Journal of Eastern Caribbean Studies
Vol. 46, No. 1, June 2021 - Online Publication

Mitigating the Impact of the First Wave of the COVID-19 Pandemic in the Caribbean Community: The Essential Role of Multi-Sectoral Collaboration

[1]Greaves Natalie S[1], Heather Harewood [1], Madhuvanti M. Murphy [2], Colette A. Cunningham-Myrie [3], Christina Howitt [2], Ian R. Hambleton [2], Selvi Jeyaseelan [1], Kim R. Quimby [2], Natasha Sobers[2], R. Clive Landis[4]

Preface

Coronavirus disease (COVID-19) diagnosed in more than 153 million persons globally has caused over 3.2 million deaths. Health systems of large developed and developing countries, including the United States of America, Brazil and India struggled to contain COVID-19; paradoxically many Small Island Developing States (SIDS) in the Caribbean Community (CARICOM) achieved relative success during the region's first wave of COVID-19. We posit that using a multi-sectoral collaborative response, aligned to the six components of the World Health Organisation's Health Systems Framework (WHO-HSF), underpinned this achievement. We describe CARICOM's actions as an exemplar for mitigating COVID-19 impact in similar resource-limited settings.

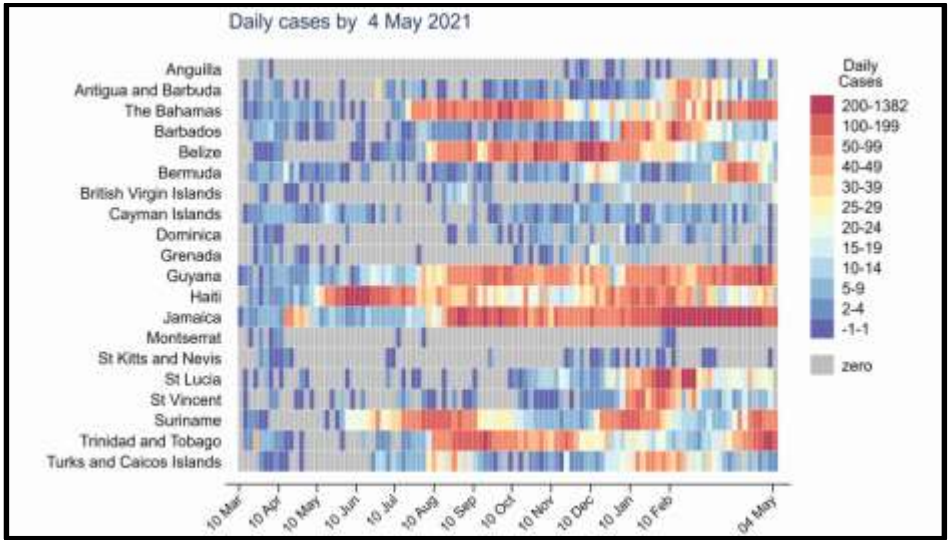
Background

Globally countries are facing unprecedented health, social and economic challenges because of the Coronavirus disease 2019 (COVID-19) pandemic (United Nations 2020). The cause, Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), has been detected in over 153 million persons globally and has led to over 3.2 million deaths (World Health Organisation 2020a). Although the world remains in the throes of the pandemic, variation in health outcomes between and within countries is evident (World Health Organisation 2020a; Bialek, Bowen, Chow *et al*., 2020, 467-470).

[1] 1 - Faculty of Medical Sciences, Cave Hill Campus, The University of the West Indies, BARBADOS
2 - The George Alleyne Chronic Disease Research Centre, The University of the West Indies, BARBADOS
3 - Department of Community Health and Psychiatry, The University of the West Indies , JAMAICA
4 - Edmund Cohen Laboratory for Vascular Research, The George Alleyne Chronic Disease Research Centre, The University of the West Indies, BARBADOS

While there has been some identification of the biologic and health characteristics of vulnerable groups (Wu and McGoogan 2019, 1239) and an increasing articulation of the socio-economic factors which may contribute to poor outcomes within communities and at the individual level (United Nations 2020),[1] population-level macro-management strategies which are likely to be most successful against COVID-19 are still being developed given the unprecedented threat to global health systems (World Health Organisation 2020b). For the countries of the Caribbean Community (CARICOM), we previously reported that comparatively early border closures and movement restrictions likely contributed to effective suppression of SARS-CoV-2 transmission (Murphy, Jeyaseelan, Howitt *et al*. 2020, 4-9). Furthermore, at the individual level, "stay at home" orders may have resonated with Caribbean populations who are well used to such public advisories during the passage of tropical storms in the hurricane season (Hambleton, Jeyaseelan and Murphy, 2020, e1114-e1115). Heat maps of daily cases (Fig. 1) illustrate the mitigation of the first wave of COVID-19 across the region (March-May 2020)[2]. However, mitigation of the first wave is unlikely to be attributable solely to Non-Pharmaceutical Interventions (NPIs) and individual-level disaster response mechanisms (Murphy, Jeyaseelan, Howitt *et al*., 2020, 4-9; Hambleton, Jeyaseelan and Murphy 2020, e1114-1115). Rather, we also ascribe some of the success to the region's collaborative mechanisms and actions.

Fig 1: Heat map showing the daily cases of COVID-19, March 2020 to May 2021 (caribdata.org- Accessed 04, May 2021)



[2] Most CARICOM countries apart from Jamaica and Haiti had low daily case numbers during the first wave COVID-19 between March-May 2020.

Arguably these synergistic multi-sectoral actions catalysed the successful implementation of public health measures to contain COVID-19 in the CARICOM's diverse geopolitical bloc of twenty low, medium, and high-income countries. We outline the coordinated actions of political, health and non-health entities that align with the six building blocks of the WHO's Health Systems Framework (WHO-HSF) (World Health Organisation 2007). We share our region's experience and recommend use of a similar integrated multi-sectoral framework for mitigating the impact of future waves of COVID-19 pandemic in other Small Island Developing States (SIDS) and low-resourced settings. A description of the CARICOM community at the start of the COVID-19 pandemic is provided for context.

The Caribbean Community (CARICOM)

Most of the English-speaking Caribbean along with Dutch-speaking Suriname and French-speaking Haiti are geopolitically organised into the 20 member CARICOM. CARICOM is one of the oldest "surviving integration movements in the developing world" being primarily concerned with the economic, political, human and social development, and security of its citizens (CARICOM 2020a). Its remit includes being the regional coordinating mechanism for health and disaster responses (CARICOM 2020a). The governance structure of CARICOM is such that there is rotation of Chairmanship amongst country leaders with 15 territories having full membership in the committee and five United Kingdom Overseas Territories having "associate membership" status (CARICOM 2020a; International Business Publications 2015, 32-37; United Nations, 2013).

The CARICOM has an estimated population of 16 million, with all 20 countries designated by the UN as SIDS (United Nations 2013). Nineteen countries are classified by the World Bank as middle, upper-middle or high income; Haiti, with the largest population is the only country currently designated as low income (Table 1). Regardless of income designation, the SIDS of CARICOM share common vulnerabilities recognised by the UN due to their small size, limited resources, exposure to environmental hazards and economic fragility. Many of the countries are heavily dependent on tourism or other service industries as the major drivers of economic activity and growth and use tax- or budget-based health care financing models (Lalta 2012). Further, health systems within the CARICOM are mainly built on the Primary Health Care Alma Ata model (Alleyne 2008, 158). Hallmarks of this model include decentralised care that emphasises accessibility, acceptability and equity (Alleyne 2008, 158). Of note, CARICOM member countries have a history of working collaboratively in response to natural disasters and other economic and health threats to the region, including the viral Zika epidemic of 2016 (Ryan, Lippi, Carlson *et al*. 2018, 1857-1859; Landis 2019, 179-187).

Table 1. CARICOM Member States by Population Per Thousand and World Bank Income Status (World Bank 2019a, 2019b, United Nations, 2020b)

Country	Population (Thousands)	Income Status
Antigua and Barbuda	96	High income
Bahamas	386	High income
Barbados	286	High income
Belize	383	Upper middle income
Dominica	72	Upper middle income
Grenada	111	Upper middle income
Guyana	779	Upper middle income
Haiti	11123	Low income
Jamaica	2935	Upper middle income
Montserrat	5	Middle income
St Lucia	182	Upper middle income
St Kitts and Nevis	52	High income
St Vincent and the Grenadines	110	Upper middle income
Suriname	576	Upper middle income
Trinidad and Tobago	1390	High income
Anguilla	15	High Income
Bermuda	64	High income
British Virgin Islands	30	High Income
Cayman Islands	64	High income
Turks and Caicos Islands	38	High income

As with other SIDS, the nations of CARICOM are facing a surge of Non-Communicable Diseases (NCDs). The region has the highest mortality of NCDs in the Americas with more than 70% of premature deaths attributable to either cardiovascular diseases, diabetes or cancer (Samuels and Unwin 2018, 4-9). NCDs, and their risk factors such as obesity, in turn are linked with poor COVID-19 outcomes (Samuels and Unwin 2018, 4-9; Yang, Zheng, Gou, *et al*. 2020, 92-95). It was from this context of the combined challenges of populations at high-risk for NCDs as well as economic vulnerabilities, that leaders of CARICOM and health officials monitored the spread of COVID-19 and impact on healthcare systems as the pandemic emerged during the first two months of 2020 in China and Italy (World Health Organisation 2020c; World Health Organisation 2020d; Grasselli, Pesenti, Cecconi 2020, 1545). While witnessing the impact of COVID-19 internationally, CARICOM simultaneously commenced organisation of its multi-sectoral response which included regional and international agencies. This was out of recognition that the region though low-resourced, would need to mobilise efforts quickly to mitigate the spread of disease and protect the health and economies of the region.

The Regional and International Entities in the CARICOM's Multi-Sectoral Response

Multi-sectoral health-related responses are broadly viewed as actions which may involve the collaborative working of health and non-health sectors to promote the health of populations in the context of sustainable human development (Tangcharoensathien, Srisookwatana, Pinprateep *et al*. 2017, 359-363). This collaborative effort is represented in the CARICOM multi-sectoral response, as shown in the table matrix (Table 2) (World Health Organisation 2007; Tangcharoensathien, Srisookwatana, Pinprateep *et al*, 2017, 359-363). The CARICOM collaborative framework is multi-level and includes functional units from within the CARICOM organisational structure itself, such as the Council for Human and Social Development (COHSOD), as well as agencies external to the CARICOM, such as the Pan American Health Organisation (PAHO). The Caribbean Public Health Agency (CARPHA) is the lead agency for the regional health response to COVID-19 with an intergovernmental mandate from CARICOM and guided by recommendations from the COHSOD Health working group. CARPHA was tasked with addressing the needs of CARICOM member states by integrating a range of regional and international health and non-health agencies including the Caribbean Disaster Emergency Management Agency (CDEMA), the Organisation of Eastern Caribbean States (OECS), the Pan-American Health Organisation (PAHO), the Implementation Agency for Crime and Security (IMPACS), the Centers for Disease Control and Prevention (CDC), Public Health England (PHE), the Public Health Agency of Canada (PHAC), the Department for International Development (DFID), the European Union (EU), and the United Nations (UN), into a coherent "Regional Coordinating Mechanism for Health Security" (RCM-HS). Significant technical and coordinating assistance to CARPHA was provided by CDEMA which is practiced in responding to national disasters (e.g., hurricanes) with experience in matters of disaster planning, logistics, supply chain management, and security, all of which are common to managing a natural disaster or pandemic.

Mapping CARICOM's Multi-Sectoral Actions to the WHO Health Systems Framework

As noted previously the action of the collaborating partners can be understood through the lens of the theoretical construct of the WHO-HSF[3] (World Health Organisation 2007). Ordinarily this framework is used to strengthen a health system as a whole and not to map a specific disease response. However, the

[3] The WHO-HSF seeks to describe the key components of a health system that are necessary to deliver safe, equitable, and quality health care in a sustainable manner. The key components are: Health Workforce, Medical Products and Technology, Service Delivery, Leadership and Governance, Health Care Financing, Information and Research.

COVID-19 response in the CARICOM thus far shows that when all six of the WHO-HSF blocks are present, a more comprehensive and decisive approach to combatting COVID-19 is possible. Importantly, the CARICOM collaborative was supported by continuous communication via weekly technical meetings between and/or within the WHO-HSF blocks. We describe two of the six blocks to illustrate how key aspects of a pandemic response can be bolstered in a low resource region through collaboration. We highlight the procurement of key resources such as Polymerase Chain Reaction (PCR) testing supplies and the generation and application of local data to inform an evidenced based pandemic response.

Procurement and Testing

The ability to perform an assessment of procurement needs and subsequent quick mobilisation of resources such as test kits and personal protective equipment (PPE) across the region in preparation for the COVID-19 response, even while competing on the international front for limited PPE resources was critical for the region. The coordination for procurement was led by CARPHA while logistics were organised by CDEMA and PAHO. CARPHA was instrumental in training and provision of PCR testing for COVID-19 for 18 of the 20 member states. This again echoed the premise of the WHO-HSF which speaks to a focused action or "primary intent" of restoring, promoting, and maintaining health including through inter-sectoral (multi-sectoral) collaboration (World Health Organisation 2007). In this case, the primary intent was the mitigation of the spread of SARS-CoV-2 transmission through the multisectoral actions described in Table 2 and the conceptual visualisation in Figure 2.

Table 2. Major actions of multi-sectoral entities in the CARICOM COVID-19 response within the WHO-HSF framework

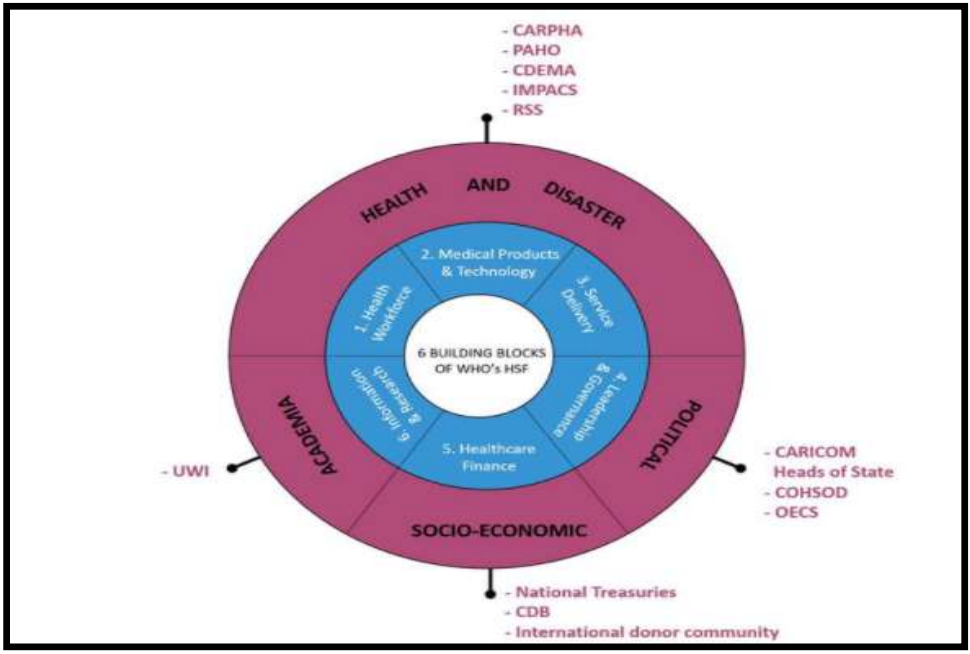
Sector	WHO Health System Framework Building Block	Regional Entity	Major Actions in the CARICOM COVID-19 Response
HEALTH AND DISASTER		**CARPHA**	Assessment and identification of disease surveillance needs; Generation of health policy guidance to governments on: i). International Health Regulation (IHR) protocols for ports of entry, ii). Guidance on the implementation of Non -Pharmaceutical Interventions (NPIs) for the containment or mitigation of COVID-19 (including physical distancing, community containment, respiratory hygiene, and the use of facial barrier equipment by the public).

	Health Workforce Medical Products and Technology Service Delivery	**PAHO**	1. Coordination of regional COVID-19 PCR testing (Caribbean Public Health Agency, 2020)
			Assessment of and modelling of likely resource needs (human and physical plant infrastructure e.g., estimation of Intensive Care Unit beds, ventilator capacity, and Personal Protective Equipment regarding hospital readiness). Procurement of COVID-19 test kits. Funding of training of CARICOM laboratories on WHO approved COVID-19 PCR kits. (Pan American Health Organisation, 2020)
		CDEMA, RSS	1. Coordination of national, regional, and international entities through the Regional Response Mechanism (RRM); Activation and coordination of the execution of the regional emergency response plan, including facilitation of regional surveillance and establishment of an Integrated Regional Logistics Mechanism comprising a hub with air and sea bridge (Caribbean Disaster Emergency Management Agency, 2020) 2. Dissemination of information including COVID-19 research products to member states 3. Coordination of emergency airlift capacity for transport of medical supplies and patient samples between islands through the Regional Security Service (RSS) while commercial air transport had been suspended
POLITICAL	Leadership and Governance	**CARICOM Heads of State,** **COHSOD, OECS**	1. Regional consensus building mechanisms which facilitated consensus among national leaders regarding NPI-implementation. Delivery of strategic public service messaging, with articulation of the need for NPIs
SOCIO-ECONOMIC	Health Care Financing	**CDB, Other Grant-giving Agencies**	1. Financing and technical assistance (CARICOM, 2020b)
ACADEMIA	Information and Research	**UWI**	1. Academic support to other entities in the multi-sectoral response- through epidemic modelling, estimating surge capacity for hospital beds among 20

			CARICOM countries, daily surveillance of COVID-19 growth rates, benchmarking against global best practice locations, and research to underpin implementation or relaxation of NPIs (Murphy, Jeyeselan, Howitt et al. 2020, The University of the West Indies, 2020, The George Alleyne Chronic Disease Research Centre, 2021)

Note: Health Sector and Disaster Entities: The Caribbean Public Health Agency (CARPHA), Caribbean Disaster and Emergency Management Agency (CDEMA), The Pan American Health Organisation (PAHO), Non-Health Sector Entities: The CARICOM, represented by the Council for Social and Human Development (COHSOD), the Caribbean Development Bank (CDB), The Organisation of Eastern Caribbean States (OECS), and The University of the West Indies (UWI).

Figure: 2: Summary Conceptual visualisation of multi-sectoral entities in the CARICOM COVID-19 response mapped to the WHO-HSF framework from Landis, R.C. "Coronavirus and CARICOM: the benefit of a regional university in a coherent pandemic response" in "Coronavirus and Islands: fracturing the 'old normal' in the Caribbean Pacific. Eds. Campbell, Y. and Connell, J. Palgrave McMillan (2021).



Research and Data Sharing

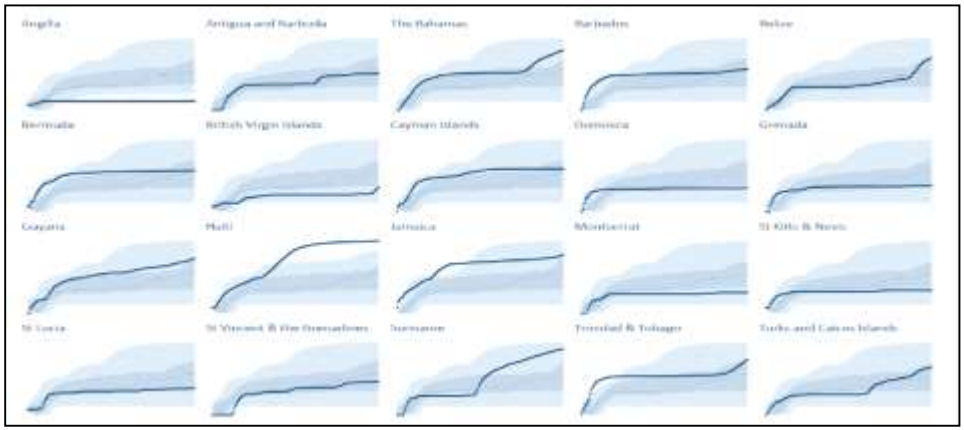
Although the WHO-HSF does not explicitly prioritise or weight the value of an individual block, from the CARICOM perspective of resource limitation, where a block within the WHO-HSF may not have been represented by a stipulated agency, they were quick to identify if any regional resources existed to fill the void (Bialek, Bowen, Chow *et al*. 2020, 467-470). In the case of information and research, access to evidence to inform the COVID-19 response was critical to the development of protocols and policies. CARICOM hence invited the regional university, The University of the West Indies (The UWI), to provide its research expertise in recognition of the role of academia in a whole of society approach (The University of the West Indies 2020). In this collaborative framework, the university leveraged its expertise in virology, epidemiology, public health, critical care medicine, psychology, economics, tourism, gender studies and ethics to help synthesize the evidence base upon which informed policy decisions could be taken in a coordinated regional response to COVID-19 (The University of the West Indies 2020).

Open sharing of research at national and multi-national levels was recognised by CARICOM leaders as a way to build public trust in policy decisions, such as NPIs, designed to contain SARS-CoV-2 transmission (Murphy, Jeyaseelan, Howitt *et. al*. 2020, 4-9; Bradshaw 2020). The positioning of academic institutions as multi-sectoral partners with a data sharing remit was integral to the execution of a coherent COVID-19 response.

The UWI used open access data to contextualise the evolving outbreak in the CARICOM sub-region along with international comparator countries, by conducting modeling studies and compiling daily surveillance outputs (The George Alleyne Chronic Disease Research Centre 2021).

Analysis of epidemic curves revealed that what can be termed as the first wave of the pandemic in the region (March-May 2020), was swiftly contained by most countries (Figures 1 and 3).

Figure 3: COVID-19 Outbreak Growth Rates for 20 CARICOM Countries March-August 27, 2020



Note: The solid line represents the growth rate for each country. The shaded regions represent the interquartile range (25th to 75th percentile, dark blue area) and range (5th – 95th percentile, lighter blue area) for the remaining 19 countries.

Although in a few states there were emerging concerns about localised transmission, the overall initial containment of the epidemic in CARICOM was comparable to that observed in other locations which eventually contained the disease, at equivalent stages in their epidemic (e.g., New Zealand, Singapore, and Iceland) (Murphy, Jeyaseelan, Howitt *et al*. 2020, 4-9). In total, during the first wave there were 107 deaths in CARICOM out of a population of 16 million (The George Alleyne Chronic Disease Research Centre 2021). The relatively low death toll may again be partly attributed to having strengthened the six pillars of the WHO-HSF during the containment effort, but the framework remains relevant to coordinate management of the COVID-19 response, including guiding the implementation and relaxation of individual and population level NPIs as the economies reopen.

Conclusion

While the WHO-HSF is not commonly used in the context of a specific disease, we have shown that it has great utility when multi-sectoral approaches are implemented within this framework. In the context of Caribbean SIDS which have limited capacities to respond to major disasters such as pandemics, aligning their multi-sectoral response with the six pillars of the WHO-HSF may have enabled the effective multi-country response to the COVID-19 pandemic. The importance of identifying potential institutions to represent blocks within the framework, along with identifying any gaps that may need the assistance of agencies that are not traditionally involved in the response cannot be understated. Being open to an all

of society approach, which hinges on sound organisation from a governing body and open and consistent communication among agencies, is seen as key to success. The framework is posited as a model for resource limited multi-country unions to increase resilience and capacity to respond quickly to COVID-19, or similar public health emergencies in the future.

References

Alleyne G and Fraser H. 2008. "Health for All: "From Vision to Action." In *Health and Development in Our Time: Selected Speeches by Sir George Alleyne*, edited by Henry Fraser, 147-154. Kingston: Ian Randle Publishers.

Bialek S, Bowen V, Chow N, Curns A, Gierke R, Hall A, Hughes M, Pilishvili T, Ritchey M, Roguski K, et al. 2020. "Geographic Differences in COVID-19 Cases, Deaths, and Incidence — United States, February 12–April 7, 2020". *MMWR Morbidity and Mortality Weekly Report*. 69 (15):465-471.

Bradshaw. S. 2020. COVID-19 Update (April 1) featuring Acting Prime Minister Bradshaw [Internet]. Prime Minister's Office, Barbados. 2020 [Accessed 19 June 2020]. Available from: https://pmo.gov.bb/2020/04/01/covid-19-update-april-1-feat-acting-prime-minister-bradshaw/.

Caribbean Disaster Emergency Management Agency. 2020. "CDEMA Participating States COVID-19 Situation Update". Accessed May 5, 2021. https://www.cdema.org/covid19.

Caribbean Public Health Agency. 2020. "Novel Coronavirus". Accessed May 5, 2021. https://carpha.org/What-We-Do/Public-Health/Novel-Coronavirus24 .

CARICOM. 2020a. "Who we are – CARICOM." Accessed May 5, 2021. https://caricom.org/our-community/who-we-are/.

CARICOM. 2020b. "CDB makes US$140M available to counter COVID-19 pandemic, other disasters". Accessed May 5, 2021. https://caricom.org/cdb-makes-us140m-available-to-counter-covid-19-pandemic-other-disasters/.

COVID-19 Update featuring Acting Prime Minister Bradshaw. Prime Minister's Office, Barbados. Filmed April 1, 2020. Accessed May 5, 2021. https://pmo.gov.bb/2020/04/01/covid-19-update-april-1-feat-acting-prime-minister-bradshaw/.

Grasselli G, Pesenti A, Cecconi M. 2020. "Critical Care Utilization for the COVID-19 Outbreak in Lombardy, Italy." *JAMA*. 323 (16):1545. doi:10.1001/jama.2020.4031.

Hambleton I, Jeyaseelan S, Murphy M. 2020. "COVID-19 in the Caribbean Small Island Developing States: Lessons Learnt from Extreme Weather Events." *Lancet Global Health*. 8(9): E1114-E1115. https://doi.org/10.1016/S2214-109X(20)30291-6

International Business Publications 2015. Important Policies, Regulations, Agreements and Treaties. In Caribbean Community, Trade and Investment Handbook, Volume 1. Strategic information and Basic Agreements. 31-37: International Business Publications USA.

Lalta S. 2012. "Financing Universal Health Coverage (UHC) in the Caribbean: The Fiscal Space Issue." Health Economics Unit, UWI Presented at PAHO/WHO Workshop Barbados, 22-23 October 2012. Accessed May 05, 2021.

https://www.paho.org/hq/dmdocuments/2012/Universal-health-LALTA-UWI-BAR- 22oct2012.pdf

Landis, R.C. 2021. "Coronavirus and CARICOM: The Benefit of a Regional University in a Coherent Pandemic Response". In *Coronavirus and Islands: Fracturing the 'Old Normal' in the Caribbean Pacific*, edited by, Campbell, Y. and Connell, (in press). J. Palgrave McMillan.

Landis, R.C. 2019. "Climate Change and Biosecurity – The Zika Lessons". *Journal of Eastern Caribbean Studies*. 44 (1): 179-187.

Murphy M, Jeyaseelan SM, Howitt C, Greaves N, Harewood H, Quimby KR, Sobers N, Landis RC, Rocke KD, Hambleton IH. 2020. "COVID-19 Containment in the Caribbean: The Experience of Small Island Developing States." *Research in Globalization*. 2 (Dec): 1-9. https://doi.org/10.1016/j.resglo.2020.100019

Pan American Health Organisation. 2020. Technical Documents - Coronavirus Disease (COVID-19). Accessed May 5, 2021 https://www.paho.org/en/technical-documents-coronavirus-disease-covid-19 .

Ryan S, Lippi C, Carlson C, et al. 2018. "Zika Virus Outbreak, Barbados, 2015–2016". *The American Journal of Tropical Medicine and Hygiene*. 98 (6):1857-1859.

Samuels T. and Unwin N. 2018. "The 2007 Caribbean Community Port-of-Spain Declaration on Noncommunicable Diseases: An Overview of a Multidisciplinary Evaluation." *Revista Panamericana de Salud Pública*. 42:1-11.

Tangcharoensathien V, Srisookwatana O, Pinprateep P, Posayanonda T. 2017. "Multisectoral Actions for Health: Challenges and Opportunities in Complex Policy Environments". *International Journal of Health Policy and Management*. 6 (7):359-363.

The George Alleyne Chronic Disease Research Centre. 2021. "COVID-19 in the Caribbean: Daily Surveillance Reports." Accessed May 04, 2021. www.uwi.edu/covid19/surveillance.

The University of the West Indies. "Resources for Policy Makers. The UWI COVID-19 Task Force." Accessed June 19, 2020. https://uwi.edu/covid19/resources/resources-policymakers.

The World Bank. 2019a. "Population Estimates: The World Bank-All Countries and Economies." Accessed May 4, 2021. https://data.worldbank.org/indicator/SP.POP.TOTL.

The World Bank. 2019b. "The World Bank- Countries and Economies". Accessed May 4, 2021. https://data.worldbank.org/country.

United Nations. 2013. "Small Island Developing States: Small Islands Big(ger) Stakes.". Accessed May 5, 2021. http://unohrlls.org/custom-content/uploads/2013/08/SIDS-Small-Islands-Bigger-Stakes.pdf.

United Nations. 2020a. "Everyone Included: Social Impact of COVID-19." Accessed May 5, 2021. Everyone Included: Social Impact of COVID-19 | DISD (un.org).

United Nations. 2020b "Income status: UN data". Accessed May 4, 2021. http://data.un.org/.

World Health Organisation. 2007 "Everybody's Business. Strengthening Health Systems to Improve Outcomes: WHO's framework for Action." Accessed May 5, 2021. https://www.who.int/healthsystems/strategy/everybodys_business.pdf?ua=1.

World Health Organisation. 2020a. "WHO Coronavirus Disease (COVID-19) Dashboard." Accessed May 4, 2021. https://covid19.who.int/.

World Health Organisation. 2020b. "WHO COVID19 Strategy update April 2020." Accessed May 5, 2021. https://www.who.int/docs/default-source/coronaviruse/covid-strategy-update-14april2020.pdf?sfvrsn=29da3ba0_19.

World Health Organisation. 2020c. "WHO- Novel Coronavirus-(2019-nCov). Situation Report-11. Jan 31, 2020." Accessed May 5, 2021. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200131-sitrep-11-ncov.pdf?sfvrsn=de7c0f7_4.

World Health Organisation. 2020d. "WHO-Coronavirus disease 2019 (COVID-19) Situation Report-51. Mar 11, 2020." Accessed May 5, 2021. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200311-sitrep-51-covid-19.pdf?sfvrsn=1ba62e57_10.

Wu Z. and McGoogan J. 2019. "Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72,314 Cases from the Chinese Center for Disease Control and Prevention." *JAMA*. 323 (13) :1239-1242.

Yang J., Zheng Y., Gou X., Pu K., Chen Z., Guo Q. 2020. "Prevalence of Comorbidities and its Effects in Coronavirus Disease 2019 Patients: A Systematic Review and Meta-analysis". *Int J Infect Dis*. 94:91–95. DOI: 10.1016/j.ijid.2020.03.017.

Abbreviations

CARICOM	Caribbean Community
CARPHA	Caribbean Public Health Agency
CDB	Caribbean Development Bank
CDC	Centers for Disease Control and Prevention
CDEMA	Caribbean Disaster Emergency Management Agency
COHSOD	CARICOM Council for Social and Human evelopment
COVID-19	Coronavirus disease 2019
DFID	Department for International Development
EU	European Union
IMPACS	Implementation Agency for Crime and Security
NCDs	Non-Communicable Diseases
NPIs	Non- Pharmaceutical Interventions
OECS	The Organisation of Eastern Caribbean States
PAHO	Pan American Health Organisation
PHAC	Public Health Agency of Canada
PHE	Public Health England
RCM-HS	Regional Coordinating Mechanism for Health Security
SARS-CoV-2	Severe Acute Respiratory Disease Syndrome Coronavirus 2
SIDS	Small Island Developing States
UN	United Nations
UWI	The University of the West Indies
WHO	World Health Organisation
WHO-HSF	World Health Organisation Health Systems Framework