ANTIGUA AND BARBUDA

HEALTH & CLIMATE CHANGE

COUNTRY PROFILE 2020

Small Island Developing States Initiative

World Health Organization
United Nations Framework Convention on Climate Change
PAHO

CONTENTS

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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 Antigua and Barbuda 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 DEVELOP AND IMPLEMENT A HEALTH AND CLIMATE CHANGE STRATEGY/ PLAN FOR ANTIGUA AND BARBUDA

Develop and implement a national health and climate change plan, 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. Involve departments and ministries responsible for health and health-determining sectors, as well as private sector, nongovernmental organizations and civil society stakeholders in the development and implementation of the plan.

2 ASSESSING 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.

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

The main barriers have been identified as a lack of information on the opportunities and a lack of capacity to prepare country proposals.

4 BUILD CLIMATE-RESILIENT 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 DEVELOP INTERSECTORAL PARTNERSHIPS TO ADDRESS FOOD AND WATER SECURITY AND SAFETY CHALLENGES

Alliances can be formed between the Ministry of Health and the Environment and ministries/ departments responsible for food and water safety and security (e.g. public works, agriculture, trade) and monitoring and response to meteorological and environmental threats (e.g. Meteorological Services and National Office of Disaster Services). These may be supplemented by international and local partnerships to develop and implement strategies to address food and water vulnerabilities to climate change and develop vibrant and effective models of operation and structural resilience.

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

BACKGROUND

Antigua and Barbuda is a Small Island Developing State (SIDS) in the Caribbean Sea *(1)*. The climate is tropical maritime, wet and dry, with minimal seasonal variation except for the hurricane season, which runs from approximately June to November *(1,2)*. Tourism is the country's dominant sector, accounting for around 80% of GDP and approximately 70% of employment; the sustainability of this sector is largely reliant upon Antigua and Barbuda's natural resources *(1)*.

As a SIDS, Antigua and Barbuda is considered highly vulnerable to climate change impacts, including sea level rise, increasing temperatures, changing precipitation patterns, and extreme weather events. Human health and well-being are also threatened by climate change, with particular threats being water insecurity (due to saltwater intrusion of freshwater aquifers); economic insecurity; heat stress; spread of vector-borne, waterborne and foodborne diseases; and death and injury from extreme weather events. With the country's economy being so reliant on tourism, threats to Antigua and Barbuda's natural environment and infrastructure could have serious implications for the country's economy and thus the social and economic development of its population.

The Government of Antigua and Barbuda recognizes the current and future threats of climate change and is working to adapt to these impacts. The water sector has been identified as a priority for adaptation, owing to risks of decreasing freshwater supply and saltwater intrusion of aquifers *(1)*. In 2015, the government of Antigua and Barbuda published its Nationally Determined Contribution (NDC). Its NDC highlights the threats to the health sector, particularly due to the spread of vector-borne and waterborne diseases; in response, the government has committed to protecting all waterways, to reduce flood risk and protect human health, by 2030. Furthermore, the health co-benefits of mitigation and adaptation are recognized *(3)*.

HIGHEST PRIORITY CLIMATE-SENSITIVE HEALTH RISKS FOR ANTIGUA AND BARBUDA

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 (4).*

CLIMATE HAZARDS RELEVANT FOR HEALTH

Climate hazard projections for Antigua and Barbuda

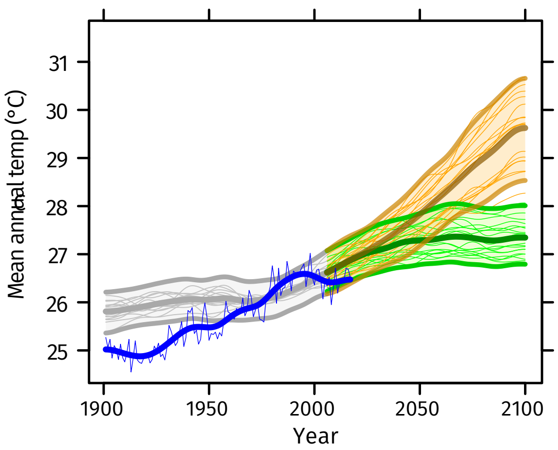
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5). The climate model projections given below present climate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

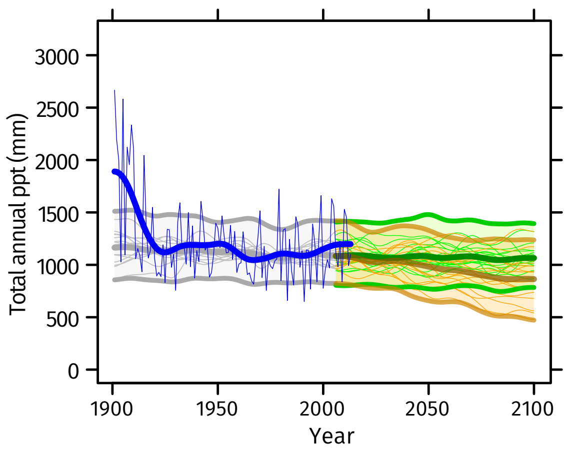
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the mean annual temperature is projected to rise by about 2.8°C on average by the end-of-century (i.e. 2071–2100 compared with 1981–2010). If emissions decrease rapidly, the temperature rise is limited to about 0.9°C.

Decrease in total precipitation

FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to decrease by about 20% on average under a high emissions scenario, although the uncertainty range is large (-48% to +6%). If emissions decrease rapidly there is little projected change on average: with a decrease of 3% and an uncertainty range of -17% to +7%.

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.

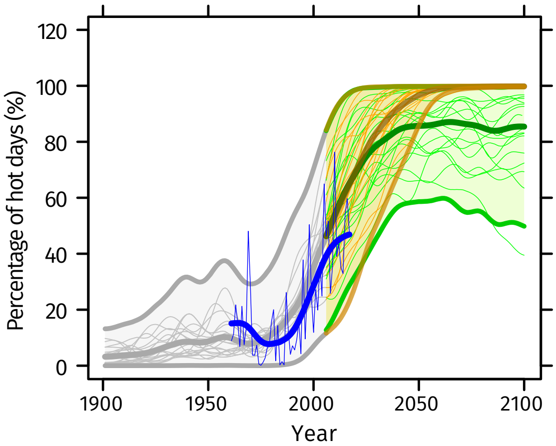
[b] Analysis by the Climatic Research Unit, University of East Anglia, 2018.

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

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

More high temperature extremes

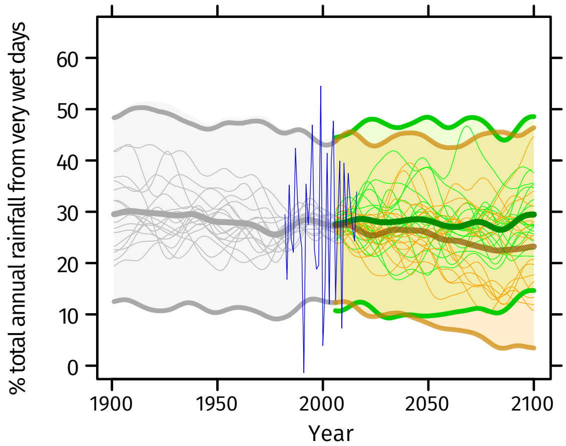
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase substantially from about 25% 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-century. If emissions decrease rapidly, about 85% of days on average are 'hot'. Note that the models tend to overestimate the observed increase in hot days (about 30% of days on average in 1981–2010 rather than 25%). Similar increases are seen in hot nights[d] (not shown).

Little change in extreme rainfall

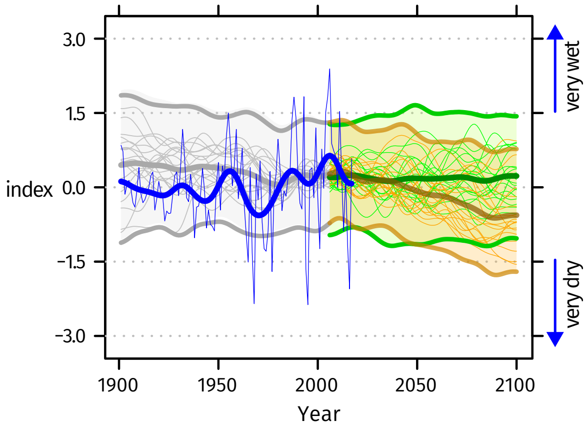
FIGURE 4: Contribution to total annual rainfall from very wet days ('extreme rainfall' and 'flood risk'), 1900–2100



Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 28% for 1981–2010) could decrease a little by the end-of-century (to about 23% on average with an uncertainty range of about 5% to 45%), with little change if emissions decrease rapidly. Total annual rainfall is projected to decrease (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). Under a high emissions scenario, SPI12 values are projected to decrease to about -0.5 on average by the end of the century (2071–2100), with a number of models indicating substantially larger decreases and hence more frequent and/or intense drought. Year-to-year variability remains large with wet episodes continuing to occur into the future.[f]



These findings underscore the importance of the government's commitment to adapting the water sector. Drought is already a common experience in Antigua and Barbuda. The probability of at least one (moderate or serious or severe drought) in a year is 45.1%, and in 5 years is 95.0%. For severe droughts alone, the probability of at least one in a year is 15.1% and at least one in 5 years 56.0% *(5).*

In recent years Antigua and Barbuda has experienced significant drought conditions. The year 2015 was the driest on record at rainfall stations in many Caribbean islands, including Antigua, and drought conditions with some short periods of relief persisted until August 2016. The 2014–16 drought periods led to decreases in agricultural production and reduced local food supply in Antigua and Barbuda. Water shortages forced water rationing. The Potworks Dam in Antigua was only 10% full by the end of 2014, and by the end of 2015, consumption of desalinated water was greater than 90%, compared with the normal 60% *(6).*

[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

Tropical cyclones have made landfall in Antigua and Barbuda on multiple occasions. Hurricanes can occur from June to November; historically, the most likely time is mid-August to mid-September. On average, there is a 33% chance of at least one hurricane affecting (passing within 120 miles) of Antigua and Barbuda in any given year or roughly once every three years *(7)*.

TABLE 1: Hurricanes that have affected Antigua and Barbuda, 1998–2018

Name	Date	Year	Central wind speed	AWG	24Rn	Stage	Type of Strike
Georges	21 Sep	1998	100	99	113.4	H3	Direct hit
Jose	20–21 Oct	1999	85	70	132.5	H2	Direct hit
Lenny	18–20 Nov	1999	110	51	241.8	H3	Direct hit
Debby	22 Aug	2000	70	31	21.3	H1	Hit
Dean	17 Aug	2007	110	46	14.6	H3	None
Omar	16 Oct	2008	115	42	147.4	H4	None
Earl	29–30 Aug	2010	90	56	174.7	H2	Hit
Gonzalo	13 Oct	2014	67	78	26.7	H1	Direct hit
Irma	5–6 Sep	2017	155	54	23.7	H5	Hit
Jose	9 Sep	2017	130	25	30	H4	Hit
Maria	19 Sep	2017	140	48	48.6	H5	Brushed

Source: Antigua and Barbuda Meteorological Services (2019) *(8)*

Notes:
All data above refer to cyclones at the time of impact on Antigua only
CWS Max wind speed in knots around the centre of the cyclone
AWG Max wind gust experienced at V. C. Bird International Airport, Coolidge
24Rn Max 24-hour rainfall measured at 8 a.m. or 1200 UTC
Stage category of the hurricane when it affected Antigua
- Direct hit: The cyclone centre passed over land or at most 15 nautical miles from land
- Hit: The cyclone centre passed between 15 and 65 nautical miles from land
- Brushed: The cyclone centre passed between 65 and 105 nautical miles from land
- None: The cyclone passed over 105 nautical miles from land but still caused storm conditions

FIGURE 6: Hurricane Irma over Barbuda, 2017