Rethinking Medtech Manufacturing: Will COVID-19 Force Lasting Change?

AUTHORS: HEBRI NANDITA MALLYA, NIDHI NAGRATH, MEGHA MAHESHWARI, LEXIE CODE, ZAID AL-NASSIR

PUBLISHED: JULY 2020

www.DecisionResourcesGroup.com
The Medical Manufacturing Ecosystem

Medtech manufacturing networks have always been a highly complex and logistically challenging ecosystem with numerous stakeholders—Original equipment manufacturers (OEMs), distributors, suppliers, export/import services, and regulatory bodies—spread across every continent. For instance, though OEMs utilize in-house manufacturing, most also partner with contract manufacturers (CMs) in order to reduce design and production costs; it may also be favorable to manufacture a product in more than one location, both domestically and internationally, so as to accelerate production, protect assets, and facilitate sales globally.

Advantageous Medtech Manufacturing Locations

Due to a combination of low labor costs, favorable education levels, low taxes, trade agreements, export infrastructure, or political stability, certain countries often represent optimal locations for medical manufacturing. The most prolific example of this is China, which has represented the main medical manufacturing hub and a central source of raw materials for medtech OEMs globally; most major economies, including the US, the EU5, Japan, and Australia have been largely reliant on China as the source for a substantial proportion of medical devices and products for a number of years.
How COVID-19 is Disrupting Global Medical Manufacturing

COVID-19 was first identified in China in late 2019; beginning in January 2020, the Chinese government implemented lockdowns to stem transmission, in effect closing most manufacturing operations across the country. As the virus began spreading outside China in the following months, similar lockdowns were implemented globally, impacting manufacturing hubs in Southeast Asia, the US, Eastern Europe, Ireland, Mexico, and Central America.

As a result of these disruptions and soaring demand, many countries, including the US, India, and various European countries, found themselves facing shortages of critical medical products—such as personal protective equipment (PPE, which includes surgical masks, gowns, and gloves), ventilators, and respirators—and components. This was further exacerbated by export restrictions, intended to ensure the domestic availability of essential medical products, that were implemented in a number of geographies, including the US, the EU, China, and India.

These challenges brought to light a number of vulnerabilities in the global medical supply chain, some of which had been previously identified—but had been largely deprioritized—in intelligence threat assessments released by countries such as Australia and the US, as well as public health reports from global health institutions and philanthropic initiatives.

In addition to having forced some unprecedented shifts among both healthcare and non-healthcare manufacturers, it appears that the pandemic has caused countries and companies to reconsider their previous manufacturing policies, and many are now looking to diversify their manufacturing and supply chain networks, whether by onshoring manufacturing operations or spreading them across more countries to avoid an overreliance on any one location.

Monthly Growth Rates of Manufacturing Output Compared to Previous Year

![Graph showing monthly growth rates of manufacturing output compared to previous year for China, North America, Europe, and East Asia.](source)

**Notes:** Negative manufacturing growth rates outside of China in Dec-19 are attributed largely to the US-China trade dispute, Brexit, and geopolitical instability within oil-producing countries in the Middle East.

Rethinking Medtech Manufacturing: Will COVID-19 Force Lasting Change?

Shifts Among Non-Healthcare Manufacturers

In addition to having pushed a number of major medtech manufacturers—such as Medtronic, 3M, Abbott Laboratories, Bayer, Johnson & Johnson, and Siemens Healthineers—to dedicate more of their manufacturing capabilities toward the production of PPE, ventilators, and respirators, shortages have also forced some non-healthcare manufacturers, including Hill-Rom, Dyson, Mercedes-Benz, Virgin Orbit, GM, Tesla, and even some clothing brands such as Nike, Adidas, and New Balance, to shift some of their manufacturing capacity to support the need for essential medical devices and supplies during the COVID-19 pandemic.

These companies did so either voluntarily (whether through government contracts or as donations) or to comply with government regulations and requests. In the US, for example, President Trump had invoked the Defense Production Act (DPA), which allows the federal government to compel companies to manufacture certain products, while UK Prime Minister Boris Johnson reportedly met with a number of manufacturing companies, asking them to support medical supply manufacturing. In Japan, companies such as Sony, Toyota, and Mitsubishi Motors responded to Prime Minister Shinzō Abe’s call to help address device shortages by converting some of their production units to manufacture medical supplies.

It is important to note that taking on aspects of medtech manufacturing is not always an easy feat. Though most PPE devices, namely gloves, face shields, masks, and gowns, are composed of few components, ventilators and respirators consist of several hundred parts, many of which have to be sourced from different suppliers. For example, Ventec Life Systems’ ventilators reportedly “use 700 components from 80 suppliers”; recently, GM utilized its strong supply chain capabilities to fast-track the sourcing of these components in order to enable Ventec to bolster its production capacity, representing yet another example of how the pandemic has forced various stakeholders to adapt their normal processes to address potential shortages and further highlighting the challenges that are forcing governments to diversify manufacturing sources.

Onshoring and Diversifying Manufacturing

Whether through tax breaks, subsidies, or the implementation of penalties, a number of governments have taken steps to encourage local companies to either onshore their production facilities or spread them out over a wider set of locations.

---

Top 5 Manufacturing Hubs, 2018

<table>
<thead>
<tr>
<th>Country</th>
<th>Share of Global Manufacturing Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>30</td>
</tr>
<tr>
<td>United States</td>
<td>25</td>
</tr>
<tr>
<td>Japan</td>
<td>10</td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
</tr>
<tr>
<td>South Korea</td>
<td>3</td>
</tr>
</tbody>
</table>

In India, for example, the government is implementing a financial incentive program for health care companies that invest in manufacturing raw materials, which India typically imports from China; additionally, the government approved the creation of government-supported medtech manufacturing parks that would support the local production of medical devices, especially capital equipment and essential products, including MRI and X-ray machines, radiology and imaging systems, and implantable medical devices such as implants and pacemakers. Such policies fall in line with the country’s Make in India initiative, which aims to bolster domestic manufacturing across a number of industries.

Japan, which is also highly reliant on imports from China, especially for raw materials and components for both drugs and medical devices, is similarly offering subsidies to Japanese manufacturers to bring back their manufacturing operations to Japan or one of the neighboring ASEAN countries, such as Vietnam, Singapore, Indonesia, or Thailand; the country has allocated $2.2 billion to support these efforts, with $2 billion earmarked for onshoring and $215 million for diversification, and will prioritize these subsidies in industries that are more reliant on imports of raw materials. However, Japan is not planning to entirely eliminate its dependence on China but is rather further utilizing the “China+1” model, in which manufacturing structures are split between China and another low-cost location, such as Mexico or Vietnam.

In Australia, although some 1400 local manufacturers have come together to satisfy the demand for PPE, ventilators, and respirators, a spokesperson for the Australian Department of Health noted that the country currently does not have the capacity to sufficiently support domestic manufacturing to satisfy current demand, but that it plans to make long-term investments in improving local supply chains so that they are better prepared for potential crises. Moreover, the Department of Health indicated that it is taking steps to ensure that, in cases where local supply cannot accommodate demand, offshore manufacturing will be adequately diversified to avoid disruptions.

Countries across Europe have also taken steps to ensure the availability of necessary medical supplies; for example, to combat device shortages, the European Union has been utilizing the Joint Procurement Agreement—originally set up after the 2009 H1N1 outbreak revealed vulnerabilities in European access to medicines and vaccines—in order to centralize procurement and avoid inter-European competition for PPE, respiratory equipment, IVD testing, and ICU medicines and also issued guidance on how to bolster manufacturing capacities for PPE, disinfectants, and 3D printing. In March 2020, the European Commission also issued guidance into proper screening of foreign direct investment into European supply chains, particularly those related to the health care industry, in order to avoid the foreign acquisition of “healthcare capacities (for example for the productions of medical or protective equipment) or related industries”, which would jeopardize strategic European infrastructure and reduce the union’s ability to control its supply chain.

The US represents a somewhat unique case because efforts to onshore manufacturing, specifically away from China, had begun prior to the onset of the pandemic, largely due to the Trump administration’s efforts to support domestic employment and reduce reliance on other countries; in addition, the tensions surrounding the US-China trade war that began in 2018, which affected a number of medical device markets, was already encouraging manufacturers, such as Philips Healthcare, to shift some of their operations to the US and others to China, as a means of avoiding tariffs. The efforts that were already underway were in many ways further bolstered by the manufacturing and supply chain vulnerabilities that the pandemic brought to light; now, US officials are, like other countries mentioned above, looking into potential subsidies and tax breaks to coax manufacturers back to the US. These efforts include a $25 billion fund to onshore manufacturing and an executive order meant to assist in moving a larger proportion of supply chains, especially those relating to essential medical products, into the US.
Key Takeaways and Challenges

Manufacturing in China Remains Strong

While there has been much talk that efforts such as those noted above will reduce China's manufacturing significance, in reality the country remains a highly appealing location for manufacturing, for the same reasons that it had been prior the pandemic; already, reports have emerged indicating a great deal of resistance to moving manufacturing operations. In addition, now that some economies are gradually reopening, less affluent countries looking to restart and reinvigorate their economies are unlikely to choose to rely on more-costly manufacturing sources, especially given that many of them have previously relied on financing from China—which continues to pursue an aggressive investment strategy in Eastern and Central Europe as part of its Belt and Road initiative—and will likely continue doing so as they look to rebuild.

Moreover, though some manufacturing may move away from China, this will ultimately benefit the country’s Made in China 2025 initiative, which aims to bolster the share of locally manufactured medical devices, especially in the fields of imaging, robotics, cardiovascular implants, gene sequencing and immunotherapy, in Chinese hospitals to 70% by 2025.

Smaller Manufacturing Hubs Will See Long-Term Benefits

The manufacturing shifts that are in fact expected to endure, such as those promoted by India and Japan, will ultimately benefit a number of medtech markets in South Asian countries, especially India and the countries that comprise the Association of Southeast Asian Nations (ASEAN). Moreover, global initiatives, such as the UN Technology Bank’s Tech Access Partnership (TAP)—which aims to promote collaboration among researchers, manufacturers, and universities with domestic manufacturers in underdeveloped economies—will not only support local medtech markets by expanding reliance on local manufacturing, particularly as it relates to essential products such as medicines and medical devices, but will also help to address supply shortages in the future.

Increased Competition From Non-healthcare and Domestic Companies

The strengthening of local manufacturing in spaces that had been unoccupied by domestic players, such as the production of PPE in India, will also have competitive implications for foreign companies. For example, India reportedly had no local PPE manufacturing prior to the pandemic, but as of late May is producing nearly half a million PPE products each day. As a result, once COVID-19 pressures subside, it is likely that foreign PPE manufacturers will face much more considerable domestic competition for market share in a number of medical device markets.

Moreover, given that many non-healthcare companies—such as Dyson, Mercedes F1, Virgin Orbit, and Tesla—have actually developed their own designs for CPAPs and ventilators, some of the may choose to make the shift toward healthcare more permanent; should this take place, traditional healthcare manufacturers will see increased competition from nontraditional players, specifically in the fields of PPE, respiratory equipment, digital healthcare products, and 3D printing.

Rising Incorporation of Automation, Robotics, and 3D Printing Into Manufacturing

Going forward, companies are also expected to increase the resilience of their manufacturing capabilities in the face of similar crises, namely by more aggressively incorporating 3D printing, robotics, and automation into manufacturing operations in order to ensure manufacturing continuity in the event of large-scale social isolation measures or other crises that may restrict the ability of employees to work.
Final Considerations

Ultimately, the COVID-19 pandemic will continue to have a substantial impact on medtech manufacturing for some time; manufacturing and supply chain shifts are complicated and arduous processes and are therefore expected to occur over an extended period of time. The situation is also highly fluid and can change abruptly. In recent weeks, for instance, we have witnessed starkly different COVID-19 trends in different locations, with some restrictions being gradually lifted in various regions, while cases continue to spike in others; we therefore advise all industry players to remain vigilant and be prepared for the implications of a second wave. DRG’s Medtech Insights (Part of Clarivate) will continue to monitor the situation to provide our industry partners with a clear, real-time understanding of the impact on their business, customers, and patients.

In addition to this paper, we’ve also assembled resources on topics such as telemedicine, access, clinical innovation and more to help companies plan for the post-pandemic marketplace.

Visit our COVID-19 resource hub: decisionresourcesgroup.com/covid19
Ask us your questions: Questions@TeamDRG.com

ABOUT DECISION RESOURCES GROUP

Decision Resources Group (DRG) is uniquely positioned to help healthcare businesses improve the lives of patients around the world by creating patient-centric commercial strategies that drive better outcomes and better access. DRG helps clients propel commercial success with evidence-based business decisions by delivering expert consultation, data, and analysis enhanced by artificial intelligence (AI) and machine learning. With collaborative experts spanning healthcare markets, disease areas, and data science disciplines, DRG clients have unprecedented access to the expertise, data, and AI-technology solutions they need to anticipate customer needs and generate new solutions to healthcare challenges. DRG’s market access solutions give life sciences companies the most comprehensive view of patient access, and payer and health system dynamics at local levels for the global healthcare ecosystem. DRG is a part of Clarivate, a global leader in providing trusted information and insights to accelerate the pace of innovation.