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Healthcare

Report

Diagnostics: Unraveling the Future

July 2022

Foreword

Indian diagnostic industry has emerged as a preferred play in India's growing healthcare sector, driven by attractive margins and good headroom for growth. The domestic diagnostic industry in FY21 was ~US$ 10B and is expected to grow at a compounded annual growth rate (CAGR) of ~14% over the next five years. This growth will be primarily driven by increasing demographics, urbanization, penetration, and better realizations per test.

The diagnostic industry is characterized by a high degree of fragmentation with over ~100K labs. Of the US$ 10B markets, standalone centers account for 48% market share, followed by hospital-based labs with 37% share, and national chains account for only 5% share. This fragmentation poses a challenge in terms of capability, scalability, and quality of labs, but on the other hand, it also provides an opportunity to consolidate newer business models to evolve.

While the pathology segment contributes ~57% to the diagnostic market share, radiology is importantly extensive at ~43% of the market, comprising tests like computed tomography (CT) scans magnetic resonance imaging (MRI), color doppler ultra-sound scans, etc.

This report analyzes the current state of the diagnostic market and analyzes the key trends that we see emerging. These include a) Changing patient expectations from diagnostic players, b) Newer tests addressing critical and precise clinical needs, c) Non-traditional competitors entering the market, d) Newer patient-centric business models working around industry challenges, and e) Logistics becoming critical in the pursuit to serve customers at their convenience, and f) Use of technology and digital to improve customer experience, support clinical decisions and serve as a backbone of the business.

Our endeavor with this report is to understand, qualify and quantify the impact these trends will have on the Indian diagnostics market in short to medium term. We hope you find the report informative and look forward to continuing the discussion. We hope that this report will give you an insight into the underlying success factors to ride this wave of growth in the Indian diagnostics industry.

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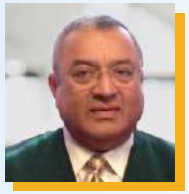

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Executive summary

Section	Key takeaways
Market landscape	• **Market size:** Estimated market size in FY21 was **US$ 10B, of which 57% was pathology and 43% radiology;** Biochemistry comprised ~20% of the market, and low-end radiology another ~22% • **Market growth:** Indian diagnostics market is projected to grow at a **CAGR of 14%** to reach **US$ 20B by FY26** • **Significantly under-penetrated market:** Pathology tests per 1000 population in India is 1,111 versus 5,924 in Brazil, 10,000 in Australia, and 20,958 in the USA; Number of CT, MRI tests per 1000 population in India was 36 compared to 53 in Brazil, 144 in the UK, 192 in Australia, and 407 in the USA • **Highly fragmented and urbanized:** Standalone centers and hospital-based labs (including government labs) have an 85% share of the market; urban areas account for 74% of the market • **Reasonable penetration in Tier 2 and 3 cities in terms of number of labs:** This indicates market readiness to expand and adopt more specialized tests and technologies • **GP driven market:** ~55% of the tests prescribed in out-patient settings are from General Practitioners and Gynaecologists

Emerging trends in diagnostics market	1 **Changing patient behavior –** pricing, convenience, and reliability are the top three driving factors while selecting a diagnostic service provider
	• **Preference for convenience:**
	  • **Home collection over walk-ins** - ~75% of the customers prefer home collection over lab walk-ins and are willing to pay 75 -100 for home sample collection services
	  • **Easy access to reports:** Test tracking, report access through email, app, and other ways; Easy to read reports for customers; Longitudinal analysis of historical reports
	  • Neighbourhood labs: Preference remains high for acute and doctor driven tests
	• **Customers seek reasonable pricing:**
	  • **For self-initiated or wellness tests –** preference is high for online platforms with competitive discounts
	• **Preference for reliable service providers:** Convenience driving customers towards more reliable branded chains
	2 **Specialized wellness tests driving growth**
	• Specialized tests: Comprises 15-22% by volumes and 40-45% by value; Molecular pathology poised to grow at 35-40% year on year
	• Wellness tests: Currently comprises 1-3% by volume and 10-15% by revenue; Growth likely to be driven by general wellness and condition-specific monitoring packages
	• In addition, PoC and rapid tests have seen a wide acceptance during COVID and, going forward, are likely to witness wider acceptability with advancements in technologies

Executive summary

Section	Key takeaways
Emerging trends in diagnostics market	3 **Playfield becoming more competitive** • Due to attractive margins, players from adjacent service areas of the healthcare ecosystem have entered the diagnostics market and become more competitive. Examples include pharmaceutical companies (e.g., Lupin), Hospitals (e.g., Max, Aster DM, Sterling), Diagnostic service aggregators, telehealth providers • Government is taking several initiatives to strengthen the public health infrastructure and make diagnostics more accessible and affordable With increasing competitive intensity in Metros and Tier-1, **lab chains are undertaking aggressive expansion** in Tier 2+ through asset-light models 4 **New business models** • **New business models around teleradiology and telepathology** to improve access, quality, and efficiency of diagnostics; Newer players include computational pathology solution providers and teleradiology service providers; Teleradiology was estimated to be a US$ 356M market in 2020 and is likely to evolve into US$ 700M market by 2025 growing at a CAGR of ~15% • **Network of partnerships:** Diagnostics ecosystem has expanded from comprising only core equipment and reagent providers to include players offering lab automation, third party logistics & ones offering tech-centered business models; With the decoupling of operating layers, models are evolving into a network of partnerships • While still at its nascency, Insurance cover for out-patient care could propel a rapid growth 5 **Supply chain innovation** • **Best in class sample logistics is fast evolving into a core enabler of a successful pathology business:** Supply chain innovations in sample processing in both pre and post-analytical stages are levers of key differentiators among the service providers. The focus is on improving sample visibility and, reliability & responsiveness of the supply chain 6 **Technology and digital** • Focus on improving **customer experience through digitalized journeys** • **Use of AI systems,** especially in image processing across radiology and pathology • **Robust IT system for fulfillment layer** – collection scheduling, sample logistics, and tracking • While the considerable focus has been on leveraging digital to become efficient and deliver customer delight, many areas of opportunity remain unexplored
Key challenges	• Key challenges facing the industry are across the regulatory, **fragmented market with a low focus on quality, commoditization and increasing competitive intensity,** nonaccess to specialized resources, and value-conscious Indian customers

Executive summary

Section	Key takeaways
Future outlook	• While the industry is poised for healthy growth at a **CAGR of 14%** to reach **US$ 20B by FY26,** diagnostic companies have certain imperatives laid out for them. These include: • **Growing their core:** Omni-channel strategy, accretive value Tier 2, 3, and 4 city expansion, stitch network of partnerships for faster growth, introducing new products • **Expansion through inorganic route and in non-core:** Expansion into adjacencies: e.g., Addition of capabilities for teleradiology and telepathology; integrated health offerings – e.g., wellness services; Data monetization or value add services • **Supply chain and operations: Improving service TAT and reliability, supply chain digitization** to enhance supply chain visibility and reliability; usage of digitalization tools such as AI for process efficiencies • **Customer acquisition, experience, & retention:** fine-tuning digital journeys for customers and enhancing loyalty • **Bottom line improvement:** With increasing competition and tests becoming more commoditized, there is a need for super-efficient operations to keep the bottom line healthy

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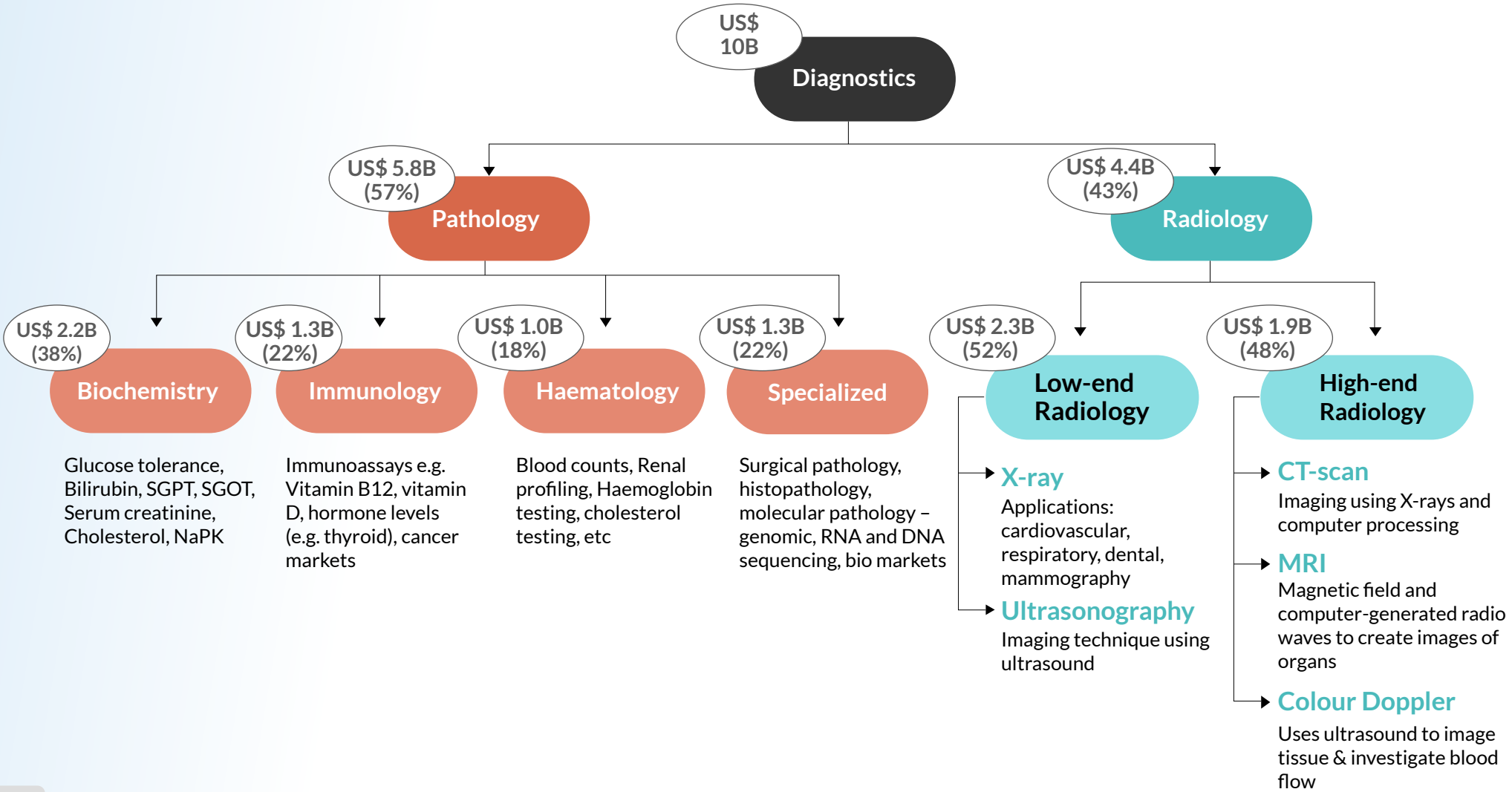
Overview of diagnostics market

In the Indian diagnostics market, biochemistry has the largest share of pathology, while low-end radiology is the largest in radiology

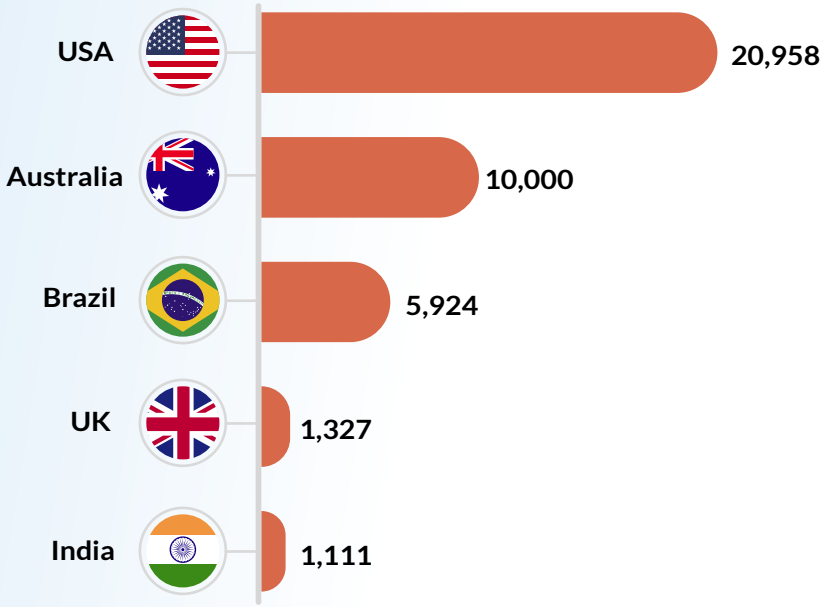


Sources: CRISIL reports, HDFC Securities report, Praxis analysis

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

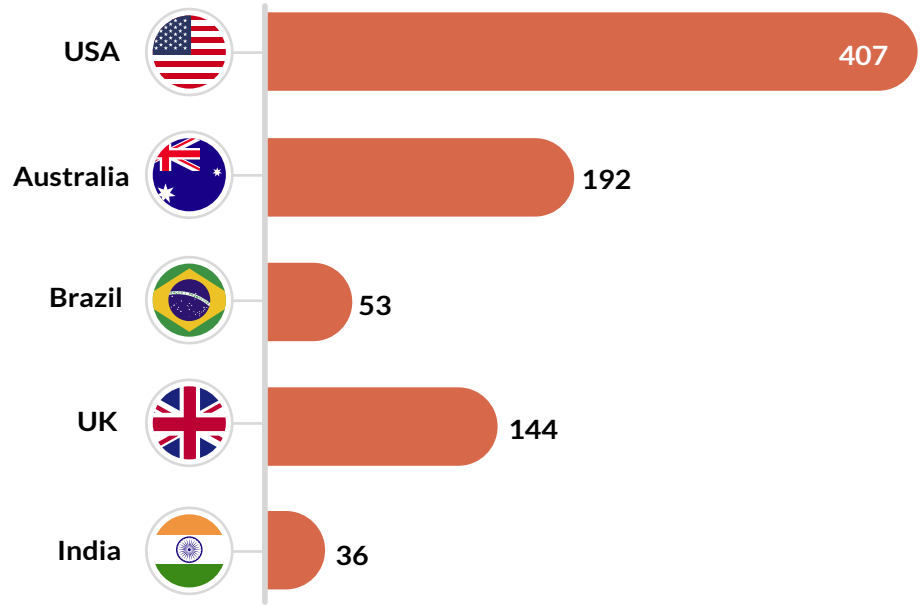
While closer to UK, number of tests performed per capita in India are far lower

Diagnostics test under penetration in India
tests per '000 population per year



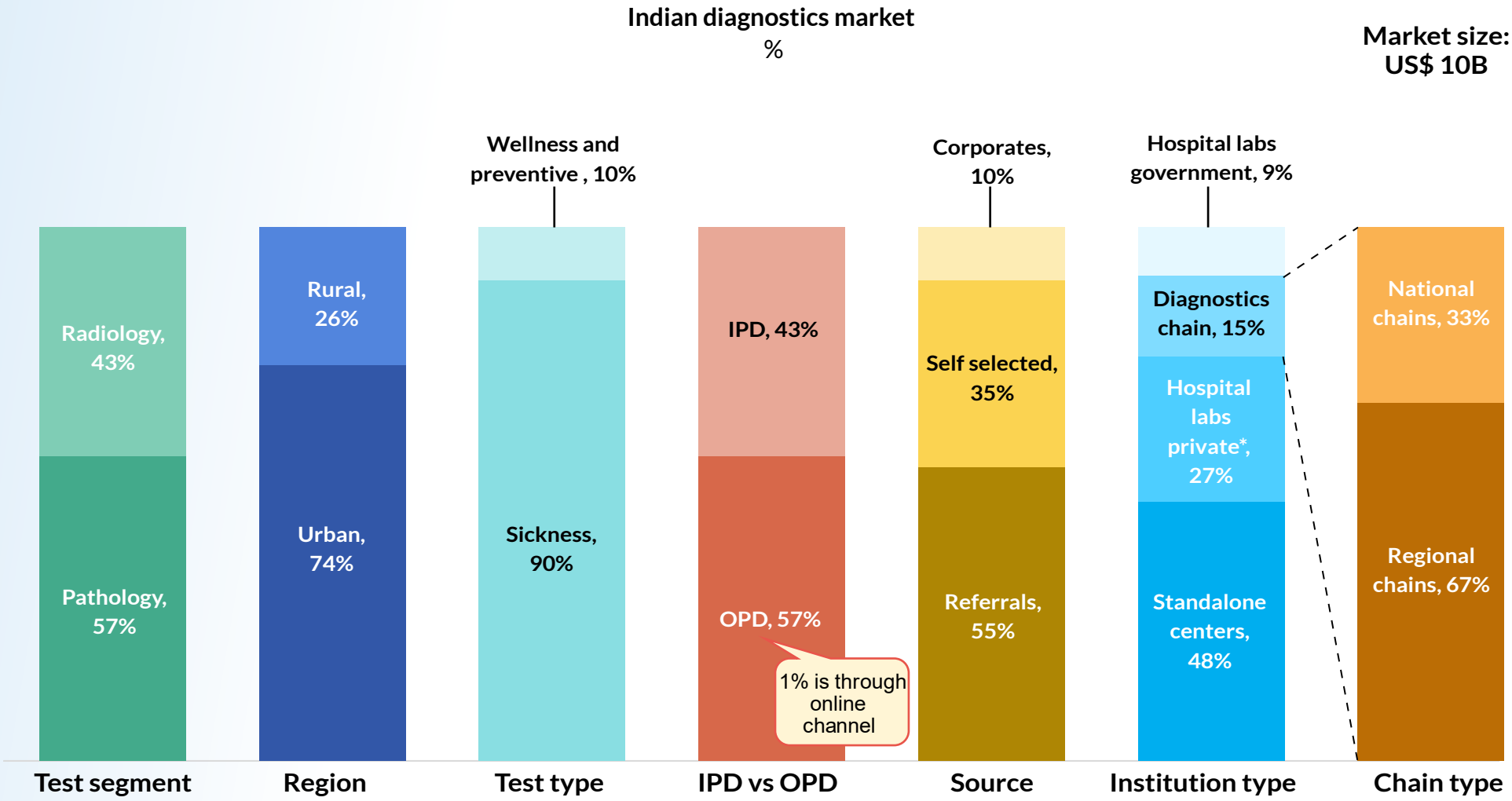
Even for imaging tests such as CT and MR, there is significant headroom for growth when benchmarked with other countries

CT and MR test under penetration in India
tests per '000 population per year



Notes: Data for US, Australia, and India is of 2019. UK and Brazil is 2018
Sources: OECD Statistics, Praxis report – Outpatient healthcare market in India, Press releases, Secondary research, Praxis analysis; American Clinical Lab Association (www.acla.com)

Standalone centers and hospital-based labs (including government labs) have an 85% share of the market; urban areas account for 74% share

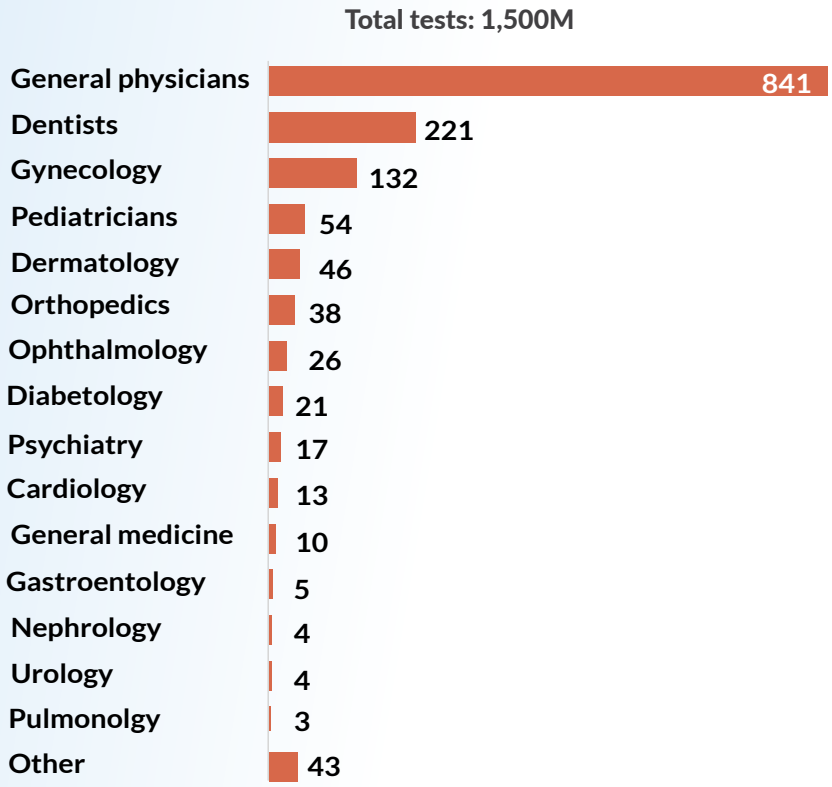


Notes: *Hospital-based labs in Institution type is inclusive of Government labs. Private and Government labs split is estimated at 75:25, and for market estimation price of tests are assumed at market prices instead of subsidized rates
Sources: CRISIL reports, HDFC Securities report, Praxis analysis

In OPD, general physicians followed by gynecologists account for the largest share of the diagnostics test prescriptions

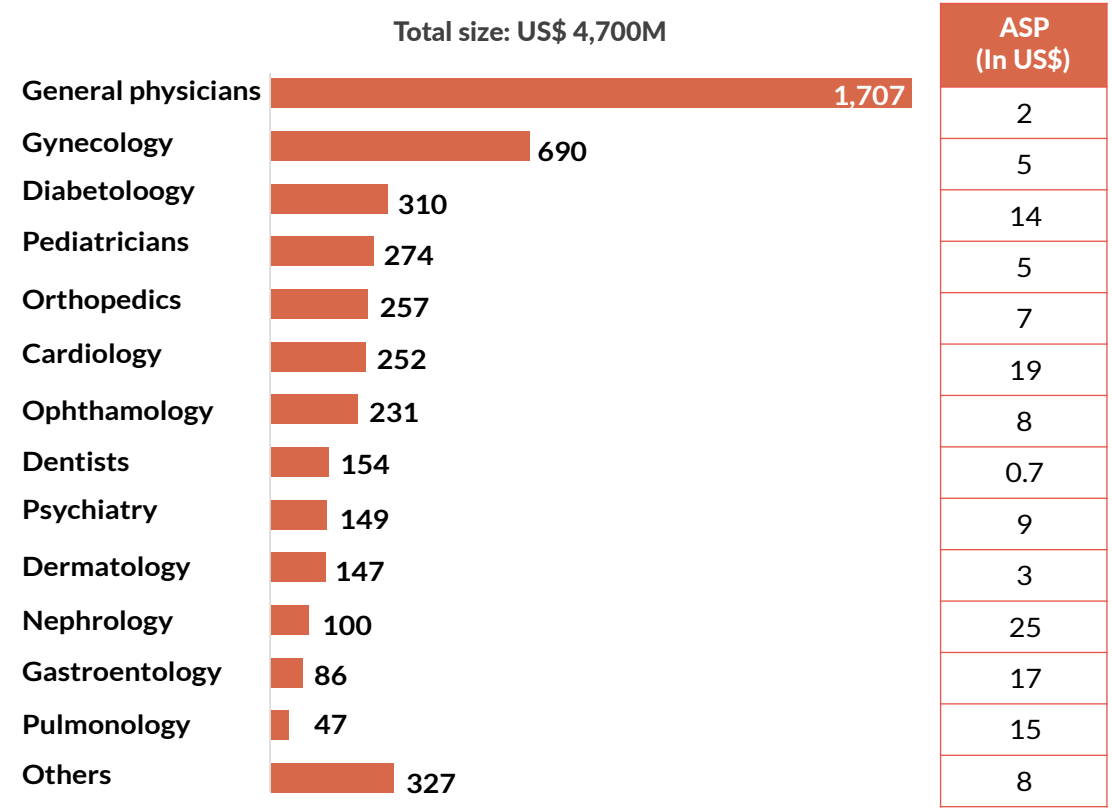
General physicians have 55% share of the diagnostics test prescription market by volume

OPD diagnostics test prescription market
#tests, M



General physicians have 36% share of the diagnostics test prescription market by value

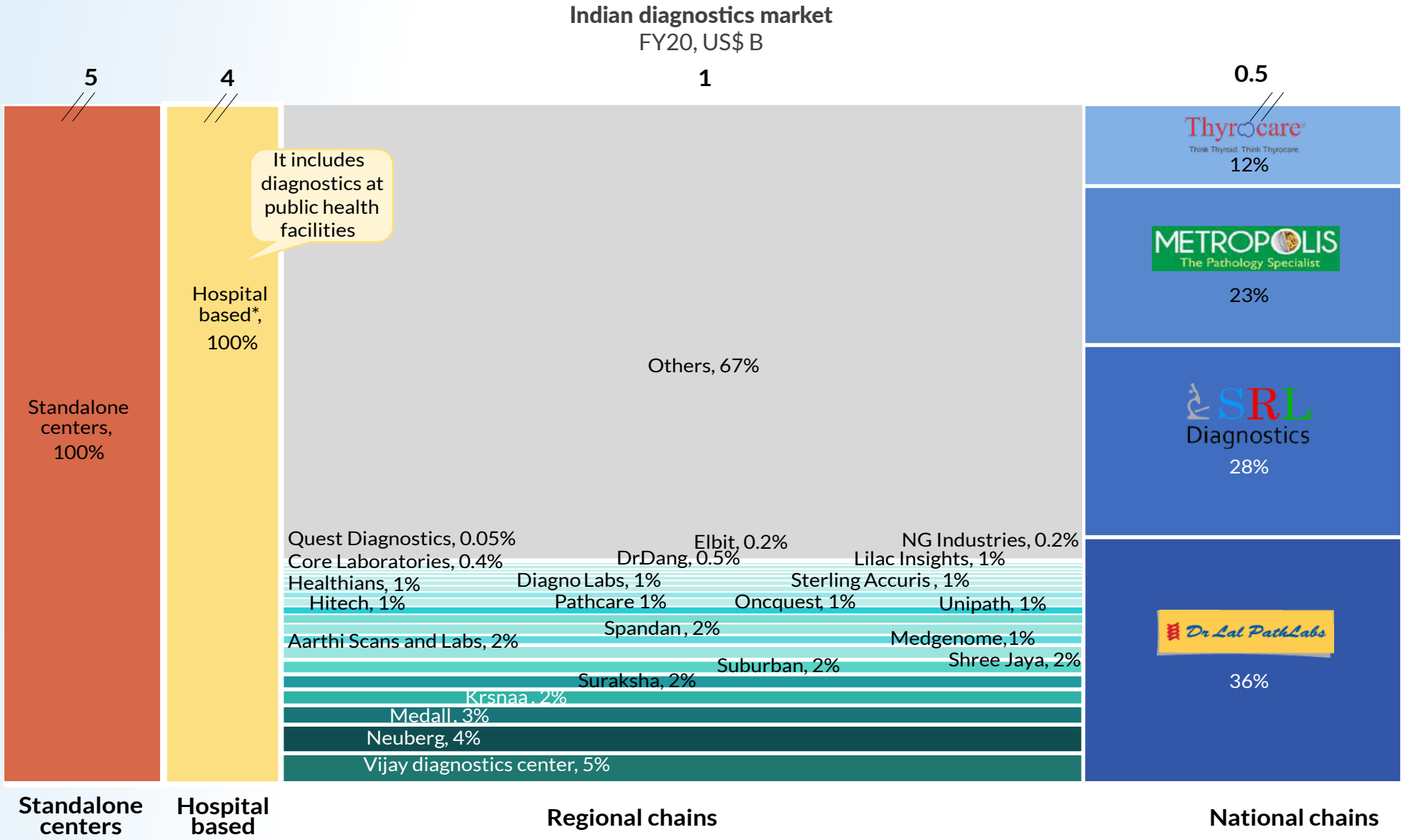
OPD diagnostics test prescription market
US$ B



ASP (In US$)
2
5
14
5
7
19
8
0.7
9
3
25
17
15
8

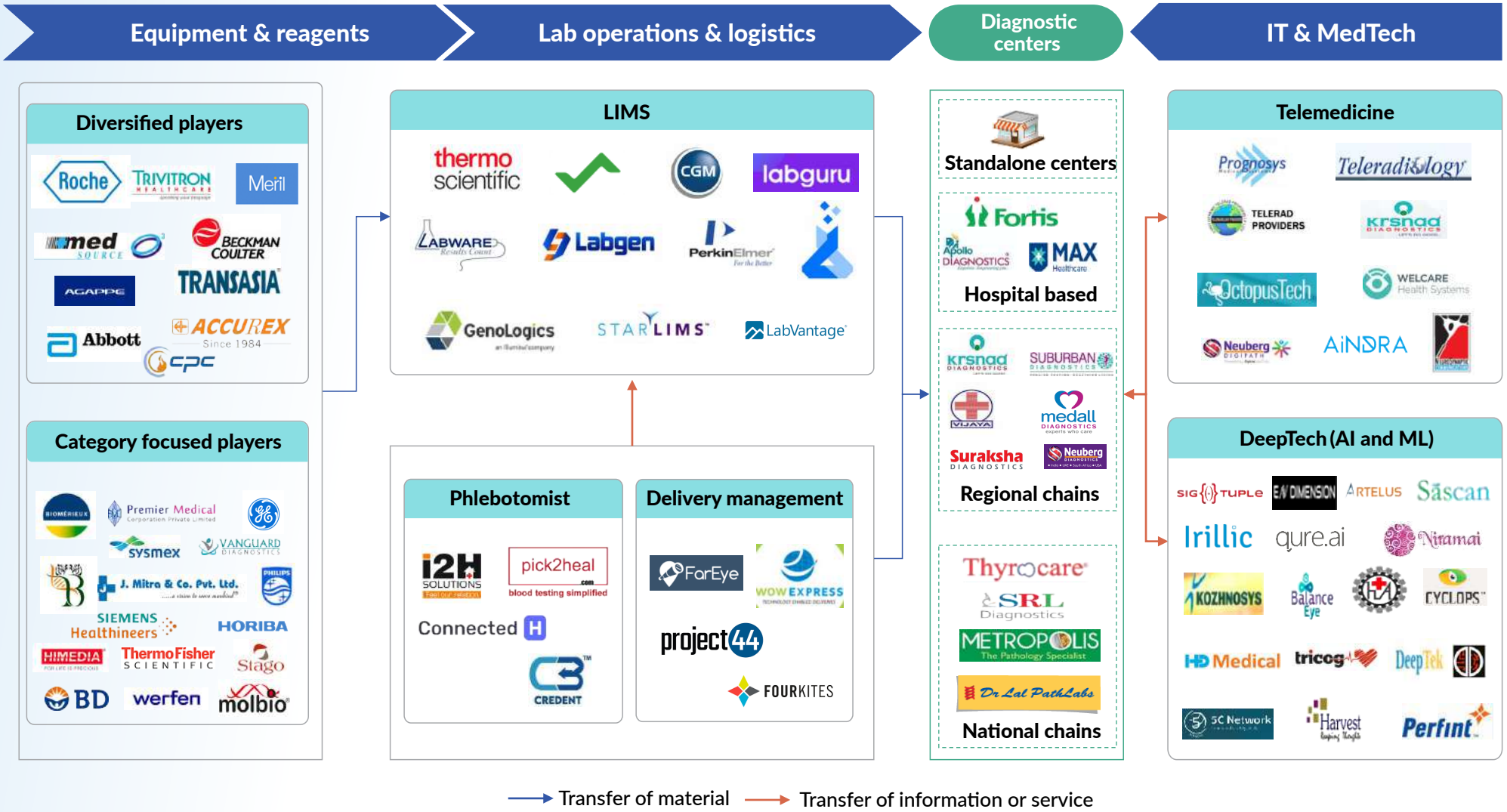
Notes: Others include General medicine, endocrinology and other specialties
Sources: Praxis report – Outpatient healthcare market in India

Standalone centers have a 48% share, followed by hospital-based labs at 37%; national chains have a 5% share, led by Dr. Lal PathLabs



Notes: Revenue for players has been estimated based on their market share in FY20. *Hospital-based labs in Institution type is inclusive of Government labs. Private and Government labs split is estimated at 75:25, and for market estimation price of tests are assumed at market prices instead of subsidized rates
Sources: Company filings, Annual reports, Tracxn, Press reviews, Analyst reports, Praxis analysis

The ecosystem has expanded from only core equipment and reagent providers to players offering lab automation, third party logistics & tech-centered business models

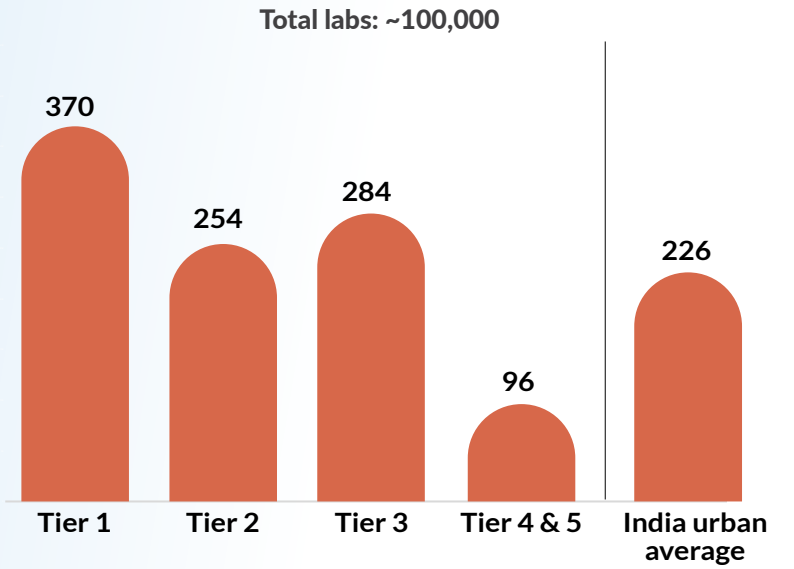


Notes: LIMS – Laboratory information management systems
Sources: Secondary research, Praxis analysis

Tier 2 and 3 cities are reasonably penetrated with headroom for growth, indicating market readiness to expand and adopt more specialized tests and technologies

In Tier 2 and 3 cities, while pathology labs have reasonable penetration, the offerings are more basic

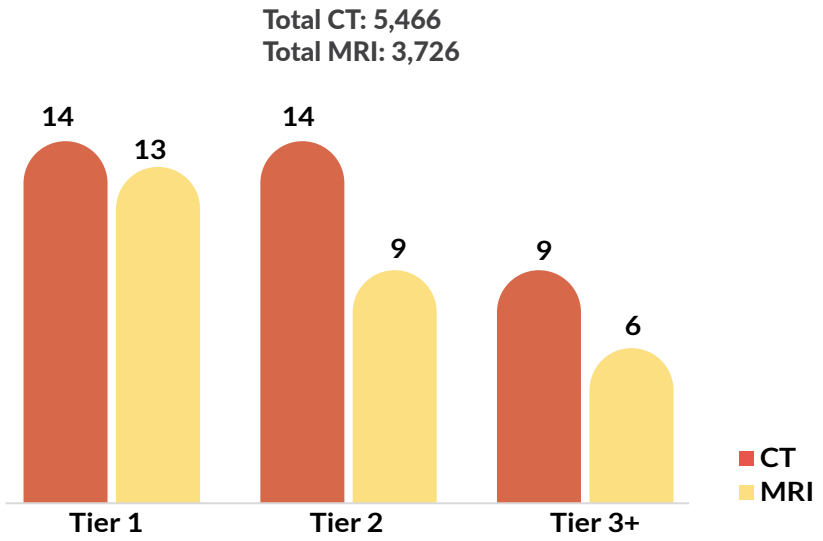
Distribution of diagnostics labs in India
per M, FY 20



Labs by tiers	43,700	20,064	19,039	17,097	100,000
Labs per city	4,370	608	241	41	185

Tier 1 and Tier 2 cities have similar penetration of CT scanners while MRI has higher penetration in Tier 1

Distribution of CT & MRI installations in India
per M, FY 20



CT by tiers	1,803	1,257	2,405	5,466
MRI by tiers	1,602	745	1,379	3,726

	Tier 1	Tier 2	Tier 3	Tier 4 & 5
Population (In M)	118	79	67	178

Notes: City tier classification criteria: Tier 1 – Population > 40 Lakhs, Tier 2 – Population 15 - 40 Lakhs, Tier 3 – Population 5 - 15 Lakhs, Tier 4&5 – Population < 5 Lakhs
Sources: Just Dial scrape, AERB database, Praxis analysis

COVID-19 shaped the market – emphasizing the need for diagnostics & treatment, influencing consumer acceptance of PoCT & home collection

	Impact of COVID
Trust on home collection	• Home collection revenues (excluding COVID business) grew by **25-30%** for most of the national chains in **FY21**
Proliferation of molecular testing	• Astronomical growth in the number of NABL accredited molecular testing labs → from **40** in **March 2020** to **1,690 in November 2021** • The additional capacity will remain in place as the pandemic subsides, which could potentially find multiple applications for the RT-PCR assay as the dominant method for diagnosing viral infections in India
Adoption of digital solutions for improving customer experience	• **Usage of apps** (from aggregators as well as diagnostics chains) for booking tests increased multifold and is likely to increase as customers would continue to **book tests online** post COVID • Several diagnostics chain players have improved their online presence and invested in automating and expanding the customer support team
Usage of tele-diagnostics solutions	• Multiple players have implemented technology to allow their technicians and pathologists to read images remotely to drive better utilization of expert resources

Sources: Secondary research, Praxis Analysis

Contents

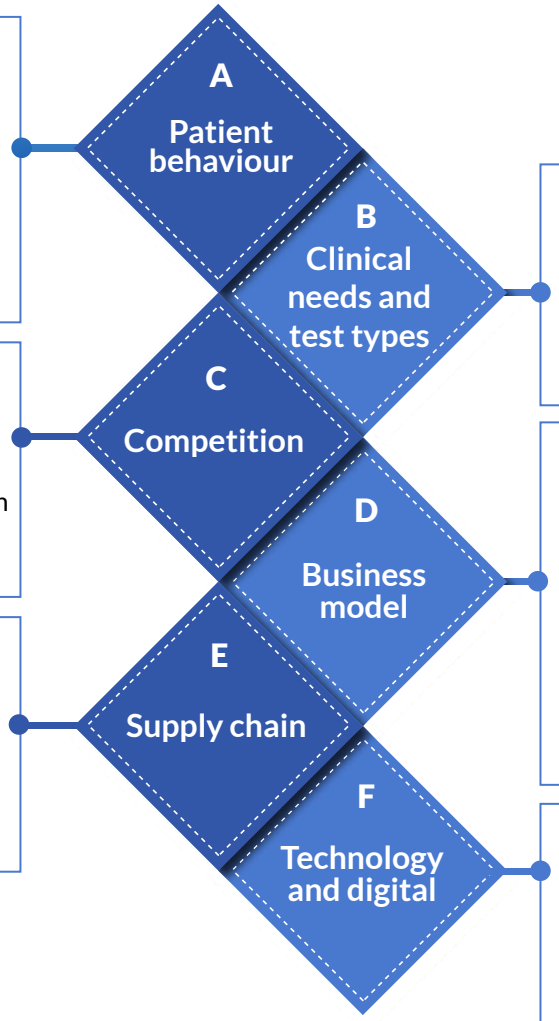
Emerging trends

Emerging trends in Indian diagnostics market

- **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, wellness tests
- **Improving experience**: Attractive economics as patient experience is the focus

- **Entry of players from allied industries:** pharmaceuticals, hospitals, telehealth service providers, online players aggregating and setting up own labs
- **Public investment:** Government is investing significantly in strengthening diagnostics capabilities in the public health network

- **Visibility:** Visibility has increased due to delivery management software (Real-time visibility of patient samples)
- **Reliability and responsiveness of supply chain:** With automation of the supply chain, reliability has increased, and TAT has decreased



- **Personalized medicine:** Incorporation of genomic testing in certain clinical areas (oncology, prenatal, etc.)
- **Point of care tests** for an earlier start of the right treatment
- **Cancer screening**: Below 20% of cases are diagnosed before stage 3 and have a high survival rate

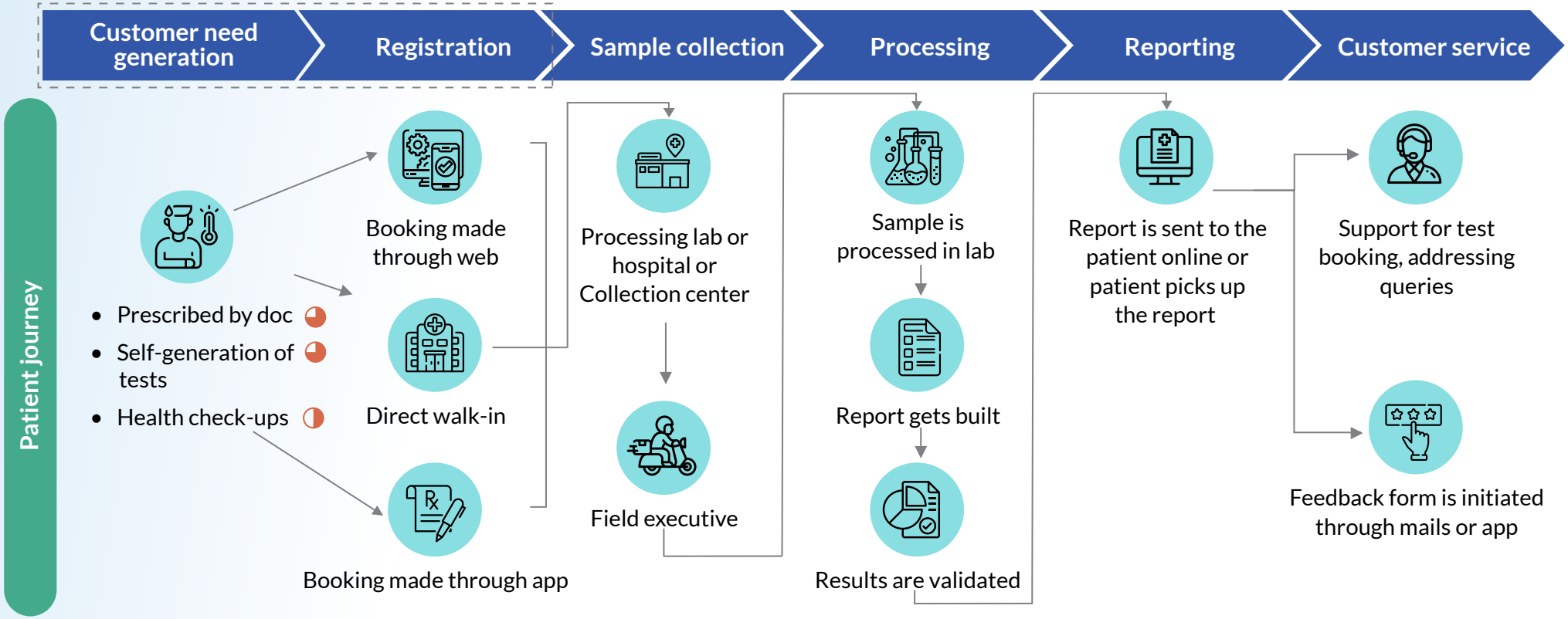
- **Asset-light expansion** in Tier-2, 3, and 4 cities
- **Remote diagnostics:** Incorporated telemedicine services
- **Decoupling of operating layers**: Customer-facing, fulfillment layer, and backend labs, e.g., online aggregators, lab partner networks, outsourced
- **Payors and financing:** OPD health insurance coverage is still at its nascency
- **Corporate wellness:** Corporates are increasingly becoming benevolent, offering curative as well as wellness services

- Focus on improving **customer experience through digitalized journeys**
- **Use of AI systems,** especially in image processing across radiology and pathology
- **Robust IT system for fulfillment layer:** Collection scheduling, sample logistics, and tracking

Sources: Praxis analysis

Evolving patient behaviour

A Customers are increasingly seeking convenience, reliability and going for wellness-related tests



Behavioural change

- **Seeking convenience - Ease of test booking, home pickup, choice of slot**
- Seeking packages and discounts
- Preference for branded service provider
- Lab recommended by doctors, friends, and family
- Increased focus on preventive & wellness tests
- Corporate wellness
- Test tracking, report access through email, app, other ways
- Easy to read reports for customers
- Ease of maintaining medical records
- Longitudinal analysis of historical reports
- Easy to access and responsive customer service

Weightage and level of preference

Low ○ ◔ ◑ ◕ ● High

Notes: Does not include the online supply chain (1mg, etc)
Sources: Primary research, Praxis analysis

A For self-initiated tests & regular check-ups, online platforms are preferred; customers also desire additional value-added services while booking tests online

Online platforms are emerging as customer preference for self-initiated and regular check-ups

Preferences of online platforms across tests types	Self-initiated tests	Regular check-ups	Doctor prescribed tests
Online platforms	●	◕	◑
Branded lab chains (e.g., national and regional chains)	◕	◕	◕
Other private standalone labs	◔	◑	◕
Hospitals	◔	◑	◑

Majority of customers believe following additional value-added services can make their online diagnostic test experience better

Additional value-added services by customers while booking tests via online platforms	
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	◑

Emerging preference

Low ◔ ◑ ◕ ● High

Sources: Customer conversations, Secondary research, Praxis analysis

A Price, quicker access to reports & home collection facility are the primary reasons for the selection of diagnostic service provider

Reasons for preferring online platforms as diagnostics service provider	
Price competitiveness	●
Quicker access to reports	●
Convenience of at-home sample collection facility	●
Quality of service being provided	◕
Accuracy of the reports	◕
Prominent brand name of the provider	◕
Hygiene factors	◑
Availability of tests within the hospital	◔
Safety procedures and practices of the facility	◔

Emerging preference

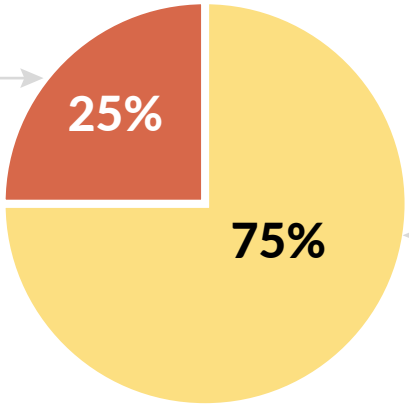
Low ◔ ◑ ◕ ● High

Sources: Customer conversations, Secondary research, Praxis analysis

A

~75% of the customers prefer home collection over lab walk-ins and are willing to pay rupee 75 - 100 extra for the same

Preference for customers among home collection versus lab walk-ins
In %



- Already satisfied with services
- Proximity of test center nearby
- Prefer walk-ins as its convenient
- Better accuracy of tests data
- Trusted labs don't have home collection facility
- Concerns on sample getting affected
- Better prices

- Convenient & hassle-free
- No wait time
- Ease of booking slots
- Free home sample collection facility
- Lack of proximity to labs

Willingness to pay

- Customers are **willing to pay rupee 75 -100** for the home sample collection facility

Preference factors

Low — High

Sources: Customer conversations, Secondary research, Praxis analysis

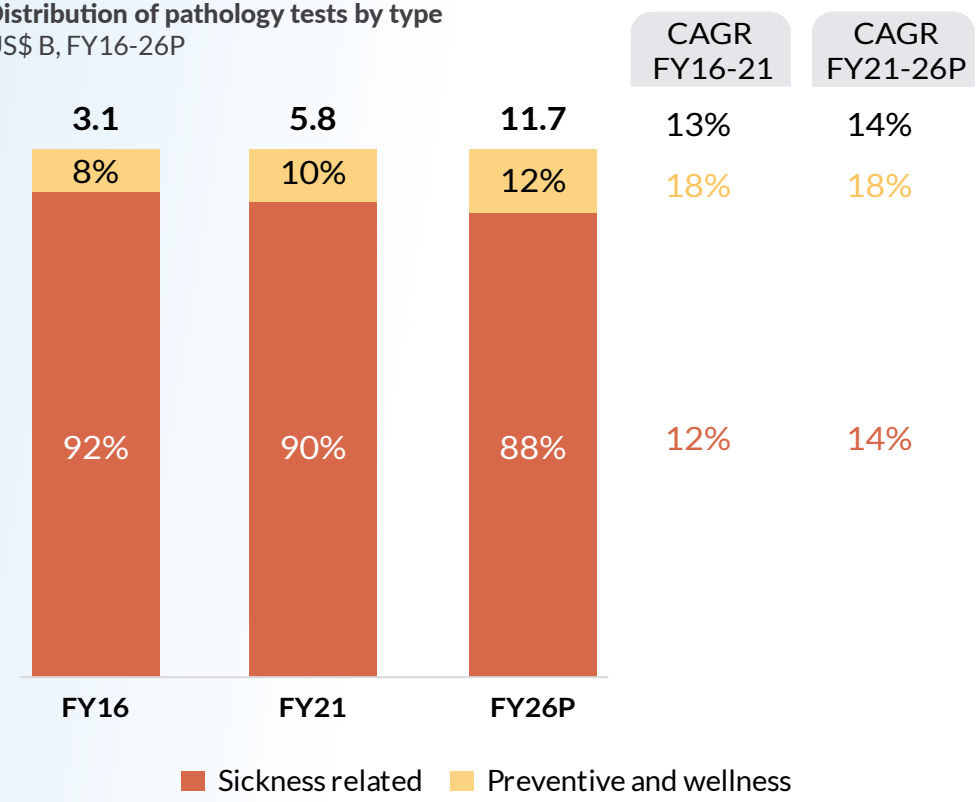
A

Consumers are increasingly adopting preventive and wellness related tests

Share of such tests is estimated to increase from ~10% to ~12% by FY26 at a CAGR of 18%

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

Distribution of pathology tests by type
US$ B, FY16-26P



Growth drivers for preventative tests

- Increasing awareness for personal immunity and preventive healthcare post COVID-19
- Rise in disposable income among the Indian population (Section 80D of Income Tax Act allows income deduction of rupee 5-7K for preventive health check-ups)
- Government's push towards developing new models for health and wellness as part of the National Health Mission
- Corporate sectors are now encouraging employees to undergo preventive healthcare testing in order to boost workplace productivity
- Focus of online aggregators is moving towards the preventive and wellness segment of diagnostics
- Advances in the medical field such as preventive genetic testing will also push more people towards preventive healthcare

Sources: CRISIL, Secondary research, Praxis analysis

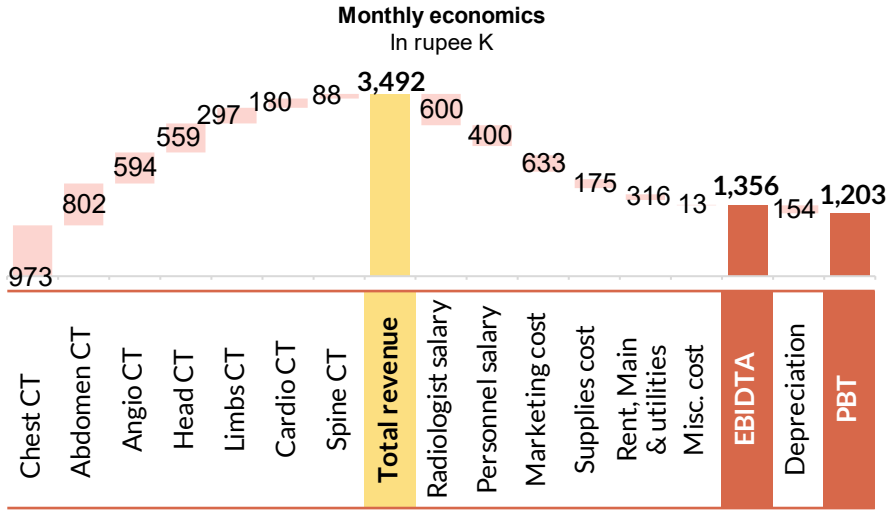
Evolving patient behaviour

A While radiology has many pain points being addressed, the attractive economics of this segment offers growth opportunities

Several key challenges exist to be solved across the value chain of imaging (e.g., CT scan), such as shortage of advanced labs, shortage of transparency in procedure charges, etc.

	Need and discovery	Selection of the lab	Preparation & scanning	Report & analysis
Pain points	Insufficient information about process	Not enough labs for advanced CT	Uncomfortable preparation for scanning	Could not understand or delay in report
	First-timers and are scared of CT scan	Shortage of female radiologists and technicians	Radiologists did not brief about the process	Delay in report
			Fidgeting and movement	Price charged more than expected
			Contrast dye being uncomfortable	

With attractive economics and these challenges remaining, radiology is emerging as an attractive segment (illustrative economics for CT scan unit at the large hospital)



Return on CT scanner	
Total investment	~₹ 18 M
RoI*	~56%
Simple payback	~2 years
EBIDTA	~ 39%
PBT	~ 34%

Notes: US$ 1 = rupee 75; *Calculated on PAT = 0.7*PBT (30% tax assumed)
Sources: Primary conversations, Secondary research, Praxis analysis

B Specialized and wellness tests are the key segments projected to be growth drivers for the Indian clinical testing market

Segments by clinical area	Test Mix	Growth outlook	Rationale
Routine tests Such as **CBC, lipid profile,** urine culture, etc.	• In volume mix, this category is the major contributor to the **volume,** i.e., **40-45%** of total clinical tests; however, in value terms, it's just **12-17%**	⬆	• Routine + semi-specialized tests that are primarily **biochemistry pathology, immunology, and microbiology constitutes 75-85%** of the total clinical tests volume • Year on year growth in these segments is projected to grow at **10-15% year on year**
Semi specialized tests Such as **diabetes, thyroid,** liver profile, etc.	• In volume mix, this category is the second major contributor to **volume** i.e., **35-40%** of total clinical tests however in value terms it's **25-35%**	⬆	
Specialized tests Such as molecular diagnostics for **colorectal cancer tests, lung cancer tests, somatic panel tests, etc.**	• In volume mix, this category is the second least contributor to **volume,** i.e., **15-22%** of total clinical tests; however, in value terms, it's already the highest, i.e., **40-45%**	⬆⬆	• Molecular pathology testing, which is more of **genomics, genetic-based DNA, and RNA segment** sequencing, is poised to **grow at 35-40%** year on year • Some of the key factors driving the growth are finding alternative utilization of the rapidly installed base for PCR & rapid test products during the pandemic, growth in lifestyle diseases, etc.
Wellness tests Such as **cholesterol, BP,** mammogram, etc. under annual health check plans such as from corporates and individuals	• In volume mix, this category is the least contributor to the volume, i.e., only **1-3%** of total clinical tests; however, in value terms, it's already a healthy **10-11%**	⬆⬆	• Wellness testing will **grow to double that of sickness testing** for the next 20-25 years – till wellness is 60-70% of the total, which is just 10% currently • This is dues to **increased offerings, awareness, and adoption of bundled tests profiles** and wellness packages

Diagnostics market outlook

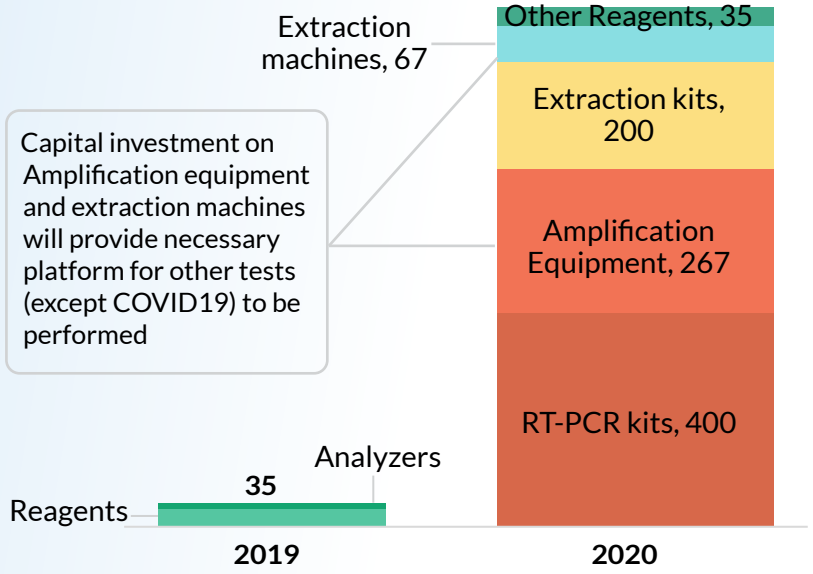
⬆ At par market growth ⬆⬆ Above market growth

Sources: Metropolis investor presentation, Industry reports, Press reviews, Praxis analysis

B Infrastructure for molecular testing expanded multi-fold during COVID, which in a post COVID world could be used to create a market for new viral tests

Indian molecular diagnostics market grew exponentially in 2020 with COVID19 creating additional sales of ~US$ 934M (est.)

Indian Molecular diagnostics market
US$ M, CY19-20



Evolution of market

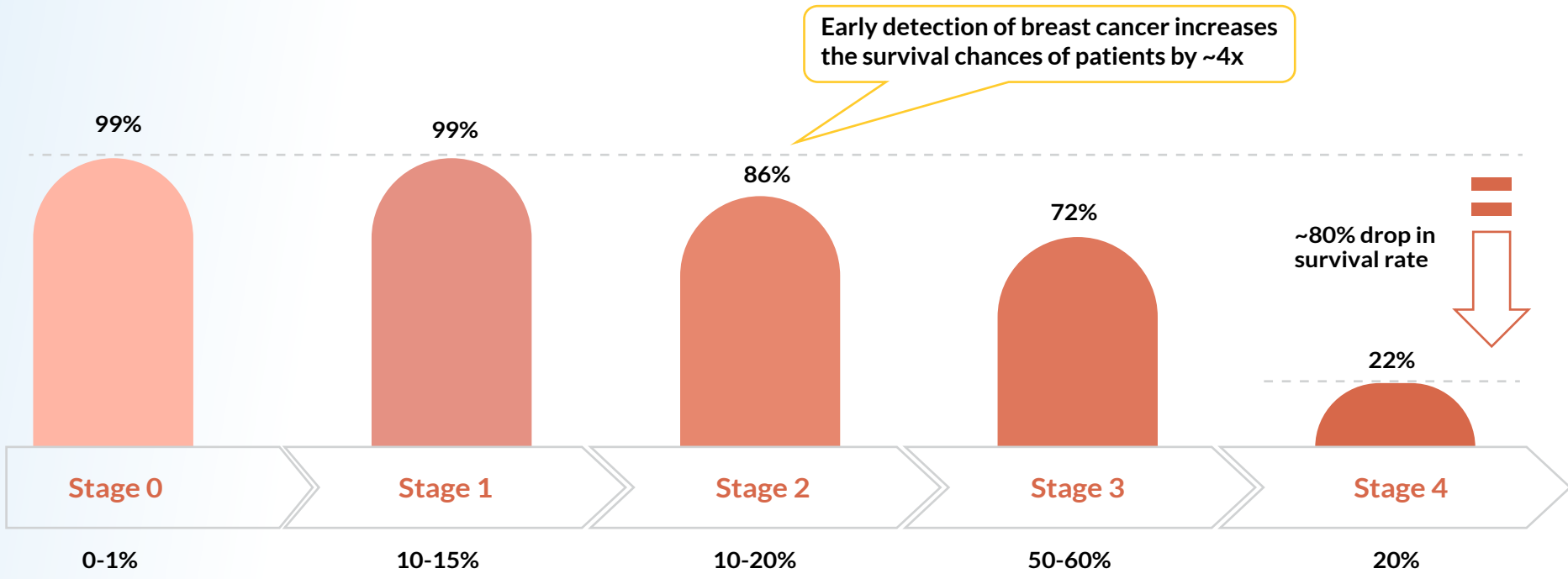
Pre-COVID19 market	• Niche segment in India with only a few active players due to low volume requirements • The largest sub-segments, including HIV, HBV, and HCV reagents (US$ 14M) and TB reagents (US$ 13M), constituted ~80% of the market
Impact of COVID19	• Many companies entered the market, with 30+ companies getting manufacturing licenses and 119+ companies getting import licenses • **Multi fold capacity expansion undertaken** – Anywhere between 2x-10x by RT – PCR & raw material suppliers of **enzymes and reagents** such as Thermo Fisher Scientific, Promega Corporation, NEB, Bio-Rad, Qiagen, and Takara Bio
Expected evolution Post-COVID19	• **Alternative applications for ramped up capacity of molecular testing equipment** – The additional capacity will remain in place as the pandemic subsides, which could potentially find multiple applications for the RT-PCR assay as the dominant method for diagnosing viral infections in India such as **TB (3 M cases in FY20), septicemia (11 M cases in FY20), meningitis (15K cases in FY19 and other CNS (central nervous system) infections**

Notes: 1 US$ = rupee 75
Sources: MCA filings, primary conversations (N = 46), Secondary research, Praxis analysis

Healthcare

B Less than 20% of breast cancer cases get diagnosed early (before Stage III)

Breast cancer 5-year survival rate across stages

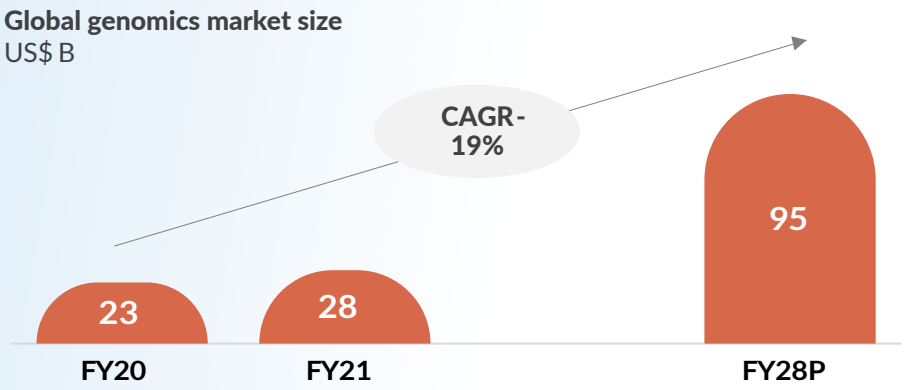


	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4
Diagnosis rate	0-1%	10-15%	10-20%	50-60%	20%
Description	• There may not be a lump that can be felt during a self-examination • There may be no other symptoms	• Earliest stage of invasive breast cancer • Tumor is <2 cm, and no lymph nodes are involved	• Tumor between 2-5 cm • Spreads to the lymph nodes under the arm	• Locally advanced breast cancer • The tumor is >2 inches and extensive in the lymph nodes or has spread to other tissues	• Metastatic breast cancer • Spreads beyond the breast, underarm, and mammary lymph nodes to other parts of the body

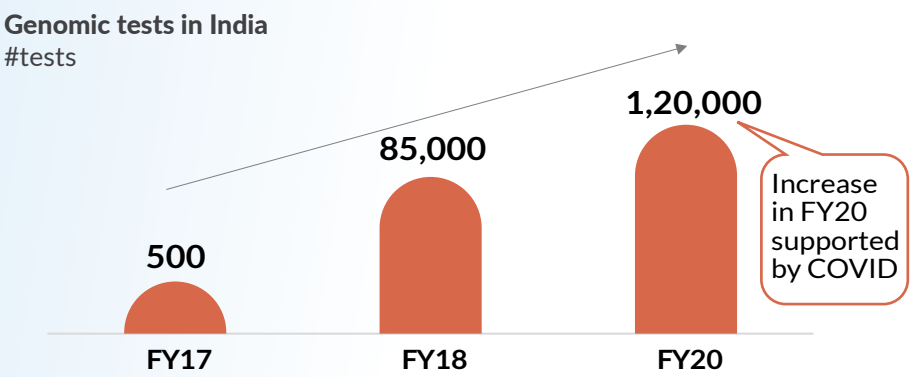
Notes: For ovarian cancer - the TNM staging, subsequent treatments and 5- year survival rates remain similar; and FIGO and AJCC stage ovarian cancer into I, IA, IB, IC, II , IIA, IIB, IIIA1, IIIA2, IIIB, IIIC, IVA, and IVB; diagnosis rates imply what % of people get detected with cancer across stages
Sources: Oncology research papers; Praxis analysis

B Global genomic testing market is expected to grow at ~20% CAGR; In India too, tests are being increasingly used for oncology, reproductive health, and predictive testing

The global genomic market is expected to grow from US$ 28B in 2021 to US$ 95 in FY 2028 at CAGR of 19%



Number of tests done by MedGenome* has shown exponential growth from FY17-19



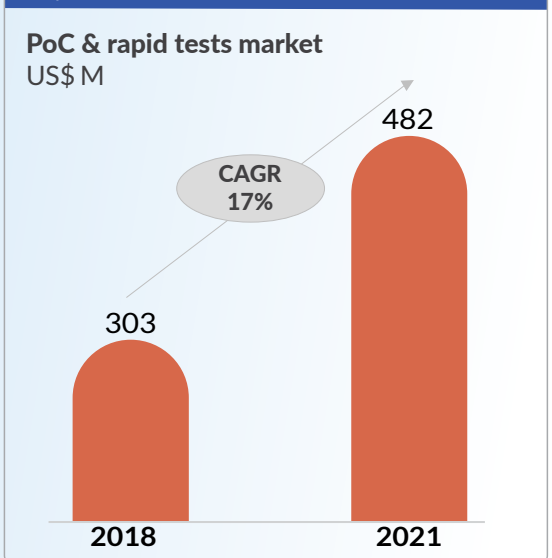
Growth drivers for Indian genomic market

- **Increased use in the management of cancer and rare diseases:** With an increase in incidence and early detection of cancer, clinicians are relying on these tests to decide the best line of treatment
- **Pre-symptomatic testing:** Increased use to confirm or rule out a suspected genetic condition and the probability of the development of a genetic disorder or the same being passed on to the next generation
- **Government initiatives:** Projects like "Genome India Project" and "IndiGen" to further drive the genomic diagnostics market in India
- **Entry of new players in the market:** Involvement of private sector laboratories in genome sequencing tests during the COVID period to increase the genome sequencing capacity of India
- **Increased awareness about the genomic industry:** Will increase the number of people willing to pay for DTC as well as B2B2C genomic testing

Notes: India's leading genomic solutions company into oncology, reproductive health, inherited diseases and infectious diseases. It started in 2013 in the US and India.
Sources: Industry reports, Secondary research, Praxis analysis

B PoC and rapid tests have seen a wide acceptance during COVID and in future are likely to witness wider acceptability with the advancement in technologies

PoC & rapid tests market scaled to U$ 482M in 2021



City tier	TAT	Awareness	Relevance	Accuracy	Testing urgency
Description	• Enables instant or quick diagnosis and administration of treatment plan	• Awareness amongst patients in metros is on the rise • Doctors or hospitals want to become a one-stop solution for aware patients	• Medium to high in clinical decisions taken by doctors • Acts as the biggest driver in tier 2 cities	• Satisfactory accuracy levels achieved as per doctors w.r.t. the time taken • Trade-off between speed and accuracy favorable for PoC test for many use cases	• Establishing a set of basic PoCT devices helps GPs or specialists, or hospitals in getting better first-hand information and is quite helpful in times of emergency where time is of essence
Metro	●	◕	◑	◑	◔
Tier 2	◕	◔	◕	◕	◑
Tier 3	◕	○	◑	◑	◕

Barriers to adoption of PoCT

City tier	Low accuracy	Absence of trust	High cost
Description	• Accuracy achieved via PoCT is not 100% satisfactory. Doctors want highly accurate readings (>90% accuracy) as sometimes a second verification test from a traditional laboratory has to be done, and it defeats the purpose of PoCT	• Trust is a major factor with PoCT as sometimes the patients are skeptical about the results and sometimes even doctors are not 100% confident about the PoCT outputs	• Zero willingness amongst patients to pay rupee 500 for a test when the consultation fee itself is not more than rupee 200 • In case of specialists in tier-3 cities, PoCT isn't as feasible due to high initial costs
Metro	◕	◑	◔
Tier 2	◕	◔	◕
Tier 3	◑	◕	●

Intensity level
Low ○ ◔ ◑ ◕ ● High

Notes: Sophisticated PoCT devices: POC devices other than glucometer, sphygmomanometer, oximeter and infrared thermometer
Sources: GP & specialists IDIs (N = 45), Hospital IDIs (N = 5), Expert interviews (N = 3), PoCT player interviews (N = 8), Tracxn, BIRAC, PGA Labs analysis

Competition

C Due to attractive margins, players from adjacent service areas of the healthcare ecosystem have entered the diagnostics market and made it more competitive

Player type	Market actions
Pharma companies	• One of the major pharma companies plans to set up its **National Reference Laboratory** in Navi Mumbai, and **plans to open 100 labs and 1000 collection centers** pan India in the next 3 years • Another Pharma giant **commercialized its RT-PCR test kit** 'ViraGen' for COVID-19 • And launched a **portable wireless spirometer** for diagnosis of chronic obstructive pulmonary disorder (COPD) and asthma
	• Whereas another player **launched diagnostic center chain** in 2017, and is currently expanding in Maharashtra and other western & central states of India
Hospital chains	• One of the national chains **formulated a wholly-owned subsidiary focused on diagnostics**
Comprehensive telehealth service providers	• An online pharmacy player **acquired** 66% stake in Thyrocare, the **fourth largest diagnostics chain in India**
	• Whereas the other competitor in this space **acquired** Droplet, a **logistics company specializing** in home sample collection for diagnostics labs • And another player in this space launched **phlebotomist services for consumers to avail lab tests** from the comfort of their homes
Diagnostics service aggregators	• An online platform for health services, **launched health testing at home in 100 new cities in the country** by recruiting 1,500 support staff, including pathologists, phlebotomists, lab technicians, etc.
	• Whereas another provider **expanded its diagnostic solutions** to 3500+ routine and specialized tests for hormone testing, genomic testing, routing pathology investigations, etc.

Sources: CRISIL, Secondary sources, Praxis analysis

Competition

C Government is taking initiatives to strengthen the public health infrastructure and make diagnostics more accessible and affordable

Recent policies

Free diagnostics service under NHM

- **Timeline:** FY18 – ongoing
- Free radiology and pathology services **at SHCs, PHC, CHCs, District & sub-district hospitals** to reduce high out-of-pocket expenditure
- Tests include hematology, serology, biochemistry, clinical pathology, microbiology, radiology, and cardiology. However, States are free to add to the list based on their priorities

National Program for Prevention & Control of Cancer, Diabetes, Cardiovascular Diseases & Strokes

- Timeline: FY19 – ongoing
- Free treatment to poor people at SCIs or TCCCs
- Preventive screening for ~7 Cr; 67K cancer, 99K strokes, 42 lakh Hypertension, 33 lakh Diabetes and 2 lakh cardiovascular diseases cases diagnosed

National Essential Diagnostics List

- **Timeline:** FY19 – ongoing
- **105** general lab tests, **30** disease-specific tests, and **24** radiology tests to address a critical gap in the **standardization of medical devices and IVD devices**

Pradhan Mantri Atma Nirbhar Swasth Bharat Yojana

- **Timeline:** FY22 – 26
- Support for 17,788 rural HWCs, and 11,024 urban HWCs through the establishment of **integrated public health labs in all districts**

Ongoing initiatives

Procurement of imaging equipment by State govts

- Procurement of equipment such as CT and MR by state govts for in-house public facilities
- **For CT:** States such as Maharashtra, Karnataka, Gujarat & Kerala floated **~ 122** tenders between 2020 – 21
- **For MR:** States such as Maharashtra, Telangana, Uttarakhand & Kerala floated **~ 48 tenders** between 2020 - 21

Diagnostics centers under PPP model

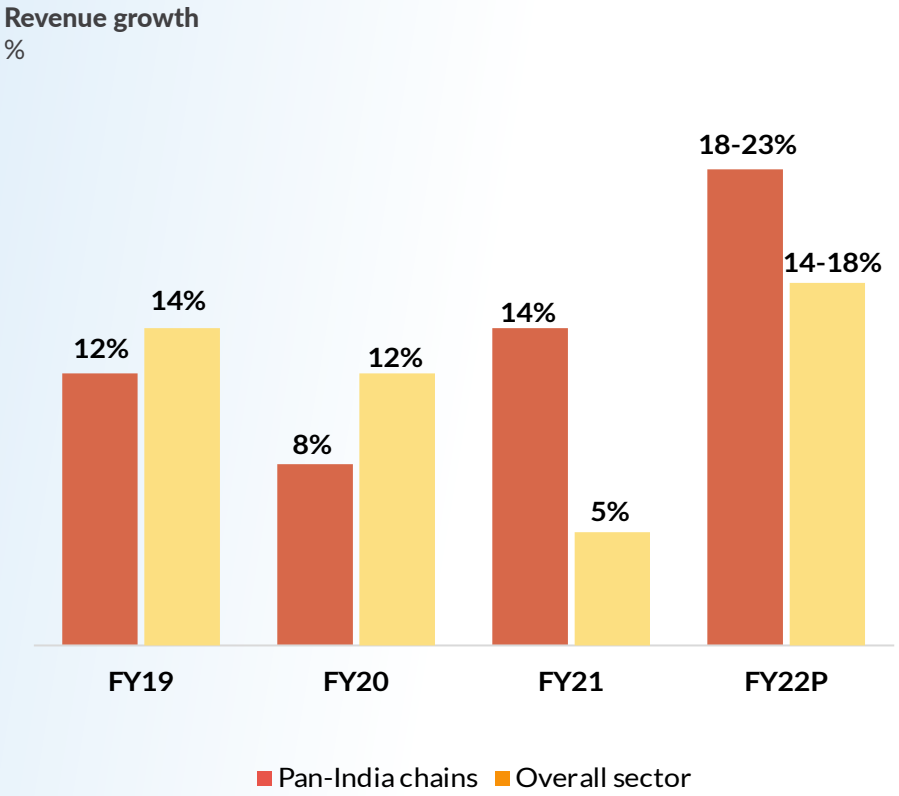
- **1,797 centers** under the PPP model operated by Krsnaa Diagnostics across 14 states
- Expansion of hub & spoke centers as 1,127 centers added in the last three years

Notes: SCI: State Cancer Institutes; TCCC: Tertiary Cancer Care centers
Sources: MoHFW website, Secondary sources, Praxis analysis

Competition

C Despite competition, organized labs are expected to have better revenue growth than others due to their wider test portfolio, better customer experience, and deeper reach

Pan-India chains are witnessing faster revenue growth since the beginning of the pandemic



Rationale for shift towards organized labs

Customer preference for accredited labs	• NABL accredited labs increased from 347 in 2012 to 1,880 in Mar-21, which have mostly been from the organized chains segment • Organized lab chains have been able to capitalize on the COVID testing market due to their existing capabilities for molecular diagnostics
Lower costs and better customer experience	• Organized segment has a lower price for the tests primarily due to lower costs enabled by a hub and spoke operating model • Organized labs provide a better customer experience by having online portals for test booking, home collection, tracking, and report generation
Increase in lab penetration due to investments an M&A	• Vijaya Diagnostics & Krsnaa Diagnostics raised rupee 1,895 Cr and rupee 1,213 Cr through IPOs for increasing their network labs and testing capabilities • National chains are acquiring regional chains to expanding footprint

Sources: CRISIL, Secondary sources, Praxis analysis

Business models

D Due to increased competition in Metros and Tier-1, lab chains are undertaking aggressive expansion in Tier 2+ cities through asset-light models

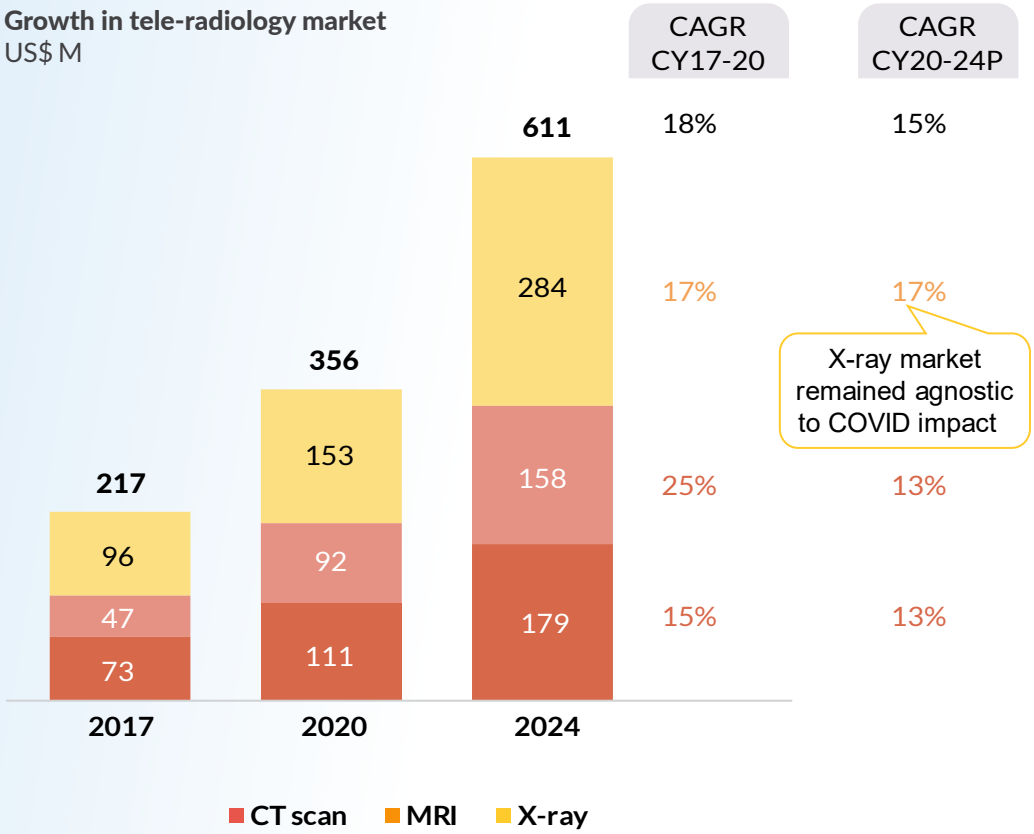
Route for business expansion	Details
Acquisition and consolidation of labs	• **Online players betting big on diagnostics, e.g., Pharmeasy's acquisition of Thyrocare** • Acquisition of larger stand-alone facilities, and regional chains for geographic expansion and establishing pan-India presence
New labs in T2+ cities	• Lab chains are fast **expanding through organic and inorganic routes in Tier 2+ cities** • Diagnostic chains **going for IPO seek aggressive growth** across city tiers
Collection centers	• Lab chains are further **deepening their presence** in multiple cities across the country through collection centers, patient service centers, pick-up points, etc. e.g., some of the key national chains have a s**trong network of over 14K collection centers and over 55K patient touchpoints**

Sources: Analyst presentations, IPO reports, Secondary Analysis, Praxis analysis

Healthcare

D To cater to the latent demand, teleradiology is seeing wider adoption and is likely to expand in T2, T3, and T4 cities

Teleradiology market in India is projected to grow at a CAGR of 15% to reach US$ 611 M in 2024



Drivers of adoption	Description	Benefits
Cost benefits of teleradiology	• In case of **low scan volume,** in-house radiologist salary can become an unrecovered fixed cost	• Teleradiologist paid on a per scan or % scan price basis resulting in cost-effectiveness • **~40% cost saving** in the radiologists cost*
Lower reporting TAT	• Availability of a single or smaller team of 2 – 3 radiologist increases the reporting TAT	• **Distribution of scans** among the larger panel of tele-radiologist making it possible to report multiple scans all at once
Shortage of radiologists	• Unavailability of in-house radiologist • Unexpected increased scan volume	• Wider panel of radiologist with **varying skills and experience**
Shortage of experienced staff	• Occasionally in-house or associated radiologist do not have expertise to interpret complex cases	• Wider panel of radiologist with varying skills **and expertise to solve complex cases**

Notes: Teleradiology market size (TAM) = (# Installed base of radiology equipment) X (# Radiology scan) X (Teleradiologist fees per scan) ; Installed base and number of scans are sourced from secondary research, while teleradiologist fees is sourced through conversations with industry experts
Sources: Secondary research, Praxis analysis

Business models

D Even in pathology, wherever images are involved, players are investing to make business plans around remote diagnosis and improve quality and efficiency of diagnostics

Plays	Offering	Players (illustrative)
Service providers	• Digitization of tissue slides • Access to a large pool of histopathologists to analyze images for domestic and international markets	AINDRA, Digiscan™ Leader in Digital Pathology, Neuberg DIGIPATH Powered by OptraScan Inc.
In-house use of Technology	• Hospitals and diagnostic chains adopting solutions esp. for cancer diagnostic	Dr Lal PathLabs, HCG adding life to years

Computational pathology solution providers	• **AI-powered digital pathology solution for cancer diagnostics**
	  • Significant improvements in diagnostic efficiency, with a 25-30% reduction in time-to-diagnosis compared to conventional microscope viewing,
	  • 1 - to 2 - day reductions in total turnaround time
		• Philips – Ibex Medical tie-up
		• Roche – Ibex tie-up for workflow and AI analysis for cancer

Sources: Secondary research, Praxis analysis

Business models

D With the decoupling of operating layers, models are evolving into a network of partnerships

	Customer facing layer	Logistics	Backend sample processing	Reporting
Conventional diagnostic operations	• COCO collection centers • Hospital labs • B2B pickup points	• Own logistics	• Own labs • Home grown LIMS	• Report preparation by the labs themselves
Modern diagnostic operations	• Online aggregators	• Third party logistics	• Partner labs • Robust LIMS providers	• Teleradiology • Telepathology
Examples	Healthians, redcliffe lifetech	pick2heal (blood testing simplified), DROPLET (Acquired by 1mg)	Healthians, redcliffe lifetech	Krsnaa Diagnostics, Telerad Providers, Welcare Health Systems, Neuberg Diagnostics

Sources: Secondary research, Praxis analysis

D Business models are evolving fast to align with customer preferences

Key partners

- **Decoupling of layers:** Home pickup businesses and third-party phlebo networks
- Technology partnerships: sample movement & tracking, LIMS

Value proposition

- **Convenience:** At home collection
- **Pricing:** bundling of tests, pricing discounts
- **Accuracy and reliability:** COVID has prompted the shift towards branded players
- **Readability of report:** 80% of patients cannot understand their report

Channel

- Franchising of labs, partner labs
- **Proximity to the customer:** collection centers, pick-up points
- **Online channels:** digital customer acquisition, online test booking

Customer Segments and relationship

- **Affordable and value services** (e.g., value radiology)
- **Condition specific segments:** Onco, elderly, chronic ailments
- **Owning the customer:** Growth of online models
- **Loyalty:** Increasing criticality of loyalty with increasing competition

Cost structure

- **Asset light models** - Deepening presence in multiple cities across the country through collection centers, patient service centers, pick-up points, etc.
- **Reagent rental models:** Pay per use to reduce upfront CAPEX
- **Centralization of resources:** Tele-models – radiologists, histopathologists, lab-work
- **Computational pathology:** Better accuracy, higher productivity

Revenue streams

- **Newer tests:** Molecular diagnostics, genomics, health, and wellness tests
- **Remote diagnostics:** Telepathology and teleradiology services

Sources: Praxis analysis

Financing and payers

While still in nascency, insurance cover for out-patient care could propel a rapid growth

Launched in June 2020 and currently only serving B'lore

		digit	Manipal Cigna Health Insurance	Max Bupa Health Insurance	care HEALTH INSURANCE	even
# network hospitals		5,900	6,500	6,700	8,250	11
Claim settlement ratio %		~94%	~91%	~96%	~93%	
% penetration of OPD policies		• 5-10% of retail health policies sold include OPD cover	• 5-10% of retail health policies sold include OPD cover	• 5-10% of retail health policies sold include OPD cover	• 5-10% of retail health policies sold include OPD cover	• All plans cover OPD consultations and diagnostics
Policies with OPD cover	Policy name	• Smart + OPD	• ProHealth Plus	• GoActive	• Comprehensive	• Even Plus
	Hospitalization cover	• 5L	• 6L	• 5L	• 5L	• 50L a year per family member
	OPD cover (rupee)	• 5,000 (25% copayment in year 1) • **Net OPD cover: 3,750**	• 2,000 (no co-payment) • **Net OPD cover: 2,000**	• 2,400 (no co-payment) • **Net OPD cover: 2,400**	• 5,000 (no co-payment) • **Net OPD cover: 5,000**	• Unlimited doctor consultations • Unlimited diagnostic tests
	Premium (rupee)	• Without OPD cover: 4,300 • With OPD cover: 6,300 • **Premium for OPD cover: 2,000**	• Without OPD cover: 7,093 • With OPD cover: 8,170 • **Premium for OPD cover: 1,077**	• Without OPD cover: 7,697 • With OPD cover: 8,874 • **Premium for OPD cover: 1,177**	• Without OPD cover: 6,621 • With OPD cover: 10,535 • **Premium for OPD cover: 3,914**	• With OPD cover: Starts at 1,050 per month
	Premium (rupee)	• 53%	• 72%	• 49%	• 78%	
	Claim process (OPD expenses	• Bills reimbursed in 3 working days (cashless through Godigit app)	• Bills reimbursed in maximum 7 working days (cashless through Medibuddy app)	• Bills reimbursed in maximum 7 working days (through Max Bupa website or app)	• Bills reimbursed in 7-10 working days (cashless through their app)	• Procedures are already paid for, no need to file claims (cashless)
	Diagnostics Coverage	• All necessary and prescribed diagnostics up to the extent of sum insured	• All necessary and prescribed diagnostics up to the extent of sum insured	• Diagnostics test are allowed in lieu of permissible annual health check-up expenses	• All necessary and prescribed diagnostics up to the extent of sum insured	• Unlimited coverage of diagnostics test prescribed by partner doctor and carried out at partner hospital or lab

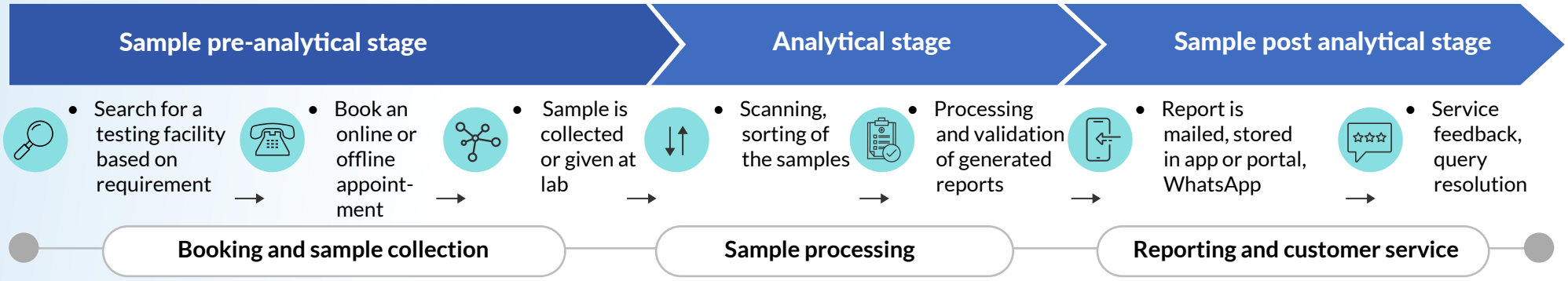
Notes: OPD cover here refers to expenses that do not require hospitalization; All policy prices based on 27 year old male living in Metro

Sources: Company websites, Agent interviews, Insurance aggregator websites, Praxis analysis

More favorable — Less favorable

Supply chain

E Supply chain innovations in sample processing pre and post-analytical stages are levers of key differentiators among the service providers



Pain points

Booking and sample collection

- Order entry, patient, and specimen misidentification
- Sample collected from infusion route
- Inappropriate container while handling sample
- Storage and transportation issues

Sample processing

- Sorting and routing of samples
- Time and or speed of centrifugation
- Pipetting and labeling of the samples
- Equipment malfunctions, QC loss

Reporting and customer service

- Transcription errors & improper data entry
- Incorrect interpretation of ranges
- Excessive turnaround time (TAT) in reporting
- Failure or delay in reporting critical values

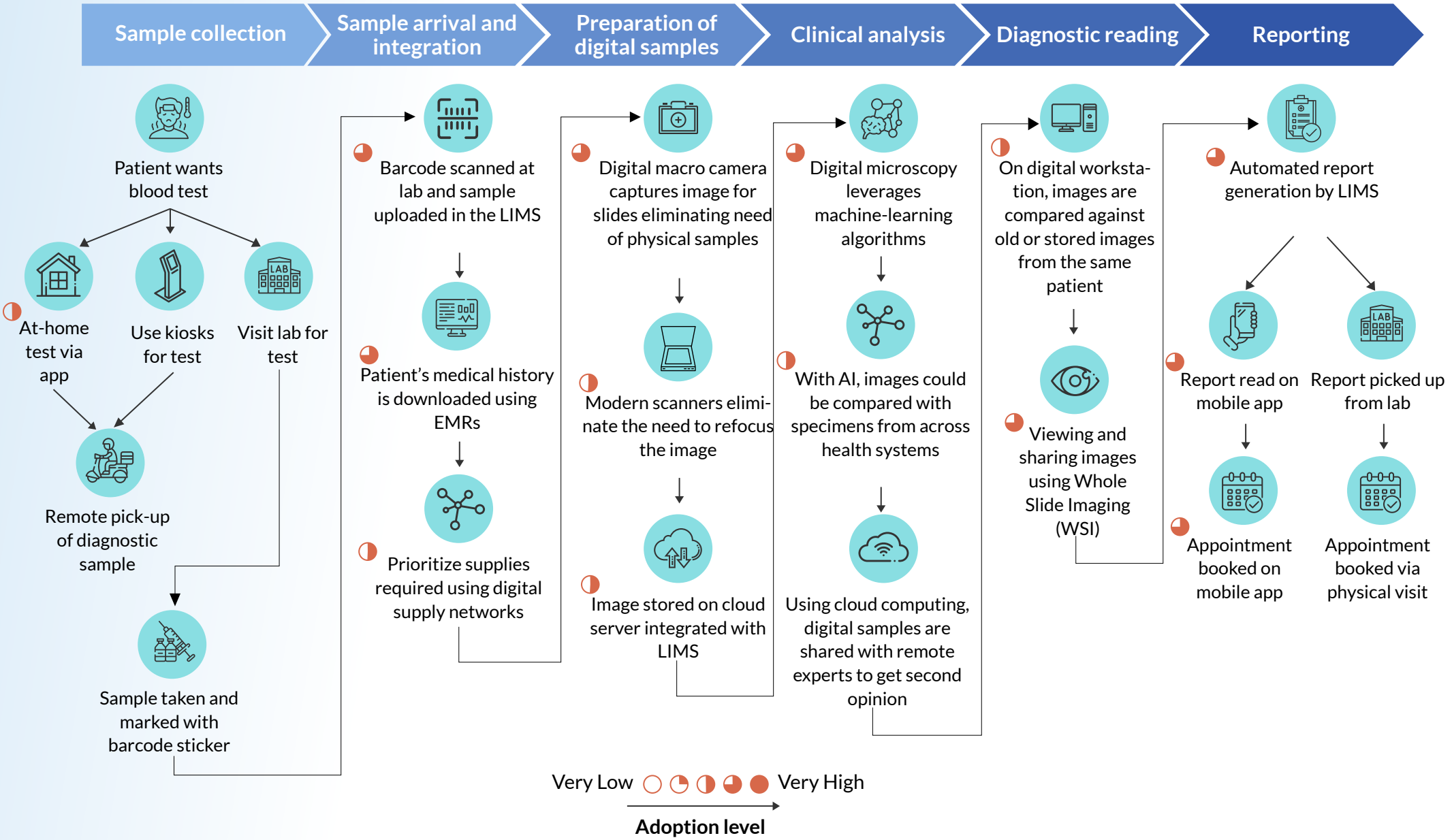
Innovation trends

- Adoption of software to **coordinate and track phlebotomists** such as SLA buckets while collection (home or in-lab)
- Develop and track **sample acceptance and rejection criteria** which are linked to the monitoring of the collection and transport processes
- Adopting tools and monitor guidelines for **container usage, transport temperature or time and safety, within-laboratory** pre-analytical temperature or time or safety criteria
- Tracking of key quality metrics such as blood culture **contamination rate, specimen labeling error rates**, etc
- **Adoption of wider TAT** i.e., from request to report generation instead of the sample received to reporting
- Leveraging tools of information technology such as **electronic medical records, clinician order entry, electronic handbooks and embedded hyperlinks in reports, etc.**

Pain points
Low ○ ◔ ◑ ◕ ● High

Sources: Industry reports, Press reviews, Praxis analysis

F Digital transformation is happening across areas in diagnostics



Sources: Praxis analysis

Healthcare

F While considerable focus has been on leveraging digital to become efficient and deliver customer delight; many areas of opportunity remain unexplored

Customer Experience	Operational processes	Business model

Digital strategy aligned with business strategy → Business model driven by digital

Customer understanding
- Analytics based segmentation
- Knowledge from social engagement

Process digitization
- Automation
- Performance improvement
- New features

Digitally modified business
- Product and service augmentation
- Transitioning physical to digital
- Digital wrappers

Top line growth
- Digitally enhanced selling
- Predictive marketing
- Streamlined customer processes

Employee enablement
- Working anywhere anytime
- Knowledge sharing
- Better and faster communication

Digitally enabled offerings
- Digital products
- Reshaping organization boundaries

Customer touch points
- Customer service
- Cross-channel coherence
- Self-service

Performance management
- Management insight systems
- Data driven decision making

- Unified data and processes
- Analytics capability
- Business & IT integration
- Ecosystem – partnerships
- Portfolio – new incubation

Low adoption ○ ◔ ◑ ◕ ● High adoption

Sources: Primary research, Praxis analysis

Contents

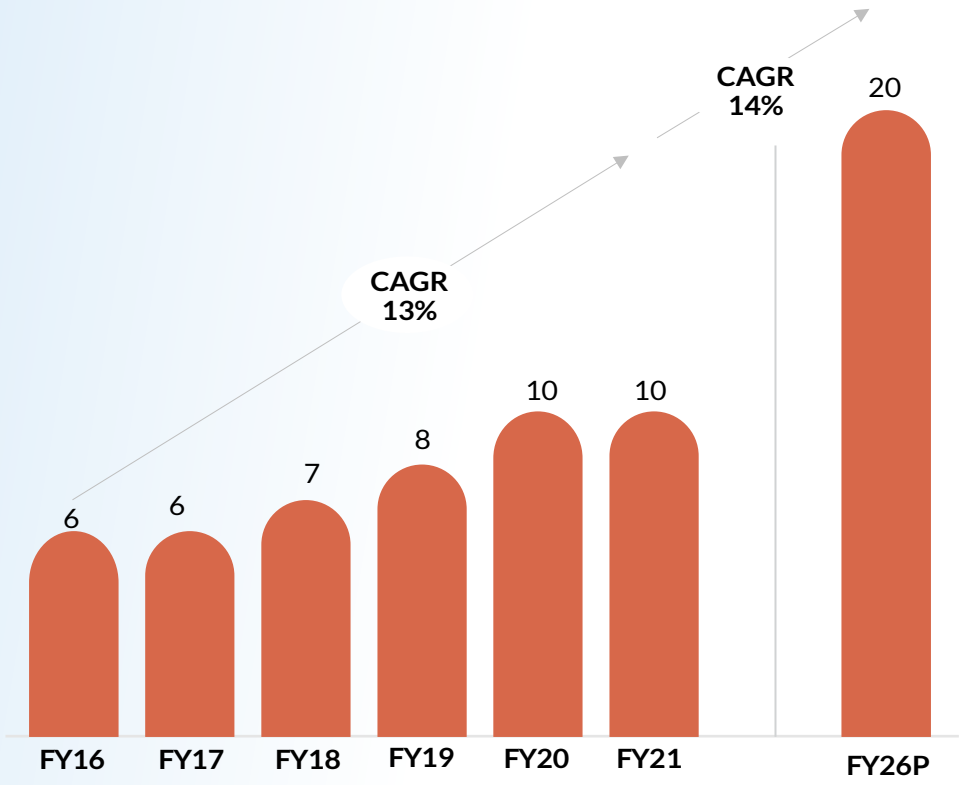
Future outlook

Future outlook

Indian diagnostics market is projected to grow at a CAGR of 14% & reach US$ 20B by FY26

Diagnostics market grew at a CAGR of 13% to reach US$ 10B in FY21

Size of diagnostics market in India
US$ B, FY16-26P



Growth drivers	Expected growth rate	Rationale
Population	1.0%	• India population expected to grow annually at ~1% from FY21-FY26
Urbanization	2.5%	• With increasing urbanization, diagnostics market is expected to grow
Penetration	5.0%	• Penetration expected to improve by 5% driven by access (home collections), affordability and focus of state governments on establishing labs under PPP model in under-served locations
Tests or patient	2.0%	• Higher awareness about preventive care, test mix moving towards specialized tests
Realization per tests	2-4%	• Pathology: Growth in realization per test has been ~4% from FY17-FY20 • Radiology: Realization is lower due to the dependence on referrals (Channel margins), but growth in teleradiology is driving growth in realization per test • Effect of cost controls on the essential test could be balanced out with increased volumes (as witnessed historically in the case of Malaria and Dengue) and a shift in test mix towards specialized tests
Diagnostics CAGR FY21 – 26	~14%	• Pathology: The growth rate is expected to be ~15% • Radiology: Growth rate is expected to be in the range of 11-13%

Notes: US$ 1 = rupee 75
Sources: CRISIL report, Praxis analysis

Future outlook

Challenges facing the industry

Challenges	Likely impact
Regulatory	**Price control, especially on tests covered under NEDL – Low likelihood** • Focus likely to be on ensuring the tests are provided to patients who need it • Barring exceptional situations, Government will allow markets to operate
	High margin, high volume 'routine tests' may face pricing pressure. • Government is likely to invest in augmenting diagnostics infrastructure, which, if utilized well, may impact unorganized labs more • Could lead to the growth of the industry as 'evidence-based treatment' would find higher acceptance
Fragmented market, low focus on quality	**NABL is not mandatory and not likely to be made mandatory in medium terms** • Industry is highly fragmented, and enforcing accreditation may not be feasible • Consolidation would drive focus on quality in medium to long term
Commoditization and increasing competitive intensity	• Pricing pressure could be there on semi-specialized and specialized tests; however, with scale, margins can still be maintained • Will require Companies to work on increasing ticket size through bundling of tests, promote health and wellness tests, and introduce specialized tests
Access to specialized resources	• Emerging models like teleradiology and telepathology could address this issue
Value conscious market	• Could witness value products from leading OEM to address the value segment across Tiers of cities

Sources: Praxis analysis

Imperatives for diagnostic companies

Opportunities

Growth in core

- **Channels:** Omni-channel strategy
- **New Products:**
  - **Bundling of tests:** Design and bundling of tests into packages, a greater number of specialized tests
  - **Leadership in emerging test categories:** Emerg ing tests such as genom ics, molecular diagnotics, etc.
- **T2 and 3 expansion:** Network expansion in T2 and T3 cities in-align with an increase in penetration of healthcare services
- **Network of partnerships:** e.g., Franchising of labs to increase reach

Growth in non-core and inorganic

- **Evaluation of M&A** opportunities to grow geographically
- **Adjacencies:** e.g., Addition of capabilities for telera-diology and telepatholo-gy; integrated health offerings – e.g., wellness services
- **Data monetization or value add services:** Provide value added services through the analysis of longitudinal data for disease risk assessment and chronic care management

Supply & ops

- **Service TAT and reliabil-ity:** Optimize service delivery in new cities to ensure consistent coverage
- **Supply chain digitiza-tion:** Implement a control tower set up to enhance supply chain visibility and reliability
- **Tech for process efficiencies:** Usage of digitalization tools such as AI for process efficiencies

Customer acquisition, experience, & retention

- **Customer Loyalty:** Institutionalize touchpoint and integrated NPS capability; integrate NPS 3.0
- **Digital journeys for customers:** Robust best-in-class digital journeys. Improve UI/UX through personalization, booking and appointments, medical profiles, family profiles, recommendations, etc.

Bottom line improvement

- **Super efficient network:** With the growth in footprint, changing demand patterns, economics, and technology, redesign the network to balance TAT and cost to serve
- Improved tech integration and reduction of cancellation, the efficiency of own Phlebo team

Sources: Secondary research, Praxis analysis

Contents

Praxis offerings

Healthcare

How can we add value to diagnostics? – Praxis Global Alliance

Strategy and Transformation

- Digital transformation
- Portfolio & Growth strategy

Growth and Scale-Up

Business expansion

- Domestic market share improvement and expansion
- Micro-market evaluation

Business expansion

- Adjacencies
- Expansion into radiology
- Pricing, Bundling, Packages & Discounts

Data monetization

Omni channel strategy

State wise market share growt

Cost and Performance Excellence

Reduction in cost per reportable test:

- Procurement cost reduction
- Consumption optimization

Network optimization

Control Tower Transformation

Product cost and product profitability

KPIs: Board to lab alignment of KPIs

Customer Loyalty and Experience

- **Customer loyalty:** Patients, Doctors, hospitals, corporate customers
- **LTV maximization**
- **Digital integration with doctors, hospitals, patients**

Investment Advisory

- Commercial due diligence
- Target screening

Enablement and Implementation

- Post merger integration
- Project execution

Sources: Secondary research, Praxis analysis

Healthcare

Our solutions to help increase shareholder value

Customer loyalty and experience

- Measurement of loyalty (NPS)
- Design initiatives to improve CLTV and lower customer acquisition costs

Network optimization

- Analysis of demand, footprint, economics, and resources
- Define leaner network operating models

Operational efficiency

- Benchmarking operational KPIs
- Design and implement operations performance improvement initiatives

Market share improvement

- Regional market share improvement
- Identify growth opportunities e.g. test bundling, B2B, etc.

Control Tower

- Implement control tower set up to makes both operations cost and service efficient

Cost of test reduction

- Holistic analysis of direct costs across a comprehensive set of levers

Board to lab alignment of KPIs

- Aligning business objectives with the team and individual goals
- Establishment of performance measurement metrics

Sources: Praxis analysis

Connect with us

We will be happy to share perspectives

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Build together. Win together.

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