RISK FACTORS OF COVID 19 TRANSMISSION IN CHOLERA ENDEMIC COUNTRIES
Chandrika Murugaiah¹ Liew Sat Lin Constance¹, Hassanain Al-ţalib⁵, Mehru Nisha⁴, Tunung Robin⁴, Tuan Zainazor Tuan Chilek², Atif Amin Baig⁶, Rhanye Mac Guad⁷, May Zaw Soe⁶, Abm Tofazzal Hossain¹, Falah Abbas Mohamad Salih¹, Mustafa al Shagga⁷
¹Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah
²Laboratory Medical Science Cluster, Faculty of Medicine, Universiti Teknologi MARA (UiTM)
³Clinical Laboratory Science Section, University Kuala Lumpur
⁴Universiti Putra Malaysia Bintulu Sarawak Campus
⁵Faculty of Fisheries and Food Science, University Malaysia Terengganu
⁶Faculty of Medical Sciences, University Sultan Zainal Abidin
⁷University of Nottingham Malaysia

Article Info: Received 18 May 2020; Accepted 11 June 2020
DOI: https://doi.org/10.32553/ijmbs.v4i6.1204
Corresponding author: Chandrika Murugaiah
Conflict of interest: No conflict of interest.

Abstract
COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing deaths, illnesses and economic despair. The least developed countries have limited or lack of medicine, ventilators, beds, water electricity, availability of doctors’ service for a large population and facing challenges to handle the economic fallout of the crisis. Cholera patients are more likely to reside in a slum, and this triggers worries with higher infection and spread chances if they were to be contracted with coronavirus. Decrease maternal education and reduce family income could increase cholera risk in rural children. Low Socioeconomic status, clean water supply and limited healthcare facilities may pose risks of covid spread. Should an awareness and knowledge of covid 19 in cholera endemic setting is developed, it is the residents of poor nation that stand to benefit the most.

Introduction
Since mid-December 2019, an infectious disease caused by a newly discovered coronavirus cases of a pneumonia-like disease have emerged in the central Chinese city of Wuhan, linked to a zoonotic transmission from a seafood and animal market [1]. By Mac 2020, the virus has spread to 210 countries and territories around the world. Older people and those with underlying medical problems like cardiovascular disease are badly affected [2]. The virus spreads through droplets of saliva, coughs or sneezes [3]. Infected people showed symptoms like fever, difficulty in breathing, cough and invasive lesions on both lungs [4]. Phylogenetic analysis relates this virus with the severe acute respiratory syndrome (SARS)- coronavirus clade, closely related to bat coronaviruses, pangolin coronaviruses, and SARS-CoV [5]. Protection from infection is mainly by hands washing or using an alcohol based rub frequently as no specific vaccines or treatments for COVID [6].

Threat of Covid 19 in cholera endemic countries
Covid 19 is to be a highly contagious threat in cholera endemic countries such East Africa corridor, and countries in Northwest Africa because of less of poor clean water supply, medical supplies and facilities. Despite awareness created by WHO there has been no concrete global improvement to limit transmission rate, imposing a major public health problem worldwide. Although there has been a movement control these ban to remain long is impossible. Low-income countries are facing major challenges as covid testing is expensive. Because of the lack of test kit, predicting the patterns of covid outbreaks could not be possibly achieved. Maintaining overall good personal hygiene, wearing mask and washing hands with clean water seems to be challenge for poor. In slum areas, physical distancing measures are almost impossible. Self-quarantine is impossible in slum area or people living in camps. Ways need to be figured out on how to self-quarantine infected people and how to protect someone with COVID-19 in these setting. Highly contagious cholera happen in densely populated and economically reduced areas where V. cholerae is transmitted through the feces of an infected person. These are the high risk areas of covid 19 spread, due to poor hygiene practice, inadequate sanitary facility and limitation to access to clean water supply. There are major limitations in the standard and adequate health care system in rural and poor resource countries, where a lack of medicine, ventilators, beds, water and electricity and shortages of doctors are very common. In the mid of covid crisis, there is no ways to improve the water or electricity and
availability of doctors service for a large population. 

Five years ago, Ebola virus soon spread to Guinea's capital city of Conakry as person arrives at a hospital to get treatment contaminated the others around them. We have to project in a way that if these are inadequacies in healthcare, covid mortality should get higher. The healthcare sector is still underfunded in the least developed countries where this situation is not going to get any better in the coming years.

Both cholera and covid-19 outbreaks are seasonal and connected to climate change [7][8]. A study has shown that cholera transmission was promoted when the host population had low levels of natural acquired immunity, especially when they were not in a refractory period from previous disease outbreaks [9]. In covid-19, infected people with low level of immunity have a high mortality rate. One of the covid symptoms is diarrhea. How covid infection could exuberate disease in cholera patient has to be studied as cholera occurs as a result of the loss of salt and water through sudden onset of profuse, watery diarrhea. In most severe cholera patient, nausea and vomiting with extreme loss of water, electrolytes, bicarbonates and ions lead to serious dehydration, tachycardia, hypotension, electrolyte imbalance, circulatory collapse and vascular collapse are found.

In the rural setting such as Bangladesh, decrease maternal education was associated with increase cholera risk in rural children, and reduce family income was associated with increased risk in urban cholera patients [10]. Mostly children with cholera patient were more likely to have uneducated mothers. The children from families with lower household incomes does not have improved toilet facilities and a clean drinking water source because they are less likely to come from a family that owned a home or to use tap water. They were more likely to use river water for drinking or washing. Low Socioeconomic status may pose a risk where low maternal education could increase alarming cholera and covid risk in rural children. Low Family income might lead to impossibility to purchase mask, hand wash with clean water and affordability to buy healthy food to boost immunity increasing the risk of covid infected children towards mortality. Sadly, some of cholera infected children are severely malnourished. Breastfeeding is still a powerful tool in feeding malnourished in these children.

Conclusion

How covid to affect cholera patient that can cause severe dehydration, watery stool, and bowel movements, vomiting and breathing difficulties is very worrying. Achieving an acceptable standard and adequate healthcare system in cholera endemic places is merely impossible. There are lessons to be learn from 1994, cholera outbreaks in highly dense Rwandan refugees camp where estimated 12 000 died in Goma in eastern Zaire. Limited use of oral rehydration therapy and intravenous fluids, had led to high mortality rate during this outbreak. International monetary fund and aid to overcome lack of medicine, ventilators, beds, water and electricity is required to protect poor nation in endemic setting.

References