



Climate change and health

Risks – and Adaptation Options

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Weather is an exposure to human health, since ever



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)

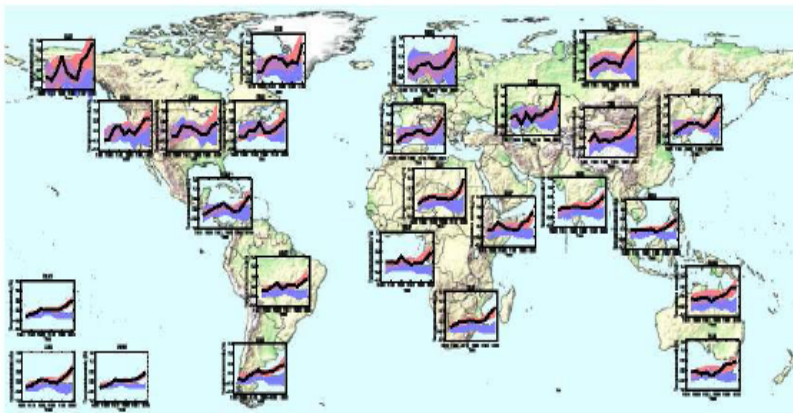
What makes climate change so different

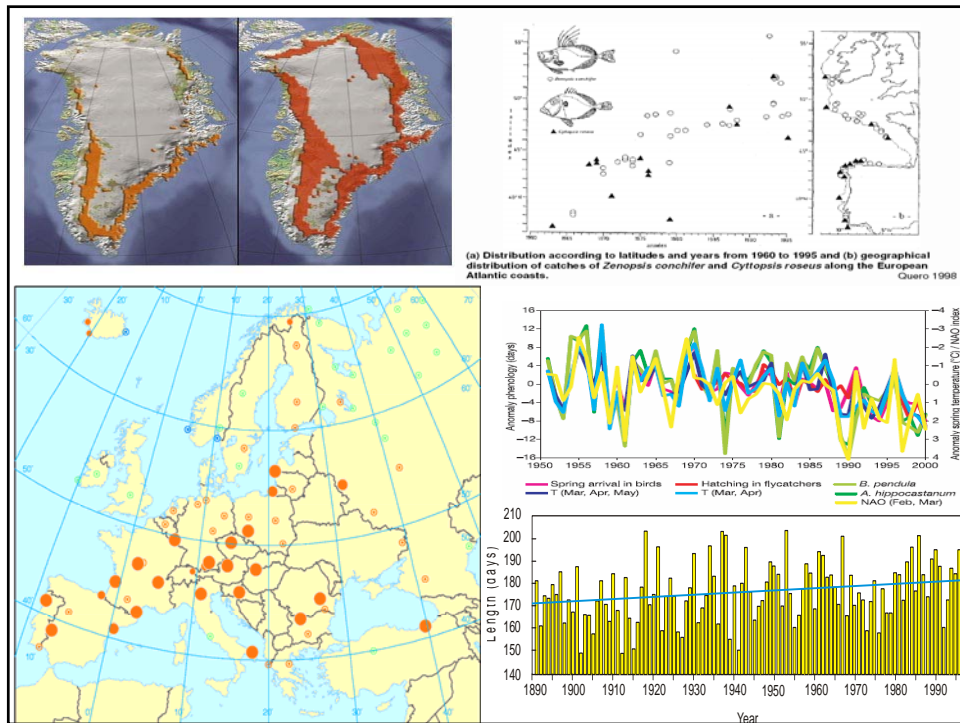
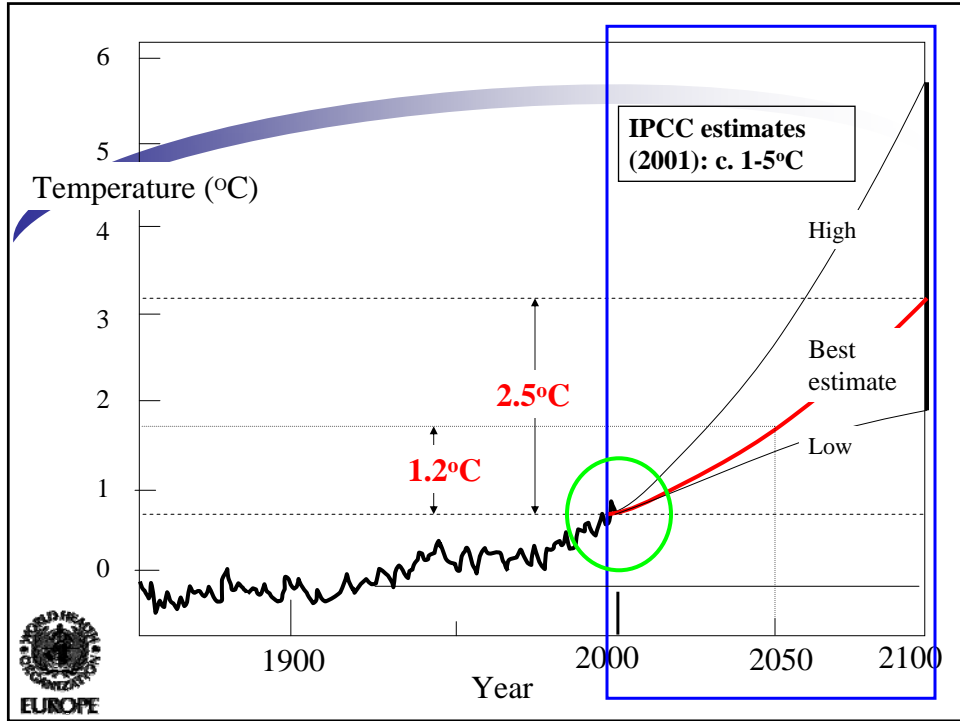
- Climate change refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.



the earth is warming

WGI





Evolutionary Response to Rapid Climate Change

William E. Bradshaw and Christina M. Holzapfel

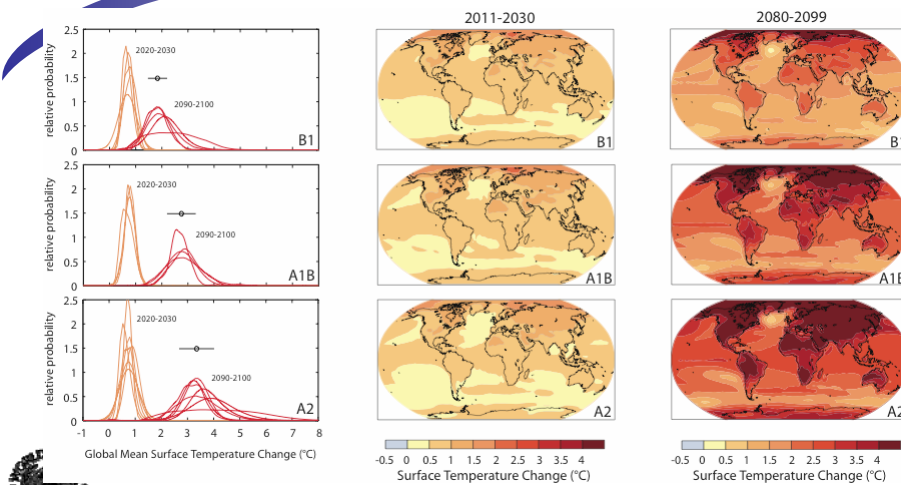
SCIENCE VOL 312 9 JUNE 2006



Adaptive animals. The Yukon red squirrel (*Tamiascus hudsonicus*) (left), the pitcher-plant mosquito (*Wyeomyia smithii*, shown descending into its carnivorous host, *Sarracenia purpurea*) (middle), and the European blackcap (*Sylvia atricapilla*) (right) show genetically based shifts in the timing of their seasonal reproduction, dormancy, or migration during recent, rapid climate warming.

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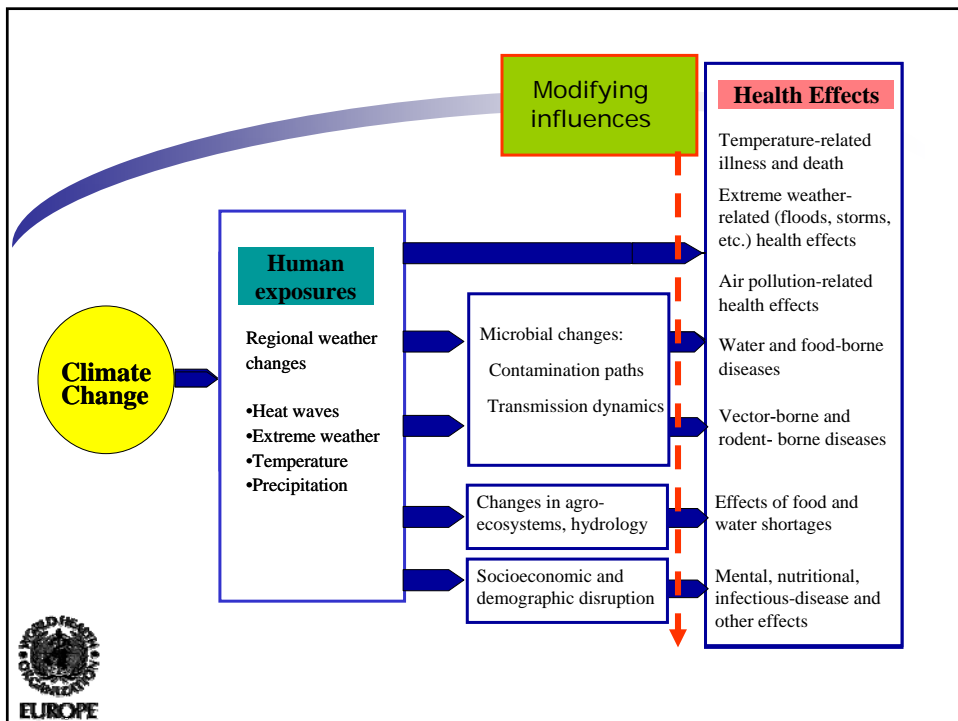
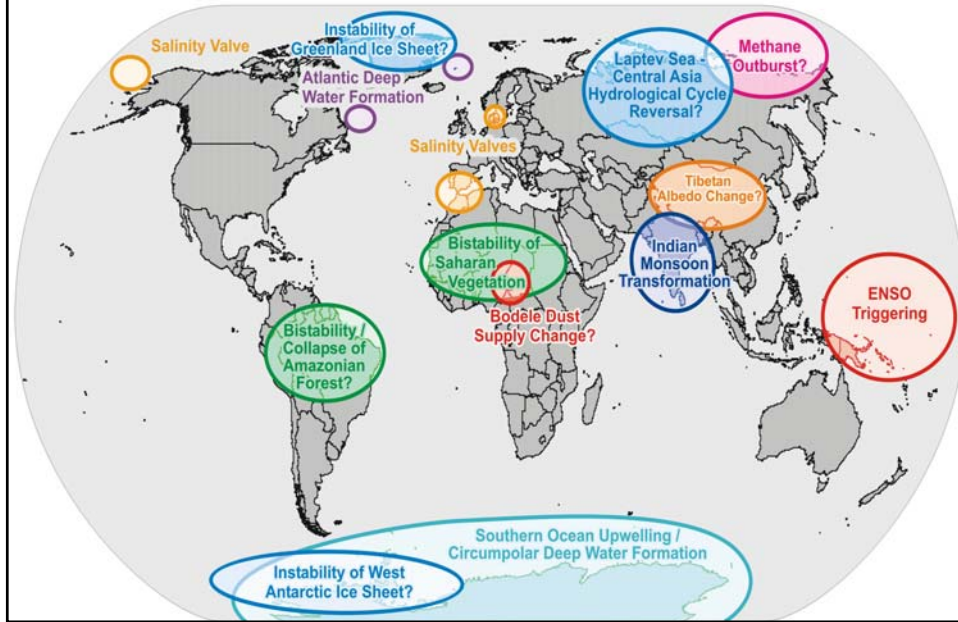
Projected climatic changes



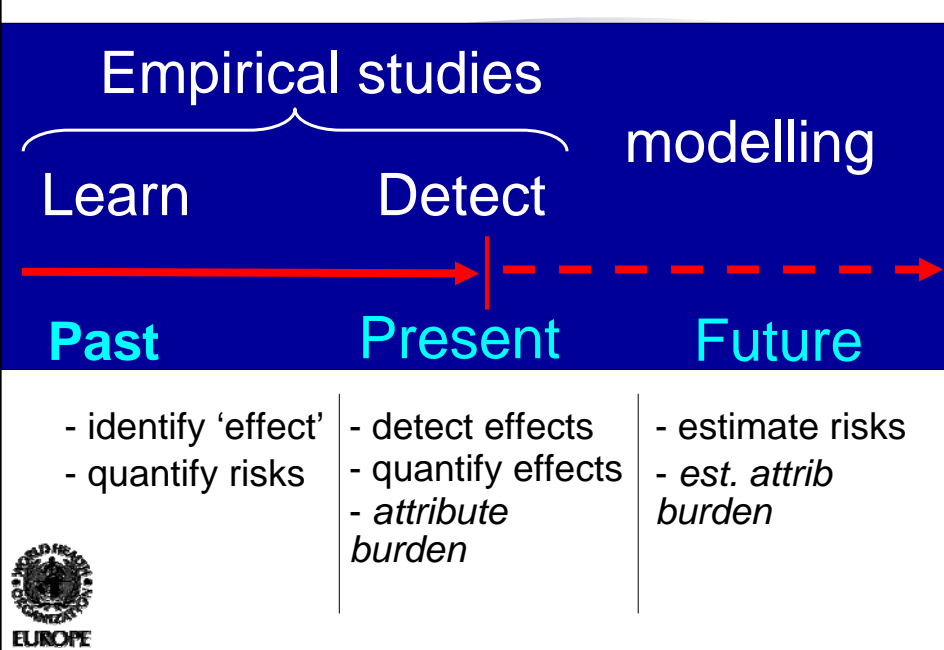
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IPCC, 2007; not to be quoted nor cited, nor used

Switch and Choke Elements in the Planetary Machinery



Research approaches



What has been observed--

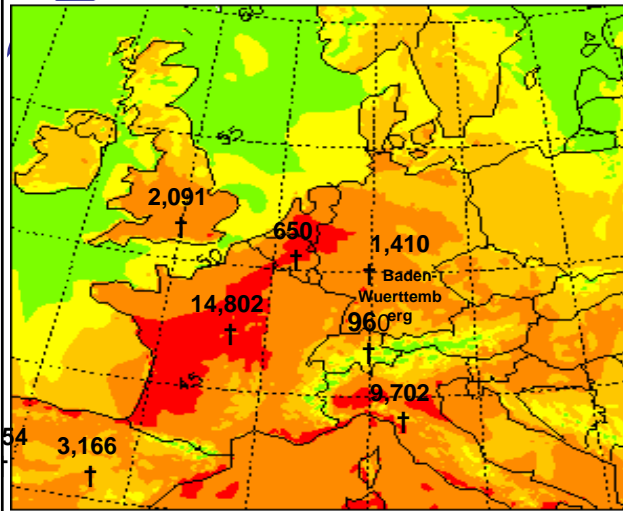
- Species in higher latitudes and altitudes, e.g. plasmodium, ixodes ricinus in Europe..
- New endemic areas in climate suitable areas
- the pollen season is expanding.
- An earlier onset followed by a prolonged exposure implies a longer and possibly heavier period of symptom occurrence;
- The introduction of new aeroallergens into an area, increases sensitization;
- The introduction of new invasive plant species with high allergenic pollen, in particular ragweed (*Ambrosia artemisiifolia*), present important risks to human health.

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Source: adapted from Lindgren, 2001; Daniel, 2003 and 2004; Lindgren and Naucke, 2006)

The risk of dying in heat is increasing

Perceived temperature on 8 August 2003 and August heat mortality



Wolf, 2004

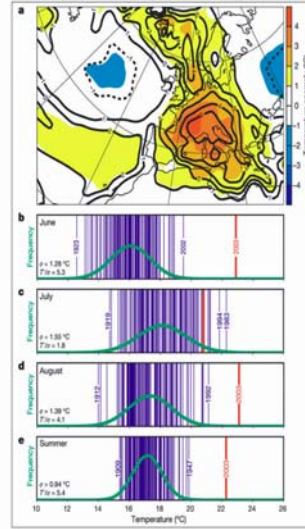
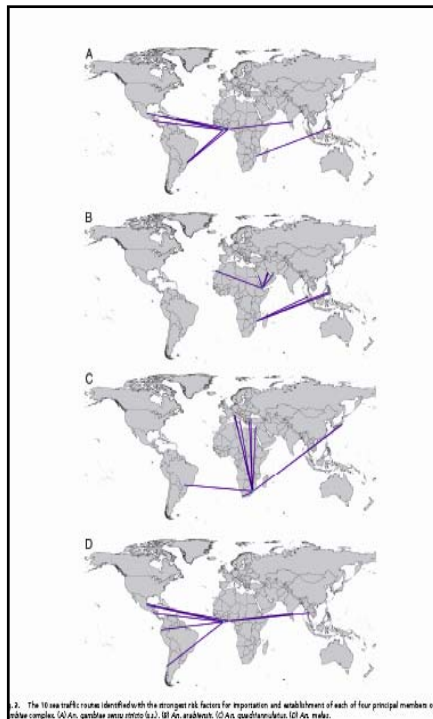


Figure 11.4. Source: Allen and Lind (2014). Reprinted by permission from Macmillan Publishers Ltd. Nature, 432, copyright 2014.

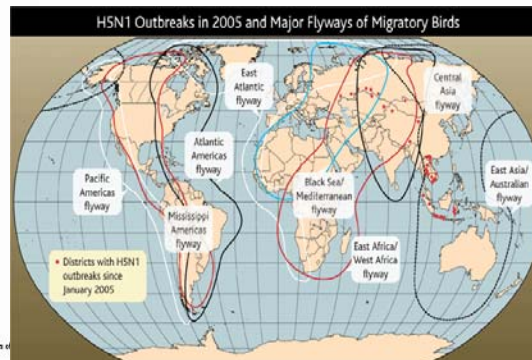
Schaer, 2004

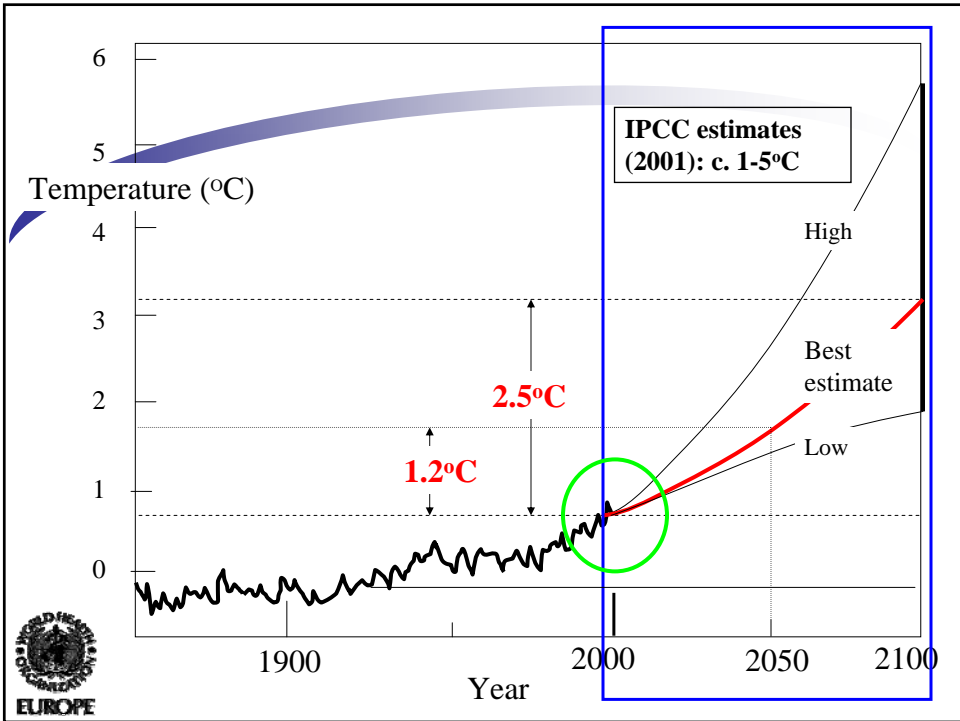
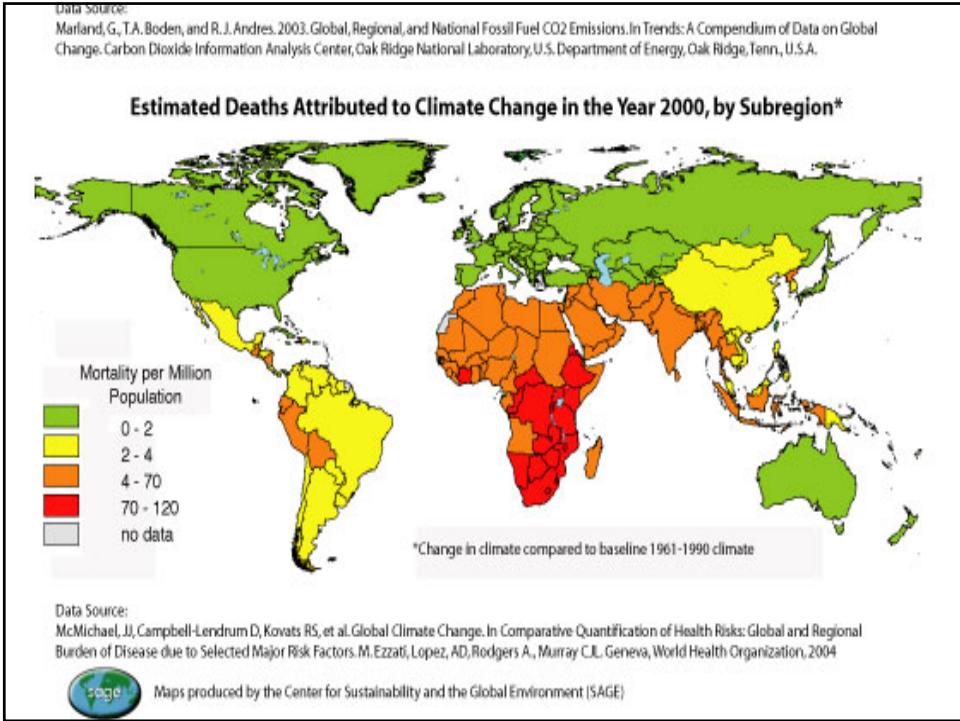


2. The 10 sea traffic routes identified with the strongest risk factors for importation and establishment of each of four principal members of the HSN1 complex: *G. An. gambria sensu stricto* (a), *G. An. arabicola*, *G. An. quadrimaculata*, *G. An. melis*.

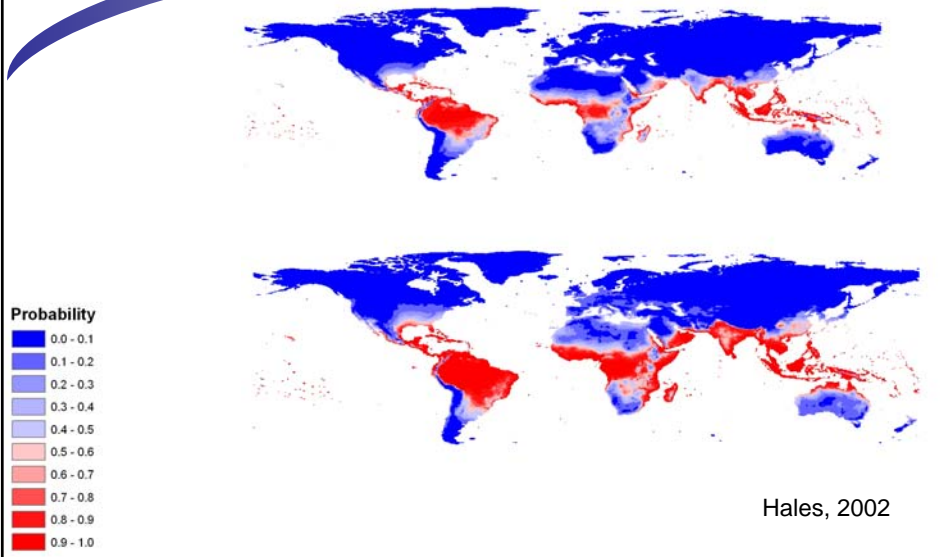
Trade, travel and climate

Tatem 2006 and Rogers, 2006

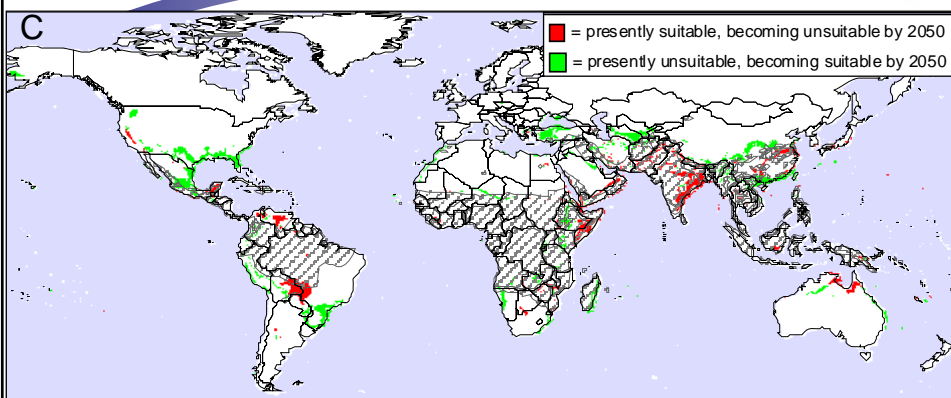




Model of baseline transmission (1961-1990) and transmission in 2050

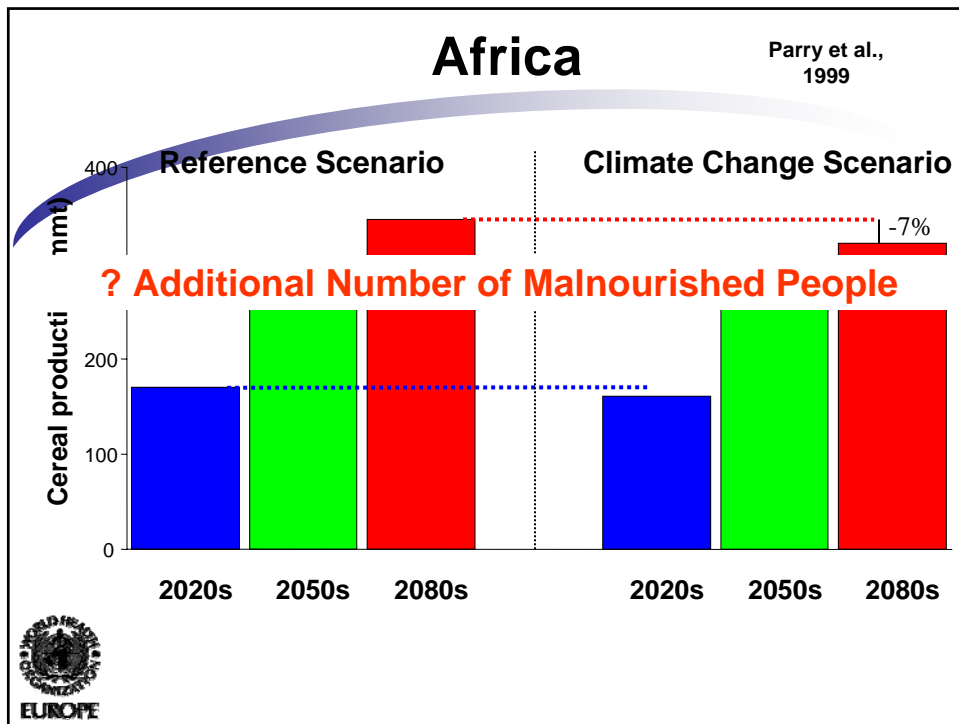


Predicted change by 2050



Change in population at risk = \pm 25 mill



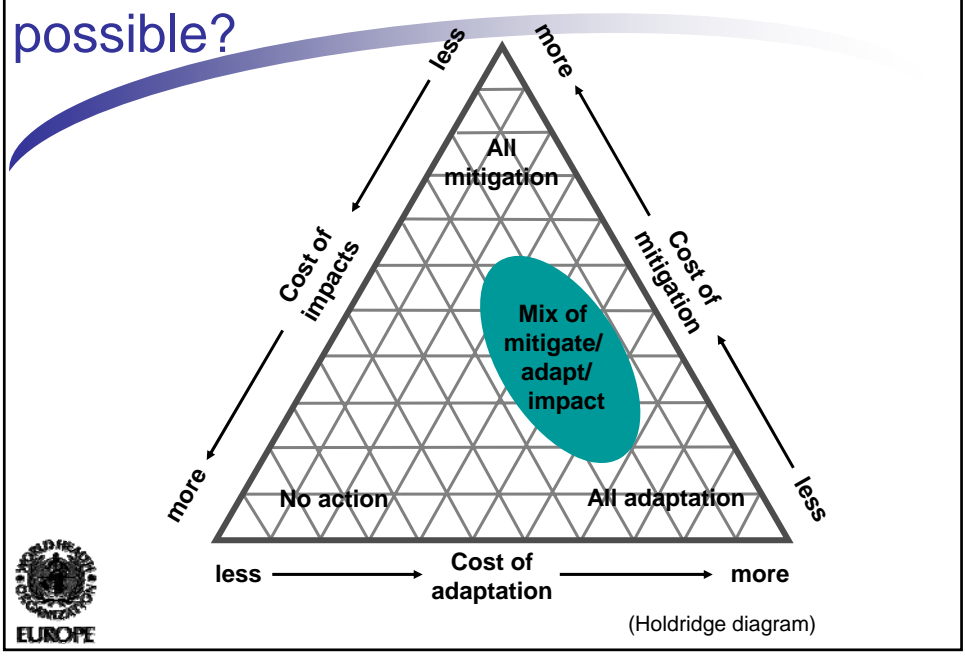


Key questions for adaptation

- What to adapt to? Where who and how?
- Are the measures, policies and strategies currently available sufficient?
- What needs to be strengthened? What needs to be developed?
- For how long will the measures be sufficient?
- Which additional action is needed at international, European and national level?

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What mix of mitigation/adaptation is possible?



The WHO EURO Global change and health programme



<http://www.euro.who.int/globalchange>





Climate change and adaptation
strategies for human health

<http://www.euro.who.int/globalchange>

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