VANUATU

HEALTH & CLIMATE CHANGE

COUNTRY PROFILE 2020

Small Island Developing States Initiative

World Health Organization

United Nations
Framework Convention on
Climate Change

CONTENTS

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 March 2018, ministers of health gathered in Fiji to develop a Pacific Islands 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. In the Western Pacific region in particular, the SIDS initiative is a joint effort with For the Future: Towards the Healthiest and Safest Region. It highlights climate change, environment and health as a thematic priority for WHO's work in the Region. The goal is to ensure that countries and communities in the Region have the capacity to anticipate and respond to the health consequences of the changing climate and environment, with the health sector taking a lead role in cross-sectoral, multi-stakeholder efforts.

This WHO UNFCCC health and climate change country profile for Vanuatu 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 FINALIZE THE HEALTH AND CLIMATE CHANGE STRATEGY FOR VANUATU

A national health and climate change strategy has been developed for Vanuatu. Next steps include the finalization and approval of the plan. Ensuring that adaptation priorities are specified, health sector mitigation measures are considered, necessary budget requirements are allocated and regular monitoring and review of progress will support its full implementation.

2 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.

3 STRENGTHEN INTEGRATED RISK SURVEILLANCE

Expand upon existing monitoring systems and ensure that meteorological information is integrated into these systems.

4 ESTIMATE THE HEALTH CO-BENEFITS OF MITIGATION ACTIONS AND SUSTAINABLE DEVELOPMENT

Vanuatu has committed to a national target of 100% renewable energy by 2030 through its Nationally Determined Contribution (NDC) and its National Energy Road Map and has outlined its National Sustainable Development Goals in Vanuatu 2030: The People's Plan. The implementation of these targets and goals will have significant health co-benefits and the next step is to estimate these benefits.

5 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 made.

WHO RESOURCES TO SUPPORT ACTION ON THESE KEY RECOMMENDATIONS:

https://www.who.int/activities/building-capacity-on-climate-change-human-health/toolkit/

BACKGROUND

Vanuatu comprises 80 islands in the Pacific Ocean. The majority of the population lives on the largest islands: Espiritu Santo and Malekula *(1)*. The climate of Vanuatu is tropical, with tropical cyclones occurring frequently between November and April *(2)*. Two thirds of the population work in small-scale agriculture, which the economy is primarily reliant on. This dependence of the population and the national economy on small-scale agriculture has hindered the economic development of Vanuatu and also increases its vulnerability to climate change, with crop failures being potentially catastrophic. Tourism is another important contributor to the economy, but the sector has struggled since the destruction to the island of Efate (the most popular island destination) due to Cyclone Pam in 2015 *(2)*.

Vanuatu is considered highly vulnerable to climate change, owing to its geographic isolation and the high costs of providing basic services *(1)*. Climate change is projected to result in numerous challenges for Vanuatu, including increasing temperatures, rising sea levels, and extreme weather events. For the health of the country's population, these changes present significant health risks, such as resource insecurity, increase in mortality and morbidity due to extreme weather events, risk of vector-borne, waterborne and foodborne diseases, and food and nutrition insecurity.

The Government of Vanuatu has outlined ambitions to tackle climate change, including being 100% renewable by 2030. Furthermore, the government highlights the threats climate change poses to human health in its Nationally Determined Contribution (NDC), which also recognizes the vulnerability of the country to climate change and the need to improve access to basic health services. Improving health is also identified as a key funding priority in the NDC *(3)*.

HIGHEST PRIORITY CLIMATE-SENSITIVE HEALTH RISKS FOR VANUATU

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	✓
Zoonoses	
Respiratory illness	✓
Disorders of the eyes, ears, skin and other body systems	✓
Diffuse effects	
Disorders of mental/psychosocial health	✓
Noncommunicable diseases	✓
Health systems problems	
Population pressures	

Source: Adapted and updated from reference *(4)*.
Please refer to reference *(4)* for further information on each category.

CLIMATE HAZARDS RELEVANT FOR HEALTH

Climate hazard projections for Vanuatu

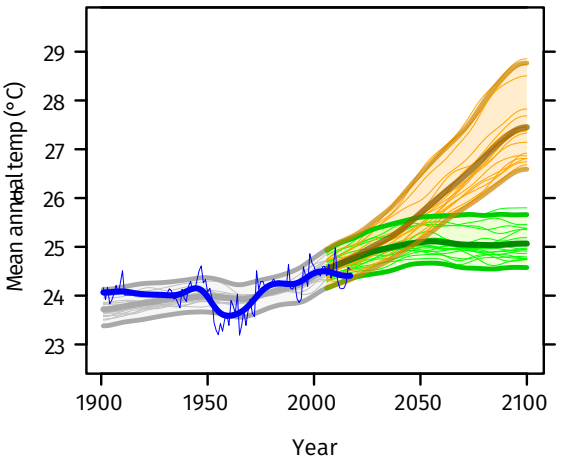
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

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

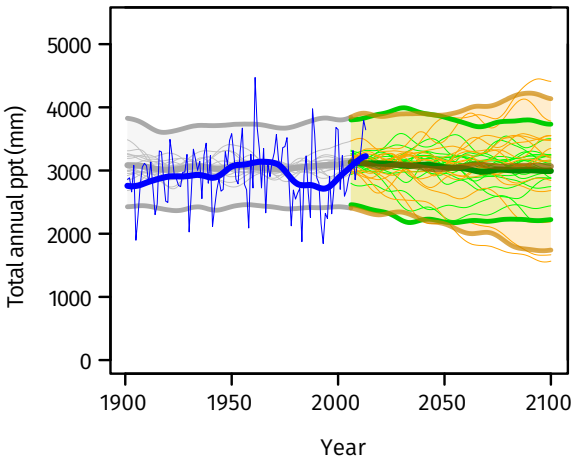
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the mean annual temperature is projected to rise by about 2.7°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 0.7°C.

Little change in total precipitation

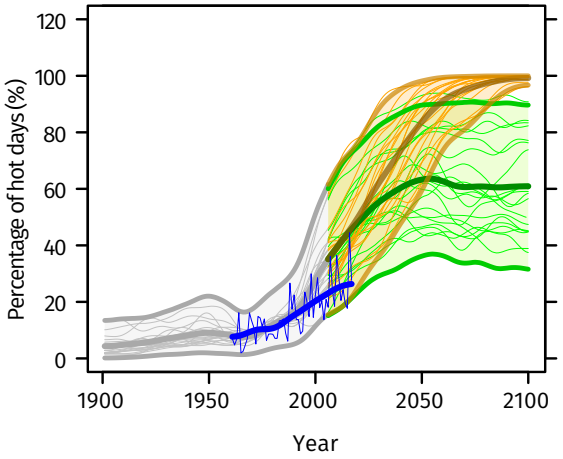
FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to remain almost unchanged on average under a high emissions scenario, although the uncertainty range is large (-39% to +24%). If emissions decrease rapidly there is little projected change on average, with an uncertainty range of -19% to +7%.

More high temperature extremes

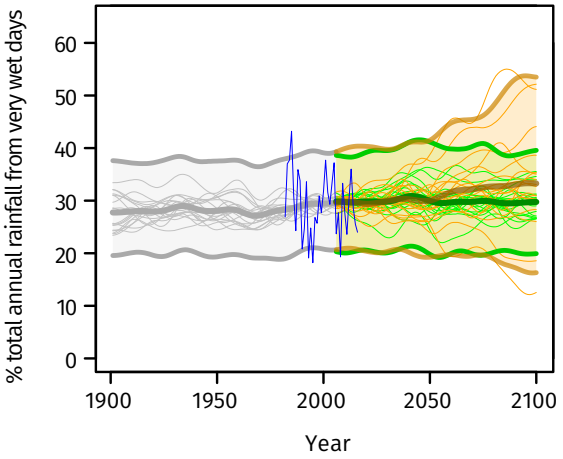
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase substantially from about 20% 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 60% of days on average are 'hot'. Note that the models tend to overestimate the observed increase in hot days (by about 5% on average for 1981–2010). Similar increases are seen in hot nights[d] (not shown).

Small increase in extreme rainfall

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

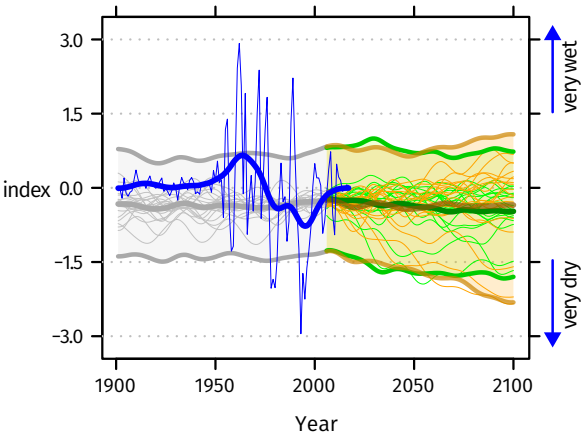


Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 30% for 1981–2010) could increase a little by the end-of-century (to almost 35% on average with an uncertainty range of about 20% to 50%), with little change if emissions decrease rapidly. These projected changes are accompanied by little or no change in total annual rainfall even under a high emissions scenario (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 an average of about -0.4, indicating little change on average in the frequency and/or intensity of wet episodes and drought events, though year-to-year variability remains large. A few models indicate larger decreases (more frequent/intense drought events) or increases (more frequent/intense wet events).



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.

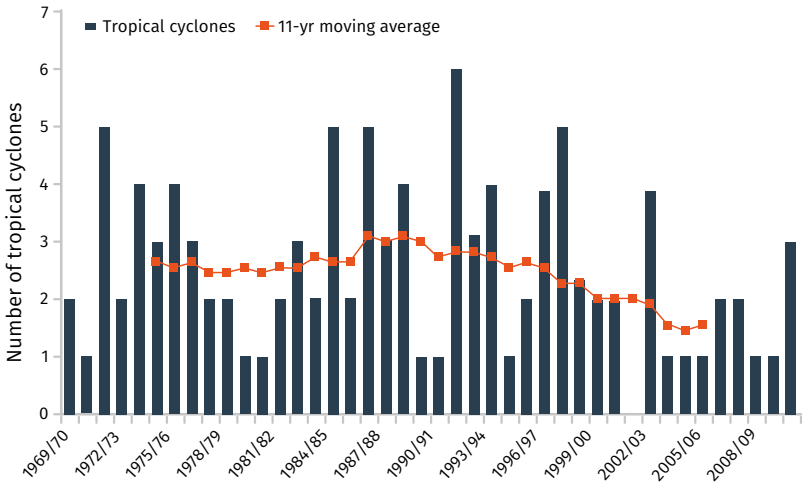
[e] The proportion (%) of annual rainfall totals that falls during very wet days, defined as days that are at least as wet as the historically 5% wettest of all days.

[f] SPI is unitless but can be used to categorise different severities of drought (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 affect Vanuatu mainly between November and April. An average of 24 cyclones per decade developed within or crossed the Vanuatu Exclusive Economic Zone (EEZ) between the 1969/70 to 2010/11 seasons (see Figure 6) *(5)*.

FIGURE 6: Time series of the observed number of tropical cyclones developing within and crossing the Vanuatu EEZ. The 11-year moving average is in orange



Source: Australian Bureau of Meteorology and CSIRO. Climate Variability, Extremes and Change in the Western Tropical Pacific: New Science and Updated Country Reports, 2014 *(5)*.

POTENTIAL FUTURE CHANGES IN TROPICAL CYCLONES: A GLOBAL PERSPECTIVE *(6–13)*[a]

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.

0.4–0.9 m

Further rise in Vanuatu by 2090 (5)

High emissions scenario (RCP8.5). With variation in models and emissions scenarios.

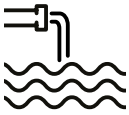
Impacts of sea level rise include

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 a global scale.

HEALTH VULNERABILITY TO CLIMATE CHANGE

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.

1. NO POVERTY

Proportion of population living below the national poverty line (2010) *(14)*

12.7 %

3. GOOD HEALTH AND WELL-BEING

3.7 %

Current health expenditure as percentage of gross domestic product (GDP) (2016) *(16)*

48

Universal Health Coverage Service Coverage Index (2017)[a] *(15)*

26.9

Under-five mortality rate (per 1000 live births) (2017) *(17)*

6. CLEAN WATER AND SANITATION

Proportion of total population using **at least basic drinking-water services** (2017)[b] *(18)*

91 %

Proportion of total population using **at least basic sanitation services** (2017)[b] *(18)*

34 %

13. CLIMATE ACTION

Total number of weather-related disasters recorded between 2000 and 2018[c] *(19)*

10

Highest total number of persons affected by a single weather-related disaster between 2000 and 2018[c] *(19)*

188 000

[a] 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.

[b] Data for SDG6 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.

[c] Data for SDG13.1 are currently not available. Alternative indicators and data sources are presented.

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.

HUMAN RESOURCE CAPACITY (2018)

40%

International Health Regulations (IHR) Monitoring Framework Human Resources Core Capacity *(20)*

No

"Does your human resource capacity as measured through the IHR adequately consider the human resource requirements to respond to climate-related events?" *(21)*

No

"Is there a national curriculum developed to train health personnel on the health impacts of climate change?" *(21)*

HEALTH WORKFORCE (PER 10 000 POPULATION, 2016) *(22)*

1.71
Medical doctors

13.85
Nurses and midwives

N/A
Environmental and public health workers

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.

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 require greater capacity from often already strained health services. In small island developing states, health care facilities are often in low-lying areas, subject to flooding and storm surges, making them particularly vulnerable.

15.43
Health centres*

2.37
Hospitals*

* Total density per 100 000 population (2013) *(20)*

Heat stress

Climate change is expected to increase the mean annual temperature and the intensity and frequency of heatwaves, resulting in a greater number of people at risk of heat-related medical conditions. Heatwaves, 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:

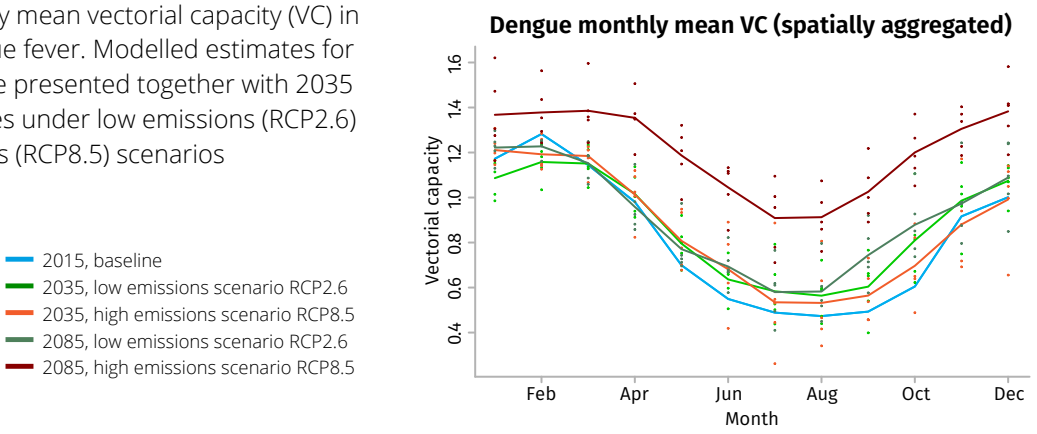
- elderly people
- children
- individuals with pre-existing conditions (e.g. diabetes)
- the socially isolated.

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 *(23,24)*.

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 7 presents modelled estimates for Vanuatu 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 Vanuatu is consistently highly suitable for dengue transmission under all scenarios and thus vulnerable to outbreaks *(25–28)*.[b,c]

FIGURE 7: Monthly mean vectorial capacity (VC) in Vanuatu 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.

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.

NONCOMMUNICABLE DISEASES IN VANUATU

62.7

Healthy life expectancy (2016) *(29)*

7.1%

Adult population considered **undernourished** (2015–17 3 year average) *(30)*

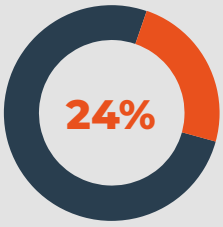
23.5%

Adult population considered **obese** (2016) *(31)*

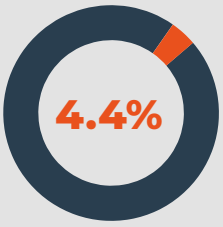
13.1%

Prevalence of **diabetes** in the adult population (2014) *(32)*

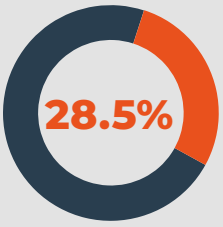
MOTHER AND CHILD HEALTH



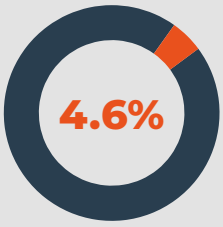
Iron deficiency anaemia in women of reproductive age (2016) *(33)*



Wasting in children under five years of age (2013) *(34)*



Stunting in children under five years of age (2013) *(34)*



Overweight in children under five years of age (2013) *(34)*

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 2017/2018 WHO health and climate country survey *(21)*. Key indicators are aligned with those identified in the Pacific Islands Action Plan.

Empowerment: Supporting health leadership

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?	O
Are the health co-benefits of mitigation action considered in the strategy/plan?	O
Performance indicators are specified	O
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

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

Sector[a]	Agreement in place
Transportation	O
Electricity generation	✓
Household energy	O
Agriculture	✓
Social services	O
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.

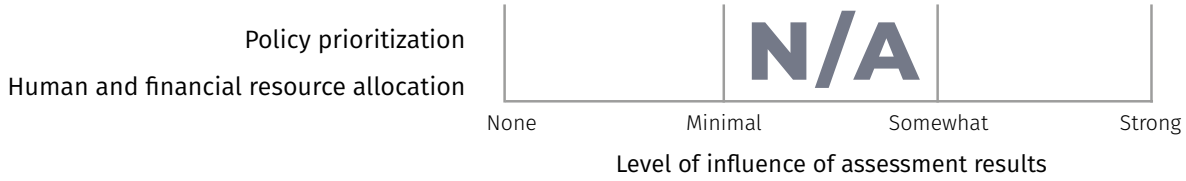
Evidence: Building the investment case

Vulnerability and adaptation assessments for health

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

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?



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)	✗	N/A	✗
Vector-borne diseases	✓	✓	✓
Foodborne diseases	✓	✗	✓
Waterborne diseases	✓	✓	✓
Nutrition (e.g. malnutrition associated with extreme climatic events)	✗	N/A	O
Injuries (e.g. physical injuries or drowning in extreme weather events)	✗	N/A	O
Mental health and well-being	✗	N/A	O

✓=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	✗	✗	N/A
Storms (e.g. hurricanes, monsoons, typhoons)	✓	✓	✓
Flooding	✓	✗	N/A
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?	O

If yes, from which sources?

- ☐ Green Climate Fund (GCF)
- ☐ Global Environment Facility (GEF)
- ☐ Other multilateral donors
- ☐ Bilateral donors
- ☐ Other: _____

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

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	

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