



UNDP Climate Information & Early Warning Systems

Supporting Livelihoods and Protecting Lives in a Changing Climate

Climate Information UNDP Approach

1

Build Services

Ensure people receive climate info

2

End to End Approach

Identify gaps – build tailored solutions

3

Promote Innovation

Lower-cost technology

Climate Information

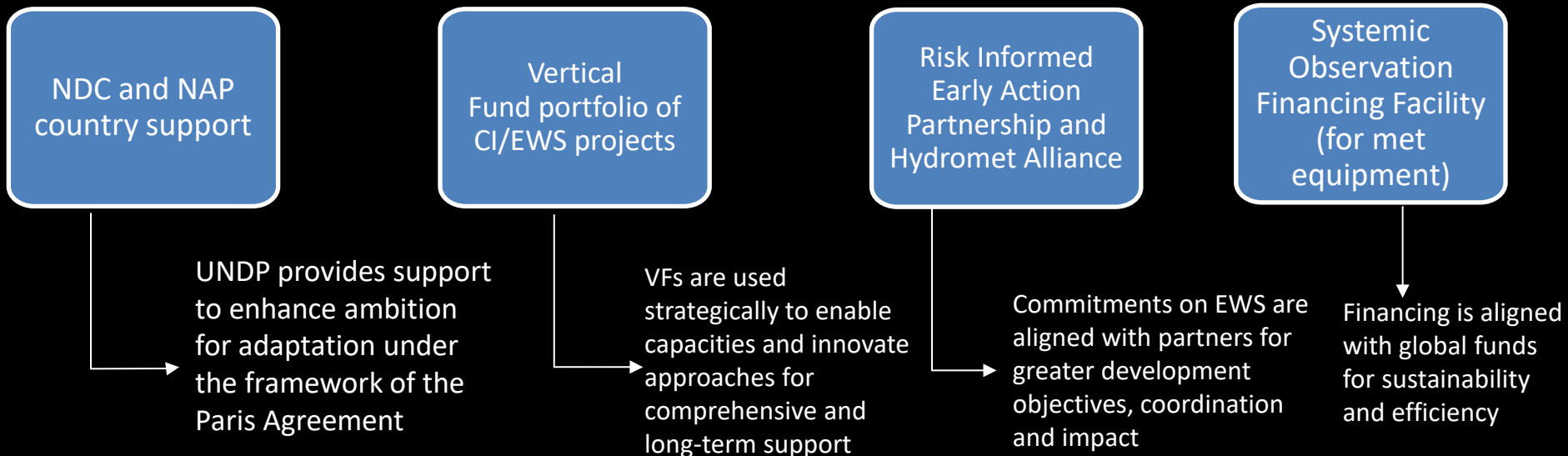
- ▶ Weather and climate data
timely, accessible, understandable
- ▶ Make informed decisions
survive in a changing climate
- ▶ Impact
human lives, health, food security,
infrastructure

UNDP's Support for the SG's Early Warning for All

"By the end of 2027 everyone on Earth will be protected from hazardous weather, water, or climate events through life-saving early warning systems"

Secretary General's Pledge under the Early Warning for All Initiative

UNDP has the capacity to respond by aligning its work with countries and partners on EWS



Early Action, EW, and CI

Innovative technology	Funding early action	Resilient Livelihoods
<p>Private sector, government</p> <ul style="list-style-type: none"> • Mobile data collection of field instruments and vulnerability • Applications and SMS based warnings and advisories • Satellite monitoring of environment and impacts • AI tools to identify impacts and translate warnings/advisories • Engage mobile operators to use rain fade, cell broadcast tech. • Social media tools to monitor evolving events 	<p>Response agencies</p> <p>Establish and fund consistent and evidence-based early action</p> <ul style="list-style-type: none"> • Developing scientific and data driven triggers for action • Early action protocols and standard operating procedures • Establishing early action funds and contingency plans (reduce damage) • Forecast based financing • Innovative use of risk financing- insurance and bonds • Integrating climate risk in financial planning and investments 	<ul style="list-style-type: none"> • Sector specific advisories and value chain services to support revenue generation • Climate informed extension services • Mobile platforms with weather/climate information • Farmer feedback and workshops to help co-produce products • Multi channel communication (radio, Whatsapp, TV, etc) • Expand/strengthen district climate information centers • Parametric insurance



Observational Systems

- Investment in observational equipment (capacity assessments, maintenance capacities, standardization)
- Lake buoys + lightning detection for forecasting severe weather
- Product development for tailored early warning alerts
- Data processing for enhanced forecasting
- Incorporating remote sensing data
- Community monitoring protocols

Capacity building and regional coordination

- Improve regional forecasting capacities (climate and impact modelling)
- Support regional coordination of disaster management responses
- Establish regional technical support networks with academia
- Improve data sharing and knowledge exchange
- Support work with national agencies and global centres
- Enhancing community capacity for informed action

Disaster Risk Management

- Anticipatory Action and Disaster Preparedness
- Community-based EWS linked to national forecasts
- Strengthening area and village civil protection committees
- Water-level and stream flow gauges (manual + automatic)
- Hydraulic flood models and risk mapping
- Tailored alerts for coastal and marine areas
- Safety at sea through beach village committees



Examples of UNDP Work on EWS and Climate Information in the CAREC region

Multi Hazard EWS – Uzbekistan GCF

US\$ 10 mln (GCF) + co-finance
Duration: 2021-2027

Output 1 Upgraded hydro-meteorological observation network, modelling and forecasting capacities



- Upgrading and modernization of the hydrometeorological Observation System
- Upgrading Uzhydromet capacity to store, process and develop hazard products, and to communicate hydrometeorological data
- Re-training and advanced training of Uzhydromet staff

Output 2 A functional impact-based MHEWS based on innovative impact modelling, risk analyses, effective regional communication and community awareness



- A modernized system for assessing climate risks, including socio-economic risk models for decision making and prioritization of future resilience-building investments
- Technical guidance, institutional and coordination frameworks
- A system for information dissemination to provincial MES management centres and area-specific mobile alerts including an information visualization system

Output 3 Strengthened climate services and disaster communication to end-users



- Establishing National Framework for Climate Services
- Designing a sustainable business model for disaster-related information and services
- Strengthening disaster warning dissemination and communication with end-users

Multi Hazard EWS – Georgia GCF

US\$ 27 mln (GCF) + US\$ 38 mln (co-finance)

Duration: 2019-2026

Output 1 Expanded observation network and modelling capacities for reliable information on climate hazards, vulnerability and risks



- Procurement, installation and operationalization of new hydro meteorological monitoring equipment
- Climate sensitive hazard and risk maps
- Gender-sensitive socio-economic vulnerability assessments
- Multi-hazard disaster risk data repository with centralized information management, data protocols and knowledge portal

Output 2 MHEWS and new climate information products supported with regulations, coordination mechanism and institutional capacities



- Policy, regulatory and legal frameworks and institutional capacities for enhanced use of climate information and MHEWS
- Design and introduction of MHEWS for all 11 river basins
- Access and use of tailored climate weather information products and advise to farmers/agricultural enterprises
- Climate-informed basin-level multi hazard risk management plans and municipal multi-hazard response and preparedness plans

Output 3 Improved community resilience through the implementation of the MHEWS and priority risk reduction measures



- Community-based early warning schemes and community-based climate risk management
- Public awareness and capacity building to effectively deliver climate risk information for communities and local first responders
- Implementation of project selected from 13 short listed sites for location specific priority risk reduction interventions

Global UNDP/GCF Programme «Early Warning for All» (EW4All)

Investing 100M to scale up EWS and CI for increased resilience



GCF FINANCE is 100M in 3 Outcomes across 7 + 10 countries

Global partners: WMO, UNDRR, ITU, IFRC

Outcome 1: Development of a pipeline of projects that are investment ready

5M

Gap and needs assessments, technical and scientific support to upgrade hydromet infrastructure, harness remote sensing systems and develop surveys for vulnerability assessments (incl. Tajikistan)

Outcome 2: Sustained support for global coordination and support architecture for EW4All

6M

Data sharing frameworks, technical support through WMO Region Climate Centres, engagement with corporate and private sector partners

Outcome 3: End-to-end EWS that is inclusive and builds community resilience to climate hazards

89M

National level investments for impact-based forecasting, enhanced capacities for data processing, observation infrastructure, multi channel information systems for early alert dissemination

Antigua & Barbuda, Cambodia, Chad, Ecuador, Ethiopia, Fiji, Somalia (all targeted through the SG's EW4All)

Central Asia – Regional Engagements

- UNDP/UNDRR mapping study on EWS across Central Asia (2024) identified key actors, their roles, and gaps in stakeholder engagement, and provided recommendations for improving existing EWS.
<https://www.undp.org/eurasia/publications/early-warning-systems-stakeholders-mapping-exercise-across-central-asia>
- Regular CA DRR Ministerial Forums facilitated by UNDP
- [A Joint Appeal](#) to the UNSG by the Heads of emergency management authorities in 5 CA counties requesting support to a Regional Early Warning and Information System under the EW4All - an outcome of the 2023 CA Ministerial Forum.
- EU-funded *Climate change and resilience in Central Asia*: community-level EWS pilots in Fergana Valey (Kyrgyzstan, Tajikistan and Uzbekistan)
- DRR and preparedness actions: satellite GLOF monitoring and warning

Central Asia: Urban Resilience to Disaster Risk and Climate Change



Boosting urban resilience to disaster and climate-driven risks in Central Asia by utilizing regional collaborative mechanisms and national transformational strategies, fostering sustainable and resilient futures...

KEY BARRIERS

- **Reactive Systems:** Tendency to focus on disaster response rather than risk management and adaptation.
- **Risk Understanding:** Limited anticipation of emerging risks and systemic challenges.
- **Integration Gap:** Limited coordination between climate, disaster risk, and urban planning.
- **Governance Issues:** Weak urban risk governance and unclear stakeholder roles.
- **Unplanned Growth:** Rapid, unplanned urbanization worsens climate-related risks and infrastructure vulnerability.
- **Data Deficiency:** Insufficient local data impedes effective decision-making.
- **Limited Capacity:** Inadequate human resources and risk financing mechanisms.
- **Lack of Inclusiveness:** Limited community involvement in urban planning.
- **Private Sector Role:** Insufficient engagement in managing climate and disaster risks.
- **Innovation Shortfall:** Lack of integration of smart city solutions and innovations.

Central Asia: Urban Resilience to Disaster Risk and Climate Change



OUTPUT 1: REGIONAL COLLABORATIVE MECHANISM FOR URBAN RESILIENCE

Activity 1.1: Promote and guide regional urban resilience-building efforts.

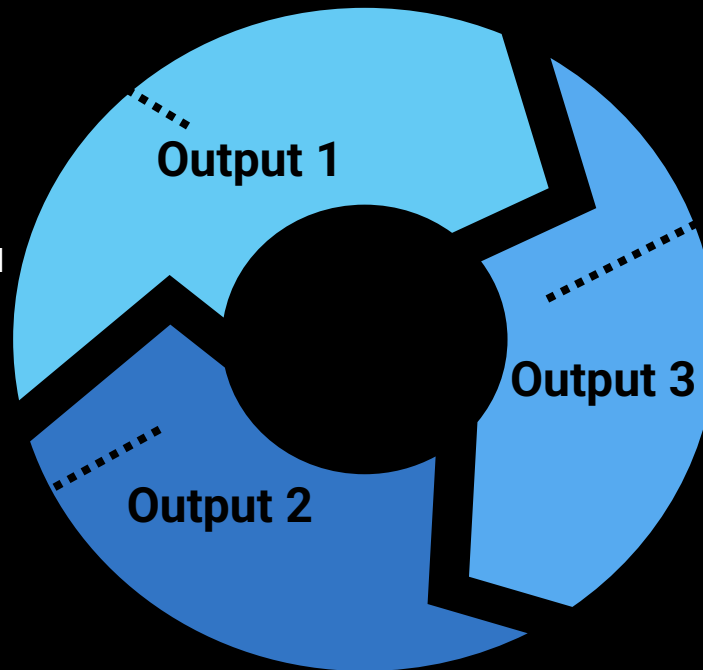
Activity 1.2: Strengthen regional urban resilience-building capacities.

Activity 1.3: Support and advance regional urban resilience dialogue.

OUTPUT 2: TRANSFORMATIVE RISK GOVERNANCE FOR URBAN RESILIENCE

Activity 2.1: Enhance urban planning through improved risk assessment and governance.

Activity 2.2: Introduce risk-informed and collaborative urban planning approaches.



OUTPUT 3: INNOVATIVE ADAPTATION AND RISK REDUCTION MEASURES

Activity 3.1: Generate an inclusive portfolio of innovative urban resilience projects.

Activity 3.2: Promote practical urban resilience solutions for sustainable risk financing.

Investment Opportunities: Climate and Health Early Action, EW, and Climate Information



Global GCF/UNDP/WHO proposal on Climate and Health (concept)

GCF proposal for 15 countries; US\$64 mln (GCF); US\$58 mln (co-finance)

Output 1 Multi-partner co-investment facility for transformative action on climate and health

Output 2 Policy, knowledge, and investment frameworks for 15 countries to deliver on their COP26 Climate and Health Commitments (incl. Georgia)

Output 3: Innovative climate solutions for climate resilient and sustainable healthcare systems and facilities

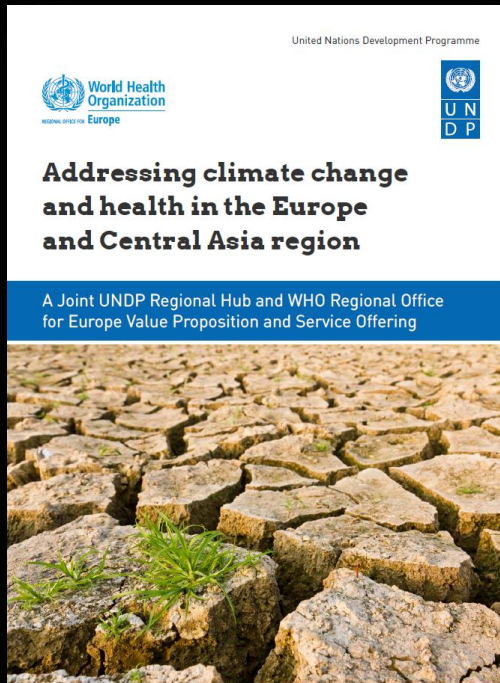
Relevant activities:

Enhance climate and health knowledge, data and information systems: design climate-informed health EWSs

Implement integrated climate and health surveillance and EWS: integrating climate and weather information in health EWS; ICT/Digital tools for climate and health surveillance and EWS; enabling policies, SOPs, communication protocols; capacity building and training for hydromet and health workforce

Enhance climate-informed disease control and prevention programmes

WHO-UNDP JOINT REGIONAL INITIATIVE ON CLIMATE CHANGE AND HEALTH IN EECCA REGION



- ❑ 2020: WHO Europe and UNDP IRH worked on a joint scoping and value proposition on climate and health in EECCA
- ❑ 2022: Climate and health baseline and vulnerability assessment in EECCA
- ❑ 80% of countries in the region report health as the social dimension most at risk under climate change
- ❑ COVID-19 health crisis offers lessons and opportunities on how we can work together
- ❑ Need to support individual and community health efforts in response to both climate change and COVID-19

GAPS AND BARRIERS TO CLIMATE RESILIENT AND LOW CARBON HEALTH SYSTEMS

Climate-Health data, risk information, surveillance and early warning

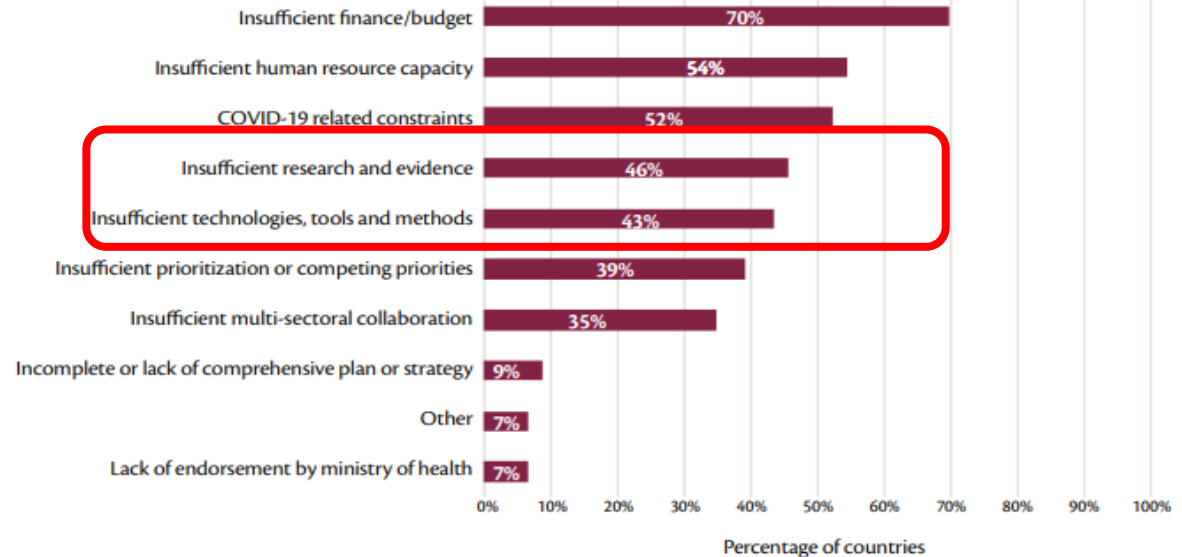
Governance, policy and regulations, and institutional capacities

Preparedness, response capacity, last-mile service delivery and infrastructure

Essential medical products & technologies

Access to finance for climate and health action

Barriers to implementation of national health and climate change plans or strategies. Source: 2021 WHO Health and Climate Change Global Survey Report.



CLIMATE AND HEALTH VULNERABILITY ASSESSMENT – EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

Climate hazards level in selected targeted countries

	River flood	Urban flood	Land- slide	Water scarcity	Extrem e heat	Wildfire	Cyclone	Coastal flood
Georgia	high	high	high	low	high	high	No data	No data
Kyrgyzstan	low	high	high	medium	medium	high	v.low	x
Uzbekistan	high	high	high	high	high	high	v.low	x

A CLIMATE AND HEALTH
VULNERABILITY ANALYSIS FOR
**EASTERN EUROPE
AND CENTRAL ASIA**



CLIMATE AND HEALTH VULNERABILITY ASSESSMENT – EASTERN EUROPE, CAUCASUS AND CENTRAL ASIA

Climate-Health information and EWS gaps in EECCA

- Data integration and methodologies to measure climate-health impacts.
- Publicly available data and evidence-base on the interrelation of climate change, air pollution and health.
- Human and financial resources and capacity to access and adequately use technology to monitor, model and forecast climate-induced changes, and analyze related health impacts.
- Knowledge and capacities of health sector staff on the use of relevant technology to understand climate risks and subsequently inform healthcare planning.
- Early Warning Systems (EWS), including “last mile” warning dissemination and communication services

REGIONAL PROGRAMME PROPOSAL: CLIMATE RESILIENT HEALTH SYSTEMS AND SERVICES IN EECCA

**1. Enhanced risk knowledge,
climate and health data and
early warning for climate-
informed health services**

- 1.1 Improving climate-health data and evidence-base
- 1.2 V&AA
- 1.3 Enhancing climate-informed disease surveillance and EWSs
- 1.4 Strengthening last-mile communication and outreach
- 1.5 Regional learning and knowledge exchange

**2. Integrated and risk-
informed climate-health
policies and institutional
frameworks**

- 2.1 Integrating climate - health policies and processes
- 2.2 Improving health component of adaptation planning and NDCs
- 2.3 Cross-sectoral coordination and institutional capacities
- 2.4 Integrating climate-health nexus in sectoral policies

**3. Upgraded response
capacities and infrastructure**

- 3.1 Innovative financing frameworks / investment cases
- 3.2 Investment in climate-resilient health services and facilities
- 3.3. Climate-informed disease control and prevention programmes
- 3.4 Capacity building for health workforce
- 3.5 Community-based and municipal-level climate-health response

REGIONAL PROGRAMME PROPOSAL: CLIMATE RESILIENT HEALTH SYSTEMS AND SERVICES IN EECCA

1. Enhanced risk knowledge, climate and health data and early warning for climate-informed health services

1.1 Improving climate-health data integration
1.2 Climate vulnerability and adaptation assessments
1.3 Enhancing climate-informed disease surveillance and Early Warning Systems (EWSs)
1.4 Strengthening last-mile communication and outreach
1.4 Regional learning and knowledge exchange for scaled-up CCH action

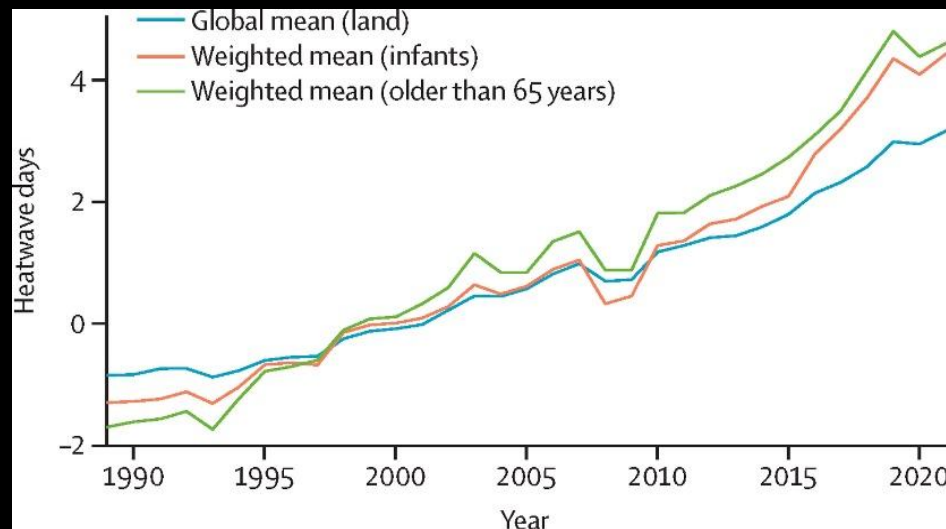
Regional aspects:

- Regional and sub-regional partnerships and regional digital platform for exchanging data and information on climate and health
- Regional consultations on gaps and options for regional climate-health data exchange
- Cross-country learning and knowledge exchange on climate-informed disease surveillance systems based on integration of climate, weather and health information
- Digital solutions for climate and health information systems
- Regional information products (i.a. analysis, modelling, forecasting by health and climate/hydrometeorological authorities)
- SOPs/protocols on data sharing, technical guidance and communication protocols

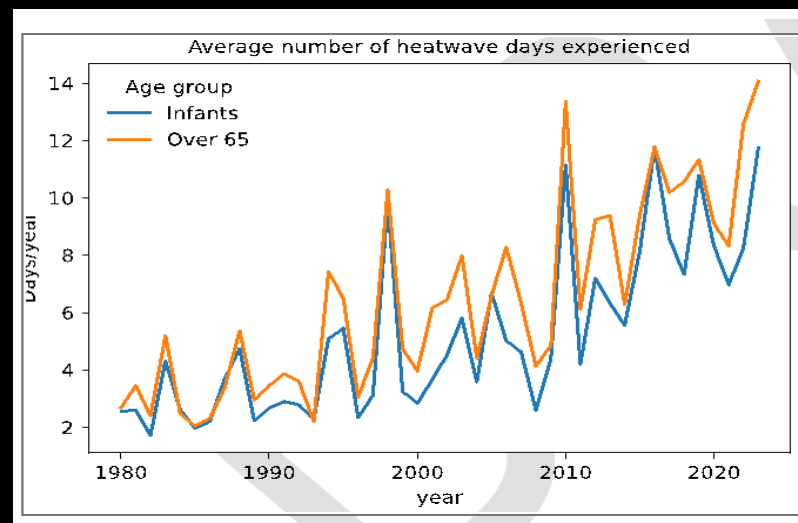
Health impacts from heat exposure

The Lancet *Countdown on health and climate change*

Change in heatwave days compared with the 1986–2005 baseline (10-year rolling mean), The Lancet



Average days of heatwave experienced by people over 65 and infants under one year old, The Lancet 2023



Health impacts from heat exposure: Georgia

The Lancet Countdown on health and climate change



- As temperatures rise, populations in Georgia face growing risks of disease and mortality associated with heat exposure. Elderly populations, those with underlying chronic health conditions (including cardiovascular disease, heart disease, diabetes), and very young children are most at risk.
- In 2014-2023, each infant under the age of one and adult over the age of 65 in Georgia were exposed to an average of at least 20 heatwave days per year. This is an approx. 165% and 250% increase compared to annual averages from 1986-2005.
- Rising temperatures and aging populations resulted in a 128% increase in average annual heat-related deaths among adults over 65 from 1990-1999 to 2014-2023. Without climate change, the increase would have been just 15% (driven mostly by a growth in the size of the over-65 population).
- Between 2014 and 2023, heat exposure of local workers caused the loss of over 33.75 million potential labour hours annually on average in Georgia - an 45% increase in the loss of potential labour hours due to heat exposure from the 1990s. This translates to an estimated US\$75.5 million in potential income lost annually due to heat exposure between 2014 and 2023.

Regional climate and health information system

Regional/sub-regional scoping: assessment and gap analysis on climate-health data integration and EWSs

Prioritization of climate hazards and geographic focus

Pre-feasibility/feasibility studies for selected countries

Design and costing of investment interventions across 4 pillars of EWS

Design of regional learning and SSTC framework





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