

After the Flood: A Post-disaster Health Crisis

Essay Summary

This essay examines the health effects of the 2018 and 2019 floods in Kerala, a state in India. Kerala has a strong healthcare system that is considered one of the best in the country. A strong emphasis on social healthcare has improved markers of development in this state. Despite this, the floods had an adverse effect on the health of the population. These health issues, both physical and mental, are discussed. Furthermore, scientists continue to disagree about the causes of the flood. While some scientists believe that climate change is responsible for the flood and the resultant loss of life, others are not convinced that climate change has played a role. Whatever the reason for the flood is, it is necessary to acknowledge that repeated occurrences of these adverse weather conditions need close examination so as to prevent future disasters, and to be adequately prepared to face adverse public health consequences that arise from them.

Essay

Unless there is a substantial decrease in carbon dioxide emissions, global temperatures are expected to increase by 1.5°C as early as 2030. At this rate of increase, regions including South and Southeast Asia will face a high risk of flooding (Döll, et al., 2018). A majority of these regions are in countries classified as low and lower-middle income, and may not have the resources to deal adequately with the consequences of these disasters (Moser and Satterthwaite, 2010). Thus, it is important to examine the issues that may arise due to a disaster in these regions.

Kerala is a state in the southwestern part of India. With a population of 34.8 million, Kerala has made significant improvements in public health over the past 30 years. Despite having a Gross Domestic Product (GDP) of only US\$130 billion - the 13th highest in the country - Kerala has invested heavily on education, healthcare, infrastructure, agriculture and housing. Consequently, the state of Kerala continues to surpass other states in the country in terms of literacy rate, infant mortality rate, average life expectancy, etc (Parayil, 1996). This development plan, characterised by improvement in human development index despite low per capita income, is termed as the “Kerala model of development.” The success of this model has been attributed to various factors such as high levels of political participation and wealth redistribution, along with the presence of political leadership committed to sustainable development (Franke and Chasin, 2000).

In 2018 and 2019, Kerala faced devastating floods that claimed hundreds of lives and left millions stranded (Agarwal, 2018). This was due to a 40% increase in rainfall (India Meteorological Department, 2018), resulting in the opening of dams that led to massive overflow of water. The Indian government classified the floods as a “calamity of severe nature,” also known as a Level 3 (L3) Calamity (National Disaster Management Authority, Government of India, 2007). A classification of L3 indicates that the state government may not have the capacity to respond to the disaster and would require aid from the central government.

Is Climate Change Responsible?

The Western Ghats, a mountain range that traverses six states of India, intercept the moisture-laden air drawn from warm ocean waters as part of the southwest monsoon

circulation (Bora, 2018). South-westerly winds from the high-pressure Bay of Bengal is attracted by the low pressure of the Arabian sea. These winds become concentrated over this region due to high moisture and contributes to the rainfall in Kerala (Chauhan and Babu, 2018). However, the 2018 flood was the worst flood event in the state since 1924.

Climate change is considered as the primary reason for the flood, with the state having faced the impact of this phenomenon previously in the form of droughts and changing monsoon patterns (Agarwal, 2018). Mishra and Shah (2008) have questioned the role of climate change in the development of these floods. These authors argue that Kerala has seen a significant decline in the monsoon season precipitation from 1951 to 2017. Moreover, the state has seen a significant rise in the mean temperature during the monsoon season during the same period. Therefore, long-term trends indicate drying and warming in the monsoon season in Kerala. The mean monsoon season total runoff also saw a significant decline during 1951 to 2017. Therefore, it would be difficult to argue that the 2018 flood was caused by climate change. Instead, these authors argue that anomalous large-scale circulation features might have led to the extreme rainfall that led to the flood.

Other authors argue that factors responsible for climate change contributed to the anomalous weather seen in 2018 and 2019. This includes deforestation, solar radiation, greenhouse gas emissions, discharge of toxic wastes from industries, etc (Agarwal, 2018). Human activity, such as increasing encroachment of flood plains, improper reservoir storage and operation, and improper land usage have been cited as antecedents to the flood (Mishra, et al., 2018). India's Central Water Commission holds the view that the dam operations neither worsened nor improved the damage caused by the flood (Hydrological Studies Organisation, Central Water Commission, Government of India, 2018). Some authors hold the view that the disaster worsened because water resources were managed for drought mitigation and not flood prevention (Ghosh, 2019). Given the occurrence of another flood the following year, and increased rainfall in the latter part of 2019, further investigations are required to pinpoint the factors that contributed to the flood.

Public Health Concerns

Apart from the loss of life and damage to property, the flood has resulted in various public health issues. A study of literature on the aftermath of floods show that injuries and communicable diseases are common short-term health consequences following a flood, while malnutrition, poor birth outcomes, and mental health issues are some of the long-term consequences (Ahern, et al., 2005; Zhong, et al., 2018). Indeed, a year after the first flood, data about public health in Kerala reveal similar patterns. In a state which has seen outbreaks of malaria, chikungunya and dengue fever (Datta, 2019), stagnant water resulting from the flood is a major cause of concern. This water creates a breeding ground for insects that spread communicable diseases (Morse, 2001). Following the flood, cases of leptospirosis, dengue fever, malaria and diarrhoea have been reported (Muttarak and Dimitrova, 2019).

Disrupted food supply and contaminated water can have a significant effect on health. In Kerala, children are particularly vulnerable to undernutrition (Rajaram, Sunil and Zottarelli, 2003). The disruption to food supplies and contamination of water can exacerbate this. Following the flood, girl children are more likely to be stunted and wasted compared to their male peers (Muttarak and Dimitrova, 2019). This sex difference has probably occurred due to gender discrimination in feeding practices, which give priority to the male

child's nutritional requirements. Financial status of the family can also play a role in undernutrition, as this study indicated that the negative impact of the flood was felt more acutely among children of mothers from a lower socioeconomic background.

A majority of public funds are directed towards “relief packages”, rebuilding of irrigation and sanitation systems, and reconstruction of houses (Press Trust of India, 2019). With limited resources, it is unlikely that public health issues will receive the funding they require. Interventions, whenever present, should be designed to improve nutrition for children, especially children of mothers from a lower socioeconomic background. Moreover, reconstruction activities should keep in mind the need for proper sanitation and availability of clean drinking water. This would go a long way in mitigating the development of health issues in the future.

Mental Health

Flooding can have a significant impact on the psychological state of survivors. Mental health issues such as post-traumatic stress disorder (PTSD), depression, and anxiety are common among survivors of floods (Ahern, 2005). In a lower middle-income country such as India, resources to deal with mental health issues are scarce (Khandelwal, et al., 2004). There are various issues that prevent individuals from receiving adequate care for their mental health issues, ranging from stigma attached to mental illness, to systematic issues such as limited budget for mental health, shortage of mental health professionals, scarcity of medication for psychiatric disorders etc. The need for increased resources for mental health issues are acutely felt following a disaster, when much of the health relief efforts focus on prevention and treatment of communicable diseases.

In Kerala, a considerable proportion (48%) of residents from flood-affected areas were diagnosed with depression (Thomas, et al., 2019). The geriatric population showed a higher prevalence of depression. These results should be interpreted with caution, as the socioeconomic status of individuals were not controlled for. Despite this limitation, the prevalence rate seen here is similar to rates of depression following a natural disaster reported in other states of India, such as Tamil Nadu (George, Sunny and John, 2007) and Orissa (Kar and Bastia, 2006).

PTSD is a mental health issue that is frequently diagnosed following a natural disaster. Studies of survivors of natural disasters in India indicate that the incidence of PTSD varies depending on the magnitude of the event, with the highest reported rate at almost 70% (Asim, et al., 2019). A longitudinal study from India indicates that the prevalence of PTSD declines with the passage of time (Shah, 2013). Similar to epidemiological data of post-disaster depression, a study of flood-affected parts of Bihar showed that the geriatric population was more vulnerable to PTSD (Telles, Singh and Joshi, 2009).

The severity of psychological distress depends on several factors, such as the gravity of the natural disaster, support available to the affected individuals, cultural factors, and so on. A study from Kashmir has shown that support from family can counter the negative impact that floods have on psychological health (Dar, et al., 2018). In this case, a yoga intervention was successful in preventing the increase of anxiety and in reducing feelings of sadness and depression. Population-based studies need to be conducted to examine the epidemiology of mental illness following natural disasters. This will help in designing interventions for the survivors, as well as in developing disaster management strategies in

preparation for future calamities. It is also necessary to inform policy makers about the burden of mental illness after such a disaster, especially in older individuals. As studies have shown that indigenous interventions such as yoga are effective for alleviating psychological distress, it would be helpful to consider these forms of treatment when planning mental health interventions as part of disaster management.

The Kerala model of development has been suggested as a viable model to follow for the development of third world countries with limited income. This suggests that Kerala has the commitment and resources necessary to enact systemic and policy changes that would ensure better preparedness to deal with the public health effects brought on by climate change and adverse weather conditions. For this to happen, it is necessary to acknowledge the effects of climate change. This acknowledgement would be the first step in a series of corrective and preventative actions taken to decrease the effect of adverse weather events on health and well-being. With the increasing frequency of natural disasters across the world, such an action would be of relevance at the global level.

Biography

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