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POLICY BRIEF

Strengthening Vector-borne Disease Surveillance Pre- and Post-Hurricane

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EXECUTIVE SUMMARY

Caribbean Small Island Developing States (SIDS) face multiple, interlinking climate-driven health risks, where increasingly intense hurricanes interact with fragile health systems, amplifying vector-borne, water-borne, zoonotic, respiratory, and non-communicable diseases (NCDs). Flooding, damaged infrastructure, and disrupted health care drive factors that influence the transmission/ contraction of diseases and can additionally cut off access to primary healthcare for essential treatment for NCDs. The introduction of non-native invasive species adds new vector threats, requiring continuous surveillance and adaptive control. The Category 5 hurricanes Irma, Maria, Beryl, and Melissa, experienced in the past 5 years, indicate rising regional hazards that overwhelm national response capacity and limit the ability of countries to support each other between events. To protect the region, a coordinated, climate-informed health agenda is needed, linking multi-disease surveillance, WASH resilience, and sustained vector control with regional financing, disaster insurance, and measurable annual goals for preparedness. Strengthening health systems before storms—not only reacting after impact—is critical to building long-term resilience against escalating climate-sensitive disease threats.

INTRODUCTION

- High intensity hurricanes making landfall have become increasingly frequent in the recent years. Hurricane Melissa made landfall in Jamaica as a catastrophic Category 5 storm on October 28, 2025, causing unprecedented destruction.
- The Caribbean remains endemic to several vector-borne diseases including dengue, chikungunya, and Zika. Countries in the region routinely report outbreaks of water- and food-borne illnesses, such as leptospirosis, cholera (where present), and acute diarrhoeal infections. Evidence suggests that disease outbreaks tend to rise following hurricanes, likely due to flooding and associated environmental changes.
- The cost of managing healthcare post disaster is enormous for economically challenged countries.
- Are there policies/ systems that can be implemented to positively support post-hurricane healthcare challenges?

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MAKING THE CASE

- The region has been hit by high intensity hurricanes. Is this a new demonstratable trend?
 - Hurricanes Melissa, Beryl, Maria and Irma, occurred between 2017 – 2025, and impacted Caribbean countries as a category 5.
- These high intensity climate-systems are costly for the country not just for infrastructural repair/damages, but also healthcare. Hurricane Dorian that made landfall in the Bahamas To repair health facilities alone exceeded \$ USD 20 million
- Heavy rainfall and flooding often create conditions that increase habitats for mosquitoes and other aquatic vector insects. These expanded habitats can intensify the transmission of existing vector-borne diseases. In addition, these climate events are frequently linked to heightened risks of water-borne, zoonotic, and respiratory diseases.
- Flooding and infrastructural damage can further disrupt healthcare services, which can cut off access to primary healthcare for essential response and or disease treatment for the affected populations.
- Leptospirosis and increased in dengue incidence were the primary diseases reported following 12 hurricanes that made landfall in the Caribbean between 1963 – 2025.
- Caribbean countries have long advocated for integrative vector-control programmes, however storms trigger multisectoral public health challenges that extends beyond vector-control diseases.

RECOMMENDATIONS

The following are some recommendations emerging from the experience with Hurricane Melissa (and other weather extremes that have impacted Jamaica):

- Build climate-informed, multisectoral strategies that link entomological and epidemiological surveillance, WASH, and social welfare.
 - Surveillances should occur pre- and post- hurricane.
 - Surveillances should not report on a single pathogen vector-borne diseases, but take into consideration multiple diseases that may be transmitted in the result of a storm.
 - Future changes need to be data driven
- Have targets to reduce disease outbreaks yearly, pre- hurricane. Implement strategies and goals that will facilitate this.
- Recognize the Caribbean as a whole instead of independent countries, affected by similar challenges. Hurricanes can affect multiple countries, as observed with Hurricanes Melissa, Maria and Irma
- Implement a multi-hazard preparedness system that factors climate and health and considers sub-island ecological/ disease vulnerable zones.
 - Identify stations/ shelters that may be used to access healthcare services to receive/give aid from military or for medical personnel.

All challenges here, should be treated as short to long term, and be routinely assessed for the practicality and usefulness, with time.

* Short-term (0–6 months); **Medium-term (6–18 months); ***Long-term (18+ months)

CONCLUSIONS

For sustained effective health-system resilience, a climate-health agenda for Caribbean SIDS and a proactive system are necessary. This includes climate-informed, multisectoral strategies that link entomological and epidemiological surveillance, WASH, and social welfare, recognizing the Caribbean as a whole, to ensure resilience against the full spectrum of climate-sensitive diseases threatening the region.