WASHINGTON STATE
Academy of Sciences
10TH ANNUAL MEETING & SYMPOSIUM
CLIMATE CHANGE IN WASHINGTON STATE
Research Questions Critical to Preparing for the Future

Human Health

Kristie Ebi

UW

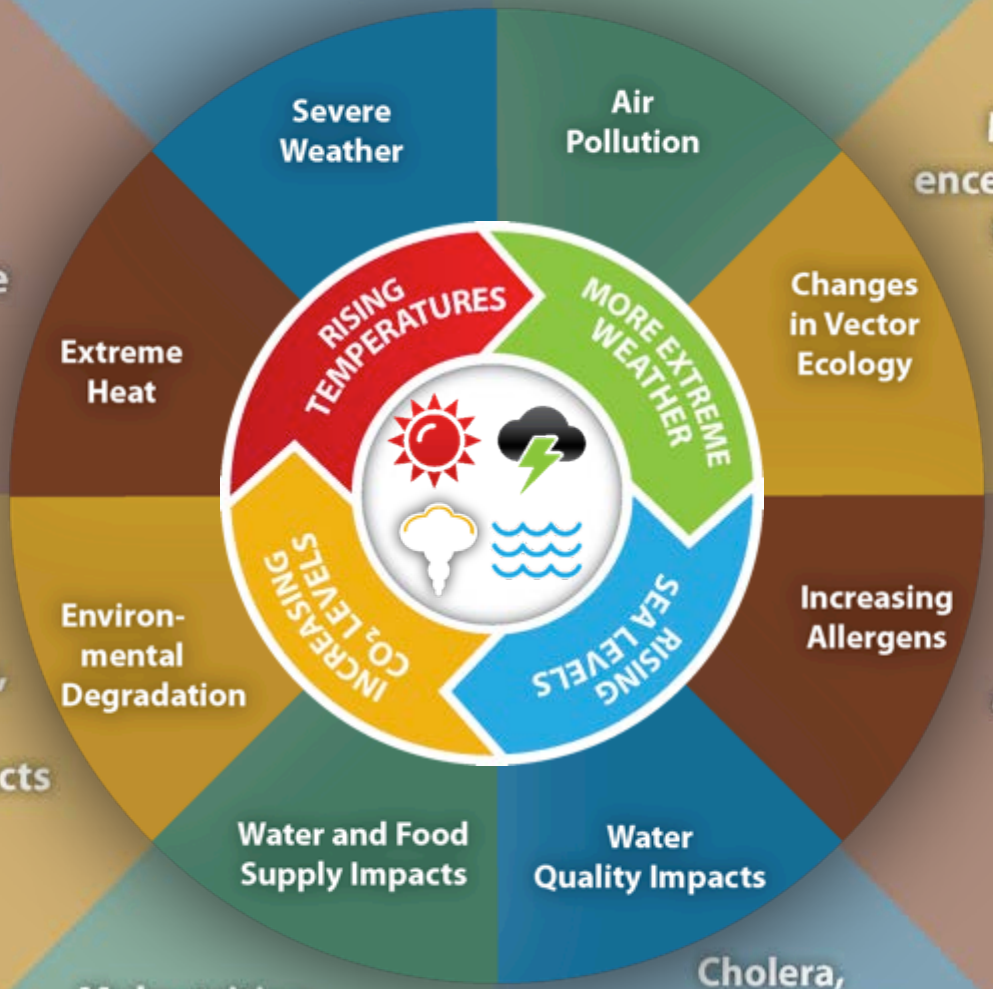
DEPARTMENT OF GLOBAL HEALTH

UNIVERSITY *of* WASHINGTON

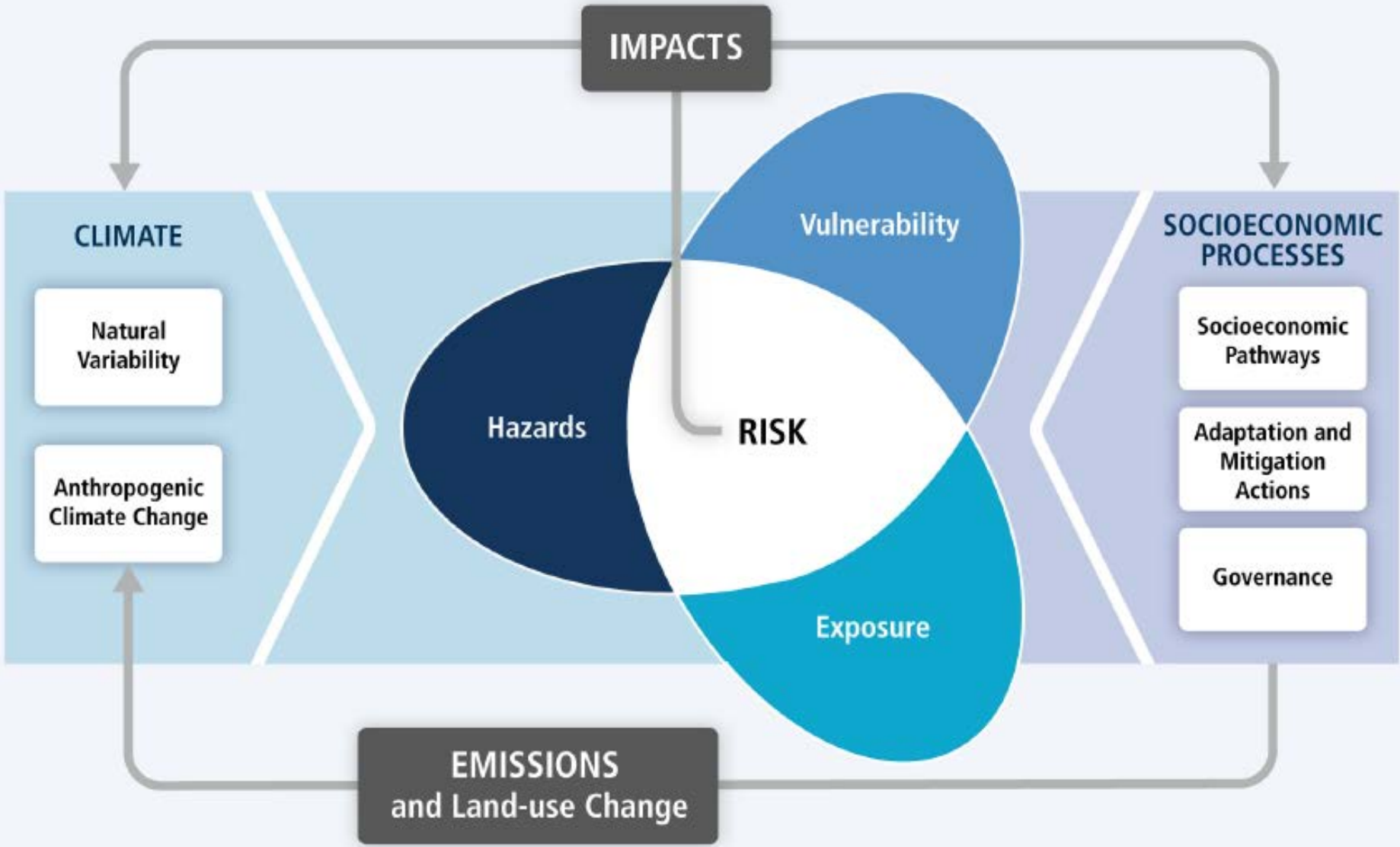
SCHOOL OF PUBLIC HEALTH

UNIVERSITY *of* WASHINGTON

Impact of Climate Change on Human Health



Slide courtesy of Dr. George Luber, CDC

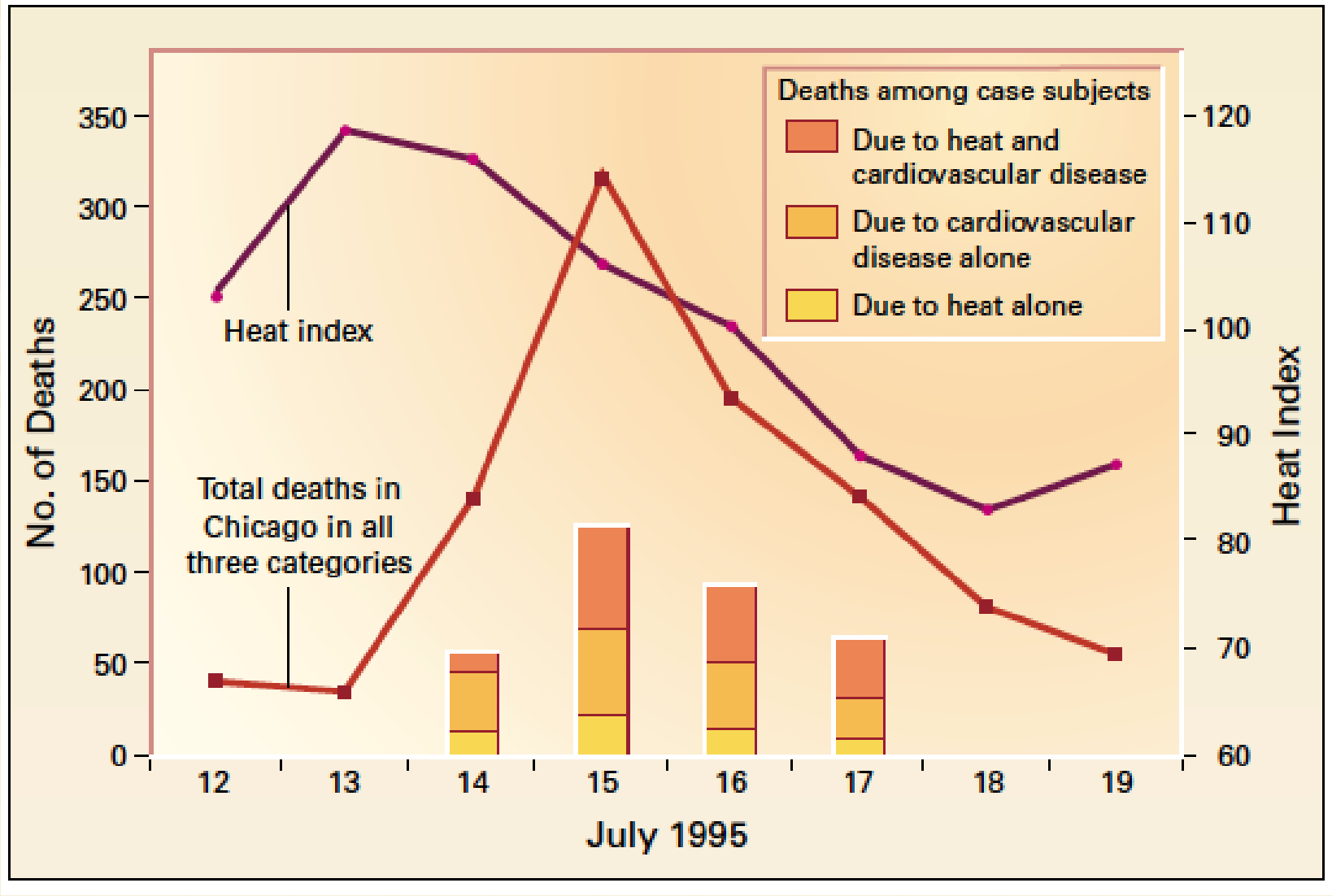

IMPACTS
CLIMATE
Natural Variability
Anthropogenic Climate Change
Vulnerability
Hazards
RISK
Exposure
SOCIOECONOMIC PROCESSES
Socioeconomic Pathways
Adaptation and Mitigation Actions
Governance
EMISSIONS and Land-use Change

IPCC 2014

WHAT EACH COUNTRY LEADS THE WORLD IN

MOST COUNTRIES LEAD THE WORLD IN SOMETHING--SOMETIMES GOOD THINGS, SOMETIMES NOT SO GOOD THINGS, AND SOMETIMES FUNNY THINGS. THIS MAP SHOWS WHAT EACH COUNTRY DOES BEST COMPARED TO ALL OTHER COUNTRIES. DATA SOURCES: HTTP://THEDOGHOUSEDIARIES.COM/MAPLESYRUP.

DOGHOUSEDIARIES / 2013



Semenza et al. 1996


LaGRO
DISTRIBUTION SYSTEM
LaGROU
ONE WAY

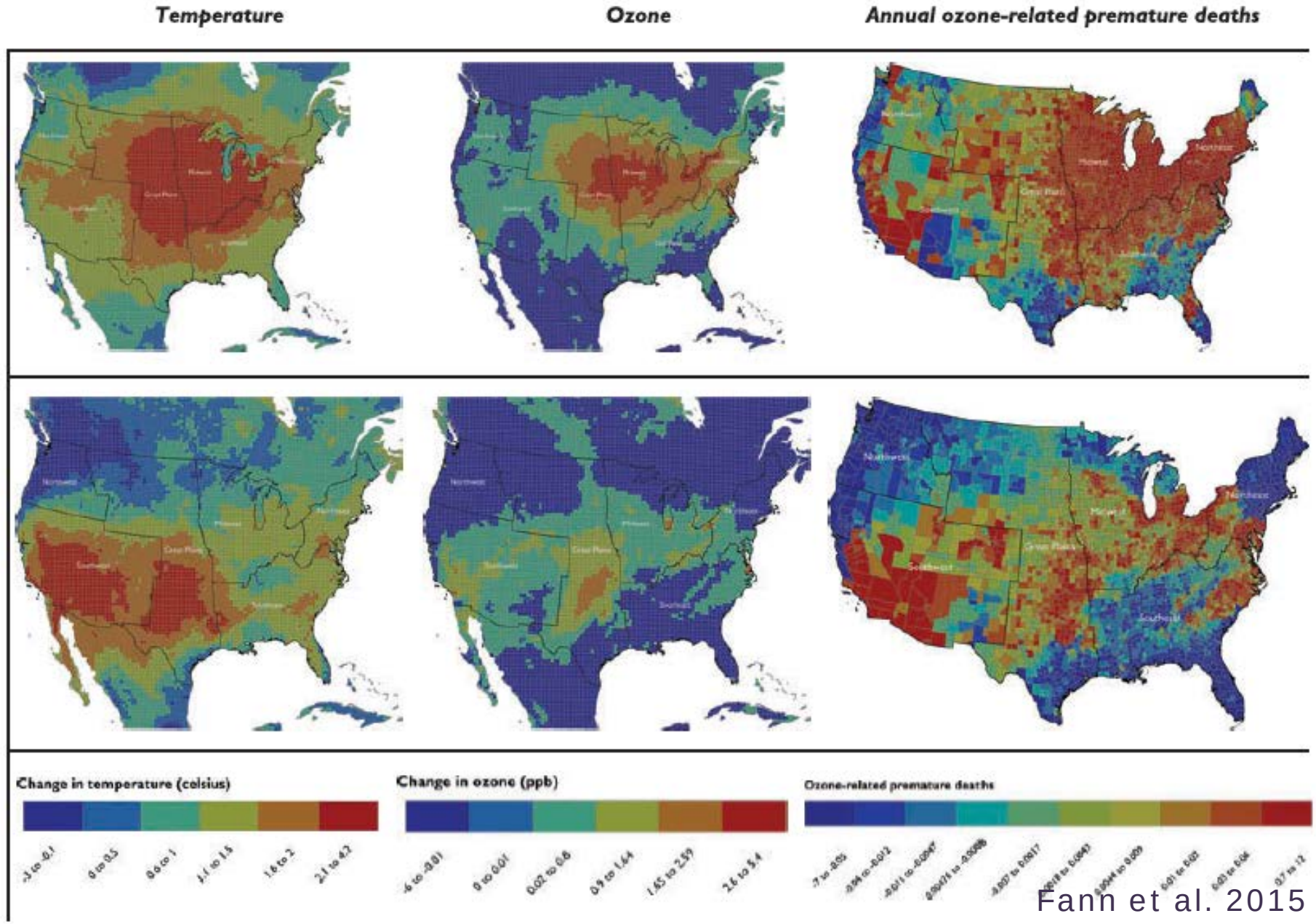

G&G
ORCHARDS
96
G&G
ORCHARDS
G&G
alamy stock photo
G8TGWP
www.alamy.com

Public Health England

NHS England

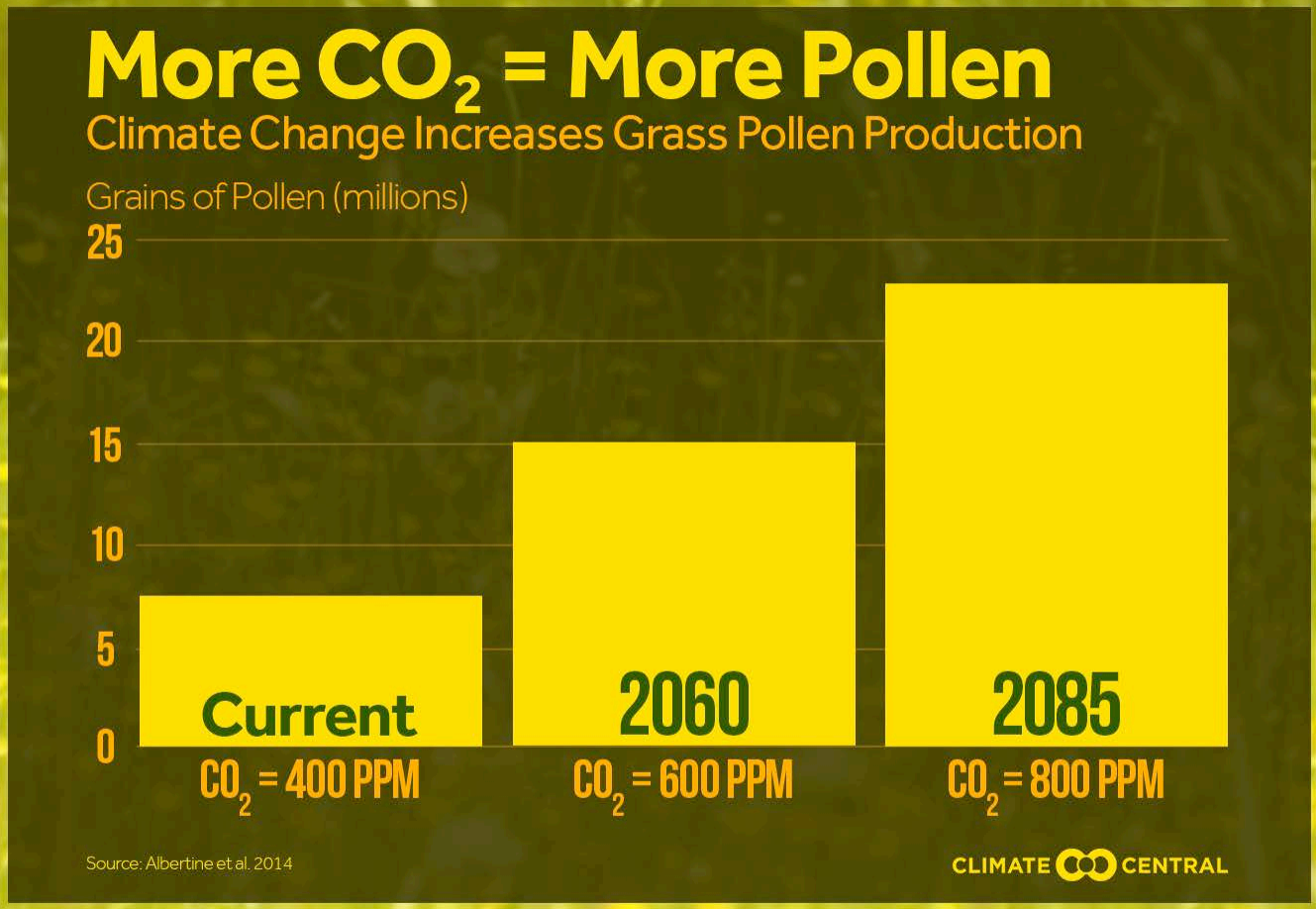
Beat the heat: staying safe in hot weather

Projections 2030

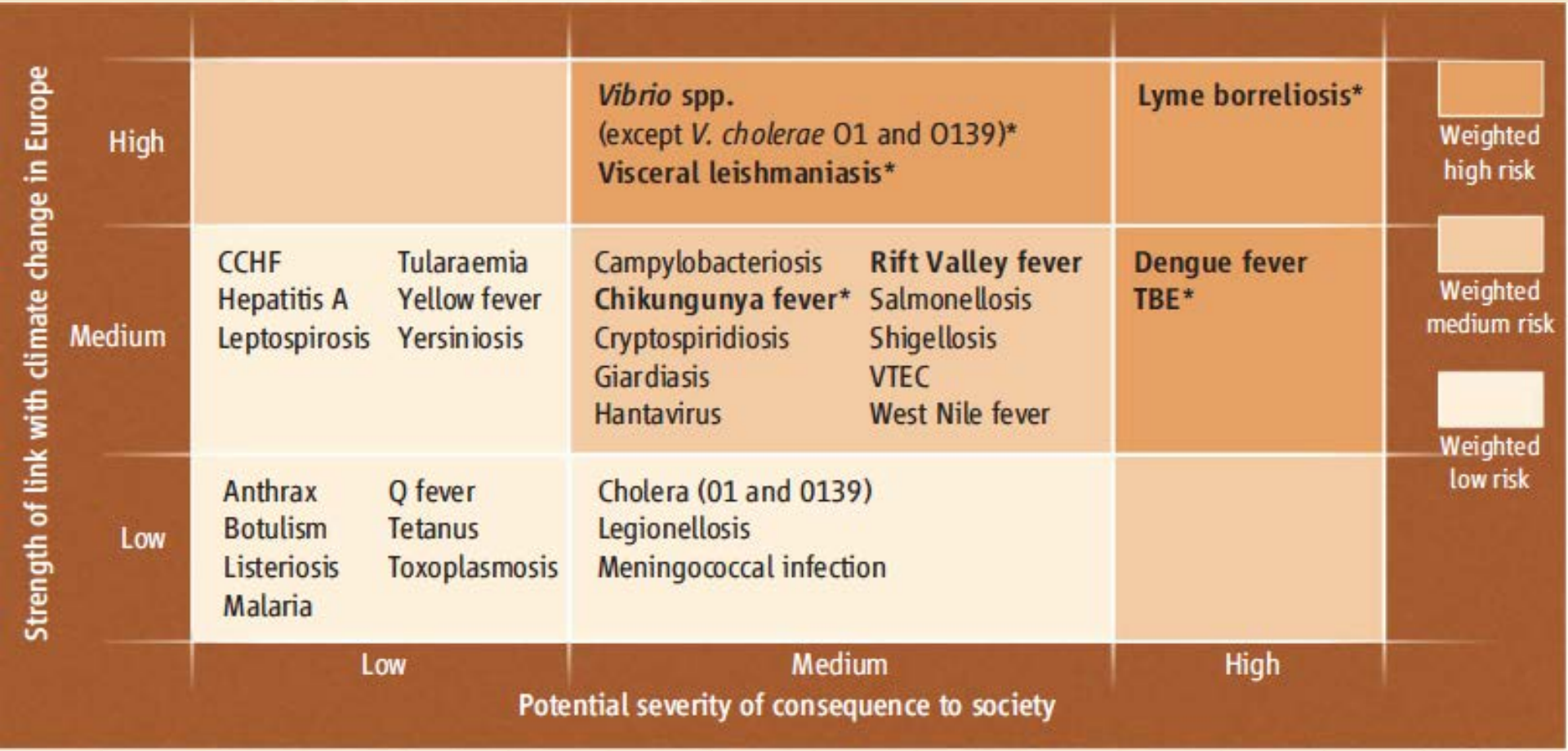


Fann et al. 2015

Jill Pelto

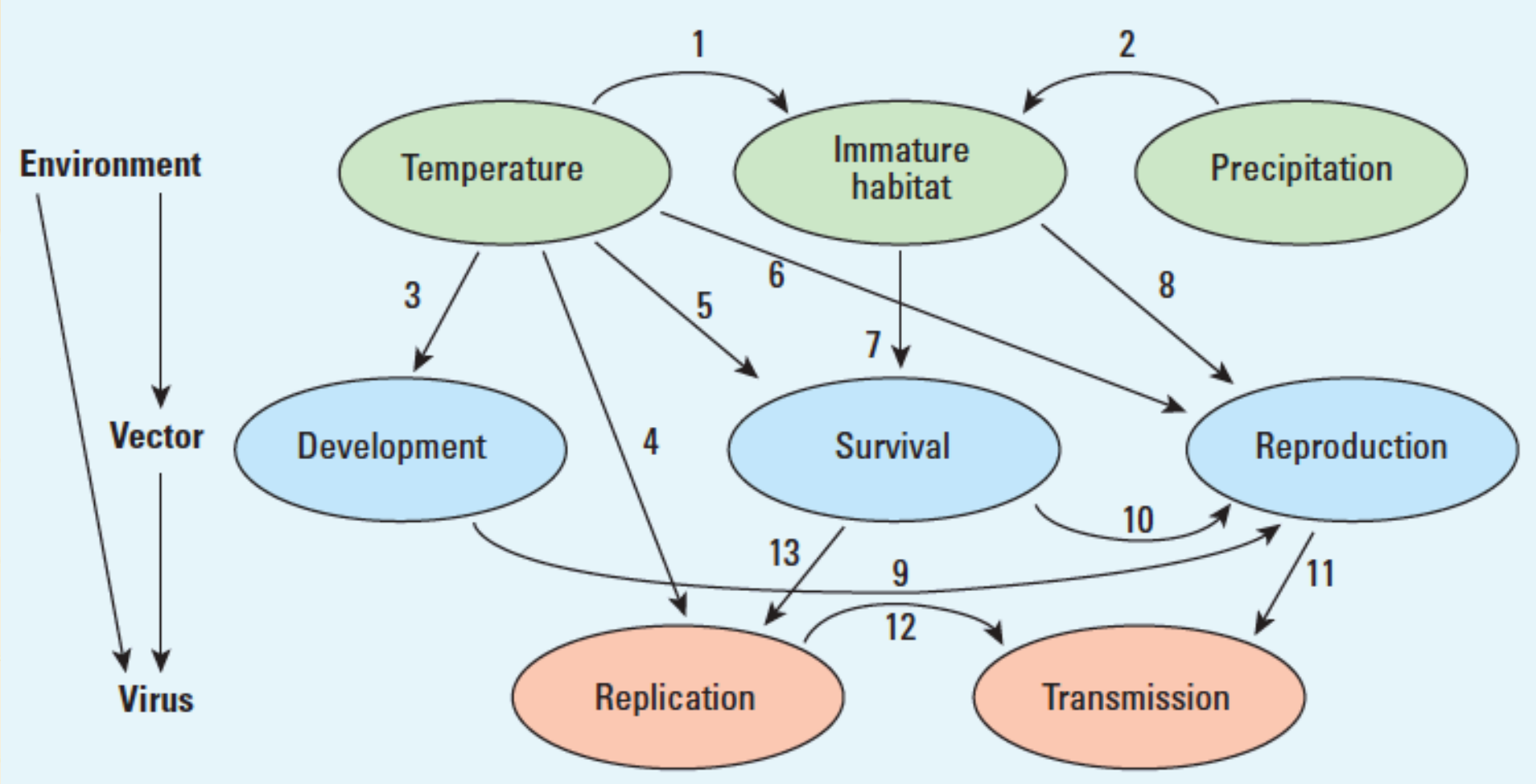

More CO_2 = More Pollen
Climate Change Increases Grass Pollen Production
Grains of Pollen (millions)
25
20
15
10
5
0
Current
CO_2 = 400 PPM
2060
CO_2 = 600 PPM
2085
CO_2 = 800 PPM
Source: Albertine et al. 2014
CLIMATE CENTRAL

Weighted risk analysis of climate change impacts on infectious disease risks in Europe



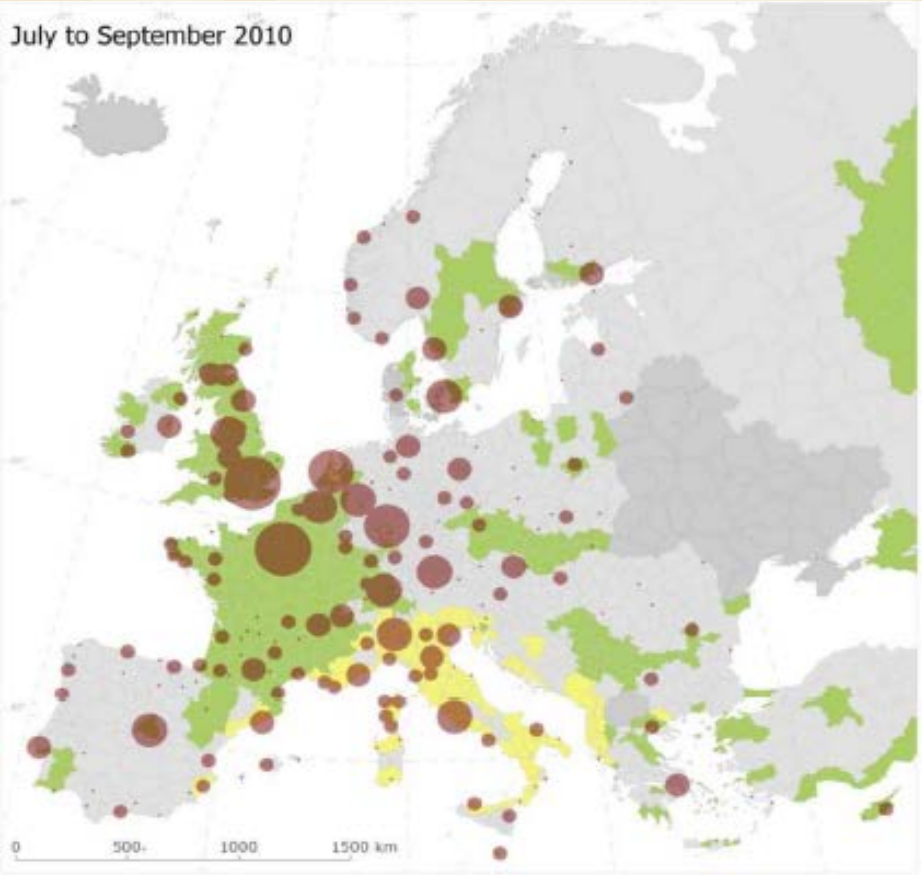
Lindgren et al. 2012

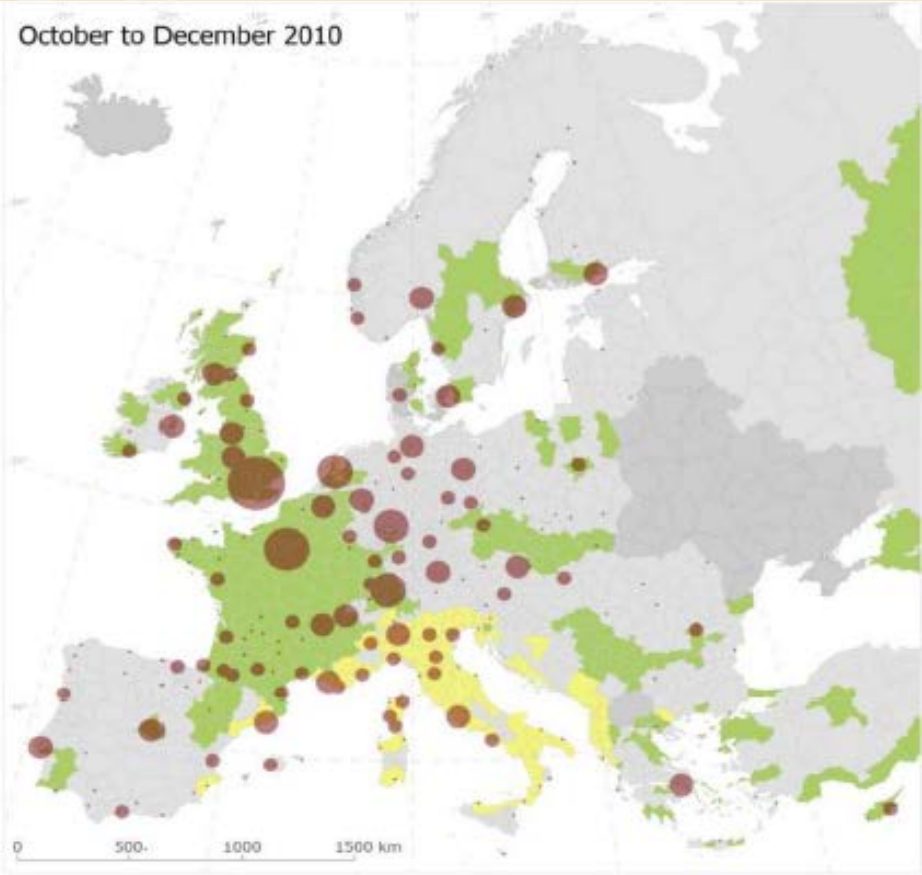
Biophysical influences on dengue ecology showing the interactions between climate variables, vectors, and the virus



Morin et al. 2013

Airport final destination of international travelers from dengue affected areas



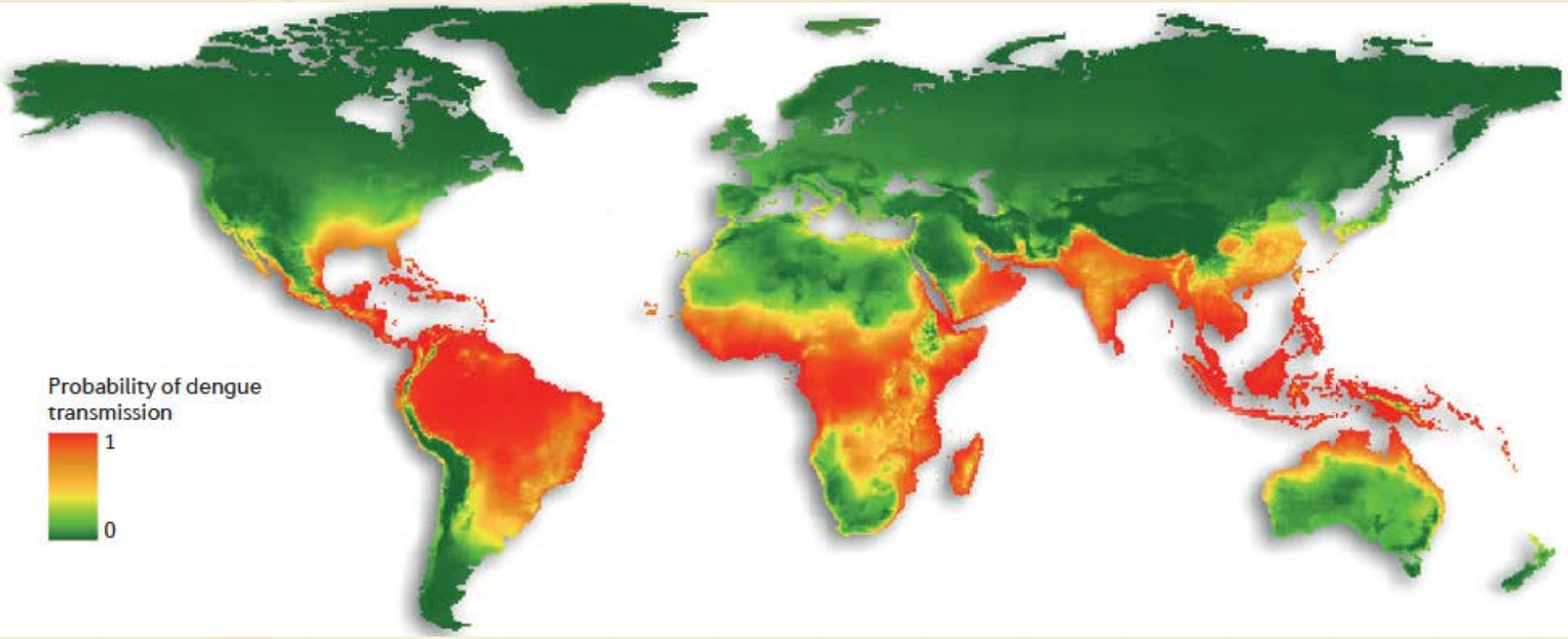


Semenza et al. 2014

Mosquito species capable of carrying Zika virus found in Ontario

23 Aug 2017

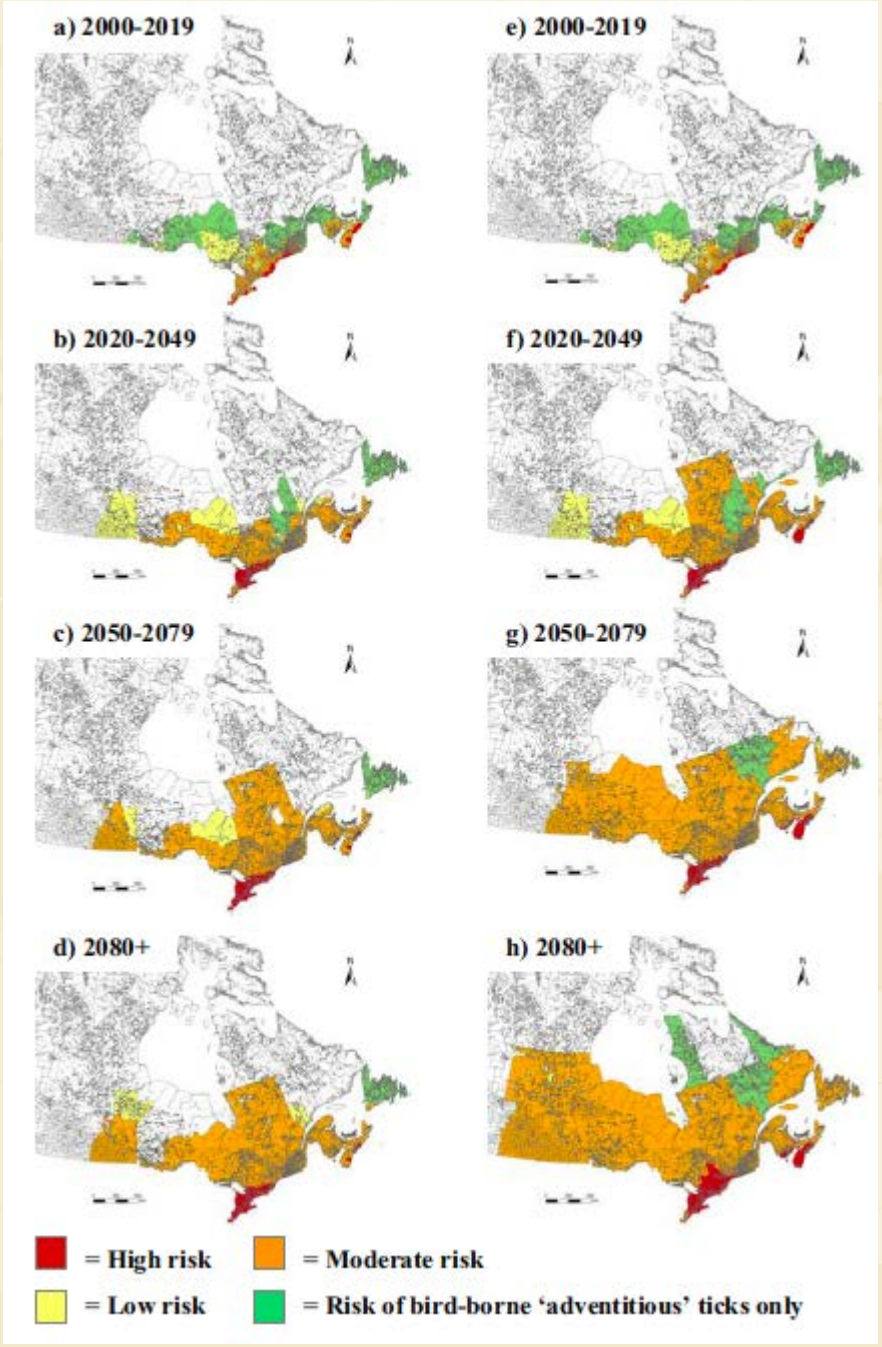
Projected dengue distribution 2085



Messina et al. 2015

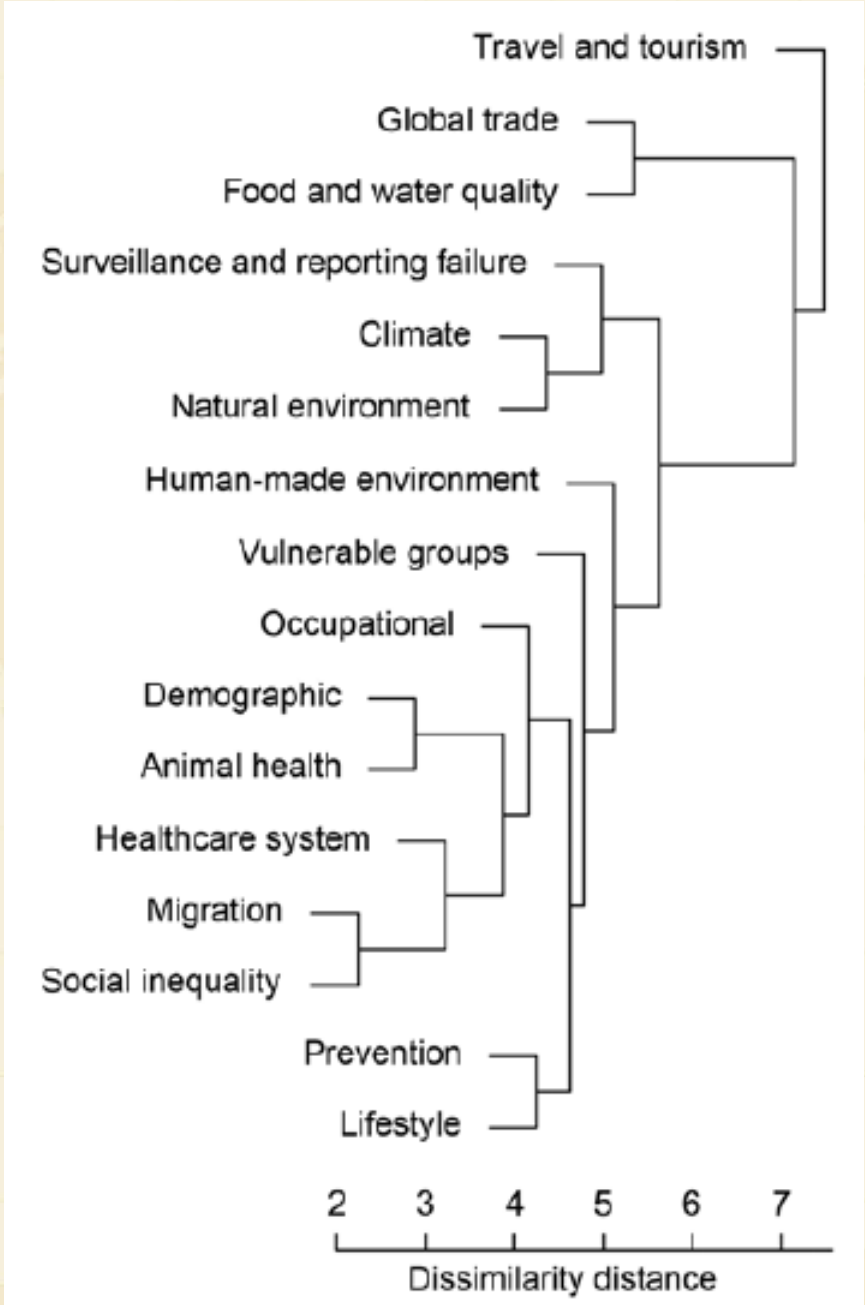
Risk maps for the occurrence of the Lyme disease vector from 1971-2000 to 2080s; slow and fast scenarios

Ogden et al. 2008

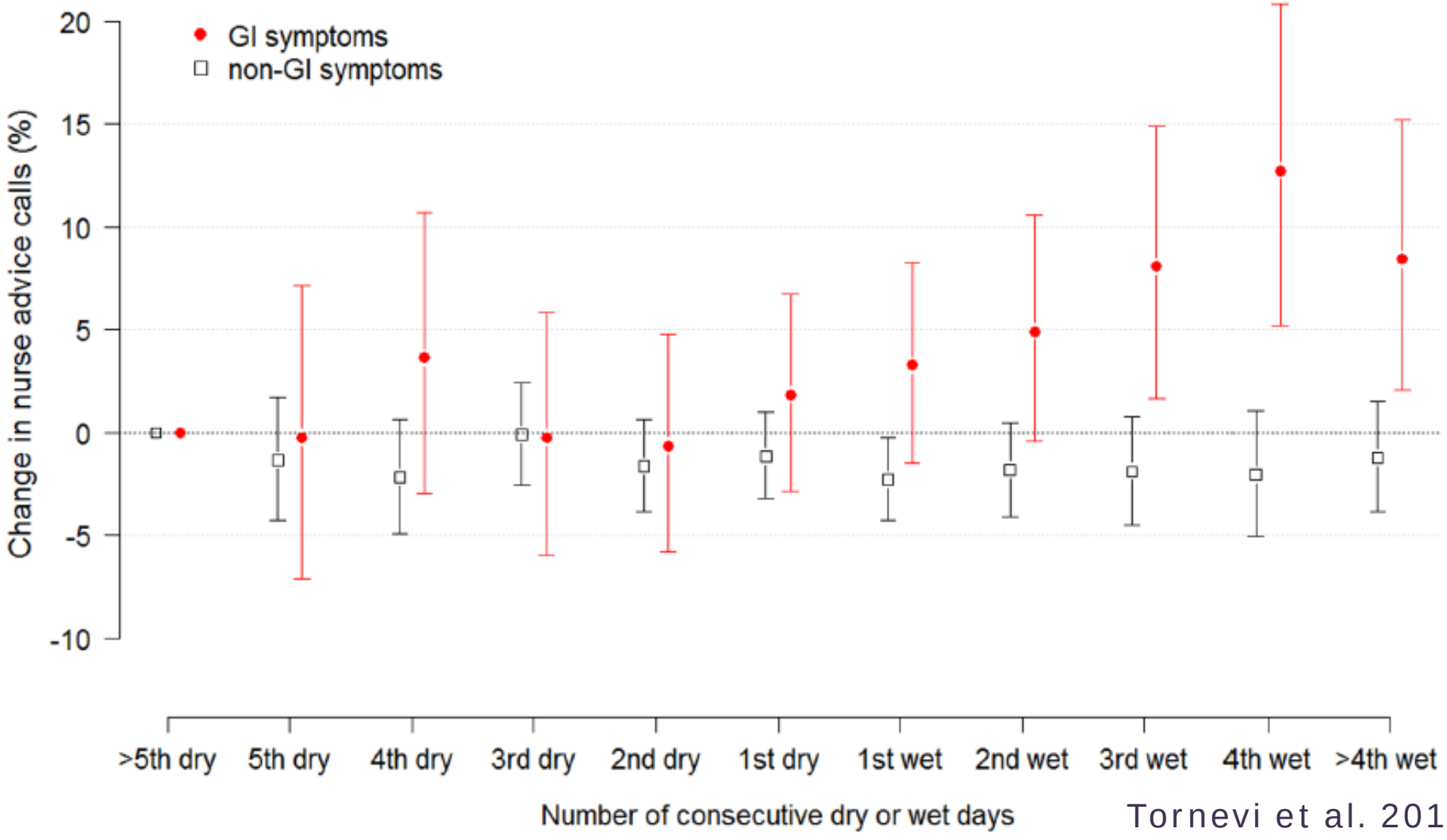


Cluster dendrogram of drivers contributing to observed infectious disease threat events in Europe, 2008-2013

Semenza et al. 2016

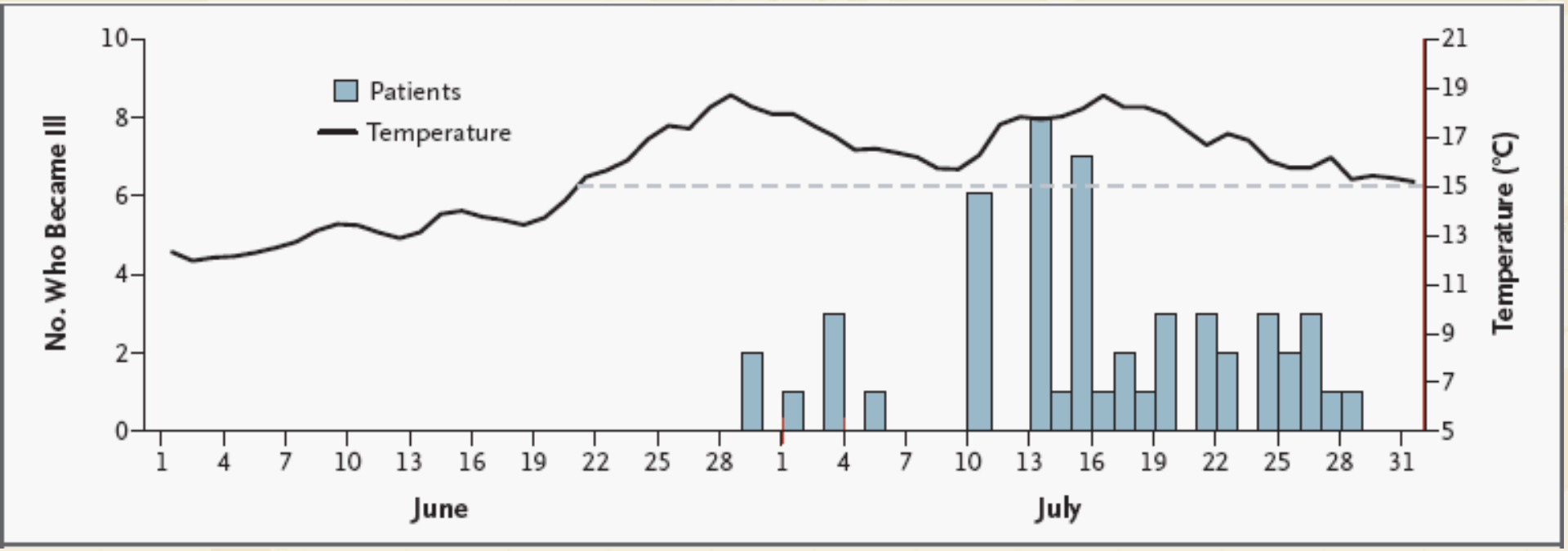


Nurse advice calls for GI symptoms on consecutive dry or wet days, Gothenburg



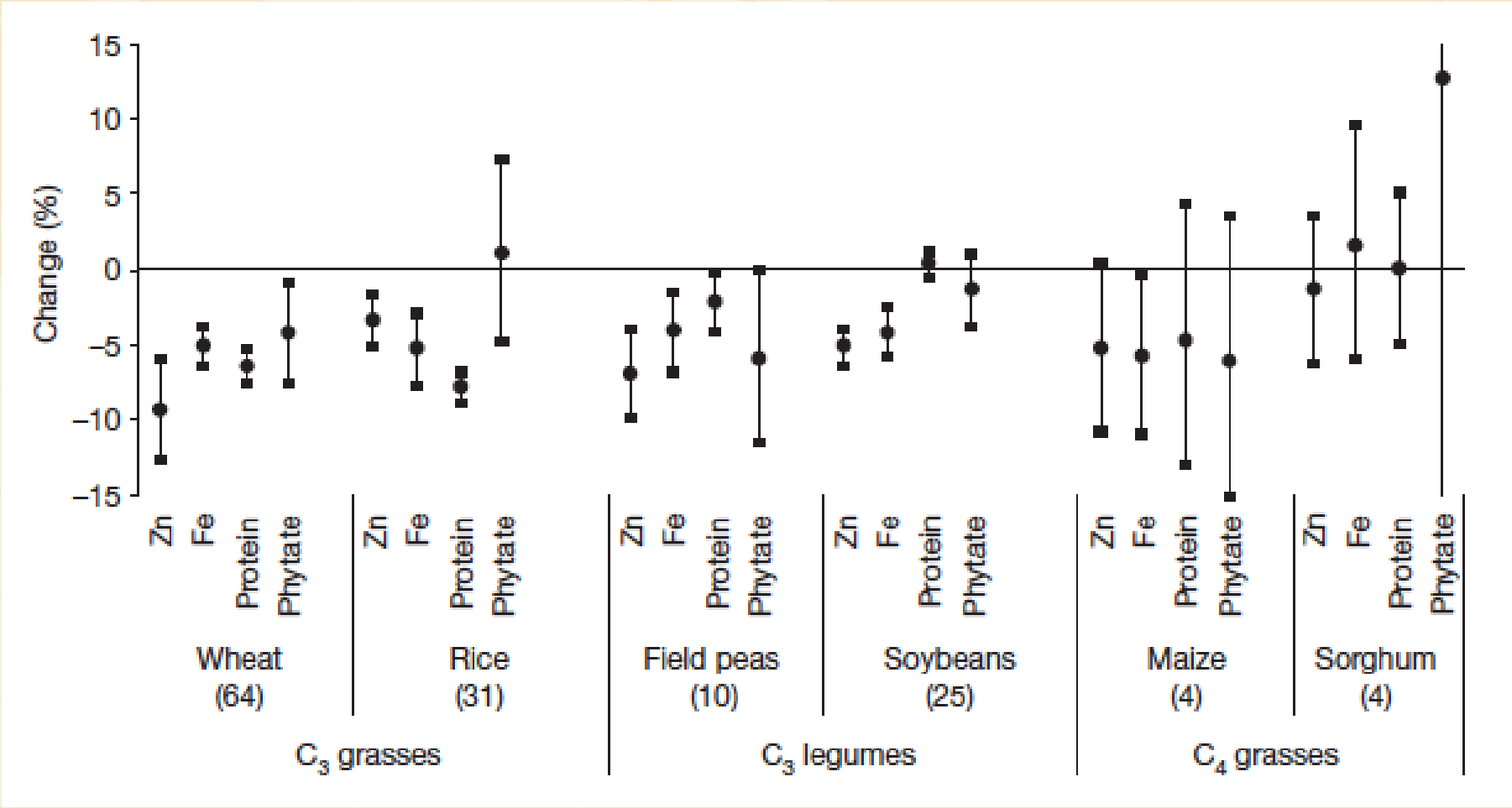
Tornevi et al. 2013

Vibrio parahaemolyticus infections by harvest date and mean daily water temperature



McLaughlin et al. 2005

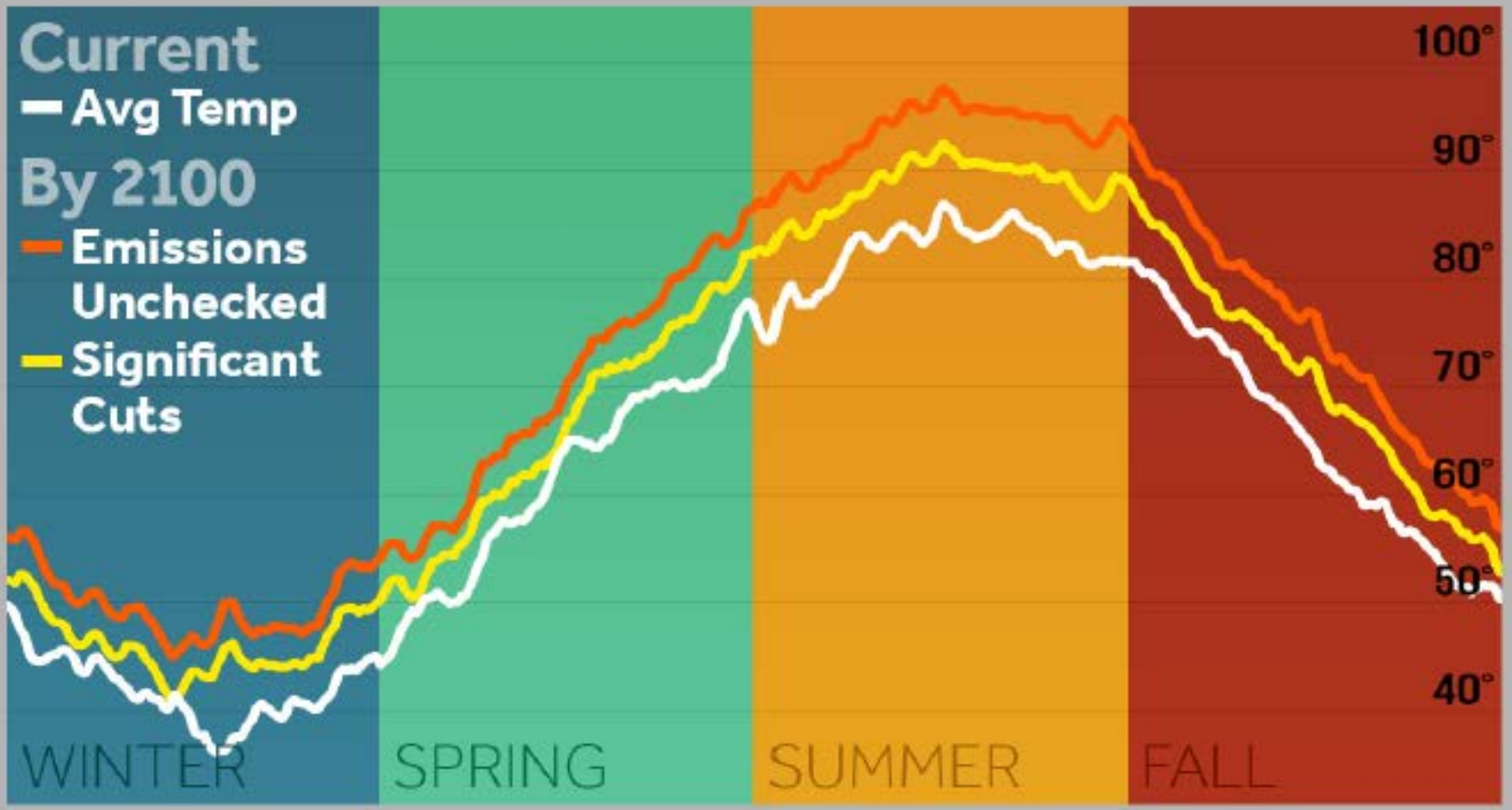
% change in nutrients in elevated vs. ambient CO_2



Myers et al. 2014

Today's Emissions, Tomorrow's Warming

New York City



Year of Average High Temperatures

20-year average of daily maximum temperature

Source: Projections RCP 4.5 & 8.5 - CMIP5, Oak Ridge National Lab; Current - ACIS.org

CLIMATE CENTRAL

Co-benefits – early health gains from wise climate moves

Shifting 5% of short urban car trips to bicycles in New Zealand would save annually

- **22 million liters of fuel**
- **116 deaths due to increased physical activity (vs. 5 extra road crash deaths)**
- **$200 million in health costs**


HELLO KITTY