

Communicable Diseases and Supply Chain

Many would say 2020 did not start with a good note. As the new century dawns onto us, a new string of coronavirus, the COVID-19, has risen and quickly made itself known worldwide. With the first case being reported in December 2019, COVID-19 has taken its 11,002,451th victim on 3rd July 2020. While the rest of the world is scrambling around to take health and safety measures to mitigate the possible loss, many are also concerned about the consequential impact of the pandemic on business continuity, particularly the supply chain. In fact, this is indeed a long-standing problem with all communicable diseases, mostly because they spread so quickly that businesses were often left helpless as their supply chain cannot adapt to the sudden disruption. Accenture has found that over 75% of companies have experienced negative effects in their businesses from COVID-19. In this article, we will look into what communicable diseases are, why are they potentially fatal to many businesses, and what can we do to better prepare our businesses in the future.

Background

In this section, we will first understand the background of communicable diseases before diving into how it will affect businesses and their supply chain. What exactly do communicable diseases mean? Communicable diseases are illnesses that can be spread from one human to another mainly via four separate forms, namely physical contact with an infected person, bites from an infected animal / insect, contact with a contaminated surface, or through airborne particles / droplets. In contrast, non-communicable diseases are illnesses that cannot be spread through these channels to another human, such as cancer and diabetes. In this article, we will be looking into the supply chain issues during four different epidemics, namely SARS, H1N1, Ebola and Covid-19. The table below will provide a quick summary of these diseases, drawing us the necessary backdrop for further discussion. Do take note that many numbers below are official estimated figures, and many of them are believed to vastly understate the true spread of these diseases.

Communicable Diseases	SARS	H1N1 flu pandemic	Ebola	COVID-19
Year	2002	2009	2013	2019
Origin	Guangdong, China	Central Mexico	West Africa	Wuhan, China
Official Figures	8,098 cases, 774 deaths	0.7–1.4 billion cases, 151,700–575,400 deaths	28,646 suspected cases, 11,323 deaths	11,002,451 cases, 528,409 deaths (as of 3rd July)
Fatality rate	9.8%	0.03%	39.5%	4.06%

Why then would communicable diseases pose a higher risk to businesses than their non-communicable counterparts? This is because the infectious nature of communicable

diseases are likely to incite fear among humans, especially if they are highly contagious such as the COVID-19. The unpredictable nature of a pandemic outbreak induces uncertainties in the business environment causing operations to slow down or even halt entirely. For instance, a pandemic outbreak could trigger the government to enforce emergency response measures such as preventing border movement, which will directly affect firms that carry out international operations. It will also be harder to implement Just-In-Time supply chain practices and lean management strategies since businesses will not be able to forecast demand. Generally, companies are predicted to only be able to last for two to five weeks after their supply is interrupted. Thus, when the market is under a demand shock due to a pandemic, either a spike due to panic buying or a fall due to a general market recession, our supply chain will struggle to keep up. On the other hand, communicable diseases will also potentially cause an economic recession because demand is likely to fall sharply once movement control orders or MCOs are implemented. Once consumers are no longer able to go out, small and medium enterprises (SMEs) especially will be negatively impacted due to the reduced footfalls and consequently reduced sales. Reportedly, SMEs in Malaysia expect to have no cash inflow for at least three months during MCO. Over half of the companies in Malaysia, including both SMEs and larger corporations, have stated that MCO restrictions must be relaxed urgently to allow for economic recovery. Therefore, we can conclude that pandemics are highly disruptive to the economy. This article will highlight one aspect of this disruption, the supply chain, which is famously known as the backbone of many enterprises worldwide.

Now, let's take a deep dive and look into how the business supply chain has been affected by the diseases we have listed above.

Supply Chain

What exactly is supply chain and why does it affect business performance? In short, a supply chain is every company's lifeline. A supply chain is an entire system of producing and delivering a product or service, from the very beginning stage of sourcing the raw materials to the final delivery of the product or service to end users. The Council of Supply Chain Management Professionals (CSCMP) defines supply chain management as the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management strategies. Supply chain management also includes the coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. It matches supply and demand by ensuring that requests of purchases will be supplied, fulfilled and sent into the buyer's hands. Briefly, it includes sourcing, procurement, logistics and many more. When there is a communicable disease outbreak, it is often that business operations will be interfered with, causing a breakdown along the supply chain.

Supply Reliability

The first roadblock appears from the suppliers. Many companies have a network of suppliers that they rely on to keep their business running. During an epidemic, companies might face the problem of suppliers having to stop their operations or run at half capacity, which would have a direct impact on the supply chain for the rest of the companies. This will be a major problem if the companies only have one supplier or all of their suppliers are located in the same geographical area.

During the Ebola crisis, Sub-Saharan Africa's output in commodities such as oil, minerals, ores, rubber and agricultural products have been greatly impacted by Ebola. Liberia's rubber exports faced difficulties during the Ebola outbreak because rubber harvesting is a labor-intensive job that could spark an Ebola outbreak among the plantation workers if poorly managed. Liberia's exports have suffered during the year, and this was no different to other Ebola-impacted areas in Africa (further breakdown of all other agricultural supply chains can be found here). The importance of supply reliability was further highlighted in the 2002 SARS and the recent COVID-19 pandemic. As both viruses originated from China, they have brought many difficulties worldwide due to the country's strong presence in the manufacturing industry. During SARS, Adidas-Salomon AG was forced to move a portion of its production in China to Vietnam and Indonesia to overcome the problems of travel ban and containment orders. Even if a company may have suppliers outside of China, these suppliers might also be dependent on a Chinese factory to supply them with components and intermediary parts. Apple is one of the well-known brands that feared a disruption in their operations due to their reliance on Chinese suppliers. The company had announced to its investors on February 17 that they might no longer be able to hit their Q2 revenue target. However, their April 30 press release revealed that its revenue was able to grow by 1% as compared to its year-ago quarter, thanks to the stellar growth in its Services and Wearables. Other household names such as Honda, Nissan and Hyundai are also affected.

Logistical challenges

Aside from supply issues, a pandemic will also trigger a chain of logistical issues along the supply chain, such as the travel bans and movement restrictions. Depending on the severity of a pandemic, governments will impose measures to control the spread among its population. When that happens, it is common that many ports and passageways may close, affecting air, land, and sea freight alike. This is widespread during COVID-19 and it has also happened during the Ebola outbreak. With airlines cancelling more of the already-dwindling flights in Africa, many businesses struggled with their supply chains as those that rely solely on commercial airlines to ship goods will need to search for alternative cargo airlines. Countries will also start imposing stricter border controls during a pandemic, causing delays in customs clearance and worsening supply lead time.

Aside from that, developing countries tend to be worse off when pandemics occur as they may have poor transportation infrastructure and limited access to remote areas. Or, the affected area might be one that is trapped in political turmoil, where wars and conflicts impede humanitarian efforts. Consequently, essential items such as vaccines or medical supplies might not be able to reach rural areas in due time. On top of that, sudden excessive

demand also strains the supply chain especially if it exceeds the company's existing logistical capacity. For example, if a company only has 25 trucks in its fleet, it would be difficult for the company to respond to spikes of demand in short notice if the volume needed to be shipped exceeds what the 25 trucks could move at a time. This situation is only worsened by the fact that it will be difficult for companies to find drivers that are willing to drive during a pandemic, especially if it's in the affected area.

How It Affects Consumers

While the idea of business continuity might be unfamiliar to us, its effects on our lives are obvious. When production halts and logistics slows, supply lead time increases, meaning that it will take longer for the goods we seek to end up in our hands. During times of pandemic, these might mean shortages, delayed delivery and empty shelves. Businesses could no longer respond in time to stockouts, and we consumers are left waiting, helpless to the break in supply. The imbalance of demand and supply will trigger a change in market price, and we consumers might be required to pay high prices for daily commodities. Besides that, we will also see scarcity in pharmaceutical and medical supplies; from medicines in hospitals to basic protective items such as face masks, hand sanitizer and gloves. The disruption to supply chains will have a more lasting impact in manufacturing hotspots like China or India. Not only does China supply electronics, but it also supplies clothing, toys, packaging, wedding gowns, and many other day-to-day items. The COVID-19, for example, may cause a wedding gown shortage during summer due to the production shutdowns during the peak of the pandemic in the country.

Prevention and Mitigation

Previous pandemics have enlightened us to the vulnerability of our supply chains. It is often that businesses would focus on profit-generating rather than the long-term stability of their operations, which would prove fatal to their business continuity when crises happen. Lengthening the supply chain too far across the globe might stretch it just a little bit too thin and cause fragility to disruptions. This section will highlight some actions that governments and businesses can take to mitigate losses during a pandemic.

Firstly, companies should start investing in increased visibility along their supply chain. Supply chain visibility is a company's ability to track and trace their products and commodities during transit. For instance, Grab provides good last-mile visibility to their food delivery customers because we can always track and check where our order is on the mobile application. For companies, supply chain visibility can be useful to obtain accurate demand data, to know where stoppages happen during a pandemic, and where their shipments are at a moment's notice. An increased visibility allows companies to respond and plan for further actions, and make path corrections if so required. Visibility will also be beneficial for the humanitarian supply chain, where oftentimes many institutions and governments will work hand-in-hand. All humanitarian efforts, such as earthquake disaster relief and vaccine deliveries to affected zones, involve a complex and unpredictable supply chain. Logisticians and companies will have to improvise and adapt their approaches to the differing circumstances for each incident. More often than not, the humanitarian supply chain

involves more stakeholders, such as governments and NGOs, than a commercial supply chain. A transparent humanitarian supply chain will allow all parties to work together seamlessly and reduce possibilities of duplicated efforts and wasted resources.

Next, governments must take the initiative to save for a rainy day. Since pandemics cannot be prevented or predicted, nations must ensure that they have an emergency response plan in place. A multilateral regional mechanism can be initiated by nations within regions such as ASEAN, the EU and Africa, where governments and emergency response groups can convene and lay down the contingency plans in times of crisis. Governments must clearly understand what resources they have at hand, what capacity can they move in a short notice, and what organisations or commercial companies can they engage and be involved with humanitarian efforts. Subsequently, these plans must be rolled out clearly to the stakeholders so all parties can understand the role they will play when necessary. In this case, pandemic and disaster response preparedness are very similar, and countries should never make the mistake of overlooking one for another.

Similar planning will also benefit companies. Companies should place more emphasis on supply chain risk management (SCRM), and address aspects such as business continuity plan, supply chain design for resiliency, and crisis management. Businesses could choose to diversify their sourcing strategy geographically just to avoid putting too many eggs in one basket and growing dependent on their suppliers. It is also important for businesses to map their supplier network, including those that are tier 2 and above (suppliers for tier 1 suppliers) so that they can quickly recognise an incoming supply disruption during an incident. Aside from external plannings, companies should also draft internal continuity plans so that their employees could still maintain a certain level of productivity during an outbreak. Employees will have more confidence in the companies' management if there are clear health and safety rules imposed across the organisation prior to a crisis occurs. Clear guidelines will minimise panic from spreading within the workshop, which would prevent a productivity paralysis. A good reference to this would be Cisco's response during H1N1. Other documents that provide more detail on a company's best practices during pandemics can also be seen [here](#), [here](#) and [here](#).

Conclusion

Fear can quickly obscure our vision during a pandemic outbreak, but businesses have to respond swiftly to counteract the effects that communicable diseases bring to their supply chain or they risk being left behind. While it is important to implement supply chain cost-cutting measures to boost business performance, companies must also realise that investing in its resilience is equally important too. Companies must prepare for the worse, run worst-case doomsday scenarios to thoroughly understand the resources and limits of their business. When the going gets tough, organisations must remain as a strong team to keep the boat afloat, and being prepared will always be a good way to start.

References:

1. <https://www.accenture.com/sg-en/about/company/coronavirus-supply-chain-impact>
2. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0021828>
3. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(12\)70121-4/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(12)70121-4/fulltext)
4. <https://hbr.org/2020/02/how-coronavirus-could-impact-the-global-supply-chain-by-mid-march>
5. <https://www.theedgemarkets.com/article/covid19-malaysia-smes-see-zero-cash-inflow-least-three-months-due-mco>
6. https://www.ey.com/en_my/take-5-business-alert/covid-19-impact-on-malaysian-businesses
7. <https://corporatefinanceinstitute.com/resources/knowledge/strategy/supply-chain/>
8. https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx
9. https://www.bsigroup.com/globalassets/localfiles/aaa/Whitepaper%20Ebola_10.14_7.pdf
10. https://www.researchgate.net/publication/332998309_Impacts_of_Ebola_on_Supply_Chains_in_MRB_Countries
11. <http://www.fao.org/3/a-i5641e.pdf>
12. <https://www.apple.com/newsroom/2020/02/investor-update-on-quarterly-guidance/>
13. <https://www.forbes.com/sites/randybrown/2020/02/10/the-coronavirus-threat-to-supply-chains-is-a-big-risk/#7491e3513d96>
14. <https://www.logisticsbureau.com/the-ebola-outbreak-and-why-logistics-are-struggling/>
15. <https://business.financialpost.com/news/economy/chance-of-canadian-supply-chain-disruptions-from-coronavirus-high-rbc>
16. <https://www.cnn.com/2020/02/21/business/wedding-gowns-coronavirus/index.html>
17. <https://www.stimson.org/2015/preventing-pandemics-ebola-and-the-global-health-supply-chain/>
18. <https://www.eetimes.com/sars-outbreak-jangles-industrys-nerve/#>
19. http://webuser.bus.umich.edu/anupindi/cases/GL1428881I_Cisco.pdf
20. <https://www.cdc.gov/h1n1flu/business/guidance/smallbiz.htm>
21. <http://www.cidrap.umn.edu/sites/default/files/public/downloads/cidrap-shrm-hr-pandemic-toolkit.pdf>
22. <https://hbr.org/2020/02/prepare-your-supply-chain-for-coronavirus>

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