

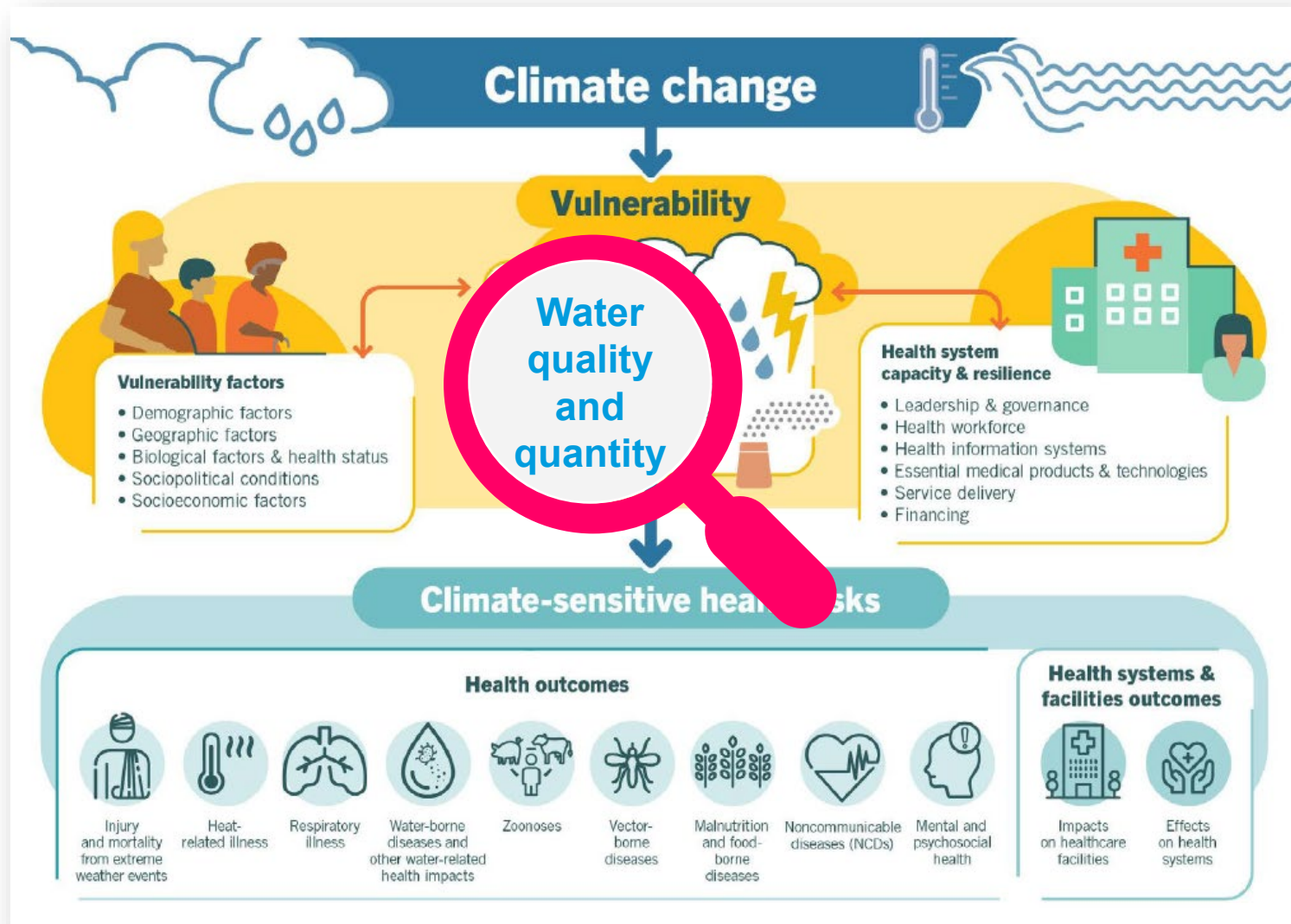
Climate change impacts on water, sanitation and health



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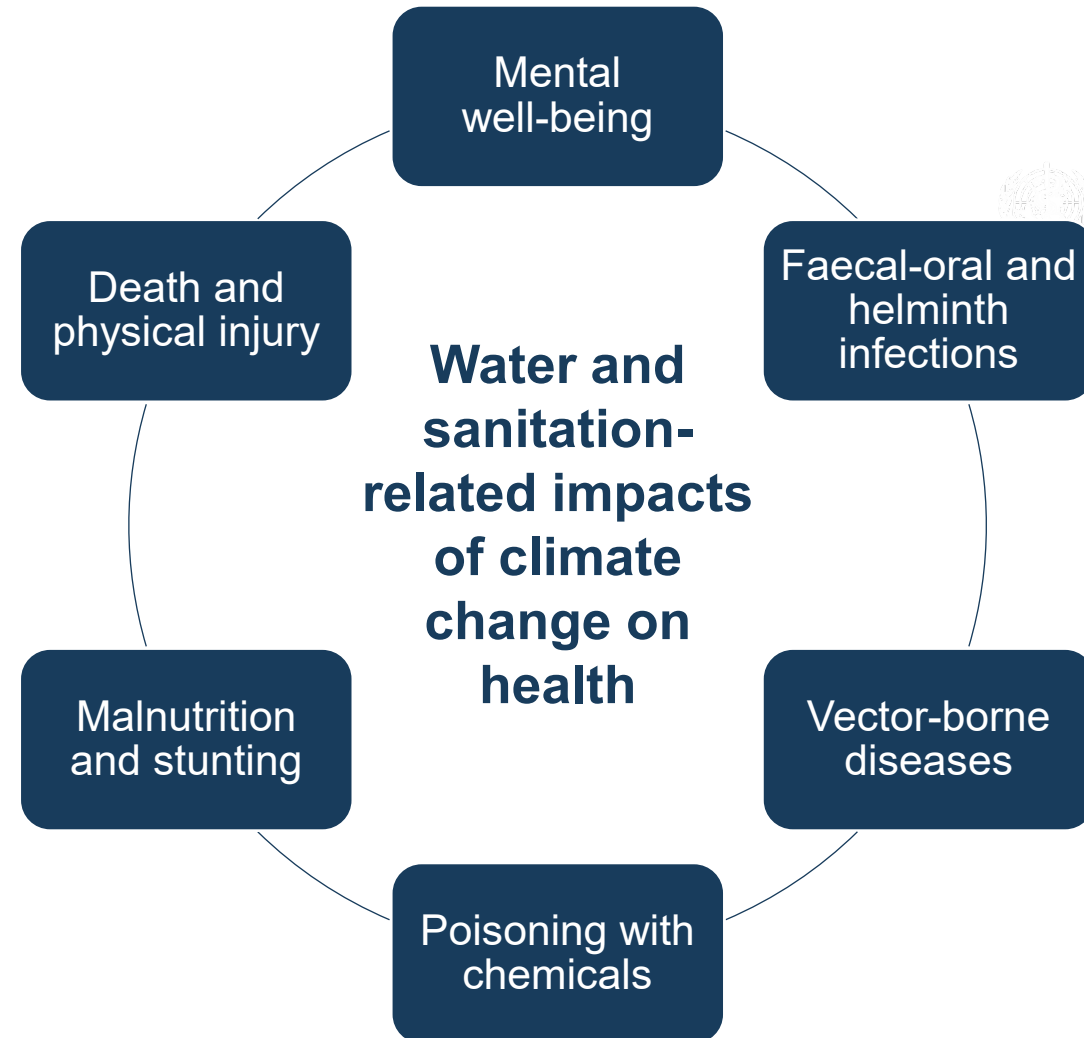
Global workshop on building climate-resilience through improving water management and sanitation at national and transboundary levels
29 March 2021

Vulnerabilities and pathways of health risks



Water and sanitation-related health outcomes

- Increases in water-related disasters
- Increases in areas suffering from water stress
- Increases in poor water quality related outcomes
- Increases in sanitation-related risks



Too much water matters



Photo: Oliver Schmolli/WHO

- Climate change correlates to the increase of frequency and severity of floods
- Over the past 20 years, floods killed more than 2,000 people and affected more than 9 million people in the WHO European Region
- Flood events account for 36% of the damages recorded from natural disasters in Europe, and generated at least €72 billion in losses

Too little water matters too

Atmospheric processes

Heat, air pollution and
dust emissions

Meteorological
droughts

Health outcomes

Heat mortality and morbidity
Respiratory and cardiovascular diseases

Terrestrial processes

Soil properties, crop productivity
and environmental degradation

Agricultural
droughts

Health outcomes

Tick- and rodent-borne diseases
Malnutrition and stunting
Mental health issues

Direct human processes

Water abstraction and access,
and use of urban water containers

Hydrological
droughts

Health outcomes

Water-borne diseases
Dengue, West Nile virus and Chikungunya

Increases the need for reuse of wastewater



Ingestion (unintentional)
after contact with wastewater



Ingestion of contaminated
water



Consumption of contaminated
produce



Dermal (skin) contact with
excreta and wastewater



Creation of habitats for
vectors



Inhalation of aerosols and
particles

Alters sanitation systems



RAIN AND FLOODING

Damage to sanitation assets and infrastructure

Flooding and/or collapse of on-site systems

Overflow of overwhelmed storm- and wastewater containment systems

Spillage from bypassed wastewater treatment plants



DROUGHT

Ground movement leading to broken pipes

Increased corrosion of sewer pipes

Impeded function and use of water-reliant sanitation systems

Reduced capacity of receiving water bodies to dilute wastewater



INCREASED TEMPERATURE

Higher water demand

Increase in algae blooms (\pm toxigenic)

Reduced efficiency of biological wastewater treatment

Quicker drying of faecal sludge in waterless latrines



SEA-LEVEL RISE

Reduced efficiency of biological treatment processes due to saltwater

Damage to underground infrastructure from rising groundwater levels

Damage to wastewater treatment works in low-lying/coastal areas

Increases health risks from sanitation

- Flooding of on-site systems:
 - Increases stress
 - Potential exposure to violence
 - Anxiety from lack of access to toilet facilities and reliance on open defecation
- Declining water supply:
 - Increases risks of waterborne diseases due to lack of water for flushing and cleaning resulting in poor sanitary conditions and poor hygiene



Photo: Oliver Schmolli/WHO

Alters water quality and quantity patterns



RAIN AND FLOODING

Increased upstream erosion and run-off

Damage to assets and infrastructure

Overwhelmed water treatment and distribution facilities



DROUGHT

Intermittent supply and associated ingress

Increased concentration of pollutants

Increased competition for scarce water resources

Release of contaminants from reservoir sediments



INCREASED TEMPERATURE

Higher water demand

Increase in algae blooms (± toxigenic)

More favourable growth conditions for pathogens

Reduced stability of residual chlorine



SEA-LEVEL RISE

Saltwater intrusion into distribution networks

Saltwater intrusion into aquifers

Inundation of critical assets and infrastructure

Limits availability of local water sources

- Compromised hygiene practices at low quantities available
- Increased reliance on poor quality sources, which are more yielding or closer
- Increased distances to (alternative) sources:
 - Carrying heavy containers can cause pain, physical injury and musculoskeletal disorders
 - Impacts school attendance
 - Harassment of woman and girls



Photo: Oliver Schmoll/WHO

Increases the need for storage

- Increased urban water storage and at household level
- Poorly managed storage provides larval habitats and breeding sites for vectors, such as mosquitoes (malaria and dengue)
- Safe storage practices



Photo: Oliver Schmolli/WHO

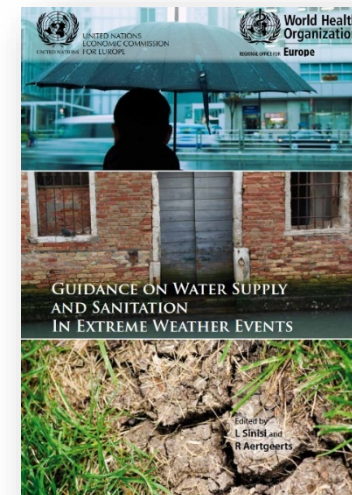
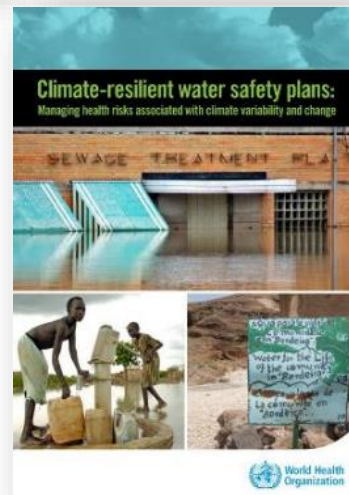
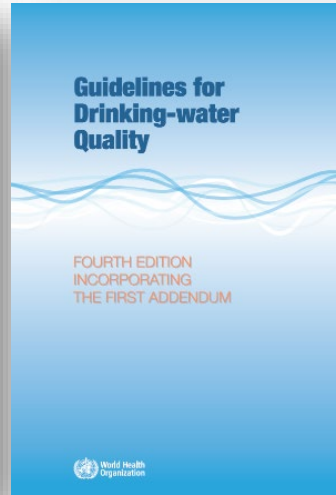
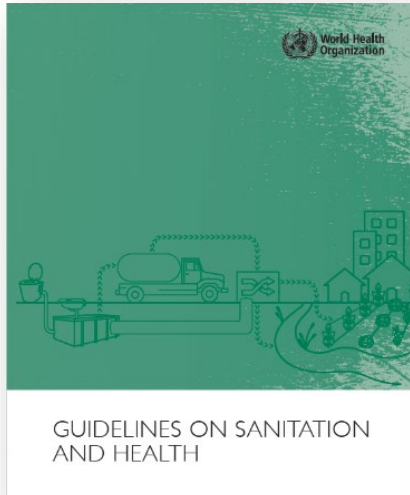
Changes our restorative relationship to water

- Climate change may proliferate water-based diseases:
 - Increased transmission areas for *Schistosoma* and *Leptospira*
 - Increased abundance of *Vibrio vulnificus* in sea water
- Health and well-being benefits of urban water environments (“blue space”)



Photo: Oliver Schmolli/WHO

WHO Guidelines and selected tools



Thank You

Stay
healthy
and
safe

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