



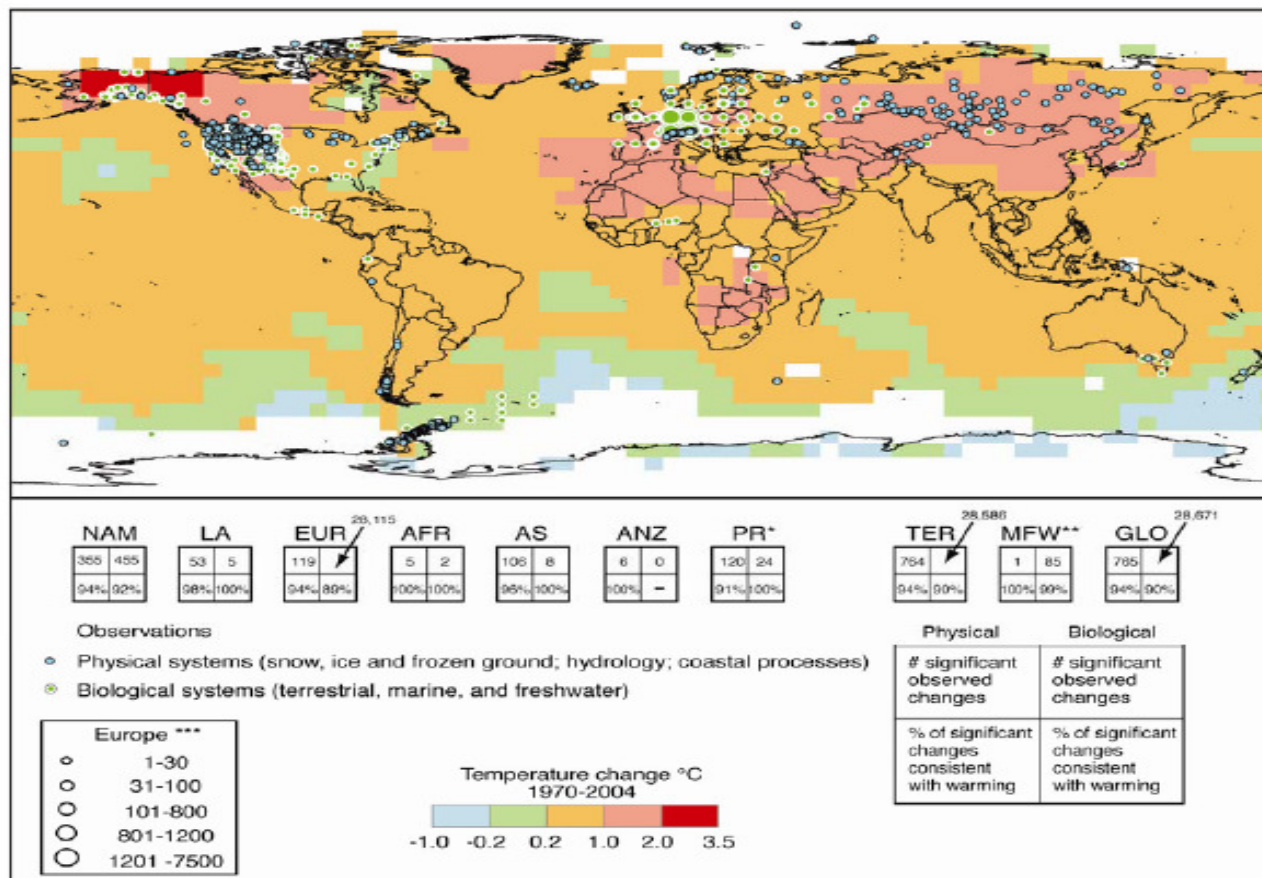
# Climate change and Human health

presented by  
Bettina Menne  
WHO Regional Office for Europe

# Changes in physical and biological systems

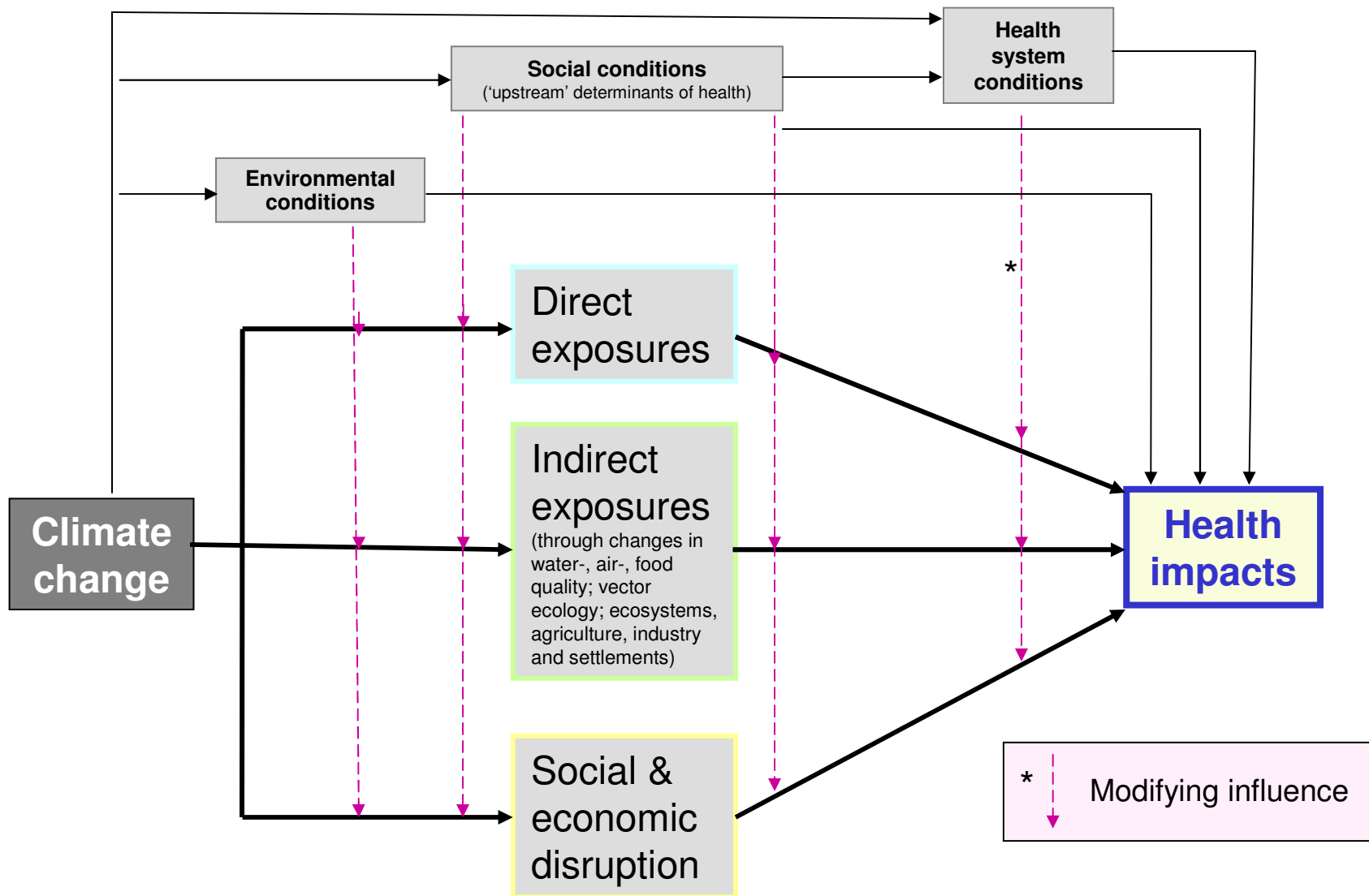


Changes in physical and biological systems and surface temperature 1970-2004

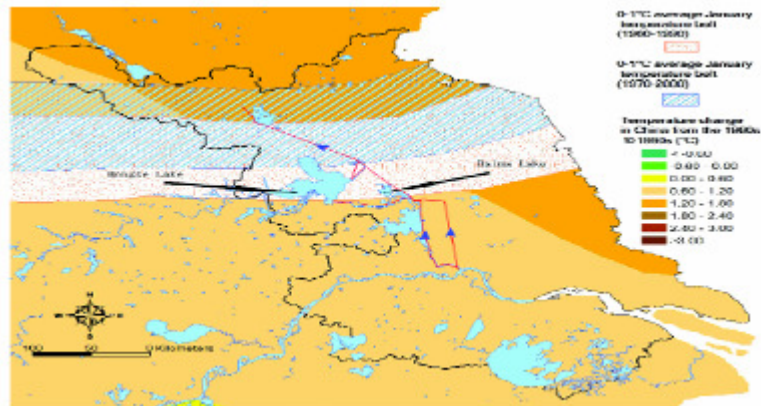
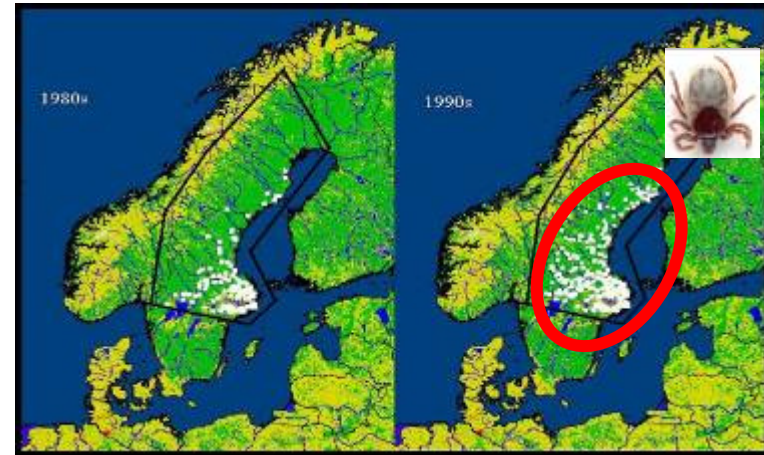
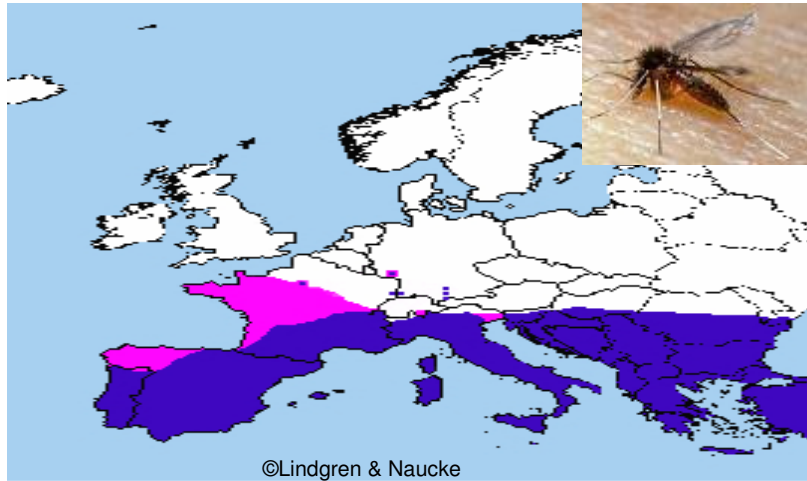


IPCC (2007),  
Summary for policy makers,  
working group 2

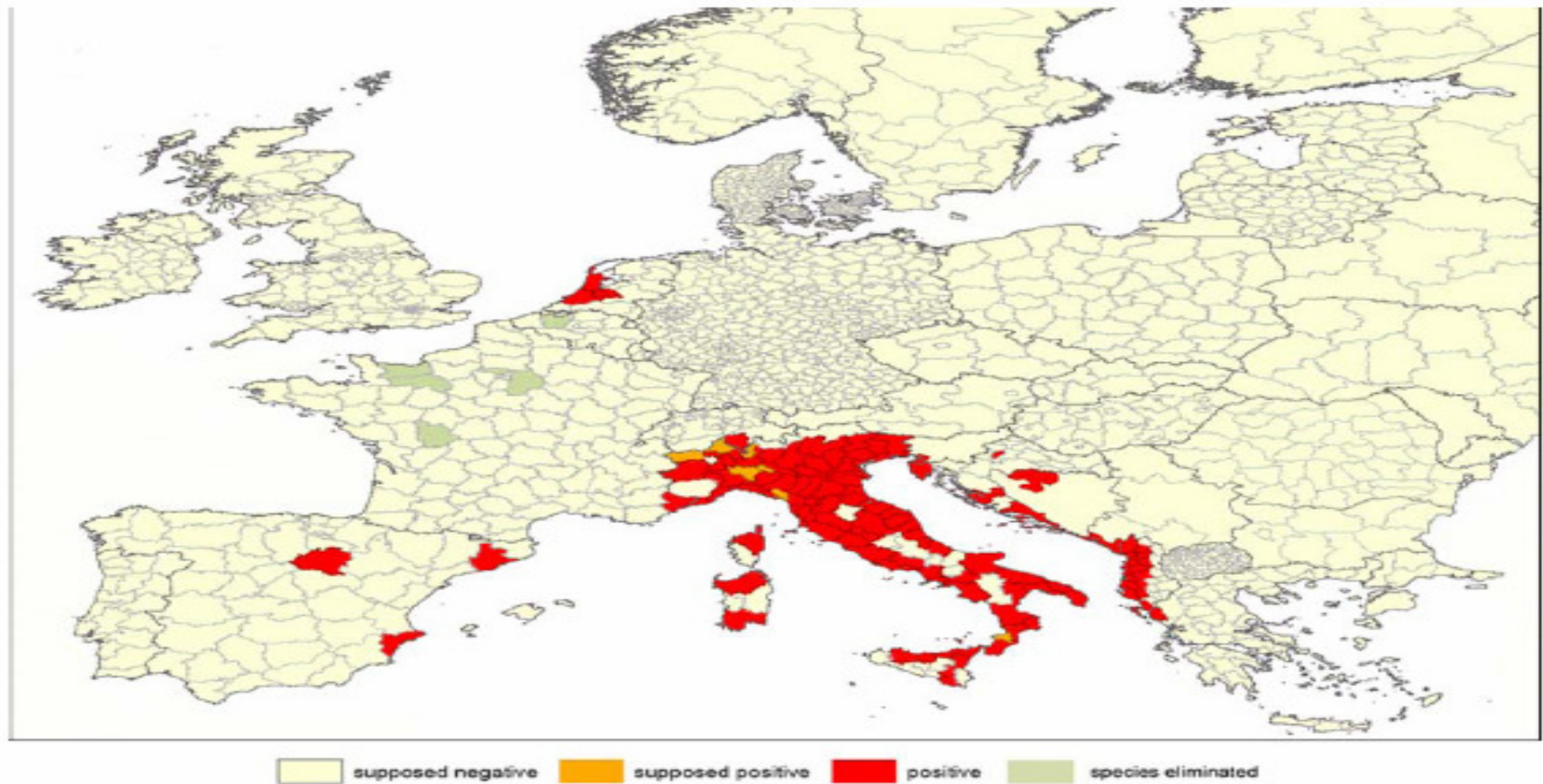
# Schematic diagram of pathways by which climate change affects health



# Emerging evidence of climate change effects

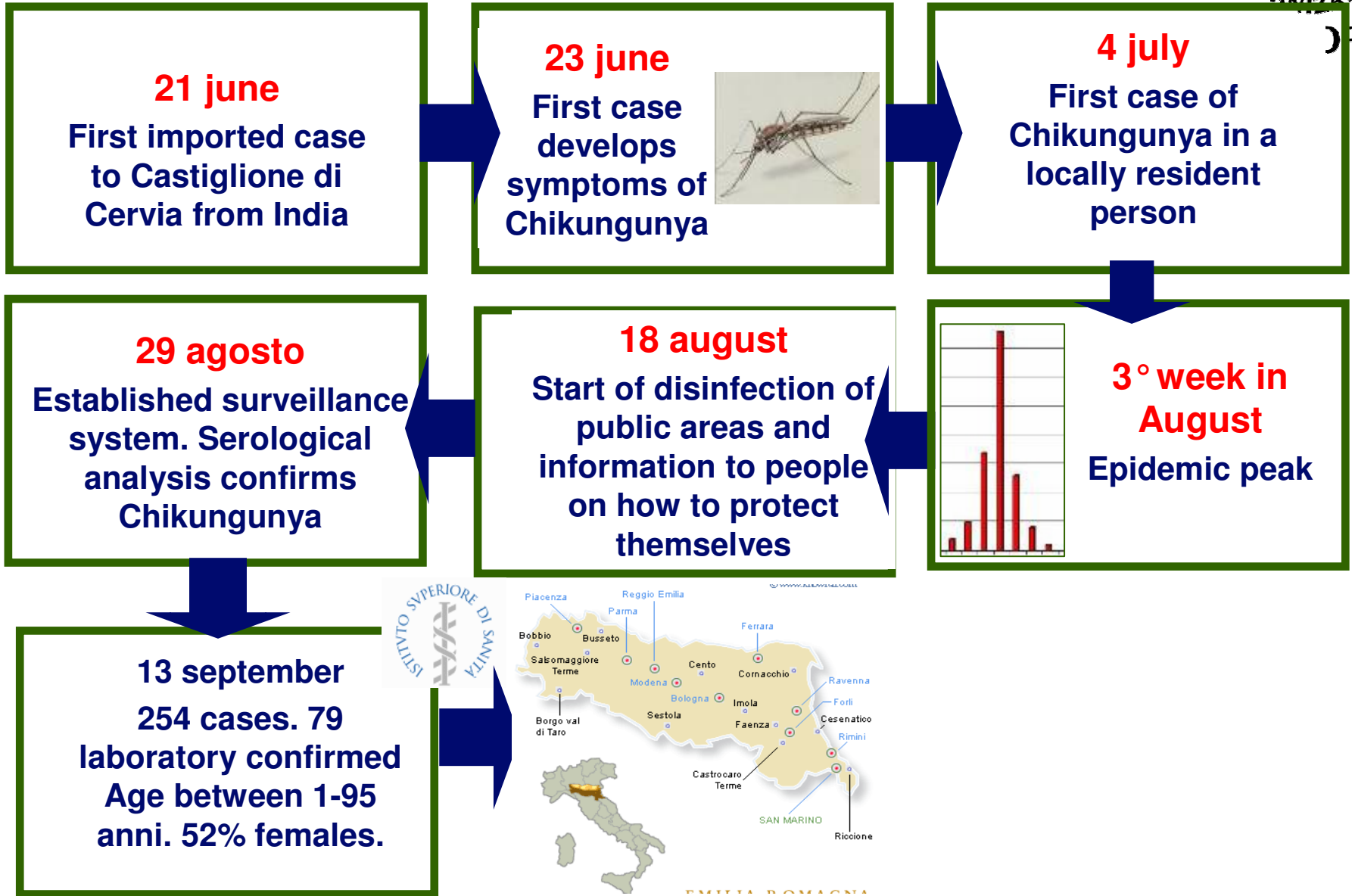


# Current *Ae. Albopictus* distribution

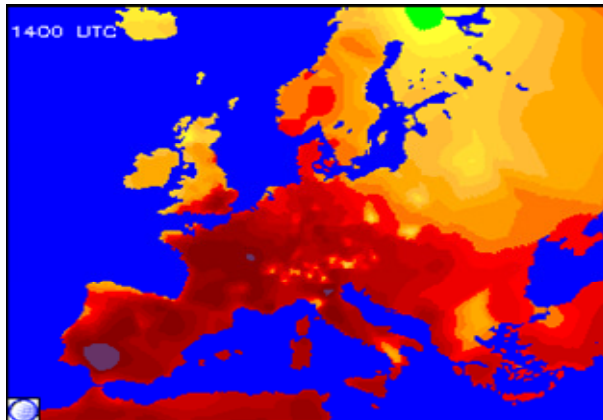


With permission from Schaffner et al,

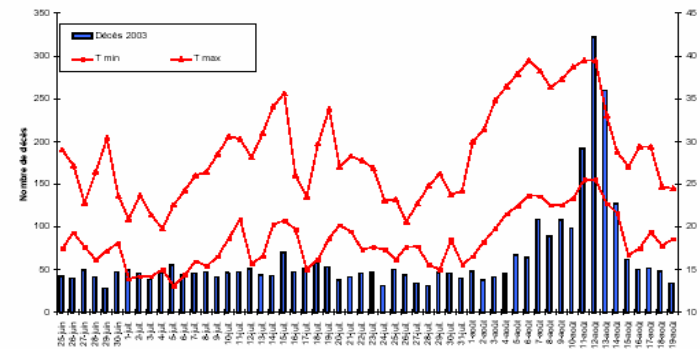
# Cronology of an epidemic



# The example of the heat-wave in 2003



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



Paris Funeral Services (2003)



*They got what they did not  
have before  
(Klinenberg...*



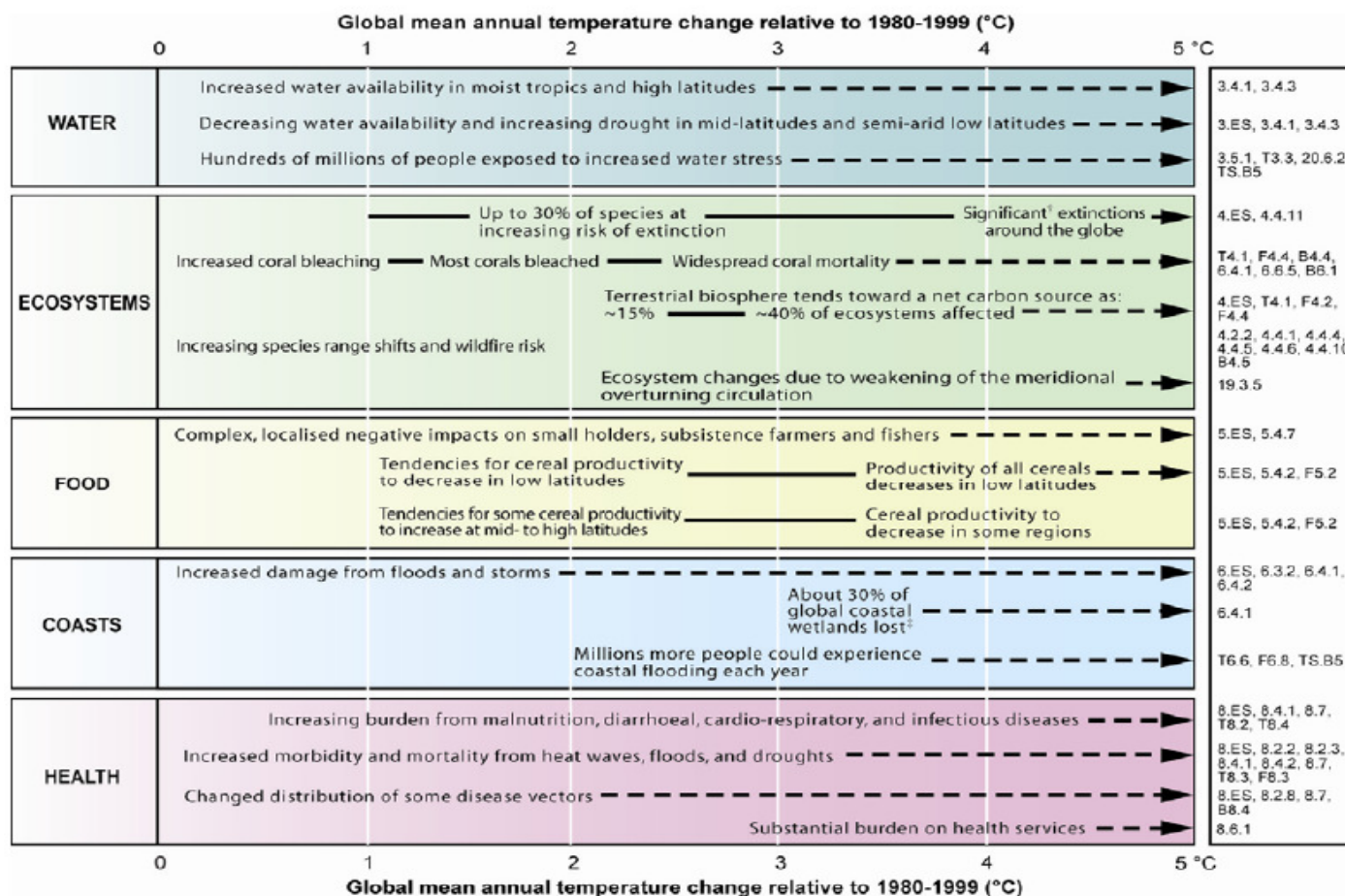
*... cooling and medical  
attention.....*



# Direction and magnitude of change of selected health impacts of climate change



	Negative Impact	Positive Impact
Very High Confidence <i>Malaria: Contraction and expansion, changes in transmission season</i>		
High Confidence <i>Increase in malnutrition</i>		
<i>Increase in the number of people suffering from deaths, disease and injuries from extreme weather events</i>		
<i>Increase in the frequency of cardio-respiratory diseases from changes in air quality</i>		
<i>Change in the range of infectious disease vectors</i>		
<i>Reduction of cold-related deaths</i>		
Medium Confidence <i>Increase in the burden of diarrheal diseases</i>		



<sup>1</sup> Significant is defined here as more than 40%.

<sup>2</sup> Based on average rate of sea level rise of 4.2 mm/year from 2000 to 2080.

**Table SPM-1.** Illustrative examples of global impacts projected for climate changes (and sea-level and atmospheric carbon dioxide where relevant) associated with different amounts of increase in global average surface temperature in the 21st century [T20.7]. The black lines link impacts, dotted arrows indicate impacts continuing with increasing temperature. Entries are placed so that the left hand side of text indicates approximate onset of a given impact. Quantitative entries for water scarcity and flooding represent the additional impacts of climate change relative to the conditions projected across the range of Special Report on Scenarios (SRES) scenarios A1FI, A2, B1 and B2 (see Endbox 3). Adaptation to climate change is not included in these estimations. All entries are from published studies recorded in the chapters of the Assessment. Sources are given in the right hand column of the Table. Confidence levels for all statements are high.

# Two questions



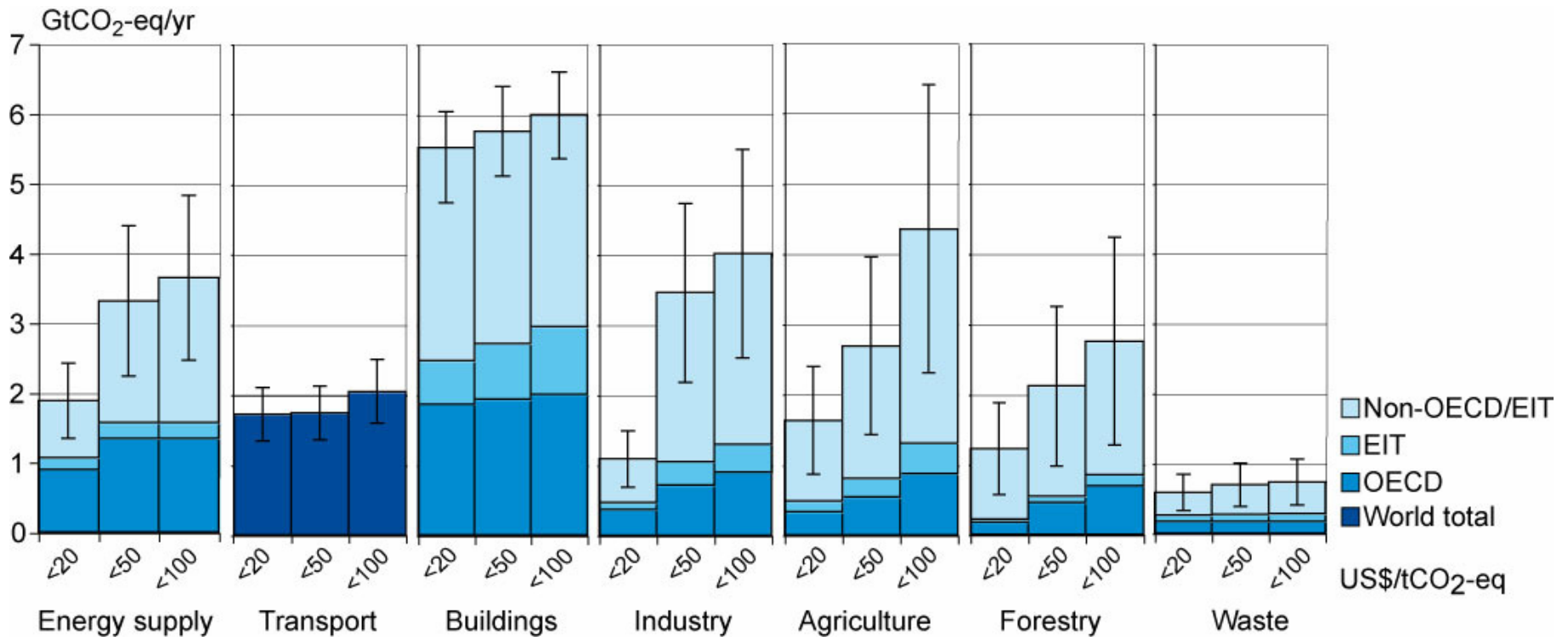
- **Which are the co-benefits or collateral damages of climate change related policies, measures and strategies? Thus what can be safely promoted?**
- **What measures (adaptation) need to be strengthened and what additional measures, policies and strategies are needed?**

# Sectorial IPCC proposals



- Energy Supply
  - Improved supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal and bioenergy); combined heat and power; early applications of CCS (e.g. storage of removed CO<sub>2</sub> from natural gas)
  - Carbon Capture and Storage (CCS) for gas, biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy, including tidal and waves energy, concentrating solar, and solar PV.
- Transport
  - More fuel efficient vehicles; hybrid vehicles; cleaner diesel vehicles; biofuels; modal shifts from road transport to rail and public transport systems; non-motorised transport (cycling, walking); land-use and transport planning
  - Second generation biofuels; higher efficiency aircraft; advanced electric and hybrid vehicles with more powerful and reliable batteries
- Buildings
  - Efficient lighting and daylighting; more efficient electrical appliances and heating and cooling devices; improved cook stoves, improved insulation ; passive and active solar design for heating and cooling; alternative refrigeration fluids, recovery and recycle of fluorinated gases
  - Integrated design of commercial buildings including technologies, such as intelligent meters that provide feedback and control; solar PV integrated in buildings

# All sectors have the potential to contribute



Note: estimates do not include non-technical options, such as lifestyle changes.

IPCC (2007),  
Summary for  
policy makers,  
working group 3

# Health effects from electricity generation

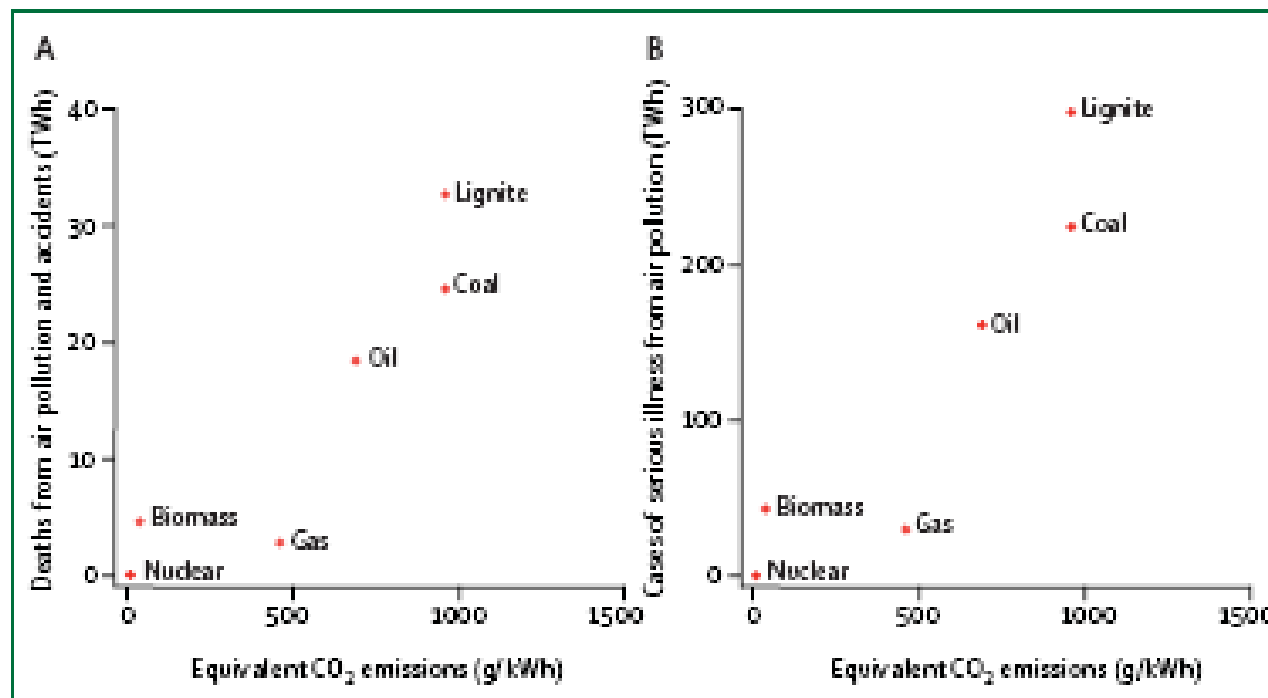


Figure 3 : Health effects of electricity generation per TWh  
(A) deaths from air pollution and accidents involving workers or the public; (B) cases of serious illness attributed to air pollution. Data for CO<sub>2</sub> equivalent emissions from IAEA, 2001.<sup>40</sup>

Markandya and  
Wilkinson, 2007



Globally, there are each year roughly

- 1.2 million deaths due to road traffic injuries
- 800,000 deaths due to urban air pollution.
- 1.9 million deaths ascribed to physical inactivity.

# Solutions are available



Policy	Reducing crashes	Reducing air pollution	Reducing noise	Mitigating climate change	Promoting physical activity
Speed management	+	+	+	+	+
Traffic calming and speed reduction in residential areas	+	+	+	+	+
Reducing transport demand (such as by telecommunication)	+	+	+	+	+
Road pricing	+	+	+	+	+
Cleaner fuels and more efficient vehicles	/	+	/	+	/
Promotion of safe cycling, walking and public transport	+	+	+	+	+
Safer cars (including fronts protecting pedestrians)	+	/	/	/	/
Implementing noise reduction barriers	/	/	+	/	/
Investment in safe infrastructure for cyclists and pedestrians	+	+	+	+	+
Urban parking management	+	+	+	+	+
Environmentally differentiated fees for motorized transport in urban areas	/	+	/	+	/
Reducing the power of vehicles	+	+	/	+	-

Adapted from Racioppi, et al, 2004





Biomass fuels in households are responsible annually for approximately 0.7 to 2.1 million premature deaths in low-income countries.

# Long term mitigation (after 2030)



- Mitigation efforts over the next two to three decades will have a large impact on opportunities to achieve lower stabilization levels

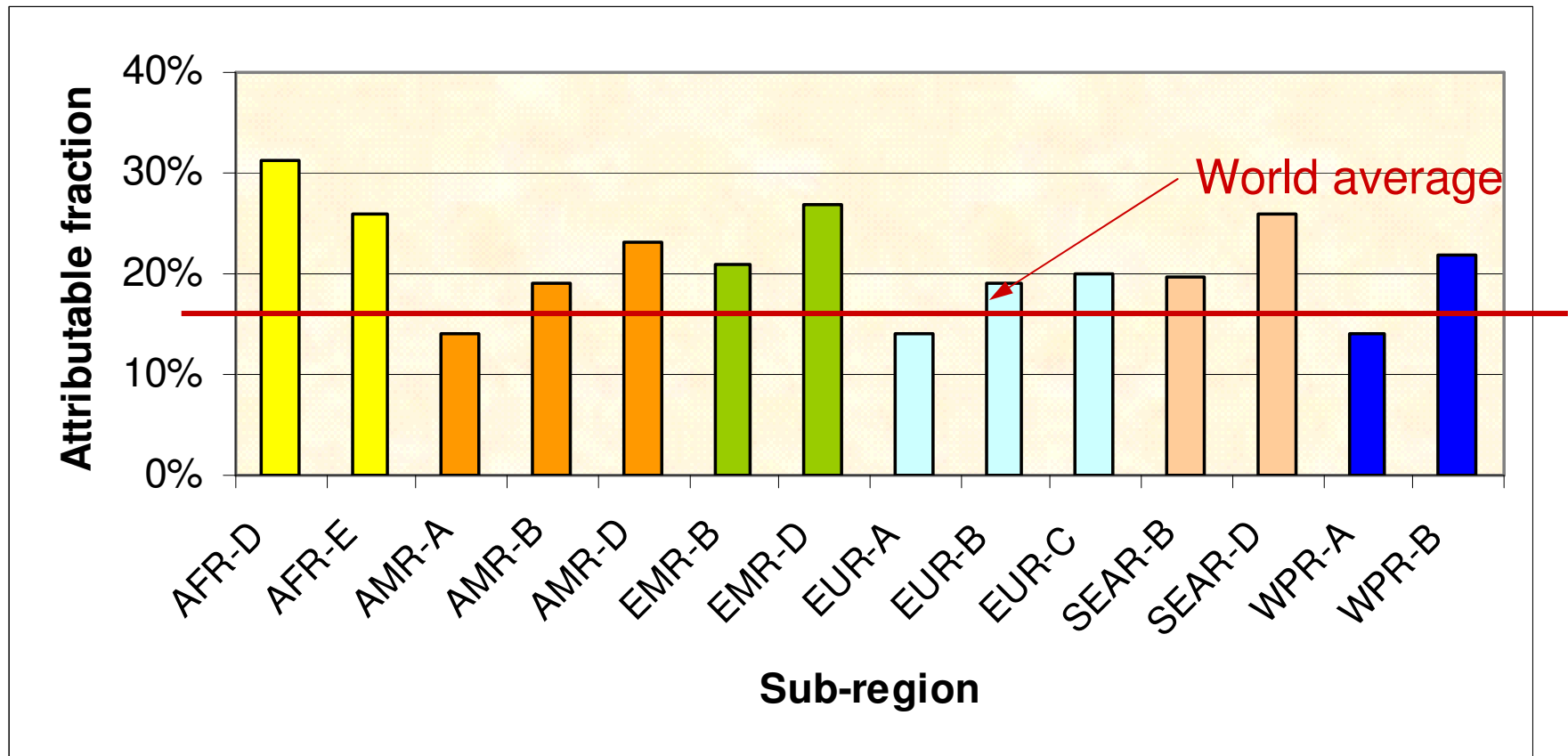
Stab level (ppm CO <sub>2</sub> -eq)	Global Mean temp. increase at equilibrium (°C)	Year CO <sub>2</sub> needs to peak	Year CO <sub>2</sub> emissions back at 2000 level	Reduction in 2050 CO <sub>2</sub> emissions compared to 2000
445 – 490	2.0 – 2.4	2000 - 2015	2000- 2030	-85 to -50
490 – 535	2.4 – 2.8	2000 - 2020	2000- 2040	-60 to -30
535 – 590	2.8 – 3.2	2010 - 2030	2020- 2060	-30 to +5
590 – 710	3.2 – 4.0	2020 - 2060	2050- 2100	+10 to +60
710 – 855	4.0 – 4.9	2050 - 2080		+25 to +85
855 – 1130	4.9 – 6.1	2060 - 2090		+90 to +140

IPCC (2007), Summary for policy makers, working group 3

# How much disease could be prevented by modifying the environment ?



Current evidence - best conservative estimate 24%



Pruess-Austin and Corvalan,  
WHO, 2006

# Additional adaptation: approaches at different scales and across scales



- International:
  - Global climate related infectious disease surveillance;
  - Regional early warning mechanisms and actions for the health sector;
  - Inclusion of climate change into multilateral agreements
- National and regional:
  - Early warning systems linked to intervention plans (heat and infectious diseases);
  - Specific disease risk identification and surveillance;
  - Specific awareness programs;
  - Inclusion of climate change into risk management mechanisms
- Health sector:
  - Health system response plans; training of health professionals; climate proofed infrastructure
- Individual:
  - Information about solutions (e.g. heat in summer)
- Across scales: win-win approaches
  - Climate proofed housing

**“Collective action is more likely than piecemeal initiative to advance policy and practice” (Dr Chan, 2007)**







- Thanks to....
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