

BULGARIA



HEALTH AND CLIMATE CHANGE **COUNTRY PROFILE 2021**



World Health
Organization



United Nations
Framework Convention on
Climate Change

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HOW TO USE THIS PROFILE

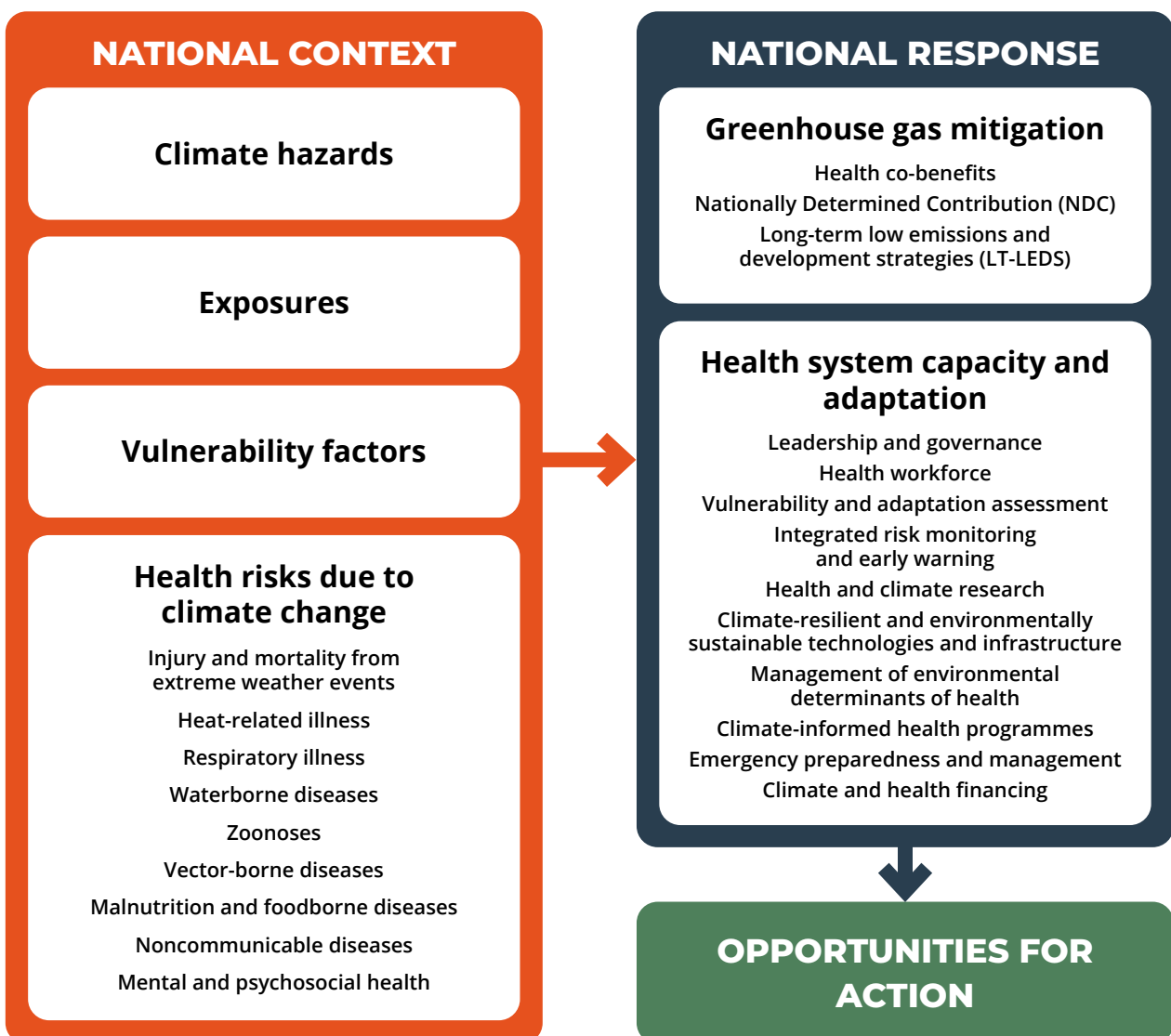
This health and climate change country profile presents a snapshot of country-specific climate hazards, climate-sensitive health risks and potential health benefits of climate change mitigation. The profile is also a key tool in monitoring national health sector response to the risk that climate variability and climate change pose to human health and health systems. By presenting this national evidence, the profile aims to:

- Raise awareness of the health threats of climate change within the health sector, other health-related sectors and among the general public;
- Monitor national health response;
- Support decision-makers to identify opportunities for action;
- Provide links to key WHO resources.

Tools to support the communication of the information presented in this country profile are available. For more information please contact: nevillet@who.int

The diagram below presents the linkages between climate change and health. This profile provides country-specific information following these pathways. **The profile does not necessarily include comprehensive information on all exposures, vulnerability factors or health risks** but rather provides examples based on available evidence and the highest priority climate-sensitive health risks for your country.

CLIMATE CHANGE AND HEALTH



COUNTRY BACKGROUND

Located in southeastern Europe, Bulgaria's topography consists of hills and mountains (around 60%) and forests (around 34%) (1). Classified as an upper-middle income country, Bulgaria's economy predominantly depends on the private sector, which accounts for more than 80% of the national GDP; scientific and technological research are at the top of the budgetary expenditure (2). Bulgaria's overall population has decreased, but the urban population is increasing, while the rural population is decreasing (1).

Bulgaria's climate is temperate continental with an influence from the subtropical climate of the Mediterranean. High altitude areas receive the most precipitation. Bulgaria has experienced a rise in temperatures; changing precipitation patterns (including drought and flood events); less snow cover; and severe storms. Climate-related health risks include atypical infectious diseases, such as malaria; ambient air pollution; and heat stress (affecting outdoor workers in particular) (1,3).

There have been many extreme weather events in Bulgaria in recent years, with injuries, deaths and material losses; for example, flash floods (in January 2021 and June 2014), droughts, tornadoes and storms. Indeed, the number of extreme weather events has risen by 30% in Bulgaria in the period 1991–2007, compared with the period 1961–1990, and is estimated to have risen by 50% in 2020. By 2050, the number of extreme weather events in Bulgaria could triple (data provided by the Ministry of Health).

Bulgaria, as a member of the European Union (EU), is committed to the European Nationally Determined Contribution (NDC), which seeks to mitigate at least 55% of its greenhouse gas emissions by 2030 compared with the 1990 levels (4). Bulgaria's National Adaptation Strategy identifies health adaptation options, such as education and awareness programmes, and assessing health vulnerability at the national and local level (3).

CLIMATE-SENSITIVE HEALTH RISKS – BULGARIA

Health risks

Health impacts of extreme weather events	●
Heat-related illnesses	●
Respiratory illnesses	●
Waterborne diseases and other water-related health impacts	●
Zoonoses	●
Vector-borne diseases	●
Malnutrition and foodborne diseases	●
Noncommunicable diseases	○
Mental/psychosocial health	●
Impacts on health care facilities	○
Effects on health systems	○
Health impacts of climate-induced population pressures	○

● yes ● no ○ unknown / not applicable

Source: Government of Bulgaria, 2014 (5).

CURRENT AND FUTURE CLIMATE HAZARDS

CLIMATE HAZARD PROJECTIONS FOR BULGARIA

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

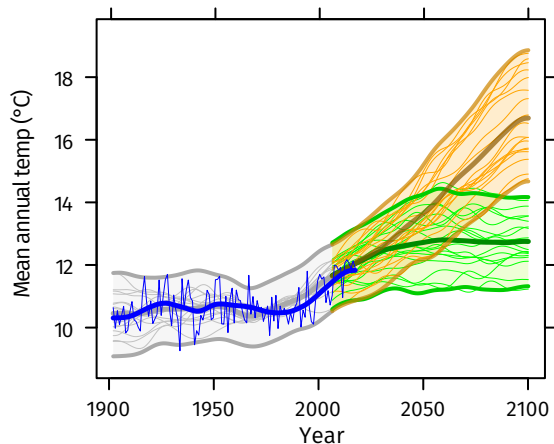
The climate model projections given below present climate hazards under a high emissions scenario, Representative Concentration Pathway 8.5 (RCP8.5 – in orange) and a low emissions scenario (RCP2.6 – in green).^a The text describes the projected changes averaged across about 20 global climate models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

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



Rising temperature

FIGURE 1: Mean annual temperature, 1900–2100

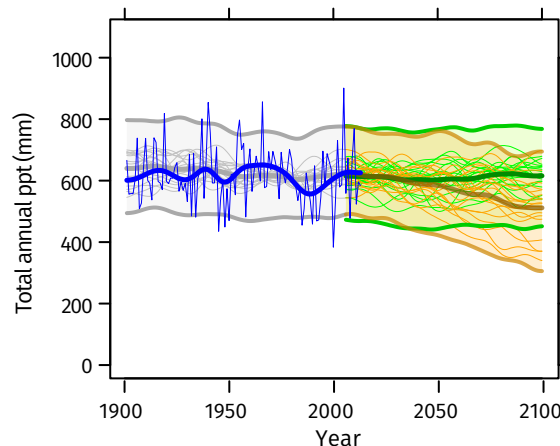


Under a high emissions scenario, the mean annual temperature is projected to rise by about 4.8°C on average by the end-of-century (i.e. 2071–2100 compared with 1981–2010). If emissions decrease rapidly, the temperature rise is limited to about 1.5°C.



Decrease in total precipitation

FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to decrease by about 15% on average under a high emissions scenario, although the uncertainty range is large (-33% to +2%). If emissions decrease rapidly, there is little projected change on average with an uncertainty range of -6% to +8%.

NOTES

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

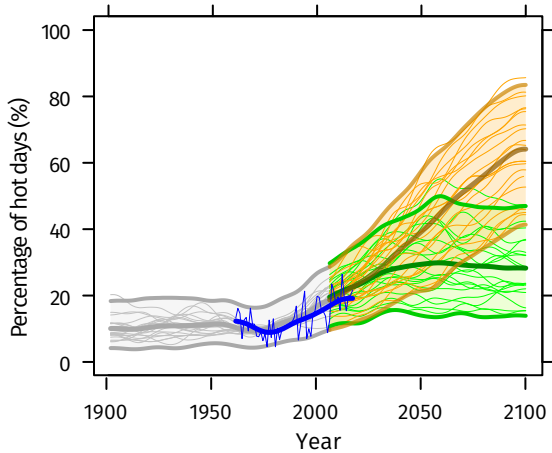
^b Observed historical record of mean temperature and total precipitation is from CRU-TSv3.26. Observed historical records of extremes are from JRA55 for temperature and from GPCC-FDD for precipitation.

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



More high temperature extremes

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



The percentage of hot days^d is projected to increase substantially from about 15% of all days on average in 1981–2010 (10% in 1961–1990). Under a high emissions scenario, about 60% of days on average are defined as 'hot' by the end-of-century. If emissions decrease rapidly, about 30% of days on average are 'hot'. Similar increases are seen in hot nights^d (not shown).



Drought frequency and intensity

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

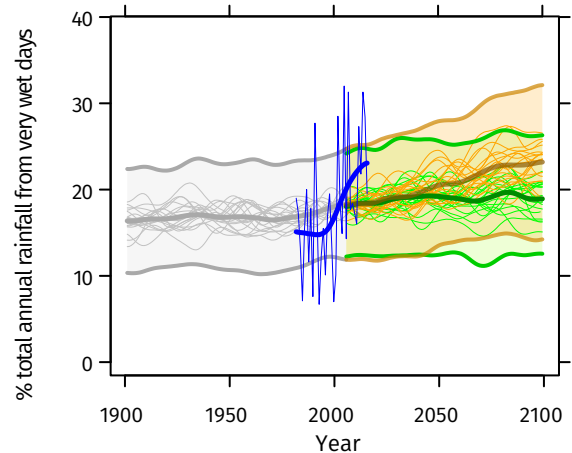
The Standardized Precipitation Index (SPI) is a widely used drought index which expresses rainfall deficits/excesses over timescales ranging from 1 to 36 months (here 12 months, i.e. SPI12). It shows how at the same time extremely dry and extremely wet conditions, relative to the average local conditions, change in frequency and/or intensity. SPI is unitless but can be used to categorize different severities of drought (wet): above +2.0 extremely wet; +2.0 to +1.5 severely wet; +1.5 to +1.0 moderately wet; +1.0 to +0.5 slightly wet; +0.5 to -0.5 near normal conditions; -0.5 to -1.0 slight drought; -1.0 to -1.5 moderate drought; -1.5 to -2.0 severe drought; below -2.0 extreme drought.

Under a high emissions scenario, SPI12 values are projected to decrease from about 0 to -0.6 on average by the end-of-century (2071–2100) indicating an increase in the frequency and/or intensity of dry episodes and drought events. If emissions decrease rapidly, there is little change although year-to-year variability remains large.

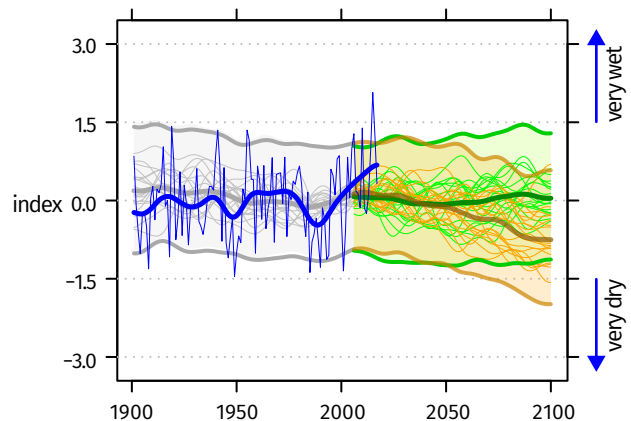


Increase in extreme rainfall

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



Under a high emissions scenario, the proportion of total annual rainfall from very wet days^e (about 15% for 1981–2010) could increase by the end-of-century (to about 25% on average with an uncertainty range of about 15% to 30%), with little change if emissions decrease rapidly. These projected changes are accompanied by a decrease in total annual rainfall under a high emissions scenario (see Figure 2).



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


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

HEALTH RISKS DUE TO CLIMATE CHANGE

HEAT STRESS

CLIMATE HAZARDS^a

 Up to 4.8°C mean annual temperature rise by the end-of-century.

 About 60% of days could be 'hot days' by the end-of-century.

EXPOSURES

Population exposure to heat stress is likely to rise in the future, due to increased urbanization (and the associated urban heat island effect) and climate change increasing the likelihood of severe heat waves (periods of prolonged heat).

EXAMPLE VULNERABILITY FACTORS^b



Age (e.g. the elderly and children)



Biological factors and health status



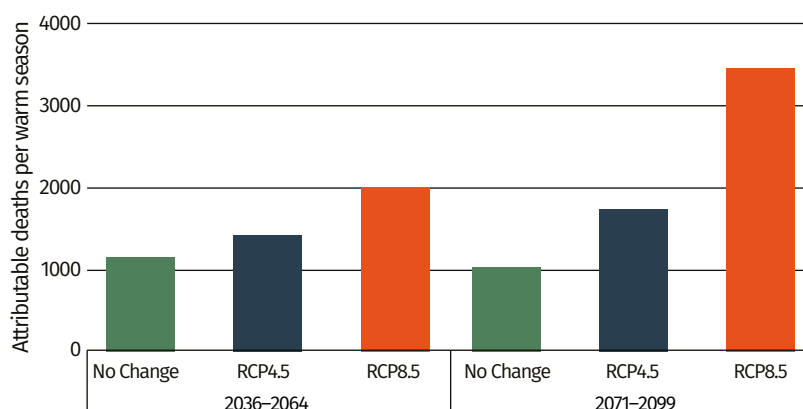
Geographical factors (e.g. urbanization)



Socioeconomic factors (e.g. occupation and poverty)

HEALTH RISKS^c

FIGURE 6: Attributable deaths per warm season in Bulgaria expected for the future time period 2036–2064 and 2071–2099 under the reference scenario (apparent temperatures at the historical levels observed during the period 1971–2001) and additional attributable deaths in relation to this counterfactual as expected under the RCP4.5 and RCP8.5 scenarios (6)



The health risks of heat stress include heat-related illnesses such as dehydration, rash, cramps, heatstroke, heat exhaustion and death.

Under a high emissions scenario (RCP8.5), additional attributable deaths per warm season are projected to rise to 3463 in 2071–2099. A reduction in emissions (RCP4.5) could reduce attributable deaths per warm season in 2071–2099 to 1742 (6).


^a For details see "Current and future climate hazards".


^b These vulnerability factors are not comprehensive but rather examples of relevant vulnerability factors. Please see the WHO Quality Criteria for Health National Adaptation Plans for more details: <https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>.

^c See "National health response: health system capacity and adaptation" for the national response to heat stress.


FOOD SAFETY AND SECURITY

CLIMATE HAZARDS^a

 Up to 4.8°C mean annual temperature rise by the end-of-century.

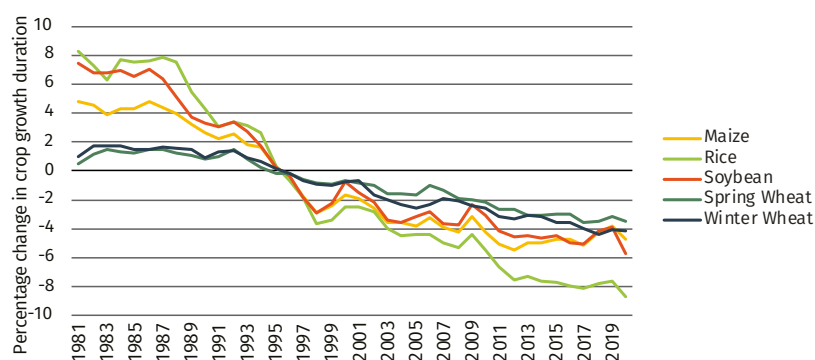
 About 60% of days could be 'hot days' by the end-of-century.

 Total annual precipitation could decrease by about 15% by the end-of-century.

 Large year-to-year variability in drought conditions.

EXPOSURES

FIGURE 7: Percentage change in crop growth duration in Bulgaria in 1981–2020, relative to the 1981–2010 average, expressed as the running mean over 11 years (5 years before and 5 years after) (7,8)



Reliable food resources are essential to good health. Climate change significantly increases exposure to changes in the safety and sustainability of food systems, directly through its effects on agriculture and indirectly by contributing to underlying risk factors such as water insecurity, dependency on imported foods, urbanization and migration, and health service disruption.

EXAMPLE VULNERABILITY FACTORS^b



Age (e.g. the elderly and children)



Biological factors and health status (e.g. pregnant women)



Environmental factors (e.g. loss of biodiversity)



Gender and equity



Socioeconomic factors

HEALTH RISKS^c

Food safety and security problems can lead to malnutrition, micronutrient deficiencies, other non-communicable diseases (NCDs), foodborne diseases and mortality. Increasing temperatures can also lead to increases in foodborne illnesses through spoiled food from refrigeration failure in transport/storage or changes in patterns of salmonella growth. Around half of Bulgaria's land is used for agricultural purposes, which contributes around 5% to the country's GDP. Agricultural production has already been affected by climate change in Bulgaria, with extreme weather events (including droughts and floods) and overall rising temperatures posing significant challenges (9).

^a For details see "Current and future climate hazards".


^b These vulnerability factors are not comprehensive but rather examples of relevant vulnerability factors. Please see the WHO Quality Criteria for Health National Adaptation Plans for more details: <https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>.

^c See "National health response: health system capacity and adaptation" for the national response to food safety and security.


WATER QUANTITY AND QUALITY

CLIMATE HAZARDS^a

 Up to 4.8°C mean annual temperature rise by the end-of-century.

 Annual rainfall from very wet days could increase by the end-of-century.

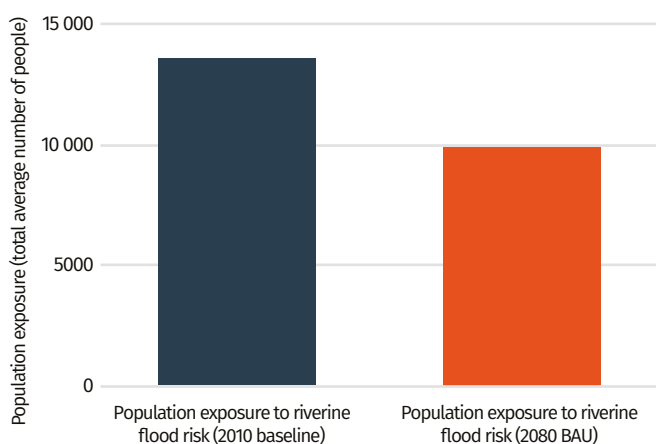
 Total annual precipitation could decrease by about 15% by the end-of-century.

 Large year-to-year variability in drought conditions.

EXPOSURES

FIGURE 8: Change in population exposure to riverine flooding in Bulgaria from 2010 (baseline) to 2080 (under a BAU scenario)^b (10)

Climate change increases the intensity and frequency of extreme weather events including drought and floods. These events can lead to population displacement and affect water and sanitation infrastructure and services, contaminate water with faecal bacteria (e.g. *E. coli*, salmonella) from run-off or sewer overflow. Increasing temperatures and precipitation can also lead to water contaminated with *Vibrio* bacteria or algae blooms.



EXAMPLE VULNERABILITY FACTORS^c



Access to clean and safe water and sanitation services



People living near flood and drought zones



Socioeconomic factors



Gender and equity

HEALTH RISKS^d

Physical injury and drowning are direct health risks from extreme weather events associated with climate change. Indirectly, the impact of climate change on water quality and quantity can lead to waterborne diseases (such as diarrhoeal disease) and noncommunicable diseases. Increasing extreme weather events and changing precipitation patterns are likely to increase water security issues for Bulgaria. There is a particular need to update infrastructure and implement integrated water resource management and integrated risk management of floods and droughts, to ensure future sustainability of water resources under increased climatic variability (11).

^a For details see "Current and future climate hazards".

^b This analysis, conducted by Aqueduct, shows projections for changing population exposure to riverine and coastal flood risk under a BAU scenario, which reflects RCP8.5 and SSP2. SSP2 is the socioeconomic pathway representing "middle of the road", whereby global social, economic and technological trends do not shift significantly from historical patterns.

^c These vulnerability factors are not comprehensive but rather examples of relevant vulnerability factors. Please see the WHO Quality Criteria for Health National Adaptation Plans for more details: <https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>.

^d See "National health response: health system capacity and adaptation" for the national response to water quantity and quality.

VECTOR DISTRIBUTION AND ECOLOGY

CLIMATE HAZARDS^a

 Up to 4.8°C mean annual temperature rise by the end-of-century.

 Total annual precipitation could decrease by about 15% by the end-of-century.

EXPOSURES

In Bulgaria, the local burden of malaria has been eliminated for more than 55 years. However, a recent study on the spatial analysis of imported cases of malaria in Bulgaria shows that many areas with a significant reduction in the time for sporogony and correspondingly accelerated malaria transmission rates fall into the clusters with the highest number of reported cases of imported malaria. These clusters are identified as areas at increased risk of re-establishment of malaria transmission (12).

EXAMPLE VULNERABILITY FACTORS^b



Environmental factors



Biological factors and health status (e.g. pregnant women or pre-existing conditions)



Disease dynamics



Socioeconomic factors

HEALTH RISKS^c

There is a potential risk of re-establishment of local malaria transmission in Bulgaria, which is determined by receptivity and vulnerability. Currently, vulnerability is identified as moderate and is determined by the number of imported malaria cases from endemic countries. However, vulnerability is dependent upon a number of factors, including migration, economic, social and cultural factors, which could change in the future. Therefore, the vulnerability of Bulgaria to malaria transmission must be continually monitored (12).

^a For details see "Current and future climate hazards".

^b These vulnerability factors are not comprehensive but rather examples of relevant vulnerability factors. Please see the WHO Quality Criteria for Health National Adaptation Plans for more details: <https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>.

^c See "National health response: health system capacity and adaptation" for the national response to vector distribution and ecology.

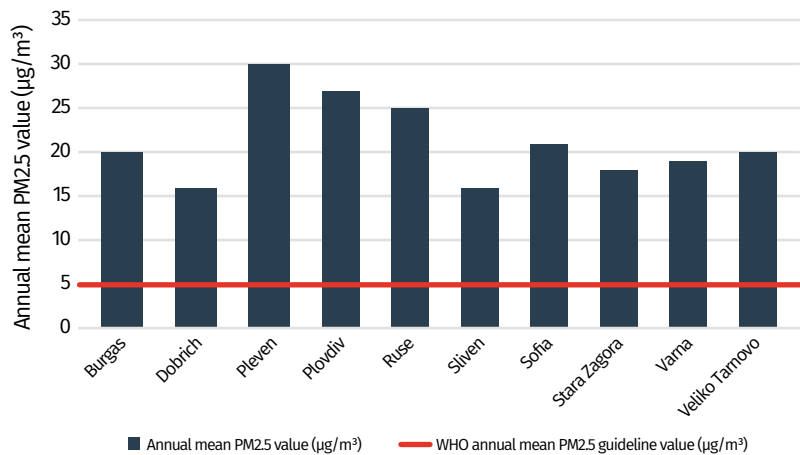
HEALTH RISKS DUE TO AIR POLLUTION

Many of the drivers of climate change, such as inefficient and polluting forms of energy and transport systems, also contribute to air pollution. Air pollution is now one of the largest global health risks, causing approximately seven million deaths every year. There is an important opportunity to promote policies that both protect the climate at a global level, and also have large and immediate health benefits at a local level.

EXPOSURES

All of the top ten most populated cities in Bulgaria for which air pollution data were available had annual mean PM_{2.5}^a levels that were above the WHO guideline value of 5 µg/m³ (see Figure 9) (13).

FIGURE 9: Annual mean PM_{2.5} in top ten most populated Bulgaria cities, for which data were available, compared with the WHO guideline value of PM_{2.5} of 5 µg/m³. Source: Ambient Air Pollution Database, WHO, 2018. A standard conversion has been used on some data points; see source for further details (13)



EXAMPLE VULNERABILITY FACTORS^b



Age
(e.g. the elderly and children)



Biological factors and health status
(e.g. pre-existing conditions)



Gender and equity



Geographical factors
(e.g. rural/urban areas)



Socioeconomic factors
(e.g. poverty)

HEALTH RISKS^c

Ambient air pollution can have direct and sometimes severe consequences for health. Fine particles, which penetrate deep into the respiratory tract, subsequently increase mortality from respiratory infections, lung cancer and cardiovascular disease.

8613

deaths from ambient air pollution in Bulgaria in 2016 (14)

29.5%

economic costs of premature deaths from ambient particulate matter pollution and household air pollution as a percentage of GDP (2010) (15)

^a PM_{2.5} is atmospheric particulate matter (PM) with a diameter of <2.5 µm.

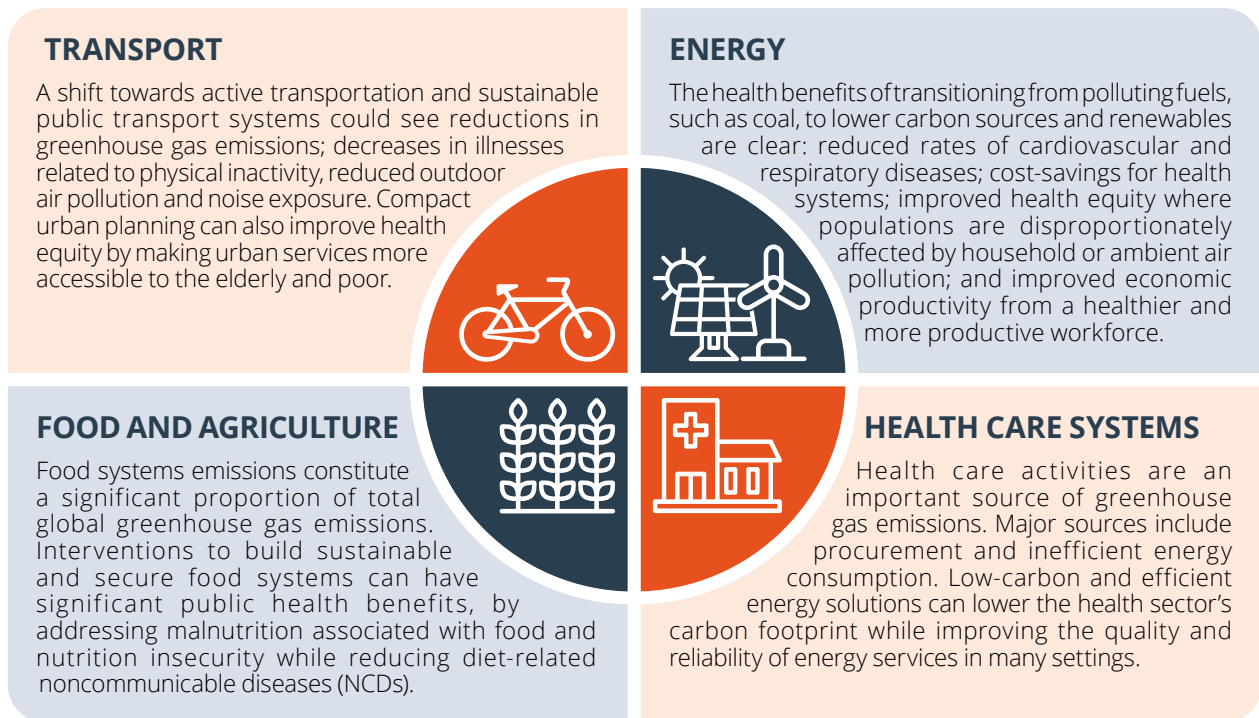
^b These vulnerability factors are not comprehensive but rather examples of relevant vulnerability factors. Please see the WHO Quality Criteria for Health National Adaptation Plans for more details: <https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>.

^c See "National health response: health system capacity and adaptation" for the national response to air pollution.

HEALTH CO-BENEFITS FROM CLIMATE CHANGE MITIGATION

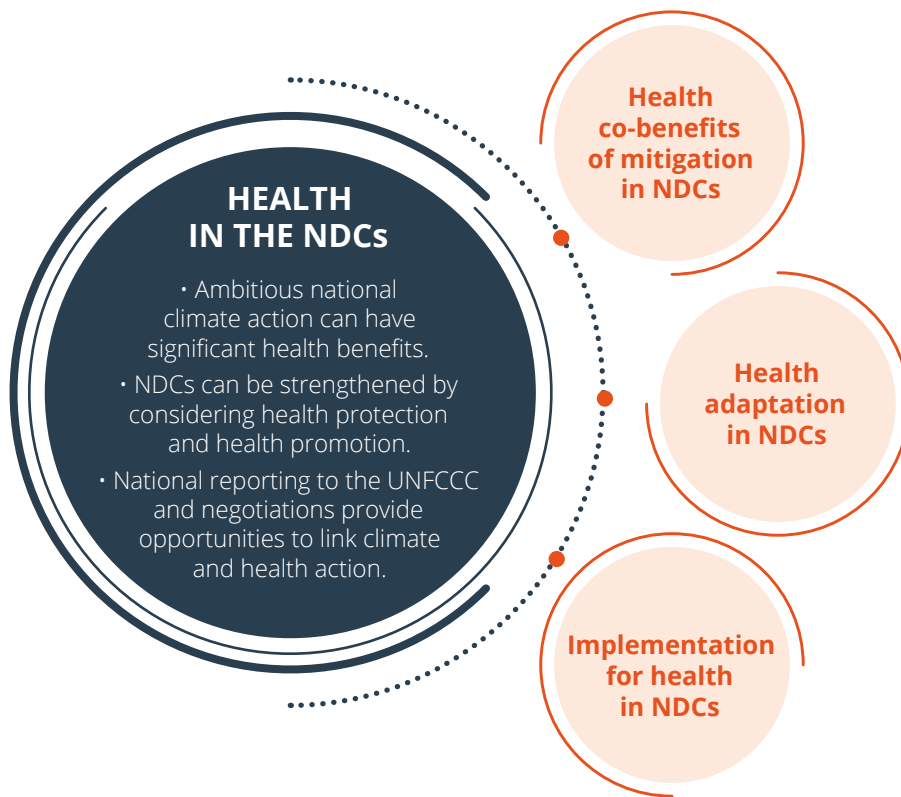
Health co-benefits are local, national and international measures with the potential to simultaneously yield large, immediate public health benefits and reduce greenhouse gas emissions.

GLOBAL EXAMPLES



NATIONAL RESPONSE

HEALTH IN THE NATIONALLY DETERMINED CONTRIBUTION (NDC)



The EU NDC does not outline specific health adaptation targets (4).

NATIONAL HEALTH RESPONSE: HEALTH SYSTEM CAPACITY AND ADAPTATION

The following section measures progress in the health sector in responding to climate threats based on country reported data collected in the WHO Health and Climate Change Global Survey (17).

GOVERNANCE AND LEADERSHIP



National planning for health and climate change

Has a national health and climate change strategy or plan been developed? ^a	
Title: National Climate Change Adaptation Strategy and Action Plan	<input checked="" type="radio"/>
Year: 2019	
Content	
Are health adaptation priorities identified in the strategy/plan?	<input checked="" type="radio"/>
Are the health co-benefits of mitigation action considered in the strategy/plan?	<input type="radio"/>
Have performance indicators been identified?	<input checked="" type="radio"/>
Level of implementation of the strategy/plan	<input type="radio"/>
Portion of estimated costs to implement the strategy/plan covered in the health budget	<input type="radio"/>

yes
 no
 unknown / not applicable

Intersectoral collaboration to address climate change

Is there an agreement in place between the ministry of health and this sector which defines specific roles and responsibilities in relation to links between health and climate change policy?

Sector ^b	Agreement in place
 Transportation	<input type="radio"/>
 Electricity generation	<input type="radio"/>
 Household energy	<input type="radio"/>
 Agriculture	<input type="radio"/>
 Social services	<input type="radio"/>
 Water, sanitation and waste-water management	<input type="radio"/>

yes
 no
 unknown / not applicable

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

^b Specific roles and responsibilities between the national health authority and the sector indicated are defined in the agreement.

EVIDENCE AND IMPLEMENTATION

Vulnerability and adaptation assessment for health

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



Title: Analysis and assessment of the vulnerability of Bulgarian economy sectors from climate change. Government of Bulgaria; 2020

Year: 2020

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



● yes ● no ○ unknown / not applicable

Integrated risk monitoring and early warning






Climate-sensitive diseases and health outcomes	Health surveillance system exists ^a	Health surveillance system includes meteorological information ^b	Climate-informed health early warning system (EWS) in place
Thermal stress (e.g. heat waves)	●	●	●
Vector-borne diseases	●	●	●
Foodborne diseases	●	●	●
Waterborne diseases	●	●	●
Nutrition (e.g. malnutrition associated with extreme climatic events)	●	●	●
Injuries (e.g. physical injuries or drowning in extreme weather events)	●	●	●
Mental health and well-being	●	●	●
Airborne and respiratory diseases	●	●	●

● yes ● no ○ unknown / not applicable

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

^b Meteorological information refers to either short-term weather information, seasonal climate information or long-term climate information.


Emergency preparedness

Climate hazard	Early warning system in place	Health sector response plan in place	Health sector response plan includes meteorological information
 Heat waves	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 Storms (e.g. hurricanes, monsoons, typhoons)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 Flooding	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 Drought	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
 Air quality (e.g. particulate matter, ozone levels)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

yes no unknown / not applicable


CAPACITY, INFRASTRUCTURE AND SUSTAINABILITY

Human resource capacity

	International Health Regulations (IHR) Monitoring Framework Human Resources Core Capacity (2018) (18)	60%
	Does your human resource capacity, as measured through the IHR, adequately consider the human resource requirements to respond to climate-related events?	<input checked="" type="radio"/>
	Is there a national curriculum developed to train health personnel on the health impacts of climate change?	<input checked="" type="radio"/>

yes no unknown / not applicable

Health care facilities, infrastructure and technology

	Has there been an assessment of the climate resilience of any public health care facilities?	<input checked="" type="radio"/>
	Have measures been taken to increase the climate resilience of health infrastructure and technology?	<input checked="" type="radio"/>
	Is there a national initiative/programme in place to promote the use of low-carbon, energy-efficient, sustainable technologies in the health sector?	<input checked="" type="radio"/>

yes no unknown / not applicable

OPPORTUNITIES FOR ACTION



1. STRENGTHEN MULTISECTORAL COLLABORATION ON HEALTH AND CLIMATE CHANGE

There are no multisectoral agreements in place on climate change and health. Enhance collaboration between health and health-determining sectors with agreements on climate change and health action (e.g. with transport, energy, water and sanitation, national meteorological and hydrological services sectors). Promote climate mitigation and adaptation policies that protect and promote health and strengthen health systems.



2. STRENGTHEN INTEGRATED RISK SURVEILLANCE AND HEALTH EARLY WARNING SYSTEMS

Meteorological information is not currently used to inform risk surveillance of climate-sensitive diseases. The use of climate/weather information can be integrated into health surveillance systems and used to predict outbreaks of climate-sensitive diseases (i.e. climate-informed health early warning systems) to help ensure a preventive approach to specific climate-sensitive health programmes.



3. ASSESS THE HEALTH CO-BENEFITS OF NATIONAL CLIMATE MITIGATION POLICIES

Health co-benefits of mitigation are currently not included in Bulgaria's Nationally Determined Contribution (NDC). Ensure that climate mitigation policies include the health risks posed by climate change, identify health adaptation priorities and measure and optimize the health co-benefits of climate mitigation action.



4. BUILD CLIMATE-RESILIENT AND ENVIRONMENTALLY SUSTAINABLE HEALTH CARE FACILITIES

Measures can be taken to prevent the potentially devastating impacts of climate change on health care facilities and health service provision while decreasing the climate and environmental footprint of health care facilities. A commitment towards climate-resilient, environmentally sustainable health care facilities can improve system stability, promote a healing environment and mitigate climate change impacts.

WHO RESOURCES FOR ACTION

-  **Operational framework for building climate-resilient health systems**
<https://www.who.int/publications/i/item/operational-framework-for-building-climate-resilient-health-systems>
-  **WHO guidance to protect health from climate change through health adaptation planning**
<https://www.who.int/publications/i/item/who-guidance-to-protect-health-from-climate-change-through-health-adaptation-planning>
-  **Quality Criteria for Health National Adaptation Plans**
<https://www.who.int/publications/i/item/quality-criteria-health-national-adaptation-plans>
-  **Protecting health from climate change: vulnerability and adaptation assessment**
<https://www.who.int/publications/i/item/protecting-health-from-climate-change-vulnerability-and-adaptation-assessment>
-  **Integrated risk surveillance and health early warning systems**
<https://www.who.int/activities/supporting-countries-to-protect-human-health-from-climate-change/surveillance-and-early-warning>
-  **WHO guidance for climate-resilient and environmentally sustainable health care facilities**
<https://www.who.int/publications/i/item/9789240012226>
-  **Heat early warning systems guidance**
<https://www.who.int/publications/i/item/heatwaves-and-health-guidance-on-warning-system-development>
-  **Climate services for health fundamentals and case studies**
<https://public.wmo.int/en/resources/library/climate-services-health-case-studies>
-  **Climate-resilient water safety plans**
<https://www.who.int/publications/i/item/9789241512794>

REFERENCES

1. Seventh National Communication on Climate Change. United Nations Framework Convention on Climate Change. Republic of Bulgaria, SOFIA; 2018 (https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/274195_Bulgaria-BR3-NC7-1-VII_NC_Bulgaria_2018.pdf, accessed 20 October 2021).
2. Data: Bulgaria. World Bank Group; 2020 (<https://data.worldbank.org/country/bulgaria>, accessed 17 November 2020).
3. National Climate Change Adaptation Strategy and Action Plan. Republic of Bulgaria; 2019 (<https://www.globalwps.org/data/BGR/files/National%20Climate%20Change%20Adaptation%20Strategy%20and%20Action%20Plan.pdf>, accessed 20 October 2021).
4. Update of the Nationally Determined Contribution of the EU and its Member States. Submission by Germany and the European Commission on Behalf of the European Union and its Member States; 2020 (https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/European%20Union%20First/EU_NDC_Submission_December%202020.pdf, accessed 20 October 2021).
5. Analysis and assessment of the vulnerability of Bulgarian economy sectors from climate change. Government of Bulgaria; 2014 (https://www.moew.government.bg/static/media/ups/articles/attachments/Specialna_chat929dbdd9d9a2e4690311a63dd80adda6.pdf, accessed 11 March 2021).
6. Kendrovski V, Baccini M, Martinez GS, Wolf T, Paunovic E, Menne B. Quantifying projected heat mortality impacts under 21st-century warming conditions for selected European countries. *Int J Environ Res Public Health*. 2017;14(7):729. doi: 10.3390/ijerph14070729.
7. Romanello M, McGushin A, Di Napoli C, Drummond P, Hughes N, Jamart L et al. The 2021 report of the Lancet countdown on health and climate change: code red for a healthy future. *Lancet*. 2021;398(10311):1619–62. doi: 10.1016/S0140-6736(21)01787-6.
8. The Lancet. Explore our data (website). Lancet countdown: tracking progress on health and climate change (<https://www.lancetcountdown.org/data-platform/>, accessed 22 November 2021).
9. Climate Change Knowledge Portal: Bulgaria. World Bank Group; 2020 (<https://climateknowledgeportal.worldbank.org/country/bulgaria>, accessed 16 October 2020).
10. Aqueduct Flood Risk Data. World Resources Institute [website]. Aqueduct; 2020 (<https://www.wri.org/aqueduct>, accessed 20 October 2021).
11. Water Security in Bulgaria. World Bank Group; 2017 (<https://www.worldbank.org/en/events/2017/09/18/water-security-in-bulgaria>, accessed 16 October 2020).
12. Kaftandjiev IK. Characteristics of imports and assessment of the possibility of malaria recovery in Bulgaria in the face of global climate change. PhD Thesis. National Center of Infectious and Parasitic Diseases, Sofia; 2019 (<https://www.ncipd.org/images/UserFiles/File/IskrenKaftanjiev/ABSTRACT-ENGLISH.pdf>, accessed 11 March 2021).
13. Ambient Air Pollution Database, WHO; 2018 (<https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/ambient-air-pollution>, accessed 20 October 2021).
14. Ambient air pollution – Deaths by country. Geneva: World Health Organization, Global Health Observatory data repository; 2016 (<http://apps.who.int/gho/data/node.main.BODAMBIENTAIRDTHS>, accessed 10 June 2019).
15. Economic cost of the health impact of air pollution in Europe: clean air, health and wealth. WHO Regional Office for Europe, OECD; 2015. Copenhagen: WHO Regional Office for Europe (https://www.euro.who.int/_data/assets/pdf_file/0004/276772/Economic-cost-health-impact-air-pollution-en.pdf, accessed 20 October 2021).
16. UNFCCC Greenhouse Gas Inventory: Bulgaria. UNFCCC; 2020 (https://di.unfccc.int/ghg_profile_annex1, accessed 16 October 2020).
17. Climate and health country survey (part of the WHO UNFCCC Health and Climate Change Country Profile Project). Geneva: World Health Organization; 2021 (<https://www.who.int/globalchange/resources/countries/en/>, accessed 18 October 2021).
18. International health regulations (2005) monitoring framework. State Party self-assessment annual reporting tool (e-SPAR). Geneva: World Health Organization; 2019 (<https://extranet.who.int/e-spar>, accessed 9 May 2019).

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