

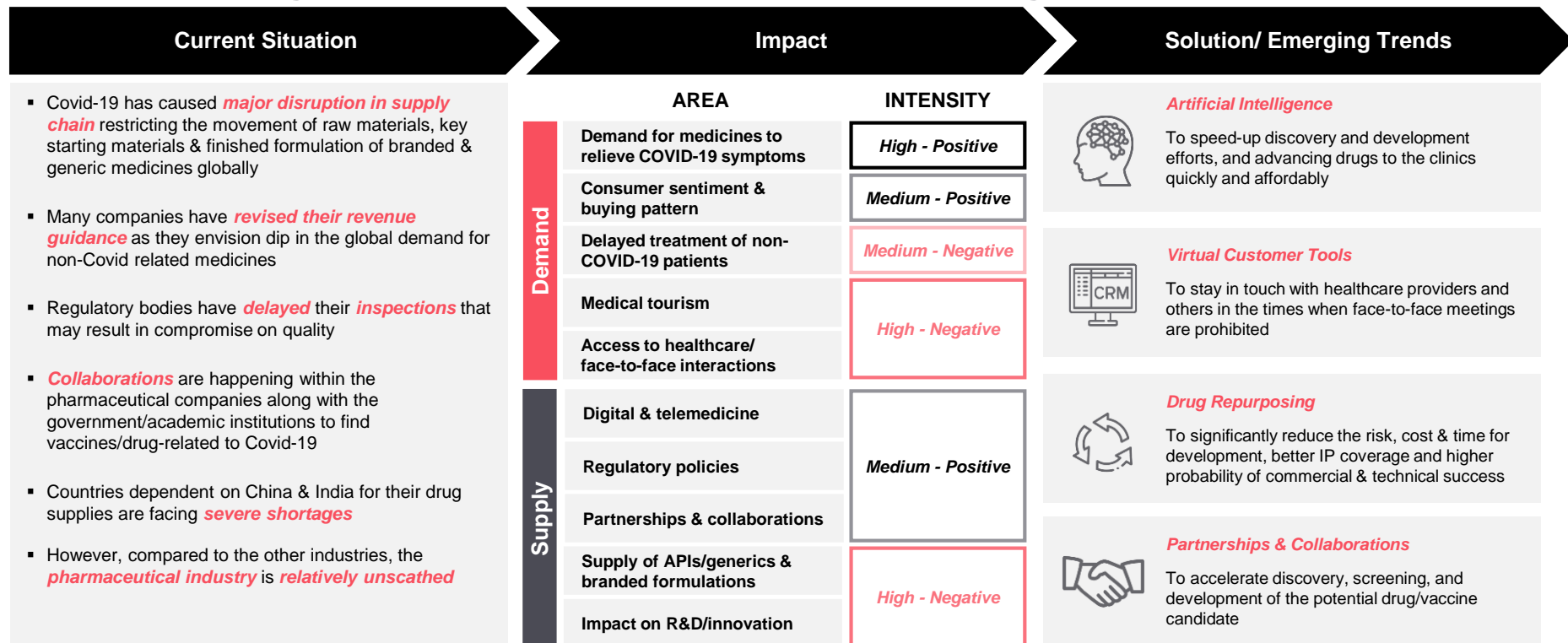


IMPACT OF
COVID-19
ON THE
**PHARMA-
CEUTICAL**
INDUSTRY



FutureBridge

Covid-19 has impacted the Pharmaceutical industry relatively less over the other industries. Drug repurposing, non-traditional partnerships, and quick regulatory approvals driving the speed to market for Vaccines and drugs for the treatment of COVID



Pharmaceutical companies are taking up measures to mitigate the business risks in different capacities to ensure their business continuity & adequate supplies of medicines to the patients

Key Facts & Figures

>2800 Clinical trials comprising **~80%** of multisite trials sponsored by pharma companies could be impacted by Covid-19 since these sites are in locations that are under partial or full lock-down

500 Inspections postponed by the USFDA of Chinese plants which could result in **compromised quality**

130 Antiviral studies are conducted using approaches such as nucleotide analogs that prevent viral genetic replication

~4-6.4 billion USD Lower revenue in the year 2020 as per the guidance provided by Johnson & Johnson

>14,000 compounds In ReFRAME collection being reviewed by The Scripps Research Institute, on the repurposing front

60% Global ARV drugs & vaccines which are supplied from India could be **impacted** as India depends on China for **70%** of its APIs **supply**

60% of total **finished products** are imported by the US from other countries, could be **impacted**

Key Risks to Business Due to Covid

Employee
safety

Business
Continuity

Raw Material
Shortages

Cyber
security

Mitigation measures taken by the Pharma Companies

- **Pfizer** expanded the use of the **Digital Operations Center** that enables its supply operations. The expansion provides **visual management** and **action tracking capabilities** that allow site colleagues - **either physically or virtually** - to stay connected and **work collaboratively** while **maintaining social distancing guidelines**
- **Pfizer** customer-facing employees in the **U.S. and Puerto Rico** have switched to **virtual customer tools** to stay in contact with healthcare providers and others
- **Sanofi** said it's **creating** the **world's second-largest active pharmaceutical ingredients (API)** manufacturer by spinning out its six European manufacturing sites into a standalone company to ensure long-term consistent access of drugs to Europe

Supply Side

Impact of Covid-19

Demand Side

Supply of APIs/Generics & Branded Formulations

- Impact:- High - Negative
- High dependency of certain countries on China & India for APIs, key starting materials, and formulated products has led to disruption in pharma supply chain with increased risk of drug shortages

Impact on R&D/ Innovation

- Impact:- High - Negative
- Decreased cash-flows due to the negative impact on the topline & suspension of clinical trials due to partial/full lockdown in various countries have impacted R&D and innovation activities

Digital & Tele-medicine

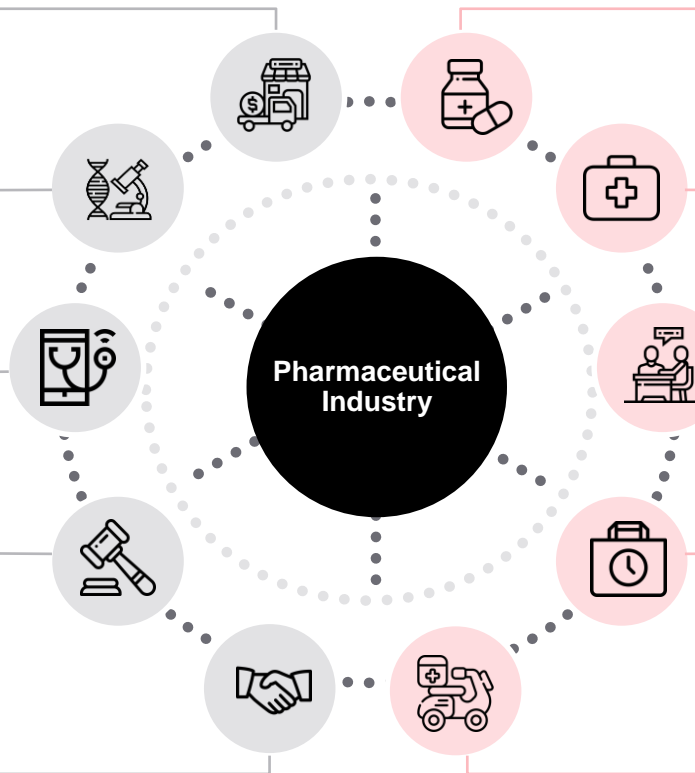
- Impact:- Medium - Positive
- With prohibitions on face-to-face interactions and emphasis on delaying non-Covid treatments, the digital & telemedicine industry is witnessing an unprecedented demand

Regulatory Policies

- Impact:- Medium - Positive
- The FDA and other regulatory agencies have relaxed the norms in certain areas like fast-track approvals for drugs-related to Covid-19, enforcement of environmental laws, etc.

Partnerships & Collaborations

- Impact:- Medium - Positive
- Many pharma companies have started collaborating to expedite the R&D efforts for Covid-19 related drugs & vaccines. A few companies have donated their compounds formerly tested on HIV & Ebola to the government agencies



Demand for Medicines to relieve COVID-19 Symptoms

- Impact: High - Positive
- With an increasing number of COVID-19 patients, demand for palliative drugs like Ibuprofen & preventive drugs like HCQs have dramatically increased

Medical Tourism

- Impact: High - Negative
- With travel restrictions imposed by most of the countries, the healthcare demand generated by the medical tourism industry is severely impacted

Access to Healthcare/Face-to-face Interactions

- Impact: High - Negative
- Many jurisdictions in the US & other countries have limited the face-to-face interactions to only the most essential health conditions leading to limited access to healthcare services
















Delayed treatment of non-COVID-19 Patients

- Impact: Medium - Negative
- While most countries are limiting the healthcare access to only Covid-19 patients or those requiring essential healthcare services, the demand from non-Covid-19 related treatments is badly impacted

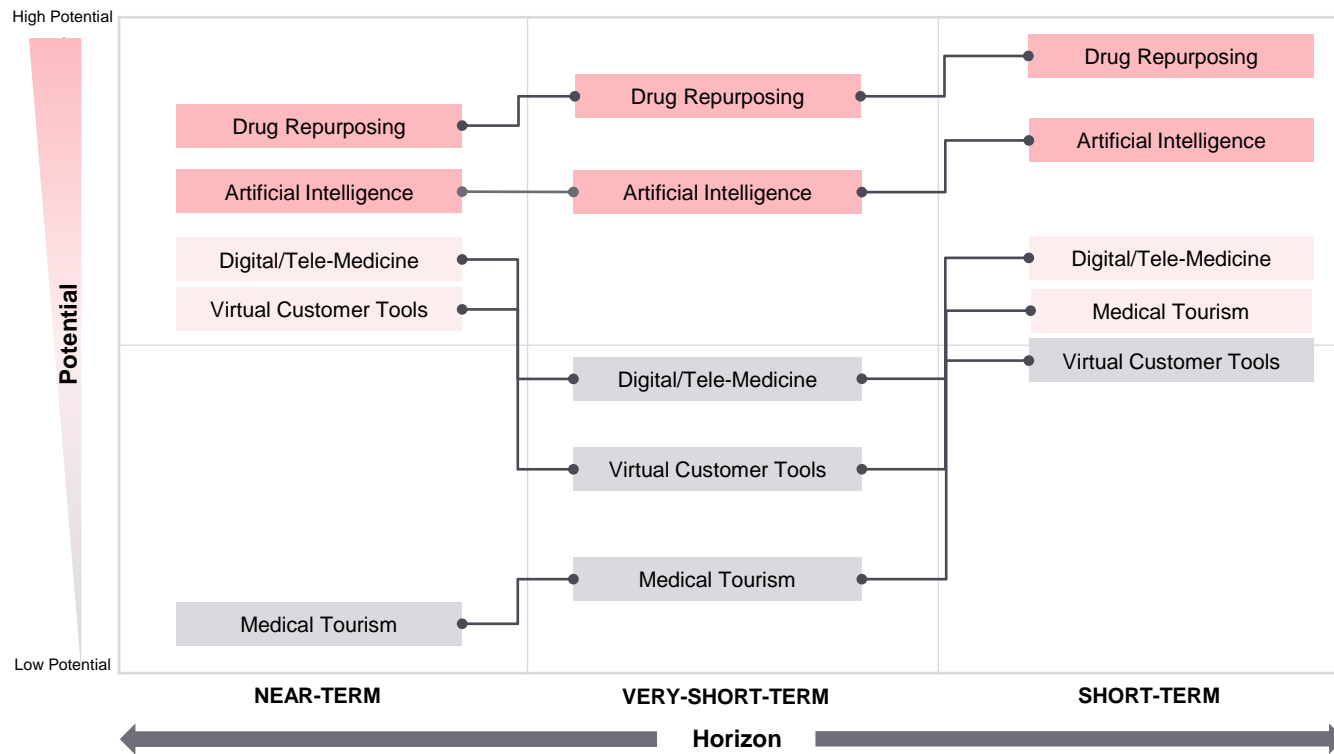
Consumer Sentiment & Buying Pattern

- Impact: Medium - Positive
- Though the consumer sentiment is negatively impacted, the buying pattern has turned favorable for organized channels like e-commerce with most of the consumers shifting to online stores to buy products/medicines

In its quest to combat Covid-19, pharmaceutical companies are leveraging advanced technologies & external innovation

Emerging Trends				
Technology	Artificial Intelligence 	Virtual Customer Tools 	Drug Repurposing 	Partnerships & Collaborations 
Reasons for Adoption	<ul style="list-style-type: none"> It allows leveraging deep generative models to speed-up chemical discovery and development, advancing drugs to the clinic quickly and affordably It also allows automation of the design, reaction screening, and optimization (RSO), as well as generation of target molecules. 	<ul style="list-style-type: none"> To stay in contact with healthcare providers and others in the times when face-to-face meetings are prohibited & increasing restrictions at doctors' offices and hospitals 	<ul style="list-style-type: none"> To significantly reduce the risk, cost & time for development, better IP coverage, and higher probability of commercial & technical success 	<ul style="list-style-type: none"> To accelerate the discovery, screening, and development of the potential drug/vaccine candidate
Future Trends	<ul style="list-style-type: none"> Increased usage of AI-related platforms for accelerated drug discovery & development 	<ul style="list-style-type: none"> With increasing reluctance from physicians to meet medical reps, companies will continue leveraging virtual CRMs to increase their touch-points in post-Covid world 	<ul style="list-style-type: none"> Repurposed drugs now command 25% of worldwide drug revenues, estimated at \$1T annually, with this trend expected to accelerate in the future 	<ul style="list-style-type: none"> The trend is expected to continue as it provides great potential to mitigate risk & increase the success probability
Case Study	<ul style="list-style-type: none"> Artificial intelligence (AI) technology provider Iktos and research center SRI International have partnered to discover and develop drugs to treat various viruses, including the novel coronavirus that causes Covid-19 and influenza <div>   </div>	<ul style="list-style-type: none"> A rep sends an approved email to an HCP that includes a link to the Veeva Engage Portal. The HCP views a presentation (CLM content) and the rep can track the HCP's content usage activity <div>   </div>	<ul style="list-style-type: none"> Gilead's Remdesivir – an antiviral drug was originally developed to combat RNA viruses, including respiratory syncytial virus Aptorum Group is set to choose three repurposed drug candidates out of ~2600 approved small drug molecules screened using its Smart-ACT drug discovery platform <div>    </div>	<ul style="list-style-type: none"> AbCellera and Lilly have announced a collaboration to develop antibody therapies for COVID-19 treatment Janssen R&D announced a collaboration with the BARDA to develop a vaccine candidate for coronavirus <div>     </div>

Drug Repurposing, Tele-medicine, and AI would lead the opportunity space in near to short term



Note: Red color text indicates high potential and grey indicates low potential on the industry

FutureBridge Perspective

Drug Repurposing is a well-established approach popular for its ability to bring in **cost & time efficiencies**. The approach is adopted by various industry players & is expected to continue to rise in the future as well

Artificial Intelligence, mainly used in drug discovery, is expected to expand in other areas of value chain e.g., supply chain, etc. However, given the **complexity of the technology**, adaptability in the near to very-short-term will remain a challenge

Digital/Tele-medicine & Virtual Customer Tools, though have a high potential in the near to short term, **requires a behavioral change in the consumers** which we expect would take place only in the longer term

Medical Tourism is **badly impacted due to Covid-19** situation. However, even medical tourism **requires a change in consumer behavior** which is expected in the long term only

Questions that the clients are asking us

What are the technology trends that are emerging due to COVID-19, e.g., drug repurposing, open/external innovation, humanitarian aid, etc.?

Which suppliers, manufacturers, and service providers (CMOs/CDMOs/CROs) are active in consumables and emergency medicines that are ready to collaborate in specific geographies?

What are the key risks associated with pharmaceutical manufacturing and supply chain?

How companies can leverage exponential technologies to overcome the impact of COVID-19 like Digitalization, Artificial Intelligence, etc.?

What measures have been taken by competitors to minimize the impact of COVID-19 on their different business units?

Which start-ups are active in developing disruptive solutions to address the unmet needs of therapies which could be targeted for COVID-19?

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?

What regulatory route companies are taking to get faster approval for repurposed drugs and vaccines targeted to COVID-19?

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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