



Enabling healthy living in the Caribbean – Linking Climate Change and Health

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Acknowledgements

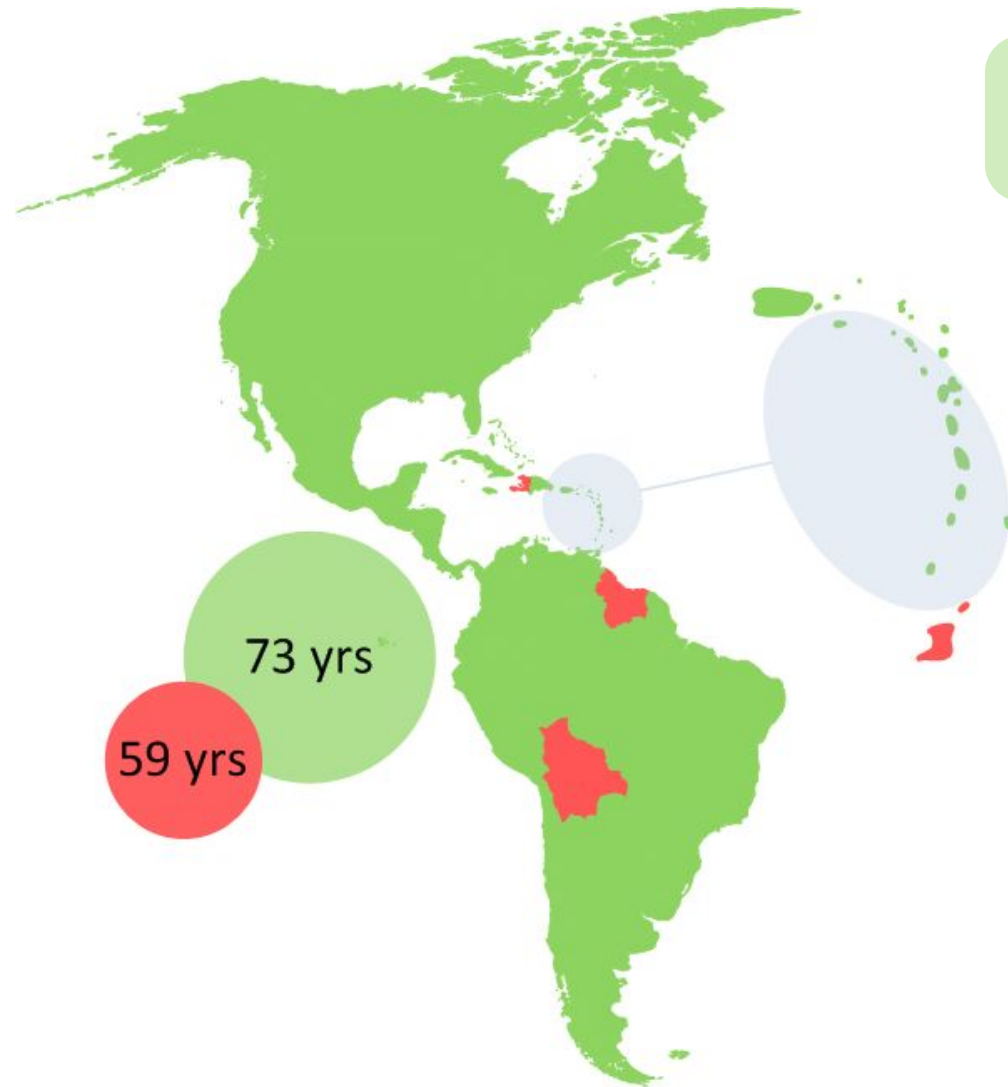
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Sharing materials on climate change and research conducted in
Barbados



Regional LE in the Americas

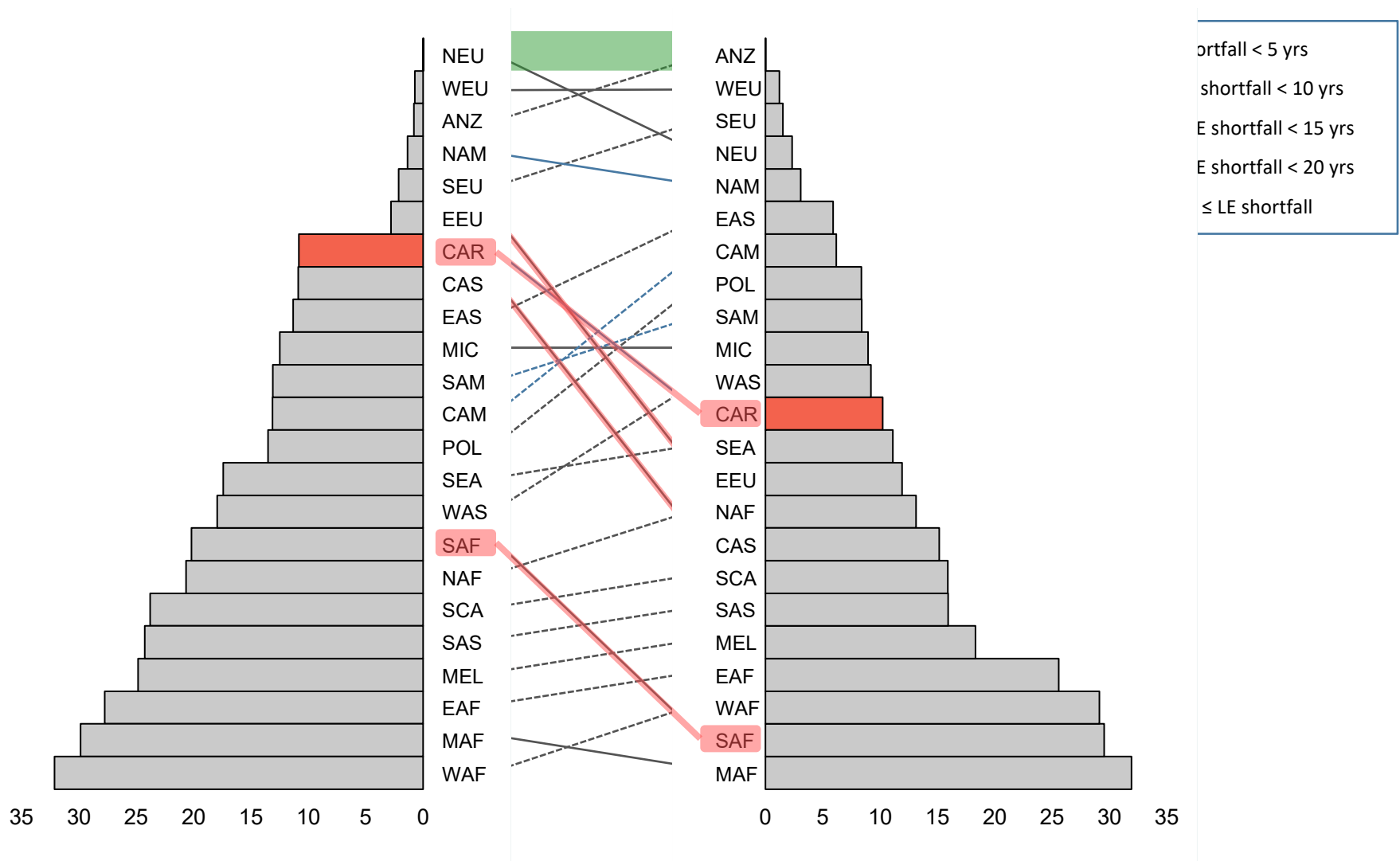


International LE targets met by most countries

...population growth has dropped to replacement levels and life expectancy is relatively high...

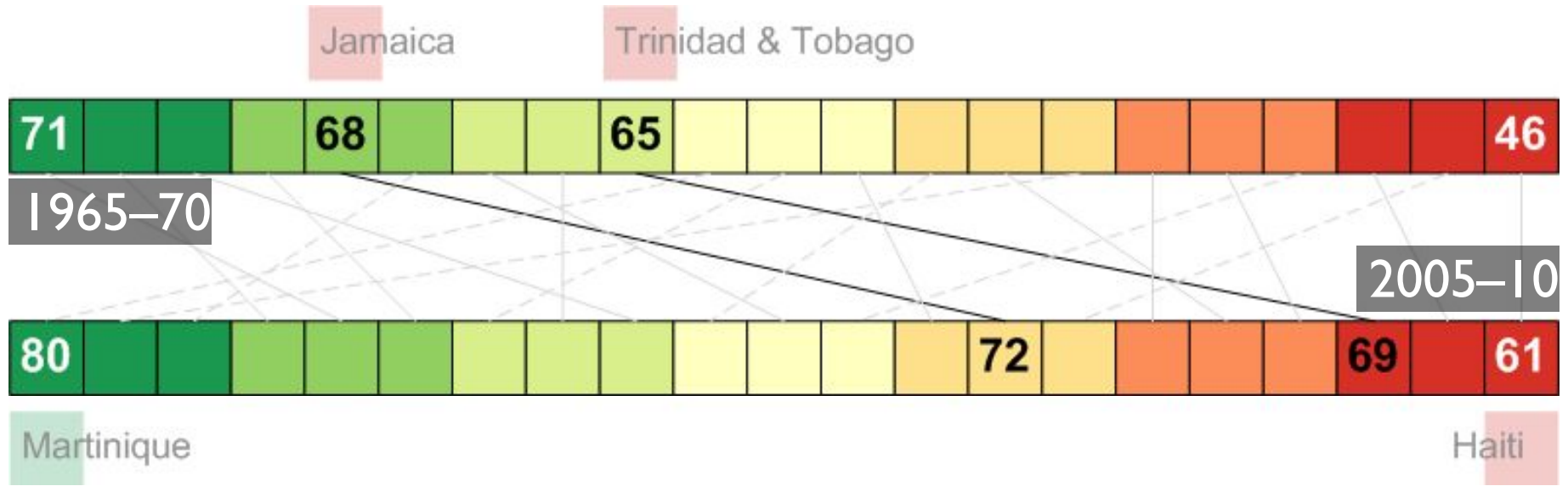
A positive picture.
But not the whole picture...

Regional LE around the world



“EEU/CAR” “WAF/MAF” “WAF/MAF” “Alcohol”

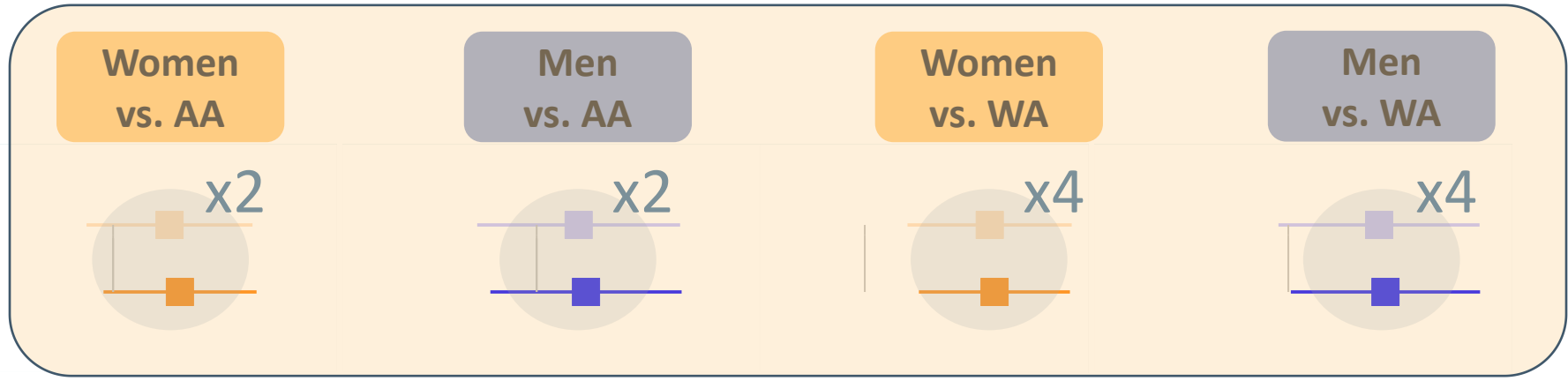
Country LE in the Caribbean



“Monitoring variation within the Caribbean”

Disparities in the African diaspora

Caribbean diabetes mortality excess

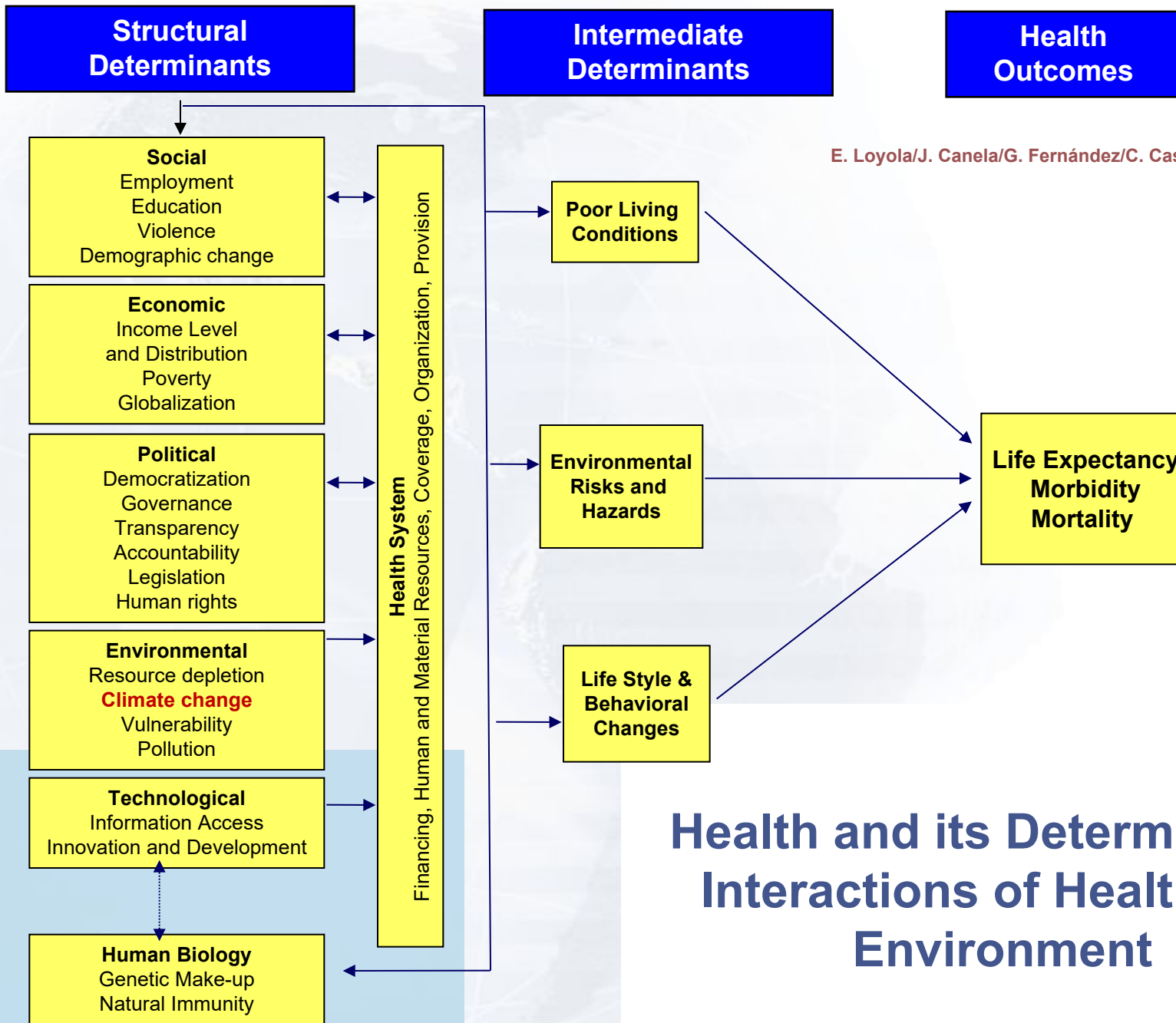


“Whoever wishes to investigate medicine properly, should proceed thus: in the first place to consider the **seasons** of the year, and what effects each of them produces for they are not at all alike, but differ much from themselves in regard to their changes...

Then the **winds, the hot and the cold**, especially such as are common to all countries, and then such as are peculiar to each locality”

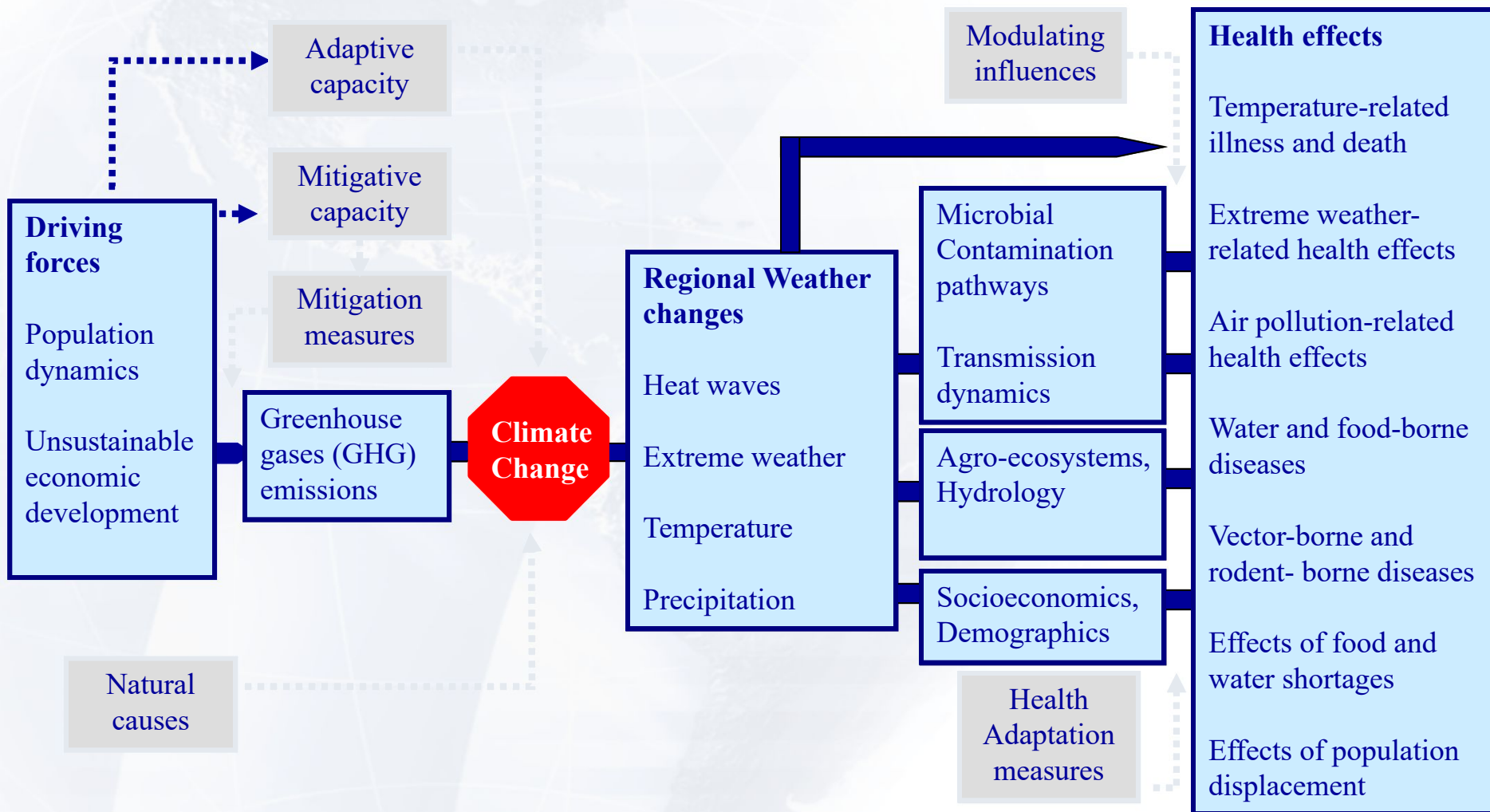
On Airs, Waters and Places. Hippocrates (Circa 400 B.C)





Health and its Determinants: Interactions of Health and Environment

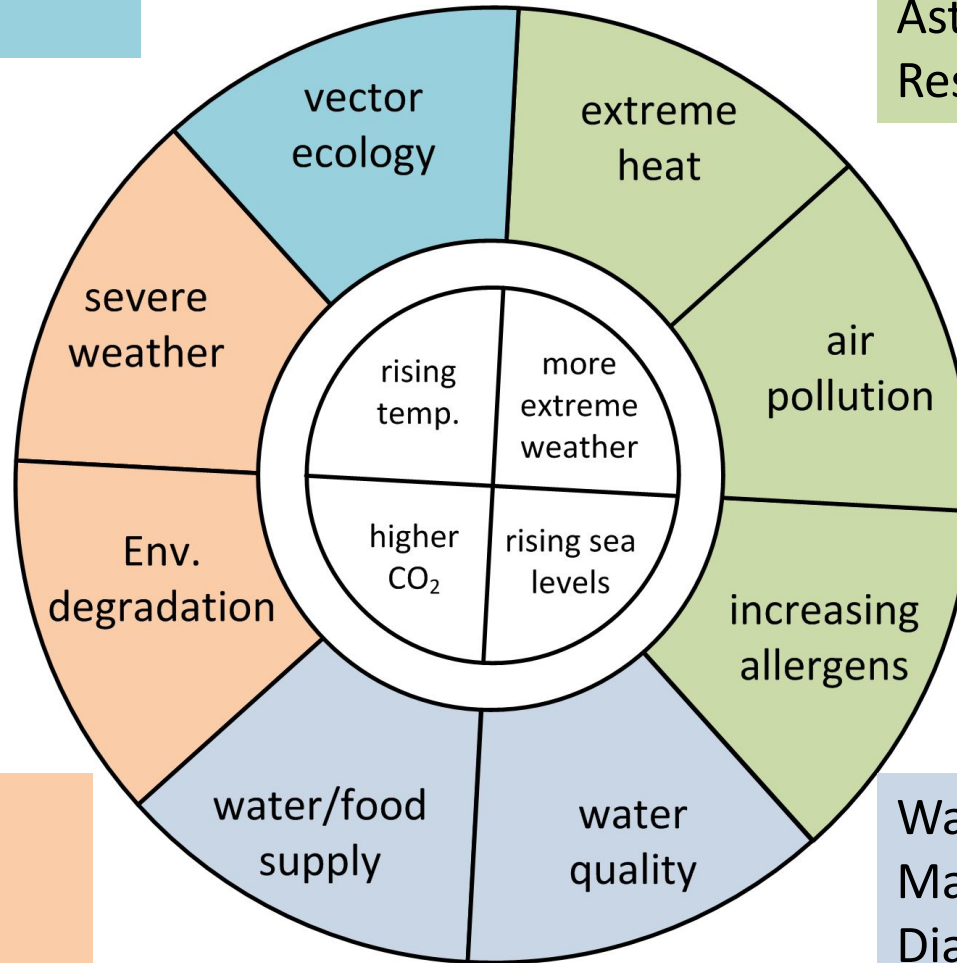
Multiple Drivers & Pathways



Impact of climate change on human health

Malaria, Dengue, Zika, Chikungunya etc.

Cardiovascular disease
Asthma / Allergies
Respiratory disease



Injuries
Mental health
Conflict
Forced migration

Water-associated disease
Malnutrition / NCDs
Diarrheal disease
Bacterial disease

Climate, Vectors, Zoonoses and Health

- Domestic animals and wildlife, incl. marine mammals, sea turtles, seabirds and fish may serve as reservoirs for human pathogens
- WHO estimate malaria responsible for 2.9% worlds DALY's
- Changes in precipitation and temperature patterns affect VBZDs
 - transmission dynamics and distribution of vector and risk of transmission
- Biodiversity change leads to altered dynamics of vector and pathogen reservoir population



Climate, Vectors and Health

- Mosquito-borne illness
 - Malaria (*Anopheles*)
 - Dengue, Yellow fever, Chikungunya, Zika, (*Aedes sp*)
- Higher incidence attributed to changes in temperature and rainfall patterns
- Vectorial capacity
 - A measure of efficiency of VBD transmission related to vector density, frequency of blood meals, extrinsic incubation period (EIP) duration and life expectancy
 - EIP for DEN-2: 12 days at 30°C vs 7 days at 32-35°C (Focks, 1995)



Climate, Water and Health

- Waterborne outbreaks highly correlated with extreme precipitation events
- Increases in water temperature, precipitation frequency and intensity and changes in coastal ecosystem health - pH, salinity, nutrient and contamination runoff
 - Pathogen and pollutant specific effects of water contamination
- Urbanization of coastal regions may lead to additional nutrient, chemical and pathogen loading

Climate, Water and Health – Disease Categories

- Water washed
 - Inadequate water for domestic and personal hygiene
- Water-borne
 - Ingestion of water contaminated by human or animal faeces or urine containing pathogens
- Water-related
 - Insect vectors which either breed in or bite near water
- Water-based
 - Parasitic pathogens found in aquatic host organisms



Climate, Scarcity of Food and Water & Health

- Absolute and relative water scarcity
 - Projected – 10%-30% decrease rainfall (CIMH)
 - Salt water intrusion into the aquifers
- Implications for food security
- Implications for recreational water use in tourism dependent states
- Aquatic food source impacts



Climate and Non-Communicable Diseases

- Extreme heat, poor air quality (pollution and allergens)
 - Asthma and other respiratory illnesses
- Mechanism: increased human exposure to
 - Pollen - due to altered growing seasons),
 - Molds - from extreme or more frequent precipitation
 - Air pollution and aerosolized marine toxins - increased temperature, coastal runoff, and humidity
 - Tropospheric ozone
 - Dust - droughts



Climate and Non-Communicable Diseases

- Cardiovascular disease (CVD) and stroke
 - Increased heat stress linked hospital admissions for CVD and stroke
 - Increased body burden of airborne particulates
 - Altered distribution of zoonotic vectors that cause diseases linked with cardiovascular manifestations (Chagas, Lyme)
 - Ozone - increases cardiac effort and impairs gas exchange, also associated with myocardial infarction

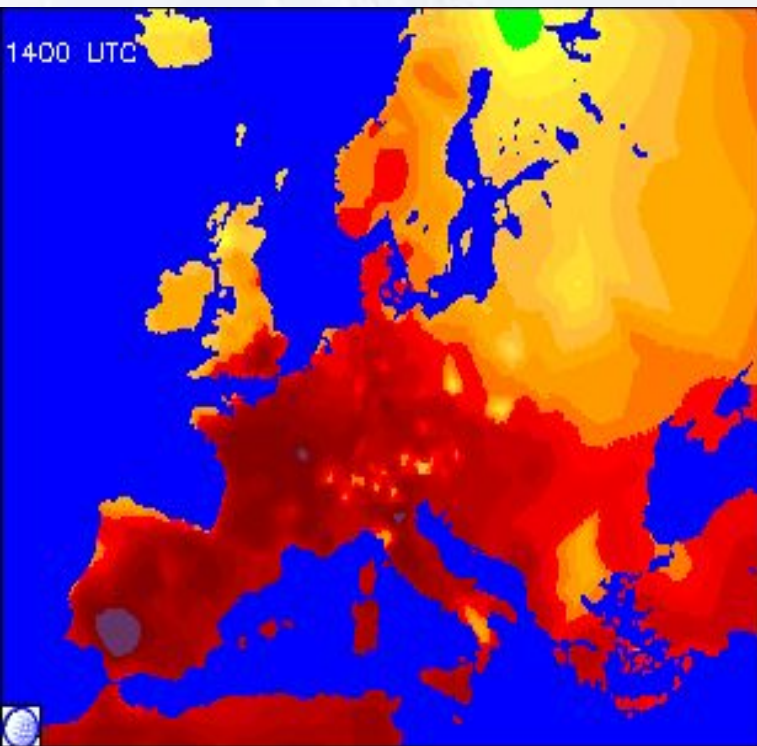


Climate and Non-Communicable Diseases

- Global average temps to increase between 1.8°C and 4.0°C by end of century
- CIMH projects – 10%-30% decrease rainfall; 2°-3° C increase in temperature
- Exacerbates pre-existing conditions
 - Injuries, mental health, psychotropic drugs users at high risk
- Cities and climate co-evolving in way that will amplify health effects of heat and vulnerability of urban populations by magnifying increased temperatures (urban heat island effect)
- Estimated that 60% world pop. in cities by 2030

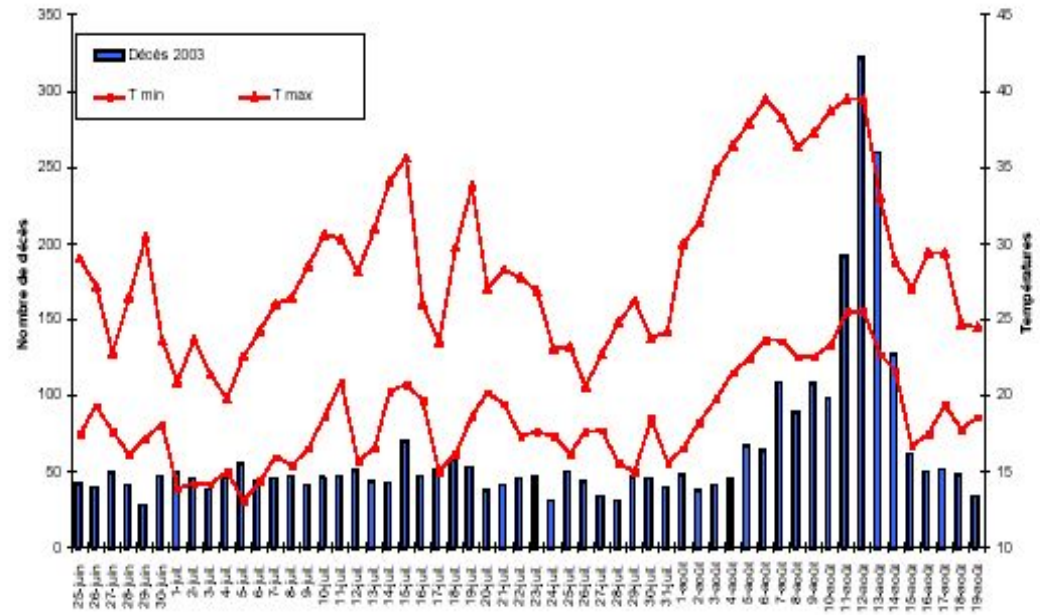


Climate Change Impacts on Health



European temperatures, Summer 2003
over 70, 000 deaths

Graphique n°1 : Nombre de décès journaliers à Paris et températures minimales et maximales entre le 25 juin et le 19 août 2003



Deaths During Summer Heatwave 2003
(Source: Paris Funeral Services)

Foodborne and Nutrition-Related Diseases

- Climate change may be associated with:
 - Staple food shortages and altered diversity of food crops
 - Malnutrition and GI effects
 - >70,000 deaths from malnutrition and ~47,000 deaths from diarrhea due to climate change in 2000 (WHO)
 - Food contamination
 - Molluscan shellfish more vulnerable to microbial infection
 - Ocean acidification may affect shell formation and immune responses



Climate Change and Mental Health

- Climate change may be associated with:
 - Stress and serious mental health consequences including post-traumatic stress disorder (PTSD), depression, and/or general anxiety
 - Related to the perceived impacts on everyday life, and experiences related to understanding and responding appropriately to climate change and its implication
 - Most recover over time, but a significant proportion of develop chronic psychological dysfunction
 - Risk may be increasing over time



Gaps in our understanding imply need for further research into the links between CC and health

Methods

- Enhanced surveillance, modelling and time series, mixed methods to quantify and to understand the context
- Current projects
 - MRC community foods initiative: developing methodology for assessing the effectiveness of community food initiatives
 - (2) Project 2. Farm2Fork II. Linking community farming initiatives that improve access to "healthy foods" with the NCD findings from the Port of Spain Evaluation

Thank you

Questions?





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