

# EXECUTIVE SUMMARY

The advent of the first pandemic of the 21<sup>st</sup> century changed the facet of how the world operates. With the technological development & improved connectivity, there is a steep rise in the movement of goods, services, and people across the globe. Due to this improved connectivity, since the last 2-3 decades, companies trying to be reduced their operational costs by outsourcing some of the tasks or importing resources from elsewhere. Countries across the world developed international trade relations. There was a well-established Global Supply and Operations Network for most of the MNCs & Tier 1 suppliers in various industrial sectors. However, things have suddenly changed & due to a major pandemic that the connected modern world has never seen before. With lockdown implemented across the nations minimizing the cross-border trades, governments of various countries have faced the challenge of producing the needed medical equipment domestically. Canada has been relying on its medical needs from other countries from where most of its medical supplies are imported from. Realising the fragile & intricate nature of this network many nations are turning to the local manufacturers to meet the sudden rise in demand of necessary goods and services during the times of emergency.

Our report firstly analyses the situation of COVID-19 in Canada and the relation between the need for ventilators and the growth of COVID-19 cases. The number of active cases has multiplied 80 times in 20 days in March. With the rise of active cases & rapid transmission of disease, there has also been an increase in intensive cases. Intensive cases are those where the patient cannot have natural breath flow. In these cases, there is a need for an artificial breath support system. Ventilators are the devices that can artificially pump oxygen into the lungs. Ventilators are the last resort for the patient to survive. At the onset of COVID-19, there are approximately 5000 ventilators across Canada and most of them in the province of British Columbia. The health ministry of Canada is faced with this challenge of regulating ventilator allocation. Ventilator allocation is a critical factor of consideration, depending on various factors which change from patient to patient. Time a patient may need critical care is also higher in the case of this disease & thus a ventilator may be in use for a longer than normal time, increasing its scarcity. Next our report analyses the contracts made by the government with four private manufacturers to produce 30000 new ventilators. Even though Canada currently has enough ventilators, the government

decided to manufacture excess in case of need. This decision was taken looking at the conditions in other countries like Italy & the USA, just to be well-equipped for a worst-case scenario. The approach by the four companies in terms of supply chain management, manpower planning, technology and process planning, medical regulations in terms of quality control are discussed. Further, a discussion about the challenges that the companies may face in terms of regulations controlled by the government for the manufacturing of the ventilators is outlined. Finally, recommendations are made as of how the innovations in technology can answer an unexpected situation like this pandemic, how the technological modifications from automotive industries can help mass produce ventilators in short time frame. A brief discussion about what the post-COVID scenario about the ventilators is also discussed.

There are two key take-away points that our report focuses on. The first is the importance of maintaining the standards in producing the ventilators. Even though there is a high demand that must be delivered in a short time, the companies have to follow a standard to produce these machines because of their criticality in terms of usage. To aid the companies, the government has relaxed the norms to boost production. The second take away is the importance of process change that companies can follow to meet the large demands. Usually, the companies can produce at the rate of 50 ventilators per month. With the COVID situation, the companies are asked to produce at a rate of 500 per week. This requires a strategic approach and can be achieved by thinking smartly. Technological innovations such as modifying pressure control devices that automobile companies for cars, airplanes, and these being produced in large numbers can be used as a ventilator, which is an innovation in a time of need.