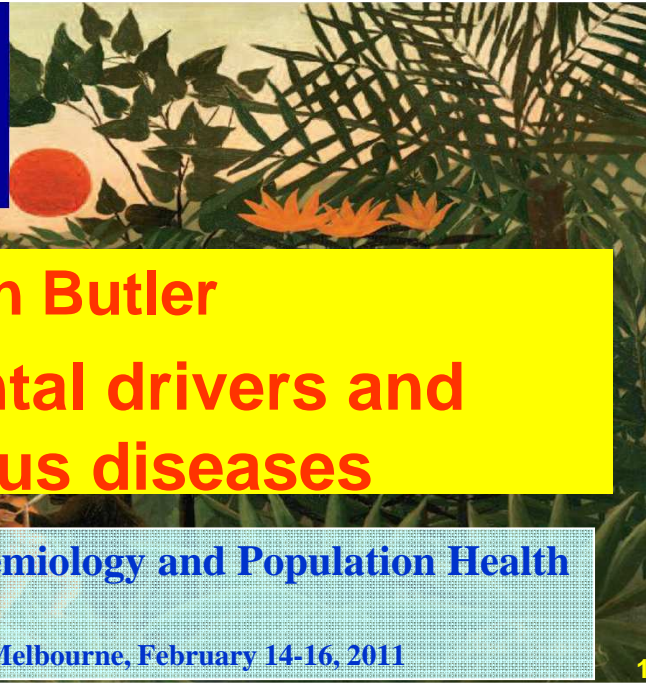




ANU

THE AUSTRALIAN NATIONAL UNIVERSITY



Colin Butler
**Environmental drivers and
infectious diseases**

National Centre for Epidemiology and Population Health

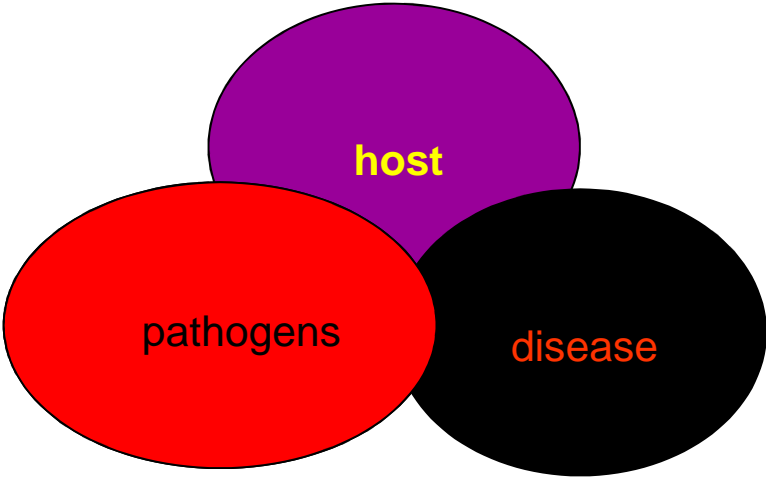
One Health Congress, Melbourne, February 14-16, 2011

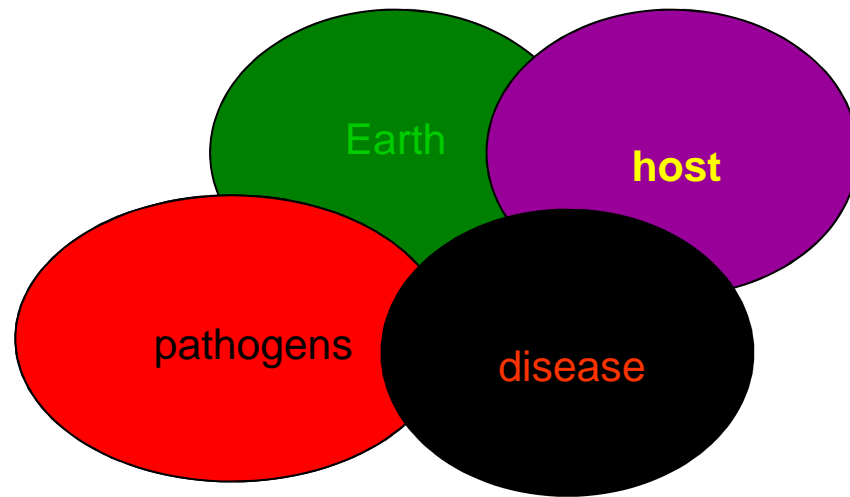
Outline

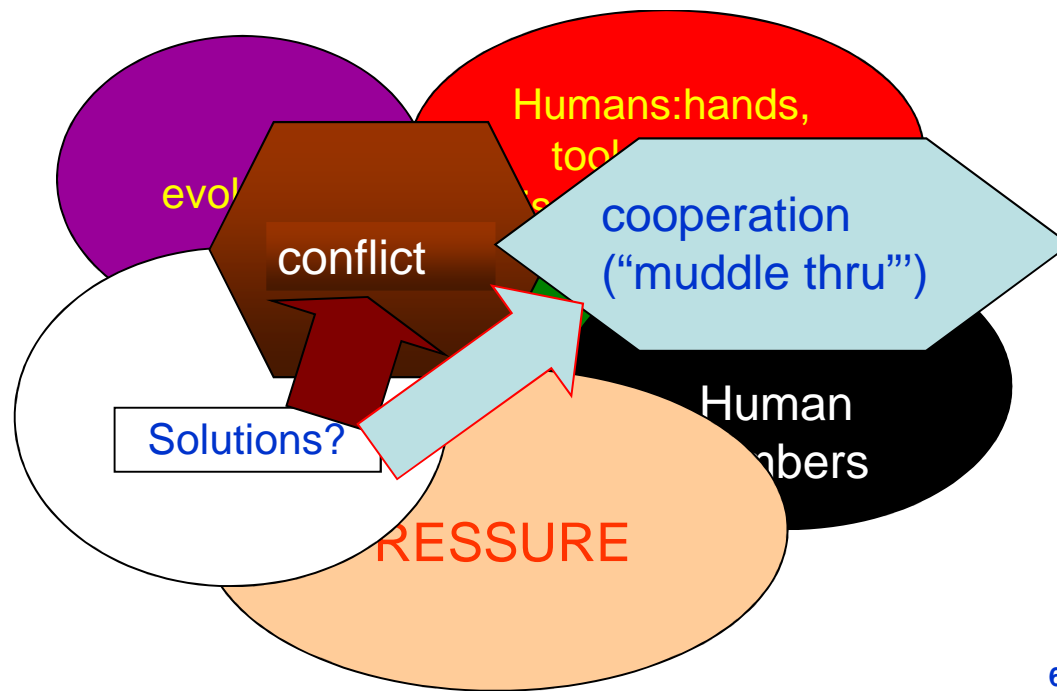
- The milieu and the microbe
- Ecosystem change and health
- Climate change and health
- Anti-science

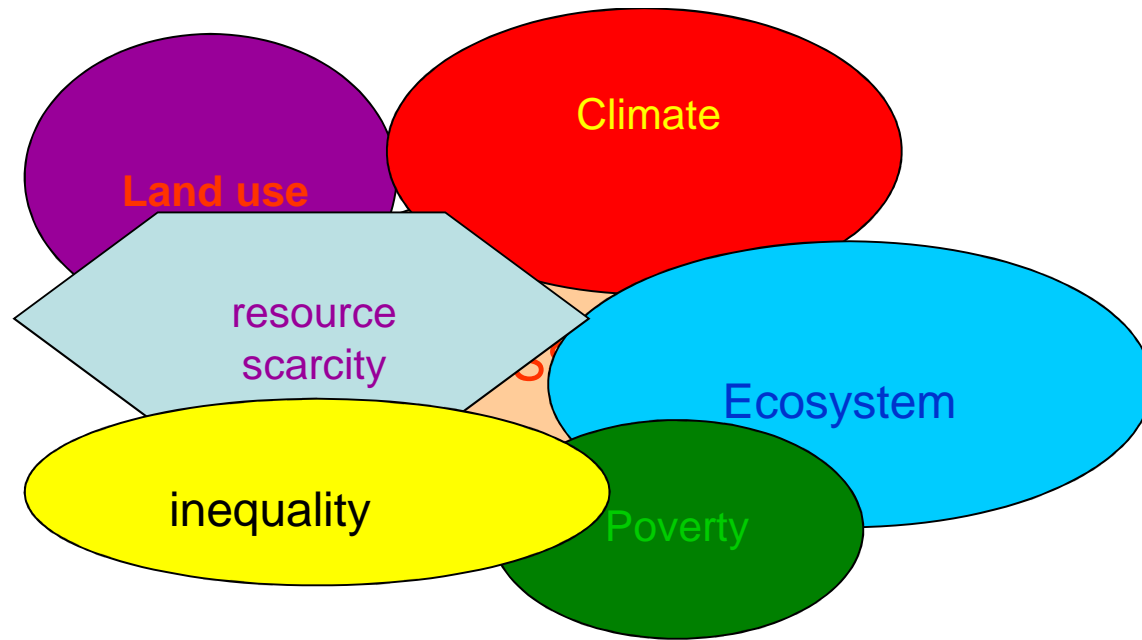
The milieu and the microbe

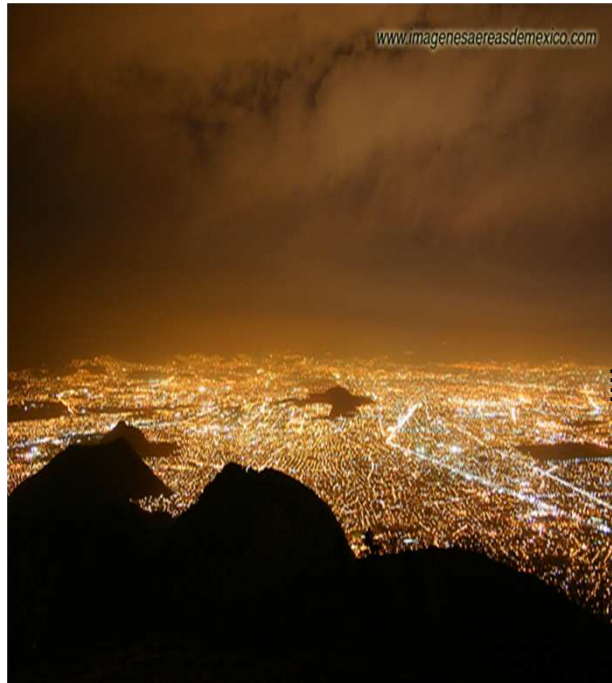
- 19th century: The French vs the Germans (Bernard, Pasteur, Möbius, Haecke)
- 20th century: Grmek: “pathocenosis”: “coexistence of diseases in a specific time, place and society”;
Randles: pathosphere (all microscopic, infectious, disease causing agents)



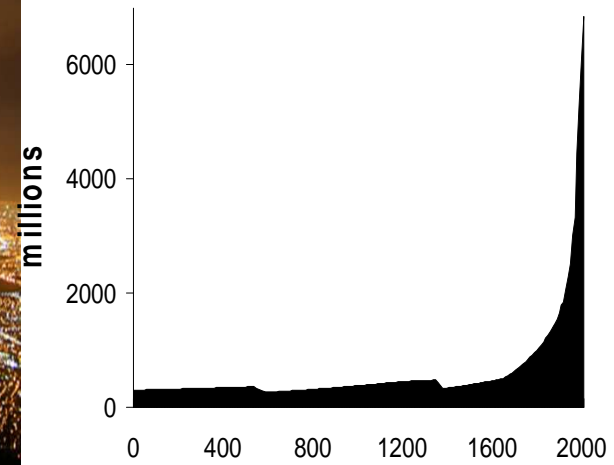




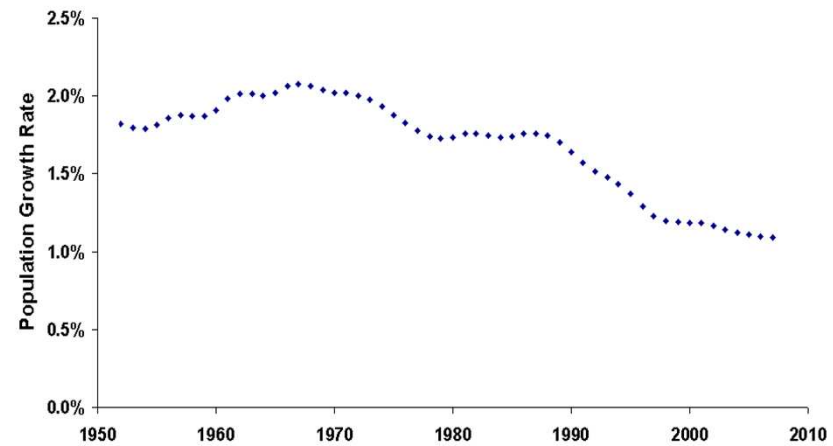




World Population: 0-2010

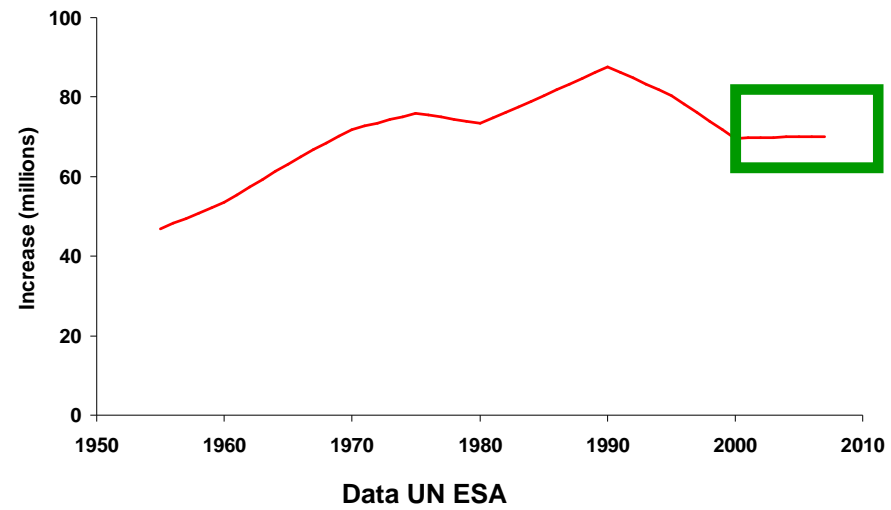


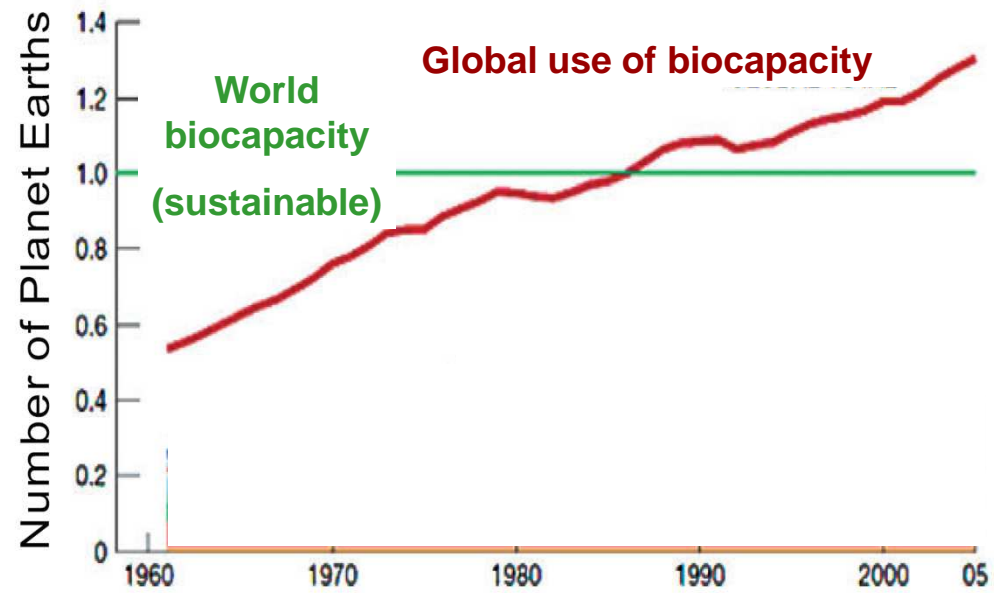
Global population growth rate: 1950-2007



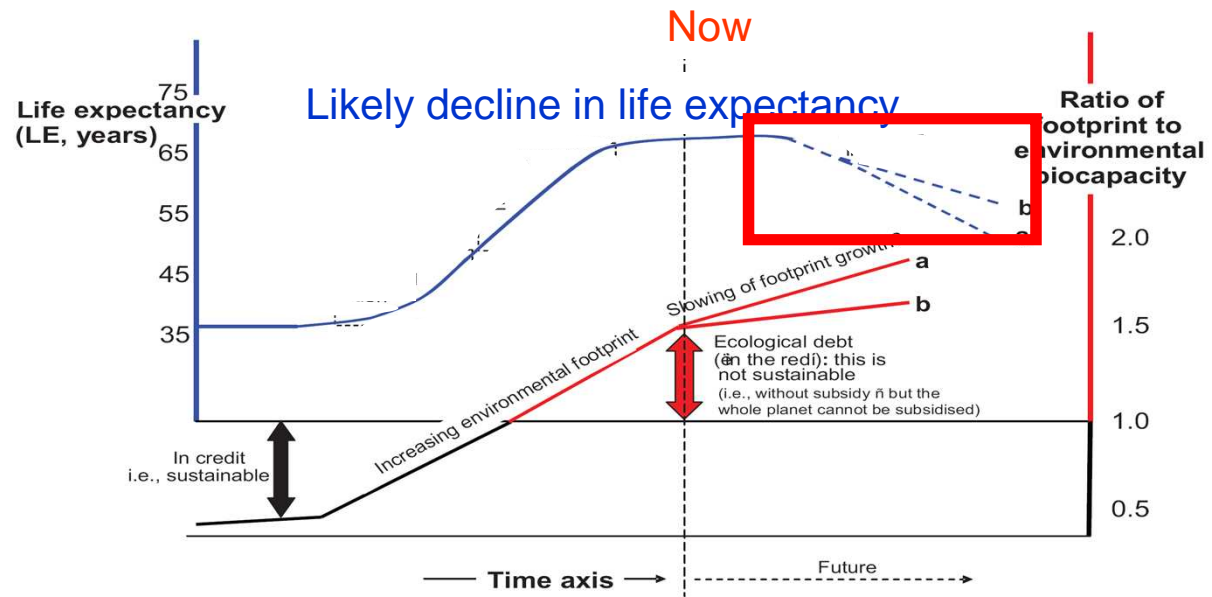
Data UN ESA

Global population increments 1950-2007

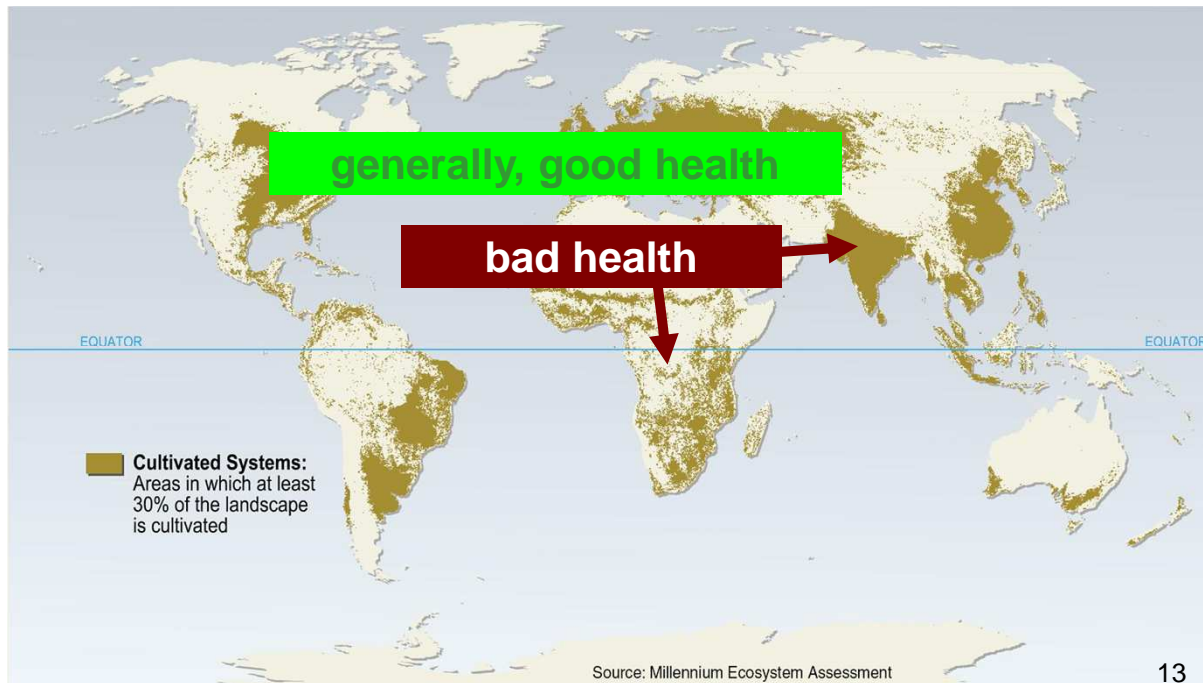


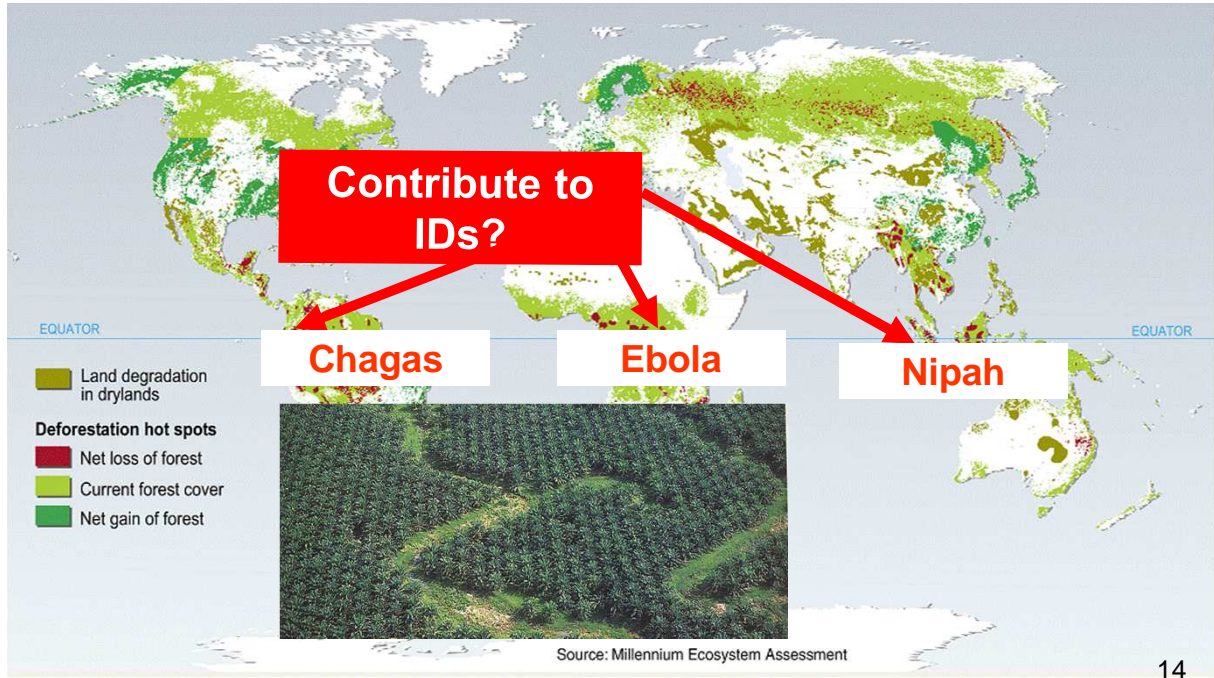


Adapted from McMichael and Butler, 2011



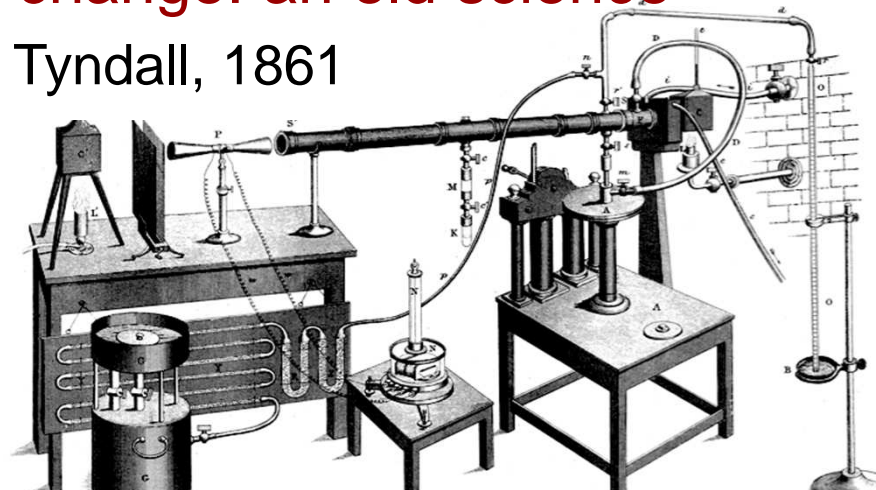
McMichael and Butler, 2011



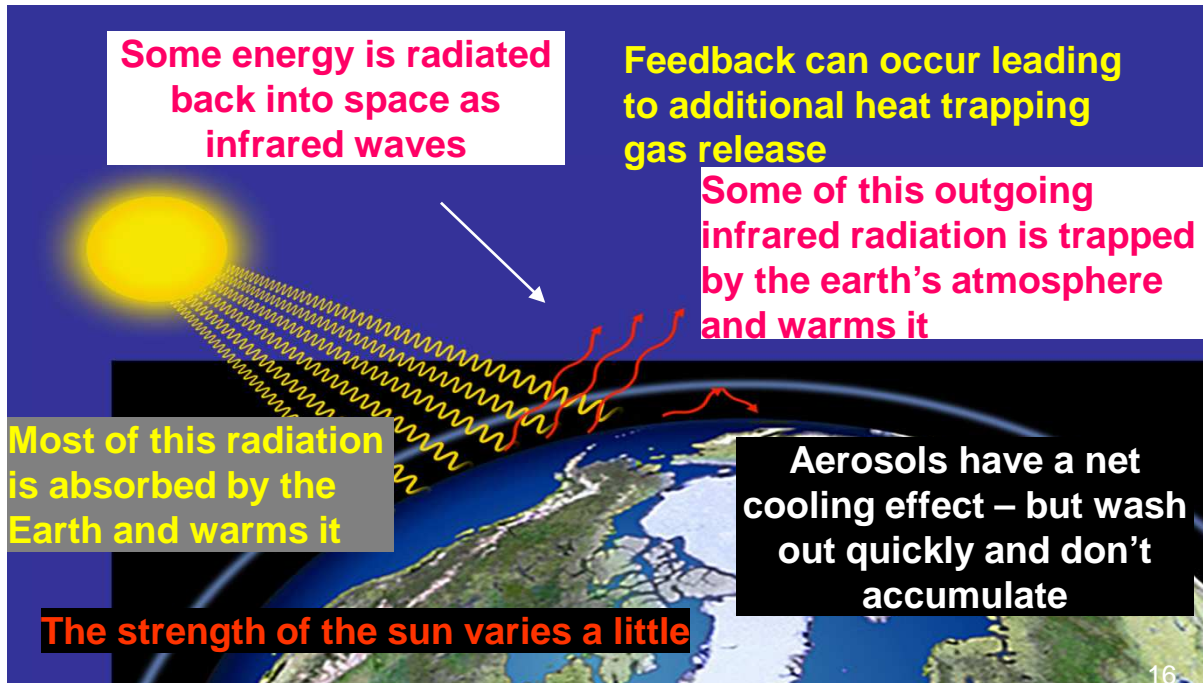


Climate change: an old science

John Tyndall, 1861



“...slight change in [the atmosphere’s] constituents...”



Some energy is radiated back into space as infrared waves

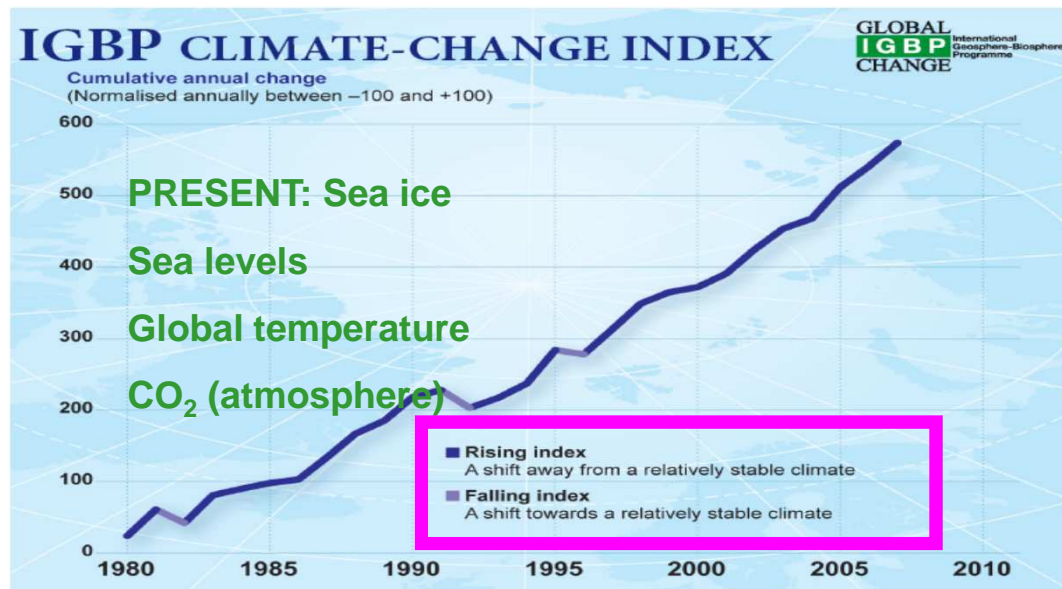
Feedback can occur leading to additional heat trapping gas release

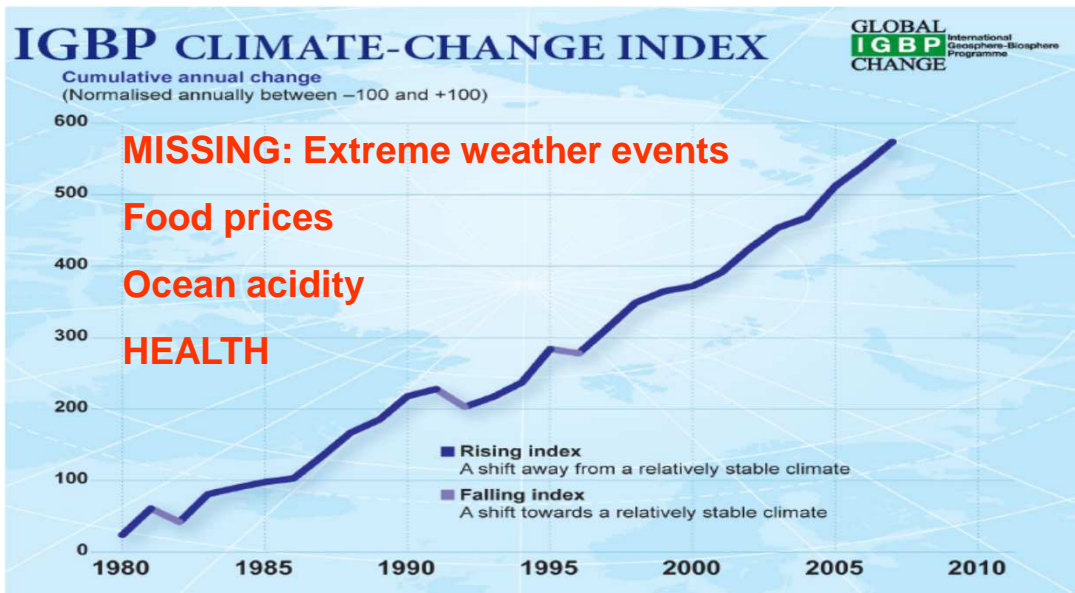
Some of this outgoing infrared radiation is trapped by the earth's atmosphere and warms it

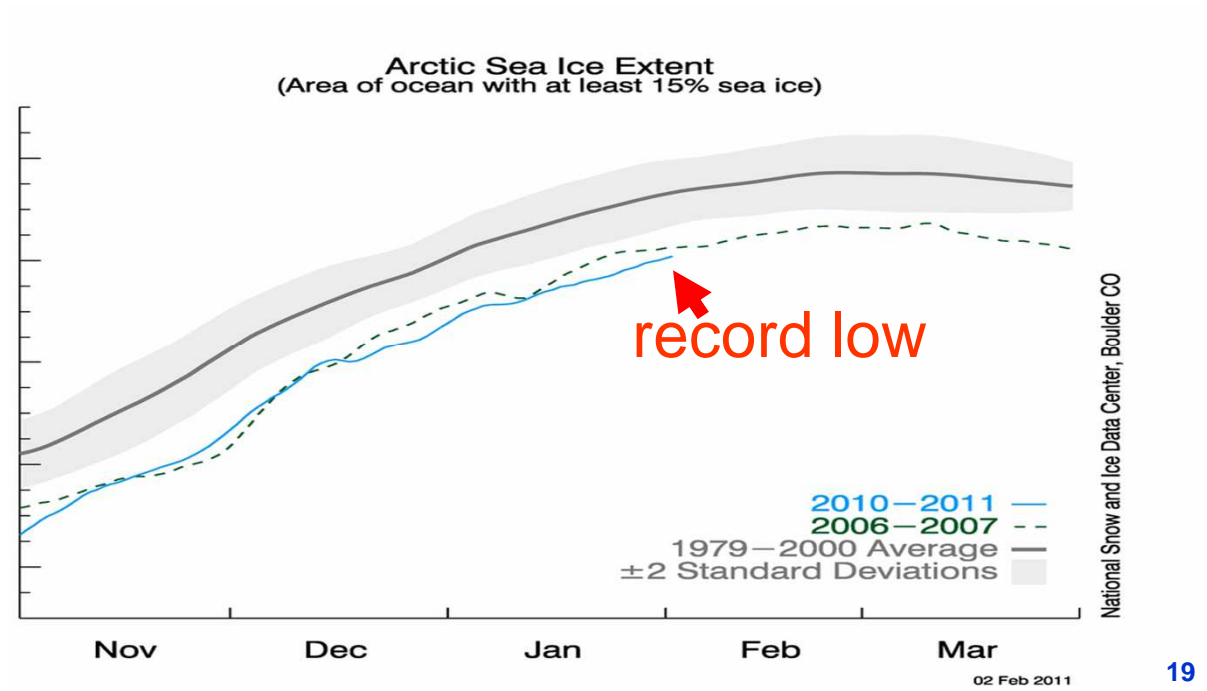
Most of this radiation is absorbed by the Earth and warms it

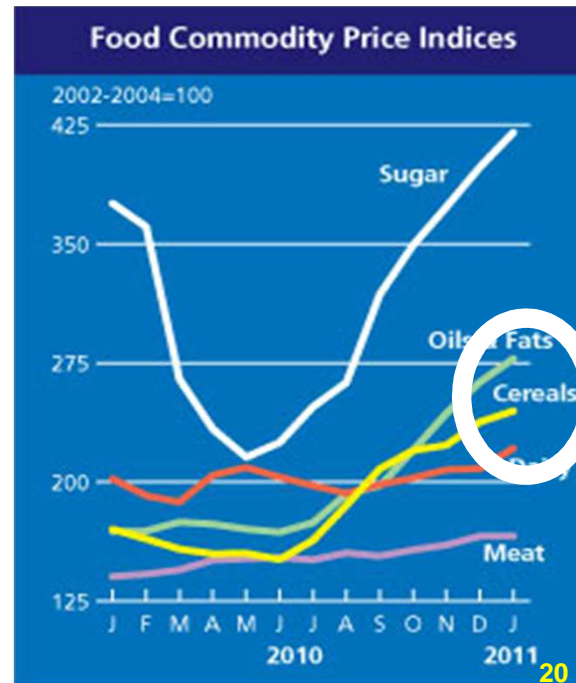
Aerosols have a net cooling effect – but wash out quickly and don't accumulate

The strength of the sun varies a little









FAO Food price index: 1990- Jan 2011



**Climate change, extreme weather events,
nutrition, immunity, infectious diseases**

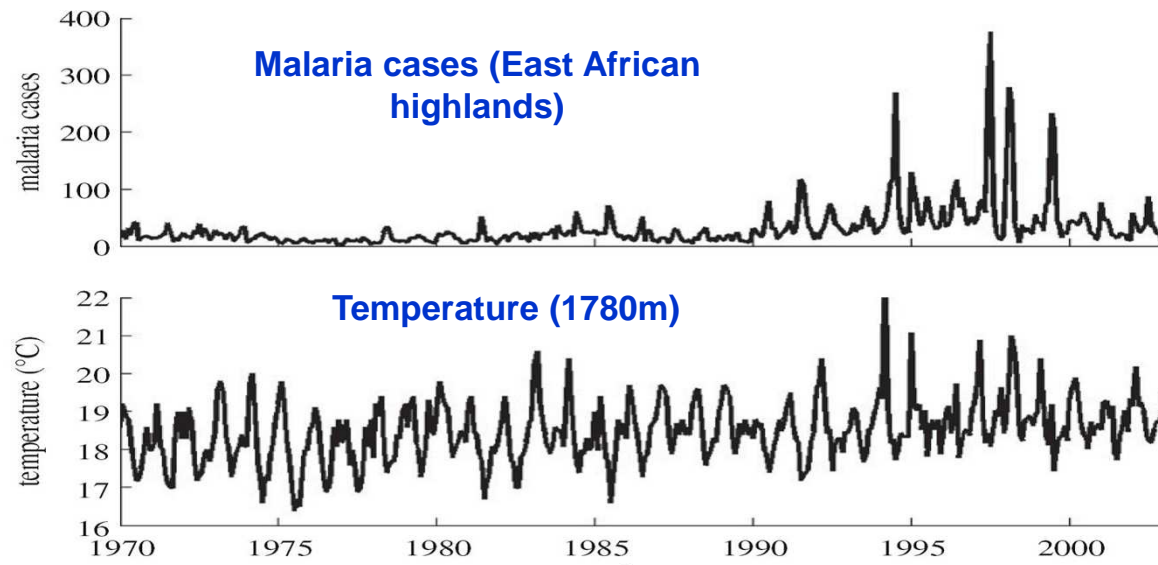
u/nutrit'n
IDs

Food price – trade off between
calories and m/nutrients
Diarrhoea, food safety, eg
aflatoxins
Animal health – loss of
livelihood, income
Migration, urbanisation

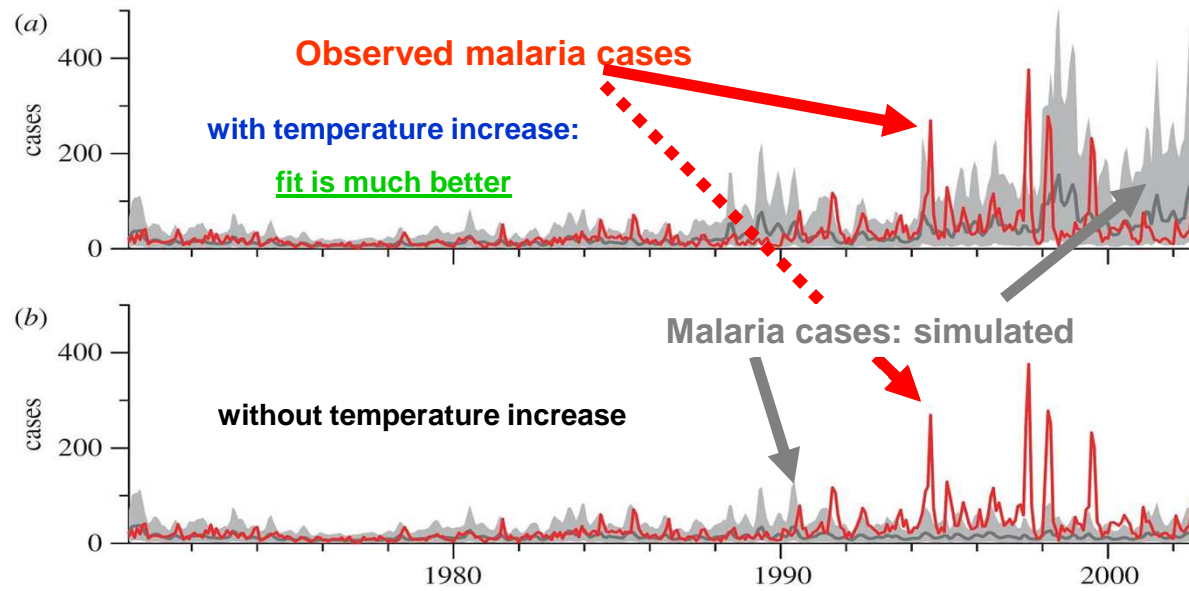
Malaria in Papua New Guinea



courtesy Prof Ivo Mueller:
Institute of Medical Research, PNG



Alonso et al, 2010



Alonso et al, 2010

malaria, other VBDs, envtl changes

landuse: forests, crops, irrigation

biodiversity: (including vector sub-species)

resistance: drugs, insecticides

socio-economic, public health

ascertainment bias, measurement error

migration (could be climate related)

climate: temperature, rainfall, humidity

Denial, anti-science

Wowfie: More global war mongering by 'the sky is falling scientists' and special interest groups trying to pass laws to benefit financially. Global **warming** is a myth.

Die2Live watch out. .. non-critically thinking global warming/climate change bobblehead soldiers .. amassing to march to the cadence of their latest "scientific" drumbeat. .. 32 years as a sample size? Give me a break.

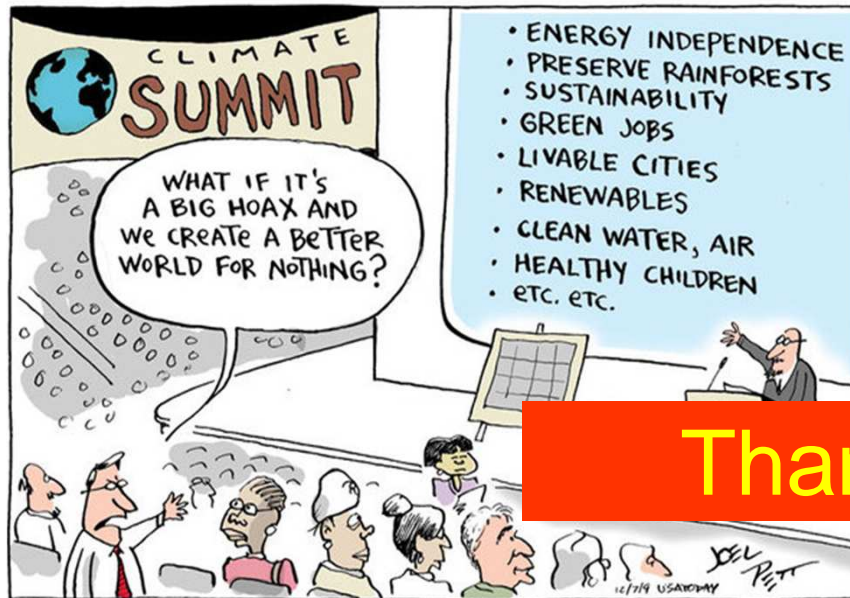
<http://content.usatoday.com/communities/sciencefair/post/2011/02/record-low-arctic-sea-ice-in-january/1>

Conclusion

“war on pathogens/vectors” – unpromising

can we better coexist with microbes and ecosystems?

can we slow the growth, then reduce the multiple forms of global environmental pressure?



Thanks!

<http://www.gocomics.com/joelpett/2009/12/13/>