TURKEY

HEALTH AND CLIMATE CHANGE
COUNTRY PROFILE 2022

World Health Organization

United Nations
Framework Convention on
Climate Change

CONTENTS

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HOW TO USE THIS PROFILE

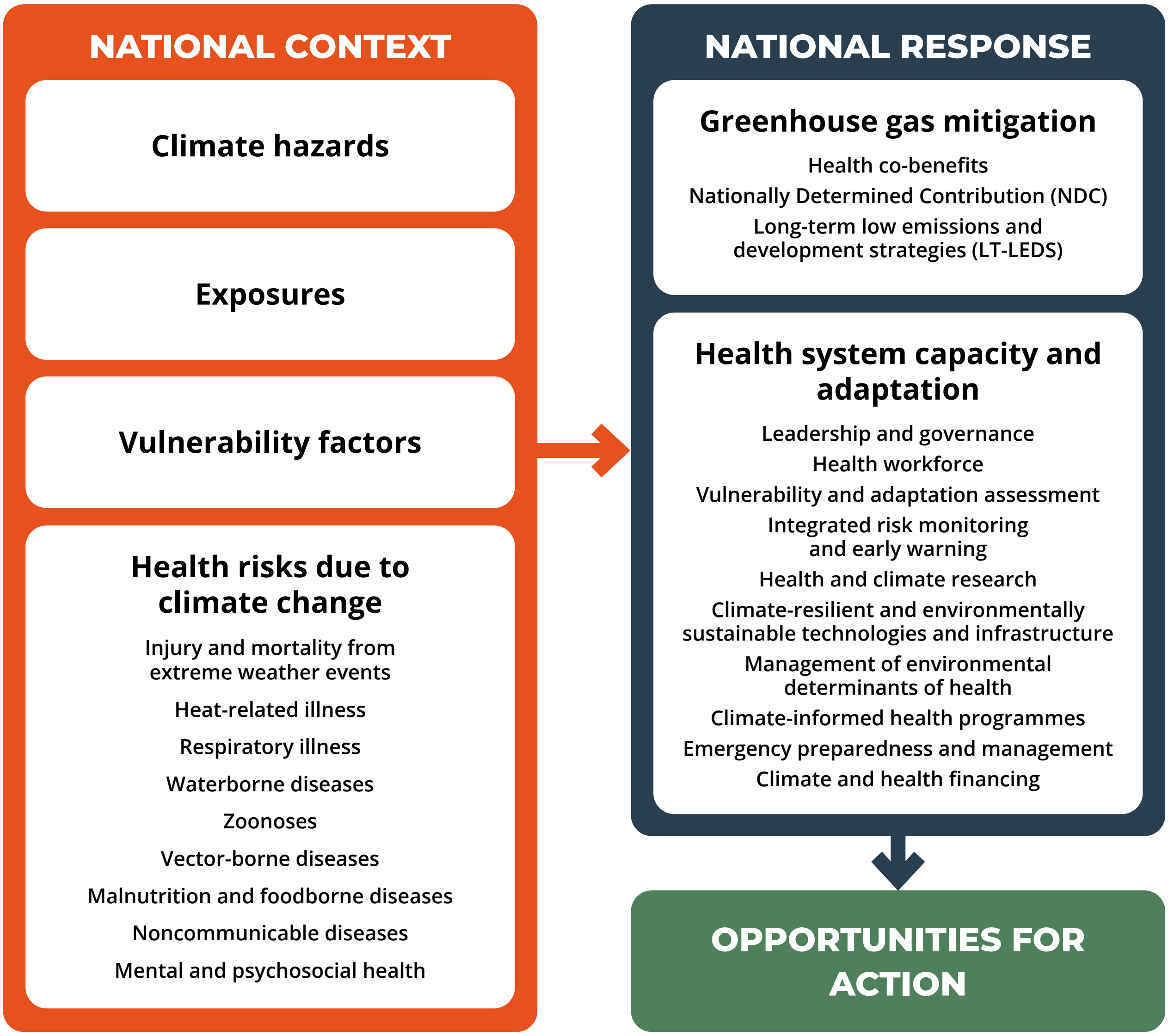
This health and climate change country profile presents a snapshot of country-specific climate hazards, climate-sensitive health risks and potential health benefits of climate change mitigation. The profile is also a key tool in monitoring national health sector response to the risk that climate variability 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 on the border of Europe and Asia, Turkey has a land area of 785 347 km^2 and a coastline of 8592 km. The Turkish economy is predominantly dependent on the service sector, industry and agriculture *(1–3)*. The Turkish population has increased in the last ten years, and it is estimated that it will continue to increase at least until 2050; an increase has also been observed in the urban population of Turkey *(1)*.

Turkey's climate is highly variable due to its differing topographical features. Rising temperatures, increasing hot days, and changing precipitation patterns are already being observed in Turkey. Water stress and reduction in agricultural production occur as a result of such climate changes. The health risks arising from climate change include waterborne, vector-borne and foodborne diseases; respiratory diseases caused by air pollution; and heat stress *(1)*. Turkey’s forests are expected to be at particular risk from climate change, due to more frequent extreme events, such as floods, storms, wildfires, insect outbreaks, invasive species, and landslides *(4,5)*. Furthermore, changing precipitation patterns, including droughts, are predicted to decrease forest productivity overall (although some forest areas may experience increased productivity due to longer growing seasons and more plentiful water); reduce forest biodiversity; and alter tree species distribution between now and 2080 *(6)*. Overall, climate change threatens some of the valuable products and services provided by Turkey’s forests, and could undermine the vital role these forests play in adaptation to climate change in Turkey *(7)*.

The objective of Turkey’s NDC is to reduce greenhouse gas emissions by 21% by 2030, below the business-as-usual estimates *(8)*. Turkey’s National Adaptation Strategy for Climate Change includes a series of health adaptation measures, such as monitoring the health effects of extreme weather events and preparing guidelines to inform citizens about what to do in case of communicable diseases *(9)*.

CLIMATE-SENSITIVE HEALTH RISKS – TURKEY

Health risks	
Health impacts of extreme weather events	○
Heat-related illnesses	○
Respiratory illnesses	● [a]
Waterborne diseases and other water-related health impacts	● [b]
Zoonoses	● [c]
Vector-borne diseases	● [c]
Malnutrition and foodborne diseases	● [d]
Noncommunicable diseases	●
Mental/psychosocial health	○
Impacts on health care facilities	○
Effects on health systems	● (grey)

● yes ● (grey) no ○ unknown / not applicable

Source: List of climate-sensitive health risks taken from the Quality Criteria for Health National Adaptation Plans *(10)*.

[a] For more information on the Health Approach to Turkey's Air Pollution and Climate Change Problems, please see: https://hsgm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-engelli-db/hastaliklar/kronik_havayolu/kitap_ve_makaleler/Turkiyenin_Hava_Kirliligi_ve_Iklim_Degisikligi.pdf

[b] Waterborne diseases (including cholera, salmonella and acute bowel infections) are constantly monitored, recorded and researched in Turkey. For example, an Early Warning Response Unit exists for acute bowel infections.

[c] For more information on Turkey’s Zoonotic Diseases Action Plan, please see: https://hsgm.saglik.gov.tr/depo/birimler/zoonotik-vektorel-hastaliklar-db/daire-baskanligi/eylem_plani/Zoonotik_Hastaliklar_Eylem_Pani.pdf

[d] Foodborne diseases are constantly monitored, recorded and researched in Turkey. For more information on Turkey’s nutrition and health research, please see: https://hsgm.saglik.gov.tr/depo/birimler/saglikli-beslenme-hareketli-hayat-db/Yayinlar/kitaplar/TBSA_RAPOR_KITAP_20.08.pdf

CURRENT AND FUTURE CLIMATE HAZARDS

CLIMATE HAZARD PROJECTIONS FOR TURKEY [a]

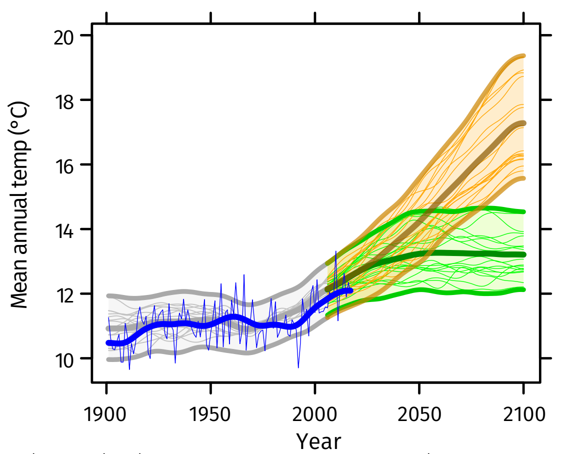
Country-specific projections are outlined up to the year 2100 for climate hazards under a 'business as usual' (BAU) high emissions scenario compared to projections under a 'two-degree' scenario with rapidly decreasing global emissions (see Figures 1–5).

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).[b] The text describes the projected changes averaged across about 20 global climate models (thick line). The figures[c] 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).[d] 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

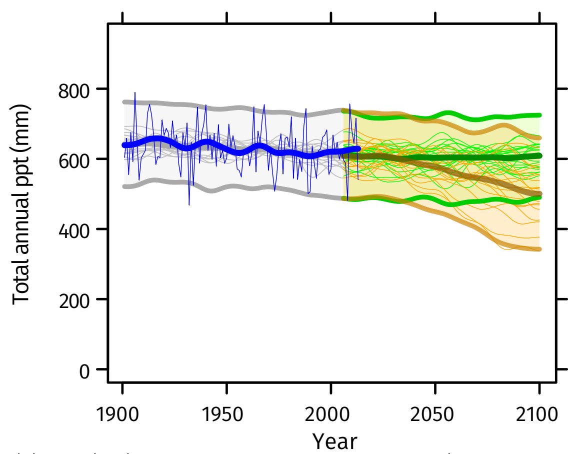
FIGURE 1: Mean annual temperature, 1900–2100



Under a high emissions scenario, the average annual temperature is projected to increase by an average of 4.9°C by the end-of-century (for 2071–2100, compared to 1981–2010). If emissions decrease rapidly, the temperature rise is limited to around 1.5°C.

Decrease in total precipitation

FIGURE 2: Total annual precipitation, 1900–2100



Although the uncertainty range is wide (-36% to +1%), the annual total precipitation is projected to decrease by an average of 15% under the high emissions scenario. If emissions are reduced rapidly, there will be little change, estimated on average with an uncertainty range of -6% to +3%.

NOTES

[a] National projections may be available. For more information, please see: https://www.mgm.gov.tr/iklim/iklim-degisikligi.aspx form.

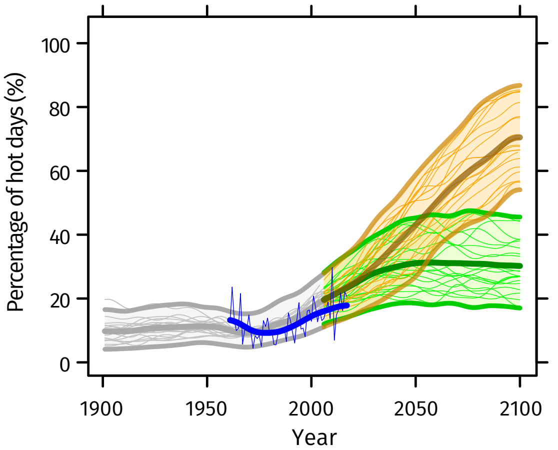
[b] Model projections are from CMIP5 for RCP8.5 (high emissions) and RCP2.6 (low emissions). Model anomalies are added to the historical mean and smoothed.

[c] 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.

[d] Analysis by the Climatic Research Unit, University of East Anglia, 2018.

Higher temperatures

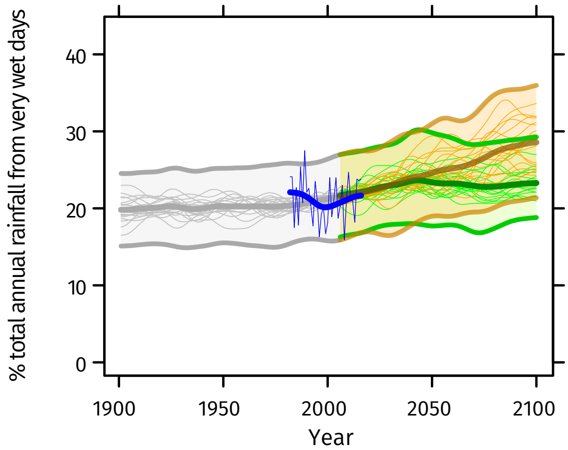
FIGURE 3: Percentage of hot days ('heat stress'), 1900–2100



The percentage of hot days[e] is predicted to increase significantly, compared to around 15% of all days between 1981 and 2010 (compared to 10% between 1961 and 1990). Under the high emissions scenario, on average about 65% of days are described as 'hot' for until the end-of-century. If emissions are reduced rapidly, on average about 30% of days will be 'hot'. But it should be noted that over the past few years, models have tended to overestimate the increase observed on hot days. Similar increases can be observed at hot nights[e] (not presented here).

Increase in heavy precipitation

FIGURE 4: Contribution to total annual precipitation from heavy precipitation days ('heavy precipitation' and 'flood risk'), 1900–2100

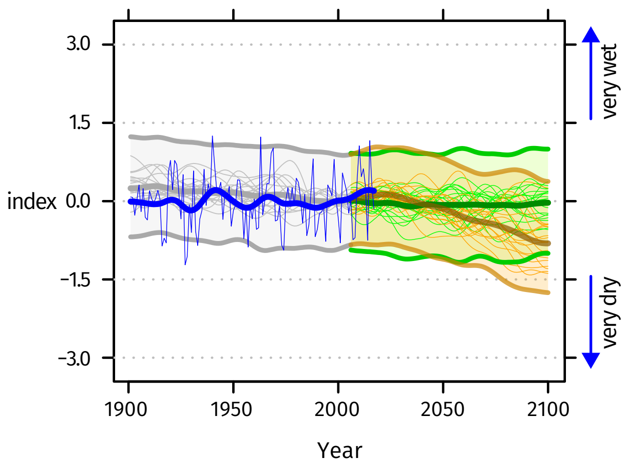


Under a high emissions scenario, the proportion of total annual rainfall from very wet days[f] (about 20% for 1981–2010) could increase by the end-of-century (to about 30% on average with an uncertainty range of about 20% to 35%), with little change if emissions decrease rapidly. These projected changes are accompanied by a decrease in total annual rainfall under a high emissions scenario (see Figure 2).

Drought frequency and intensity

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

The Standard Precipitation Index (SPI) is a widely used drought index that expresses the lack/excess of precipitation over varying time scales ranging from 1 to 36 months (here 12 months, SPI12). It also shows the variation in frequency and/or intensity of extreme dry conditions and extreme precipitation conditions relative to average local conditions. SPI does not consist of units but can be used to classify different degrees of drought (rain): Over +2.0 extremely rainy; +2.0 to +1.5 heavily rainy; +1.5 to +1.0 moderately rainy; +1.0 to +0.5 mildly rainy; +0.5 to -0.5 near normal conditions; -0.5 to -1.0 mild drought; -1.0 to -1.5 moderate drought; -1.5 to -2.0 severe drought; below -2.0, extreme drought.



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

[e] A 'hot day' (TX90p) is a day when maximum temperature exceeds the 90th percentile threshold for that time of the year.

[f] 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. R95pTOT: Annual percentage of P>95th percentile / PRCPTOT.

HEALTH RISKS DUE TO CLIMATE CHANGE
HEAT STRESS

CLIMATE HAZARDS[a]

Average annual temperature increase of up to 4.9°C by the end-of-century.

About 65% 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: Heat-related mortality for elderly individuals (over 65 years old) according to high and low emissions scenarios.[d] Source: Honda et al. (2015) *(11)*