

## Chapter 7: Impact of Climate Change on Human Health

*Authors: Prof. Ahmed Gaber, Prof. Randah Hamadeh, Dr. Djihan Hassan, Ms. Hayam El Shirbiny*

*Presenter: Dr. Djihan Hassan  
Adjunct Assistant Professor at the American University in Cairo*

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# Outline

## **I. Introduction**

## **II. Global Effects of Climate Change (CC) on Health**

- Direct Impacts
- Indirect Impacts

## **III. The Impact of Climate Change on Health in the Arab Region**

## **IV. Current Strategies and Benefits to Human Health (HH) from Addressing CC**

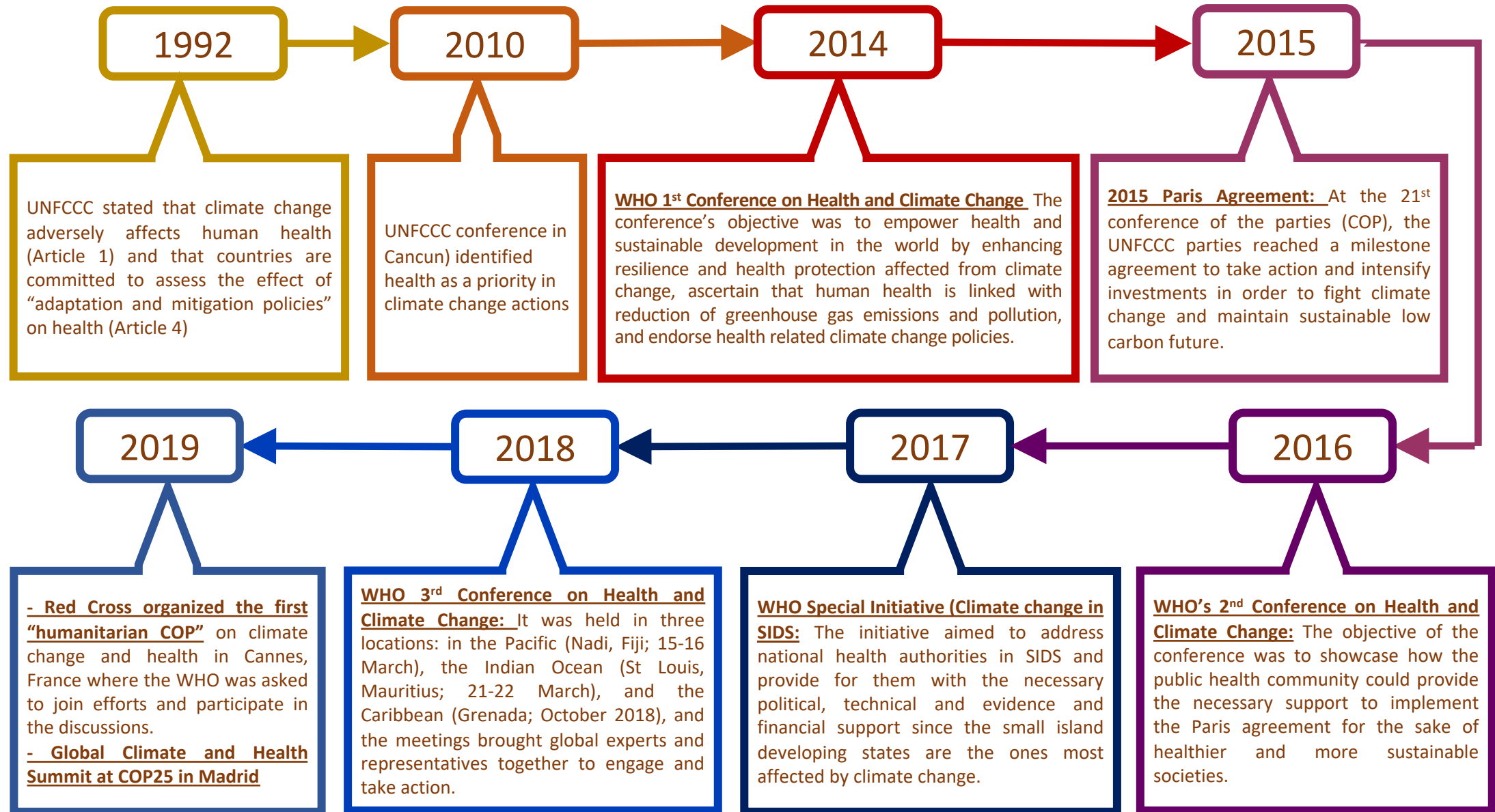
- Adaptation strategies and initiatives (Global and in the Arab Region)
- Mitigation strategies and initiatives (Global and in the Arab Region)

## **V. Conclusions and Recommendations**

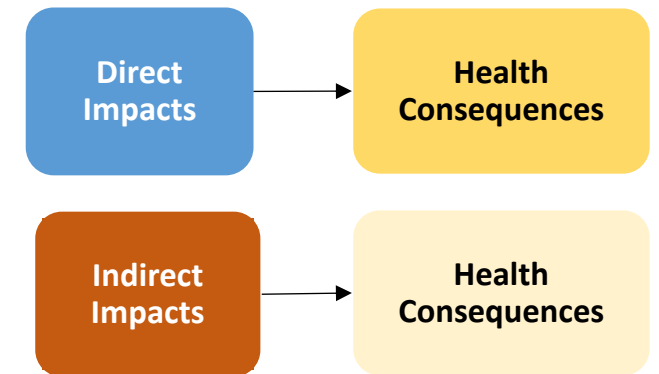
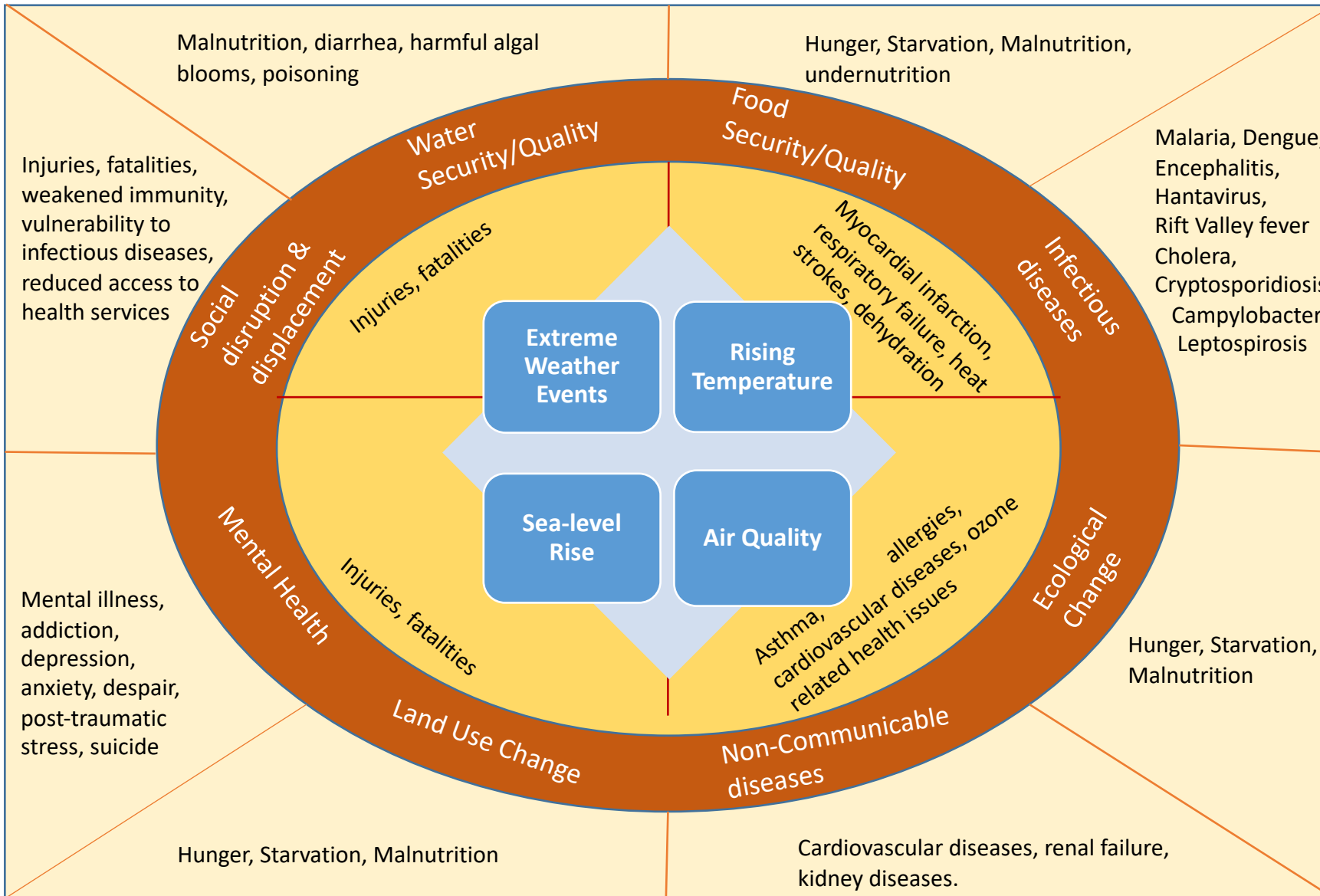
# I. Introduction

- Climate change (CC) and health are two of the greatest challenges facing the Sustainable Development Goals (SDGs) 2030 Agenda.
  - SDG 3 aims to ensure healthy lives and promote well-being for all.
  - SDG 13 calls for taking urgent action to combat CC and its impacts.
- Environmental health impacts include the rise and fall in mean annual temperature, sea level rise and loss of biodiversity.
- Humans' vulnerability to the potential health impacts of CC are divided into direct and indirect impacts.

# Timeline for Global Milestones On CC and HH



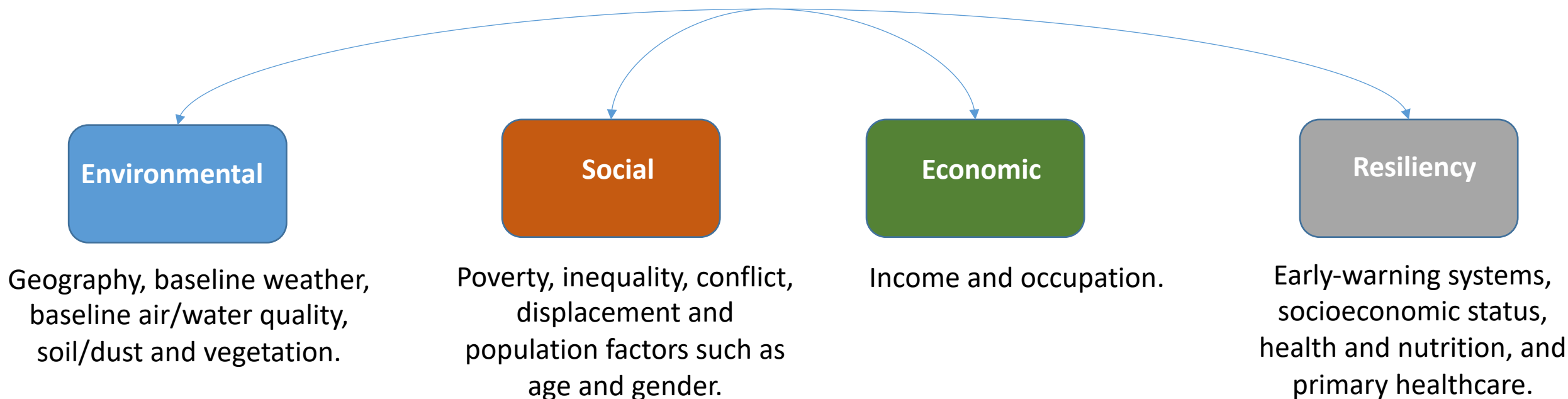
# II. Global Effects of CC on Health – Direct and Indirect Impacts



**Direct and indirect impacts of climate change on health and related health consequences**

Adapted from: (World Bank, 2017), (WHO, 2018a), (Papworth et al., 2015) & (McMichael & Lindgren, 2011)

## II. Global Effects of CC on Health – Other factors



Given the complex associations between climate change and global health, it is important to understand the various influencing factors at play in order to design effective mitigation and adaptation strategies with direct and clear effects on global health.

## III. The Impact of Climate Change on Health in the Arab Region

- The available literature indicates that climate change has already imposed a health burden in the Arab region and causes a public health concern.
- Increases in overall mortality, mortality and morbidity from communicable diseases and NCDs have been reported in countries of the region.
- Few Arab countries identified vulnerable populations like children, elderly and outdoor workers and a small number made projections.
- The impact of climate change on health is not given adequate attention by stakeholders and researchers in the region and there is variability in the information provided by countries.

# IV. Current Strategies and Benefits to HH from Addressing CC

## Global Adaptation Strategies and Initiatives

Health Risks	Legislative	Technical	Educational / Advisory	Cultural / Behavioural
<b>Thermal stress</b>	Building guidelines	Housing, public buildings, urban planning to reduce heat island effects, air conditioning	Early warning systems	Clothing, siesta
<b>Extreme weather events</b>	<ul style="list-style-type: none"> <li>• Planning laws</li> <li>• Building guidelines</li> <li>• Forced migration</li> <li>• Economic incentives for building</li> </ul>	<ul style="list-style-type: none"> <li>• Urban planning</li> <li>• Storm shelters</li> </ul>	Early warning systems	Use of storm shelters
<b>Air quality</b>	<ul style="list-style-type: none"> <li>• Emission controls</li> <li>• Traffic restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Improved public transport</li> <li>• Catalytic converters</li> <li>• Smokestacks</li> </ul>	Pollution warning	Carpooling
<b>Vector-borne diseases</b>	N/A	<ul style="list-style-type: none"> <li>• Vector control</li> <li>• Vaccination, impregnated bed nets</li> <li>• Sustainable surveillance, prevention and control programs</li> </ul>	Health education	Water storage practices
<b>Water-borne diseases</b>	<ul style="list-style-type: none"> <li>• Watershed protection laws</li> <li>• Water quality regulation</li> </ul>	<ul style="list-style-type: none"> <li>• Genetic/molecular screening of pathogens</li> <li>• Improved water treatment (e.g., filters)</li> <li>• Improved sanitation (e.g., latrines)</li> </ul>	Boil water alerts	<ul style="list-style-type: none"> <li>• Washing hands and other hygiene behaviour</li> <li>• Use of pit latrines</li> </ul>

**Options for adaptation strategies to reduce health impacts of climate change** (Source: McCarthy et. al (2001))



## IV. Current Strategies and Benefits to HH from Addressing CC

### Adaptation Strategies and Initiatives in the Arab Region

#### Egypt

**Identified actions in climate change adaptation** including:

- (1) Conducting a national assessment of climate change impacts;
- (2) Including climate information in **an Integrated Surveillance and Response system** with early warning; and
- (3) Strengthening adaptive capacity by **building climate resilient infrastructure**. However, Egypt still does not have an integrated national health adaptation strategy (WHO, 2015a).

#### Jordan

Climate change is expected to increase **water scarcity in the country** (WHO, 2013; WHO, n.d). As a response, Jordan has implemented the “Climate change adaptation to protect human health” project between 2010-2014, which aimed to **increase adaptive capacity to respond to health risks** resulting from water scarcity induced by climate change (WHO, 2015b).

#### Tunisia

Undertook an intersectoral **assessment of vulnerability and adaptation to climate change** including human health from 2007-2010 which resulted in the **development of an adaptation strategy** (WHO, 2013). Tunisia included climate information in **an Integrated Disease Surveillance and Response (IDSR) system**, including development of early warning and response systems for climate-sensitive health risks (WHO, 2015c).

# IV. Current Strategies and Benefits to HH from Addressing CC

## Global Mitigation Strategies and Initiatives

Examples of Mitigation Strategies to reduce GHG emissions	Health Co-benefits
Clean energy sources / Reduction in fossil fuel combustion	<ul style="list-style-type: none"> <li>• Improve urban air quality</li> <li>• Decrease CVD and respiratory diseases</li> </ul>
Reduced use of wood burning and other biomass for indoor cooking / the use of clean fuels and household cookstoves	<ul style="list-style-type: none"> <li>• Improve indoor air quality</li> <li>• Reduce deaths from household air pollution (Especially women and children)</li> <li>• Less risk of injury during fuel collection</li> <li>• Reduce burning accidents</li> </ul>
Energy-efficient and climate-adapted housing and buildings (e.g. using minimal energy for heating, cooling, or lighting)	<ul style="list-style-type: none"> <li>• Reduce morbidity and mortality related to heat and cold exposure, risks of airborne infectious disease transmission; and respiratory diseases related to indoor air pollution risks</li> <li>• Protects occupants not only from heat and cold, but storms and extreme weather, as well as diseases borne by pests and vectors.</li> </ul>
Well planned urban public transport policies encouraging use of public transport, walking and cycling	<ul style="list-style-type: none"> <li>• Increase physical activity and reduce obesity</li> <li>• Reduce traffic injury and deaths</li> <li>• Reduce air pollution-related mortality (from strokes, respiratory and heart disease)</li> <li>• Reduce noise pollution</li> </ul>
Reduction in meat consumption / shifting to diets richer in fresh, in-season vegetables, fruits and legumes	<ul style="list-style-type: none"> <li>• Reduce risks of obesity, heart disease and cancers associated with excessive consumption of red meat and some processed foods</li> <li>• Reduced diet-related non-communicable diseases</li> </ul>
Improve wastewater treatment (including sanitation)	<ul style="list-style-type: none"> <li>• Reduces infectious disease risks</li> <li>• Improves air quality</li> </ul>

# IV. Current Strategies and Benefits to HH from Addressing CC

## Mitigation Strategies and Initiatives in the Arab Region

Examples of Mitigation Actions or Strategies Impacting Human Health	Arab Countries Implementing
<p><b>Clean Air Initiative:</b> Commit to achieving air quality that is safe for populations, and to align their CC and air pollution policies, by 2030. Financial institutions commits to scale up investment to support climate action, health and sustainable development.</p>	<ul style="list-style-type: none"> <li>Algeria, Morocco, Palestine, Tunisia, UAE</li> </ul>
<p><b>Great Green Wall for Sahara and the Sahel Initiative (GGWSSI):</b> Restore 50 million hectares of land, sequester 250 million tons of carbon and support 300 million people across the Sahel by 2030.</p>	<ul style="list-style-type: none"> <li>Algeria, Egypt, Mauritania, Somalia, Sudan, Tunisia</li> </ul>
<p><b>Blue Growth Initiative:</b> Reduce CO<sub>2</sub> emissions by 10% in 5 years and 25% in 10 years and reduce overfishing by 20% in 5 years and 50% in 10 years in 10 developing countries.</p>	<ul style="list-style-type: none"> <li>Algeria, Mauritania, Morocco</li> </ul>
<p><b>Global Fuel Economy Initiative (GFEI):</b> Double vehicle fuel efficiency globally by 2050.</p>	<ul style="list-style-type: none"> <li>Algeria, Egypt, Jordan, Morocco, Tunisia, UAE</li> </ul>
<p><b>International Solar Alliance (ISA):</b> Mobilize more than USD 1 trillion of investments by 2030 for the massive deployment of affordable solar energy.</p>	<ul style="list-style-type: none"> <li>Algeria, Comoros, Egypt, Mauritania, Oman, Saudi Arabia, Somalia, Sudan, UAE</li> </ul>
<p><b>Africa Renewable Energy Initiative (AREI):</b> Scale up the Africa's renewable energy potential to achieve at least 10 GW of new and additional renewable energy generation capacity by 2020 and at least 300 GW by 2030.</p>	<ul style="list-style-type: none"> <li>Algeria, Comoros, Mauritania, Somalia, Tunisia</li> </ul>
<p><b>Climate Ambition Alliance: Net Zero 2050:</b> Commit to achieve net zero CO<sub>2</sub> emissions by 2050</p>	<ul style="list-style-type: none"> <li>Comoros, Mauritania, Somalia, Sudan</li> </ul>

## V. Conclusions and Recommendations

- The available literature indicates that climate change has already imposed a health burden globally and in the Arab region and causes a public health concern.
- Given the complex associations between CC and global health, it is important to understand the various influencing factors at play in order to design effective mitigation and adaptation strategies.
- It can be concluded that the impact of CC on health is not given adequate attention by stakeholders and researchers in the Arab region and that there is variability in the information provided by countries.

### **CC Adaptation**

- The WHO has undertaken many global adaptation initiatives and programs in cooperation with other international organization.
- In the Arab region, there seems to be a lack of regional adaptation strategies targeting the health sector and in many Arab countries there is a need for national adaptation plans.

## V. Conclusions and Recommendations (cont'd)

### **CC Mitigation**

- Mitigation measures are primarily driven by economic costs and energy implications, the importance of considering health in CC mitigation policies has been highlighted in recent years.
- In the Arab region, most countries have ratified the UNFCCC, the Kyoto Protocol and the Paris Agreement and are undertaking a significant number of regional and national mitigation actions. However, more work still needs to be done, especially on the policy front of climate change mitigation measures with direct health benefits.

### **The One Health Approach**

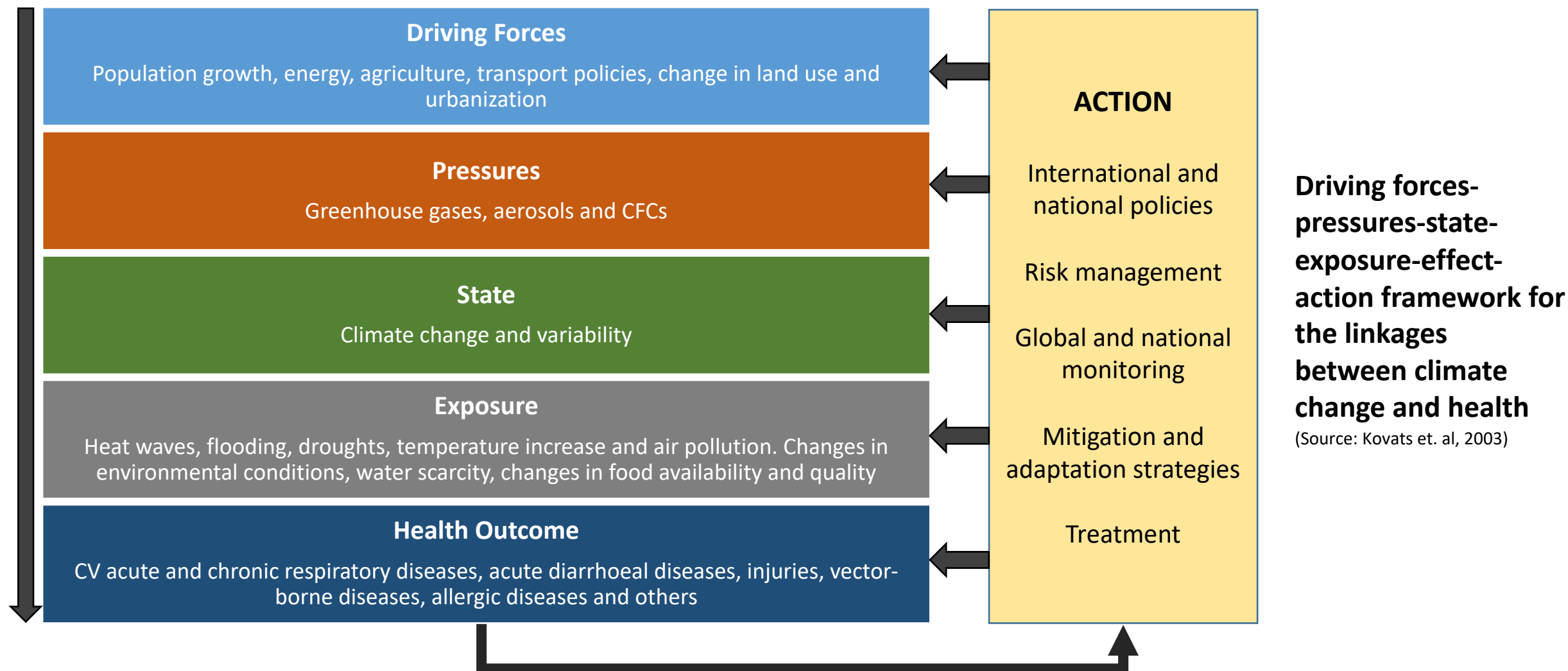
- The approach recognizes that human health, animal health, and environmental health are linked and that human health cannot be protected unless animal health and environmental health are also addressed.
- The One Health perspective is very relevant to a global challenge such as CC, since it affects the environment in which humans and animals, as well as the disease vectors and pathogens affecting them.
- Using the One Health approach in designing and implementing programs, policies, legislation and research is an efficient way to address the emergence of zoonotic diseases such as COVID-19.

**“Climate change is intrinsically linked to public health, food and water security, migration, peace, and security. It is a moral issue. It is an issue of social justice, human rights and fundamental ethics. We have a profound responsibility to the fragile web of life on this Earth, and to this generation and those that will follow.”**

**– United Nations Secretary-General Ban Ki-moon**

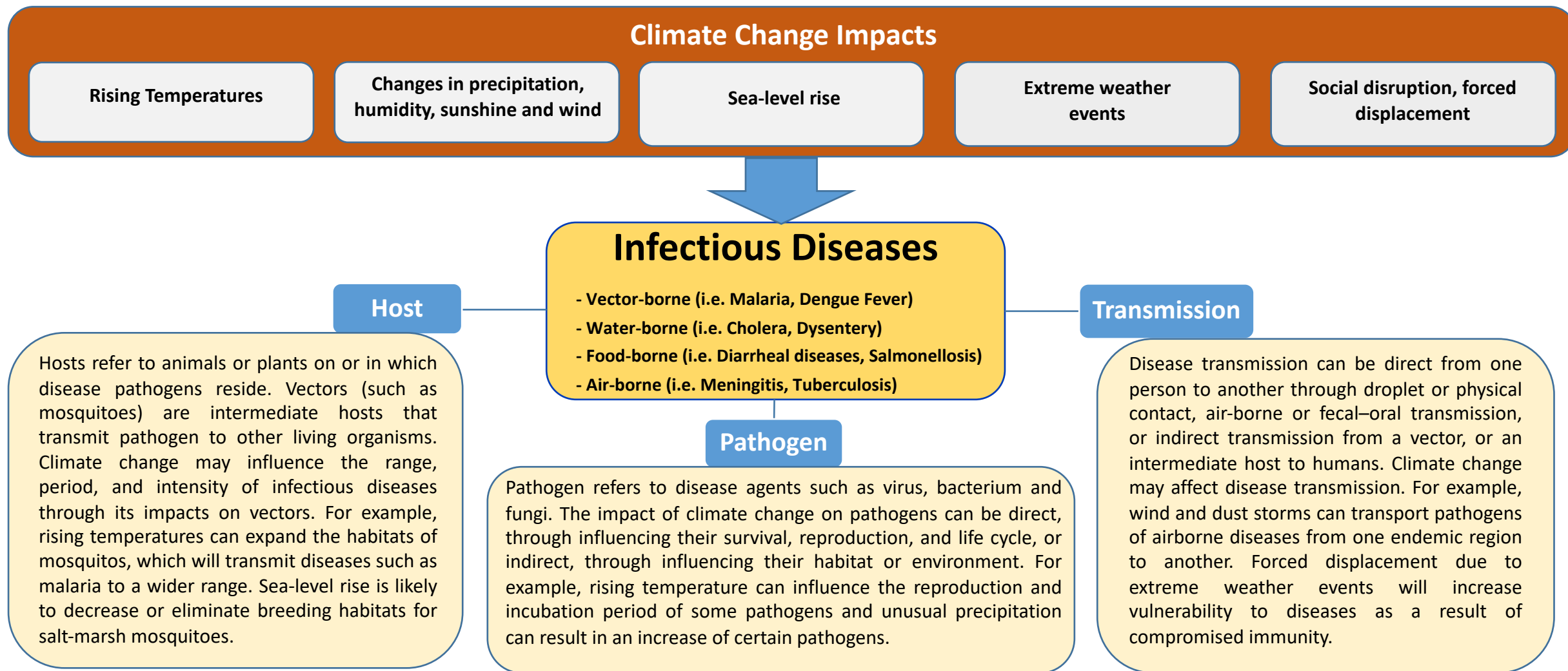
# Backup slides

# III. Current Strategies and Benefits to HH from Addressing CC





## II. Global Effects of Climate Change on Health



### The impacts of climate change on various aspects of infectious diseases

Adapted from: (Wu et al., 2015), (McMichael & Lindgren, 2011) and (WHO, 2003)

## II. CC and COVID-19

- Currently, there is ***no evidence*** of a direct connection between CC and the emergence or transmission of COVID-19 (WHO, 2020). However, CC may have an ***indirect effect on zoonotic diseases*** which include COVID-19 along with Ebola, Bird flu, Swine flu, MERS, SARS, West Nile virus...etc. (WHO, 2020; UNEP, 2020).
- The pandemic has shown some signs of ***positive impact on the environment***. For example, NO<sub>2</sub> air pollution has decreased across Europe and scientists expect carbon emissions to fall by 5% in 2020 (RFI, 2020; Euronews, 2020).
- The pandemic might also have ***negative environmental impacts*** such as an increase in the amounts of medical and hazardous infectious wastes (UN, 2020).
- ***Very little impact*** on CC and experts warn that without structural systemic changes the reduced greenhouse gas (GHG) emissions will only be temporary with no real long-term effect (RFI, 2020; UN, 2020).
- The pandemic has highlighted the ***effect and significance of global response*** to a global issue and it offers some lessons that can support such response to climate change.