

REVIEW

# Health in National Adaptation Plans





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# Abbreviations

<b>CCHSAP</b>	(Fiji) Climate Change and Health Strategic Action Plan 2016–2020
<b>CSHR</b>	climate-sensitive health risk
<b>HNAP</b>	Health National Adaptation Plan
<b>NAP</b>	National Adaptation Plan
<b>SDG</b>	Sustainable Development Goal
<b>SRHR</b>	Sexual and reproductive health and rights
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>WHO</b>	World Health Organization

# Executive summary

Climate change has significant impacts on health, both directly (e.g. injury or death from extreme weather events; heat illnesses related to temperature increases) and indirectly (e.g. malnutrition; increased spread of vector-borne diseases; impacts on mental health).

As part of the response to the threats posed by climate change across all sectors, the National Adaptation Plan (NAP) process was established under the United Nations Framework Convention on Climate Change (UNFCCC) in 2010, in the Cancun Agreements.

The aim of the NAP process is to build resilience to climate change across economies, societies and ecosystems over the medium and longer term. This is achieved by analysing current and future climate change impacts, assessing vulnerabilities, and identifying, prioritizing and implementing adaptation actions to respond. Led by national governments, NAP processes involve a range of government actors and nongovernmental stakeholders.

Many countries and areas are taking a sector-based approach to adaptation planning, using key sectors and systems as the basis for assessing vulnerabilities and identifying adaptation actions to tackle these. Some countries and areas are including sector- or system-specific adaptation actions in overarching NAPs, some are developing separate sector-based adaptation plans, and some are doing both.

This review analyses 19 of the 20 NAPs submitted to NAP Central, the UNFCCC NAP portal, by 31 December 2020 to assess the extent to which health was considered in adaptation planning processes.<sup>1</sup> A content analysis of these NAPs was performed according to a set of predetermined indicators assessing target populations; climate change and health vulnerability and adaptation assessments; coverage of climate-sensitive health risks, adaptation needs and proposed adaptation actions; and implementation mechanisms.

The review found that all NAPs highlight health as a high-priority sector vulnerable to climate change. The extent to which the health risks are considered and addressed, however, varies. Several areas of opportunity for strengthening the resilience of health systems through the NAP process were identified:

- ✓ Countries and areas, as part of NAP processes, are conducting vulnerability and adaptation assessments for high-priority sectors, which provides the opportunity to analyse the implications of climate change for different aspects of health. A comprehensive, context-specific vulnerability and adaptation assessment by the health sector should be conducted as part of the NAP process to ensure informed planning. In addition, vulnerability and adaptation assessments for health-determining sectors (e.g. water, food security, agriculture) are critical entry points for the coordinated consideration of climate-sensitive health risks.
- ✓ Institutional arrangements for NAP processes are being established in countries and areas. Health-sector engagement in these arrangements is critical to facilitate ongoing coordination and collaboration between ministries of health, the ministries responsible for climate change and the NAP process, and actors in other relevant sectors.

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<sup>1</sup> The NAP submitted by Uruguay is a sectoral NAP focusing on agriculture and was not included in the review.



- ✔ Many countries aim for synergies across sectors in NAP processes, where the adaptation priorities and actions identified in one sector are supported by those in another sector. This presents opportunities for strengthened collaboration to promote health across all sectors and coordinated cross-sectoral efforts in adaptation planning for health resilience and implementation of adaptation actions.
- ✔ NAP processes are iterative in nature, allowing for a systematic and comprehensive approach to strengthen the resilience of health systems to be developed over time.
- ✔ Depending on country context, the development of a detailed Health National Adaptation Plan (HNAP), led by the ministry of health, may be needed to elaborate a comprehensive sectoral approach or to detail the actions included in the overarching NAP. The World Health Organization (WHO) recently published guidance, *Quality criteria for Health National Adaptation Plans*, that outlines examples of good practice in six topic areas that may be useful in guiding health adaptation planning.
- ✔ Planning for adequate resourcing, both human and financial, is an important part of the NAP process to ensure effective implementation. For many countries, financing will likely be sourced from national budget allocations along with external funding sources. The NAP process provides an opportunity to increase access to climate-change funding for health adaptation from key climate funding streams such as the Green Climate Fund.
- ✔ Countries are establishing monitoring and evaluation systems for adaptation at the national level. This provides an opportunity to incorporate key indicators of resilient health systems and to track adaptation efforts within the health sector and beyond. These systems also create the foundation for learning about what works and what does not in relation to health adaptation.

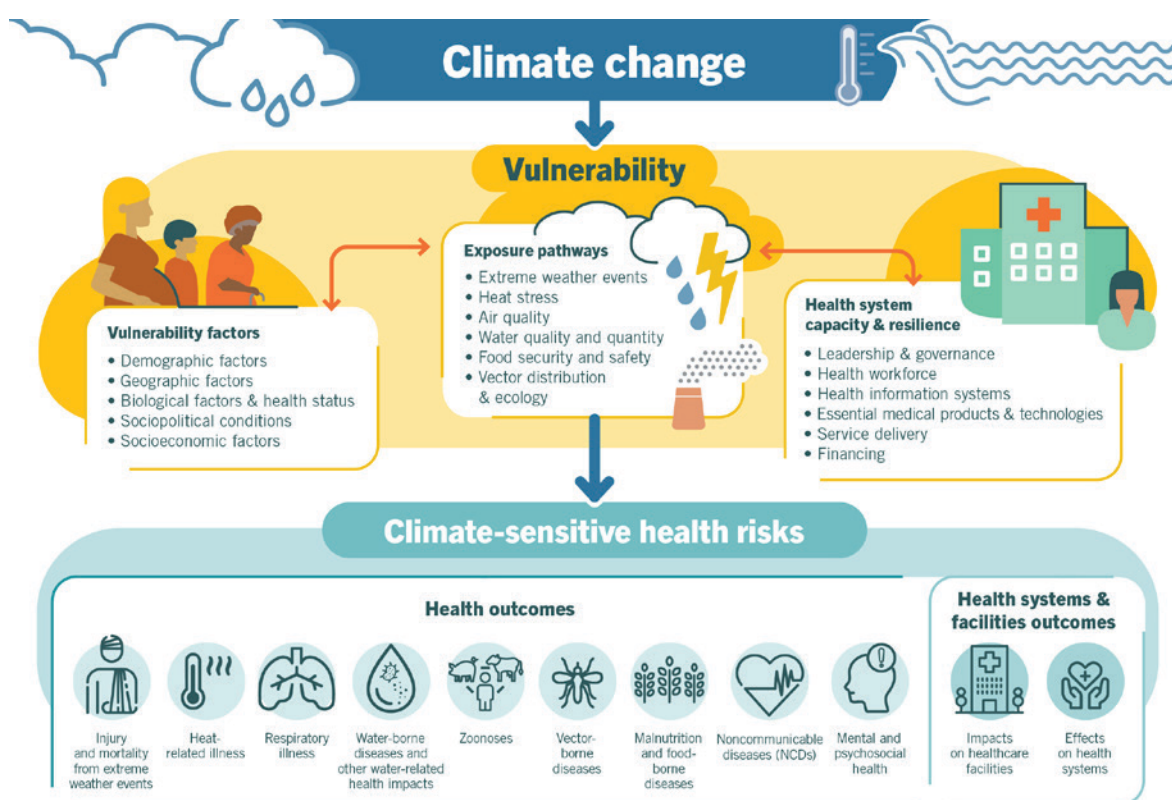


# Introduction and context

Climate change has significant impacts on health, both directly (e.g. injury or death from extreme weather events; heat illnesses related to temperature increases) and indirectly (e.g. malnutrition; increased spread of vector-borne diseases; impacts on mental health). Figure 1 describes some of the major climate-sensitive health risks (CSHRs) and causal pathways.

Very conservative World Health Organization (WHO) estimates suggest climate change will cause an extra 250 000 deaths per year by 2030 from malnutrition, malaria, diarrhoea and heat stress alone (7). Furthermore, climate change places additional pressure on health systems and facilities, with increasing burdens disproportionately affecting more vulnerable countries and communities.

Figure 1 Climate-sensitive health risks



Climate change threatens progress in health and development made in recent decades. Inaction multiplies the future health risks of climate change – it is likely to halt or even reverse development gains in many countries and areas. Addressing the health impacts of climate change is critical to the global development agenda and achievement of the Sustainable Development Goals (SDGs), and gains in achieving these goals will contribute to building health system resilience.

SDGs 2 (zero hunger), 3 (good health and well-being), 6 (clean water and sanitation), 7 (affordable and clean energy), 11 (sustainable cities and communities) and 13 (climate action) are all directly relevant to climate change and health action. The impacts of climate change on health, however,

affect nearly all SDGs in some way. As such, active engagement of the health sector in national and international climate change agenda and national adaptation planning is crucial.

In 1992 the United Nations Framework Convention on Climate Change (UNFCCC) was adopted by countries. The National Adaptation Plan (NAP) process was established under the UNFCCC in 2010 in the Cancun Agreements (2). Its importance was emphasized in the 2015 Paris Agreement, as a means of achieving the global goal on adaptation (3).

The aim of the NAP process is to build resilience to climate change across economies, societies and ecosystems over the medium and longer term. This is achieved by analysing current and future climate-change impacts, assessing vulnerabilities, and identifying, prioritizing and implementing adaptation actions to respond.

Tracking activities and results facilitates progress reporting, learning and adjustment over time. The process enables strategic integration of climate-change considerations in planning, decision-making and budgeting at different levels and across sectors. Led by national governments, NAP processes involve a range of government actors and nongovernmental stakeholders. The process puts in place the systems and capacities needed to make adaptation to climate change part of development “business as usual” (4, 5).

As a country-driven initiative, NAP processes are tailored to the specific national context and circumstances. Countries and areas are progressing at their own pace and taking different approaches. The defining features are that this is a continuous, iterative process that involves much more than a single planning document, and that the implementation and monitoring and evaluation phases are as important as the initial planning phase. NAP processes are intended to be participatory and gender-responsive, requiring stakeholder engagement throughout all the different phases (2, 4, 5).

The objectives of the NAP process include “facilitating the integration of climate change adaptation in relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate” (6). As such, many countries and areas are taking a sector-based approach to adaptation planning, using key sectors as the basis for assessing vulnerabilities and identifying adaptation actions.

Some countries and areas are including sector-specific actions in overarching NAPs, some are developing separate sector-based adaptation plans, and some are doing both.

All 19 NAPs available on NAP Central identify health as a high-priority sector (Table 1), along with agriculture and food security. Seventeen NAPs (almost 90%) include water, and 3 of these (16%) explicitly include sanitation.

**Table 1 National Adaptation Plans (NAPs) submitted to the UNFCCC NAP portal, 2020**

<b>Country/territory/area</b>	<b>Year submitted</b>	<b>Health identified as a vulnerable sector</b>
<b>Brazil</b>	<b>2016</b>	
<b>Burkina Faso</b>	<b>2015</b>	
<b>Cameroon</b>	<b>2015</b>	
<b>Chile</b>	<b>2017</b>	
<b>Colombia</b>	<b>2018</b>	
<b>Ethiopia</b>	<b>2019</b>	
<b>Fiji</b>	<b>2018</b>	
<b>Grenada</b>	<b>2017</b>	
<b>Guatemala</b>	<b>2018</b>	
<b>Kenya</b>	<b>2017</b>	
<b>Kiribati</b>	<b>2019</b>	
<b>Occupied Palestinian Territory</b>	<b>2016</b>	
<b>Paraguay</b>	<b>2020</b>	
<b>Saint Lucia</b>	<b>2018</b>	
<b>Saint Vincent and the Grenadines</b>	<b>2019</b>	
<b>Sri Lanka</b>	<b>2016</b>	
<b>Sudan</b>	<b>2016</b>	
<b>Suriname</b>	<b>2019</b>	
<b>Togo</b>	<b>2018</b>	

Given that climate impacts will affect each climate-sensitive sector differently, a sector-based approach can be a useful starting point for integrating climate-change considerations, especially in countries and areas where the budgeting process is organized around sector ministries. A sector-based approach can also be helpful for providing the level of detail required to develop operational plans that address medium- and long-term priorities.

Recognizing the cross-sectoral nature of climate change adaptation, efforts are needed to ensure synergies among actions in different sectors and to invest in the systems and capacities that support action across all sectors and levels. These include climate services, coordination mechanisms and social protection systems.

In 2012 WHO expanded its climate change and health programme to provide specific support to countries and areas to ensure health adaptation efforts were effectively integrated in the process to formulate and implement NAPs. As part of the process of building climate-resilient health, WHO supports countries and areas to develop a Health National Adaptation Plan (HNAP) – a plan developed by the ministry of health, as part of the NAP process.

The comprehensiveness of the approach to health in the broader NAP process, including the NAP documents, has been variable. This may lead to missed opportunities to strengthen health adaptation through the NAP process. This paper analyses the extent to which health is included in the NAPs submitted to UNFCCC to date.

# Methodology

A total of 19 NAPs were reviewed, which includes all overarching NAPs submitted to the UNFCCC NAP Central portal by the end of December 2020 (7).<sup>2,3</sup> Analysis of the Chile NAP includes the Health Sector Climate Change Adaptation Plan, which was developed as part of the NAP process (and specifically referenced in the NAP) and approved by the Council of Ministers for Sustainability and Change Climate.

A content analysis of the 19 NAPs was performed according to a set of predetermined indicators. Excel was used to collate and organize the data and perform simple qualitative and quantitative analyses.

Citations for specific country examples are not included in the text, but the full list of NAPs and HNAPs can be found in the bibliography at the end of this document.

There was significant variation in the structure, format and content of NAPs submitted to NAP Central. Sixteen NAPs (84%) were structured around climate-sensitive sectors.

Sudan's NAP assessed vulnerability and adaptation actions geographically and was structured with a chapter for each state. The NAP for Saint Vincent and the Grenadines focused on activities that were cross-sectoral and not sector-specific. The NAP for Ethiopia had sectoral-level adaptation options, but the document itself was not structured around sectors.

Regardless of the document structure, all of the countries and areas used high-priority sectors as entry points for planning and implementing adaptation actions.

## Limitations

This review consisted of an assessment of publicly available NAPs. There were some limitations to be considered when interpreting the results. Challenges in performing a cross-country comparison were encountered, including the different structures of NAPs, diverse approaches to the planning process, varying degrees of detail, and inconsistent scale of adaptation actions and interventions.

Only NAPs submitted to NAP Central were analysed. NAP Central houses voluntarily submitted NAPs from developing countries, territories and areas only. A number of countries and areas have completed NAPs but have not submitted them to UNFCCC. As such, these documents are not a comprehensive representation of all adaptation planning and action in the health sector.

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<sup>2</sup> NAP Central invites submissions from developing countries only ([https://www4.unfccc.int/sites/NAPC/News/Pages/national\\_adaptation\\_plans.aspx](https://www4.unfccc.int/sites/NAPC/News/Pages/national_adaptation_plans.aspx)).

<sup>3</sup> The NAP submitted by Uruguay is a sectoral NAP focusing on agriculture and was not included in the review.

# Health in NAPs: key findings

## Health leadership and enabling environment

**All NAPs identified health as a high-priority sector vulnerable to climate change.** The 16 NAPs with a sectoral approach (84%) have a section or chapter dedicated to health. On average, the length of the health section or chapter is equal to that of other sectors – about five pages.

Although the approach differs across the NAPs, these sections typically describe the impacts of climate change on health (if not already covered in an earlier section), outline the objectives for adaptation in the health sector, and identify adaptation actions to achieve these objectives. In some cases, they also estimate costs for implementation, identify roles and responsibilities, or identify progress indicators and targets.

**26%** Five NAPs made reference to a separate HNAP or a climate change and health strategy or sectoral plan.

Four of these plans were finalized and published before the NAP (Brazil,<sup>4</sup> Ethiopia, Fiji, Kiribati) and one after the NAP (Chile), which is considered an integral part of the overarching NAP.

In general, the separate HNAPs have been developed as part of a range of sectoral plans for various sectors, such as agriculture, water and transport. These plans are often more detailed than the overarching NAP and specify a more comprehensive range of health adaptation actions. Nevertheless, the extent of integration of HNAPs in the broader NAP process and alignment of objectives and actions between the two documents varies.

Fiji's Climate Change and Health Strategic Action Plan 2016–2020 (CCHSAP) was well integrated in the NAP process. It was developed in 2016 before the country's NAP was published in 2018. Fiji's NAP includes high-priority actions, including 10 of the 40 actions from the CCHSAP. It notes these are not all the adaptation actions that will be implemented but the actions prioritized as most urgent for the five-year period of the NAP. The NAP includes an action to "strengthen and empower the Climate Change and Health Unit by increasing resources and personnel with clear mandates to implement the CCHSAP".

Chile's Climate Change Adaptation Plan for the Health Sector was developed after the NAP, but was also well integrated in the NAP process, as it was viewed as an essential next step from the overarching NAP. The health sector plan is aligned with the NAP overall but includes greater detail and comprehensiveness.

**73%** Fourteen NAPs specify an ongoing role for the health sector in NAP coordination.

The ministry of health or country equivalent was identified as the lead agency in the development of the health section or chapter in 15 NAPs (94%), and an existing or planned climate change focal point in the ministry of health was specified in 5 NAPs (26%).

<sup>4</sup> The Brazil NAP refers to an updated health sector plan, Sectoral Health Plan for Mitigation and Adaptation to Climate Change 2016–2019, published in the same year as the NAP. This document does not appear to be publicly available.

Brazil, for example, has designated the Ministry of Health's Secretariat for Health Surveillance as the focal point for coordinating health-sector NAP work. Grenada's NAP specifies a goal of strengthening the institutional structure to support coordination, integration and implementation of climate change adaptation action with a target of at least 12 ministries or agencies having active climate change focal points, including health.

## Coverage of climate-sensitive health risks

**89%** **Seventeen NAPs make reference to an assessment of vulnerability that includes health impacts of climate change.**

The comprehensiveness of these assessments for health varies widely. Some NAPs discuss the health impacts of climate change in a short narrative based primarily on global data and publications (e.g. in national communications) with limited context-specific assessment.

The conduct of health vulnerability assessments and the use of findings could be strengthened in many NAPs, such as through using context-specific local data, establishing baselines and projections, using a clear methodology, and establishing a clear link between the vulnerability assessment findings and proposed adaptation actions.

Eight NAPs (40%) include actions related to further understanding vulnerability in population health and health care facilities. Nine NAPs (47%) identify additional actions in health and climate research.

**All NAPs consider a range of CSHRs.** In this report, we assess the comprehensiveness of CSHR coverage (range of CSHRs considered) in the context sections of NAPs where the health impacts of climate change are described. We group the CSHRs identified in NAPs according to the categories in Table 2.

Figure 2 shows the percentage of NAPs that consider each of the categories of CSHR. **The CSHRs most commonly identified in the NAPs are vector-borne diseases (19 NAPs, 100%), water-borne diseases (19 NAPs, 100%), and health impacts of extreme weather events (17 NAPs, 89%). The CSHRs that are least considered are zoonoses (4 NAPs, 21%) and mental and psychosocial health (7 NAPs, 37%).**

Within the two most predominant CSHR categories identified in the NAPs, some of the most commonly mentioned climate-sensitive diseases include malaria, dengue, diarrhoeal diseases, cholera, leptospirosis and typhoid fever. Figure 3 illustrates the main climate-sensitive vector-borne and water-borne diseases described in the NAPs.

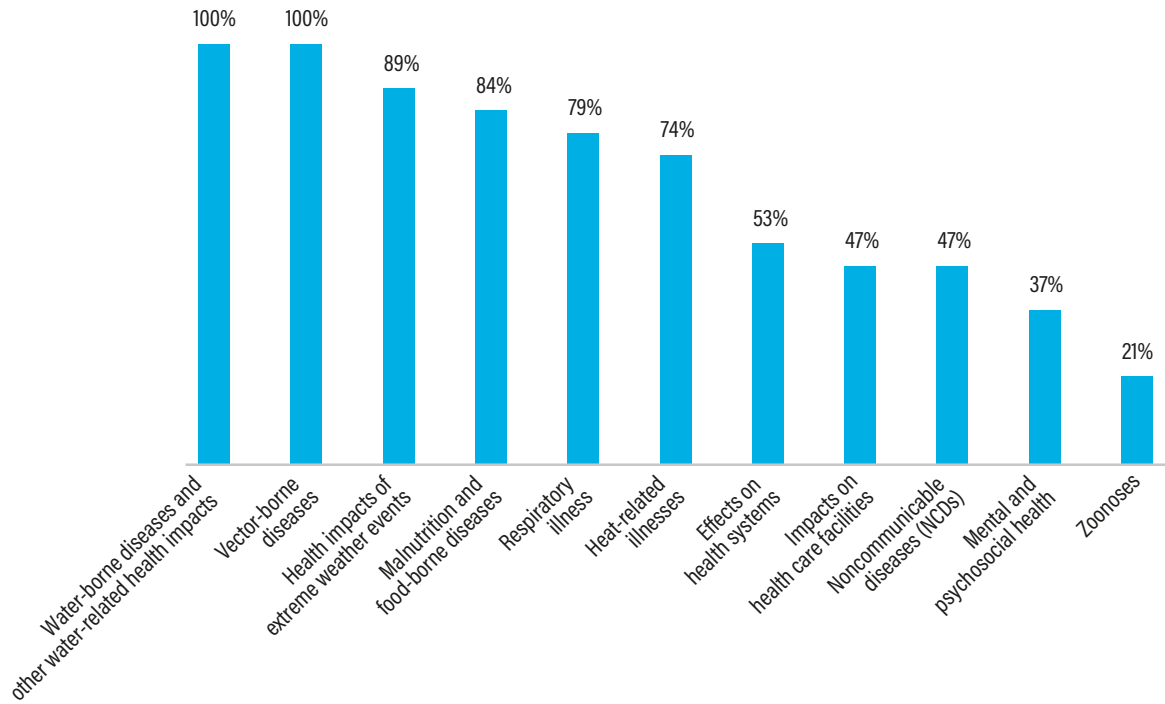
**53%** **Ten NAPs identified health-system impacts as CSHRs.**

These impacts included disruption of health services and discontinuity of regular services during extreme events, increased costs of health care, and the increased number of health workers required to manage CSHRs.

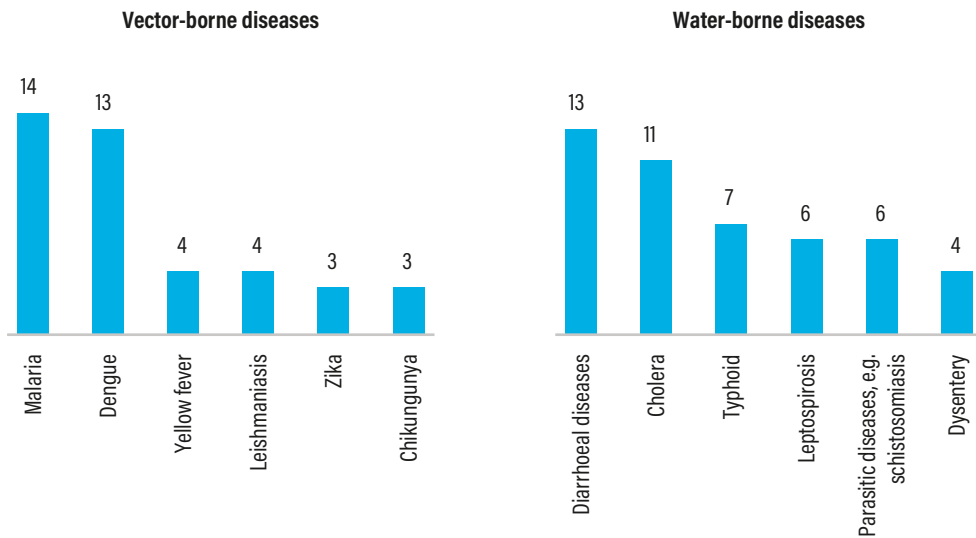
The Saint Lucia NAP identifies increased stress on public health care systems and increased health care costs as potential repercussions of climate change impacts in the health sector. The Sudan NAP notes the additional health services that would be required to address the health impacts of climate change, such as the emergence of new diseases.



**Figure 2 Climate-sensitive health risks identified in National Adaptation Plans (NAPs)**



**Figure 3 Most commonly mentioned vector-borne and water-borne diseases in national adaptation plans (NAPs)**



**Table 2 Examples of climate-sensitive health risks in National Adaptation Plans (NAPs)**

<b>Category of climate-sensitive health risk</b>	<b>Examples in NAPs</b>
Health impacts of extreme weather events	Injury Death
Heat-related illnesses	Heat stroke Cardiovascular disease
Respiratory illness	Asthma Allergies Acute respiratory infections
Water-borne diseases and other water-related health impacts	Cholera Schistosomiasis Diarrhoea Typhoid fever Hepatitis A Polio Giardiasis Rotavirus Shigellosis Harmful algal blooms Leptospirosis
Zoonoses	Rabies Hantavirus
Vector-borne diseases	Malaria Dengue fever Zika virus Chikungunya Yellow fever Leishmaniasis Lyme disease
Malnutrition and food-borne diseases	Malnutrition Salmonella Ciguatera
Noncommunicable diseases	Cardiovascular disease Chronic kidney disease
Mental and psychosocial health	General mental and psychosocial health Effects of extreme weather events Loss of traditional homes and villages Feelings of uncertainty and helplessness about the future
Impacts on health care facilities	Destruction of infrastructure Destruction of medicines
Effects on health systems	Disruption or discontinuation of health services Increased stress on health system Increased cost of health care

## Sexual and reproductive health and rights (SRHR) in NAPs

Analysis by the NAP Global Network and Women Deliver explored how SRHR are addressed in NAPs, focusing on issues related to contraceptive services, maternal and newborn health, abortion, infertility, HIV and other sexually transmitted infections, and gender-based violence (8).

Although the links between climate change and SRHR have not been documented widely, there is emerging evidence to suggest realization of SRHR can contribute to climate resilience (9, 10). Despite this, there are few references to SRHR issues in the NAPs – only 10 NAPs (53%) contain any specific references to the issues mentioned above. Of these, seven NAPs highlight the vulnerability of pregnant women to the impacts of climate change, and four NAPs cite gender-based violence, most often in relation to the increased risk in the aftermath of disasters.

Despite the small number of explicit references, the analysis found there may be indirect benefits for SRHR from investments in the health sector, for example through efforts to strengthen health services and facilities (11).

## Coverage of adaptation actions

Overall the NAPs address an average of nine vulnerable sectors, including health. In general, there is proportionality between the number of sectors in each NAP and the adaptation actions outlined for each sector. **Approximately 10% of all adaptation actions in NAPs are health actions.** This does not include health-related measures in other sectors, such as water and food security. The type and scale of adaptation options differed widely among the NAPs.

**Health adaptation actions included in NAPs most commonly address vector-borne diseases (13 NAPs, 68%),** water-borne diseases (11 NAPs, 58%), health impacts of extreme weather events (10 NAPs, 53%), and climate-resilient health care facilities (10 NAPs, 53%) (Figure 4).

Actions to address the increased spread and transmission of vector-borne diseases included implementation of local and regional early warning systems (Colombia); development of research programmes and studies, including establishment of predictive models for the behaviour of climate-sensitive vector-borne diseases (Chile, Sri Lanka); improvement of vector surveillance systems (Grenada, Suriname); and improvement of population awareness (Cameroon, Kiribati, Saint Lucia).

**5% Only one NAP includes actions to address mental and psychosocial health,**

and two NAPs (11%) include specific measures targeted at zoonoses or noncommunicable diseases. The Kiribati NAP includes an action to address diet-related noncommunicable diseases through research and publicizing the nutritional content of local foods.

**There are significant gaps between CSHRs identified in NAPs and specific actions to address them.** Figure 4 illustrates the proportion of NAPs that specify adaptation actions that directly address the categories of CSHRs compared with the mention of CSHRs in the NAPs. Sixteen NAPs (84%) mention malnutrition and food-borne diseases as a key CSHR, but only 6 NAPs (32%) specify adaptation actions in the health sector that address these risks.

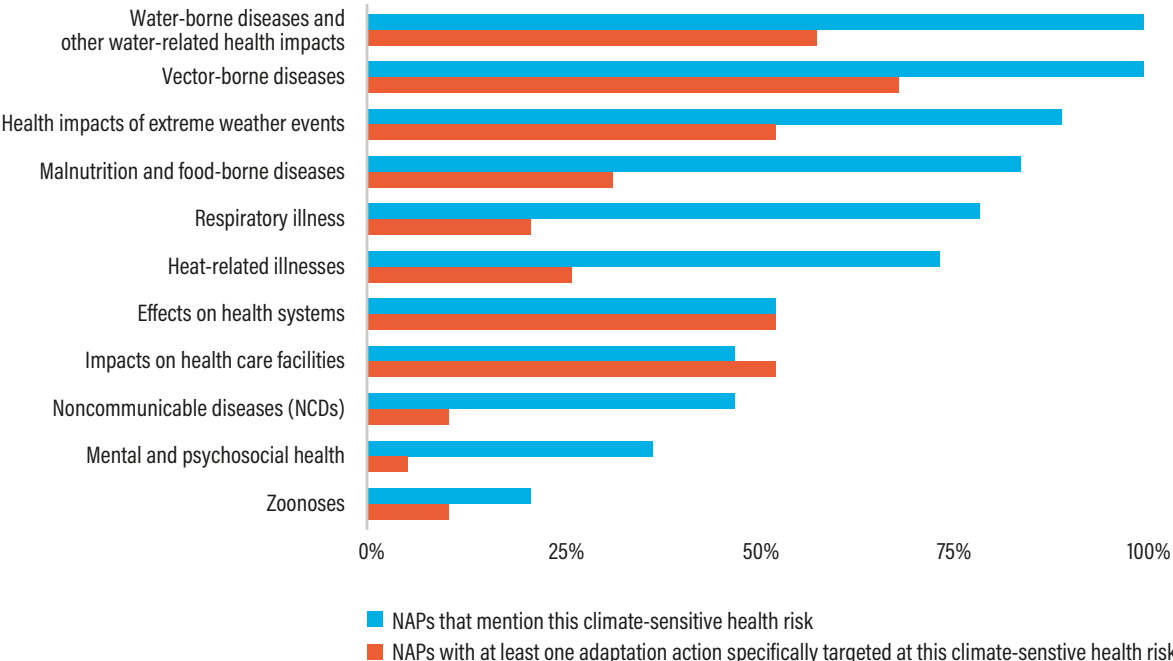
All the NAPs identify water-borne diseases as a CSHR, but only 58% include actions in this area in the health sector. This disconnect is likely to be partly because many NAPs have a separate

agriculture (11 NAPs), food security (6 NAPs) or water (13 NAPs) sectoral chapter that also outlines adaptation actions that will address the related health outcomes.

Additionally, final prioritization of actions may have been informed by feasibility considerations. Other CSHRs that were prominently cited but under-supported through adaptation actions include respiratory illness (79% of NAPs identified this but only 21% included related adaptation actions) and heat-related illnesses (74% of NAPs mentioned this but only 26% included related adaptation actions).

Some NAPs include actions that address CSHRs not explicitly identified in the context sections, such as impacts on health care facilities.

**Figure 4 Comprehensiveness of climate-sensitive health risks in National Adaptation Plans (NAPs)**



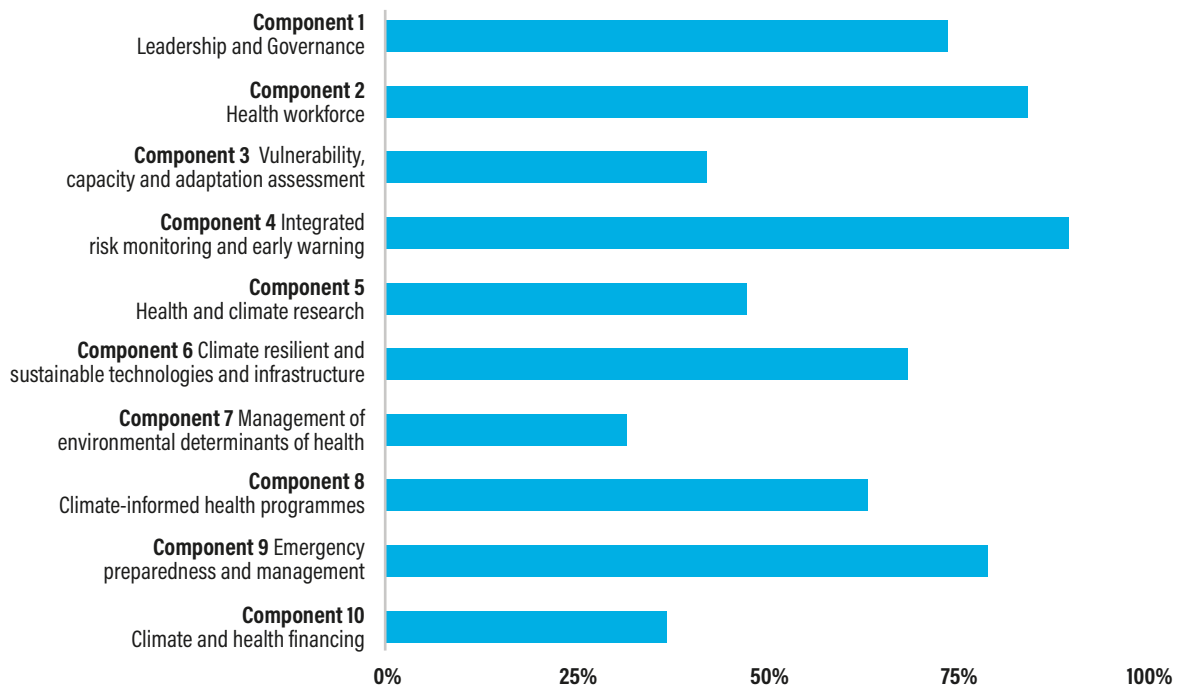
**Many of the NAPs addressed several components of building a climate-resilient health system.** The health adaptation options outlined in each of the NAPs were mapped to the 10 components of the WHO Operational Framework for Building Climate resilient Health Systems to explore which areas are comprehensively addressed and where there are gaps (12).

Figure 5 illustrates the mapping of adaptation actions to the Operational Framework components. The components that were most prioritized were integrated risk monitoring and early warning (17 NAPs, 89%) and the health workforce (16 NAPs, 84%). Components 7 (management of environmental determinants of health) and 10 (climate and health financing) were the least often prioritized, with only 6 NAPs (32%) and 7 NAPs (37%), respectively, identifying 1 or more actions relating to these components.

Some of the environmental determinants of health may be addressed in other sectors of the NAP, and several NAPs had a NAP-wide financing strategy rather than sector-specific activities. Many NAPs include adaptation actions that could be mapped to several of the components of

the Operational Framework, but often lacked a programmatic approach, which is needed to build climate-resilient health systems.

**Figure 5 National Adaptation Plans (NAPs) that identify adaptation actions addressing components of resilient health systems**



**Six NAPs identify specific target groups for health adaptation actions.** This includes a mix of documents highlighting groups to be targeted for health-sector actions more broadly, and specific actions targeted at particular groups.

Fiji's NAP notes the health-sector actions should be oriented towards people living in rural areas, women, people with lower incomes, and people from other disadvantaged groups. The NAP from Sri Lanka includes a specific action to raise awareness of health care workers on climate and health risks.

Four of the NAPs apply a gender lens to the adaptation actions for the health sector.<sup>5</sup> Kiribati's NAP, for example, highlights the need for targeted health information for women, men, young people, and people with disabilities.

## Cross-sectoral coordination

**80% Fifteen NAPs identify adaptation actions in other sectors that have potential health benefits.** These are actions outside the sector that address identified vulnerabilities related to health.

For example, Brazil's NAP highlights the risk of food insecurity and malnutrition as a result of droughts and flooding. Actions to address this are incorporated in the adaptation actions for the agricultural sector, and a specific strategy for food and nutritional security, which takes a more integrated approach.

<sup>5</sup> This refers to NAP documents that specifically address gender issues in the health adaptation actions. It does not include documents that identify gender as a cross-cutting issue.

Similarly, the NAP from Suriname notes that floods and variable rainfall can increase the risk of water-borne disease and identifies actions to address this in the water resources component of the NAP, such as by investing in water supply infrastructure. These examples emphasize the need to take a holistic approach to the NAP process.

## Resourcing and monitoring, evaluation and reporting

**Nine of the NAPs calculate budget requirements for implementation of the adaptation actions outlined in the NAP.** For these NAPs, the average annual budget for all sectors is US\$ 1.074 billion.

Eight of these budgets have a sectoral breakdown of their budget, with an average of 10 sectors. **The average proportion of these budgets estimated for the implementation of the health actions is less than 1% of the total budget (range 0.1-18.25%).**

These findings indicate that many NAPs have not estimated or planned for the necessary financial resources required for implementation of the identified health actions. Furthermore, for many of the NAPs that have provided a budget, the financial resources for health adaptation are likely to be underestimated. A number of countries and areas, however, are undertaking detailed costing exercises as part of their NAP processes, so it is likely these will provide a better estimate of real costs for implementation.

**Ten of the NAPs include indicators for monitoring progress on adaptation in the health sector.** These are generally quantitative indicators linked to the identified adaptation actions for the health sector, including a mix of process- and outcome-based indicators.

For example, Sri Lanka's NAP identifies key performance indicators for the health sector, including the number of research studies conducted on different aspects of health and climate change linkages, and the amount of money spent on identified actions, such as purchasing laboratory equipment and establishing early warning systems for extreme events.

Guatemala's NAP indicates that the number of hospitals damaged or affected by extreme weather events, and the number of people cared for versus those affected by climate-related disasters, will be tracked.

In the NAP for Kiribati, the indicators for the health sector include the percentage decrease in the incidence of climate-related diseases.

# Conclusions

This analysis aimed to assess the extent to which health is included in NAPs. The findings demonstrate that NAPs are often structured around climate-sensitive sectors and that the health sector is consistently identified as a high-priority sector. All NAPs consider health and include health-related adaptation actions, which provides a solid entry point for strengthening health system resilience and overall population health through the NAP process. Areas of opportunity include the following:

- ✓ Countries and areas, as part of NAP processes, are conducting vulnerability and adaptation assessments for high-priority sectors, which provides the opportunity to analyse the implications of climate change for different aspects of health. A comprehensive, context-specific vulnerability and adaptation assessment by the health sector should be conducted as part of the NAP process to ensure informed planning. In addition, vulnerability and adaptation assessments for health-determining sectors (e.g. water, food security, agriculture) are also critical entry points for the coordinated consideration of climate-sensitive health risks.
- ✓ Institutional arrangements for NAP processes are being established in countries and areas. Health-sector engagement in these arrangements is critical to facilitate ongoing coordination and collaboration between the ministry of health, the ministries responsible for climate change and the NAP process, and actors in other relevant sectors.
- ✓ Many countries and areas aim for synergies across sectors in NAP processes, where the adaptation priorities and actions identified in one sector are supported by those in another sector. This presents opportunities for strengthened collaboration to promote health across all sectors and coordinated cross-sectoral efforts in adaptation planning for health resilience and implementation of adaptation actions.
- ✓ NAP processes are iterative in nature, allowing for a systematic and comprehensive approach to strengthen the resilience of health systems to be developed over time.
- ✓ Depending on country context, the development of a detailed HNAP, led by the ministry of health, may be needed to elaborate a comprehensive sectoral approach or to detail the actions included in the overarching NAP. WHO has published guidance outlining examples of good practice in six topic areas that may be useful in guiding health adaptation planning (13).
- ✓ Planning for adequate resourcing, both human and financial, is an important part of the NAP process to ensure effective implementation. For many countries and areas, financing will likely be sourced from national budget allocations along with external funding sources. The NAP process therefore provides an opportunity to increase access to climate-change funding for health adaptation from key climate funding streams such as the Green Climate Fund.
- ✓ Countries and areas are establishing monitoring and evaluation systems for adaptation at the national level. This provides an opportunity to incorporate key indicators of resilient health systems and to track adaptation efforts within the health sector and beyond. These systems also create the foundation for learning about what works and what does not in relation to health adaptation.

This review demonstrates countries and areas are prioritizing adaptation to climate change in the health sector as they advance their NAP processes. It also highlights some key areas for strengthening the planning and implementing of health adaptation, and coordinating actions across sectors to address climate risks to health.

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