

## Impact of Covid -19 Pandemic to Construction Industry in Sri Lanka

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**Abstract:** Covid -19 is a highly contagious global pandemic. Social distancing measures are the most successful tactic in combating the diseases. Due to the disease itself and local and global pandemic combating measures, businesses have been compelled to operate in a new environment. Infrastructure investments are down worldwide. This research was focused in identifying the risks posed by the pandemic to construction industry in Sri Lanka. A questionnaire survey was done to identify major risk factors in the construction industry in Sri Lanka. Disruption in supply chain, prophylactic absenteeism, regional lockdowns, fear of a second wave and decrease in investments were identified as the risk factors. Disruption to supply chain is the highest risk factor. Construction industry in Sri Lanka is highly rely on the local and global supply chains. Organizations need to foster transiency in their supply chains – the ability to restore some processes and change quickly. Dependence on external entities and regions should be managed by reducing the dependency or at least increase their predictability. Prophylactic absenteeism – due to government regulations is the second most influential factor. It disrupts the movement of people. Associated issues have arisen due the disruptions of supply chain and prophylactic absenteeism.

**Keywords:** Covid- 19, Supply chain, Prophylactic absenteeism

### Introduction

Global pandemics of diseases are not a new phenomenon. Several regional and global

pandemics of diseases have emerged in different scales throughout the history. During the last century, the world has experienced Spanish Flu in 1918, Asian Flu in 1957, Hong Kong Flu in 1968 and more recently SARS in 2002, swine flu in 2009 and Ebola in 2014. In large scale pandemics, the impact is severe and wide across regions due to two reasons: either because the infection itself is widespread, or because the trade and market integration, eventually propagate the economic shock across the map (Stephany et al., 2020 and Jorda et al 2020). Covid - 19 is a global pandemic with severe economic and social impact due to travel warnings, border and store closures, regional lockdowns and social distancing measures. There is a significant uncertainty about the economic and social effects of the pandemic.

The study presented here investigates the risk factors of the pandemic in the construction industry and the gravity of them. Covid-19 is a new and an unexpected pandemic. Consequently, construction industry, a non-essential industry is affected due to government policies to curtail the pandemic and pandemic itself. The literature review investigates the economic impact of the pandemic and risk factors encountered in a pandemic situation. There was limited literature about the behaviour of the construction industry in a pandemic situation. In the analysis, the identified factors were applied to the construction industry in Sri Lanka. Applicability of the risk factors to the Sri Lankan construction industry was analyzed.

## Literature Review

### Economic impact

Planning for pandemics is important. Appropriate measures have to be taken to minimize the mortality, morbidity and economic impact associated with pandemics (Keogh-Brown et al, 2009). Maintaining business as usual and encouraging social distancing are the key factors in managing the economic impact and health related impact of a pandemic (Smith et al, 2009). It would be beneficial to estimate the cost of the disease itself, the distribution of this cost across sectors, and the cost of policies that may be used to mitigate the pandemic.

Covid -19 would be the second most devastating pandemic after Spanish flu (Stephany et al, 2020 and Jorda et al 2020). Economic impact of Covid - 19 could be dramatic (Rio-Chanona et al, 2020 cited Baldwin and Weder di Mauro, 2020).

As per Smith et al, 2009 economic-wide impact of an influenza to the economy of United Kingdom (UK) would be 0.5% - 1% of Gross Domestic Production (GDP) for low fatality scenarios, 3.3% - 4.3% for high fatality scenarios and 6% - 9.6% for extreme scenarios. Keogh-Brown further explains that the impact for economies with higher exports is slightly higher, since exports are adversely affected by the influenza shock.

The world bank estimates a baseline forecast envisions a 5.2 % contraction in global GDP in 2020. Rio-Chanona et al 2020 cited Barrot et al. (2020) suggests that six weeks of social distancing would bring GDP down by 5.6%. The impacts of the pandemic last for decades. Central bank of Sri Lanka also expected to see economic growth of 4.5% – 5% following Easter Sunday attack but now it expects an economic growth of 2.2%.

As per French statistical office by March 26 at around 65% of normal level of the economy was in operation (Rio-Chanona et al 2020).

As per Stephany et al, 2020 in United States of America (USA) from the end of January 2020 an increasing number of companies had started identifying Covid - 19 as a potential risk: 70% of companies in manufacturing sector, 78% of retail sector and 72% in hospitality sector.

As per Smith and et al, 2009, in the UK economy meat and livestock, processed foods, textiles/paper/plastics, manufacturing, and transport and communications sectors might get the highest impact while the extraction sector (mining, quarrying, forestry and fishing) followed by crops, utilities and construction, and health and non-health services might get a lower impact. Shock will transmit throughout the economy over time, different sectors will get the impact at different stages of the pandemic (Stephany et al, 2020). Fernandes (2020) has observed that in China infrastructure investment was down in the first two months of 2020 (30% from a year earlier).

### Risk factors

Shutting down the non-essential business operations would affect the whole economy. Studies have showed that shutting down in economic powerhouses would cause a loss of output in other parts of the economy through supply chain linkages, and estimate that after a month, daily output would be 86% lower than pre-shock (Rio-Chanona et al, 2020 cited Inoue and Todo (2020). China represents 16% of the global economy, any activity in Chinese economy is strongly felt throughout the world. China is currently the world's largest importer and exporter. In many individual industries, China is the main supplier of parts. Thus, disruption in China highly influence global supply chain (Fernandes, 2020). Fernandes (2020) further investigates that according to the U.S. Institute for Supply Management, 75% of companies report disruptions in their supply chains.

Black death pandemic induced labour scarcity in the European economy and pushed real wages up (Jorda et al, 2020). Deaths (permanent impacts on the working population) and absenteeism (temporarily impacts on working population), due to social distancing measures and regional lockdown influence the quantity and quality of working population of the economy (Keogh-Brown et al, 2009).

Prophylactic absence highly influences on working population and economic activities (Keogh-Brown et al, 2009 and Smith, 2009). Due to social distancing measures, school closures and prophylactic absence were observed worldwide. Direct illness impact of a pandemic is low, but school closures and prophylactic absenteeism, whether imposed by the government or as the result of fear of infection in the population could make a great impact on the economy.

Many sectors are experiencing issues on the supply-side, as governments curtail the activities of non-essential industries (Rio-Chanona et al, 2020). Delays and failures in the supply chain would disrupt the production processes. The retail and manufacturing sector in USA expect the highest number of risks due to the failures in supply chain and production (Stephany et al, 2020).

Bloom et al, 2005 states that historical data have shown that even during an epidemic outbreak, the public soon adapts to the situation and the disease and economic activity continues. A pandemic is likely to affect consumer confidence and change consumption and social behaviour. It will also affect investor confidence and reduce investments in the future. In the long run, poverty will be increased.

As per Harinarain and Haupt, 2014 South African construction industry is vulnerable to Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome

(AIDS) pandemic because the industry encompasses numerous companies of various sizes and discourages permanent employment by encouraging subcontracting and labour only subcontracting. Construction industry is also particularly vulnerable to the pandemic because it employs a constantly changing labour force that works on short-term contracts and permanent employees who move between projects across the country. The fragment nature of the construction industry might promote spreading of the disease.

### **Research methodology**

This research is focused on identifying the impact of the new pandemic, Covid – 19 for the construction industry in Sri Lanka. In order to gain an in-depth knowledge about the research area, a quantitative approach was taken.

A literature survey was done to investigate the economic impact and potential risk factors. There was limited literature about Covid -19 situation, therefore, literature on other pandemics was also considered. Risk factors that influence the economy in a pandemic situation were identified through the literature survey. Then, a questionnaire survey was done with a sample of 35 professionals in the construction industry. Results were analyzed to investigate the gravity of each risk factor in Sri Lankan context. Further, some new factors were identified through the survey. Those factors were associated factors of the risk factors, identified.

### **Data Analysis and Results**

Risk factors were identified through the literature survey on Covid -19 and other recent pandemics. The study began with 07 risk factors. Additionally, 09 factors were identified through the survey.

Risk factors identified through the literature survey were common factors for pandemics.

Therefore, the intention was to investigate the relevance of them to the construction industry in Sri Lankan context and the severity of each factor.

Additional factors of impact identified through the survey

- Damages to existing materials
- Some materials have been already used. But those materials currently cannot be sourced.
- Payment to employees without work
- Payment delays by clients
- Rental cost for office buildings and hired plants and machineries
- Risk of bankruptcy
- Risk of termination of projects
- Risk of termination of staff employment

Disruptions to supply chain is a highly influential factor, 46% of participants have identified it as a high-risk factor and 17% as an extremely high-risk factor. It can be categorized as a high-risk factor to the construction industry. Government policies to curtail the disease and regional lockdown worldwide have disrupted the global supply chains. As a result of the disruptions, acquiring more supply of materials, that has already been acquired was disrupted. Since in ongoing projects, the materials have been already selected and a part of the

consignment has been delivered, it is essential to acquire the same material. It is difficult to go for a new material to avoid a bottleneck in the supply chain.

Prophylactic absenteeism was analyzed under three categories; due to government policies phobia and school closure. Prophylactic absenteeism was mainly observed due to social distancing measures; curfew and curtailing the non-essential operations. Industry has identified this issue as a high-risk factor. In the construction industry, people work very closely and a large number of people are involved in a project, therefore there is a possibility of spreading the disease. Different health measures were encouraged; social distance, splitting shifts, disinfection of the premises, working from home, discouraging non-essential activities, monitor health of people and quarantine. These factors are not favorable factors for the construction industry. Thus, it was compelled to halt the operations of many construction projects.

School closure was identified as a factor for a prophylactic absenteeism during recent pandemics. But it has been not identified as an influencing factor for the construction industry. The rationale behind the prophylactic absenteeism and school closure is that once the schools are closed, one parent has to stay home to attend the children; mostly the mothers. Sri Lankan

*Table 1: Risk factors and the impact*

	Percentage					Total
	Not applicable	Low	Medium	High	Extremely high	
Disruptions to supply chain	0%	9%	29%	46%	17%	100%
Prophylactic absenteeism - Due to government regulations	0%	17%	23%	26%	34%	100%
Prophylactic absenteeism - Due to phobia	6%	11%	29%	40%	14%	100%
Prophylactic absenteeism - Due to school closure	23%	57%	20%	0%	0%	100%
Regional lockdowns	0%	0%	26%	29%	46%	100%
Fear of a second wave	71%	29%	0%	0%	0%	100%
Decrease in new investments	0%	29%	31%	17%	23%	100%

construction industry is a highly male dominant spectrum. Thus, the school closure is not an applicable factor.

Regional lockdowns affect every aspect of businesses. It is a high-risk factor for the construction industry. Almost all the countries have gone for some degrees of lockdown. Lockdowns are in two ways; local lockdown within the country, Colombo, Kaluthara, Gampaha, Puttalam, Jaffna and Kandy districts went for longer lockdowns and global lockdowns. Border crossings were prohibited during the lockdown period. Supply chain and movement of people have been disrupted. Continuous supply of materials and influx of people at different stages of projects are essential conditions in the construction projects. Once the normality is interrupted, the pace of project is also interrupted.

World is experiencing the first wave of Covid -19. Three waves were reported in Spanish flu between 1918 – 1920. A second and a third wave of Covid – 19 are also expected. But the industry is not much concerned. But since the danger is obvious, it is a factor to be considered in making investment decisions and in project management.

Decrease in new investment is also high-risk factor. Because there is an uncertainty of business operations worldwide. Thus, investors are much concerned about their investment. Other than the decrease of the new investments, there is another risk of the termination of existing projects.

As a result of the risks created by the pandemic, industry experience additional risks; termination of staff employment, risk of bankruptcy, damages to existing materials, payment to employees without work and rental cost for office building and hired plants and machineries, risk of claims and payment delays by clients.

## Conclusion

World Health Organization (WHO) named Covid-19 as a global pandemic. Repercussions of the pandemic are in different degrees to different countries. Out of the risk factors identified, disruptions to supply chain is the most influential factor. Regional lockdowns and government policies to curtail the pandemic contributed the disruption. Supply chain is essential for the progress of construction projects. Spanish flu lasted for three years. Covid – 19 pandemic would also last for a similar period. Thus, new techniques of supply chain are something to be developed. Organizations need to foster transiency in their supply chains – the ability to restore some processes and change quickly. Dependence on external entities and regions should be managed by reducing the dependency or at least increase their predictability.

Absenteeism – due to government regulations is the second most influential factor. It influences both supply chain and movement of people. In Sri Lanka, curfews were eased from mid of May 2020. Thus, restrictions to movements within the country have been lifted. But global supply chains have not rebounded to pre-covid situation.

Covid -19 is an unknown unknown, though world had experienced great pandemics nobody had ever thought of it. New pandemics and catastrophizes are yet to come. Risk management teams worldwide were unable plan for this pandemic. The job of risk management teams is to foresee and analyze all the types of risks. But nobody could prepare a plan for a pandemic.

Pandemics can alter power dynamics. Thus, we may encounter new dynamics in supply and demand. As a result of that, new sources of suppliers and supply chains may emerge. This research can be extended to identify

new dynamics in the supply chains in the construction industry.

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