SLOVAKIA

HEALTH AND CLIMATE CHANGE
COUNTRY PROFILE 2021

World Health Organization

United Nations
Framework Convention on
Climate Change

CONTENTS

ACKNOWLEDGEMENTS

This document was developed in collaboration with the Ministry of Health, the World Health Organization (WHO), the WHO Regional Office for Europe and the United Nations Framework Convention on Climate Change (UNFCCC). Financial support for this project was provided by the Norwegian Agency for Development Cooperation (NORAD) and the Wellcome Trust.

HOW TO USE THIS PROFILE

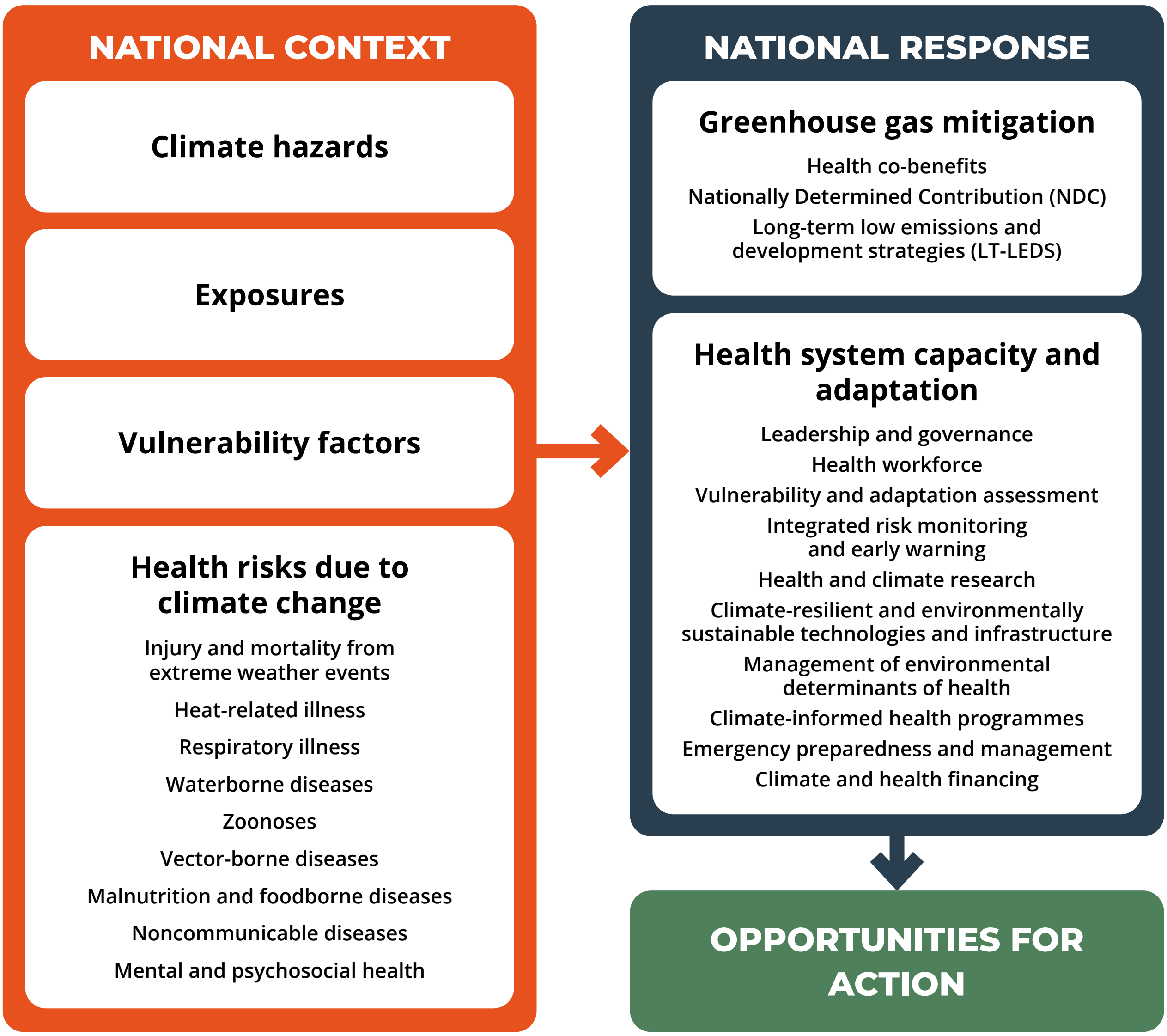
This health and climate change country profile presents a snapshot of country-specific climate hazards, climate-sensitive health risks and potential health benefits of climate change mitigation. The profile is also a key tool in monitoring national health sector response to the risk that climate variability 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 Central Europe, Slovakia varies between extensive lowlands in the south and the Western Carpathian Mountains in the north *(1)*. Classified as a high-income country, the Slovak economy has grown in recent years, mainly due to household consumption and exports of goods *(2,3)*. Slovakia's population is mainly concentrated in towns, lowlands and basins; it also has an ageing population *(1)*.

Slovakia's climate is mild and precipitation is generally equally distributed throughout the year. However, Slovakia has faced a significant increase in air temperature, changes in precipitation, desertification, and flash floods. These climatic changes have resulted in decreased agricultural production and loss of biodiversity. Health risks of climate change in Slovakia include heat stress, respiratory diseases, mental ill-health, and waterborne and foodborne diseases *(1)*.

Slovakia, 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)*. The National Strategy on Adaptation to Climate Change includes health adaptation measures, such as increasing medical facilities readiness in case of extreme events, integrating monitoring systems for foodborne diseases, and strengthening vaccination programmes *(5)*.

CLIMATE-SENSITIVE HEALTH RISKS – SLOVAKIA

Health risks	
Health impacts of extreme weather events	yes
Heat-related illnesses	yes
Respiratory illnesses	yes
Waterborne diseases and other water-related health impacts	no
Zoonoses	yes
Vector-borne diseases	yes
Malnutrition and foodborne diseases	yes
Noncommunicable diseases	yes
Mental/psychosocial health	yes
Impacts on health care facilities	no
Effects on health systems	no
Health impacts of climate-induced population pressures	no

● yes ● no ○ unknown / not applicable

Source: List of climate-sensitive health risks adapted from the Quality Criteria for Health National Adaptation Plans, WHO (2021) *(6)*.

CURRENT AND FUTURE CLIMATE HAZARDS

CLIMATE HAZARD PROJECTIONS FOR SLOVAKIA

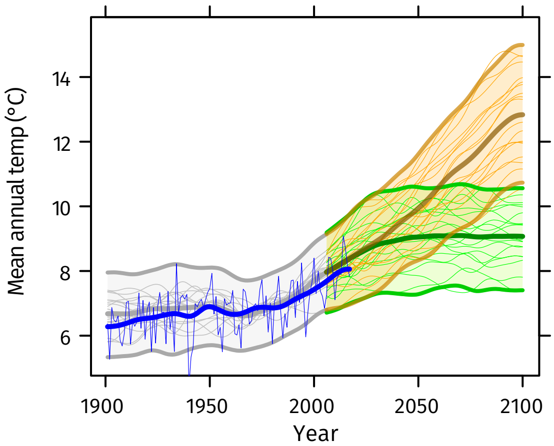
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' (BAU) high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

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

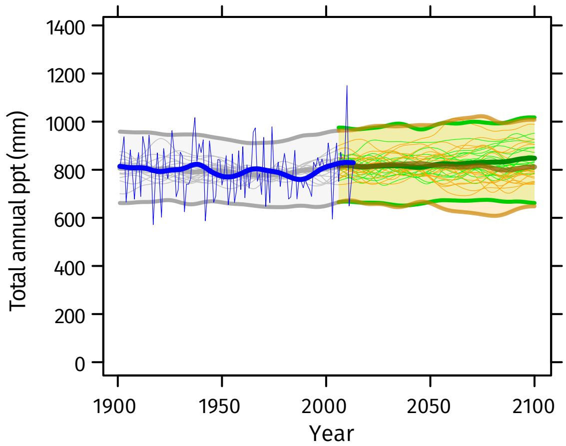
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the mean annual temperature is projected to rise by about 4.7°C on average by the end-of-century (i.e. 2071–2100 compared with 1981–2010). If emissions decrease rapidly, the temperature rise is limited to about 1.6°C.

Little change in total precipitation

FIGURE 2: Total annual precipitation, 1900–2100



Total annual precipitation is projected to remain almost unchanged under a high emissions scenario, although the uncertainty range is large (-10% to +15%). If emissions decrease rapidly, there is little projected change on average: an increase of 4% with an uncertainty range of -2% to +13%.

NOTES

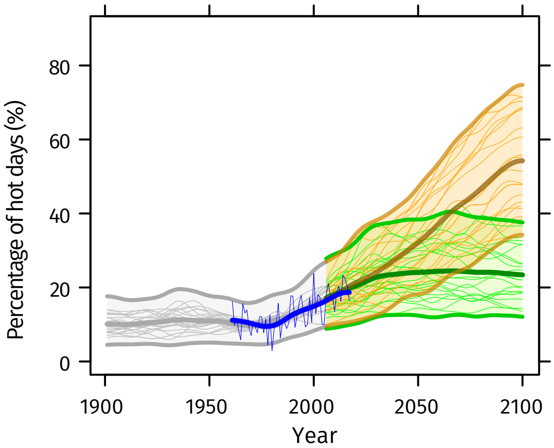
[a] Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.

[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

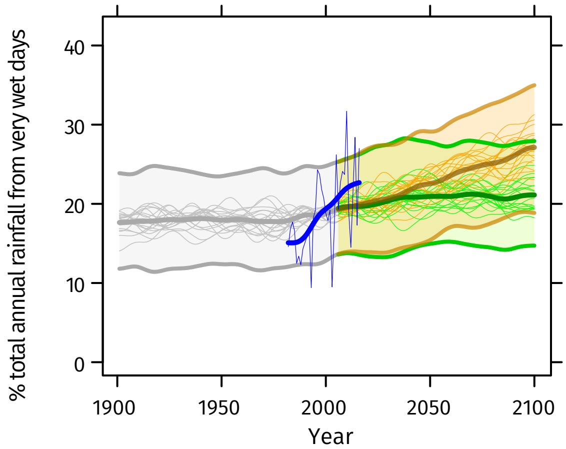
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[d] is projected to increase from about 15% of all days on average in 1981–2010 (10% in 1961–1990). Under a high emissions scenario, about 50% of days on average are defined as 'hot' by the end-of-century. If emissions decrease rapidly, about 25% of days on average are 'hot'. Similar increases are seen in hot nights[d] (not shown).

Increase in extreme rainfall

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

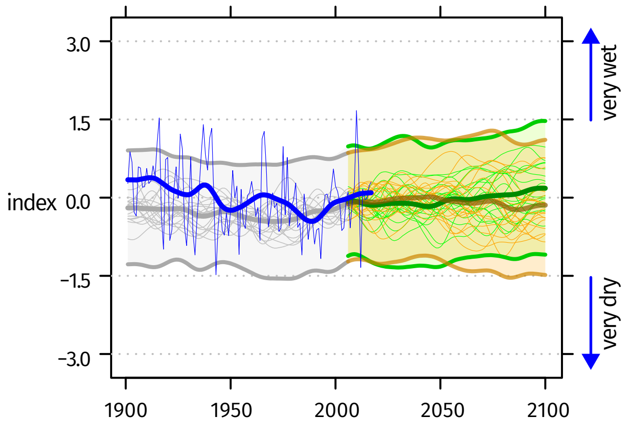


Under a high emissions scenario, the proportion of total annual rainfall from very wet days[e] (about 20% for 1981–2010) could increase by the end-of-century (to about 25% on average with an uncertainty range of about 20% to 35%), with little change if emissions decrease rapidly. These projected changes are accompanied by little or no change in total annual rainfall (see Figure 2).

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.



SPI12 values show little projected change from about -0.2 on average, though year-to-year variability remains large. A few models indicate larger decreases (more frequent/intense dry/drought events), particularly under a high emissions scenario, or increases (more frequent/intense wet events), particularly if emissions decrease rapidly.

[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 4.7°C mean annual temperature rise by the end-of-century.

About 50% 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 Slovakia 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 *(7)*