



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

COVID-19 in the Caribbean small island developing states: lessons learnt from extreme weather events



The UN recognises 58 small island developing states, with 29 in the Caribbean.¹ The World Bank classifies most of the Caribbean islands as middle-income or high-income countries, and the UN Human Development Index is generally categorised as high across the region (2018 values range between 0.7 and 0.8).^{2,3} Despite these positive development indicators, the Caribbean small island developing states share a common set of environmental, economic, and social vulnerabilities because of their absolute size and geographical remoteness.⁴ The resources available to individual small island developing states limits their capacity to prepare for, and respond to, acute environmental and health emergencies. The Global Health Security Index—measuring the national capacity to prevent, detect, and respond to public health emergencies—is below 40.0 across the Caribbean (average of 32, range 24–38) against a global average of 40.2 and an average among high-income nations of 51.9.

The seasonal hurricane threat has always framed life throughout the Caribbean. Atlantic basin hurricane activity, measured by the accumulated cyclone activity index, has been high. Since 2000, 12 years have been informally classified as above normal, and in 2017 and 2019 hurricanes Irma, Maria, and Dorian devastated national infrastructures across ten Caribbean islands. Three of the 10 countries most affected by extreme weather events over the past 20 years are in the Caribbean (Puerto Rico, Haiti, Dominica).⁵

Partly in response to these threats and vulnerabilities, the Caribbean has a history of regional collaboration. Since 1973, the Caribbean Community (CARICOM) has provided this collaborative framework, and two intergovernmental agencies lead the regional support structures for disaster preparedness and response (Caribbean Disaster Emergency Management Agency) and for public health (Caribbean Public Health Agency).

The first confirmed case of COVID-19 among the 20 CARICOM member states presented in Jamaica on March 10, 2020, and by June 17 there were 6421 confirmed cases and 152 confirmed deaths among these 20 members. Haiti dominated these numbers, with 4547 confirmed cases (71% of all CARICOM cases)

and 80 confirmed deaths (53% of all CARICOM deaths). In the 14 weeks since the start of the CARICOM outbreak, national outbreak growth rates have been low: 11 member states have kept their peak growth rate below 10%, and among the remaining 9 members, peak rates ranged between 13% and 24%. Currently, only Haiti is classified as having community case transmission.⁶ This transmission profile compares favourably internationally, particularly when compared with South America and central America, which experienced outbreak onset over a similar time period (Latin American countries confirmed their first cases over a 22 day period between Feb 26 and March 19; CARICOM members over a 17 day period between March 10 and March 27). Comparing the two subregions on June 17, 2020, outbreak growth among the 20 CARICOM member states has flattened after a short initial period of growth, whereas outbreak growth among the 17 countries in central America and South America continues (appendix).

In February and March, Caribbean governments, watching the COVID-19 outbreak unfold across Europe and North America, and perhaps aware of their own health system fragilities, acted swiftly. In a review of the Caribbean response, national measures to restrict human movement into countries were implemented up to 27 days before the first confirmed case and 23 days before selected international comparator countries. Similarly, early controls were implemented to reduce movement within communities and to deter gatherings. Stringent curfews and stay-at-home orders were generally backed up with associated punitive measures. In Caribbean countries with available data, these stringent internal controls were visually associated with marked falls in human movement.⁷ Stay-at-home orders are common across the Caribbean as storms approach the islands, and a psychological readiness might have contributed to a general willingness among the public to accept such stringent government controls. Throughout the outbreak, the CARICOM collaborative framework has been used by national governments as an experience-sharing and problem-solving platform. The Caribbean Disaster Emergency Management Agency and the Caribbean Public Health Agency have provided

Published Online
July 2, 2020
[https://doi.org/10.1016/S2214-109X\(20\)30291-6](https://doi.org/10.1016/S2214-109X(20)30291-6)

For more on the **Global Health Security Index** see <https://www.ghsindex.org/>

See **Online** for appendix

key resources and expertise, in particular in outbreak response logistics and to bolster the regional testing capacity. Other regional entities (eg, Pan American Health Organization, Caribbean Development Bank, and The University of the West Indies) have contributed additional technical and funding assistance, each working through this infrastructure.

The Caribbean response to the regional COVID-19 outbreak might be described as a network of national responses strengthened by a familiar regional support structure. The response benefited from watching the outbreak in other regions, was given urgency by the known fragility of the regional resources, and familiarity with emergency response came from the seasonal need to prepare for the threat of hurricane activity. Early border controls might have been particularly effective among the Caribbean small islands, with a manageable number of physical entry points. Four CARICOM members have land borders (Belize, Guyana, Haiti, and Suriname) and for these countries the additional resource implications of controlling international movement remains a key aspect of control. The economic shock to a region reliant on international tourism has already been substantial. With steps to open borders now being implemented, it becomes essential for the region to draw on a similarly solid foundation to balance

the competing demands of economics and public health.

We declare no competing interests.

Copyright © 2020 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

**Ian R Hambleton, Selvi M Jeyaseelan, Madhuvanti M Murphy*
ian.hambleton@cavehill.uwi.edu

George Alleyne Chronic Disease Research Centre, Caribbean Institute for Health Research, The University of the West Indies, Bridgetown BB11115, Barbados (IRH, MMM); and Faculty of Medical Sciences, The University of the West Indies, Bridgetown, Barbados (SMJ)

- 1 UN. Sustainable Development Goals knowledge platform. <https://sustainabledevelopment.un.org/topics/sids/list> (accessed June 17, 2020).
- 2 World Bank. World Bank country and lending groups. <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups> (accessed June 16, 2020).
- 3 UN development programme. Human development reports: human development index (HDI). <http://hdr.undp.org/en/content/human-development-index-hdi> (accessed June 16, 2020).
- 4 UN General Assembly. SIDS accelerated modalities of action (SAMOA) pathway—resolution adopted by the General Assembly on 14 November 2014. http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/69/15&Lang=E (accessed May 22, 2020).
- 5 Eckstein D, Künzel V, Schäfer L, Wings M. Global Climate Risk Index 2020: who suffers most from extreme weather events? Weather-related loss events in 2018 and 1999 to 2018. <https://germanwatch.org/en/cri> (accessed June 16, 2020).
- 6 World Health Organization. Coronavirus disease (COVID-2019) situation reports. www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports (accessed June 17, 2020).
- 7 Murphy MM, Jeyaseelan SM, Howitt C, et al. COVID-19 containment in the Caribbean: the experience of small island developing states. *medRxiv* 2020; published online June 2. DOI:10.1101/2020.05.27.20114538 (preprint).