IMPACT OF

COVID-19

ON THE

DIAGNOSTICS

INDUSTRY

COVID-19 has boosted the demand for testing tools & kits, giving a growth trajectory to the diagnostics market; the industry would further gain from the inflow of funds for innovation from non-diagnostic companies

Current Situation

- Diagnostic solutions such as testing kits & reagents, patient monitoring solutions, and digital X-ray are experiencing **exceptionally high demand** whereas non-essential systems like MRI and interventional solutions are losing sales
- The companies are prioritizing their efforts and workforce for the **production of rapid testing kits for COVID-19 and other diagnostic solutions**
- Demand for the COVID-19 tests could offset the **decline of routine diagnostics** compared to the pre-pandemic trajectories
- Many companies have **revised or suspended their revenue guidance** as they envision dip in the global demand for non-COVID related solutions such as analytical instruments and specialty diagnostics
- **Digitalization of diagnostic** such as wearables, contactless digital thermometers, and AI-enabled lung image analysis have emerged as promising tools to track, monitor, and fight the progression of COVID-19 and its symptoms worldwide

Impact

	AREA	INTENSITY
Supply	Approvals through emergency use authorization	*High - Positive*
	Growth in revenue	
	Automation for rapid diagnosis	*Medium - Positive*
	Diagnostic companies as potential acquisition targets	
	Bio-surveillance of viruses	*Low - Positive*
Demand	Home-based testing	*High - Positive*
	Contactless diagnosis	*Medium - Positive*
	Adoption of e-health	
	Price cap on COVID-19 test kit	*Low - Positive*
	Reach to masses	*High - Negative*

Technology Trends

CRISPR

Accelerating the pace of economical diagnostics with ease of interpretation

Artificial Intelligence

Aiding in the reduction of stress on healthcare institutions

Microfluidics

Providing rapid testing alternative through automation of sample preparation

Contactless Testing

Minimizing the risk or possibility of cross-contamination

With significant research funding dedicated to diagnostics specifically to rapid testing is expected to propel the effective diagnosis of COVID-19 patients

Overview

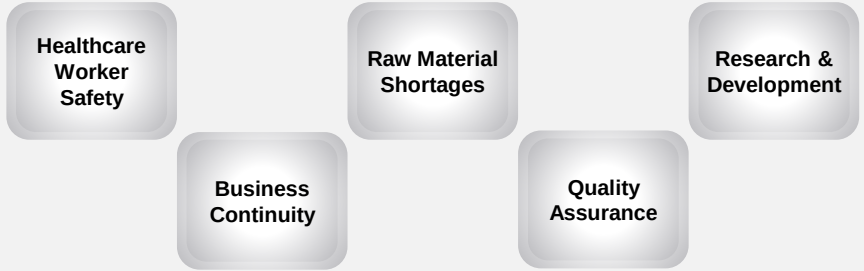
32+ FDA-approved COVID-19 test kits under emergency use authorization (EUA)

~5 minute is the **minimum turnaround time** required to run a diagnostic test for COVID-19 on Abbott's ID Now platform

~0.7% increase in sales (organic basis) for **Abbott** owing to the impact of elective procedures being postponed

500 planned inspections by USFDA of Chinese plants postponed which could mean lesser surveillance

Key Risks to Business Due to Covid



Market Status

- Over 40 diagnostic tests are under development or investigation for timely detection of the infection. More than 50% of these tests are being developed by the companies based in the Asia Pacific, out of which 85% are from China and South Korea
- With the dynamics affecting the entire world, routine testing is likely to decline in the US and other key markets, although offset by the demand for COVID-19 test kits
- Most geographies are fast-tracking the approval process for COVID-19 test kits such as Emergency Use Authorization (EUAs) in the US
- Governments are putting export bans on diagnostic kits and reagents to ramp up the local testing capacity, which is severely hitting several middle and low-income countries that lack manufacturing capability

Mitigation Measures Taken by Companies

- **Amazon** launched **Amazon Web Services (AWS) Diagnostic Initiative,** worth USD 20 million to accelerate R&D and innovation for detection of COVID-19 and other innovative diagnostic solutions to mitigate future infectious disease outbreaks
- **Roche** has shifted its focus from the accurate high-throughput test for COVID-19 to an FDA EUA on Cobas SARS-CoV-2 Test and ensure a sustainable supply of materials
- **Thermo Fisher** is working with government agencies and researchers to ensure priority access to instruments, consumables, safety supplies, and other products to address the outbreak–particularly in the analysis of virus, diagnosis, and personal protection

Impact of Covid-19

Supply Side

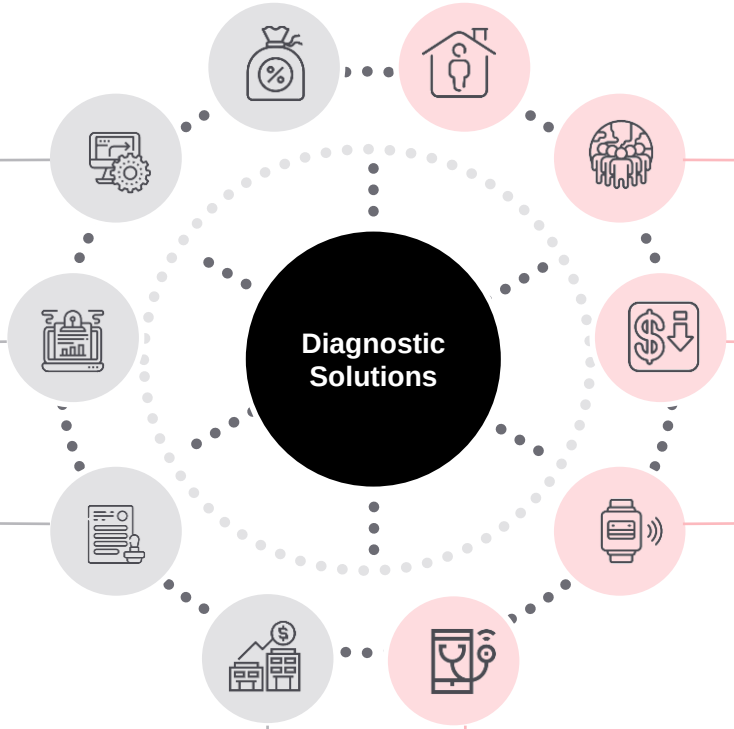
Growth in revenue
- **Impact: High - Positive**
- Diagnostic companies are positively impacted with a tremendous increase in their sales revenue

Automation for rapid diagnosis
- **Impact: Medium - Positive**
- Automation and streamlining the testing steps for reducing turnaround time from current 24 to 72 hours into a few minutes

Bio-surveillance of viruses
- **Impact: Low - Positive**
- Entities have to set up a robust framework to monitor the viruses and their mutations to continuously modify their testing kits

Accelerated approvals
- **Impact: High - Positive**
- Regulatory bodies are granting speedy approvals through Emergency Use Authorizations (EUAs to rapid testing kits used to fast track the diagnostic process during the pandemic

Diagnostic companies as potential acquisition targets
- **Impact: Medium - Positive**
- The healthcare would be looking for easy acquisition targets within the diagnostics area to enrich their portfolio



Demand Side

Home-based testing
- **Impact: High - Positive**
- The consumer attitude will shift from testing in a laboratory environment to home-based point-of-care testing, which would drive growth in this area

Reach to masses
- **Impact: High - Negative**
- Shortage of test kits in middle and low-income countries is affecting their fight against the COVID-19 spread

Price cap on Covid-19 test kit
- **Impact: Low - Positive**
- The government's mandate for capping the price of COVID-19 test kits is limiting the profit margins for diagnostic companies

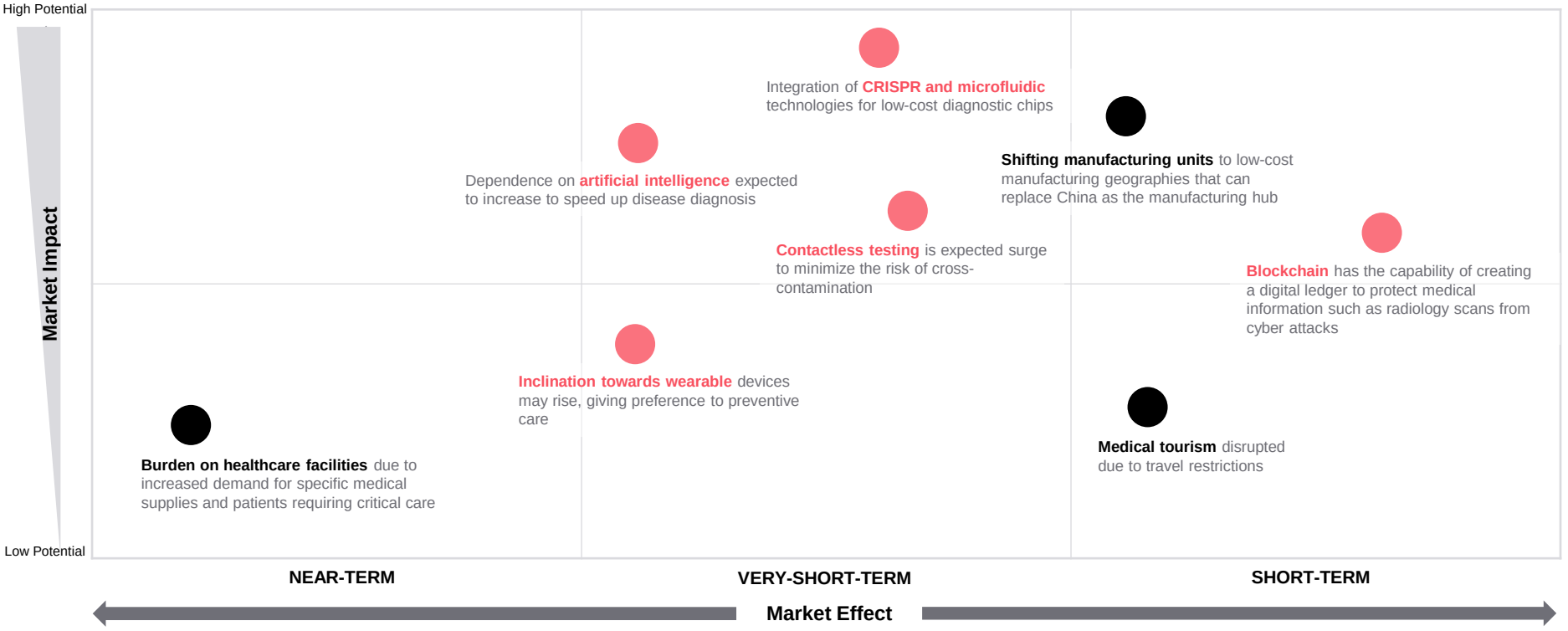
Contactless diagnosis
- **Impact: Medium - Positive**
- Minimizing the possibility of cross-contamination is driving consumers towards contactless testing

E-health
- **Impact: Medium - Positive**
- Significant increase in the adoption of digital tools such as virtual symptom checker, monitoring through a wearable device, online health surveys, etc. for high-quality remote diagnosis

Medical organizations are partnering with technology developers to focus on identifying and validating new applications of existing solutions amidst the COVID pandemic

	Technology Trends			
Technology	**CRISPR** 	**Artificial Intelligence** 	**Microfluidics** 	**Contactless Testing** 
Reasons for Adoption	▪ Rapid and reliable nucleic acid detection approach ▪ Eliminate the need for an expensive thermal cycler or PCR platform ▪ Reduces the risk of cross-contamination through a disposable kit	▪ AI-powered apps helping people screen themselves, reducing the pressure on healthcare institutions ▪ At-home risk assessment tool ▪ Accelerating medical image analysis	▪ Automate complex sample preparations on a microchip ▪ Quick sample-to-result turnaround	▪ Maintain a safe distance to reduce the possibility of cross-infection ▪ Increase efficiency as compared to manual operator
Future Trends	▪ A prominent interest in the integration of CRISPR technology into the low-cost diagnostic chip ▪ Adoption of technology rapidly accelerating the pace of diagnosis	▪ A surge in usage of AI-related platforms for accelerated diagnosis	▪ A surge in the point-of-care testing utilizing microfluidics ▪ The availability of affordable diagnostics tools to prevent the spreading of COVID which is rapidly stressing health systems	▪ Increase in adoption of contactless diagnosis ▪ Boost in the wearable device industry
Case Study	▪ **SARS-CoV-2 DETECTR:** CRISPR gene-targeting technology to test for the presence of novel coronavirus within 45 minutes MammothBiosciences UCSF University of California San Francisco	▪ **Aarogya Setu:** AI-based self-testing tool for risk assessment of COVID-19 developed by the Indian government Government Of India	▪ **GeneXpert:** FDA-approved microfluidic system adapted to test for COVID-19 Cepheid. A better way.	▪ **FORA IR41:** Fora autonomous temperature measuring station which doesn't require any manual intervention to measure temperature FORA ForaCare Suisse AG

Within digitalization and connected devices, contactless monitoring & artificial intelligence would have high potential in near to short term



Note: Red color text indicates positive impact and black indicates negative impact on the industry

Questions that the clients are asking us

- What are the technology trends that are emerging due to COVID-19, e.g., open/external innovation, humanitarian aid, etc.?
- Which suppliers, manufacturers, and service providers (CMOs/CDMOs/CROs/OEMs) are active in diagnostic industry that are ready to collaborate in specific geographies?
- Which start-ups are active in developing disruptive solutions to address the issues associated with COVID-19 diagnosis?
- What are the key risks associated with the diagnostics manufacturing and supply chain?
- How companies are leveraging exponential technologies to overcome the impact of COVID-19 like 3D printing, Digitalization, Artificial Intelligence, etc.?
- What measures have been taken by competitors to minimize the impact of COVID-19 on their different business units?
- How COVID-19 pandemic would impact the business development and expansion activities, including M&As, collaborations, etc. in the short-term and long-term? What could be lucrative potential acquisition targets in the near-term?
- What amendments & guidelines are expected by the global regulatory bodies in policies to minimize the current impact of COVID-19?
- Which are the commercially attractive geographies that can replace China as a manufacturing hub?

Our Solutions

STRATEGIC PROGRAMS | MEMBERSHIP PROGRAMS | ON DEMAND – HYPER CUSTOMIZED

FUTURE OF
- Industries
- Technologies
- Markets
- Business Models
- Competition
- Regulations

Discovery & Actionable Insights

Developing a future-proof business line: We help by answering your unknowns, by challenging your view of what is possible and by identifying linkages of emerging technologies with existing & new markets

- **Foresight & Horizon Planning**
- **Technology Scouting & Monitoring**
- **Opportunity Identification**
- **Market Assessment**
- **Competitive Intelligence**

Positioning & Strategy

Make Informed Selections. Develop Game Plans: We leverage deep rooted techno-commercial insights and work together in developing action plans to help you meet your strategic business objectives

- **Strategy Development**
- **Technology, Market & Business Model Evaluation**
- **Partner Identification & M&A**
- **Sustainability**
- **Continuous Disruption Monitoring**

Implementation & Driving Disruption

Deliver business impact: We help our clients navigate uncertainties and assist in implementing technologies and business models to solve existing business challenges, address strategic growth objectives or be the disruptors in their markets

- **Technology Adoption**
- **Technology Commercialization**
- **Company / Technology Benchmarking & Due Diligence**
- **Technology Implementation Ecosystems**

Thank you

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