

Notes that formed the basis of the discussant remarks by Dr Arthur Phillips

I am grateful to the organisers for this opportunity to be a discussant at this symposium on Biosecurity Threats in the Caribbean. I want to congratulate UWI for providing an opportunity for thought and discussion on issues that are relevant and important to the region. Thank you Dr Rollock, for your presentation on Climate Change Risks and Biosecurity Implications for the Caribbean. I thank Dr Rollock for sharing talking points prior to this presentation which make my role as discussant easier. I want to thank her for a broad and interesting talk. In my view her presentation was quite thorough and clear.

There have been increasing number of publications on climate change and biosecurity. A quick look at pubmed, a popular reputable indexed portal of health related publications, would show over 30 papers per year for over the past few years. Interestingly there is not much in the literature on climate change and biosecurity in the Caribbean in the literature. It is in that context that I think the presentation fits well as an overview.

While I would agree that global climate change has occurred with competent authorities such as the Intergovernmental Panel on Climate Change, the US National Aerospace Administration agreeing that the causes are most likely anthropometric.

I want to go beyond the scope of the presentation but stay within the topic and speak briefly to the linkage of climate and its biosecurity implications with non-communicable diseases. I think that this is a worth considering given the importance of NCDs as the leading causes of death and disability.

Luke Allen in a 2016 paper makes the point that the concept of biosecurity has been expanding from its initial focus on intentional misuse of biological agents to infectious threats. From its initial focus on protecting crops and livestock from infectious diseases and anticipating and addressing biological terrorism we now acknowledge SARS, Ebola and even Zika as biosecurity issues. Allen argues that it is therefore not an unreasonable stretch to consider the risk factors and the presence of NCDs as biosecurity issues. Indeed they have already been considered by some as threats to national and international security. He also argues that NCDs are communicable given their links to infections as well as to environment and social trends including factors such as poverty, globalization, and the availability of unhealthy products. If we add to this the linkages between climate change and NCDs I think we can justify the inclusion of NCDs. If we are to accept this reasoning we can look at climate vulnerabilities in the Caribbean through these eyes and note the NCD implications. There are implications for cancers, cardiovascular diseases and mental health.

As we examine the vulnerabilities in the Caribbean related to climate change issues such as water sources, dependence on food imports, prominence of tourism. The impacts of climate on food production has implication for NCD rates in the region. We know that extreme weather events including flooding and droughts can have negative implications for crop production. Granted most Caribbean states already import significant proportions of the food consumed. However negative impacts on regional production may mean more imported food, higher prices for foods that are high in fiber and minerals relative to those that are calorie dense and low in fiber. The cheaper foods are associated with higher rates of obesity, diabetes, hypertension and the associated complications such as heart attacks, strokes and amputations with the knock on effect on healthcare costs and decreased productivity.

A 2013 Lancet editorial argues that the linkages between climate change and NCDs are also apparent. Climate change may be associated with the release of potentially carcinogenic chemicals, such as persistent organic pesticides that are trapped in ice sheets, as well as the increased solubility and volatility at higher temperatures. Forced migration due to extreme weather events and sea level rise may result in decreased health service access including decreased access to screening services for NCDs such as cancer. There may be increased risk of Acute Myocardial Infarctions due to increased exposure to air pollution as well as to cold temperatures. The literature suggests that extreme temperatures have resulted in increased hospital admissions due to cardiovascular and respiratory conditions.

In this region the interaction of climate and NCD complications is documented in relation to Acute Myocardial Infarctions. A 2015 paper by Rivero and others examined association of Acute Myocardial Infarctions with climate variables in Cuba. The context includes the occurrence over the past 40 years of an increase of 0.9 and an increase in minimum, increases in drought and more episodes of extreme events ((drought, heavy rains, hurricanes and extremes in temperature). Rivero reported consistently higher rates of Heart Attacks during the cold weather of the dry season in Cuba.

On the issue of impacts from sea level rise, droughts, flooding and more severe weather include migration and we have the recent examples of Dominica and Barbuda. While it is easiest for those with resources and other sources of resilience to move those who are vulnerable may be more likely take on increased exposures to infection, poor food sources and other precipitants of NCDs.

With several of the islands of the Caribbean being traditionally water scarce and in several of the smaller island from is a major source wells of potable water there is potential for impact due to salt water intrusion in terms impact on hypertension. This is theoretical given that salt in our food has been acknowledged to contribute to elevated blood pressure levels and to cardiovascular event risk. A 2017 systematic literature review and meta-analysis review by Talukder and others found 3 cross sectional studies on sodium in drinking water and hypertension. While the paper was inconclusive it suggested an association between salt water intrusion and elevated of blood pressure.

Health outcomes related to climate change affect a wide range of stakeholders, providing ready collaborative opportunities for interventions, which can be differentiated by addressing the upstream drivers leading to climate change or the downstream effects of climate change itself. Changing weather patterns can increase food instability (eg, through drought, or spoiled or contaminated crops) and in turn, food security concerns might precipitate the increased use of more intensive farming practices, including greater use of carcinogenic pesticides and preservatives. Forced migration due to extreme weather events and sea level rise may result in decreased health service access including decreased access to screening services for NCDs such as cancer.

In the face of a comprehensive presentation on Climate Change Risks and Biosecurity Implications for the Caribbean it is useful; to think of the impacts that climate change has on NCDs in the Caribbean. We have made the argument that NCDs are as biosecurity threat. We have also briefly examined some possible mechanisms by which particular climate change scenarios impact NCDs in the region. If we are to accept this reasoning we can look at climate vulnerabilities in the Caribbean through these eyes and note NCD implications. As NCDs are our leading burden of illness it is worthwhile to examine the linkages and consequences of climate change on NCDs as a biosecurity issue.

Referenced Articles

Rivero A1, Bolufé J, Ortiz PL, Rodríguez Y, Reyes MC. (2015) Influence of climate variability on acute myocardial infarction mortality in Havana, 2001-2012. MEDICC Rev. 2015 Apr;17(2):14-9.

Climate change in the Caribbean – learning lessons from Irma and Maria, Michael Taylor 2017 <https://www.theguardian.com/environment/2017/oct/06/climate-change-in-the-caribbean-learning-lessons-from-irma-and-maria>

Allen, Luke. (2016). Biosecurity and Non-Communicable Diseases. Journal of Bioterrorism & Biodefense. 7. 10.4172/2157-2526.1000145.