THE BAHAMAS

HEALTH & CLIMATE CHANGE

COUNTRY PROFILE 2021

Small Island Developing States Initiative

World Health Organization

United Nations Framework Convention on Climate Change

PAHO

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Acknowledgements

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EXECUTIVE SUMMARY

Despite producing very little greenhouse gas emissions that cause climate change, people living in small island developing States (SIDS) are on the front line of climate change impacts. These countries face a range of acute to long-term risks, including extreme weather events such as floods, droughts and cyclones, increased average temperatures and rising sea levels. Many of these countries already have a high burden of climate-sensitive diseases that may be exacerbated by climate change. Some of the nations at greatest risk are under-resourced and unprotected in the face of escalating climate and pollution threats. In recent years, the voice of the small island nation leaders has become a force in raising the alarm for urgent global action to safeguard populations everywhere, particularly those whose very existence is under threat.

Recognizing the unique and immediate threats faced by small islands, WHO has responded by introducing the WHO Special Initiative on Climate Change and Health in Small Island Developing States (SIDS). The initiative was launched in November 2017 in collaboration with the United Nations Framework Convention on Climate Change (UNFCCC) and the Fijian Presidency of the 23rd Conference of the Parties (COP23) to the UNFCCC, held in Bonn, Germany, with the vision that by 2030 all health systems in SIDS will be resilient to climate variability and climate change. It is clear, however, that, in order to protect the most vulnerable from climate risks and to gain the health co-benefits of mitigation policies, building resilience must happen in parallel with the reduction of carbon emissions by countries around the world.

The WHO Special Initiative on Climate Change and Health in SIDS aims to provide national health authorities in SIDS with the political, technical and financial support required to better understand and address the effects of climate change on health.

A global action plan has been developed by WHO that outlines four pillars of action for achieving the vision of the initiative: empowerment of health leaders to engage nationally and internationally; evidence to build the investment case; implementation to strengthen climate resilience; and resources to facilitate access to climate finance. In October 2018, Ministers of Health gathered in Grenada to develop a Caribbean Action Plan to outline the implementation of the SIDS initiative locally and to identify national and regional indicators of progress.

As part of the regional action plan, small island nations have committed to developing a WHO UNFCCC health and climate change country profile to present evidence and monitor progress on health and climate change.

This WHO UNFCCC health and climate change country profile for The Bahamas provides a summary of available evidence on climate hazards, health vulnerabilities, health impacts and progress to date in health sector efforts to realize a climate-resilient health system.

KEY RECOMMENDATIONS

1 ASSESS HEALTH VULNERABILITY, IMPACTS AND ADAPTIVE CAPACITY TO CLIMATE CHANGE

Conduct a national assessment of climate change impacts, vulnerability and adaptation for health. Ensure that results of the assessment are used for policy prioritization and the allocation of human and financial resources in the health sector.

2 DEVELOP A CLIMATE CHANGE AND HEALTH STRATEGIC ACTION PLAN FOR THE BAHAMAS

A climate change and health strategic action plan would help The Bahamas reduce its vulnerability to climate change. Ensuring that adaptation priorities are specified, health co-benefits from mitigation and adaptation measures are considered, necessary budget requirements are allocated and regular monitoring and review of progress will support its full implementation.

3 STRENGTHEN INTEGRATED RISK SURVEILLANCE AND EARLY WARNING SYSTEMS

The Bahamas, as a low-lying SIDS, is particularly vulnerable to the impacts of extreme weather events. Establish integrated risk surveillance for health risks, such as heat stress, vector-borne, waterborne and foodborne diseases, which include meteorological information.

4 BUILD CLIMATE-RESILIENT AND ENVIRONMENTALLY SUSTAINABLE HEALTH CARE FACILITIES

Measures can be taken to prevent the potentially devastating impacts of climate change on health service provision, including; conducting hazard assessments, climate-informed planning and costing, strengthening structural safety, contingency planning for essential systems (electricity, heating, cooling, ventilation, water supply, sanitation services, waste management and communications). A commitment towards low-emission, sustainable practices to improve system stability, promote a healing environment and to mitigate climate change impacts can also be taken.

5 ADDRESS BARRIERS TO ACCESSING INTERNATIONAL CLIMATE CHANGE FINANCE TO SUPPORT HEALTH ADAPTATION

The lack of country eligibility has been identified as a barrier to accessing international funding. Additional funding would help to further the implementation of policies and to expand risk surveillance and early warning systems.

WHO RESOURCES TO SUPPORT ACTION ON THESE KEY RECOMMENDATIONS:
https://www.who.int/activities/building-capacity-on-climate-change-human-health/toolkit/

BACKGROUND

The Bahamas is an archipelago formed of over 700 islands in the Atlantic Ocean; less than 30 of these islands are occupied by people *(1)*. The climate of The Bahamas is tropical marine, with hurricanes often affecting the nation *(2)*. Five per cent of the world's coral and the world's third largest barrier reef are located in The Bahamas. These natural wonders are a key draw for tourists, resulting in an economy highly reliant on tourism; the service industry (mostly comprising tourism) constitutes around 90% of the economy. The islands of The Bahamas are largely flat, with approximately 80% of the land being less than 1.5 m above sea level. Furthermore, the majority of the population live along the coast *(1)*. Poverty rates vary across The Bahamas, with regional disparities in the proportion of people living below the poverty line *(3)*.

The Bahamas' reliance on tourism, low-lying land, and high concentration of coastal inhabitants makes it particularly vulnerable to climate change. Climate-related risks of particular concern include sea level rise, extreme weather events (especially tropical storms), rising temperatures, and changing precipitation patterns. These represent significant threats to human health; notably, forced displacement from sea level rise; saltwater intrusion of groundwater aquifers; loss of livelihoods; spread of infectious diseases; and death and injury from extreme weather events.

The contribution of The Bahamas to global greenhouse gas emissions is negligible (0.01%), yet it is already feeling the impacts of climate change. Tropical storms, such as Hurricane Dorian in 2019, can leave devastation in their paths. Despite its minimal contribution to global greenhouse gas emissions, The Bahamas still commits in its Nationally Determined Contribution (NDC) to reducing its 2030 emissions by 30% compared with its business-as-usual trajectory. Adaptation is absolutely essential in The Bahamas. Protection of its marine environment is highlighted in the NDC as a key means of adaptation, in providing natural protection to the islands. The Bahamas NDC also outlines potential adaptation actions specifically to protect health and wellbeing: educating health personnel and the public about the links between climate change and health, and ensuring that national emergency measures account for climate-related health risks (such as heat stress and vector-borne diseases) *(4)*.

HIGHEST PRIORITY CLIMATE-SENSITIVE HEALTH RISKS FOR THE BAHAMAS

Direct effects	
Health impacts of extreme weather events	✓
Heat-related illness	
Indirect effects	
Water security and safety (including waterborne diseases)	
Food security and safety (including malnutrition and foodborne diseases)	✓
Vector-borne diseases	✓
Air pollution	✓
Allergies	
Diffuse effects	
Mental/psychosocial health	✓
Noncommunicable diseases	✓
Mitigation actions to reduce emissions through sustainable procurement	
Mitigation measures to reduce emissions of health facilities	✓
Mitigation measures by coordinating with other sectors	

Source: Adapted and updated from the PAHO *Health and Climate Country Survey 2017 (5).*

CLIMATE HAZARDS RELEVANT FOR HEALTH

Climate hazard projections for The Bahamas

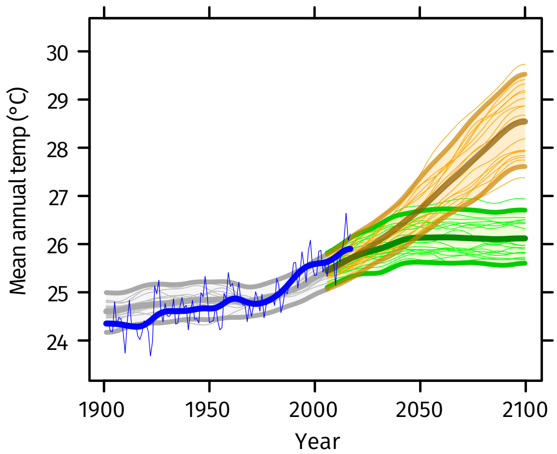
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

The climate model projections given below present climate hazards under a high emissions scenario, Representative Concentration Pathway 8.5 (RCP8.5 – in orange) and a low emissions scenario (RCP2.6 – in green).[a] The text describes the projected changes averaged across about 20 global climate models (thick line). The figures[b] also show each model individually as well as the 90% model range (shaded) as a measure of uncertainty and the annual and smoothed observed record (in blue).[c] In the following text the present-day baseline refers to the 30-year average for 1981–2010 and the end-of-century refers to the 30-year average for 2071–2100.

Modelling uncertainties associated with the relatively coarse spatial scale of the models compared with that of small island States are not explicitly represented. There are also issues associated with the availability and representativeness of observed data for such locations.

Rising in temperature

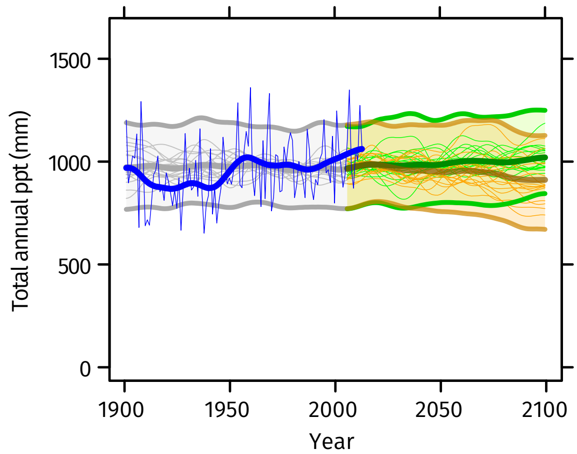
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the mean annual temperature is projected to rise by about 3°C on average by the end of the century (i.e. 2071–2100 compared with 1981-2010). If emissions decrease rapidly, the temperature rise is limited to about 0.9°C.

Little change in total precipitation

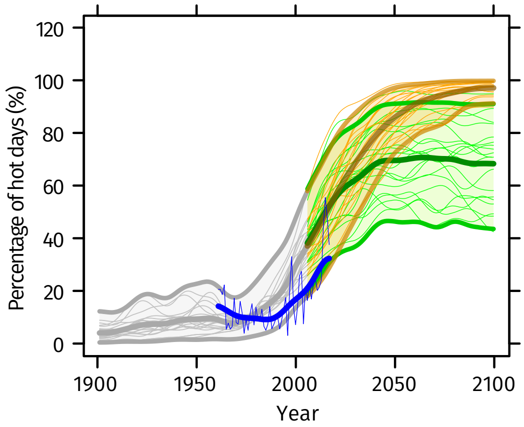
FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to decrease by about 5% on average under a high emissions scenario, although the uncertainty range is large (-17% to +8%). If emissions decrease rapidly, there is little projected change on average: an increase of 4% with an uncertainty range of -4% to +13%.

More high temperature extremes

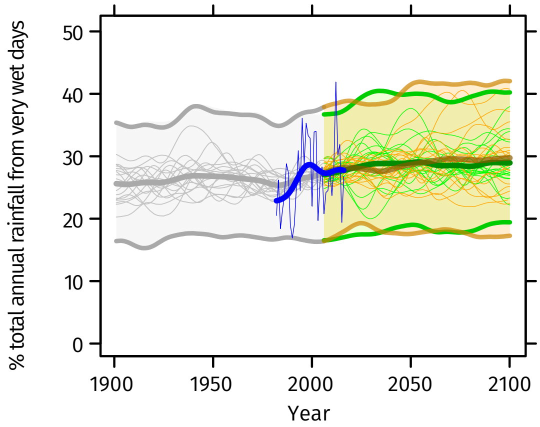
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase substantially from about 15% of all observed days on average in 1981–2010 (10% in 1961–1990). Under a high emissions scenario, almost 100% of days on average are defined as 'hot' by the end of the century. If emissions decrease rapidly, about 70% of days on average are 'hot'. Note that the models overestimate the observed increase in hot days (about 25% of days on average in 1981–2010 rather than 15%). Similar increases are seen in hot nights[d] (not shown).

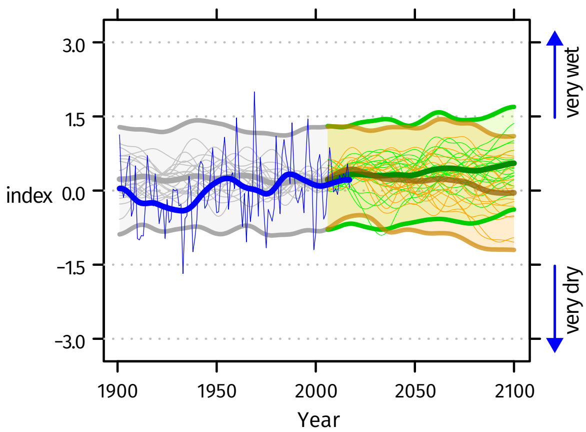
Small increase in extreme rainfall

FIGURE 4: Contribution to total annual rainfall from very wet days ('extreme rainfall' and 'flood risk'), 1900–2100



Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 25% for 1981–2010) could increase a little by the end of the century (to about 30% on average with an uncertainty range of about 15% to 40%), with similar change if emissions decrease rapidly. These projected changes are accompanied by little or no change in total annual rainfall (see Figure 2).

FIGURE 5: Standardized Precipitation Index ('drought'), 1900–2100



The Standardized Precipitation Index (SPI) is a widely used drought index which expresses rainfall deficits/excesses over timescales ranging from 1 to 36 months (here 12 months, i.e. SPI12).[f] It shows how at the same time extremely dry and extremely wet conditions, relative to the average local conditions, change in frequency and/or intensity.

SPI12 values show little projected change from about 0.2 on average, though year-to-year variability remains large. A few models indicate larger decreases (more frequent/intense dry/drought events), particularly under a high emissions scenario, or increases (more frequent/intense wet events), particularly if emissions decrease rapidly.[f]

NOTES

[a] Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.

[b] Observed historical record of mean temperature and total precipitation is from CRU-TSv3.26. Observed historical records of extremes are from JRA55 for temperature and from GPCC-FDD for precipitation.

[c] Analysis by the Climatic Research Unit, University of East Anglia, 2018.

[d] A 'hot day' ('hot night') is a day when maximum (minimum) temperature exceeds the 90th percentile threshold for that time of the year.

[e] The proportion (%) of annual rainfall totals that falls during very wet days, defined as days that are at least as wet as the historically 5% wettest of all days.

[f] SPI is unitless but can be used to categorize different severities of drought (wet): above +2.0 extremely wet; +2.0 to +1.5 severely wet; +1.5 to +1.0 moderately wet; +1.0 to +0.5 slightly wet; +0.5 to -0.5 near normal conditions; -0.5 to -1.0 slight drought; -1.0 to -1.5 moderate drought; -1.5 to -2.0 severe drought; below -2.0 extreme drought.

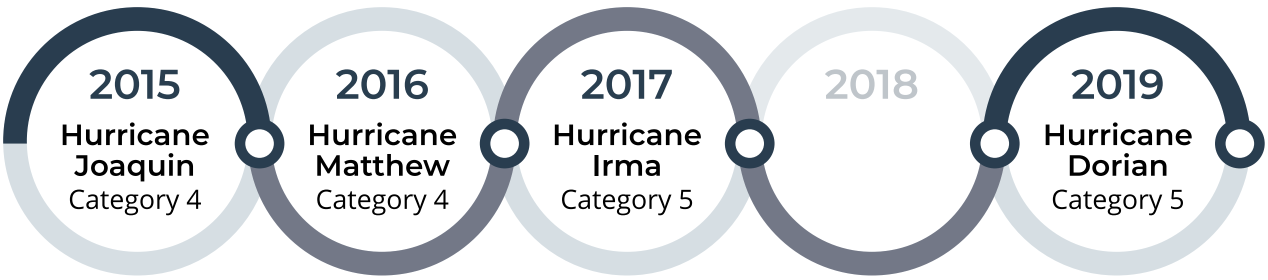
Tropical cyclones

Information and understanding about tropical cyclones (including hurricanes and typhoons) from observations, theory and climate models have improved in the past few years (*6–13*). Despite this, robust projections for specific ocean basins or for changes in storm tracks are difficult to make. It is anticipated that the total number of tropical cyclones may decrease towards the end of the century. However, it is likely that human-induced warming will make cyclones more intense.

Case Study

Hurricane Dorian, the strongest hurricane in modern Bahamian history, devastated the north-western Bahamas when it struck on 1 September 2019. More than 76 000 residents were affected and 10 000 people evacuated these islands. This created an unprecedented need for mental health and psychosocial support (MHPSS). Shortly after Hurricane Dorian passed, staff from the Sandilands Rehabilitation Centre, Public Hospitals Authority, the Bahamas Psychological Association, and a number of NGOs and INGOs were dispatched to the islands and different tent shelters to provide MHPSS. More than 3000 children and 3000 adults received MHPSS either face to face and/or by the telepsychology method. Helplines were also established immediately after the hurricane and more than 500 calls were received, between March 2020 and September 2020, from five islands and also Bahamians in universities outside the country.

It is anticipated that there will be a continuation of MHPSS services, as there may be an increased need given the traumatic experiences, uncertainty, effects of ongoing isolation, and economic situation resulting from both Hurricane Dorian and COVID-19 (case study provided by the Ministry of Health).



2015 – Hurricane Joaquin, Category 4

- Severe flooding (including a 4.6 metre storm surge), contamination of freshwater wells, and destruction of roads and infrastructure.
- Total cost for The Bahamas is estimated at over US$ 120 million *(14)*.

2016 – Hurricane Matthew, Category 4

- Many households had not yet recovered from Hurricane Joaquin.
- Damage to the electricity system took months to repair.
- Total cost for The Bahamas is estimated at a minimum of US$ 600 million *(14)*.

2017 – Hurricane Irma, Category 5

- First mandatory evacuation in Bahamian history (5000 people were transported to the capital).
- Ragged Island was hardest hit and is uninhabitable.
- Total cost for Ragged Island alone is estimated at US$ 7.8 million *(14)*.

2019 – Hurricane Dorian, Category 5

- Devastated the island of Abaco, its surrounding cays, and Grand Bahama.
- Houses, schools and business were flattened in and around Marsh Harbour in particular.
- Unprecedented flooding, with roads and bridges unpassable and/or collapsed *(15)*.
- Electrical power losses meant some health services were unable to fully operate.
- Mental health impacts were widely reported, including post traumatic stress disorder (PTSD), sleep disorders, depression, and grief and traumatic bereavement *(16)*.
- At least 70 people died.
- Total cost for The Bahamas is estimated at US$ 3.4 billion (equivalent of one quarter of national GDP) *(15)*.

Sea level rise

Sea level rise is one of the most significant threats to low-lying areas on small islands and atolls. Research indicates that rates of global mean sea level rise are almost certainly accelerating as a result of climate change. The relatively long response times to global warming mean that sea level will continue to rise for a considerable time after any reduction in emissions.

1.7 mm/year (±1.3)

Average change in Caribbean sea level over the period 1993–2010 *(17)*

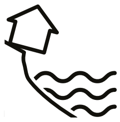
with substantial spatial variability across the region

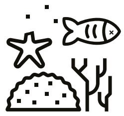
0.5–0.6m

Further rise in the Caribbean by the end of the century *(18)*[b]

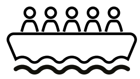
with variation amongst models and emissions scenarios

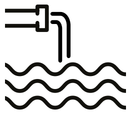
Potential impacts of sea level rise include


Coastal erosion


Ecosystem disruption


Higher storm surges


Population displacement


Water contamination and disruption


Mental health

[a] Information and understanding about tropical cyclones (including hurricane and typhoons) from observations, theory and climate models has improved in the past few years. It is difficult to make robust projections for specific ocean basins or for changes in storm tracks. Presented here is a synthesis of the expected changes at the global scale.

[b] Estimates of mean net regional sea level change were evaluated from 21 CMIP5 models and include regional non-scenario components (adapted from WGI AR5 Figure 13–20). The range given is for RCP4.5 annual projected change for 2081–2100 compared to 1986–2005.

Heat stress

Climate change is expected to increase the mean annual temperature and the intensity and frequency of heat waves, resulting in a greater number of people at risk of heat-related medical conditions. Heat waves, i.e. prolonged periods of excessive heat, can pose a particular threat to human, animal and even plant health, resulting in loss of life, livelihoods, socioeconomic output, reduced labour productivity, rising demand for and cost of cooling options, as well as contribute to the deterioration of environmental determinants of health (e.g. air quality, soil, water supply).

Heat stress impacts include:

- heat rash/heat cramps
- dehydration
- heat exhaustion/heat stroke
- death.

Particularly vulnerable groups are:

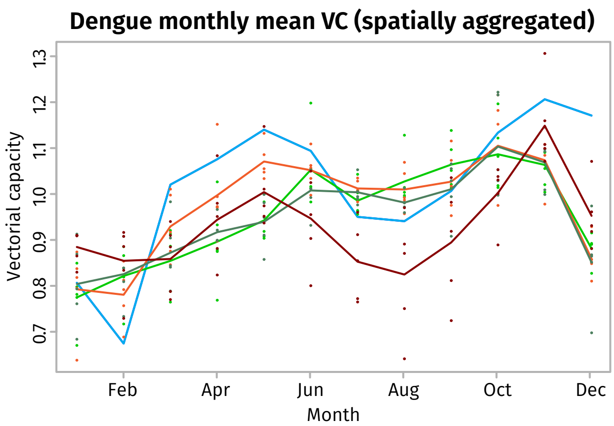
- the elderly
- children
- individuals with pre-existing conditions (e.g. diabetes)
- the socially isolate.

Infectious and vector-borne diseases

Some of the world's most virulent infections are also highly sensitive to climate: temperature, precipitation and humidity have a strong influence on the life-cycles of the vectors and the infectious agents they carry and influence the transmission of water- and foodborne diseases *(19,20)*.

Small island developing States (SIDS) are vulnerable to disease outbreaks. Climate change could affect the seasonality of such outbreaks, as well as the transmission of vector-borne diseases. Figure 6 presents modelled estimates for The Bahamas of the potential risk of dengue fever transmission under high and low emission scenarios.[a] The seasonality and prevalence of dengue transmission may change with future climate change, but The Bahamas is consistently highly suitable for dengue transmission under all scenarios and thus vulnerable to outbreaks *(21–24)*.[b,c]

FIGURE 6: Monthly mean vectorial capacity (VC) in The Bahamas for dengue fever. Modelled estimates for 2015 (baseline) are presented together with 2035 and 2085 estimates under low emissions (RCP2.6) and high emissions (RCP8.5) scenarios



[a] A suite of mathematical models was systematically developed, then applied and interpreted by a team of researchers at Umeå University (Sweden) to assess the potential for mosquito-borne disease outbreaks (e.g. dengue, chikungunya, Zika and malaria) in terms of climate-dependent VC. The baseline year is 2015, Climatic Research Unit CRU-TSv4.01. Future projections are represented for two emissions futures (Representative Concentration Pathways: RCP2.6, RCP8.5), five climate change projections (Global Climate Models: gfdlesm2m, hadgem2-es, ipsl-cm5a-lr, miroc-esm-chem, noresm1-m). (2018) Umeå University, Sweden.

[b] Given the climate dependence of transmission cycles of many vector-borne diseases, seasonality of epidemic risk is common; however, many SIDS, due to tropical latitudes, tend to have less seasonality than more temperate areas.

[c] The actual occurrences/severity of epidemics would be quite different for each disease in each setting and could depend greatly on vector- and host-related transmission dynamics, prevention, surveillance and response capacities that are not captured in this model.

Noncommunicable diseases, food and nutrition security

Small island developing States (SIDS) face distinct challenges that render them particularly vulnerable to the impacts of climate change on food and nutrition security including: small, and widely dispersed, land masses and populations; large rural populations; fragile natural environments and lack of arable land; high vulnerability to climate change, external economic shocks, and natural disasters; high dependence on food imports; dependence on a limited number of economic sectors; and distance from global markets. The majority of SIDS also face a 'triple-burden' of malnutrition whereby undernutrition, micronutrient deficiencies and overweight and obesity exist simultaneously within a population, alongside increasing rates of diet-related NCDs.

NONCOMMUNICABLE DISEASES IN THE BAHAMAS

73.9

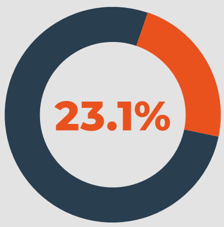
Healthy life expectancy (2016) *(25)*

N/A

Adult population considered **undernourished** (N/A) *(26)*

Climate change is likely to exacerbate the triple-burden of malnutrition and the metabolic and lifestyle risk factors for diet-related NCDs. It is expected to reduce short- and long-term food and nutrition security both directly, through its effects on agriculture and fisheries, and indirectly, by contributing to underlying risk factors such as water insecurity, dependency on imported foods, urbanization and migration, and health service disruption. These impacts represent a significant health risk for SIDS, with their particular susceptibility to climate change impacts and already over-burdened health systems, and this risk is distributed unevenly, with some population groups experiencing greater vulnerability.

MOTHER AND CHILD HEALTH



Iron deficiency anaemia in women of reproductive age (2016) *(27)*

Wasting in children under five years of age (N/A) *(28)*

Stunting in children under five years of age (N/A) *(28)*

Overweight in children under five years of age (N/A) *(28)*

HEALTH VULNERABILITY AND ADAPTIVE CAPACITY

SDG indicators related to health and climate change

Many of the public health gains that have been made in recent decades are at risk due to the direct and indirect impacts of climate variability and climate change. Achieving Sustainable Development Goals (SDGs) across sectors can strengthen health resilience to climate change.

3. GOOD HEALTH AND WELL-BEING

75

Universal Health Coverage Service Coverage Index (2017)[b] *(29)*

6.4%

Current health expenditure as percentage of gross domestic product (GDP) (2016) *(30)*

7.2

Under-five mortality rate (per 1000 live births) (2017) *(31)*

6. CLEAN WATER AND SANITATION

Proportion of total population using **at least basic drinking-water services** (2017)[c] *(32)*

99%

Proportion of total population using **at least basic sanitation services** (2017)[c] *(32)*

95%

13. CLIMATE ACTION

Total number of weather-related disasters recorded between 2000 and 2018[d] *(33)*

14

Highest total number of persons affected by a single weather-related disaster between 2000 and 2018[d] *(33)*

10 000

[a] SDG estimates are not available. National estimates may be available. For more information see: Household Expenditure Survey 2013 Report. The Government of The Bahamas; 2016 *(3)*.

[b] The index is based on low data availability. Values greater than or equal to 80 are presented as ≥80 as the index does not provide fine resolution at high values; 80 should not be considered a target.

[c] Data for safely managed drinking-water and sanitation services are not consistently available for all SIDS at this time, therefore 'at least basic services' has been given for comparability.

[d] Data for SDG13.1 are currently not available. Alternative indicators and data sources are presented. A national disaster risk reduction strategy is in place (see Health Disaster Risk Management (HDM) Programme. The Commonwealth of The Bahamas – Gaps and Priorities (July 18–19, 2019); 2019–2021).

Health workforce

Public health and health care professionals require training and capacity building to have the knowledge and tools necessary to build climate-resilient health systems. This includes an understanding of climate risks to individuals, communities and health care facilities, and approaches to protect and promote health given the current and projected impacts of climate change.

While there are no specific WHO recommendations on national health workforce densities, the 'Workload Indicators of Staffing Need' (WISN) is a human resource management tool that can be used to provide insights into staffing needs and decision-making. Additionally, the National Health Workforce Accounts (NHWA) is a system by which countries can progressively improve the availability, quality and use of health workforce data through monitoring of a set of indicators to support achievement of universal health coverage (UHC), SDGs and other health objectives. The purpose of the NHWA is to facilitate the standardization and interoperability of health workforce information. More details about these two resources can be found at: https://www.who.int/activities/improving-health-workforce-data-and-evidence.

HUMAN RESOURCE CAPACITY (2018)

60%

International Health Regulations (IHR) Monitoring Framework Human Resources Core Capacity *(34)*

No

"Does your human resource capacity as measured through the IHR adequately consider the human resource requirements to respond to climate-related events?" *(35)*

No

"Is there a national curriculum developed to train health personnel on the health impacts of climate change?" *(35)*

Health care facilities

Climate change poses a serious threat to the functioning of health care facilities. Extreme weather events increase the demand for emergency health services but can also damage health care facility infrastructure and disrupt the provision of services. Increased risks of climate-sensitive diseases will also require greater capacity from often already strained health services. In SIDS, health care facilities are often in low-lying areas, subject to flooding and storm surges making them particularly vulnerable.

396
Health centres
(2020) *(36,37)*

3
Hospitals
(2020) *(36,37)*

4
Assessed SMART health facilities
(2020) *(36,37)*[a]

0
Designated SMART health facilities
(2020) *(36,37)*[a]

[a] See SMART Hospitals Toolkit – Health care facilities are smart when they link their structural and operational safety with green interventions, at a reasonable cost-to-benefit ratio. https://www.paho.org/disasters/index.php?option=com_content&view=article&id=1742:smart-hospitals-toolkit&Itemid=1248&lang=en

HEALTH SECTOR RESPONSE: MEASURING PROGRESS

The following section measures progress in the health sector in responding to climate threats based on country reported data collected in the 2018 WHO Health and Climate Country Survey *(35)*. Key indicators are aligned with those identified in the Caribbean Action Plan.

Empowerment: Progress in leadership and governance

National planning for health and climate change

Has a national health and climate change strategy or plan been developed?[a]	✗
Title: N/A Year: N/A	
Content and implementation	
Are health adaptation priorities identified in the strategy/plan?	N/A
Are the health co-benefits of mitigation action considered in the strategy/plan?	N/A
Performance indicators are specified	N/A
Level of implementation of the strategy/plan	N/A
Current health budget covers the cost of implementing the strategy/plan	N/A

✓=yes, ✗=no, O=unknown, N/A=not applicable

[a] In this context, a national strategy or plan is a broad term that includes national health and climate strategies as well as the health component of national adaptation plans (H-NAPs).

Intersectoral collaboration to address climate change[a]

Is there an agreement in place between the ministry of health and other sectors in relation to health and climate change policy?

Sector[b]	Agreement in place
Transportation	✗
Electricity generation	✗
Household energy	✗
Agriculture	✗
Social services	✗
Water, sanitation and wastewater management	✗

✓=yes, ✗=no, O=unknown, N/A=not applicable

[a] Specific roles and responsibilities between the national health authority and the sector indicated are defined in the agreement.

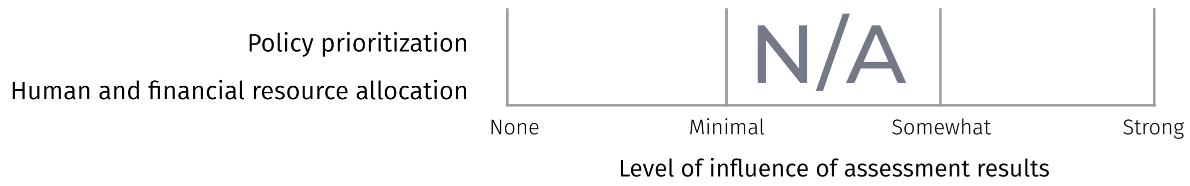
Evidence: Building the investment case

Vulnerability and adaptation assessments for health

Has an assessment of health vulnerability and impacts of climate change been conducted at the national level?[b]	✗

TITLE: N/A

Have the results of the assessment been used for policy prioritization or the allocation of human and financial resources to address the health risks of climate change?



✓=yes, ✗=no, O=unknown, N/A=not applicable

[b] The Bahamas' 2020 proposal by the Ministry of Health has requested technical cooperation by PAHO for the development of a mechanism for assessment of climate change and health vulnerability and adaptation.

Implementation: Preparedness for climate risks

Integrated risk monitoring and early warning

Climate-sensitive diseases and health outcomes	Monitoring system in place[a]	Monitoring system includes meteorological information[b]	Early warning and prevention strategies in place to reach affected population
Thermal stress (e.g. heat waves)	✗	✗	✗
Vector-borne diseases	✓	✗	✓
Foodborne diseases	✓	✗	✓
Waterborne diseases	✓	✗	✓
Nutrition (e.g. malnutrition associated with extreme climatic events)	✗	✗	✗
Injuries (e.g. physical injuries or drowning in extreme weather events)	✗	✗	✗
Mental health and well-being	✓	✗	✓
Airborne and respiratory diseases	✓	✗	✓

✓=yes, ✗=no, O=unknown, N/A=not applicable

[a] A positive response indicates that the monitoring system is in place, it will identify changing health risks or impacts AND it will trigger early action.

[b] Meteorological information refers to either short-term weather information, seasonal climate information OR long-term climate information.

Emergency preparedness

Climate hazard	Early warning system in place	Health sector response plan in place	Health sector response plan includes meteorological information
Heat waves	✗	✗	✗
Storms (e.g. hurricanes, monsoons, typhoons)	✓	✓	✓
Flooding	✓	✓	✓
Drought	✗	✗	✗

✓=yes, ✗=no, O=unknown, N/A=not applicable

Resources: Facilitating access to climate and health finance

International climate finance

Are international funds to support climate change and health work currently being accessed?	✓

If yes, from which sources?

- ☐ Green Climate Fund (GCF)
- ☑ Global Environment Facility (GEF)
- ☐ Other multilateral donors
- ☐ Bilateral donors
- ☐ Other: *PAHO/WHO*

Funding challenges

Greatest challenges faced in accessing international funds			
Lack of information on the opportunities		Lack of country eligibility	✓
Lack of connection by health actors with climate change processes		Lack of capacity to prepare country proposals	
Lack of success in submitted applications		None (no challenges/challenges were minimal)	
Other (please specify):		Not applicable	

REFERENCES

1. Climate Change Knowledge Portal: The Bahamas. The World Bank Group; 2020 (https://climateknowledgeportal.worldbank.org/country/bahamas, accessed 8 April 2020).
2. The World Factbook: The Bahamas [website]. Central Intelligence Agency; 2020 (https://www.cia.gov/library/publications/the-world-factbook/geos/bf.html, accessed 8 April 2020).
3. Household Expenditure Survey 2013 Report. The Government of The Bahamas; 2016.
4. The Government of The Bahamas. Intended Nationally Determined Contribution under the United Framework Convention on Climate Change. Communicated to the UNFCCC; 2015 (https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Bahamas/1/Bahamas%20INDC%20Submission.pdf, accessed 7 December 2020).
5. PAHO (2017). Health and Climate Country Survey.
6. Bender MA, Knutson TR, Tuleya RE, Sirutis JJ, Vecchi GA, Garner ST et al. Modeled impact of anthropogenic warming on the frequency of intense Atlantic hurricanes. Science. 2010;327(5964):454–8. doi: 10.1126/science.1180568.
7. Christensen JH, Krishna Kumar K, Aldrian E, An S-I, Cavalcanti IFA, de Castro M et al. Climate phenomena and their relevance for future regional climate change. Chapter 14. In: Stocker TF, Qin D, Plattner G-K, Tignor M, Allen SK, Boschung J et al., editors. Climate change 2013: the physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press; 2013:1217–310.
8. Knutson TR, Sirutis JJ, Zhao M, Tuleya RE, Bender M, Vecchi GA et al. Global projections of intense tropical cyclone activity for the late twenty-first century from dynamical downscaling of CMIP5/RCP4.5 scenarios. Journal of Climate. 2015;28(18):7203–24 (https://doi.org/10.1175/JCLI-D-15-0129.1, accessed 07 December 2020).
9. Kossin JP, Emanuel KA, Vecchi GA. The poleward migration of the location of tropical cyclone maximum intensity. Nature. 2014;509:349–52. doi: 10.1038/nature13278.
10. Kossin JP. A global slowdown of tropical-cyclone translation speed. Nature. 2018;558(7708):104–107. doi: 10.1038/s41586-018-0158-3.
11. Sobel AH, Camargo SJ, Hall TM, Lee CY, Tippett MK, Wing AA. Human influence on tropical cyclone intensity. Science. 2016;353:242–6. doi: 10.1126/science.aaf6574.
12. Walsh KJE, McBride JL, Klotzbach PJ, Balachandran S, Camargo SJ, Holland G et al. Tropical cyclones and climate change. WIREs Climate Change. 2016;7:65–89.
13. Yoshida K, Sugi M, Mizuta R, Murakami H, Ishii M. Future changes in tropical cyclone activity in high-resolution large-ensemble simulations. Geophysical Res Lett. 2017;44:9910–17.
14. 24th Conference of the Parties to the United Nations Framework Convention on Climate Change: Resumed opening of the high level segment. The Hon. Romauld Ferreira, M. P., Minister of the Environment & Housing; 2018.
15. Assessment of the Effects and Impacts of Hurricane Dorian in The Bahamas. United Nations and Inter-American Development Bank; 2020.
16. Extreme population exposure: Hurricane Dorian medical response in Great Abaco, Bahamas. Greig, E., Green, B.A., Ford, H.R., Farmer, D.B., Nottage, K.N., Espinel, Z., Schultz, J.M.; 2020. E Clinical Medicine. 20. 100274
17. Torres RR, Tsimplis MN. Sea-level trends and interannual variability in the Caribbean Sea. Journal of Geophysical Research, Oceans. 2013;118(6):2934–47 (https://doi.org/10.1002/jgrc.20229, accessed 7 December 2020).
18. Nurse LA, McLean RF, Agard J, Briguglio LP, Duvat-Magnan V, Pelesikoti N et al. 2014: Small islands. In: Barros VR, Field CB, Dokken DJ, Mastrandrea MD, Mach KJ, Bilir TE et al., editors. Climate change 2014: impacts, adaptation, and vulnerability. Part B: Regional aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge and New York: Cambridge University Press; 2014:1613–54 (https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap29_FINAL.pdf, accessed 11 November 2020).
19. Atlas of health and climate. Geneva: World Health Organization and World Meteorological Organization; 2012 (https://www.who.int/globalchange/publications/atlas/report/en/, accessed 7 December 2020).
20. Hales S, Kovats S, Lloyd S, Campbell-Lendrum D, editors. Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s. Geneva: World Health Organization; 2014 (https://apps.who.int/iris/bitstream/handle/10665/134014/9789241507691_eng.pdf?sequence=1, accessed 27 May 2019).
21. Quam M, Mikkel B. Imported infections' importance: global change driving dengue dynamics [dissertation]. Umeå: Umeå University; 2016.
22. Liu-Helmersson J. Climate change, dengue and Aedes mosquitoes: past trends and future scenarios [dissertation]. Umeå: Umeå University; 2018.
23. Liu-Helmersson J, Quam M, Wilder-Smith A, Stenlund H, Ebi K, Massad E et al. Climate change and Aedes vectors: 21st century projections for dengue transmission in Europe. EBioMedicine. 2016;7:267–77. doi: 10.1016/j.ebiom.2016.03.046.
24. Rocklöv J, Quam MB, Sudre B, German M, Kraemer MU, Brady O et al. Assessing seasonal risks for the introduction and mosquito borne spread of Zika virus in Europe. EBioMedicine. 2016;9:250–6. doi: 10.1016/j.ebiom.2016.06.009.
25. Pan American Health Organization. Core Indicators 2019: Health Trends in the Americas. Washington, D.C.: PAHO; 2019.
26. The state of food security and nutrition in the world 2018: building climate resilience for food security and nutrition. Rome: Food and Agriculture Organization of the United Nations; 2018 (http://www.fao.org/3/i9553en/i9553en.pdf, accessed 27 May 2019).
27. Global Health Observatory. Prevalence of anaemia in women. Geneva: World Health Organization; 2019 (http://apps.who.int/gho/data/node.main.ANEMIA3?lang=en, accessed 30 May 2019).
28. Unicef-World Health Organization-World Bank Group. Joint Child Malnutrition Estimates, Levels and Trends. 2019 (https://apps.who.int/iris/bitstream/handle/10665/331097/WHO-NMH-NHD-19.20-eng.pdf?ua=1, accessed 7 December 2020).
29. Global Health Observatory. Universal health coverage portal. Geneva: World Health Organization; 2017 (http://apps.who.int/gho/portal/uhcoverview.jsp, accessed 17 May 2019).
30. Global Health Expenditure Database. Geneva: World Health Organization; 2019 (https://apps.who.int/nha/database, accessed 17 May 2019).
31. UN Inter-agency Group for Child Mortality Estimation. Child mortality estimates. New York: United Nations Children's Fund; 2018 (http://www.childmortality.org, accessed 20 November 2018).
32. WHO/UNICEF. Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP). Geneva: World Health Organization/New York: United Nations Children's Fund; 2019 (https://washdata.org/data, accessed 1 August 2018).
33. Emergency Events Database (EM-DAT). Louvain: Centre for Research on the Epidemiology of Disasters, Université catholique de Louvain; 2019 (https//www.emdat.be, accessed 25 April 2019).
34. International Health Regulations (2005). Monitoring Framework. State Party Self-Assessment Annual Reporting tool (e-SPAR). Geneva: World Health Organization; 2019 (https://extranet.who.int/e-spar, accessed 9 May 2019).
35. WHO Climate and Health Country Survey as part of the WHO UNFCCC Health and Climate Change Country Profile Initiative. Geneva: World Health Organization; 2018 (https://www.who.int/globalchange/resources/countries/en/, accessed 7 December 2020).
36. The Government of The Bahamas. Health Care Facilities. Cooper, P, Philippe C, editors; 2020.
37. The Government of The Bahamas. Hospital Safety Index Review. Philippe, C; 2020.

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