Reflection Points On Supply Chain Management Practices During COVID-19

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Abstract

COVID-19 has created many economic disruptions in the way supply chains (SCs) are being managed. The coronaviruses are not new to the world of medicine and these types of viruses have been around for decades. This is an indication that we have not truly eradicated this problem in the past. The rapid spread of the contagion has tremendously impacted the following supply chains: meat processing, food service, and poultry. The lessons learned from this pandemic can be used in developed and developing countries to highlight essential supply chain management system strategies for future pandemics. This will allow for strong competitive advantages during crisis based on: service, operations, inbound, and outbound logistics.

Keywords: *Healthcare, Covid Best Practices, Supply Chain Management, Essential Workers, Food Supply, Medication, Pandemic Leadership, Decision-making, Coronavirus-19, Supply Shortages, Endemic Viruses.*

Introduction

Worldwide attention was shifted towards the breaking news concerning a viral outbreak occurring in Wuhan, China. As the story unfolded, the live video footage quickly became unsettling, provoked fear, and uncertainty. A ripple effect occurred from the supposed epicenter of this problem, leading into what has now become known as the coronavirus disease 2019 (COVID-19) pandemic. The coronaviruses are not new to the world of medicine and these types of viruses have been around for decades. This is an indication that we have not truly eradicated this problem in the past. According to Purwanto (2020), “Experts felt that they have isolated [coronavirus] from humans since 1960”, (p.105). It was categorized as a disease that causes minimal mortality and can be fatal with underlying or existing health challenges. The former statement appears to follow the same logic that anyone with a deficient immune system, a common cold virus can be detrimental and deadly. In 2002, the coronavirus became an epidemic creating major concerns about its re-emergence and possible impact (Purwanto, 2020). It is known and clear in medicine that viruses can resurface and mutate over time.

Furthermore, a virus mutates itself in the human or animal host with a new set of symptoms and long-term effects.

Before delving deep into the core of this subject, it is important to review the pre-events that occurred to comprehend and associate with the continuity of the pandemic. It will be imperative to get a strong sense of how selected nations are attempting to control the spread of the disease. This will also allow for personal reflection to take place on the direct and indirect consequences of inaction or action for maintaining a resilient supply chain.

Revisiting The Chain of Events

On December 2019, the world was on high alert as major disruptions from the third re-emergence of the coronavirus (CoV) had commenced in Wuhan, China (Gralinski & Menachery, 2020). Many researchers identified the starting point of COVID -19 outbreak to be in Huanan South China Seafood market (Granlinski & Menachery, 2020; Wang, Tang, & Wei, 2020). The quick spread of the virus created major concerns for an influenza pandemic throughout mainland China and to other countries (Wang et al., 2020). Environmental samples were taken from the market place. The test samples emerged with positive results for a new strain of coronavirus (Wang et al., 2020). However, there wasn't a direct or identifiable association to any animals (Granslinski & Menachery, 2020). COVID-19 is a relative of the Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS) (Purwanto, 2020; Wang et al., 2020). The commonality in the CoV appears to be the type of viral pneumonia symptoms that can be transmitted from animals to humans. However, the research does not seem to be clear about humans being able to transmit the disease to animals. What was clearly researched is the rapid spread of COVID-19 from human-to-humans and between the different cities (Wang et al., 2020).

In January 2020, an unexplained respiratory disease emerged in travellers who had a direct link to Wuhan, China (Gralinski & Menachery, 2020). This pivotal event marked the official declaration of COVID-19 as a public health emergency of international concerns (WHO, 2020). The contagion had spread to over 85 countries/territories, and areas outside of China (WHO, 2020). There appears to be a great deal of speculation and suspicions about the source and spread of COVID-19. Interestingly, many of the exported patient cases did not have any contact with Wuhan market, this suggested two possible ways of disease transmission: 1. Human- to- Human contact; and 2. A more widespread animal source (Gralinski et al., 2020). According to the research of Ali, Balch, Ahmed, Ali and Iqbal (2020), earlier cases revealed that only 22% of patients had direct exposure to the marketplace, 32% were in contact with the suspected cases and 51% had no contact with either of the source. These former results marked another important point of confirmation on the efficiency of human-to-human transmission similar to MERS, and built the need for forced measures to be in place in order to slow down and abstain transmission. Furthermore, this also created the need for producing and supplying personal protection equipment (PPE) and masks, testing samples for analysis (before and after exposure) (Ali et al., 2020). COVID-19 predominantly spreads

through the respiratory system by respiratory droplets, respiratory secretions, and direct contact. Therefore, any of these three ways of acquiring and transmitting the disease should be marked as new policies and procedures in every supply chain when handing packages, transporting or manufacturing goods and services. The reinforced point being that COVID-19 can live on different surfaces, not only human skin or clothing.

As previously introduced, the elderly and individuals with pre-existing conditions or diseases were deemed as susceptible to infection and greater life risks outcome if acquiring COVID-19 (Guo, Cao, Hong, Tan, Chen, Jin, Tan, Wang, & Yan, 2020). Most patients had a good prognosis, while others ended up in critical condition especially those with underlying conditions (Ali et al., 2020). One important point for reflection is that the immune response is vital for the control and resolution of CoV infections (Guo et al., 2020). However, COVID-19 can lead to the development of diseases affected by the immune system (Guo et al., 2020). Currently, the treatments appear to work mainly on the symptoms but in supporting the respiratory system, it has not proven to be an effective antiviral therapy against COVID-19 (Guo et al., 2020).

There are many remaining questions about the emergence of COVID-19 but having a clearer comprehension of the evolutionary path may help to adopt better strategies and solutions for suppressing the progression of the contagion. The rapid spread of the disease and transmission from human-to-human has massive implications on the importance of the “human factor” within adopting best practices in supply chains. The management of this disease is essential in avoiding further disruptions and continued health risks that require informed and diligent measures to be employed in order to constrain the propagation of COVID -19. Furthermore, the situation explicitly indicates a need to maintain safe productivity within supply chains. Another important fact, no country was left unharmed by COVID -19. This leads to question on how are supply chains prepared for uncertainty and ambiguity or newness within a situation that appears to have transitioned from a pandemic into a possible endemic.

The COVID-19 pandemic appears to have created negative effects on the mental health, physical well-being, and the way of earning a living. In addition, the pandemic had dramatic effects on workers and their families, businesses worldwide, especially, small and medium sized enterprises (United Nations, 2020). Many workers had lost their way of earning a living due to job cuts from business closures or bankruptcy or because of the health risks and lack of personal protection equipment to provide safe practices (United Nations, 2020). Approximately 94 % of worker’s around the globe where residing in countries with some form of workplace closure protocols in effect (ILO, 2020). Despite of more countries easing restrictions, 20 percent of the workers around the globe resided in countries that required workspace closures except for essential workers, whereas, an additional 69 percent of workers lived in countries that required closure for some sectors or categories of work (ILO, 2020). The devastating impact of COVID-19 varied considerably between countries and groups of people based on the pre-existing government interventions and inequalities (United Nations, 2020).
The current updates on the labour market indicate a slow progressive return to the workplace. Progression has occurred in terms of vaccination as an imperative factor for labour market recovery (ILO, 2021). However, there seems to remain a major

discrepancy between high-income and low-income countries in terms of accessibility and planned actions for receiving vaccinations. Being that COVID-19 is a novel disease there are no vaccines or highly effective treatments available, therefore, the virus continues to spread (Rejeb, Rejeb &Keogh, 2020). There appears to be national interests in vaccinating most of the population as a solution for containing the disease, which is now considered as the reality of "the new normal" (Kerson-Skabic, 2021). Countries imposed severe lockdowns measures to lessen the spread of the virus and to prevent a collapse of the health care system from occurring, but none of these actions have proven to be highly impactful in recovering from the situation (Rejeb, Rejeb & Keogh, 2020). The COVID-19 outbreak appears to be much broader than the SARS outbreak. The research indicates of the possibility of COVID-19 becoming an endemic and seasonal (Calina, Docea, Petrakis, Egorov, Ishmukhametov, Gabibov, Shtilman, Kostoff, Caralho, Vinceti, Spandidios & Tsatsakis, 2020). The former statement may pose inquiry on how organizations and industries truly preparing for this new reality.

According to the International Labour Organization (ILO), 59.8 percent of high-income and 1.6 percent of low-income countries have received vaccinations to allow for a safe return to the workplace (ILO, 2021). Interestingly enough, it has been documented that having less rigid work restrictions are associated with higher vaccination rates (ILO, 2021). How does the former statement make sense? It can appear that specific areas or sectors are being targeted for closure. The decision-making involving the policies and protocols created in the labour market do not appear to be logical and lack clarity. The global labor market continues to slowly advance but it still remains completely stalled in some sectors. It has been difficult for the global labour market to recover when a pronounced discrepancy exists in high and upper-middle income countries who have recovered but the lower-middle and low-income countries continue to suffer at a large loss (ILO, 2021). The labour market slow growth in productivity indicates a negative growth in low-and lower-middle income countries (ILO, 2021). The former statement sheds light on the notion that lower paid workers and lower productivity businesses were inexplicably damaged by the pandemic.

The average worker in high-income countries produced 18 times more output per hour than the average worker in a low-income country (ILO, 2021). The result of the former statement is an increased productivity gap between advanced economies and developing countries. The COVID-19 pandemic has created the largest productivity gap seen since 2005 (ILO, 2021). Moreover, the pandemic may have shifted and stunned financially many low-income workers in developing countries. One may inquire about what alternative strategies could be applied by Small and Medium Size enterprises (SMEs) within low-income countries to help workers to continue to earn a living, and to recover from this situation. The COVID-19 complicated international production due to multiple barriers: border closing, shortage of health risks to staff, reduction in demand, income, job uncertainties and many others (Kersan-Skaboc, 2021).

The COVID-19 pandemic altered cross-border business and trade flows making this an important side effect to be examined on how the main issues and challenges are being addressed in international trade and business (Kersan-Skabic, 2020). International production depends highly on exportation and importation of immediate and final products plus trade policy rules governing the trade (Hayakawa & Mukunoki, 2021). For example, the negative effects of COVID-19 has impacted international trade on non-essential products, and had a positive effect on providing medical products (Hayakawa & Mukunoki, 2021). The COVID-19 outbreak created changes within the structure of the trade network. However, it is important to note that not all countries were impacted, such as, China, who was able to maintain centre position in the trade network (Kersan-Sabic, 2021). Another inquiry posed may be based on the type of supply chain management (SCM) strategies implemented or maintained in order to enhance or recover profitability to remain competitive.

Supply chain management success depends on each member being a customer and supplier for the strategy implementation (Kumar & Kushwaha, 2018). The concept of supply chain follows a logic to match with operational improvement (Hallavo, 2015). The subsequent section will explore the principle concepts behind supply chains in developing countries.

Supply Chain Management (SCM)

Supply chains seem to be constantly evolving and appears to be a central discipline to comprehending management strategies. Supply chain management (SCM) can be explained as the necessary actions taken to coordinate production, location, inventory and transportation among the partakers within the supply chain to achieve effective and efficient responses for the particular market being served (Quynh & Huy, 2018). A supply chain encompasses the planning and management of all activities involved in: sourcing and procurement, conversion and all logistics management activities including intermediary suppliers, and third parties and customers (Blanchard, 2021). The framework of supply chain management that will be used for later discussion is based upon the five processes of Porter's competitive advantage theories:

1. *Inbound logistics.* These are the activities associated with receiving, storing, and disseminating inputs to the product (material handling, warehousing, inventory control, transportation scheduling, and returns to suppliers);

2. *Operations.* This refers to the activities associated with transforming inputs into the final product form (machining, packaging, assembly, equipment maintenance, testing, printing, and facility operations);

3. *Outbound logistics*. These are the activities associated with collecting, storing, and physically distributing the product to buyers (finished goods warehousing, material handling, freight delivery, order processing, and scheduling);

4. *Sales and marketing*. Within a supply chain context, these are the activities that induce buyers to purchase a product and enable them to buy it (advertising, promotions, sales force, quoting, channel selection, channel relations, and pricing);
5. *Service.* This refers to the activities associated with providing service to enhance or maintain the value of the product (installation, repair, training, parts supply, and product adjustment) (Blanchard, 2021, p. 7-8).

The SCM core elements are expanded upon to fit with advancements in technology and customer demographics and new innovations in technological advancements and customer demographics, attributes and needs change (Min, Zacharia & Smith, 2019). The underlying goal of supply chain management is to be able to:

1. Identify the supply chain and its constituents;
2. Identify bottlenecks that are slowing down the movement of information of goods and services;
3. Having the right processes in place to get the right products delivered at the right time; and
4. Empowering the right people so they can accomplish all of the previously mentioned points (Blanchard, 2021).

Now that a framework for supply chain management has been discussed, the following sections will explore a few industries to learn how the pandemic presented disruptions for that particular supply chain.

Supply Chain Management and COVID-19

Supply chains have been disrupted before by natural catastrophes that created worldwide distresses on supplies and distribution to meet demands. The major difference appears to be that the COVID-19 continues to spread with no apparent scientific evidence of a vaccine that works to slow down the contagion (Guo et al., 2020; Ali et al., 2020; Guo et al., 2020; Wang et al., 2020). COVID -19 is a reminder of the fragility of supply chain management systems (SCMs) and the imposed health risks on employment and income. Agri-food supply chains agents and economic actors will feel this sudden and long-term impact. The following section will discuss how the pandemic created disruption in the food supply chain disruption and effects of consumer choice.

COVID-19 and Food Chain Supply

Global and local food systems were disrupted due to the COVID-19, and forced social distancing efforts (Niles, Bertmann, Belarmino, Wentworth, Biehl, & Neff, 2020). COVID-19 has disrupted food accessibility and has created food insecurity due to uncertainty on the safety of food products, individual and public health adverse consequences (Niles et al., 2020). Due to the numerous adverse health outcomes from COVID-19, food insecurity was developed (Niles et al., 2020). Food insecurity had

occurred due to the lack of adequate access to food that meet dietary needs and the unknown health outcome risks to the public (Niles et al., 2020).
At the start of the pandemic, the demand from restaurants fell drastically and created the need for many food products to be stored or further processed to avoid waste. The Canadian Dairy Commission borrowing limit increased to $200 million, and the Farm Credit Canada's lending capacity was increased by 5$ billion to help farmers deal with the cash flow and revenue lost (Larue, 2021). In other words, debt increased tremendously in these industries to adapt to the sudden changes, thereby impacting the economy directly in terms of increasing pricing.

The resiliency of the food supply chain during the unfolding of COVID-19 requires careful attention. The rapid adjustment of food supply chains had to be implemented to deal with the demand-side disruptions, such as, the change patterns for in-food purchasing and panic buying (Hobbs, 2020). This also included planning for any supply-side shocks due to labour shortages and disruptions to transportation and supply networks (Hobbs, 2020). Panic buying and hoarding behaviors by consumers created a demand-side shock as governments worldwide increased the social distancing policies (Hobbs, 2020). The restrictions triggered fear and anticipation of a possible disruption to food distribution systems (Hobbs, 2020). Food supply chain disruptions were problematic due to the temporary closures that occurred for wholesale food supply chains, this was especially true for food banks (Hobbs, 2021).

All countries have particular groups that are vulnerable and affected by food insecurity created by the disruptions caused by COVID-19 (Cranfield, 2020). It appeared that Agri-food trade costs increased and reduced in the competitiveness of cross border supply chains as trade movement restrictions occurred. The action of "buying now" for "consuming later" appears to have created a dynamic inventory problem (Cranfield, 2020). The shock to agricultural labor markets and production practices will trigger higher food prices in the long-term, and volatility in price (Cranfield, 2020). However, Canada did not experience any restrictions on food and agricultural trade showing resiliency on the continuity of food supply. The research in this area implies a need to maintain and enhance the resilience of supply chain through robust and reliable supply chain relationships (Hobbs, 2020). In Canada and United States of America (USA), food supply chains adapted well to the short-term halts in transportation and border closures. The resilience is emotive and a politically sensitive subject because it is based on the interconnected supply chain of the broader concept of the food system (Hobbs, 2021). Some of these mentioned concepts include: First being the importance of prioritizing open borders for the flow of essential goods during a crisis; The second vulnerability involves labor, worker illness, labor shortages, self-isolation or movement restriction (Hobbs, 2020; 2021).

Food supply chain actors have proven to have an ability to respond at a remarkable speed in avoiding discontinuity of available food (Deconinck, Avery, Jackson, 2021). The rapid response time is indicative of having supply chain flexibility, which includes having an accessible and predictable international trading environment that allows for entering into a new supply when existing sources experience compromise (Deconinck et al., 2021). The former statement seems to be true for developed countries but leaves

questions on the reaction time needed for undeveloped countries to sustain their food supply. In many countries, seasonal workers for planting and harvesting fruit and vegetables are at risk for delays in distribution (Deconinck et al., 2021). Moreover, there is a risk of disruption for the transportation of seeds by air due to the cessation of air transport by certain countries (Deconinck et al., 2021). These experienced limits in mobility reduced the local distribution because of the difficulty in transportation (Deconnick et al, 2021). According to Deconinck et al. (2021), policymakers should be made aware of: the availability of labour for harvesting fruits and vegetables, meat processing sector implications of the shutdown, and ongoing disruption of air freight within high-value perishable products.

As the COVID-19 disease continues to spread and mutate, the research posits that this may pose an emergence of new risks to global food supply chains. The largest threat to the food security comes from the devasting effects that covid has on livelihoods and jobs, especially with developing countries where safety nets are less developed and may create increase poverty and hunger (Deconnick et al., 2021; Hobbs, 2021). Having a diversified source of supply seems to allows for rapid response during compromise by transport or logistics disruptions, having open and predictable markets are imperative for distribution of food along supply chains (Deconnick et al., 2021; Hobbs, 2021). The following will discuss meat processing sector and the adaption processes used during the pandemic.

Covid and Meat Processing

Meat processing plants had become the hotspots for COVID-19 transmission. The virus appears to thrive in cold, and therefore, the refrigerated conditions in the plants were likely fueling the contagion (Reid, Rhonda-Perez & Schenker, 2021). The U.S. Department of Agriculture (USDA) initiated an audit on actions that may have contributed to the spread of COVID-19 in meat processing facilities (Fatka, 2021). It was confirmed that some of the highest rates of COVID-19 infections came from meat processing plants (Fatka, 2021). The impact of the spread of COVID-19 harmed the workforce that was mainly comprised of immigrant's, refugees, and people of color (Fatka, 2021). This raised questions about the federal governmental actions that may have led towards the virus being found in these facilities. The US implemented new and comprehensive policies to protect the meat sector. The new policies have lowered by five times the amount of cases, which is now considered lower than the general population cases, and down by 95% from the pandemics peak in the US (Fatka, 2021). Frontline meat and poultry workers are being prioritized by government for vaccinations to make sure that Americans and the farmers economy have no disruptions in food supply (Fatka, 2021). Hence, leading to increased food prices and the staggering cost of value of livestock for farmers (Fatka 2021B). The following section will discuss about the meat processing industry and the work conditions of these essential workers.

Covid and Essential Workers

The COVID-19 research opens up the discussion on what type of critical resources were available to the workers to provide a safe work environment. An ethical dilemma appears to be raised not only on the safety of the workers but on how and where government/businesses were allocating funds to protect workers, provide healthy environment conditions and customer safety of food and meat products within the supply chain. Essential migrant and immigrant workers have bared the weight of COVID-19 (Reid, Ronda-Perez, & Schenker, 2021). There appears to have been inequitable work conditions. The term essential workers have been independent in providing safety resources and protection, they tend to be lower paid and unentitled to paid sick leave (Reid et al., 2021). Therefore, essential workers had to work despite of being infected by COVID-19 (Reid et al., 2021). A more positive outcome of the COVID-19 pandemic can occur if living and working conditions of migrant workers improve (Reid et al., 2021).

Outside of North America, there appears to be similar dilemmas occurring in other meat processing industries. In the worldwide production of poultry, beef and pork, transnational networks of corporations have attracted public investment at source or subsidized (De Campos Silva, 2020). There is a history of worker abuse in the poultry sector that has led to a range of occupational health issues, musculoskeletal diseases and mental health issues (De Campos Silva, 2020). Women poultry workers experience more occupational health hazards, and are deemed as better suited for operations in this industry (De Campos Silva, 2020). The main reason why women are deemed as better is because the work requires a particular manual dexterity that is not typically seen in men (De Campos Silva, 2020). Packers and slaughterers tend to be in degrading work conditions in this industry, despite of the invest of biotechnology and automation (De Campos Silva, 2020). In the halal sector, there are the chicken bleeders with a focus on the Muslim markets and the work must be carried out by Muslim men (De Campos Silva, 2020).

The Brazilian poultry began hiring asylum seekers within the industry and this concept is not foreign to North America (De Campos Silva, 2020). Poultry appears to be one of the most affordable proteins in the world, and when there is a disruption it can have an impact on human nutrition. In Brazil, COVID-19 is attracting more attention to the existing poor work conditions in the poultry industry, and it has also become a hot spot for spreading the virus (De Campos Silva, 2020). Workers are not provided with proper personal protection equipment (PPE) and have to work in close proximity (De Campos Silva, 2020). Two major US conglomerates in Brazil, lobbied the government to remain open during the pandemic causing three deaths and the spread of the virus to small towns (De Campos Silva, 2020). Brazil poultry processing became a source for virus spread-breeders (De Campos Silva, 2020). It has reached to the point where Brazil may be experiencing the construction of a “proto-pandemic ecology”, as it promotes the very practices that create pandemics and endemics to commence (De Campos Silva, 2020). The global emergence of new pathogens will occur as the poultry industry depends on genetic monoculture of chickens (Hafez & Attia, 2020). It is important to note that chickens are not susceptible to intranasal infection by COVID -19 virus (Hafez & Attia,

2020). However, COVID-19 will have an impact on poultry farming, transportation and consumption. International migrants are among the socially vulnerable groups in terms of transmission of COVID-19 (Diaz, Mamekund, Eid, Aaasen, Kaarboe, Brokstad, Gloppen, Beyer & Kumar, 2021). Migrant workers are overrepresented in COVID-19 laboratory tests, hospitalizations and deaths (Diaz et al., 2021). To reduce inequalities within this disease burden, there needs to be put into effect counterfactual policies to comprehend the underlying mechanisms behind these issues (Diaz et al., 2021).

There is an apparent need for more research in this area. This is a need for better decision-making towards improving workers health and safety simply because they are an essential component of the supply chain. There seems to be no clear reasons or explanations given in the literature for these poor work conditions but it does leave one to speculate on why are there more health risks for migrant workers as opposed to the host population.

Unemployment During the Pandemic

Canada marked a one-year increase within the unemployment rate in 2020 (Larue, 2021). Low-wage workers and restaurant workers were hit the hardest during the pandemic. The essential service of food distribution and agri-food supply chains proved to be resilient against the public health measures and the pandemic (Larue, 2021). However, the labour market was disrupted by the enormity of COVID -19 as previous discussed in other countries. The forced public health restrictions severely diminished the demand for workers (Larue, 2021). Furthermore, the uncertainty of the pandemic outcomes created questions about how many businesses would have to close down. The governments were forced to make rapid decisions to slow down the rate of infection. Between February and May of 2020, the unemployment rate in Canada was 13.7% and 14.7% in the US (Larue, 2021). The lockdown measures cannot seemingly be the sole reasoning for the increase in unemployment. There seemed to have been many decision-making conflicts, and understandably rapid implementation of policies and plans to help eradicate the virus and keeping everyone safe. Policy makers had to have experienced a tremendous amount of pressure in decision-making within ambiguous and unpredictable situations. As stated by Larue (2021), “It is easy to criticize the policy response in Canada and elsewhere, but policymakers were under tremendous pressure and had very little information to rapidly adjust current policies and programs and to design and to implement new ones”, (p.272). Governments around the world experienced shortages in medical supplies and testing equipment for COVID-19 and had to make on the spot decisions being that there was limited scientific information about the virus (Larue, 2021). European policy makers seemed to have placed more decision-making emphasis on their regulations for protecting employment, which explains the drastic differences in the unemployment rate to North American countries (Blanchard & Portugal, 2001; Larue, 2021). The pandemic on a positive note seemed to have created more jobs for those who are able to work from home, and accelerated the digitalization of the economy. Conversely, many jobs were lost in this process of digitalization or had become obsolete (Deady, Tan, Kugenthiran, Collins, Christensen & Harvey, 2020).

Businesses, governments and nations have been forced to focus on the economic, financial and social implications created by the COVID-19 pandemic (Bhattacharya, Smark, & Mir, 2021). Organizations had to quickly adapt to the crisis by implementing new work from home strategies, communication new work arrangement, such as, working from home as new practice for many organizations. Institutes and industries have observed crises in the past and have adapted as a preventative measure in case similar occurrences happened in the future (Bhattacharya et al., 2021). The COVID-19 pandemic created highly volatility markets and corporate failures due to financial instability, and scandals due to lack of leadership to effectively manage the crisis (Bhattacharya et al., 2021).

In Canada and many other countries, there was a visible shortage in essential items (e.g. N95 masks, gloves and sterilization products) and this led to an increased demand spike that triggered panic buying and hoarding behaviors by consumers (Clap & Moseley2020; Hobbs, 2020). There have been numerous world debates on how this crisis has been managed, the appropriateness of policy responses and weaknesses within the current system (Clap & Mosely, 2020). Furthermore, there has been a large impact on labor shortages that includes: health and illness of the workers, mental health in terms of self-isolation, and movement distribution restrictions (Hobbs, 2020). It will be necessary to learn, comprehend, knowledge share and reflect on how decision-making will proceed post COVID-19. The following section will discuss supply chain management practices during COVID-19.

Supply Chain Management Practices During COVID-19

The COVID-19 pandemic is a reminder of the fragility and sensitive nature of supply chain networks around the world and places a focus on the risks and reality of the flow of consequences that can occur within multiple system failure (Rejeb, Rejeb & Keogh, 2020). The management of supply chain disruption poses many challenges but how it is being managed indicates robustness of the supply management system, which includes a contingency plan for mitigating risks and monitoring the system during a period of disruption (Viera, 2020). The covid pandemic appears to have impacted supply chain management processes from the economies of scale, meaning the efficiencies in the vendor relationships, inventory control, logistics and production (Hobbs, 2021; Rejeb et al., 2020). Furthermore, it appears that COVID-19 may have impacted the economies of scope, meaning the increasing return from Supply chain management needed to facilitate and move product at a greater pace (Esper, 2021). In other words, the conversion of materials and components to be converted into finished products and the logistics to get those products to market (Esper, 2021). The failed ability of supply chains to get products into the market during the pandemic created worldwide media attention.

Initially, the attention of the coronavirus appeared to be an issue impacting and affecting China. The reality of the situation was that 95% of Fortune 1000 companies were

already impacted due to having the global supply chain operations in China and naturally, this created interruptions for inventory and direct product movement (Esper, 2021). It appears that the pandemic has initiated global supply chain management (SCM) risk conservations that could not have been brought to forefront without this occurrence (Esper, 2021). The SCM risk research appears to focus mainly on the operational risks that impact and posed threat on inventory investment and the cost of the supply chain (Sodhi, Son & Tang, 2012). All supply chains are vulnerable to risks and disruptions. COVID-19 appears to have placed an uncertainty about the readiness for another future event that resembles this one. Moreover, the pandemic appears to not have an end point. The former statement is denoting a "new norm" as organizations, businesses and SCM policies and procedures continue to move forward. These mentioned implications have also caused companies, such as Amazon, to experience publicized criticism towards the work conditions within their processing plants and distribution centers for their supply chain (Esper, 2021). It appears that supply chain workers understand that they are not immune to the stress of COVID-19 and is hoping a resolution can be found to improve work conditions and stop or lower the spread of the virus (Rejeb, Rejeb & Keogh, 2020). This former statement leads to inquiry about what new measures will be adapted to protect the health and safety of frontline workers Post COVID-19. The following sections will explore how COVID-19 impacted regions of Africa and their supply chain systems,

Africa and COVID-19 Impact On Supply Chain Management

During the onset of the COVID-19 pandemic, Africa appeared to be safe. After a short period of time, confirmed cases started to appear in the Northern, Southern and Western parts of the African continent (Obande, Bagudo, Mohamad, Deris, Harun, Yean, Aziah, & Singh, 2021). The variation in transmission rates appeared to be influenced by socioeconomic status, nutrition, age, race, presence or absence of comorbidities (Prevent Epidemics, 2021). The African region had the third largest amount of cumulative deaths worldwide due to COVID-19 and at the same time, had the lowest number of tests per 100,000 persons since the start of the pandemic (Obande et al., 2021). The largest number of cases occurred in the southern African region with 2,320,199 confirmed cases and 68,160 deaths (Obande et al, 2021). Interestingly, the landlocked Southern Africa country of Botswana conducted the highest amount of testing on the African continent by any country since the commencement of the pandemic (Obande et al., 2021).

Between the months of March and May 2021, Southern Africa was also hit hard with the COVID-19- Delta variant creating further disruptions and increased hospitalizations (Prevent Epidemics, 2021). Strict measures continued to be taken as the number of fatalities increased in some regions of Africa. The Delta variant created an upward turn in the rate of infection in a continent where the healthcare system is not strong enough (Prevent Epidemics, 2021). Being that Southern Africa was hit the hardest during the pandemic, what strategies where adopted to recover economically? The response may

lead to understanding new innovative ways to help lower the disease and to allow for continuity of services and productivity through supply chain management best practices.

According to Setino & Ambe (2016), South African government's supply chain management is not adequately implemented in state -owned enterprises (SOEs). There are apparent fragilities in the SOE's supply chain management enablers, the strategy, policy implementation and poor enforcement of government supply chain management rules and regulations (Sentino & Ambe, 2016). Government officials should be more strategic around Supply chain management practices to improve delivery during the COVID-19 pandemic. The upper level management of SOEs do not appear to see the importance of giving supply chain management any attention and therefore, there is lack of support creating difficulty for supply chain management practitioners to execute their day to day functions (Sentino & Ambe, 2016). The former statement indicates a clear misalignment and created blockages between organizational strategies and supply chain, which may pose greater challenges during the COVID-19 pandemic. There is a need for better services in Southern Africa to alleviate service delivery backlog and lessen any possible corruption from having a more solid structure (Sentino & Ambe, 2016). The subsequent sections will continue to explore the perceived impact on COVID-19 within Africa and discuss how it has impacted the continent. It will also review standards of SCM practices in developing countries.

COVID-19 Supply Chain Impact in Africa

The number of fatalities in Africa due to COVID-19 appears to be low in comparison to more develop countries (OECD, 2020). However, COVID–19 has created economic distress in the following three areas: lower investment and traded from china in the immediate term; lockdowns created a demand decline in European and OECD countries; domestic and intra-African trade was impacted due to a continental shock in supply (OECD 2020). It is important to note that underdeveloped African countries do not have viable alternatives to China as a buyer (OECD, 2020). Other sources of foreign direct investment into Africa seems to comes from the United States and France. The estimated earnings in Africa within the first months of the crisis had declined by approximately 80 percent in Africa (United Nations, 2020). The global COVID-19 disruptions will impact supply chains, and will lead to a decrease in the availability of final and intermediate goods imported to Africa (United Nations, 2020). The experience of relative poverty will seemingly increase in Africa as a long-term consequence of the pandemic.

The experienced "low trade" or "no trade" occurred when countries began to close borders for trade. The informal economy workers appear to have been hit the hardest in the pandemic. The informal economy can be defined as, "a process of income generation characterized by one central feature: it is unregulated by the institutions of society, in a legal and social environment in which similar activities are regulated", (Bromley & Wilson, 2018, p. 4). The negative impact on informal workers incomes increased as they were exposed to more health and safety risks through a lack of proper personal protection equipment (PPE) and having to maintain strong interaction

with co-workers (United Nations, 2020). The vulnerability experienced by informal economy workers was due to the lockdown measures (Bromley & Wilson, 2018). The concentration of women in the service provision sectors were more at risk than men (United Nations, 2020). In general, women appeared to be hit the hardest due to the lockdown measures (United Nations, 2020). Furthermore, the uncertainty that came with the closure of businesses appear to have meant that industries were operating with limited resources or came to an end.

Conclusion and Recommendations

In preparation for the next crisis, the extensive indirect and direct damages from COVID-19 can be taken as a learning strategy for finding balance, resiliency, safety for continuity and improved productivity. This discussion highlights how rapidly a contagion can spread through human contact and supply distribution. More importantly, it highlights the importance of the "human factor" in maintaining a solid and flexible supply chain for best practice during a crisis. The short-term consequences of poor decision-making can be life altering leading to death or long-term illness. COVID-19 has notably created an indirect disruption in the economy, labor shortages and current supply chains worldwide. The term indirect was used in the previous statement because the issues appear to be decisions made due to a lack of awareness and factual knowledge of what is actually being encountered. This crisis appears to be based on the virus but the more problematic areas have to do with the lack of informed decision-making processes being used world-wide. There appears to be a major ethical dilemma occurring behind the scenes of the existing supply chain management protocols and procedures leading to an increased spread of the contagion. One dilemma would be the nation's rapid response in purchasing vaccinations that do not appear to have been proven as effective in reducing the transmission, while exposing the workers to increased risk and possible sources of transmission from not having proper PPE and work conditions to lower health risks and maintain production on various supply chains.

The overarching question for reflection throughout this document has been:

> "What effective practices are being used in enterprises/industries/organizations during the pandemic to prevent a collapse of the existing supply chain?"

The answer to the question appears to be that there should be five essential elements put into place during a contagion outbreak:

1. Sound decision-making towards protecting the workers employment, Health and Safety Education, Training and Personal Protective Equipment (PPE);
2. Providing or supplying Rapid Covid testing before and after exposure; Not only on point of entry at the border but within the community;
3. Support, trust, and a diverse partnership relationship;

4. Government help in order to have flexibility and adaptability of the chain; and
5. Multiple means for having constant communication with all parts of the supply chain.

A new prescriptive teaching decision-making framework is needed for maintaining a strong competitive advantage during a viral outbreak. It appears that most of the extensive studies performed during the pandemic were done on more developed countries. Future reviews should place emphasis on how underdeveloped countries adapted and prepared for COVID-19. The former statement can bring forth some innovative low-cost strategies and insights on how to adapt with this pandemic.

Cited Works

1. Ali, S.A., Baloch, M., Ahmed, N., Ali, A.A., Iqbal, A. (2020). The outbreak of coronavirus disease 2019 (COVID-19)- An emerging global health threat. *Journal of Infection and Public Health*, *13*(4), 644-646.
2. Al-Shboul,. M. A.R., Barber, K.D., Garza-Reyes, J.A., Kumar, V., Abdi, M.R. (2017). The effect of supply chain management practices on supply chain and manufacturing firms' performance. *Journal of Manufacturing Technology Management*, *28* (5), 577-609.
3. Azadegan, A. & Dooley, K. (2021). A typology of supply network resilience strategies: Complex collaborations in a complex world. *Journal of Supply Chain Management. 57*(1), 17-26.
4. Barclay, I. (2002). Organizational factors for success in new product development. *IEEE*
5. *Proceedings - Science, Measurement and Technology*, *149*(2), 105–112.
6. Ben-Daya, M., Hassini, E., & Bahroun, Z. (2019). Internet of things and supply chain management: A literature review. *International Journal of Production Research*, *57* (15-16), 4719-4742.
7. Bhattacharya, S., Smark, C., & Mir, M. (2021). Covid-19: Social, financial and economic implications. *AABFJ, 15(*1), 1- 4.
8. Blanchard, D. (2021). *Supply chain management best practices (*3rd ed.). John Wiley & Sons Inc.
9. Blanchard, O., & Portugal, P. (2001). What hides behind an unemployment rate: Comparing Portuguese and U.S. labor markets. *American Economic Review*, *91*(1), 187–207.
10. Bromley, R., & Wilson, T.D. (2018). The urban informal economy revisited. *Latin American Perspectives*, *45*(1) issue 128, 4-23.
11. De Campos Silva, A.R. (2020). Health risks for poultry workers in Brazil in the covid -19 pandemic. *Bulletin of Latin American Research, 39* (S1), 88-91.
12. Calina, D., Docea, A.O., Petrakis, D., Egorov, A.M., Ishmukhametov, A.A., Gabibov, A.G., Shtilman,M.L., Kostoff, R., Caralho,F., Vinceti, M., Spandidios, D.A., & Tsatsakis, A. (2020). Towards effective covid-19 vaccines: Updates perspectives and challenges (review). *International Journal of Molecular Medicine*, *46*, 3 -16.
13. Cheong, J., Kwak, D. W., & Tang, K. K. (2018). The trade effects of tariffs and non-tariff changes of preferential trade agreements. *Economic Modelling*, *70*, 370–382.
14. Clapp, J., & Moseley, W. G. (2020). The food crisis is different: Covid-19 and the fragility of the neoliberal food security order. *Journal of Peasant Studies*, *47*(7), 1393 -1417.
15. Castillo, V.E., Mollenkopf, D. A., Bell, J. E., & Bozdogan, H. (2018). Supply Chain Integrity: A Key to Sustainable Supply Chain Management. Journal of Business Logistics, *39*(1), 38-56.
16. Cranfield, J.A.L. (2020). Framing consumer food demand responses in a viral pandemic. *Canadian Journal of Agricultural Economics*. *68*, 151-156.

17. Deconinck, K., Avery, E., Jackson, L.A. (2021). Food supply chains and covid - 19: Impacts and policy lessons. *EuroChoices. 19*(3), 34-39.
18. Diaz, E., Mamelund, S., Eid, J., Aasen, H.S., Kaarboe, O.M., Brokstad, R.J.C., Gloppen, S., Beyer, A., & Kumar, B.N. (2021). Learning from the covid-19 pandemic among migrants: An innovative, system-level, interdisciplinary approach is needed to improve public health. *Scandinavian Journal of Public Health, 49*, 804-808.
19. Erol, I., & Velioglu, M. N. (2019). An investigation into sustainable supply chain management practices in a developing country. International Journal of Business and eGovernment Studies, *11*(2), 104-118.
20. Esper, T.L. (2021). Supply chain management amid the coronavirus pandemic. *Journal of Public Policy & Marketing*, *40*(1), 101-102.
21. Fatka, J. (2021). USDA inspector to examine meat processing COVID cases. *Western Farm Press-Penton Business Media*. 1-3.
22. Fatka, J. (2021 B). Higher food prices could result if meat plants required to increases space requirements between workers.
23. Flynn, B., Cantor, D., Pagell, M., Dooley, K.J., & Azadegan, A. (2021). From the editors: introducing to managing supply chains beyond covid 19- preparing for the next global mega disruption. *Journal of Supply Chain Management*, 57(1), 3 - 6.
24. Fonseca, L.M., & Azevedo, A.L. (2020). Covid-19: outcomes for global supply chains. *Management & Marketing Challenges for the Knowledge Society*. *15*(Special Issue),
25. Gralinski, L.E. & Menachery, V.D. (2020). Return of the coronavirus: 2019 -nCov. *Viruses*, *12*(135), 1-8.
26. Guo, Y., Cao, Q., Hong, Z., Tan, Y., Chen, S., Jin, H., Tan, K., Wang, D., & Yan, Y. (2020) The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak- an update on the status. *Military Medical Research, 7(*11), 1-10.
27. Hafez, H.M., & Attia, Y.A. (2020). Challenges to the poultry industry: Current perspectives and strategic future after the covid-19 outbreak. *Frontiers in Veterinary Science*, *7*(516), 1-16.
28. Harvey, C., & Lewis, S. R. (1991). Policy choice and development performance in Botswana. *African Studies Review, 34*(3), 137-139.
29. Hallavo, V. (2015). Superior performance through supply chain fit: a synthesis. *Supply Chain Management: An International Journal*, *20*(1), 71–82.
30. Hayakawa, K., & Mukunoki, H. (2021). The impact of covid-19 on international trade: Evidence from the first shock. *Journal of the Japanese and International Economies*, *60*, 101-135.
31. Hobbs, J. E. (2020). Food supply chains during Covid-19 pandemic. *Canadian Journal of Agricultural Economics*. *68*, 171-176.
32. Hobbs, J.E. (2021). Food supply chain resilience and the covid-19 pandemic: What have we learned? *Canadian Journal of Agricultural Economics*. *69,* 189-196.
33. Hope, K. R. (1995). Managing the public sector in Botswana. *International Journal of Public Sector Management*, *8*(6), 51–62.

34. ILO. (2020). International labour organization (ILO) covid -19 monitor. 4th Ed May 2020https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_745963.pdf
35. ILO. (2021). ILO monitor: Covid-19 and the world of work. 8th Edition
36. International Labour Organization. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_824092.pdf
37. Juan Ding, M., Jie, F. A.,. Parton, K., & J. Matanda, M. (2014). Relationships between quality of information sharing and supply chain food quality in the Australian beef processing industry. *The International Journal of Logistics Management*, *25*(1), 85–108.
38. Karthik, K. A. and Sinha, M. (2021). The Impact of Physical Distancing on the Sharing Economy, *Australasian Accounting, Business and Finance Journal*, *15*(1), 2021, 22-36.
39. Kersan-Skabic, I. (2021). The covid-19 pandemic and the internationalization of production: A review of the literature. *Development Policy Review,* 00, 1-15.
40. Kumar, A., & Kushwaha, G. (2018). Supply chain management practices and operational performance of fair price shops in India: An empirical study. *Scientific Journal of Logistics, 14*(1), 85–99.
41. Lancet T. (2020). The plight of essential workers during the covid -19 pandemic. *Lancet*, 395, 1587.
42. Larue, B. (2021). Covid-19 and labor issues: An assessment. *Canadian Journal of Agricultural Economics, 69*(2), 269-279.
43. Marobela, M. (2008). New public management and the corporatisation of the public sector in peripheral capitalist countries. *International Journal of Social Economics*, *35*(6), 423–434.
44. Matsui, Y., Nguyen, M. H., & Phan, A. C. (2018). Supply chain management in developing countries: empirical evidence from Vietnamese manufacturing companies. *International Journal of Productivity and Quality Management*, *24*(4), 566-582.
45. Min, S., Zacharia, Z.G., & Smith, C. D. (2019). Defining supply chain management: In the past, present and future. *Journal of Business Logistics, 40* (1), 44-55.
46. Niles, M.T., Bertmann, F., Belarmino, E. H., Wentworth, T., Biehl, E., & Neff, R. (2020). The early food insecurity impacts of covid-19. *Nutrients, 12*,
47. Novitasari, M., & Agustia, D. (2021). Green supply chain management and firm performance: the mediating effect of green innovation. Journal of Industrial Engineering and Management, *14*(2), 391–403.
48. Obande, G.A., Bagudo, A.I., Mohamad, S., Deris, Z.Z., Harun. A., Yean, C.Y., Aziah, I., & Singh, K.K.B. (2021). Current state of covid-19 pandemic in africa: Lessons for today and the future. *International Journal of Environmental research and Public Health, 18*, 1-15.
49. OECD. (2020). *Covid -19 in Africa: Regional socio-economic implications and policy priorities. https://read.oecd-ilibrary.org/view/?ref=132_132745-u5pt1rdb5x&title=COVID-19-in-Africa-Regional-socio-economic-implications-and-policy-priorities&_ga=2.195473004.1388414703.1636511120-1376897899.1636511120.*

50. Ozkan-Ozen, Y., Kazancoglu, Y., & Kumar Mangla, S.. (2020). Synchronized barriers for circular supply chains in industry 3.5/industry 4.0 transition for sustainable resource management. *Resources, Conservation and Recycling, 161*, 104986.
51. Prevent Epidemics. *Update on COVID-19 in Africa*. https://preventepidemics.org/covid19/science/insights/ update-on-covid-19-in-africa/
52. Purwanto, B. (2020). Learning from the corona virus pandemic: Interdisciplinary history and strategic issues of historical research. *Indonesian Historical Studies,4*(2), 100-112.
53. Quynh, D.V.X., & Huy, N.H. (2018). Supply chain management practices, competitive advantages and firm performance: A case of small and medium enterprises (SMEs) in Vietnam. *Journal of Modern Accounting and Auditing*, *14*(3), 136-146.
54. Rapitsenyane, Y. (2019). A Conceptual Review of Sustainable Innovation: A Driver for Growing the Manufacturing Industry in Botswana. *Journal of Creativity and Business Innovation, 5*, 43–61.
55. Reid, A., Ronda-Perez, E., & Schenker, M.B. (2021). Migrants workers, essential work, and covid -19. *American Journal of Industrial Medicine*, *64*(2), 73-77.
56. Rejeb, A., Rejeb, K., & Keogh, J. G. (2020). Covid-19 and the food chain? Impacts and future research trends. *Scientific Journal of Logistics*, *16*(4), 475-485.
57. Ruele, M. (2011). Eradicating Poverty and Promoting Dignity in Botswana through Contextual Theology of Liberation: Challenges and Prospects. *Journal of Social Development in Africa*, *26*(1), 161-186.
58. Salyer, S.J., Maeda, J., Sembuche, S., Kebede, Y., Tshagela, A., Moussif, M., Ihekweazu, C., Mayet, N., Abate, E., Ouma, A.O., Nkengasong, J. (2021). The first and second waves of the covid-19 pandemic Africa: a cross-sectional study. *The Lancet, 397*(10281), 1265-1275.
59. Sebata, D. (2021). *Supply chain management best practices: An empirical research on the botswana state-owned enterprises.* (Unpublished doctoral dissertation). Monarch Business School, Switzerland.
60. Sánchez-Flores, R. B., Cruz-Sotelo, S. E., Ojeda-Benitez, S., & Ramírez-Barreto, M. E. (2020). Sustainable supply chain management-A literature review on emerging economies. *Sustainability*, *12*(6972), 1-27.
61. Setino, R., & Amba, I.M. (2016). Supply chain management practices in state-owned enterprises environment. *Risk Governance & Control: Financial Markets & Institutions, 6*(4), 380- 391.
62. Simão, L.E., Gonclaves, M.B., Rodriguez, C.M.T. (2016). An approach to assess logistics and ecological supply chain performance using postponement strategies. *Ecological Indicators, 63*, 398- 408.
63. Sodhi, M.S., Son, B.G., & Tang, C.S. (2012). Researchers perspectives on supply chain risk management. *Production and Operations Management*, *21*(1), 1-13.
64. Srivastava, R. K., Shervani, T.A., & Fahey, L. (1999). Marketing, business processes and shareholder value: An organizationally embedded view of

marketing activities and the discipline of marketing. *Journal of Marketing*, *63*(Special Issue), 168 -179.
65. Temtime, Z. T., Chinyoka, S., & Shunda, J. (2004). A decision tree approach for integrating small business assistance schemes. *Journal of Management Development*, *23*(6), 563–578.
66. United Nations. (2020). *Policy brief: The world of work and covid -19.* United Nations. https://www.un.org/sites/un2.un.org/files/the_world_of_work_and_covid-19.pdf. 1-24.
67. Van Hoek, R., Gibson, B., & Johnson, M. (2020). Talent management for a post-covid-19 supply chain- the critical role for managers. *Journal of Business Logistics*, 41(4), 334-336.
68. Vieira, A.J. (2020). Supply chain disruptions and challenges post covid 19 crises in Indian context. *Supply Chain Pulse*, *11*(1), 22-23.
69. Wang, W., Tang, J., & Wei, F. (2020). Updated understanding of the outbreak of 2019novel coronavirus (2019-nCov) in Wuhan, China. *Journal of Medical Virology*, *92*, 441-447.
70. WHO. (2020). *Coronavirus disease (COVID-19) pandemic*. https://www.who.int/emergencies/diseases/ novel-coronavirus-2019
71. Yanamandra, R. (2021). Investigating the influence of organizational factors on supply chain awareness. *Operations and Supply Chain Management, 14*(2), 189-202.
72. Zekhnini, K., Cherrafi, A., Bouhaddou, I., Benghabrit, Y., & Garza-Reyes, J. A. (2020). Supply chain management 4.0: a literature review and research framework. *Benchmarking: An International Journal*, *28*(2), 465–501
73. Zoumpourlis, V., Goulielmaki, M., Rizos, E., Baliou, S., & Spandidos, D.A. (2020). The covid-19 pandemic as a scientific and social challenge in the 21st century. *Molecular Medicine Reports*, *22*, 3035-3048.