

**2023 WHO
review of health
in Nationally
Determined
Contributions
and long-term
strategies:**

**health at the heart of
the Paris Agreement**



**World Health
Organization**

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Acronyms and abbreviations

CMA	Conference of the Parties serving as the meeting of the Parties to the Paris Agreement
COP	Conference of the Parties
HNAP	Health National Adaptation Plan
LDC	Least developed country
LLMICs	Low and lower-middle income countries
NAP	National Adaptation Plan
LT-LEDS	Long-term Low Emissions and Development Strategies
NDC	Nationally Determined Contribution
SDGs	Sustainable Development Goals
SIDS	Small island developing state
SLCP	Short-lived climate pollutant
UNFCCC	United Nations Framework Convention on Climate Change
V&A	Vulnerability and adaptation
WHO	World Health Organization

About this report

Mounting an effective response to the health risks posed by climate change is now urgent for all countries. The consequences of the climate emergency are severe for population health and health systems and further drive health and social inequities (1).

Nationally determined contributions (NDCs) outline countries' and areas' short- to mid-term plans for reaching the goals of the Paris Agreement, including by mitigating and adapting to climate change¹. They are the primary policy instrument for protecting people's health in the face of climate change. Governments can strengthen NDCs by developing health-inclusive and health-promoting climate targets and policies (2).

Long-term Low Emissions and Development Strategies (LT-LEDS), also known as long-term strategies, represent country plans to achieve the long-term goals of the Paris Agreement, and can be understood as complementary to the actions laid out in NDCs. By developing an LT-LEDS, governments set out a mid-century vision to cut greenhouse gas emissions and strengthen climate resilience, while simultaneously achieving national development objectives, including for health (3).

Comparability between NDCs and LT-LEDS is limited due to the diverging policy scope, degree of available guidance from the United Nations Framework Convention on Climate Change (UNFCCC), and sample sizes for both types of policy documents. Nonetheless, comparing mid- and long-term policy priorities for climate and health can help improve consistency and transparency.

The 2023 WHO review of *Health in Nationally Determined Contributions and long-term strategies* provides a snapshot of the overall progress governments have made in addressing the health risks of climate change to achieve the goals of the Paris Agreement.

This report synthesizes information from the latest available NDCs, communicated by 193 Parties² to the Paris Agreement and recorded in the official registry of the UNFCCC, as of 23 September 2022.³ The report also synthesizes information from the latest available LT-LEDS, communicated by 62 Parties to the Paris Agreement and recorded on the UNFCCC website, as of 23 September 2022 (4).

The report builds on a 2019 WHO review of health in NDCs. The scope of indicators has been significantly expanded to capture progress in the quantity and quality of health measures in the NDCs. A total of 166 Parties have communicated a new or updated NDC since the 2019 WHO review, including nine Parties that

¹ Any reference to “countries” in this report should be understood to refer to “countries and areas”. Reference to “nationally determined contributions” is without prejudice to questions of status and should not be understood to imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

² For the purpose of this review, the term ‘Party’ is used to denote all 194 Parties to the Paris Agreement. This publication follows WHO style, however it is noted that the terminology used in the context of the Paris Agreement may be at variance with that of WHO. The designations employed in this publication do not imply any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

³ This cut-off date was selected to match the deadline for NDC submissions to be included in the 2022 UNFCCC synthesis report, following UNFCCC decision 1/CMA.3, para. 30.

have submitted an NDC for the first time.⁴ Wherever possible, the 2023 WHO review adheres to reviewing methodologies used by the UNFCCC, to allow for comparisons with other sectors and action areas.

This document is intended to complement the *WHO guidance for healthy Nationally Determined Contributions and long-term strategies [in press]* and aims to inform the design of health targets and policies in NDCs and LT-LEDS to the Paris Agreement.

Further information on the methodology used in this review, including a complete list of included Parties, data collection and validation procedures, can be found in Annex 1.

This review includes information from NDCs representing 193 Parties to the Paris Agreement, covering 94.9% of total global emissions (using 2019 estimates) and providing near-universal geographical coverage. Only four⁵ Parties to the UNFCCC are not a Party to the Paris Agreement and were therefore excluded from this review. For detailed information on LT-LEDS included in this review see Annex 1.

⁴ Several Parties to the UNFCCC had not ratified the Paris Agreement and/or submitted an NDC at the time of the 2019 WHO review but have submitted an NDC since. These include Angola, Brunei Darussalam, Iraq, Kyrgyzstan, Lebanon, Philippines, Russian Federation, Senegal, South Sudan and Türkiye.

⁵ Parties to the UNFCCC that are not a Party to the Paris Agreement include Eritrea, Iran (Islamic Republic of), Libya and Yemen. The Holy See, which became a Party to the Paris Agreement on 4 October 2022, is also not considered in this report.

TABLE 1

Geographical representation, by WHO region, for the NDCs review

WHO region	List of Parties to the Paris Agreement included in the NDCs review	Number of Parties included ⁶	Number of WHO Member States and areas in this region
African Region	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo (Republic of), Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe	46	47
Region of the Americas	Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States of America, Uruguay, Venezuela (Bolivarian Republic of)	35	35
Eastern Mediterranean Region	Afghanistan, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, South Sudan, occupied Palestinian territory, including East Jerusalem, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates	20	21
European Region	Albania, Andorra, Armenia, Austria (EU), Azerbaijan, Belarus, Belgium (EU), Bosnia and Herzegovina, Bulgaria (EU), Croatia (EU), Cyprus (EU), Czechia (EU), Denmark (EU), Estonia (EU), European Union (EU), Finland (EU), France (EU), Georgia, Germany (EU), Greece (EU), Hungary (EU), Iceland, Ireland (EU), Israel, Italy (EU), Kazakhstan, Kyrgyzstan, Latvia (EU), Liechtenstein, Lithuania (EU), Luxembourg (EU), Malta (EU), Monaco, Montenegro, Netherlands (EU), Norway, Poland (EU), Portugal (EU), Republic of Moldova, Republic of North Macedonia, Romania (EU), Russia, San Marino, Serbia, Slovakia (EU), Slovenia (EU), Spain (EU), Sweden (EU), Switzerland, Tajikistan, Türkiye, Turkmenistan, Ukraine, United Kingdom of Great Britain and Northern Ireland, Uzbekistan	55	53
South-East Asia Region	Bangladesh, Bhutan, Democratic People's Republic of Korea, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste	11	11
Western Pacific Region	Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia, Mongolia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Republic of Korea, Samoa, Singapore, Solomon Islands, Tonga, Tuvalu, Vanuatu, Viet Nam	27	37

⁶ Certain Parties to the Paris Agreement are not WHO Member States. The terminology used in the context of the Paris Agreement may be at variance with that of WHO.

TABLE 2

Geographical representation, by World Bank income group classification (5), for the NDCs review

World Bank income group classification	Number of Parties
High income	59
Upper-middle income	51
Lower-middle income	53
Low income	26
Not Members of the World Bank Group	3

TABLE 3

Inclusion of Parties to the Paris Agreement according to country groupings of SIDS (6) or LDCs (7) for the NDCs review

Country grouping	Number of Parties
Small island developing states (SIDS)	40
Least developed countries (LDCs)	44

Main findings

The following findings are based on a review of 193 Nationally Determined Contributions (NDCs) and 53 Long-term Low Emissions and Development Strategies (LT-LEDS).

- 1** The majority (91%) of NDCs to the Paris Agreement now include health considerations. The inclusion of health in NDCs has increased, compared with 2019, across all action areas, including health co-benefits of mitigation, health adaptation and resilience, and climate finance (Chapter 1).
- 2** Two thirds of all NDCs (66%) consider the COVID-19 recovery in relation to their climate commitments, with a third (32%) highlighting the need for a healthy, green recovery from COVID-19 (Chapter 1).
- 3** Around a third (30%) of NDCs identify health co-benefits of climate mitigation, while one in 10 (10%) quantify and/or monitor these benefits. Health co-benefits of mitigation are recognized across various sectors, including: food, agriculture and land-use; transport; and household energy (Chapter 2).
- 4** Several NDCs (16%) include standalone targets, measures or policies for the reduction of air pollution and/or short-lived climate pollutants (SLCPs) (Chapter 2).
- 5** A growing number of NDCs (11%) now include an emissions reduction commitment for the healthcare sector (Chapter 2).

6 Two thirds (63%) of NDCs have health-specific adaptation actions or plans, with comprehensive coverage across the components needed for building climate-resilient health systems (Chapter 3).

7 Sixty per cent (60%) of all NDCs refer to one or more climate-sensitive health risks or outcomes. One in 10 (11%) NDCs now also specifically mention the concept of ‘Loss and Damage’ in relation to human health (Chapter 4).

8 Close to a third (29%) of NDCs now allocate climate finance to health actions and/or plans. However, only one in 10 (11%) include unconditional finance targets (i.e. domestically sourced) for some or all of their health actions and/or plans (Chapter 5).

9 Almost three quarters (72%) of LT-LEDS include specific goals or provisions around safeguarding the health and wellbeing of populations as a key outcome of achieving a net-zero and resilient society by the middle of the century (Chapter 6).

10 Around a third (30%) of LT-LEDS highlight the need for a healthy, green recovery from COVID-19. Almost no LT-LEDS (4%) expect the pandemic to impede the achievement of long-term climate and development goals (Chapter 6).

11 Three quarters (75%) of LT-LEDS identify health co-benefits of climate mitigation, while a third (32%) quantify the health co-benefits of mitigation. This is notably higher than the percentage of NDCs (Chapter 6).

Summary of key indicators for NDCs

Key indicator ⁷	2019 NDCs (184 documents)	2022 NDCs (193 documents)
Leadership and governance		
Includes health considerations	70%	91%
Assesses its impact on SDG 3	–	23%
Places the recovery from COVID-19 in relation to climate action	–	66%
Promoting health co-benefits of climate change mitigation		
Contains a standalone reduction target or policy for air pollutants	10%	16%
Includes an emissions reduction commitment for the health sector	–	11%
Identifies health co-benefits of climate mitigation	10%	30%
Quantifies and/or monitors the health co-benefits of mitigation	1%	10%
Health adaptation and resilience		
Includes an evidence-based assessment of climate-sensitive health risks or outcomes	10%	32%
Sets health adaptation priorities ⁸	59%	63%
Loss and Damage to health		
Identifies health impacts from climate change	47%	60%
Includes reference to Loss and Damage in the context of health	–	11%
Means of implementation for health		
Allocates climate finance to health actions and/or plans	15%	29%
Allocates unconditional finance to health actions and/or plans	–	11%

⁷ Some indicators are new for the 2020–2022 cycle and were not captured in the 2019 WHO review. Review methodology of the 2020–2022 cycle has been updated to be aligned with the methodological approach of the UNFCCC. Progress on all key indicators will be tracked in a standardised manner in future survey cycles.

⁸ In the 2019 review, it was found that 108 out of 184 NDCs (59%) mentioned health adaptation priorities. This was reported as the number of NDCs that mention adaptation priorities and actions compared with the total number of NDCs that included health considerations (84% of NDCs that included health considerations most often referred to health in relation to adaptation priorities and actions (108 out of 129 NDCs)).

Summary of key indicators for LT-LEDS

Key indicator ⁹	LT-LEDS (53 documents)
Includes health considerations	98%
Uses health as a guiding principle	72%
Places the recovery from COVID-19 in relation to climate action	51%
Identifies health co-benefits of climate mitigation	75%
Quantifies and/or monitors the health co-benefits of mitigation	32%
Includes an evidence-based assessment of climate-sensitive health risks or outcomes	28%
Sets health adaptation priorities	47%
Identifies health impacts from climate change	70%
Includes reference to Loss and Damage in the context of health	11%
Allocates climate finance to health actions and/or plans	11%
Commits to financial reforms with climate and health benefits	45%

⁹ Comparability between LT-LEDS and NDCs is limited due to diverging sample sizes, policy scope, and UNFCCC guidance. Review methodology of LT-LEDS follows the methodological approach of the UNFCCC wherever possible.

Leadership and governance

The inclusion of health considerations in Nationally Determined Contributions (NDCs) is important to identify the health impacts of climate change, outline health adaptation and resilience priorities, and present evidence of the health co-benefits of climate mitigation policies to strengthen the health argument for accelerating climate action.

Progress has clearly been made on including health considerations in NDCs; only 70% of NDCs (129 out of 184) included health considerations in 2019 (2), while 91% (175 out of 193) include health in 2022. Strengthening evidence on health and climate change and ensuring the active representation of health stakeholders in the development and implementation of NDCs will further advance these efforts (8).

In addition, the COVID-19 pandemic has demonstrated how crucial it is that health systems are prepared for shocks and stresses, with clear strategies in place that can be implemented immediately (9). NDCs offer a crucial policy platform to connect near-term national climate strategies and COVID-19 recovery efforts (10).

Health in NDCs

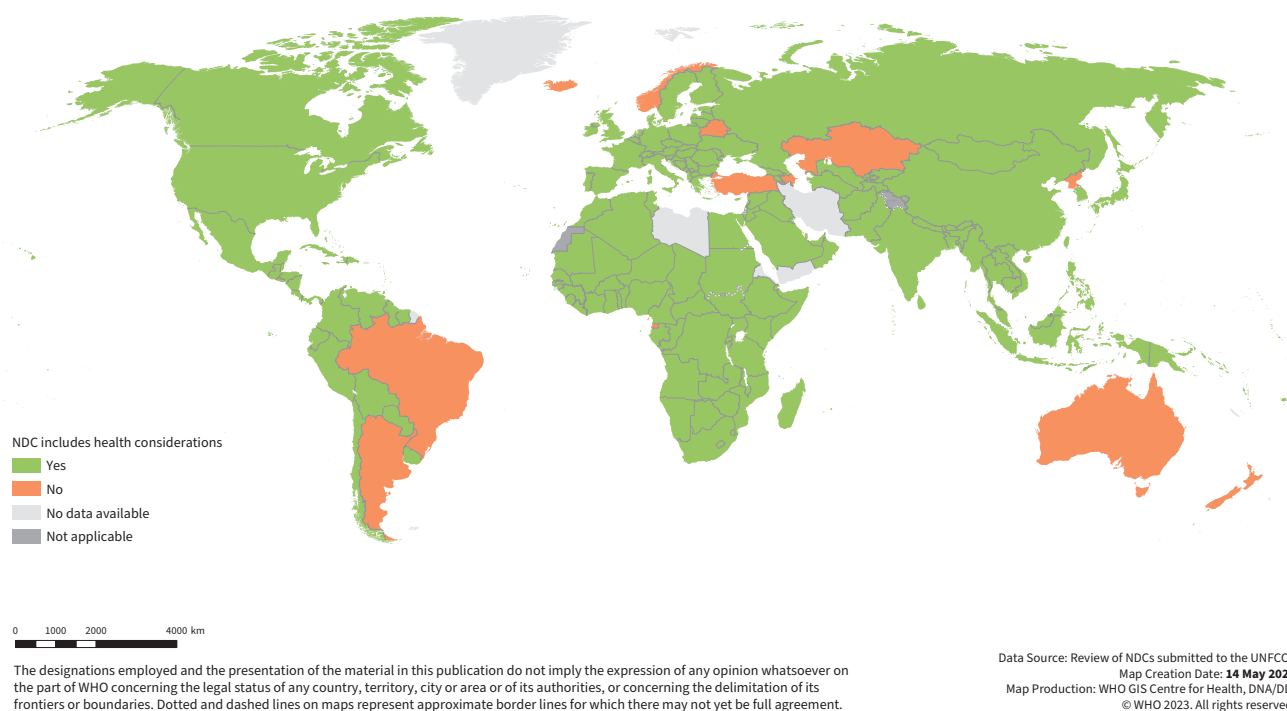
Most NDCs (91%) now include public health considerations across a wide variety of action areas; health-inclusive and health-promoting climate targets and policies have been developed for mitigation, adaptation, means of implementation, Loss and Damage, and long-term sustainable development.

NDCs increasingly report the involvement of ministries of health in the development and implementation of climate policies and targets. For example, the NDCs of **Antigua and Barbuda**, **Burkina Faso**, **Mozambique**, **Pakistan**, **Zimbabwe** and others report the involvement of the ministry of health in the development of the NDC, while the NDC of the **United States** reports that the office of the US Secretary of Health and Human Services is a member of the National Climate Task Force. The NDC of **Paraguay** reports the involvement of public health experts in certain mitigation programmes. These examples support the findings of the *2021 WHO health and climate change global survey report*, which found that in 43% of surveyed countries (39 out of 90) the ministry of health contributed to the development of the country's NDC (8).

Various NDCs recognize the role of health in underpinning the legislative and regulatory preconditions for national action on climate change. For example, the NDC of **Indonesia** points to the Indonesian Constitution, which mandates, among other things, that “every person shall have the right to enjoy a good and healthy environment”. The NDC of **Guatemala** highlights that intersectoral governance arrangements for health are needed to ensure health adaptation and resilience, while the NDC of **Pakistan** commits to adopting a Health in All Policies approach to the country's energy policy. The NDC of **Tunisia** informs that the human right to a healthy environment is part of its constitution and has been used as a guiding principle in the development of its NDC.

FIGURE 1

Map of Parties to the Paris Agreement that include health in their NDCs (as of 23 September 2022)



Synergies between climate action and sustainable development for health

Nearly a quarter (23%) of NDCs now assess the impact of some or all of their climate targets and policies on Sustainable Development Goal 3 (SDG 3), to ensure healthy lives and promote wellbeing for all at all ages. This is often defined qualitatively. However, some NDCs do include indicators to monitor progress on SDG 3.

For example, the NDC of **Sri Lanka** systematically assesses the positive or potential negative impacts of its mitigation and adaptation measures on the SDGs, including for health, and makes use of an “SDG Climate Action Nexus tool”. It also recognizes investment in the health sector as a form of low-carbon development.

Other NDCs provide health metrics when describing their current developmental context or national circumstances and how this relates to the country’s level of climate ambition. For example, the NDCs of **Nepal**, the **Philippines**, **Timor-Leste** and others share metrics on morbidity and mortality, access to healthcare, and health infrastructure when describing their national circumstances and development pathways.

Some NDCs point to health in the context of long-term development goals. For example, the NDC of **Lebanon** reports that health is a central feature in its development plan. The NDC of **Togo** points out that its climate targets will contribute to the achievement of universal health coverage and its national development plan, while the NDC of **Viet Nam** assigns one of the main criteria for the successful

implementation of its NDC to be the achievement of universal health coverage. The NDCs of **Chad**, the **Democratic Republic of the Congo** and others assert that the overall goal of their respective NDCs is to improve people's health and lives.

The NDCs of the **Marshall Islands**, **Uganda** and others point to the fact they have included health goals in their respective Long-term Low Emissions and Development Strategies (LT-LEDS), including goals for the development of climate-resilient health systems.

In certain cases, the right to health is also given as a reason for countries to continue developing, often in the context of a concept known as Common but Differentiated Responsibilities and Respective Capabilities. For example, the NDC of the **Solomon Islands** imparts that it has a right to develop its economy and improve the wellbeing of its population.

Promoting a healthy and green recovery from COVID-19

Two thirds of all NDCs (66%) consider the COVID-19 recovery in relation to their climate commitments, with 32% of NDCs highlighting the need for a healthy, green recovery from COVID-19 and 28% of NDCs indicating that the economic impacts of the pandemic might impede the achievement of national climate goals.

A third of all NDCs (32%) highlight the need for a healthy, green recovery from COVID-19. For example, the NDC of **Jordan** highlights that the country's NDC is a key vehicle for a green recovery, while the NDC of the **European Union** commits to significant public and private investment at a European level to enable a sustainable and resilient recovery from COVID-19.

The COVID-19 pandemic has had a severe impact on economies and has often worsened existing social and economic inequalities. Just over a quarter (28%) of all NDCs recognize this as an important consideration in assessing the level of ambition and/or implementation of national climate goals. For example, the NDC of the **Seychelles** points out that its revised national climate plan should be understood in the context of the severe economic impacts of the pandemic on the country's tourism and fisheries sectors, while the NDC of **Oman** asserts that the pandemic has plunged the national economy into an unprecedented recession.

Various NDCs (17%) recognize the role of nature-based solutions and/or a One Health approach in addressing both climate change and the COVID-19 pandemic. For example, the NDC of **Cabo Verde** underscores how the impacts of the pandemic are worsened by biodiversity loss, while the NDC of the **European Union** recognizes that nature-based solutions play an important role to solve global challenges such as biodiversity loss and ecosystems degradation, poverty, hunger, health, water scarcity and drought, gender inequality, disaster risk reduction, and climate change.

Several NDCs (8%) prioritize health, equity and social justice measures in response to the COVID-19 pandemic. For example, the NDC of **Canada** recognizes that the effects of both climate change and COVID-19 disproportionately impact its First Nations peoples. It commits to incorporate and address systemic inequities and gaps in its climate efforts, including those that have resulted from the historical and ongoing impacts of colonization, land dispossession and assimilationist policies.

TABLE 4

Percentage of NDCs that include COVID-19 measures or considerations

COVID-19 measure or consideration	Percentage of NDCs (193)
Healthy, green recovery from COVID-19	32%
Impact on economy and inequality	28%
Need for nature-based solutions and/or One Health approach	17%
COVID-19 a barrier to more ambitious climate action	16%
COVID-19 a driving force for more ambitious climate action	15%
COVID-19 impeding NDC development process	15%
Other*	15%
Prioritization of health, equity and social justice measures	8%

*Other COVID-19 measures or considerations might include: supply chain disruptions and measures; food insecurity; exacerbated risks and vulnerabilities; converging crises; the need for strengthened international cooperation; and others.

Promoting health co-benefits of climate change mitigation

Evidence shows that there are substantial health co-benefits from taking ambitious climate mitigation and adaptation action across sectors like energy, transport, housing, agriculture and industry. Health gains and their associated economic savings can provide an important incentive for governments to raise their climate ambition. For example, the economic benefits for human health from air quality improvement arising from mitigation action can be of the same order of magnitude as mitigation costs, and potentially even larger (11). Many mitigation actions also have benefits for health through lower air pollution, active mobility (e.g. walking, cycling), and shifts to sustainable healthy diets (12).

However, some mitigation policies may not maximize potential health gains and some could potentially cause harm to health. As such, it is important that countries continue to strengthen the evidence of health benefits from climate mitigation action and that health stakeholders are fully involved with climate processes at all levels, to ensure health considerations are well understood, appreciated, and accounted for when developing national policies to address climate change (1).

Air pollution targets and policies

Some NDCs (16%) include standalone targets, measures or policies for the reduction of air pollution and/or short-lived climate pollutants (SLCPs). For example, the NDC of the **United Kingdom of Great Britain and Northern Ireland** asserts that air pollution is the top environmental risk to human health in the UK and sets out a Clean Air Strategy to tackle all types of air pollution. The NDCs of **Bangladesh, Benin, the Central African Republic, Chile, Colombia, Côte d'Ivoire, Dominican Republic, Mexico, Nigeria, Togo** and **Zimbabwe** include numeric targets to reduce SLCPs by 2030.

Health co-benefits of mitigation

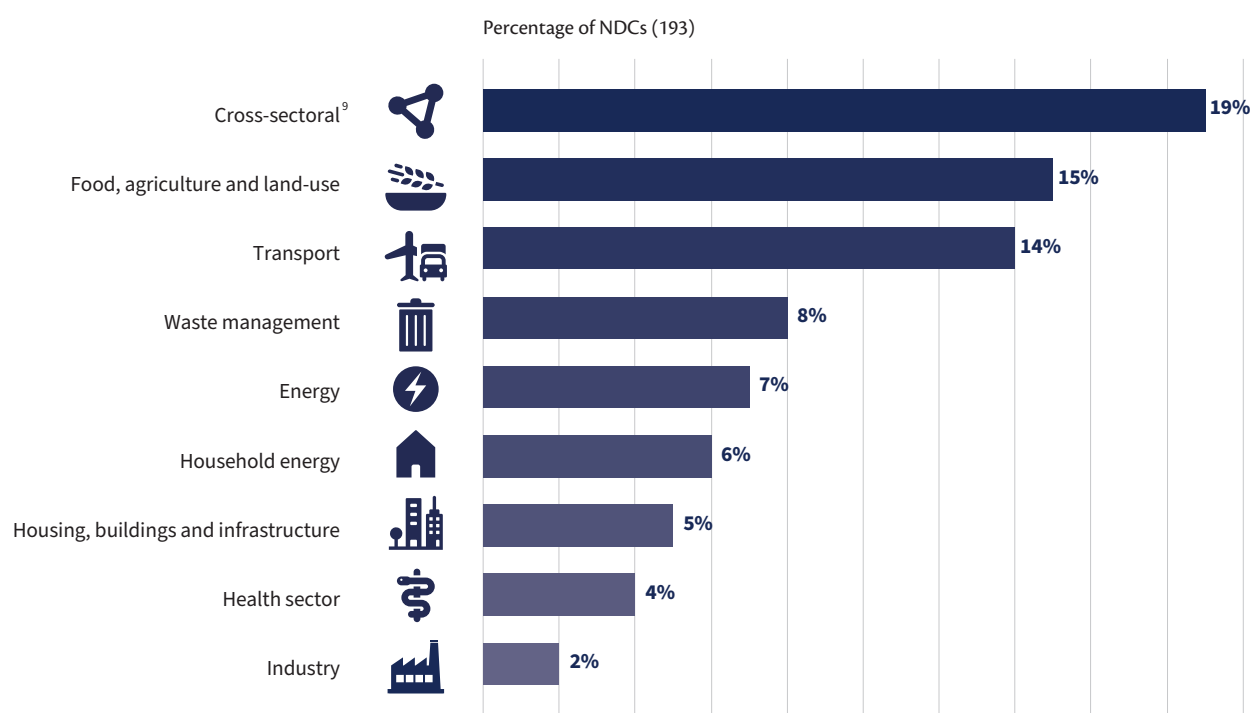
Around a third (30%) of NDCs identify health co-benefits of climate mitigation, including for sectors such as food, agriculture and land-use (15%), transport (14%), household energy (6%), and others.

Various health co-benefit effects from climate mitigation measures are identified in the NDCs. A fifth (20%) of NDCs identify certain mitigation measures that will also cause a reduction in air pollution and associated health impacts, while a quarter of NDCs (24%) assert that certain mitigation measures will bring about a general improvement in population health. Hardly any NDCs (2%) recognize that certain mitigation measures will help reduce healthcare costs.

Only one in 10 NDCs (10%) quantify the health co-benefits of mitigation, although this represents a significant increase compared with the first round of NDCs (1% in 2019). For example, the NDC of **Pakistan** uses the Low Emission Analysis Platform-Integrated Benefit Calculator tool to assess the multiple benefits of reducing emissions, including health benefits. The NDC of the **Republic of Moldova** prioritizes climate investments based on the social and health co-benefits of various mitigation measures and commits to monitoring health co-benefits through a National System for Monitoring and Reporting.

¹⁰

FIGURE 2
Percentage of NDCs that identify health co-benefits of national climate mitigation policies



Health sector mitigation

Twenty-one NDCs (11%) now also include an emissions reduction commitment for the health sector. For example, the NDC of **Viet Nam** commits to energy-saving and energy-efficiency measures in hospitals and community health centres, while the NDC of **Sudan** commits to provide solar energy to health centres, to provide basic services to communities in remote areas without reliable access to electricity. The NDCs of **Maldives, Myanmar, Panama** and others point out that mitigation measures in the health sector can have co-benefits for adaptation and resilience; for example, providing health facilities with renewable sources of energy can increase the climate resilience and energy security of such facilities.

¹⁰ Many NDCs recognize that the overall implementation of the outlined climate policies will have benefits to human health and wellbeing. In addition, NDCs do not always specify which climate policies and targets will deliver the described health co-benefits.

Health adaptation and resilience

To effectively manage the health risks of climate change, health systems need to be strengthened to prepare for and respond to ongoing changes. Many countries have formulated and implemented National Adaptation Plans (NAPs), as well as Health National Adaptation Plans (HNAPs), with the goal of building climate-resilient health systems that can anticipate, absorb and transform in a changing climate to protect population health while improving the management of other health threats (13). Others have set out – or have reiterated – health adaptation priorities in their NDCs and/or in other national climate change plans or strategies.

NDCs can play an important role in outlining health adaptation and resilience priorities, for example by ensuring that sectoral health adaptation actions are aligned with national multisectoral climate change plans and targets, and by guaranteeing the necessary finance, governance structures and political support are in place to successfully implement health adaptation priorities.

Assessment of climate-sensitive health risks

Sixty per cent of all NDCs refer to one or several climate-sensitive health risks or outcomes, such as heat-related illness; injury and mortality from extreme weather events; and vector-borne diseases (see Chapter 4: Loss and Damage to health). Only half of this subgroup of these NDCs (32% of all NDCs) include an evidence-based assessment for one or several climate-sensitive health risks or outcomes, such as through a vulnerability assessment for health, scientific research or risk analysis. A smaller share still (23%) reports to have conducted a more comprehensive vulnerability and adaptation (V&A) assessment for health (Figure 3; Component 3). This is despite almost two thirds (60%) of NDCs identifying the health sector as vulnerable to climate change.

For example, the NDC of **South Africa** makes use of a vulnerability assessment to prioritize its adaptation actions, including for health, and concludes that “modifying factors” in the population, such as age, nutritional status, access to services and underlying health conditions, worsen the health impacts of climate, and calls for targeted health adaptation actions. The NDC of **Cambodia** draws on its WHO and United Nations Framework Convention on Climate Change (UNFCCC) Health and Climate Change Country Profile (14) to assess its vulnerability to the health impacts of climate change and prioritize its health adaptation actions.

Health adaptation

Two thirds (63%) of all NDCs have set health adaptation priorities, while nearly all NDCs (87%, 67 out of 77) from low and lower-middle income countries (LLMICs) have set health adaptation priorities.¹¹ Health is one of the sectors most often cited as an adaptation priority in NDCs; only water, agriculture and ecosystems have a larger share of adaptation components (15).

When prioritizing health adaptation, NDCs often outline a relatively comprehensive range of health adaptation actions to build climate-resilient health systems. The WHO operational framework for building climate-resilient health systems considers 10 components as the necessary building blocks for comprehensive health adaptation (16). Compared with the first round of NDCs, there has been an overall increase in the inclusion and spread of the 10 components (Figure 3).

Health adaptation components most often included in NDCs include leadership and governance (48%), integrated risk monitoring and early warning (36%), climate-informed health programmes (35%), and climate-resilient and sustainable technologies and infrastructure (31%). For example, the NDCs of **Papua New Guinea, Uganda, the United Arab Emirates** and others include measures to improve early warning systems for health risks and impacts, such as vector-borne diseases. The NDCs of **Fiji, Lao People's Democratic Republic** and others include measures to increase the resilience of public health infrastructure, including by developing climate-resilient and environmentally sustainable health care facilities.

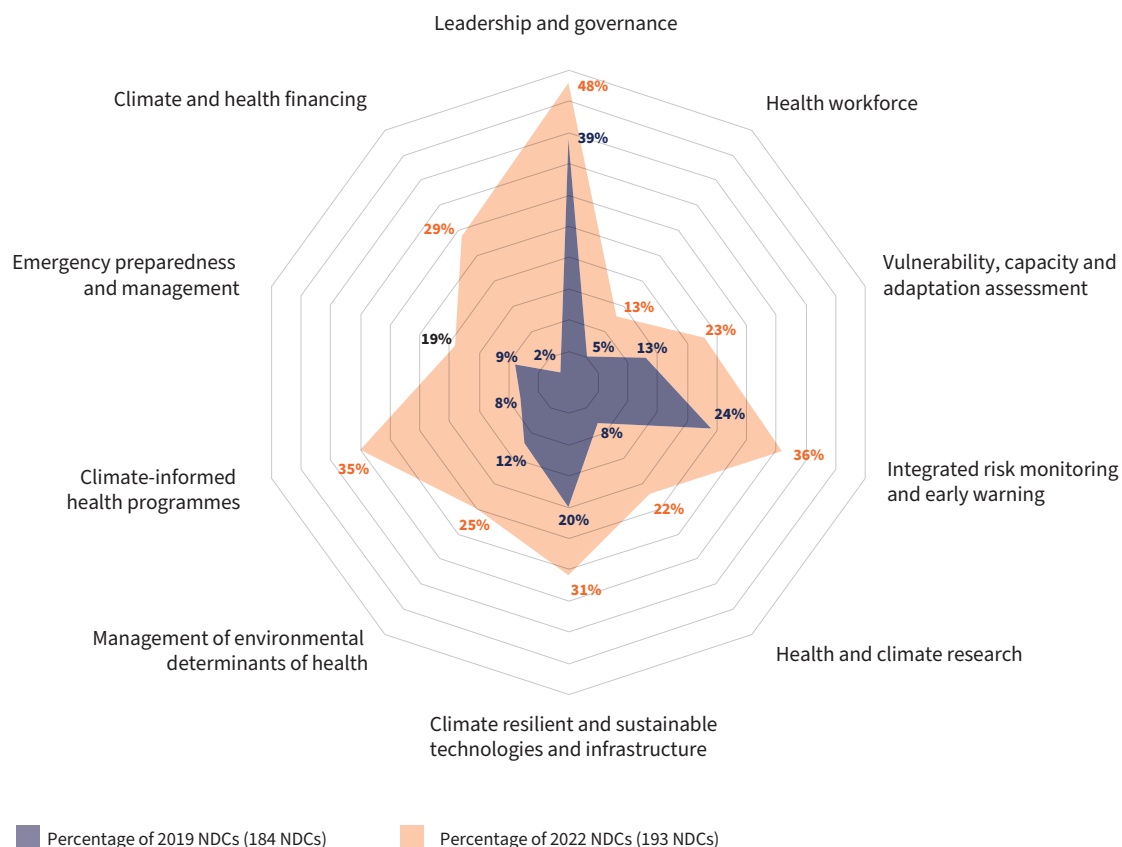
The health adaptation component that has seen the strongest increase in coverage is finance, with nearly a third (29%) of NDCs now allocating climate finance to health adaptation actions and/or plans. This rise is partly due to improved standards for communicating NDCs and a change in WHO's reviewing methodology (see Chapter 5).

The health adaptation component least often included is the health workforce (13%). Examples include the NDCs of **Georgia, Haiti, Namibia** and others committing to strengthening the capacity of health professionals to respond to climate impacts and stressors and the NDC of the **Seychelles** committing to integrate climate change into the curriculum for health professionals.

¹¹ It is common practice for many high income countries to not include adaptation priorities in their respective NDCs, even when national adaptation plans exist. Therefore, the number of countries that have set health adaptation priorities is likely significantly higher than the number of countries that have reflected these priorities in their NDCs.

FIGURE 3

Percentage of NDCs that include components of the WHO operational framework for building climate-resilient health systems



Close to half of NDCs (48%) set health adaptation priorities based on existing policies. This is most often (21%, 41 NDCs) based on a country’s HNAP or NAP. Some NDCs (18%, 34) also align their health adaptation actions with other broader multisectoral national climate change plans or strategies. This is a positive step towards aligning HNAPs and NAPs with NDCs.

Loss and Damage to health

Climate change is already harming human health and wellbeing everywhere. It is affecting people in many ways: illness, injury and death caused by extreme climate events; increased incidence and spread of vector-borne diseases; a rise in cardiovascular disease caused by extreme heat; respiratory diseases from air pollution; food insecurity; increased risks for mental health and wellbeing; and health risks from indirect effects on livelihoods, migration and conflict. Climate-sensitive health risks or outcomes were estimated to make up 69.9% of global deaths in 2019 (17).

The losses and damages from climate impacts are already an existential threat. This is particularly the case for the loss of life and degraded health, wellbeing and livelihoods that many vulnerable countries and communities are experiencing (1).

The 27th UN climate change Conference of the Parties (COP27) in November 2022 agreed to establish a dedicated fund for Loss and Damage by COP28 in December 2023 (18). Information on Loss and Damage contained in the NDCs, describing the ways in which people and communities are already being impacted, could provide an important baseline for UNFCCC discussions.

Health impacts

Sixty per cent of NDCs (115 out of 193) refer to one or several climate-sensitive health risks or outcomes from climate change. This is a significant increase compared with the first round of NDCs, when 47% (86 out of 184) identified them (2).

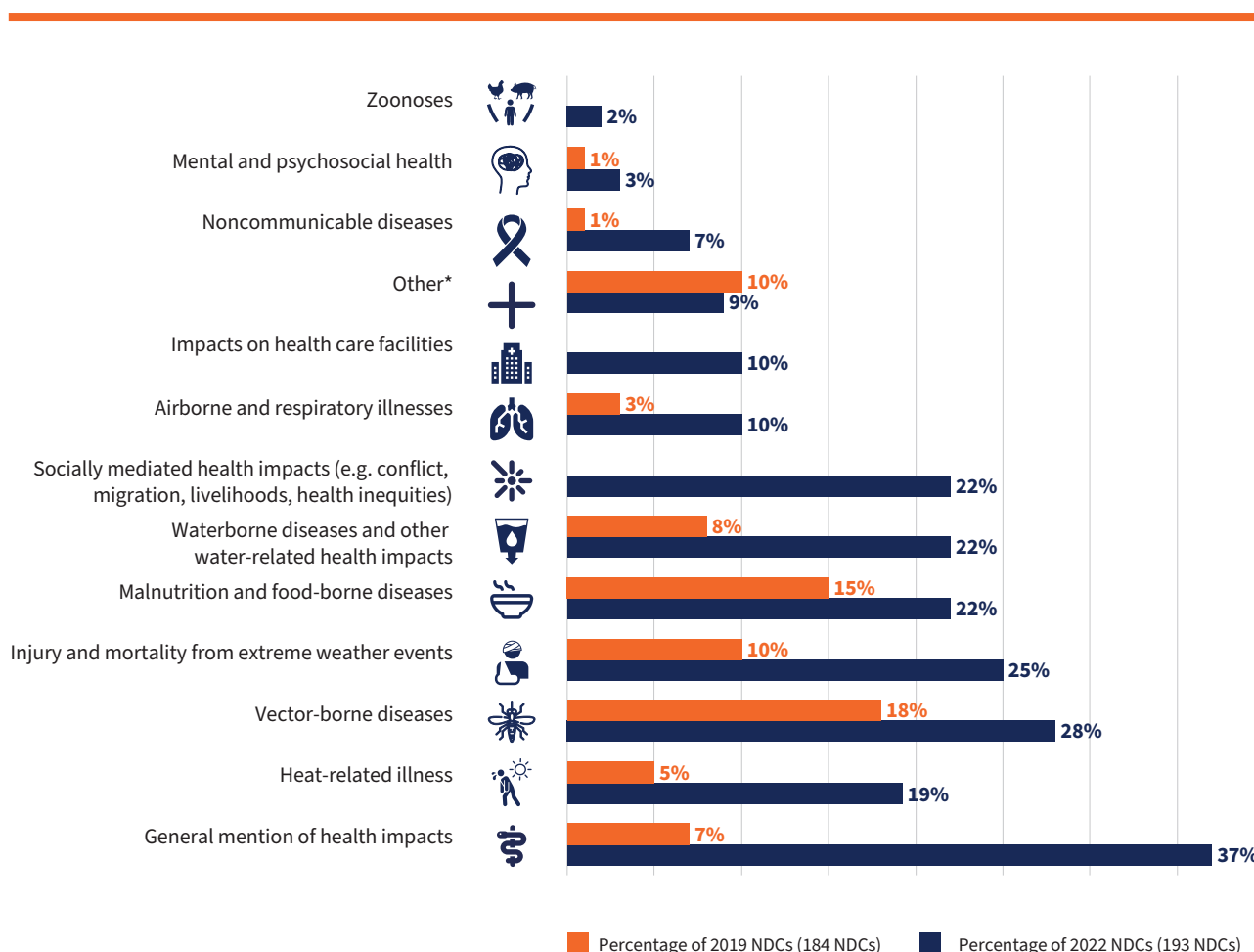
References to health impacts in the NDCs have increased across a wide range of risks, including heat-related illness (19%), vector-borne diseases (28%), injury and mortality from extreme weather events (25%), and others.

This review also captures socially mediated health risks and outcomes for the first time. One in five NDCs (22%) now recognize the health dimensions of socially mediated climate impacts, such as conflict, migration and displacement, livelihoods, and health inequities. For example, the NDC of **Vanuatu** recognizes that women and girls in Vanuatu experience heightened social, economic and health impacts of climate change and points to existing health inequities that need to be addressed. Several NDCs, such as those of **Chad**, **Guatemala** and **Kiribati** and others point to the health dimensions of climate-related migration and/or displacement.

One in 10 NDCs (10%) now register climate impacts on health care facilities. For example, the NDCs of **Antigua and Barbuda**, **Fiji**, **Madagascar**, **Mozambique** and others report that a rise in extreme weather events are causing the destruction of critical infrastructure such as hospitals, alongside injuries and loss of life.

The impact of climate change on mental and psychosocial health remains under-represented in NDCs (3%, five out of 193). This finding is in line with the 2021 WHO health and climate change global survey, which found that of 40 reviewed national health and climate change plans only nine have so far included mental health and psychosocial support as a priority (8).

FIGURE 4
Percentage of NDCs that refer to climate-sensitive health risks or outcomes



*Other climate-sensitive health risks or outcomes might include: eye disorders and diseases; skin diseases; and others.

The frequent references to climate-sensitive health risks and outcomes in many NDCs (60%) reflects the fact that climate change is already having substantial negative effects on people’s health and livelihoods around the world (17). In the UNFCCC and the Paris Agreement, this is captured in the concept of “Loss and Damage”, referring to the destructive impacts of climate change that cannot be – or have not been – avoided by mitigation or adaptation (19).

However, one in 10 NDCs (11%) now also specifically mention the concept of Loss and Damage in relation to human health. For example, the NDCs of **Antigua and Barbuda, Cambodia, Saint Kitts and Nevis, Vanuatu** and others make this explicit connection.

Climate finance for health

Climate finance is essential for health adaptation, mitigation, and addressing Loss and Damage. Often, the most climate change vulnerable countries in the world have the highest burden of disease and lack sufficient resources to adequately prepare for and protect against the scale of climate impacts they face. If climate financing does not meet the level required, we risk worsening existing global, regional and local inequalities.

In addition, health is often neglected within climate funding. Previous reviews have indicated that only approximately 2% of adaptation funding and 0.5% of overall funding from multilateral climate finance sources is allocated to projects that explicitly aim to protect or improve human health (1). Of the US\$ 1.14 billion in climate finance that was approved by the Green Climate Fund in 2021, 15% went towards adaptation activities with benefits that included increased resilience of health and wellbeing. However, no activities were funded that had a direct focus on strengthening health systems (20).

Close to a third (29%) of NDCs now allocate climate finance to health actions and/or plans. This is most often allocated to health adaptation actions and building climate-resilient health systems, although in some cases also includes other action areas. This is a significant increase compared with 2019, when only 15% of NDCs (28 out of 184) allocated climate finance to health.

The rise is partly due to improved standards for communicating NDCs; standard guidance for the “clarity, transparency and understanding” of NDCs was adopted by Parties to the Paris Agreement after the 2019 WHO review, and more standardized reporting practices have emerged since (21). A change in WHO’s reviewing methodology also means that climate–health finance references with limited to no detail on their respective targets are counted as health adaptation finance (see Chapter 3). Nonetheless, both the inclusion of climate finance for health in NDCs, and the level of specificity of climate–health finance targets and timelines, have markedly increased over the past years.

However, most of the climate finance for health remains conditional, meaning policy commitments made in the NDC depend on international financial support. Only 11% of NDCs include unconditional finance targets (i.e. domestically sourced) for some or all of their health actions and/or plans. For example, the NDC of **Sierra Leone** provides an “indicative cost” to strengthen the climate resilience of its health sector, and designates 30% of that cost as unconditional, while 70% is dependent on multilateral climate finance.

In addition to climate finance, other means of implementation considered under the Paris Agreement and the UNFCCC include technology development and transfer, and capacity building. At least 12% of NDCs specifically mention the need for increased capacity building of the health sector, and in some cases connect this to climate finance. Some NDCs (7%) also highlight the need for technology transfer or development to the health sector.

Health in long-term strategies

To achieve the long-term goals of the Paris Agreement, Parties have agreed to complement the actions laid out in their NDCs with Long-term Low Emissions and Development Strategies.

By developing an LT-LEDS, governments set out a mid-century vision to cut greenhouse gas emissions and improve climate resilience while simultaneously achieving national development objectives. LT-LEDS provide an overarching government vision that helps inform: (a) near- to mid-term climate targets, such as the NDCs; (2) long-term climate goals, such as the achievement of net-zero emissions and climate resilience; and (3) the achievement of the SDGs and other national development goals (3).

As such, LT-LEDS are a crucial policy tool that can help to place short-term actions in the context of the long-term structural changes required to transition to a low-carbon, resilient economy by 2050 (22). LT-LEDS help to ensure consistency across national climate policies and avoid the lock-in of carbon-intensive pathways, thereby providing a roadmap for action to achieve the long-term goals of the Paris Agreement and safeguard the health and wellbeing of current and future generations (3).

This review includes information from 53 LT-LEDS, representing 62 Parties to the Paris Agreement and accounting for 68% of total global emissions, 83% of global GDP, 47% of the global population, and 69% of total energy consumption (using 2019 estimates (23)). A list of all LT-LEDS included in this review can be found in Annex 1.

Health in long-term strategies

The inclusion of public health considerations in LT-LEDS is near universal (98%, 52 out of 53), similarly to health in NDCs (91%, 175 out of 193). Three out of four LT-LEDS (72%, 38 out of 53) use health as a guiding principle, by including specific goals or provisions around safeguarding the health, wellbeing and prosperity of populations as a key outcome of achieving a net-zero and resilient society by the middle of the century. For example, the LT-LEDS of **Costa Rica**, the **Marshall Islands** and **Slovenia** aim to safeguard the human right to health and/or the human right to a healthy environment; the LT-LEDS of **Indonesia**, **Thailand**, **Uruguay** and others aim to achieve health goals described in national legislation; while the LT-LEDS of **Germany**, the **United Kingdom**, the **United States** and others prioritise those long-term climate goals that will maximize the health and wellbeing of their populations.

The widespread inclusion of health as a long-term outcome in LT-LEDS indicates that safeguarding health is a useful guiding principle for the development of long-term strategies and can guide governments in articulating the long-term vision needed to limit global temperature increases, while protecting and promoting health.

Promoting a healthy and green recovery from COVID-19

Half of all LT-LEDS (51%, 27 out of 53) consider the COVID-19 recovery in relation to their climate commitments. However, when excluding those LT-LEDS published before the year 2020 – the year the COVID-19 pandemic emerged – that number rises to two thirds of all LT-LEDS (61%, 27 out of 44), which is similar to the proportion of NDCs (66%, 127 out of 193).

A similar percentage of LT-LEDS (30%) and NDCs (32%) highlight the need for a healthy, green recovery from COVID-19. Notably, while some NDCs (16%) consider COVID-19 to be a barrier to climate goals in the short- to mid-term (i.e. up to 2030), almost no LT-LEDS (4%) expect the pandemic to impede the achievement of long-term climate and development goals.

A larger proportion of LT-LEDS (26%) prioritize health, equity and social justice measures in response to the COVID-19 pandemic, compared with NDCs (8%). For example, the LT-LEDS of **Japan, Malta, Morocco** and others commit to investing in additional social measures to support vulnerable population groups and reverse inequities worsened by the pandemic.

TABLE 5

Percentage of LT-LEDS and NDCs that consider the COVID-19 recovery in relation to their climate commitments

COVID-19 measure or consideration	Percentage of LT-LEDS (53 documents)	Percentage of NDCs (193 documents)
Total	51%	66%
Healthy, green recovery from COVID-19	30%	32%
Impact on economy and inequality	26%	28%
Need for nature-based solutions and/or One Health approach	4%	17%
COVID-19 a barrier to more ambitious climate action	4%	16%
COVID-19 a driving force for more ambitious climate action	26%	15%
COVID-19 impeding NDC development process	25%	15%
Other*	11%	15%
Prioritization of health, equity and social justice measures	26%	8%

*Other COVID-19 measures or considerations might include: supply chain disruptions and measures; food insecurity; exacerbated risks and vulnerabilities; converging crises; the need for health system reform; and others.

Health co-benefits of long-term mitigation goals

Three quarters of LT-LEDS (75%) identify health co-benefits of climate mitigation, including for sectors such as transport (47%); food, agriculture and land-use (40%); energy (28%); and others. The inclusion of health co-benefit considerations in LT-LEDS is substantially higher than in NDCs (30%). This could partly be explained by the fact that submissions from high income and upper-middle income countries currently make up a majority of LT-LEDS (85%, 45 out of 53).

TABLE 6

Percentage of LT-LEDS and NDCs that identify health co-benefits of national climate mitigation policies

Identification of health co-benefits from mitigation in this sector or area	Percentage of LT-LEDS (53 documents)	Percentage of NDCs (193 documents)
Total	75%	30%
Cross-sectoral mitigation	53%	10%
Transport	47%	14%
Food, agriculture and land-use	40%	15%
Energy	28%	7%
Housing, buildings and infrastructure	19%	5%
Waste management	13%	8%
Household energy	8%	6%
Industry	6%	2%
Health sector	0%	4%

Various health co-benefit effects from climate mitigation measures are recognized in LT-LEDS. Over half of LT-LEDS (57%) recognize that certain mitigation measures will also cause a reduction in air pollution and associated health impacts, while a third (32%) assert that certain mitigation measures can ensure improved food security and nutrition. A quarter (25%) identify one or several health co-benefits arising from policies that promote active transport and physical activities, while 15% recognize that mitigation policies will bring reduced healthcare costs.

A third of LT-LEDS (32%) quantify at least some of the health co-benefits of mitigation. For example, the LT-LED of the **United States** calculates that the reduction of air pollution caused by mitigation measures in the energy sector will help avoid 85 000 to 300 000 premature deaths and health and climate damages of US\$ 150 to US\$ 250 billion through to 2030, while also helping to alleviate the pollution burdens disproportionately borne by disadvantaged communities. The LT-LED of **Chile** quantifies the prevented losses and avoided premature deaths its climate policies will enable.

Health adaptation and resilience in long-term strategies

Close to half of LT-LEDS (47%) include health adaptation priorities and policies. Generally, LT-LEDS do not include detailed health adaptation targets or measures, although some do highlight specific health adaptation measures. For example, the LT-LEDS of **Colombia, Lithuania, Malta** and others include an extensive health adaptation plan, describing both sectoral and cross-sectoral activities. The LT-LEDS of **Benin, Fiji, Indonesia** and others consider health as a long-term adaptation priority and point to existing health adaptation policies and plans.

One in three LT-LEDS (34%) set health adaptation priorities based on existing policies, most often based on the country's HNAP or NAP (15%, eight).

Loss and Damage to health in long-term strategies

A slightly higher percentage of LT-LEDS (70%, 37 out of 53) than NDCs (60%, 115 out of 193) refer to climate-sensitive health risks or outcomes. However, a higher proportion of NDCs (32%) support references to health risks and outcomes with evidence or analysis compared with LT-LEDS (28%). Moreover, NDCs more often identify a range of specific health risks and outcomes when describing the health impacts of climate change, while LT-LEDS more often refer to the general negative impacts on health. Only three climate-sensitive health risks – heat-related illness; injury and mortality from extreme weather events; and airborne and respiratory illnesses – are referenced by more than one in five LT-LEDS.

In other words, there is a relatively high recognition in LT-LEDS of the long-term danger to people's health and wellbeing, but they generally identify fewer specific health risks or outcomes and make less use of evidence or analyses to quantify these risks compared with NDCs. This could partly be explained by the fact LT-LEDS are relatively high-level strategic policy documents, while NDCs outline short- to mid-term policy priorities and more directly inform national climate policies.

TABLE 7

Percentage of LT-LEDS and NDCs that refer to climate-sensitive health risks or outcomes

Climate-sensitive health risk or outcome	Percentage of LT-LEDS (53 documents)	Percentage of NDCs (193 documents)
Total	70%	60%
General mention of health impacts	58%	37%
Heat-related illness	21%	29%
Vector-borne diseases	17%	28%
Injury and mortality from extreme weather events	17%	25%
Malnutrition and food-borne diseases	9%	22%
Waterborne diseases and other water-related health impacts	9%	22%
Socially mediated health impacts (e.g. conflict, migration, livelihoods, health inequities)	15%	22%
Airborne and respiratory illnesses	21%	10%
Impacts on health care facilities	6%	10%
Other*	13%	9%
Noncommunicable diseases	4%	7%
Mental and psychosocial health	2%	3%
Zoonoses	6%	2%

*Other climate-sensitive health risks or outcomes might include: eye disorders and diseases; skin diseases; and others.

Therefore, most LT-LEDS recognize the long-term harmful effects of climate change on people's health, wellbeing and livelihoods. One in 10 LT-LEDS (11%) specifically place the UNFCCC concept of Loss and Damage in relation to human health, which is a similar proportion to NDCs. For example, the LT-LEDS of **Chile, Denmark, Nepal** and others make this explicit connection.

Financial commitments and reforms for health

Climate finance is essential for health adaptation, mitigation, and climate-resilient development. Overall, the long-term goals of the Paris Agreement are guided by its aim of making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development, as described in Article 2.1c of the Agreement (24). Therefore, LT-LEDS often provide information on both financial commitments for climate action as well as more systemic and long-term financial or economic reforms.

Even though most LT-LEDS (85%) refer to financial needs for implementing long-term goals (23), and three out of four (72%) include health as a guiding principle to achieve their long-term goals, only one in 10 (11%) include climate finance for health.

On the other hand, many LT-LEDS (45%) do include financial reforms that would be beneficial to climate and health goals. One in five (23%) include financial instruments with explicit health provisions, such as taxes, levies, fiscal incentives, and carbon pricing mechanisms that will be beneficial to health. Examples include the LT-LEDS of **South Africa, New Zealand** and the **United Kingdom**. One in three LT-LEDS (30%) commits to financial reforms to enable a healthy, green recovery from COVID-19. This includes the LT-LEDS of the **European Union, Indonesia, Japan** and others.

In addition, one in three LT-LEDS (34%) recognize, and sometimes quantify, a return on investment for health from the implementation of climate policies. For example, the LT-LEDS of **Fiji, Morocco, Spain** and others recognize that long-term sectoral mitigation goals will bring economic savings from air pollution reduction.

Lastly, close to a quarter of LT-LEDS (23%) recognize the economic costs from the long-term health impacts of climate change. For example, the LT-LED of **Switzerland** estimates that a business-as-usual climate scenario would lead to annual costs of up to Sw.fr. 11 billion in healthcare.

Conclusion

This 2023 WHO review of health in Nationally Determined Contributions and long-term strategies provides a snapshot of the overall progress in the formulation of mid- and long-term climate and health policy objectives for governments to achieve the goals of the Paris Agreement.

The review highlights significant progress made in the integration and mainstreaming of health, compared with previous rounds of NDCs and LT-LEDS. Health-inclusive and health-promoting climate targets and policies are increasingly being developed for mitigation, adaptation, means of implementation, Loss and Damage, and long-term sustainable development strategies. Compared with previous rounds of national climate plans, many climate and health targets have improved their evidence base, level of quality, scope, and financing.

Most national climate plans now recognize climate change is a threat to human wellbeing and planetary health, while the benefits for human health arising from mitigation action are increasingly incorporated in climate targets.

However, many areas for further improvement remain in order to mainstream health in national climate plans. First, NDCs and LT-LEDS can strengthen their evidence base on health and climate change and ensure the active representation of health stakeholders in the development and implementation of climate policies. Second, a Health in All Policies approach can help maximize synergies across sectors and development goals. Human health will benefit from integrated mitigation and adaptation options that mainstream health across sectors, such as food, infrastructure, social protection and water policies.

Third, while NDCs and LT-LEDS increasingly identify the significant health co-benefits of climate mitigation, more efforts are needed to assess and monitor these benefits in order to inform policy design and implementation. Fourth, many NDCs and LT-LEDS now capture the Loss and Damage caused by climate change on people's health and livelihoods, but there is a need for a more comprehensive understanding of existing vulnerabilities, capacities and needs to respond to and recover from losses and damages related to human health and wellbeing.

Fifth, health remains a chronically underfunded priority area. Allocating climate finance to projects that explicitly aim to protect or improve human health can help close this financing gap. Lastly, the COVID-19 pandemic has demonstrated how crucial it is that health systems are prepared for shocks and stresses. Integrating health priorities in NDCs and LT-LEDS can enable governments to connect national climate strategies with COVID-19 preparedness and recovery efforts.

Without urgent, effective and equitable mitigation and adaptation actions, climate change increasingly threatens the livelihoods, health and wellbeing of current and future generations. NDCs and LT-LEDS offer crucial inter-sectoral policy platforms for national governments to safeguard human and planetary health.

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Methodology

This report synthesizes information from the latest available Nationally Determined Contributions (NDCs), communicated by 193 Parties to the Paris Agreement and recorded in the official registry of the United Nations Framework Convention on Climate Change (UNFCCC), as of 23 September 2022. In addition, it synthesizes information from the 53 latest available Long-term Low Emissions and Development Strategies (LT-LEDS), representing 62 Parties to the Paris Agreement, as submitted to the UNFCCC secretariat on 23 September 2022.

For the purpose of this review, the term ‘Party’ is used to denote all 194 Parties to the Paris Agreement]. This publication follows WHO style, however it is noted that the terminology used in the context of the Paris Agreement may be at variance with that of WHO. The designations employed in this publications do not imply any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The cut-off date of 23 September 2022 for NDCs was selected to match the deadline for NDC submissions to be included in the 2022 UNFCCC NDC synthesis report, following UNFCCC decision 1/CMA.3, para. 30. Similarly, the cut-off date for LT-LEDS was selected to match the deadline for submissions to be included in the 2022 UNFCCC LT-LEDS synthesis report, following UNFCCC decision 1/CMA.3, para. 34.

This report builds on a 2019 WHO review of health in NDCs, available on the WHO website at www.who.int/publications/i/item/9789240000674. The 2019 WHO review synthesized the first NDCs, communicated by their respective Parties, in accordance with decision 1/CP.21 (Article 4 paragraph 8 of the Paris Agreement), which mandated Parties to provide the information necessary for clarity, transparency and understanding in accordance with decision 1/CP.21 and any relevant subsequent decisions of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA).

The 2023 WHO review has significantly expanded the scope of indicators to capture progress in the quantity and quality of health measures in the NDCs, compared with the 2019 review. The expanded scope of the 2023 report aims to capture: the availability of additional UNFCCC guidance, the progression of new and updated NDCs, as well as the improved inter-comparability and standard reporting practices of NDCs. For example, a total of 166 Parties have communicated a new or updated NDC since the 2019 WHO review, including nine Parties that have submitted an NDC for the first time (Angola, Brunei Darussalam, Iraq, Kyrgyzstan, Lebanon, Philippines, Russia, Senegal, South Sudan, Türkiye). Additional UNFCCC guidance has also been adopted on the information necessary for clarity, transparency and understanding of NDCs, following UNFCCC decision 4/CMA.1, annex 1.

Wherever possible, the 2023 WHO review adheres to reviewing methodologies used by the UNFCCC secretariat. This allows for the comparative analysis of health indicators with indicators of other sectors and action areas, as captured by UNFCCC synthesis reports. However, comparability between health indicators and indicators capturing progress in other sectors and action areas might be limited, due, in part, to the lack of UNFCCC NDC guidance on areas other than mitigation, as captured by UNFCCC decision 4/CMA.1, paragraph 8. Both the UNFCCC and WHO reviews are without prejudice to the inclusion of components other than information on mitigation in an NDC, and both synthesize information included in the NDCs but not covered by existing UNFCCC guidance.

NDC and LT-LEDS text was extracted from the UNFCCC NDC registry, accessible at <https://unfccc.int/NDCREG>, and the UNFCCC long-term strategies portal, accessible at <https://unfccc.int/process/the-paris-agreement/long-term-strategies>. A Boolean search strategy was used to identify all references to health in NDCs and LT-LEDS documents, using the following multilingual search string:

[health OR wellbeing OR well-being OR welfare OR disease* OR illness OR cancer OR mortality OR morbidity OR injury OR injuries OR death* OR deadly OR lethal OR life OR lives OR YLL OR DALY OR cobenefit* OR co-benefit* OR depression OR harm* OR mental OR allerg* OR asthma OR obesity OR nutrition OR undernutrition OR nutritional OR malnutrition OR heat OR stress OR zoono* OR vector OR air OR SLCP OR pollution OR pollutant* OR NCD OR COVID OR pandemic OR equity OR equality OR justice OR just OR fair OR fairly OR unequal OR inequality OR inequity OR disadvantaged OR equality OR equitable OR disability OR disabilities OR sedentary OR UHC OR humanitarian OR sanitation OR sanitary OR safe OR safety OR hunger OR hungry OR walk* OR cycl* OR active OR diet OR hygiene OR santé OR soins OR sain OR bien-être OR social OR sociale OR malade OR maladie OR maladies OR cancer OR mortalité OR morbidité OR blessure OR blessures OR décès OR mortel OR mortels OR létaux OR vies OR YLL OR DALY OR AVAI OR EVCI OR cobénéfice OR co-bénéfice OR co-bénéfices OR dépression OR nuisible OR nuisance OR nocive OR dommage OR mental OR allergie OR allergies OR allergique OR asthme OR obésité OR nutrition OR nutritionnel OR dénutrition OR malnutrition OR stress OR thermique OR zoonoses OR zoonose OR zoonotique OR vecteur OR air OR SLCP OR pollution OR polluants OR NCD OR MNT OR COVID OR pandémie OR équité OR égalité OR égalités OR égalisation OR justice OR juste OR équitable OR inégalité OR défavorisée OR disproportionnée OR handicap OR sédentaire OR CSU OR humanitaire OR assainissement OR sanitaire OR sécurité OR faim OR marcher OR vélo OR régime OR actif OR hygiene OR salud OR bienestar OR sanidad OR saludable OR salubre OR enfermedad OR enfermedades OR sana OR sano OR social OR cáncer OR mortalidad OR morbilidad OR lesiones OR lesión OR muerte OR muertes OR mortal OR letal OR vida OR vidas OR YLL OR AVP OR DALY OR AVAD OR cobeneficio OR cobeneficios OR depresión OR daño OR nocivo OR perjudicar OR mental OR alergia OR alergias OR asma OR obesidad OR desnutrición OR nutricional OR estrés OR térmico OR calor OR zoonosis OR zoonosis OR vector OR aire OR SLCP OR CCVC OR contaminación OR contaminante OR contaminantes OR NDC OR ENT OR pandemia OR COVID OR equidad OR justicia OR justa OR equitativa OR desigualdad OR desproporcionada OR equitativa OR discapacidades OR sedentarismo OR UHC OR CSU OR humanitaria OR saneamiento OR sanitario OR sanitaria OR seguridad OR hambre OR caminar OR andar OR bicicleta OR dieta OR activa OR higiene].*

In selected cases, optical character recognition was used to convert images into text. Matching text was verified manually, after which false positives were removed. Spanish and French texts were kept in their original language to avoid the introduction of translation biases. Relevant text was extracted verbatim and organized within a table. A desktop review was conducted by organizing extracted text according to the categories of the WHO review framework for NDCs and LT-LEDS. Only text in proximity to positive matches (i.e. in the same paragraph) was considered. Health-relevant climate policies or targets not directly included in the text were not considered. Data quality and validation was conducted by randomized and blinded re-analysis of policy documents. Summary statistics were prepared for each category of the WHO review framework. Selected summary statistics and case studies were presented in the WHO review.

Box A1.1. WHO review framework for health in NDCs and LT-LEDS

Leadership and governance

Institutional arrangements

Does the NDC/LT-LEDS report the involvement of the ministry of health in the development of the policy document, and/or in the implementation of climate policies and targets?

Health as a guiding principle for policy development

Does the NDC/LT-LEDS recognize the role of health in underpinning the legislative and regulatory preconditions for national action on climate change?

Synergies between climate action and sustainable development for health

Does the NDC/LT-LEDS assess the synergies between climate policies and targets, and sustainable development goals for health (i.e. SDG 3)?

Promoting a healthy and green recovery from COVID-19

Does the NDC/LT-LEDS consider the COVID-19 recovery in relation to climate policies and targets?

Sub-themes:

- Healthy green recovery from COVID-19
- Prioritization of health, equity and social justice in relation to the COVID-19 recovery
- Need for nature-based solutions and One Health approach
- Need for science-based decision-making
- COVID-19 a barrier to more ambitious climate action
- COVID-19 a driving force for more ambitious climate action
- COVID-19 impact on economy and inequality
- COVID-19 impeding development of (and/or participation in) the NDC process
- Just transition from fossil fuels
- Gendered impacts and risks
- Other

Promoting health co-benefits of climate change mitigation

Air pollution target

Does the NDC/LT-LEDS include standalone targets, measures, or policies for the reduction of air pollution and/or short-lived climate pollutants (SLCPs), as they pertain to population health?

Health co-benefits of mitigation

Does the NDC/LT-LEDS identify the health co-benefits of climate mitigation?

If yes, for which sector?

- Energy
- Household energy
- Transport
- Food, agriculture and land-use
- Industry
- Housing, buildings and infrastructure
- Waste management
- Health sector
- General mitigation
- Other

Box A1.1. Contd.

If yes, what health co-benefit pathways are recognized?

- General improvement of population health (unspecified)
- Reduction in air pollution and associated health impacts
- Reduced exposure to health risks
- Reduced deaths and injuries
- Increased resilience or adaptive capacity to health impacts
- Improved food security and nutrition
- Reduced healthcare costs
- Reduced health inequities
- Improved access to healthcare
- Increased physical activity and associated health benefits
- Other

If yes, is at least one of the identified health co-benefits quantified and/or monitored?

Health sector mitigation

Does the NDC/LT-LEDS include standalone emissions reduction policies or targets for the healthcare sector?

Health adaptation and resilience

Health sector prioritization

Does the NDC/LT-LEDS identify health as a priority sector due to its vulnerability to climate change?

Vulnerability and adaptation assessment

Does the NDC/LT-LEDS include an evidence-based assessment of climate-sensitive health risks and outcomes in order to inform its health adaptation priorities?

If yes, what kind of assessment was used?

- Vulnerability and adaptation analysis
- National Adaptation Plan
- WHO–UNFCCC country profile or survey
- Scientific research
- WHO research or recommendations
- Other

Health adaptation

Does the NDC/LT-LEDS include health-specific adaptation actions or targets?

If yes, which components of the WHO operational framework for climate resilient health systems are included?

- Component 1: Leadership and governance
- Component 2: Health workforce
- Component 3: Vulnerability, capacity and adaptation assessment
- Component 4: Integrated risk monitoring and early warning
- Component 5: Health and climate research
- Component 6: Climate resilient and sustainable technologies and infrastructure
- Component 7: Management of environmental determinants of health
- Component 8: Climate-informed health programmes
- Component 9: Emergency preparedness and management
- Component 10: Climate and health financing

If yes, are they informed by health adaptation policies or action plans?

- National Adaptation Plan (NAP)
- Health National Adaptation Plan (HNAP)
- National climate change strategy or plan
- Other

If yes, have the actions and/or targets been determined using scientific evidence or assessments?

Box A1.1. Contd.

Loss and Damage to health

Health impacts

Does the NDC/LT-LEDS identify climate-sensitive health risks or outcomes?

If yes, which climate-sensitive health risks or outcomes does it identify?

- Airborne and respiratory illnesses
- Heat-related illness
- Injury and mortality from extreme weather events
- Malnutrition and food-borne diseases
- Impacts to mental and psychosocial health
- Noncommunicable diseases
- Vector-borne diseases
- Waterborne diseases and other water-related health impacts
- Zoonoses
- Impacts on health systems and health care facilities
- General mention of health impacts
- Socially mediated health impacts (e.g. through conflict, migration, health inequities)
- Other

Loss and Damage

Does the NDC/LT-LEDS refer to the concept of “Loss and Damage” in relation to the impacts of climate change on human health?

Means of implementation for health

Climate finance for health

Does the NDC/LT-LEDS allocate climate finance to health actions or plans?

If yes, what percentage of climate finance for health is unconditional?

Financial reform and assessment

Does the NDC/LT-LEDS commit to financial reforms beneficial to climate and health goals, and/or financial assessments of the health impacts of climate policies or targets?

If yes, which ones?

- Financial cost of health impacts from climate change
- Return on investment for health from climate policies
- Green recovery from COVID-19
- Climate subsidies, tax and pricing beneficial to health
- Other

Other means of implementation

Does the NDC refer to health in relation to means of implementation, other than finance?

If yes, which ones?

- Capacity building
- Technology transfer or development
- Communication plan or strategy
- Other

Other health elements

Health references

Does the NDC/LT-LEDS include any other elements related to human health and wellbeing?

Geographical representation for the LT-LEDS review

TABLE A1.1

Geographical representation by WHO region for the LT-LEDS review

WHO region	List of Parties to the Paris Agreement included in the LT-LEDS review	Number of Parties included ¹²	Number of WHO Member States in this region
African Region	Benin, Gambia, Nigeria, South Africa	4	47
Region of the Americas	Canada, Chile, Colombia, Costa Rica, Guatemala, Mexico, United States of America, Uruguay	8	35
Eastern Mediterranean Region	Morocco	1	21
European Region	Andorra, Austria, Belgium, Czechia, Denmark, European Union, Finland, France, Germany, Hungary, Iceland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Republic of North Macedonia, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland	27	53
South-East Asia Region	Indonesia, Nepal, Thailand	3	11
Western Pacific Region	Australia, Cambodia, China, Fiji, Japan, Marshall Islands, New Zealand, Republic of Korea, Singapore, Tonga	10	37

TABLE A1.2

Geographical representation by World Bank income group classification for the LT-LEDS review

World Bank income group classification	Number of Parties
High income	32
Upper-middle income	12
Lower-middle income	7
Low income	1
Not members of the World Bank Group	3

¹² Certain parties to the Paris Agreement are considered WHO non-Member territories and areas. The names and designations used to describe parties to the Paris Agreement might differ from the names and designations used to describe WHO Member States and non-Member territories and areas. The names and designations of parties to the Paris Agreement do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

TABLE A1.3

Inclusion of Parties to the Paris Agreement according to country groupings of SIDS or LDCs for the LT-LEDS review

Country grouping	Number of Parties
Small island developing states (SIDS)	4
Least developed countries (LDCs)	4

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