diagnostics
- **Favourable government policies:** Enhanced government support and increased healthcare funding are driving the development and adoption of new IVD technologies
- **Increasing prevalence of chronic diseases:** The rising disease burden, with chronic/non-communicable diseases expected to increase from 46% in CY06 to 51% in CY26, highlights the growing impact of long-term health conditions. This highlights the critical need for targeted interventions, preventive measures, and healthcare strategies to address the growing prevalence of chronic diseases
- **Increasing availability of minimally invasive surgical procedures:** State governments are actively procuring equipment for in-house public facilities, with a notable increase in tenders for CT scans and MRI systems in recent years. This trend indicates a strategic focus on bolstering diagnostic capabilities within public healthcare infrastructure, enhancing medical services and diagnostic capacities at the regional level

Exhibit 5.5

Ageing population, technological advancements and favorable govt. policies act as tailwinds

Tailwinds	Brief description
Aging population	<ul style="list-style-type: none"> • Elderly population (aged 60 and over) is projected to rise from 11% in CY22 to an estimated 21% by CY50, indicating a substantial increase in the need for diagnostics
Technological advancements	<ul style="list-style-type: none"> • Ongoing technological innovations, such as POC testing, digital pathology, and artificial intelligence (AI) applications in diagnostics and imaging
Favourable government policies	<ul style="list-style-type: none"> • Enhanced government support and increased funding for healthcare innovation is fuelling the development and adoption of new IVD technologies
Increasing prevalence of chronic diseases	<ul style="list-style-type: none"> • Disease burden due to chronic / non-communicable diseases is expected to increase to 51% in CY26 from 46% in CY06
Increasing availability of minimally invasive surgical procedures	<ul style="list-style-type: none"> • Increasing procurement of equipment by state govts for in-house public facilities, with ~122 and ~48 tenders floated in CY20-21 for CT and MRI respectively

5.5.2 Headwinds

- **High capital and technical know-how requirement:** Substantial capital investment is necessary for research and development, technology upgrades, and related initiatives, leading to a prolonged break-even period. This requires enduring commitment and financial resilience from organizations engaging in advancements and innovation within the industry
- **Stringent regulatory and compliance requirements:** Stringent CDSCO regulations and NPPA price caps pose challenges, necessitating industry players to navigate a complex regulatory landscape while balancing innovation and pricing compliance
- **Reliance on imports:** India's medical device sector heavily relies on imports for high and medium-technology products. Addressing self-sufficiency through domestic manufacturing, innovation, and supply chain enhancement is crucial for long-term resilience and sustainability
- **Competitive pressure:** Intense competition, both domestically and internationally, exerts significant pressure on pricing and profit margins within the market. Navigating this competitive landscape requires pricing strategies and operational efficiency to maintain profitability

Exhibit 5.6

High capital requirement and regulatory compliance act as headwinds

Headwinds	Brief description
High capital and technical know-how requirement	<ul style="list-style-type: none"> • Significant capital investment is required for R&D, technology upgradations, etc. with a long break-even period to reap the investment benefits
Stringent regulator and compliance requirements	<ul style="list-style-type: none"> • Stringent regulatory requirements and compliance standards set by CDSCO can pose challenges
Reliance on imports	<ul style="list-style-type: none"> • India is dependent on imports for high – medium technology based medical device products
Competitive pressure	<ul style="list-style-type: none"> • Intense competition from domestic and international players exerts pressure on pricing and profit margins



06

THEMES THAT WILL DEFINE THE FUTURE



6.0 THEMES THAT WILL DEFINE THE FUTURE

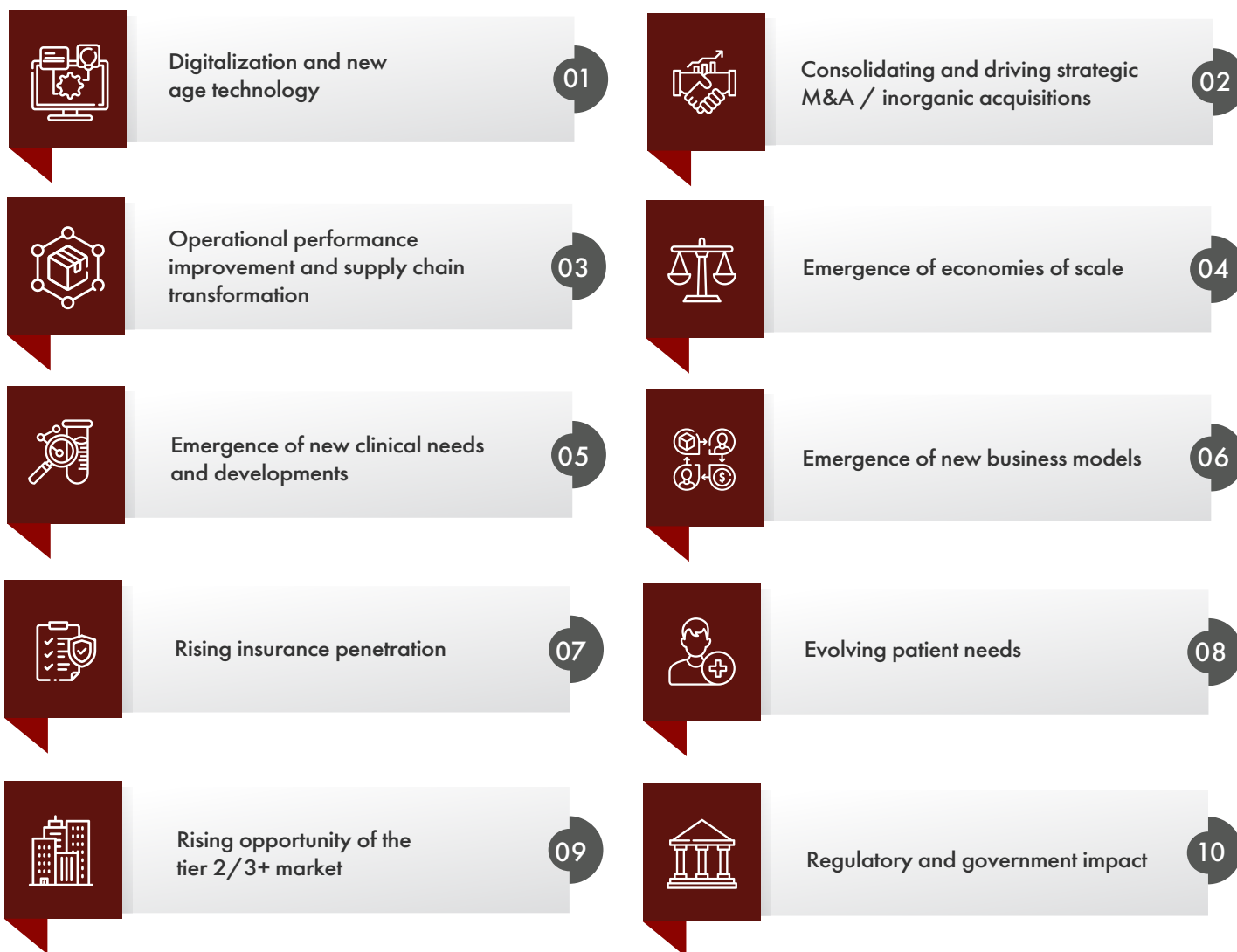
The diagnostics industry is at the cusp of a transformation, driven by an array of emerging opportunities that are set to redefine its future. Below are the key themes poised to shape the trajectory of the diagnostics landscape.

6.1 Emerging opportunities in the diagnostic industry

- **Embracing digitalization and new age technology:** The digital wave has swept through the diagnostics sector, bringing forth technologies that elevate precision and efficiency. In the future, market dominance will belong to those who incorporate artificial intelligence, machine learning, and data analytics into their operations. These tools will not only improve patient outcomes but also ensure that companies remain cutting-edge and patient-focused
- **Strategic growth through M&A:** The consolidation trend via mergers and acquisitions is recalibrating the industry's competitive dynamics. The winners will be those who successfully merge or acquire to broaden their services and extend their reach. This inorganic growth promises a robust positioning in a crowded marketplace
- **Pursuing operational excellence:** Operational excellence and supply chain innovation are becoming the backbone of the diagnostics industry. By adopting lean operations and just-in-time inventory, providers can reduce costs and provide high-quality services, allowing them a distinct competitive advantage
- **Capitalizing on economies of scale:** As diagnostic companies scale up, they reap the benefits of reduced costs and increased service accessibility. The economies of scale thus achieved can result in more affordable diagnostics, with the added advantage of greater bargaining power in the marketplace
- **Catering to new clinical needs:** The rapid pace of medical discoveries dictates the emergence of new clinical demands. Providers that can quickly adapt and offer new and sophisticated diagnostic tests will be able to capture emerging market segments and cater to unmet medical needs
- **Innovative business models:** The shift towards value-based care demands innovative business models centered around patient outcomes. The future belongs to those who not only provide diagnostic services but also enhance the overall patient care continuum
- **Leveraging insurance penetration:** With broader insurance coverage, the customer base for diagnostic services is expanding. Providers that can efficiently work with insurance companies and understand the intricacies of billing will be able to tap into the growing market
- **Addressing evolving patient needs:** Changing patient demographics and expectations necessitate an evolution in service offerings. Providers that can offer personalized diagnostics, tailored to the needs of diverse patient groups, will find greater success and relevance
- **Expanding into tier 2/3+ cities:** The untapped markets of smaller cities and rural areas hold vast potential for growth. Companies that can deliver affordable and high-quality diagnostics in these regions will not only grow but also contribute to the greater goal of universal healthcare
- **Navigating regulatory and governmental changes:** Regulatory frameworks and government health initiatives are significant influencers in the diagnostics industry. Adapting to these changes and aligning with public health objectives is crucial for sustainable growth

Exhibit 6.1

Winners in the diagnostics industry will need to ride on the new waves of opportunities



6.2 Integration of technology in diagnostics

The diagnostics sector is undergoing a rapid transformation, fueled by technological advancements that are optimizing operations, enhancing patient experiences, and introducing new business models.

6.2.1 Advancements in information management and operational apps

The backbone of modern diagnostics is increasingly digital. LIMS integrated with lab instruments and digital dashboards for monitoring turnaround times are pivotal innovations driving the industry's internal operations. These systems allow for real-time tracking and quality control, ensuring accuracy and efficiency.

6.2.2 Enhancing customer interactions through digital platforms

On the customer front, apps and chatbots are revolutionizing the way patients interact with diagnostic services. These tools facilitate the booking of lab tests, provide medical information, and enhance overall customer service by integrating AI and machine learning for personalized test recommendations.

6.2.3 Emergence of new business models in diagnostics

The rise of online diagnostic platforms and mobile laboratories represents a significant shift in the business landscape. These models offer greater accessibility and convenience to patients, particularly in remote areas, and support high-volume testing with faster turnaround times, which is essential for large-scale health initiatives. From enhancing operational workflows to improving patient interactions and rolling out new service models, technology is at the forefront of this transformation. Diagnostic companies that successfully leverage these tech-driven opportunities are set to lead the market.

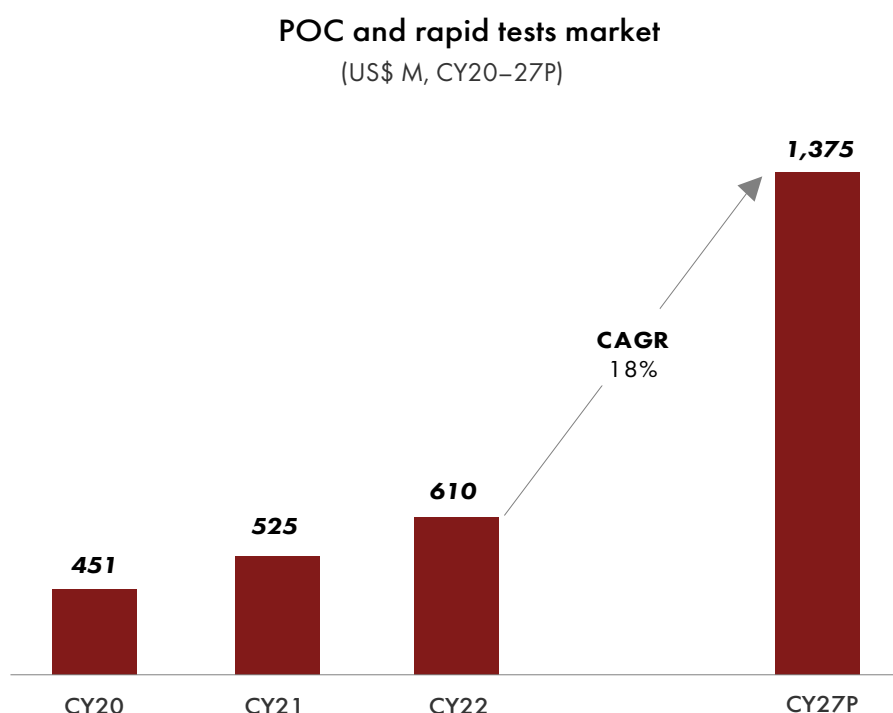
6.2.4 The rising trajectory of POC and rapid tests in the post-COVID era

The POC and rapid tests market has expanded significantly during the COVID-19 pandemic, setting a precedent for growth and wider acceptance in the healthcare landscape. Here's an analytical perspective on this trend:

The market for POC and rapid tests is on a robust growth trajectory, expected to grow at a CAGR of 18% from CY22 to CY27. This growth is driven by the market's recognition of the value offered by these tests in terms of speed and convenience.

Exhibit 6.2.1

POC and rapid tests market is expected to grow at a CAGR of 18% between CY22 to CY27



6.2.5 Drivers of POC and rapid tests adoption

The adoption of POC and rapid tests is propelled by their lower TAT for diagnosis, crucial in administering timely treatment plans. Additionally, the pandemic has heightened patient awareness about these testing options, contributing to their increased adoption by healthcare providers. The steady increase in market value for POC and rapid tests, from US\$ 451 M in CY20 to a projected US\$ 1,375 M in CY27, signifies the burgeoning potential of this sector. Exhibit 6.2.2 indicates that while there's high awareness and need for rapid testing in Metro and tier 1 cities, there's a significant opportunity for increased adoption in tier 2/3+ cities, considering the affordability and the urgency of testing needs in these regions.

Exhibit 6.2.2

Lower TAT in diagnosis and increasing patient awareness are the key drivers for adoption of POC and rapid tests

	City tier			Description
	Metro/ Tier 1	Tier 2	Tier 3+	
TAT				<ul style="list-style-type: none"> Enables instant/quick diagnosis and administration of treatment plan
Awareness				<ul style="list-style-type: none"> Increasing patient awareness translating to doctors/hospitals incorporating POC and rapid tests in their portfolio
Affordability				<ul style="list-style-type: none"> Many of these tests are relatively affordable, which is a crucial factor in a country like India where out-of-pocket healthcare expenses can be high
Accuracy				<ul style="list-style-type: none"> Satisfactory accuracy levels achieved as per doctors w.r.t. the time taken Favorable trade-off between speed and accuracy for POC test for several use cases
Testing urgency				<ul style="list-style-type: none"> POCT devices help GPs/specialists/hospitals get better first-hand information Very useful in times of emergency



6.3 Mergers & Acquisitions: Fueling growth and expansion in Indian diagnostics

The diagnostics industry in India is consolidating, with strategic M&A playing a key role in shaping the market. This consolidation is not just about growth; it's a strategic move to expand services, reduce costs, and gain competitive advantage.

6.3.1 Valuation trends in diagnostics M&A

Recent acquisitions in the Indian diagnostics space highlight a significant range in valuation multiples. The EBITDA multiple, a common valuation metric, has ranged from approximately 7x to as high as 29x. Exhibit 6.3.1 gives a detailed look into this trend.

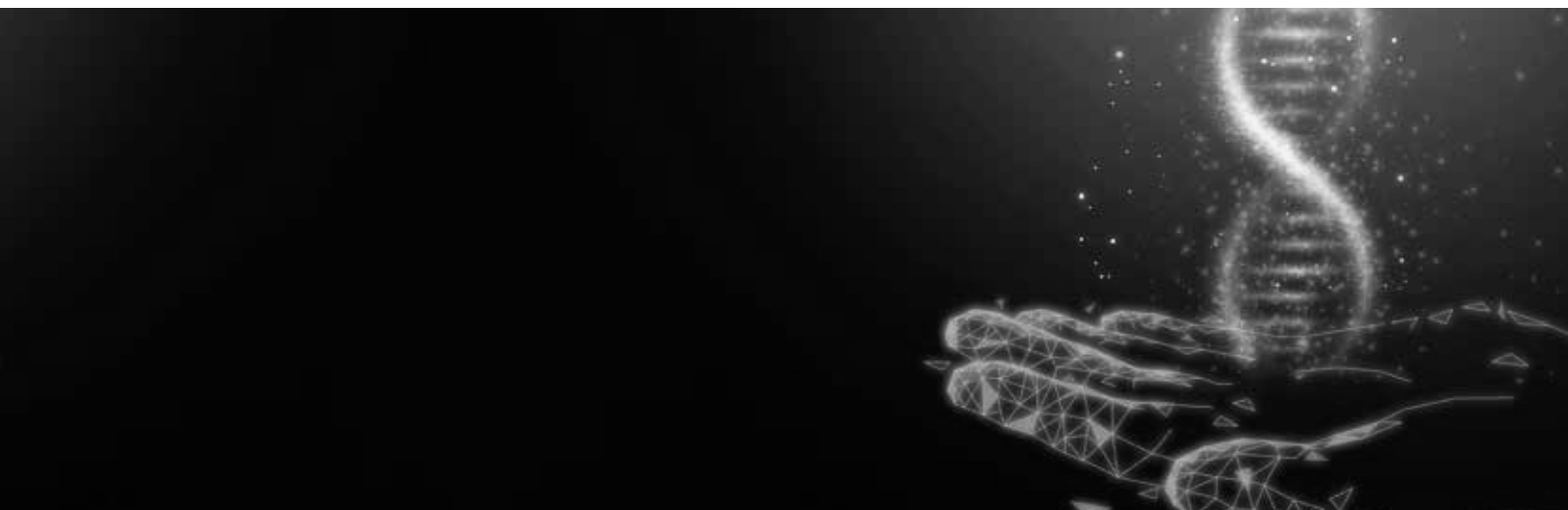


Exhibit 6.3.1

Average EBITDA multiple of recent acquisitions are in the range of ~7-29x

Acquirer	Target	Cost of acquisition (INR B)	EBITDA Multiple	Revenue multiple	Target revenue (INR B)	Target EBITDA (INR B)
Leading national chain 1	Small regional chain 1	6.4	~15x	~6x	1.1	0.4
Leading national chain 2	Small regional chain 2	9.3	~14x	~3x	3.0	0.6
Leading national chain 3	Small regional chain 3	3.5	~3x	~3x	3.0	1.3
Leading national chain 4	Small regional chain 4	1.0	~7x	~1x	0.7*	0.1*
Leading national chain 5	Small regional chain 5	0.3	~12x	~2x	0.1^	0.02^
Leading national chain 6	Small regional chain 6	0.3#	~29x	~2x	0.1#	0.01#

- EBITDA multiple is in the range of **~7x to ~29x**
- Revenue multiple is in the range of **~1x to ~6x**

Note(s): Target revenue and EBITDA based on FY21 revenue; *Based on FY22 revenue; ^Based on FY23 revenue; #Cost of acquisition has been extrapolated for 100% stake, Based on FY20 revenue

Exhibit 6.3.2

M&A has been driving growth for national chains in India

Expansion into new geography	<ul style="list-style-type: none"> • Major players acquire regional firms for rapid market entry • Strategy targets wider customer base and market expansion
Increasing market share in existing geographies	<ul style="list-style-type: none"> • National chains target regional players for zonal expansion • Acquisitions enhance city-level presence and competitive edge
Access to resources / new capabilities	<ul style="list-style-type: none"> • Boosting product offerings and service capacities • Expanding collection centers and testing labs for improved TAT and patient volumes

National chains strategically acquire regional players, swiftly entering new markets and expanding without building new infrastructure. This broadens their customer base, and provides them with access to local expertise and market knowledge. M&A enhance the local presence, increasing brand recognition and customer touchpoints for added convenience. Acquiring labs optimizes logistics, thereby improving turnaround times. Additionally, mergers provide access to new technologies, expanding test offerings and enhancing their value proposition. This diversification attracts new customers while improving operational efficiency and capacity, potentially reducing costs and enhancing service delivery.

Exhibit 6.3.3

Major players are trading at EBITDA multiple of ~10-30x

Player	EBITDA multiple	Revenue multiple
Leading national chain 1	~22x	~6x
Leading national chain 2	~29x	~8x
Leading national chain 3	~9x	~3x
Leading national chain 4	~19x	~5x

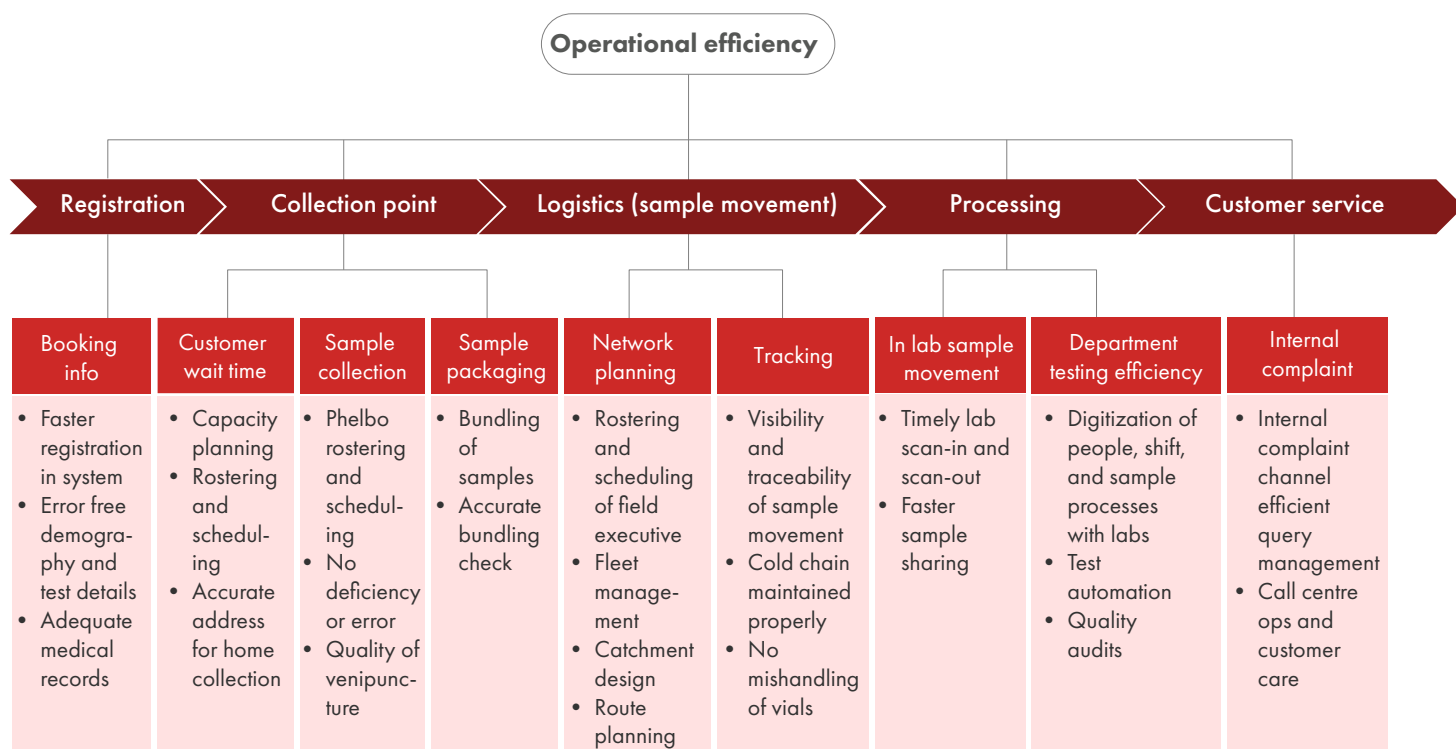
6.4 Navigating price pressures through enhanced operational efficiency in diagnostics chains

In the competitive landscape of diagnostic services, chains are encountering increasing pressure to offer cost-effective solutions without compromising on quality. This market dynamic necessitates a rigorous evaluation and enhancement of operational efficiency across the value chain to safeguard margins.

- **Registration and booking:** The first step in the customer journey has seen a digital transformation with faster system registration and error-free data capture. Ensuring adequate medical records and test details at this stage can significantly reduce downstream errors and inefficiencies
- **Collection point management:** Diagnostics chains have optimized customer wait times through better capacity planning and rostering. The quality of sample collection is a critical factor, with phlebotomists being rostered and scheduled to avoid errors, and address home collections more accurately
- **Logistics and sample movement:** The movement of samples from collection points to processing is a logistically complex operation. Chains are implementing advanced tracking and cold chain management systems to ensure sample integrity, coupled with sophisticated route planning to reduce transit times
- **Processing efficiency:** Within the lab, operational efficiency is being driven by digitization. This includes timely lab scan-ins and scan-outs, faster sample sharing between departments, and automation to expedite the process throughput without sacrificing accuracy
- **Customer service:** On the customer service front, internal complaint management systems have been streamlined to handle queries efficiently, with call centers using advanced operational techniques to enhance customer care

Exhibit 6.4

Increasing downward pressures on prices have forced diagnostics chains to evaluate and improve operational efficiency to maintain margins



6.5 Emergence of economies of scale

The emergence of economies of scale in the diagnostics sector can be observed as the industry experiences growth and advancements in technology. As diagnostic services expand and technologies evolve, several factors contribute to the realization of economies of scale in this sector.

6.5.1 Lower margins

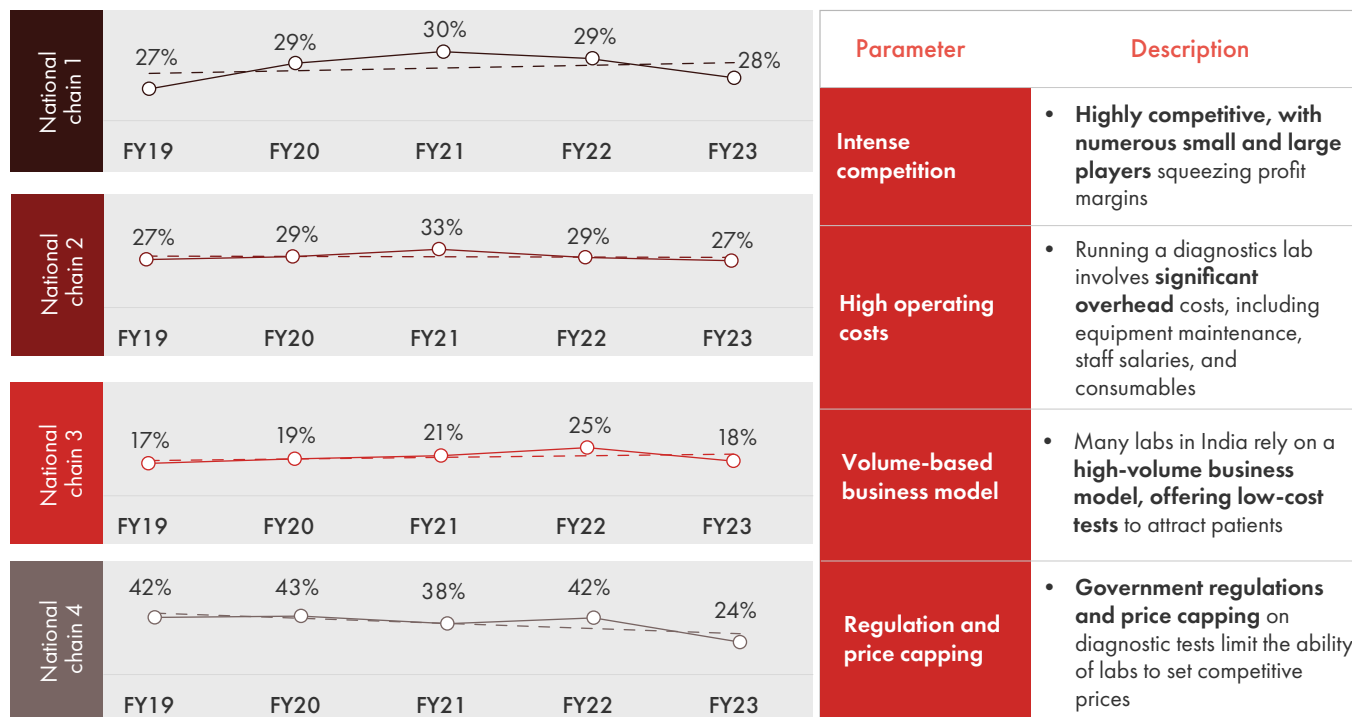
EBITDA margin is a key financial metric that measures a company's operating profitability by examining its ability to generate earnings from its core business operations. Over the past five years, a concerning trend has emerged in the financial performance of prominent national chain laboratories, as evidenced by a consistent decline in their EBITDA in Exhibit 6.5.1.

- Exhibit 6.5.1 illustrates that the declining margins are driven by a convergence of factors such as intense competition, high operating costs, a volume-based business model, and the impact of regulatory frameworks and price-capping by the government. Exhibit 6.5.1 also breaks down the cost structure of a diagnostics lab. The fixed costs of a lab consist of the man power salary, pathologist salary, and rent. These costs are approximately 43% of the total costs for a lab. Hence, as growing downward price pressures are squeezing margins, diagnostics chains need to prioritize economies of scale to sustain growth

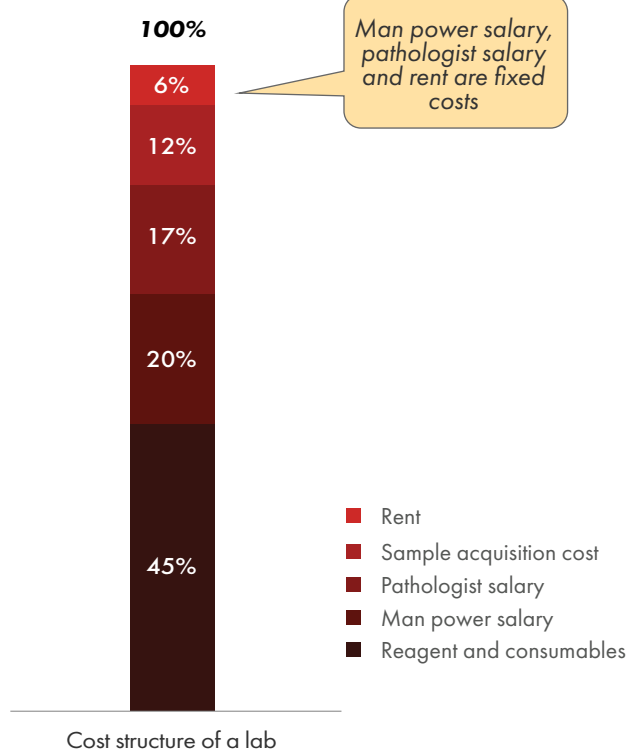
Exhibit 6.5.1

As growing downward price pressures are squeezing margins, diagnostics chains need to prioritize economies of scale to sustain growth

EBITDA margin for labs
(%, FY19-23)



Cost structure of a lab
(%)



6.5.2 Scale drives economies: Pathology lab

A critical metric for evaluating financial performance is unit economics. Unit economics delves into the direct costs and revenues associated with a single unit of a product or service, providing valuable insights into the profitability of individual centers within an organization. In this comparative analysis, we scrutinize the unit economics of a national chain lab, a standalone lab and a small hospital lab to illuminate the disparities in their financial performance. Exhibit 6.5.2 illustrates that a national chain lab exhibits 2x the EBITDA and 7x the ROI as that of a small private hospital.

Exhibit 6.5.2

Scale drives economies in a pathology lab; a national chain lab has a 2x EBITDA and 7x ROI compared to a small private hospital

Unit economics (monthly)	National chain lab		Standalone lab		Small hospital lab (Private standalone)	
CAPEX ¹	INR 5,600K		INR 465K		INR 1,200K	
Financial metrics	Value	% of gross revenue	Value	% of gross revenue	Value	% of gross revenue
Number of daily patients (#)	200-220	-	20-30	-	10-20	
AOV per patient (INR)	1.1K	-	0.6-0.8K	-	0.8-1.2K	
Gross Revenue (INR)	6,615K	100%	525K	100%	450K	
COGS (INR)	1,918K	29%	194K	37%	270K	60%
Employee cost (inc. phlebo) (INR)	1,558K	24%	126K	24%	45K	10%
Lab rent (INR)	265K	4%	26K	5%	32K ¹	7%
Logistics/sample acquisition charges (INR)	529K	8%	32K	6%	-	-
Miscellaneous expenses (INR)	662K	10%	63K	12%	50K	11%
EBITDA (INR)	1,654K	25%	84K	16%	54K	12%
PAT* (INR)	996K	15%	48K	9%	30K	7%
ROI (%)	~213%		~123%		~30%	
Pay back period	6 months		10 months		40 months	

Top line growth

Cost heads

Return metrics

Note(s): Medium workload lab has been considered for national chain lab; small hospitals typically have a ~5-7% share in gross lab earnings, in lieu of lab rent; Miscellaneous expenses include utilities, software rent, maintenance, waste disposal, office supplies, and training and development cost; ¹CAPEX includes cost of equipment, infrastructure, licenses, certifications, initial supplies and staff training; *tax rate assumed at 30%

6.5.3 Scale drives economies: Radiology lab

A similar exercise was conducted for a CT unit in standalone imaging centers, national imaging chains, medium hospitals and large hospitals. Exhibit 6.5.3 illustrates the important costs and expenses incurred by each customer segment.

It has been found that a CT unit in a large hospital has 8x EBIDTA and ROI compared to a standalone imaging centre. By utilizing the inference that scaling up improves the financial performance of a diagnostics lab, the diagnostics player can drive sustained profitability and operational excellence.

Exhibit 6.5.3

Scale drives economies in radiology as well; a CT unit in a large hospital has 8x EBIDTA and ROI compared to a standalone imaging centre

	Standalone imaging centers	National imaging chains	Medium hospitals (private standalone)	Large hospitals (private /government/chains)
CAPEX CT unit >	2-4 slice machine, INR 80 Lakh	4-16 slice machine, INR 1.1-1.5 Crore	16-32 slice machine, INR 1.3-1.8 Crore	32+ slice machine, INR 1.8-6.0 Crore
Volume	• 4 scans per day, 120 in month	• 15 scans per day, 450 in month	• 25 scans per day, 600 in month	• 30 scans per day, 900 in month
ASP	• INR 3.3K	• INR 3.6K	• INR 3.3K	• INR 5.8K
Radiologist cost, (# of radiologists)	• NA	• 41% of revenue, (2 radiologists)	• 44% of revenue, (3 radiologists)	• 27% of revenue, (3 radiologists)
Incentive or Patient acquisition cost (PAC)	• 19% of revenue as PAC, referrals 65%	• 1% of revenue as incentive*	• 2% of revenue as incentive*	• 6% of revenue for the marketing department
Staff costs	• 7% of revenue, (1 technician and 1 support staff)	• 6% of revenue, (2 technicians and 3 support staff)	• 6% of revenue, (5 technicians and 4 support staff)	• 8% of revenue, (6 technicians, 4 support staff + Bio med team)
Other costs	• ~42% of revenue, almost 36% is rent, maintenance, and utilities	• ~26% of revenue, almost 20% is rent, maintenance, and utilities	• 18% of revenue, ~12% is rent, maintenance, and utilities	• 11% of revenue, ~6% is rent, maintenance, and utilities
EMI	• 26% of revenue	• 8% of revenue	• 5% of revenue	• NA, no loan or financing
EBIDTA (%)	• 6%	• 19%	• 25%	• 48%, 8x time of standalone
ROI* (%)	• 14%	• 56%	• 79%	• 110%
Pay back	• 7 years	• 1.8 years	• 1.3 years	• 0.9 years

Top line growth

Cost heads

Return metrics

Note(s): Other costs includes rent and maintenance and services, utilities, medical supplies and miscellaneous; KUB scans – Kidney, Uterus and Bladder; *incentive of INR 300 for 15% of cases; *tax rate assumed at 30%

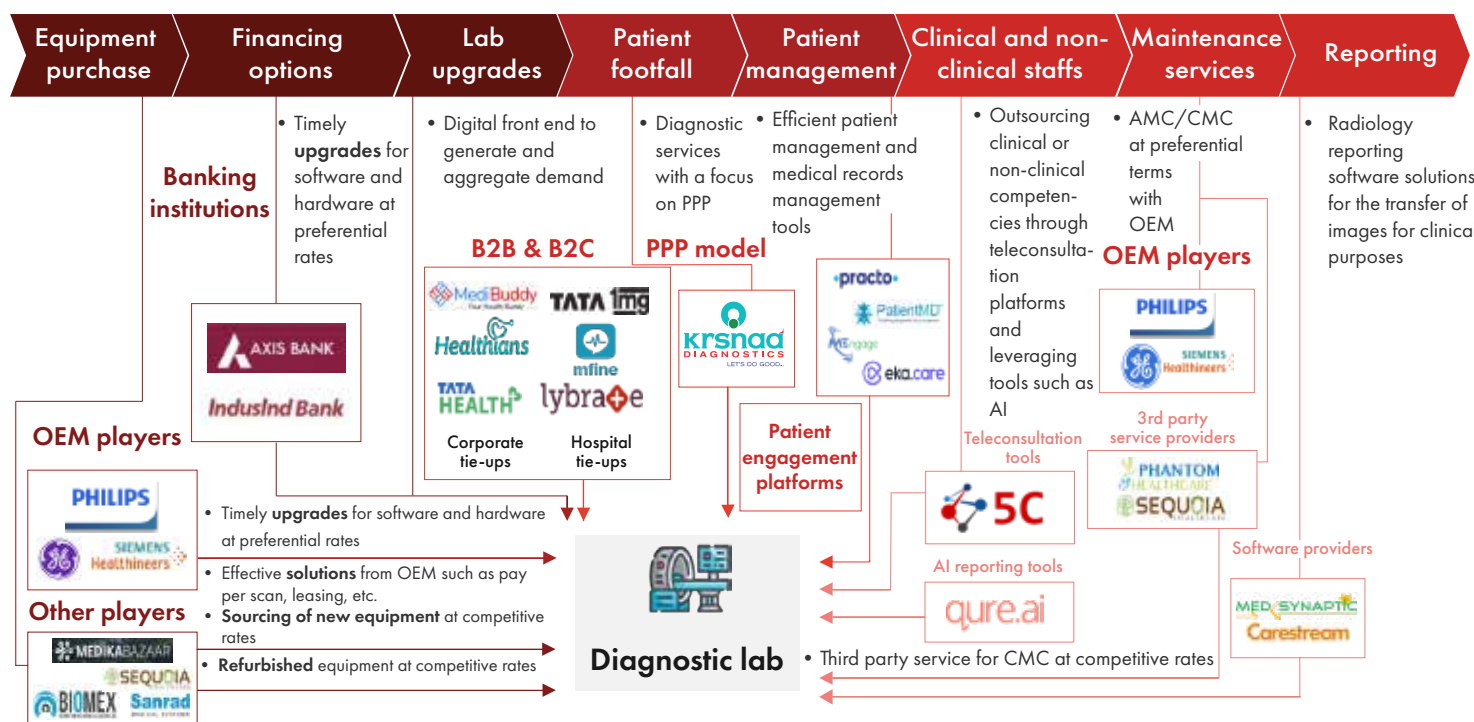
6.5.4 Scale drives operating leverage

Exhibit 6.5.4 illustrates that the diagnostics market consists of multiple players in the value chain.

On the supply side, economies of scale allows diagnostic labs to procure high quality equipment at lower prices, get favourable financing terms and utilise their high bargaining power. On the demand side, scale allows labs to access channels that increases their patient footfall and patient management solutions. On the operations side, economies of scale allows for lower operation costs, better negotiations, and access to digital solutions.

Exhibit 6.5.4

With the market seeing a more evolved ecosystem, scale can drive significant operating leverage



Drivers							
Procures high quality equipment from OEMs at lower prices	Easier and favourable financing terms enabling cheaper funding	Utilize their high bargaining power to command preferred rates	Access to a wider base via B2B/ B2C channel and PPP models allowing higher footfall	Deploying efficient patient management solutions allows cost reduction and enhanced patient experience	Outsourcing allow for lower employee cost for scaled players	Can negotiate better terms for maintenance services	Can deploy digital solutions for reporting applications

6.6 Emergence of new clinical needs and development

6.6.1 Specialized tests

Specialized tests such as Microfluidics POC, Liquid biopsy and genomics are gaining increasing attention.

The Microfluidics POC test market is projected to grow at a CAGR of 13% in the next 5 years. This growth is fueled by its ability to enable early disease detection through the analysis of biomarkers and genetic material. The test also offers high sensitivity and specificity, detecting low concentrations of analytes accurately. Additionally, the miniaturized and portable nature of the devices reduces sample and reagent consumption while enhancing ease of use, making Microfluidics POC tests an efficient diagnostic solution.

The Liquid Biopsy test market is poised to grow at a CAGR of 22% in the next 5 years. This growth is driven by its ability to enable early cancer detection through the analysis of CTCs and cfDNA in blood samples. Additionally, it offers a non-invasive and convenient alternative to traditional tissue biopsies, providing patients with a less intrusive diagnostic option. The test also delivers real-time molecular profiling of tumors, enhancing precision in diagnostic insights. Overall, liquid biopsy tests emerge as a pivotal tool in advancing cancer diagnostics.

Exhibit 6.6.1

Microfluidics POC market is expected to grow at CAGR of 13% between CY23 to CY28

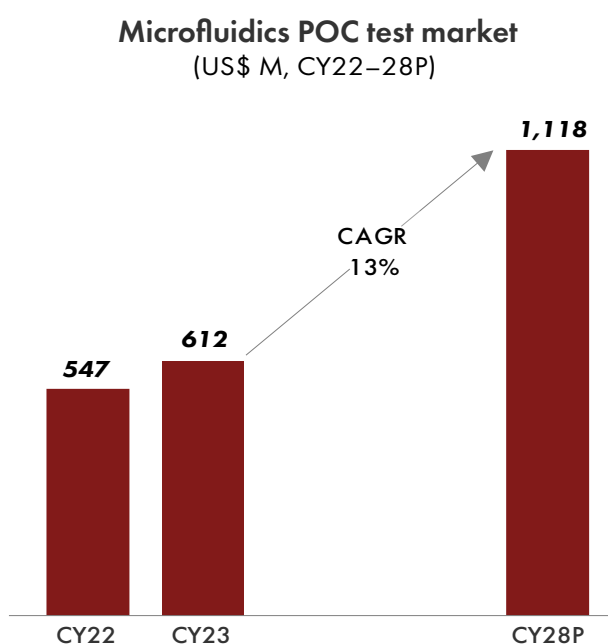
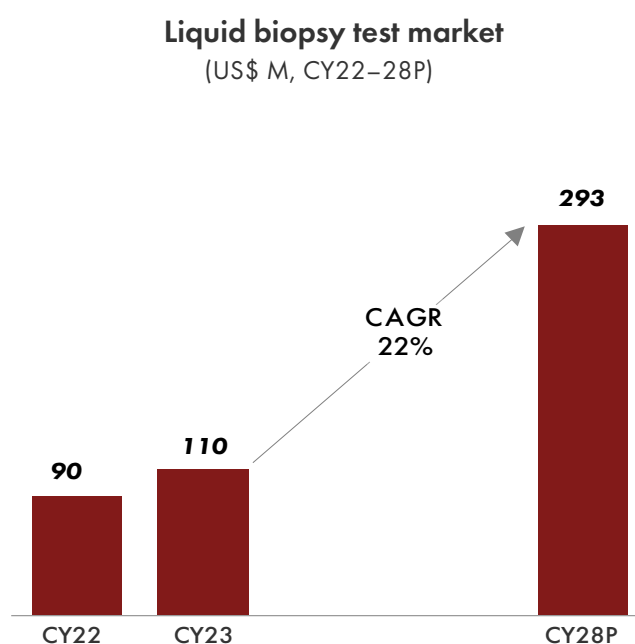


Exhibit 6.6.2

Liquid biopsy market is expected to grow at CAGR of 22% between CY23 to CY28



6.6.2 Genomics testing market

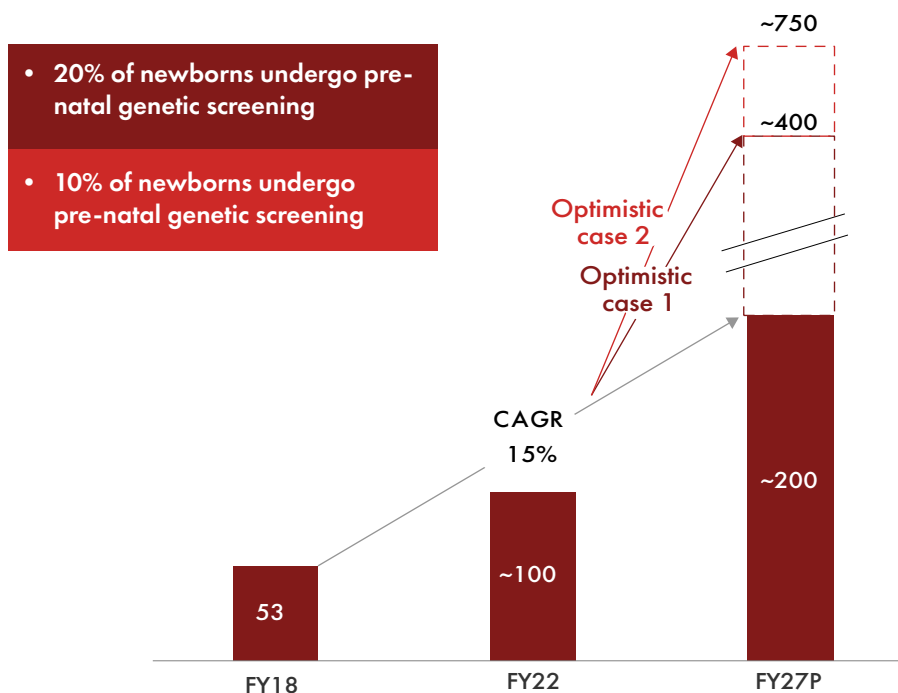
The genomics testing market is poised for a robust CAGR of 15% in the next 5 years. It meets the demand for personalized medicine by enabling healthcare providers to tailor treatment plans based on individual genetic profiles. The test also facilitates precise treatment selection through the identification of specific genetic markers, enhancing therapeutic efficacy. Additionally, genomic testing plays a key role in risk assessment and management by identifying inherited genetic risks for diseases, contributing to proactive healthcare strategies.

Exhibit 6.6.3 illustrates that the genomics testing market in India is expected to grow at 15% to reach ~US\$ 200M by FY27.

Exhibit 6.6.3

Genomics testing market in India is expanding and has potential to reach ~US\$ 745M by the end of FY27

Genomics testing market in India
(US\$ M, FY18–27P)



Note(s): Adult genetic testing penetration is considered to be 0.1% and 0.2% for optimistic case 1 and optimistic case 2 respectively

There are three major points driving the genetic testing market in India, as illustrated in Exhibit 6.6.4:

Exhibit 6.6.4

Key growth drivers for genomics testing market in India

Increase in chronic and genetic diseases	<ul style="list-style-type: none"> ~1.5M new cases of cancer recorded in CY22 1 in 2,500 patient is diagnosed with a rare disease; 70+ million people in India are suffering from rare diseases
Technological advancements	<ul style="list-style-type: none"> Progression of Indian pharma on the innovation ladder NGS aiding in reducing costs and early diagnosis Initiative by GOI to map 10k+ genomes by CY23
Increase in D2C	<ul style="list-style-type: none"> Pre-natal genetic testing advised for the identification of genetic illnesses transmissible to offspring Recreational genetic testing

6.6.3 Investments in genomics market in India

The genetic testing market in India is witnessing a surge in investment, with companies like LifeCell and MedGenome securing substantial funding in recent rounds. Angel investors and venture capitalists are pivotal in funding early-stage startups such as Acrannolife and Clevergene, indicating growing confidence and interest in India's genetic testing industry.

Overall, the Indian genetic testing market is poised for significant growth in the coming years, driven by increasing investment, rising awareness, and technological advancement.

Exhibit 6.6.5

Genomics focused companies have been consistently attracting investment from PE / VC firms

Company	Latest funding round	Revenue* (US\$ M, FY22)	Funding (US\$)	Investors
Acrannolife	CY23	0.7	422K	Angels - Aman Gupta, Peyush Bansal
MedGenome	CY22	28	219M	Novo Holdings, Sofina
Redcliffe Genetics	CY22	10	61M	LeapFrog, IDG Ventures
LifeCell	CY21	32 (FY21)	38M	Orbimed, Helion Venture Partners
Haystack Analytics	CY21	0.3	1.4M	STRIVE, Aroha Technologies
MapMyGenome	CY20	14	1.7M	Enemtech capital, Angels like Ratan Tata
Clevergene	CY20	1	633K	Auxano
Oncophenomics	CY19	-	606K	Omphalos Ventures, T-Hub
SciGenome	CY15	0.6 (FY21)	364K	Department of Biotechnology

Note(s): *Includes revenue from other services apart from genomics

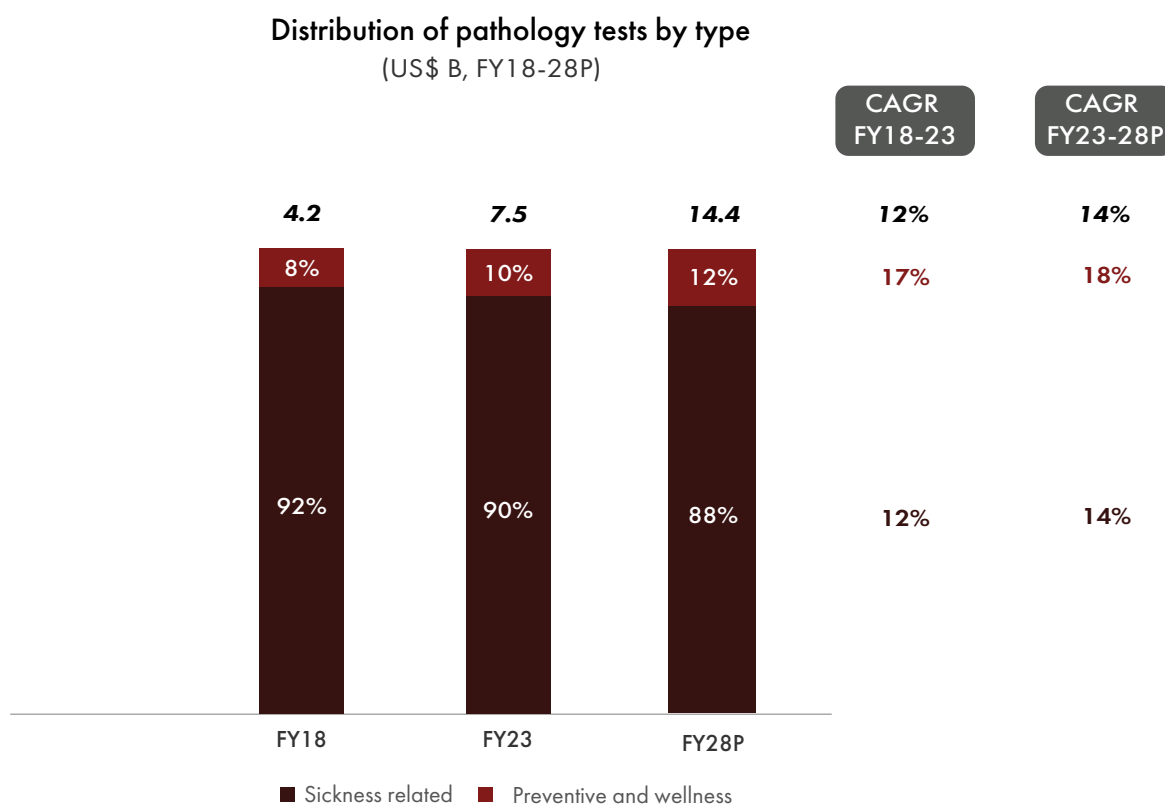


6.6.4 Adoption of preventive and wellness related tests

The total market of pathology is anticipated to reach US\$ 14.4B by FY28P. Preventive tests are expected to experience robust growth with a CAGR of 18%, increasing their share in all diagnostics tests to approximately 12% by FY28. In contrast, sickness-related tests are projected to witness a decline in their share, accounting for around 88% of all diagnostics tests, while still growing at a CAGR of 14%.

Exhibit 6.6.6

Preventive tests are projected to grow at a CAGR of 18% to increase their share in all diagnostics tests to ~12% in FY28



Consumers are showing a growing inclination toward adopting preventive and wellness-related tests. This trend reflects a proactive approach to healthcare, where individuals are becoming more engaged in monitoring their health and promoting overall well-being. Preventive and wellness tests provide valuable insights into one's health status, risk factors for various diseases, and opportunities for lifestyle modifications to maintain optimal health. As awareness about the importance of preventive care increases, more consumers are seeking out these tests as part of their healthcare regimen, contributing to a shift towards proactive health management strategies.

- **Increasing awareness** and a rise in disposable income serve as key drivers for preventative tests. The heightened awareness, particularly post COVID-19, emphasizes preventive healthcare to bolster immunity and detect diseases in their early stages
- **Rise in income** among the Indian middle class enables higher healthcare spending. Section 80D of the Income Tax Act further incentivizes preventive health check-ups by offering income deductions of INR 5-7K
- **Government initiatives**, including the National Health Mission, contribute to the development of new health and wellness
- **Online aggregators** are shifting their focus towards the emerging preventive and wellness segment of diagnostics
- **Advances in the medical field**, such as preventive genetic testing, are also encouraging more individuals to prioritize preventive healthcare

6.6.5 Self-testing and wellness devices

The growing emphasis on health awareness, coupled with factors such as convenience, affordability, and technological advancements, has spurred the widespread adoption of self-testing devices. With an increasing understanding of the importance of monitoring one's health, individuals are actively seeking ways to track their health parameters, leading to a surge in demand for self-testing devices. These devices offer unparalleled convenience, accessibility, and affordability, allowing people to monitor their health without the need for frequent visits to healthcare facilities. Moreover, the rising prevalence of lifestyle-related diseases has further fueled the adoption of self-testing devices, as individuals seek to monitor crucial parameters like blood sugar levels and blood pressure. Rapid advancements in sensor technology, data connectivity, and mobile applications have significantly enhanced the user experience, making self-testing devices more intuitive and user-friendly. Additionally, urbanization and the expansion of the middle-class population have contributed to increased disposable income, making self-testing devices more affordable and accessible to a wider demographic.

Exhibit 6.6.7

Rising health awareness, convenience and affordability and the rise of lifestyle diseases are the key drivers for self-tests

Increasing awareness	<ul style="list-style-type: none"> • More attention paid to preventive healthcare post COVID to build immunity and detect diseases in early stages
Rise in disposable income	<ul style="list-style-type: none"> • Rise in income of the Indian middle class allowing for higher healthcare spend • Section 80D of Income Tax Act allows income deduction of INR 5-7K for preventive health check-ups
Government initiatives	<ul style="list-style-type: none"> • Government's push towards developing new models for health and wellness as part of the National Health Mission
Shifting focus of online aggregators	<ul style="list-style-type: none"> • Focus of online aggregators is moving towards the emerging preventive and wellness segment of diagnostics
Advances in the medical field	<ul style="list-style-type: none"> • Advances in the medical field such as preventive genetic testing will push more people towards preventive healthcare

- **Tracking + Teleconsultation + Diagnostics + E-Pharmacy:** Companies providing comprehensive solutions that include health tracking, remote teleconsultation with healthcare professionals, access to diagnostic services, and online pharmacy services
- **Tracking + Teleconsultation + Diagnostics:** Companies offering platforms for health tracking, remote teleconsultation services with medical professionals, and access to diagnostic testing facilities
- **Tracking + Teleconsultation:** Companies focusing on platforms that enable users to track their health metrics and schedule teleconsultations with healthcare providers for medical advice and guidance
- **Tracking:** Companies providing solutions primarily focused on health tracking, allowing users to monitor various health parameters and track their progress over time

Exhibit 6.6.8

Attractive opportunity has pulled multiple companies into health management and wellness segments

Tracking + Teleconsultation +
Diagnostics + E-Pharmacy

Jeevam Health BeatO CONTROL DIABETES WITH EXPERTS
VISIT elix zyla

Tracking + Teleconsultation
+ Diagnostics

trackmybeat NanoHealth HEALTH TODAY. HAPPINESS TOMORROW!
onco GrowAyu CONNECT AND CARE

Tracking + Teleconsultation

wellthy sugar.fit SKOOC
CURO-HEALTH FitterFly Cardiotrack

Tracking

ULTRAHUMAN breathAI
Control D PINOTY Connected Care
Human Fractal.AI
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6.7 Emergence of new business models




The diagnostics industry is witnessing a wave of innovation across its value chain, with new business models emerging to revolutionize how services are delivered:

- **Equipment acquisition:** This involves the procurement of diagnostic equipment needed for conducting various tests and analysis. Innovative models may include options like capital purchase, reagent rental, or refurbished equipment procurement to optimize costs and access cutting-edge technology
- **Distribution and logistics:** This aspect involves the efficient management and distribution of diagnostic equipment, reagents, and supplies. Innovative approaches may include hub-and-spoke models, franchise arrangements, or partnerships with local labs to ensure widespread access and timely delivery of services

- **Laboratory testing:** Laboratory testing encompasses the actual analysis and interpretation of samples collected from patients. Innovative business models may focus on optimizing workflows, leveraging technology for faster and more accurate results, and offering a range of testing options tailored to specific needs and preferences

Exhibit 6.7

Innovative business models are emerging across the diagnostics value chain

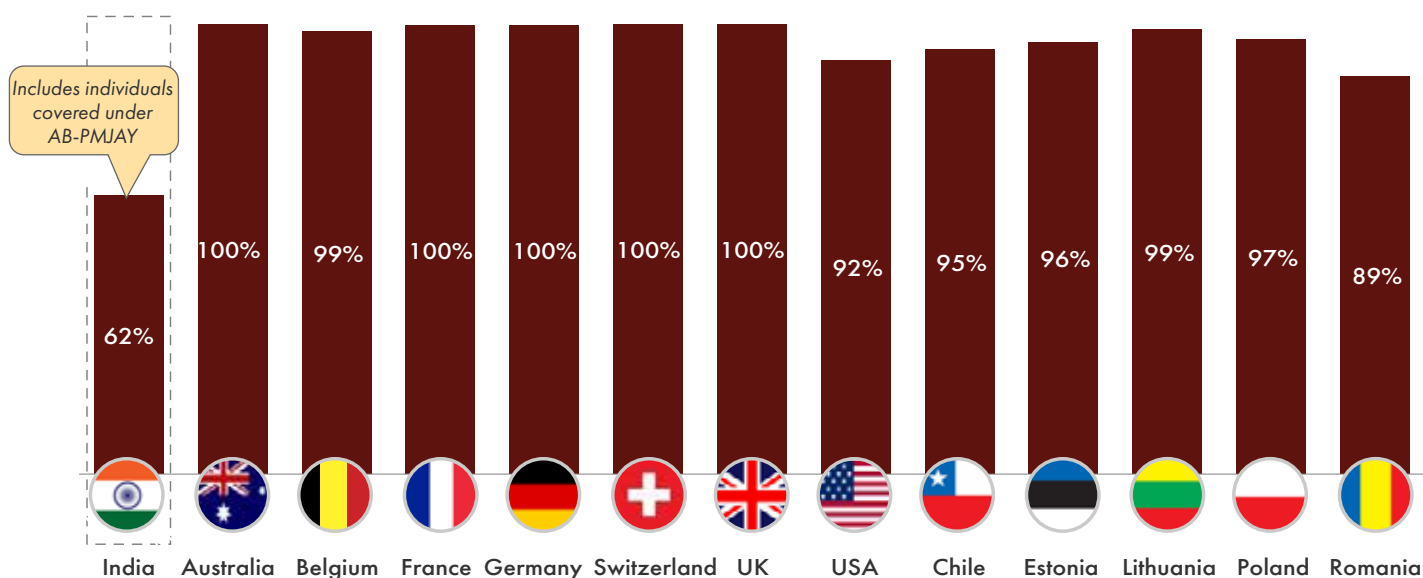
Value chain for diagnostic player	 Equipment acquisition	 Distribution and logistics	 Laboratory testing
Traditional business model	<ul style="list-style-type: none"> • Capital purchase: Purchase equipment for control and depreciation benefits • Reagent rental: Tie-up for bundled equipment and reagent packages 	<ul style="list-style-type: none"> • Hub-and-Spoke: Central lab with a network of sample collection centers • Franchise models: Expanding reach through entrepreneurs using labs brand, processes, and quality standards 	<ul style="list-style-type: none"> • Centralized labs: Traditional business model with on-site resources and technicians in a specialized facility.
Emerging business models	<ul style="list-style-type: none"> • Pay-per-use/subscription services: Manage demand without hefty upfront investments • Refurbished equipment: Procure cost-effective used equipment from upgrading facilities • Partial rental model: Hybrid model where diagnostic centers pay an upfront cost for equipment and then continue to make payments through a rental agreement • Technology transfers and global agreements: Partnerships with international players to license, adopt, or co-develop technologies already proven in other markets, avoiding local R&D investment and accelerating innovation 	<ul style="list-style-type: none"> • PPPs: Partnering with the government to provide diagnostic services, often in rural or underserved areas • B2B: Providing diagnostic services to businesses such as clinics, nursing homes, and corporate health programs • Tier 2/3+ distribution: Collaborate with local labs, set up spoke labs for expansion • Shop-in-Shop(SIS) / Pickup point(PUP) models: Diagnostic labs extend beyond clinics by embedding collection facilities in retail spaces or setting up stand-alone / partnered pickup points 	<ul style="list-style-type: none"> • HLM labs: Managing centralized labs within hospitals focusing on high-volume, low-margin business • POC diagnostics: Portable devices with rapid results at the point of patient care • Mobile testing labs: Mobile labs with focused test menu for on-site testing filling geographic gaps • Radiologist-on-Demand: Access to a remote network of specialized radiologists for imaging interpretation

6.8 Rising insurance penetration

Exhibit 6.8.1

Health insurance is underpenetrated in India at ~62% of total population as compared to other developed countries

Health insurance coverage
(% of total population, CY22)



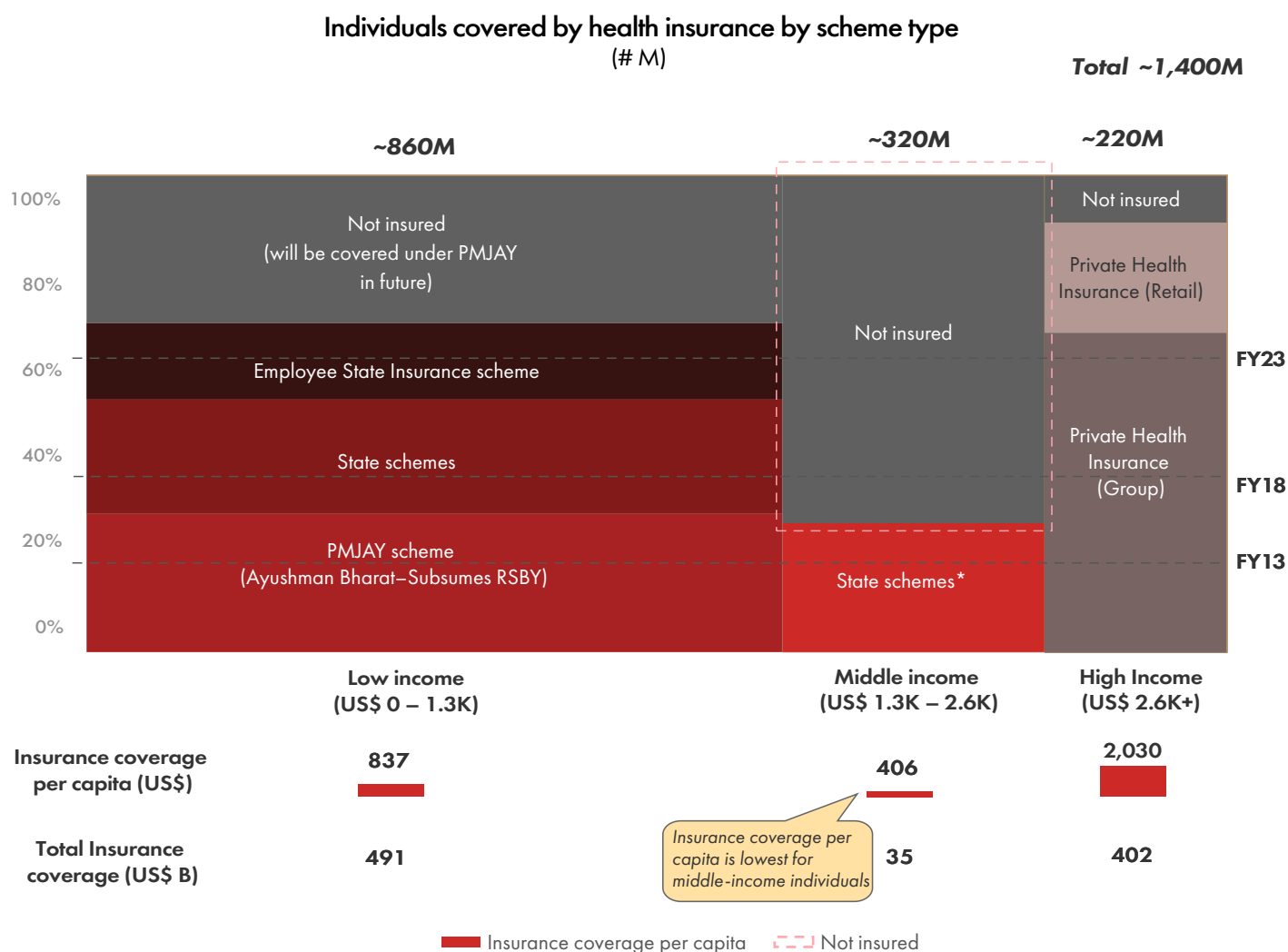
Note(s): Data for India is of FY22; Data for Australia, Belgium, France, Germany, Switzerland, UK and USA is of FY21; OPD cover refers to expenses that do not require hospitalization; all policy prices based on 27-year-old male living in Metro

In the healthcare landscape, a significant gap persists, with over 70% of middle-income individuals lacking health insurance coverage. However, strategic government initiatives such as the Ayushman Bharat Yojana and State Government extension schemes play a crucial role, providing comprehensive hospitalization cover to approximately 69% of the low-income population. Another segment, constituting around 15% of the population employed in the public sector, benefits from coverage under CGHS and ESIS schemes.

Approximately 14% of the population secures private voluntary health insurance coverage, contributing to a more diversified healthcare financing model. Despite these efforts, a substantial portion, representing around 38% of the population, remains without health insurance. For insurers, this presents an untapped market opportunity, encouraging strategic interventions to extend coverage and bridge existing gaps. Recommendations for innovative insurance products, targeted outreach, and collaboration with government schemes could be instrumental in addressing this unmet need and enhancing overall healthcare accessibility.

Exhibit 6.8.2

More than 70% of the middle-income individuals are devoid of health insurance; Insurance coverage per capita is also the lowest for the middle-income individuals



Note(s): *Also includes a few private schemes, calculation estimates based on consideration of maximum of one insurance scheme per capita

6.9 Evolving patient needs

The healthcare industry is experiencing a paradigm shift in patient preferences, particularly in the diagnostics sector. Patients are increasingly favoring home sample collection services over traditional lab walk-ins, driven by the convenience, efficiency, and enhanced experience they offer.

- Patients prefer home collection over walk-ins:** As depicted in the infographic, the top reasons for choosing home collection include the convenience of not having to leave home, elimination of waiting times, and ease of booking appointments. Notably, a significant majority of patients, over 75%, show a preference for home collection. This shift is indicative of a broader trend towards personalized healthcare services delivered at the doorstep
- Customers are willing to pay extra for value-added services:** The second infographic emphasizes that customers are not only looking for basic services but are also willing to pay a premium for additional value. Services such as transparent booking processes, consultations with certified medical professionals, and user-friendly report formats are high on the list of desired features. These preferences signal a growing demand for a more comprehensive, patient-centric approach to diagnostic care

Exhibit 6.9.1

Reasons for customers preferring home collection over lab walk-ins to submit samples

Patients prefer home collection over walk-ins primarily due to convenience and no wait-time	
Reasons for customers preferring home collection over lab walk-ins to submit samples	
Convenient and hassle free	●
No wait time	●
Ease of booking slots	●
Free home sample collection facility	●
Lack of proximity to labs	●
Already satisfied with the services	●
Proximity of tests centre nearby	●
Prefer walk-ins as more convenient	●
Better accuracy of tests data	●
Trusted labs don't have home collection facility	●
Concerns about sample getting affected in transit	●
Better prices	●

Customers are willing to pay extra for value-added services to make their experience better		
WTP and desired additional value-added services by customers while booking tests via online platforms		
Willingness to pay/spend (WTP) up to INR 100	●	
Desired value-added services	Transparent and systematic slot booking process	●
	Consultation by certified medical professional at minimal cost	●
	Descriptive and user-friendly report format	●
	Home sample collection facility	●
	Booking experience	●
75%+ customers	Prefers home collection	Emerging preference Low ● ● ● ● High
Rest customers	Prefers lab walk-ins	

6.9.1 Key influencers in the selection of online healthcare platforms

The digital transformation of healthcare services has empowered consumers to seek medical assistance, diagnostic services, and pharmaceutical needs online. A study has highlighted the critical factors influencing user preference for online healthcare platforms, ranging from consultation to diagnostics and pharmacy services. These insights help in understanding consumer behaviour and preferences in the online healthcare domain.

- Choosing an online consultation platform:** Users prioritize trusted and certified doctors, easy availability of healthcare professionals, the platform's brand name, and recommendations from family or friends. 68% of users value trusted and certified doctors and easy availability of doctors
- Selecting an online diagnostics platform:** Accuracy and timely delivery are paramount for users choosing an online diagnostics service. Users are looking for reliable test results, prompt report delivery, and reasonable pricing. 72% of respondents prioritize accuracy in test reports, while 68% value the timely delivery of those reports
- Preferring an online pharmacy:** In the realm of online pharmacies, timely delivery and cost savings are the leading drivers of user preference. Consumers also value the ease of returns and the availability of a wide range of products. 79% of users are influenced by timely delivery, and 67% by the discounts offered, indicating a high sensitivity to cost and service efficiency

Exhibit 6.9.2

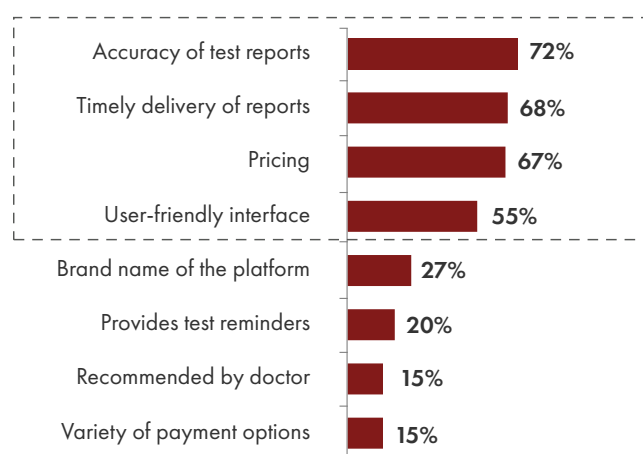
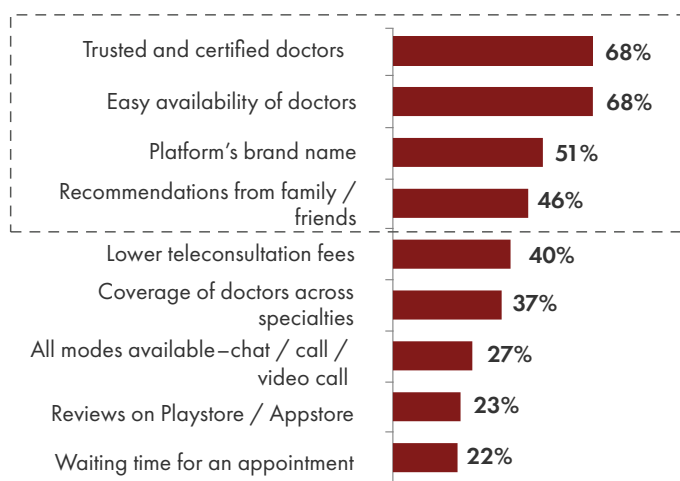
Certified doctors, accurate test reports, quick turnaround, competitive prices, discounts and timely delivery influence the choice of online healthcare platforms

**Q. What are the top 4 factors while choosing your primary online consultation platform?
[Select up to top 4] (N=141)**

**Q. What are the top 4 factors while choosing your primary online diagnostics platform?
[Select at least top 4] (N=94)**

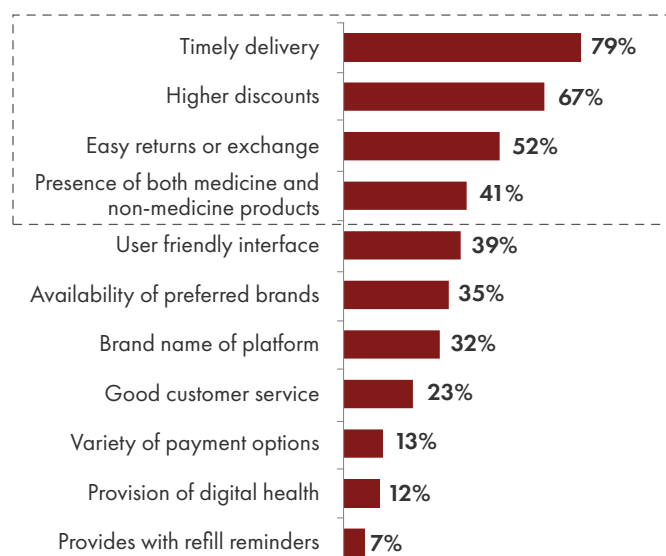
**Reason for preference of online consultation platform
(N=141)**

**Reason for preference of online diagnostics platform
(N=94)**



**Q. What are the top 4 factors while choosing your primary online pharmacy platform?
[Select at least top 4] (N=145)**

**Reason for preference of online pharmacy platform
(N=145)**



6.10 Rising opportunity in tier 2/3+ market

Exhibit 6.10 illustrates a notable disparity in the distribution of diagnostic labs across city tiers in India. Tier 1 cities boast abundant options, with 399 labs per million people, while tier 2 cities lag behind at 245 labs per million people. The gap widens in tier 3+ cities and rural areas, reaching a concerning 205 labs per million people.

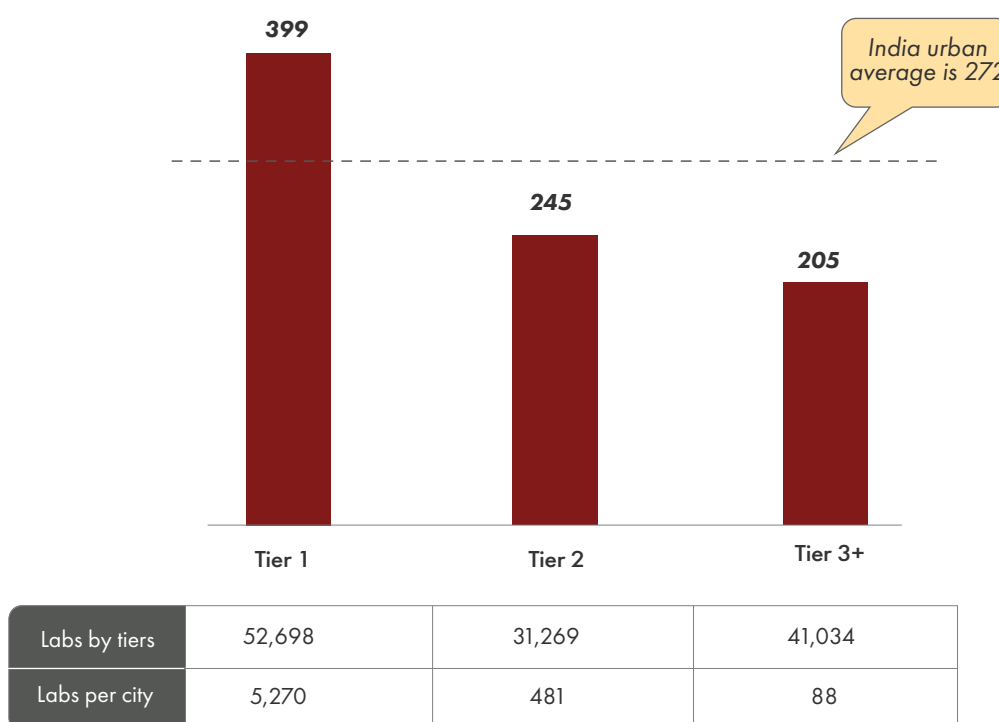
This disparity highlights unequal access to essential diagnostic services, with tier 1 residents enjoying greater convenience compared to those in tier 2 and beyond. This accessibility gap may contribute to delayed diagnoses and treatment, exacerbating health issues.

However, this contrast also presents a lucrative opportunity for the diagnostic industry. Expanding into tier 2/3+ cities holds significant growth potential, both financially and in terms of societal impact. Strategic investments in these regions can bridge the diagnostic gap, fostering greater equity in healthcare access.

Exhibit 6.10

Labs per million population is lower for tier 2/3+ cities signifying under-penetration

Distribution of diagnostics labs in India
(# per M population, FY23)



6.10.1 Expansion plans of major chain labs in tier 2/3+ cities

- **Metropolis:** Metropolis expands with 16 labs and 506 collection centers in tier 2/3+ cities by FY22. Acquisition of Hitech Diagnostics (31 labs, 68 collection centers) reinforces commitment to comprehensive services and strategic growth
- **Dr. Lal Path labs:** DLPL strategically focuses on tier 2/3+ towns in North and East India, emphasizing metros/tier 1 cities in South/West India. Suburban Diagnostics acquisition (38 labs, 177 collection centers) reinforces commitment in Maharashtra. DLPL's proactive expansion efforts in South India exemplify its dedication to sustained growth
- **Thyrocare:** Thyrocare adopts asset-light expansion, leveraging branded franchisees. Focus on international markets, particularly Africa, aligns with global expansion. Partnerships with the government, active participation in health tenders for public healthcare initiatives

- **Redcliffe Labs:** Redcliffe Labs aims to add 250 labs and 10,000 collection centers by CY25, aligning with the vision for extensive diagnostic services
- **Krsnaa Diagnostics:** Krsnaa Diagnostics strategically expands pathology business using the PACE model, with a primary focus on tier 2+ cities. Plans to set up 600 collection centers through franchisee model by FY24 for widespread accessibility
- **Vijaya Diagnostics:** Vijaya Diagnostics focuses on tier 2/3+ cities, combining company-owned centers and selective acquisitions. Reinforces hub-and-spoke model, concentrating efforts in Eastern and Southern India for balanced and sustainable growth
- **Mahajan Imaging:** Mahajan Imaging prioritizes accelerated growth in pathology while expanding existing radiology operations. Ventures into "integrated diagnostics" combining various services for a holistic approach to patient care
- **Medall Diagnostics:** Medall Diagnostics strategically targets tier 2/3+ cities in Tamil Nadu for focused expansion, with plans to open 300-400 centers in South India, spanning Karnataka, Andhra Pradesh, Telangana, and Kerala. Primary focus on tier 2/3+ expansion aligns with the commitment to comprehensive healthcare solutions and extended geographic reach

6.11 Government and regulatory impact

6.11.1 Government has been actively promoting PPPs

Exhibit 6.11.1 illustrates the distribution of government labs and hospitals across states in India, shedding light on regional focus. The government is actively promoting PPPs to address infrastructure and service delivery challenges in the diagnostics sector. Government labs and hospital labs are projected to grow from 18,000 in CY23 to approximately 29,000 in CY27, indicating significant opportunities, primarily through PPP models. The projected CAGR of 12% highlights the potential for growth in this sector.

Exhibit 6.11.1

Government labs volume is expected to grow at 12% CAGR between CY23–27

Government labs and hospital labs

(# K, CY23–27P)

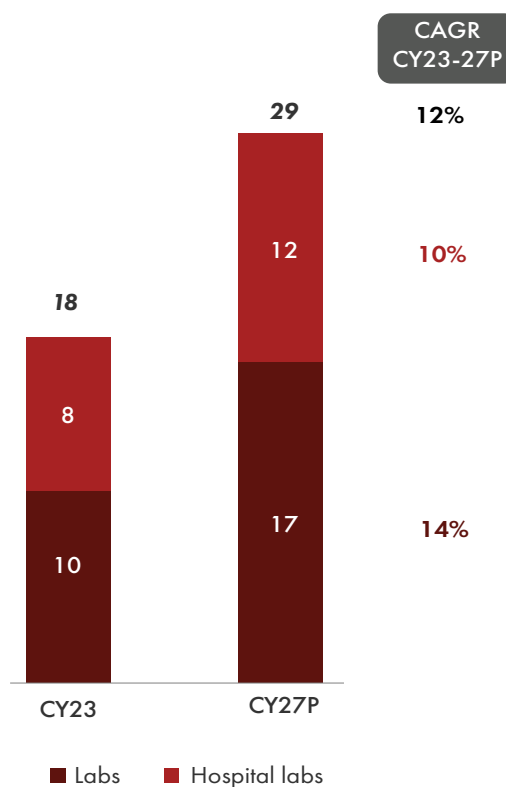


Exhibit 6.11.2

Diagnosics players can capitalize on the expanding opportunities created by government initiatives

		National Chain Labs		Regional Chain Labs		
		Chain 1	Chain 2	Chain 1	Chain 2	Chain 3
North	Haryana					
	Himachal Pradesh					
	Jammu and Kashmir					
	Punjab					
	Rajasthan					
	Uttar Pradesh					
East	Assam					
	Jharkhand					
	Manipur					
	Meghalaya					
	Odisha					
	Tripura					
	West Bengal					
South	Andhra Pradesh					
	Karnataka					
	Tamil Nadu					
	Telangana					
West	Gujarat					
	Maharashtra					
Centre	Madhya Pradesh					







Note(s): The list is not exhaustive and only indicative as of CY21

6.11.2 Make in India is incentivizing foreign players to setup manufacturing base in India

The Make in India initiative aims to bolster domestic manufacturing and enhance the competitiveness of Indian companies by offering products and services at affordable prices. To incentivize high-value domestic manufacturing, the government has introduced initiatives such as the Production Linked Incentive (PLI) scheme, covering 14 key manufacturing sectors. Additionally, the Government e-Marketplace (GeM) platform facilitates easier access for Indian manufacturers to engage in public procurement with government entities. Quality assurance for Indian medical devices is ensured through the Indian Certification for Medical Devices (ICMED), aligning standards with global benchmarks. The Digital Health Incentives Scheme (DHIS) has provided incentives totaling ~US\$ 585K to around 120 health facilities and 7 healthtech companies by June CY23. Furthermore, the establishment of bulk drug parks and medical device parks is being promoted, supported by a financial outlay of around US\$ 366M until FY25.

Exhibit 6.11.3

Foreign players setting up local manufacturing base

	Players	Existing undertakings	Future plans
Western MNCs		<ul style="list-style-type: none"> Inaugurated a manufacturing facility in Vadodara to produce urinalysis strips and biochemistry reagents New production line at the Bengaluru facility to manufacture medical imaging products 	<ul style="list-style-type: none"> Setting up a new campus in Bengaluru-integrated R&D centre and manufacturing hub-investing ~US\$ 159M
		<ul style="list-style-type: none"> Opened a manufacturing facility in Gurugram for testing kits and reagents 	-
		<ul style="list-style-type: none"> Opened an integrated R&D and manufacturing facility in Hyderabad's Genome Valley to develop new pharma products 	<ul style="list-style-type: none"> Establishing another formulation unit in Hyderabad for manufacturing its product Pentasa (Mesalazine), investing ~US\$ 61M
		<ul style="list-style-type: none"> Opened a manufacturing facility in Mundra, Gujarat for medical cold chain products 	-
Asian MNCs		<ul style="list-style-type: none"> Has an established reagent production factory in Baddi, Himachal Pradesh 	<ul style="list-style-type: none"> Establishing a new manufacturing base in Sanand II Industrial Estate, Gujarat, for reagents and devices
		<ul style="list-style-type: none"> Opened hematology and other medical reagents manufacturing facilities in Nagpur and Haridwar 	-
		<ul style="list-style-type: none"> Has an established dialyzer and medical devices manufacturing plant in Khandala, Maharashtra 	<ul style="list-style-type: none"> Signed an MoU worth US\$ 201M for setting up a glass tubing production facility in Pune

6.11.3 Digital Personal Protection Act, 2023

- **Small diagnostic centers:** Limited resources to invest in new data privacy and security technologies could place them at a competitive disadvantage
- **Large diagnostic centers:** While they possess resources for compliance, navigating complex data localization norms and restrictions on cross-border data transfers could hinder their global operations
- **Global diagnostic companies:** While boasting vast resources and expertise, they must now contend with stringent data localization norms and potential restrictions on cross-border data transfers, potentially impacting their global operations and international collaborations

Exhibit 6.11.4 gives a detailed outline of the opportunities and challenges presented by the DPDPA

Exhibit 6.11.4

Digital Personal Data Protection Act is expected to have significant implications for diagnostics companies

	Small diagnostic centers Unorganized players	Large diagnostic centers 	Global diagnostic companies
Challenges	<ul style="list-style-type: none"> Limited resources to invest in new technologies for data privacy and security management Competitive disadvantage compared to larger counterparts Constrained abilities for data sharing with third parties to whom services are outsourced due to consent requirements 	<ul style="list-style-type: none"> Significant costs involved in transitioning their existing data systems and protocols to be compliant with new data privacy norms Restrictions on sharing Indian patient data with their global partners or third parties due to localization requirements 	<ul style="list-style-type: none"> Navigating data localization norms and restrictions on cross-border data transfers Adapting global data models and technologies to meet India-specific regulatory needs
Opportunities	<ul style="list-style-type: none"> Act as localized databases to enable patients to share data with global companies while retaining local control 	<ul style="list-style-type: none"> Develop proprietary population health datasets and analytics models Acquire smaller diagnostics centers to gain scale and access regional / tier 2 markets 	<ul style="list-style-type: none"> Leverage experience of data compliance from EU, US markets to adapt processes for India. Offer proprietary algorithms and technologies for efficient consent management and compliance
Way forward	<ul style="list-style-type: none"> Focus consent efforts on specific high-priority datasets rather than collecting all patient data. Collaborate on efficient consent management and data anonymization technologies 	<ul style="list-style-type: none"> Invest in technologies to capture data as per compliance and derive insight from data analytics while protecting individual privacy. <ul style="list-style-type: none"> Appoint data protection officers and audit protocols to ensure compliance across massive data operations 	<ul style="list-style-type: none"> Set up Indian data subsidiary or acquire Indian player to house domestic data to comply with localization norms Modify consent protocols and data models to align with the regulatory framework in India

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engagements



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SEA
(50+ projects)

Rest of Asia
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Europe
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Australia
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...helping organizations to



Accelerate
growth profitably



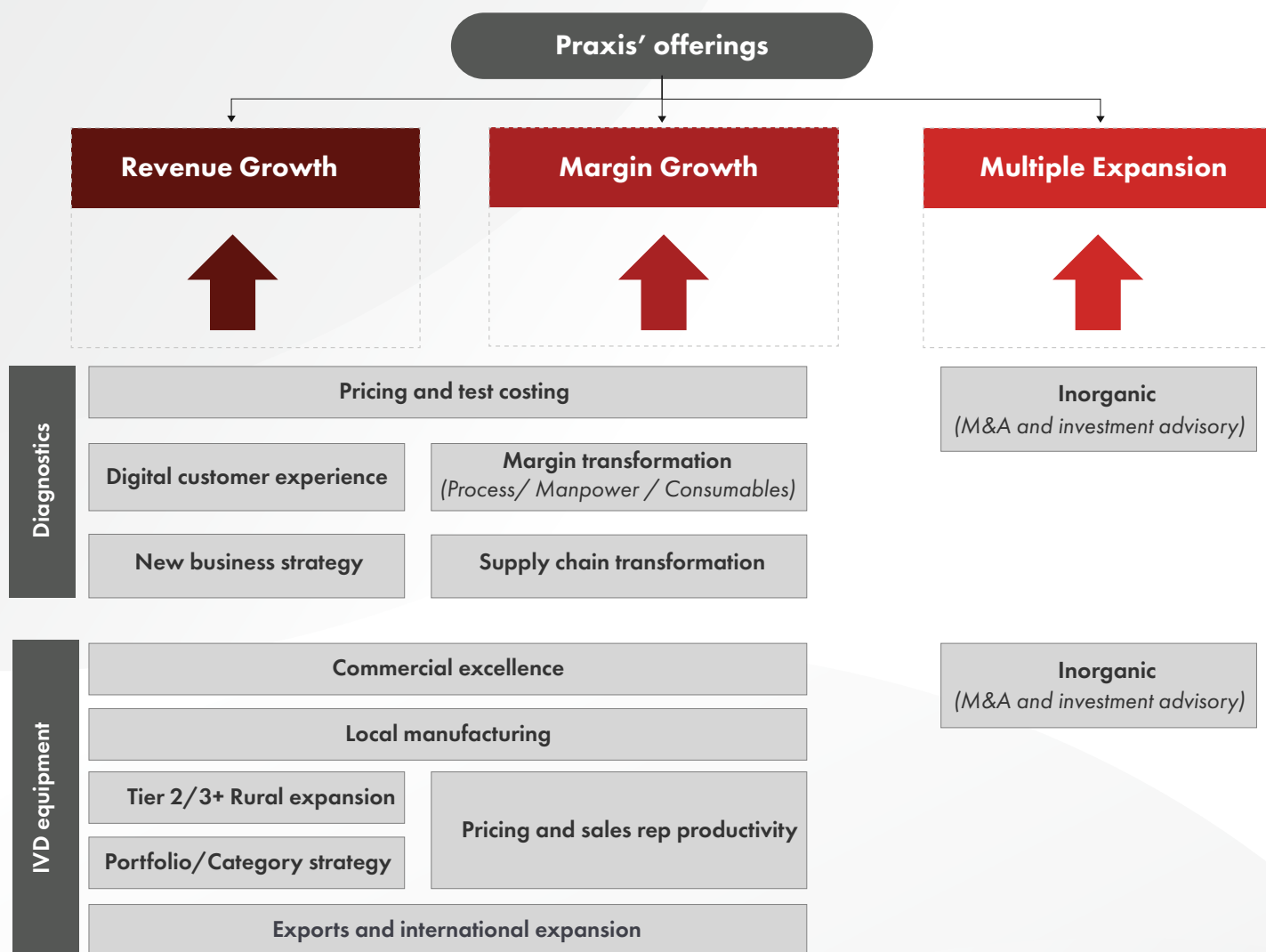
Execute better



Digitalize faster
seamlessly



Unlock people
productivity



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