



Preventing Disease through Healthy Environments



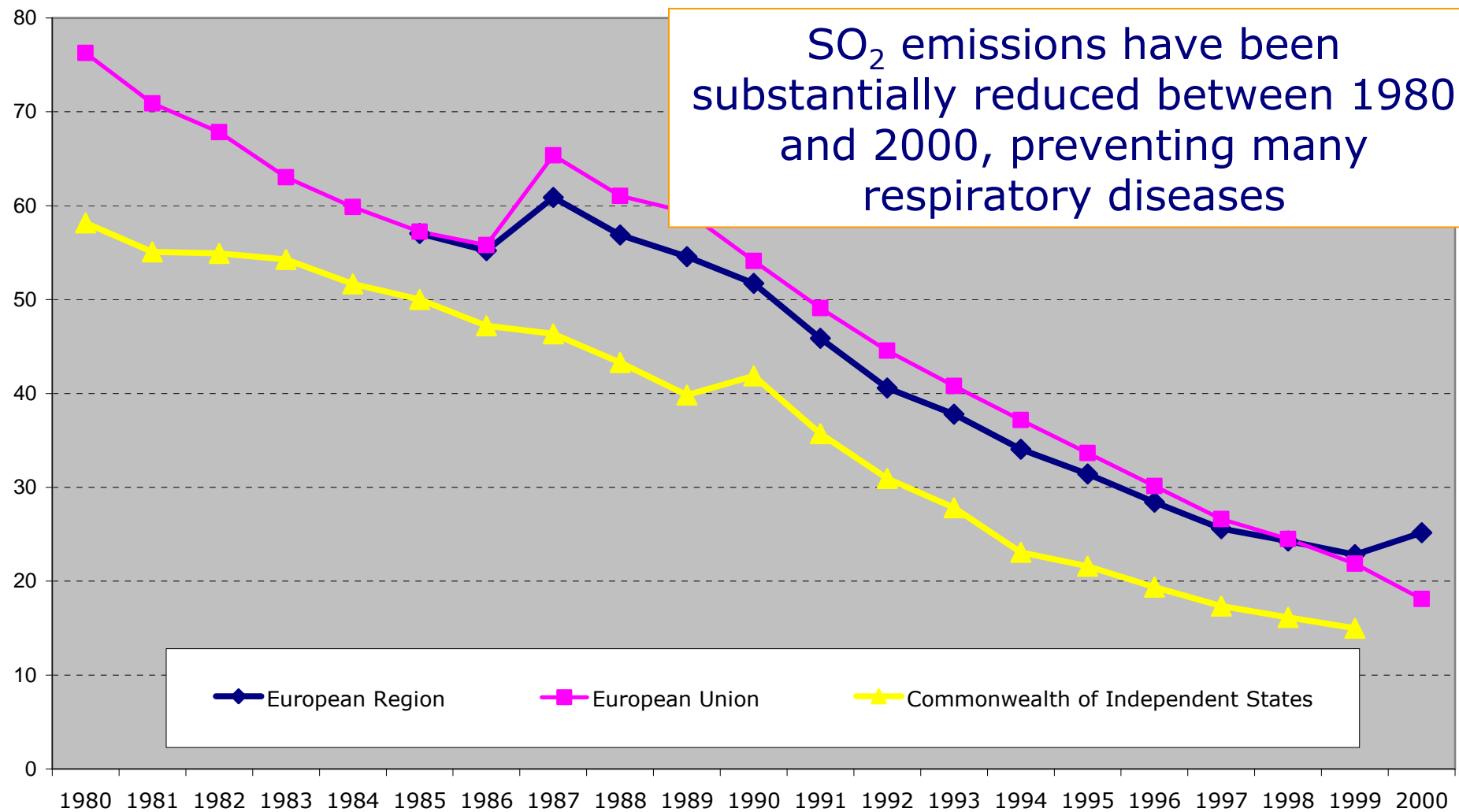
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Public Health and Environment
WHO Headquarters**



What is the evidence for Public Health and Environment?

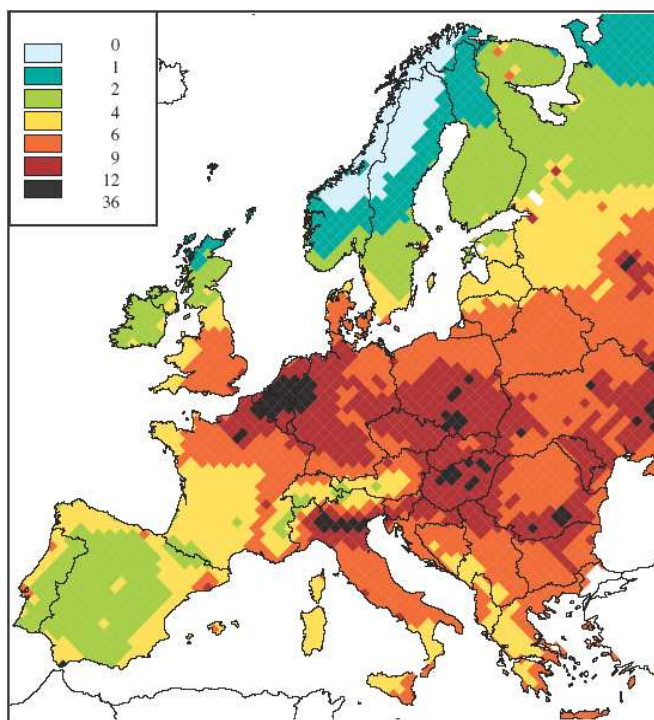
Reduced exposures



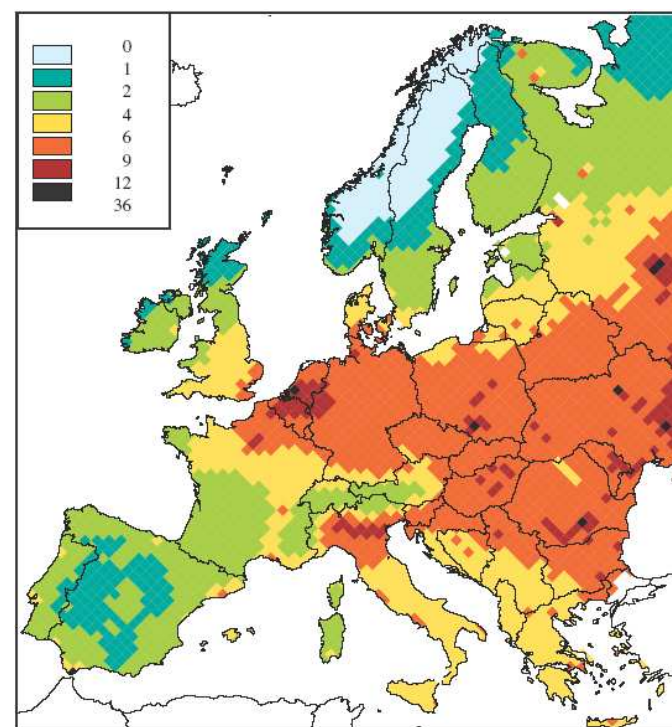
Sulphur dioxide emissions, kg per capita per year

Some exposures pose a challenge

After decrease, PM₁₀ concentrations are stable, leading to a loss of life expectancy



2000

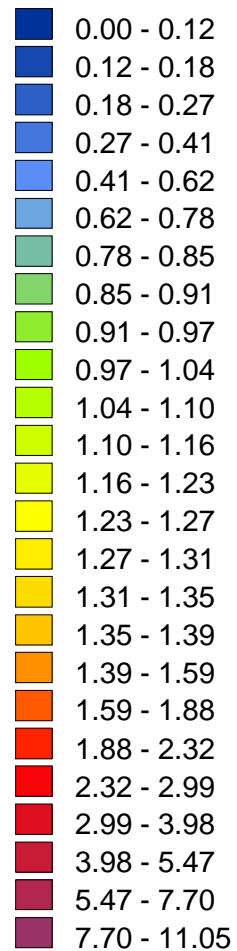


2020

Loss of life expectancy in months

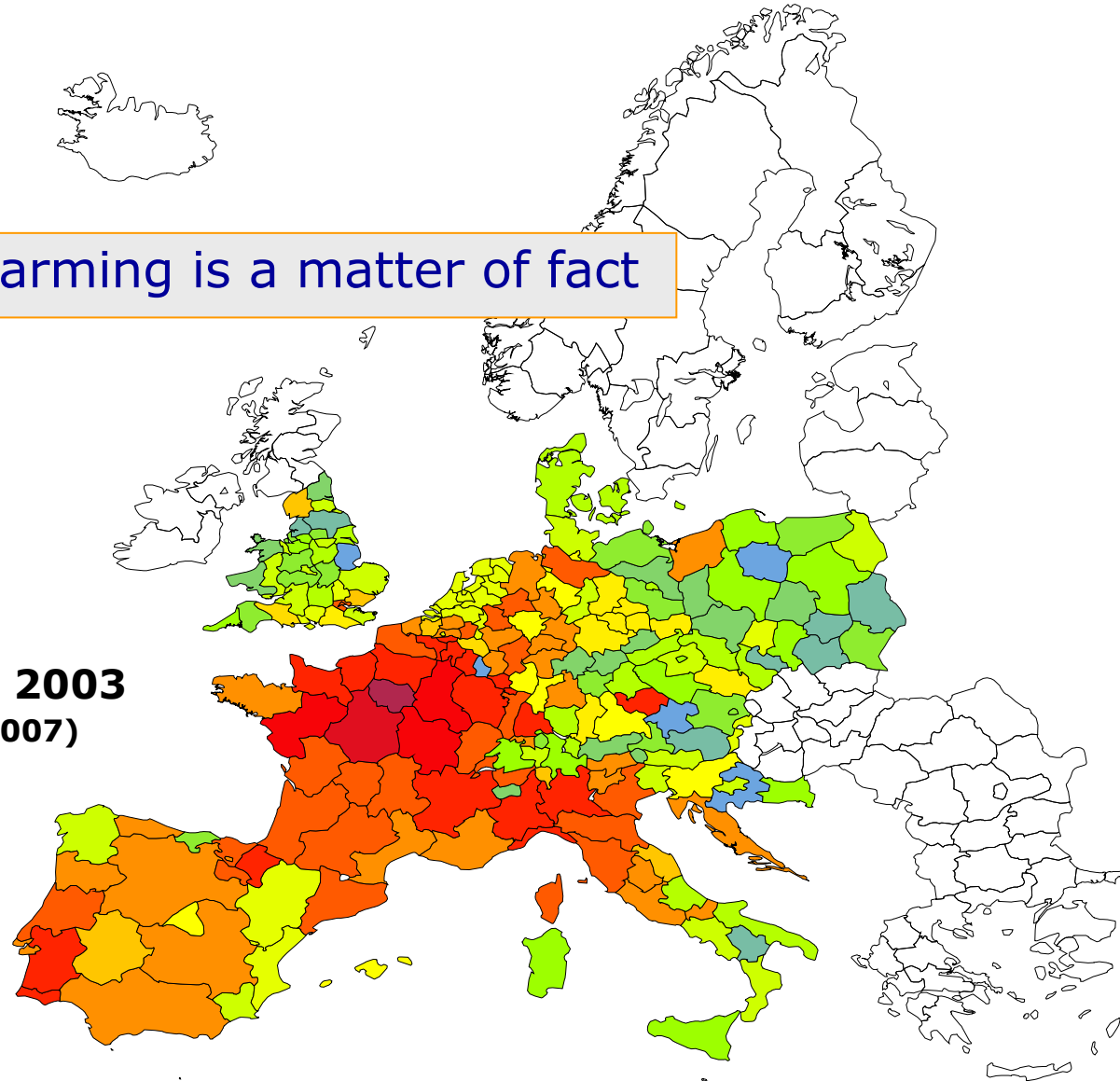
New exposures

Percentage
Mortality exceedance

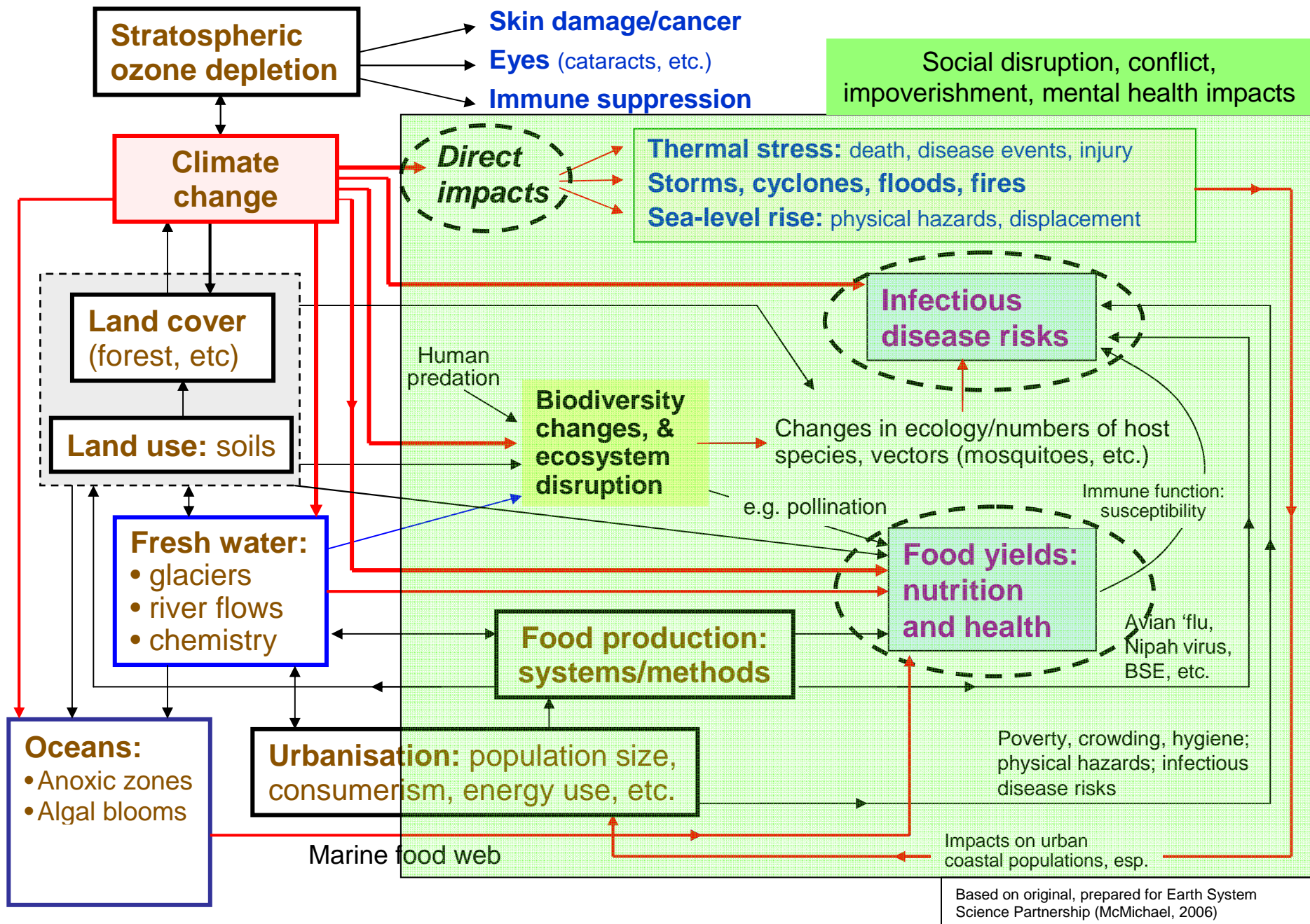


Global warming is a matter of fact

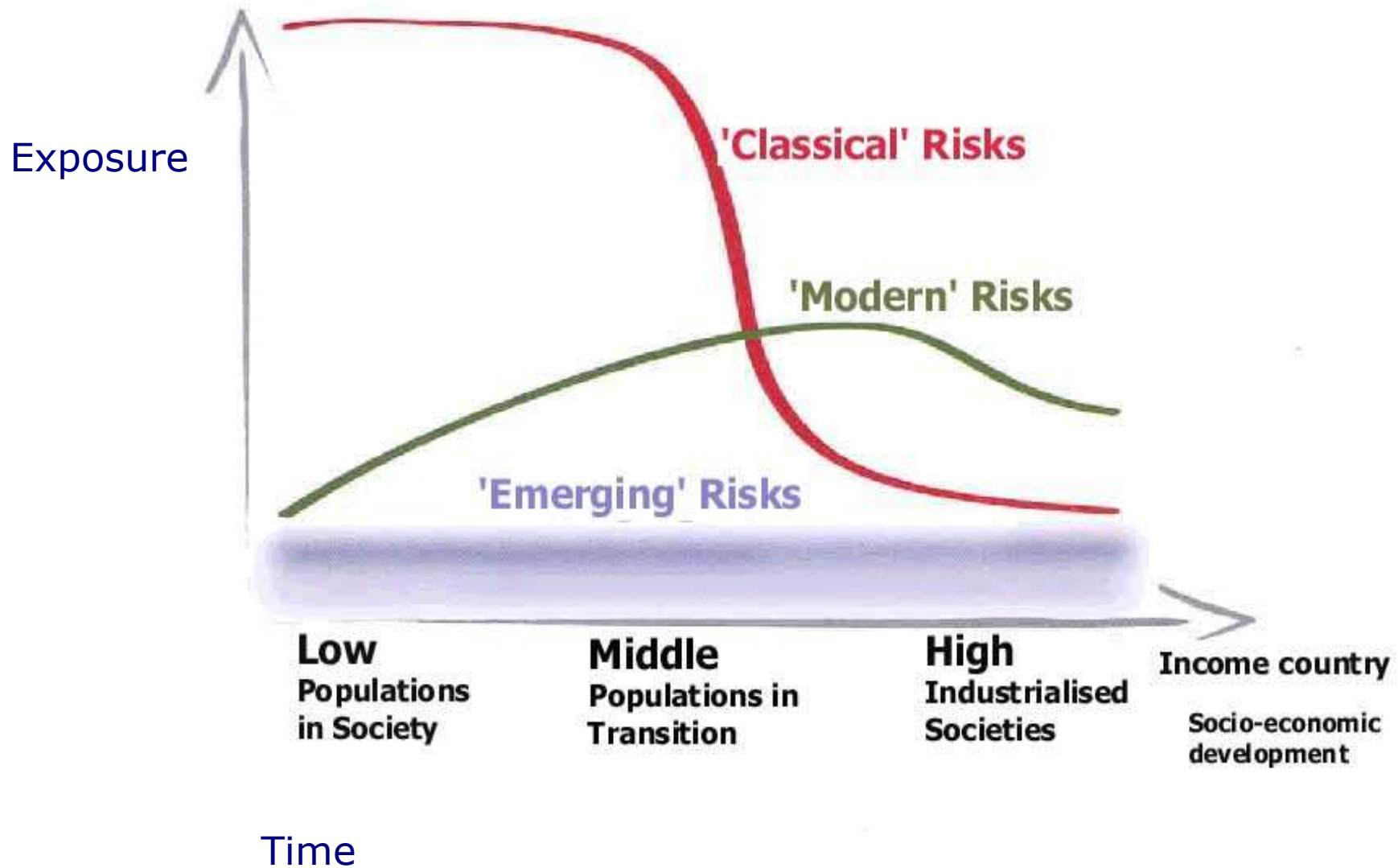
12 August 2003
(Inserm, 2007)



Global Environmental Changes: health risks

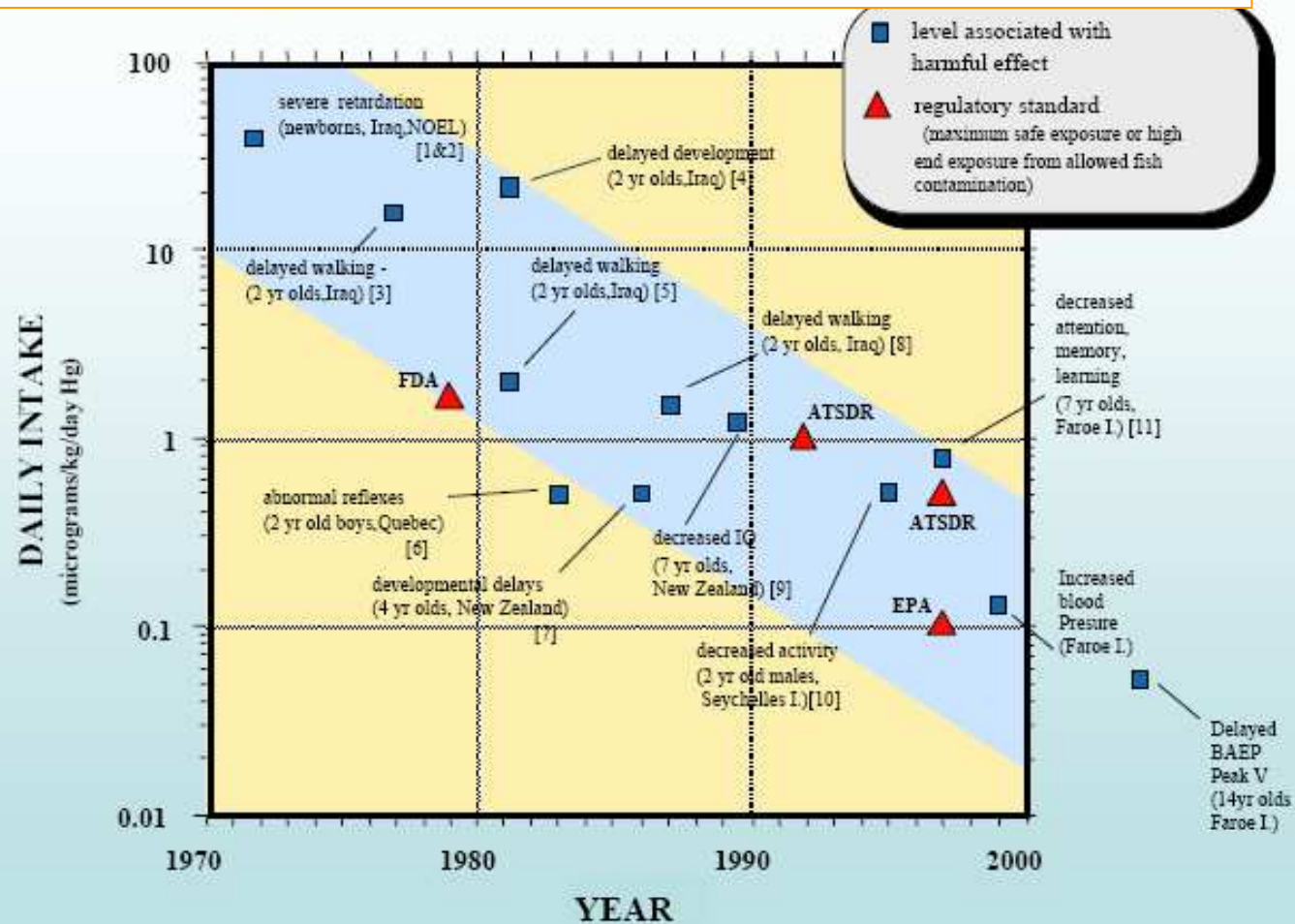


Environmental health transition



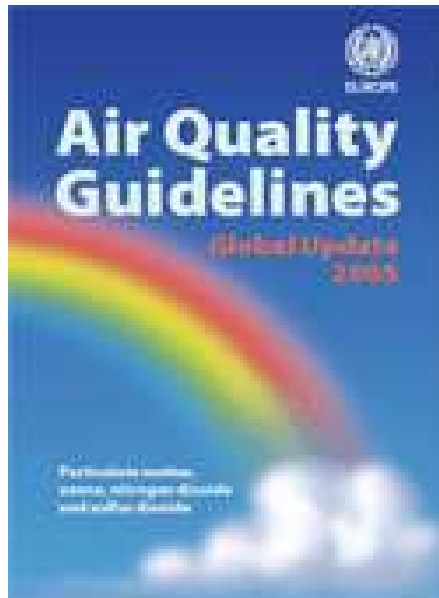
Improved knowledge

Changes in threshold values and corresponding regulatory standards following increased knowledge on health effects of lead



Improved knowledge

Air quality guideline values 2000 vs 2005



	2000	2005
PM10		
Daily mean	No value	50
Annual mean	No value	20
SO2		
10 minutes mean	500	500
Daily mean	125	20
Annual mean	50	Not needed
NO2		
Daily mean	200	200
Annual mean	40	40
Ozone		
Daily maximum 8 hour mean	120	100

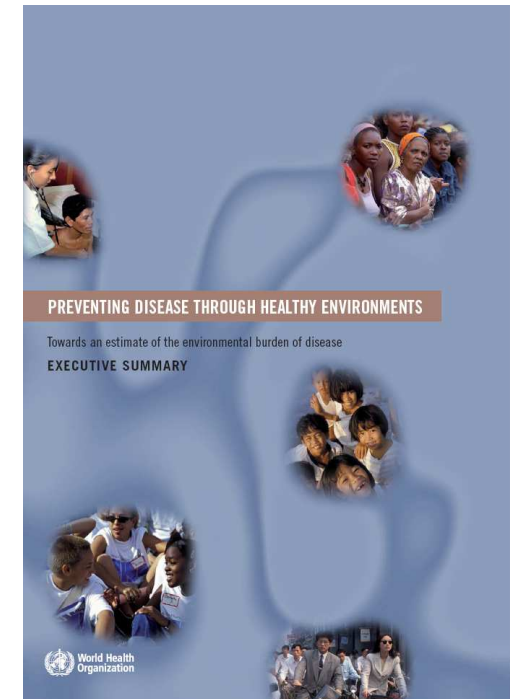
Burden of Disease Study: Background

- No systematic review and calculation of the preventive potential of the environment available
- WHO's 2002 Comparative Risk Assessment (CRA) has provided partial results
- Relevant to address the "modifiable" environment
- How much health gain could be achieved by environmental interventions



Method – systematic reviews and expert opinion

- Systematic reviews or CRA cover only about one third of expected environmental contributions (10 risks, 45 diseases)
- Completed systematic literature reviews with expert opinion
- Experts from or selected by WHO programmes, and authors from key publications
- Global representation of experts
- More than 100 experts contributed



What is the modifiable environment ?

- Pollution
- UV and ionizing radiation, noise, EMF
- Occupational risks
- Built environment, incl. housing, land use, roads
- Agricultural methods, irrigation schemes
- Man-made climate change, ecosystem change
- Related behaviour, e.g. hand-washing



What is the modifiable environment ?

Not included:

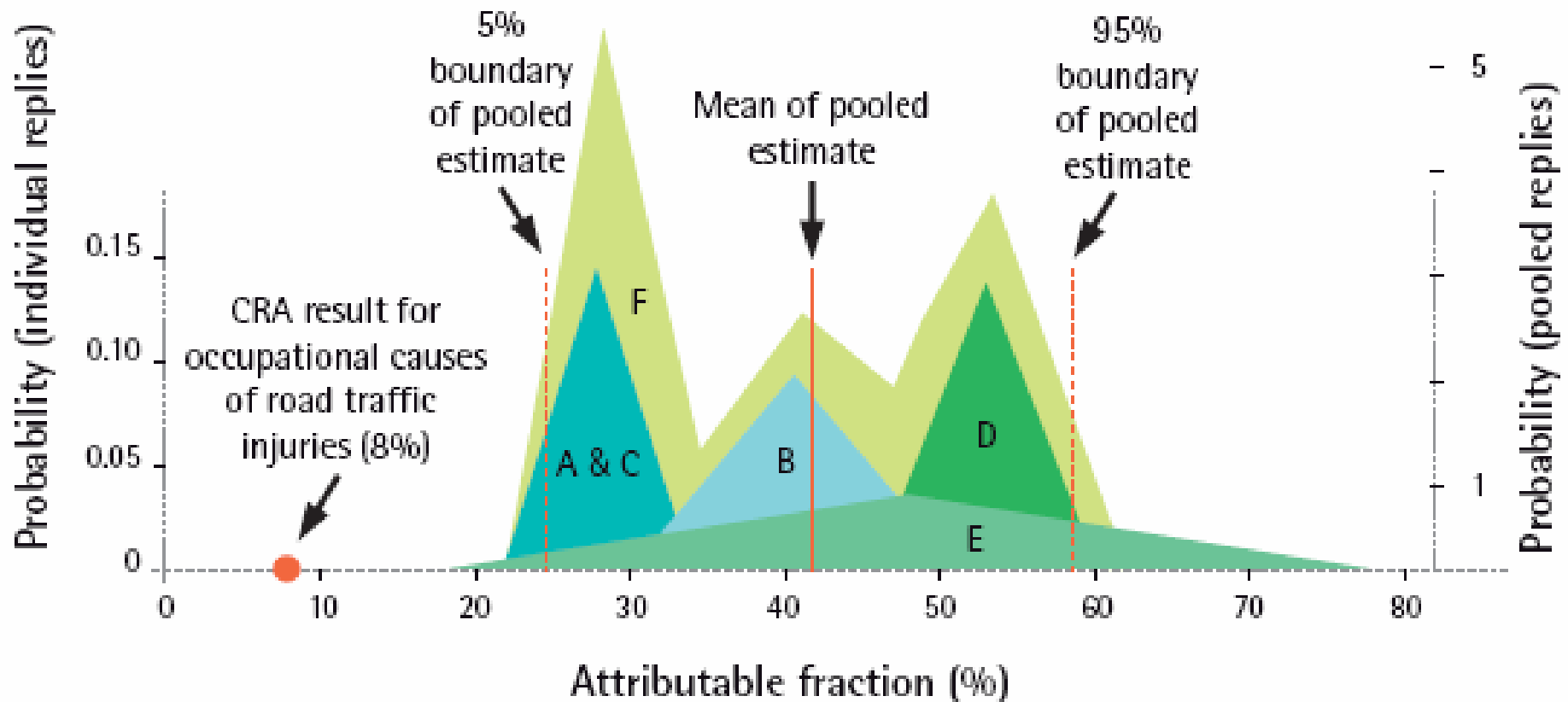
- Tobacco use, diet
- Natural environments that cannot reasonably be modified
- Personal transmission that cannot be modified through environmental interventions
- Social and cultural factors (e.g. unemployment)

... although certain aspects such as advertising and lack of alternatives leading to low quality food intake could overlap with the physical environment.



Methods – systematic approach

Each expert opinion is assumed to have triangular distribution, characterized by mean, 5% and 95% confidence boundaries



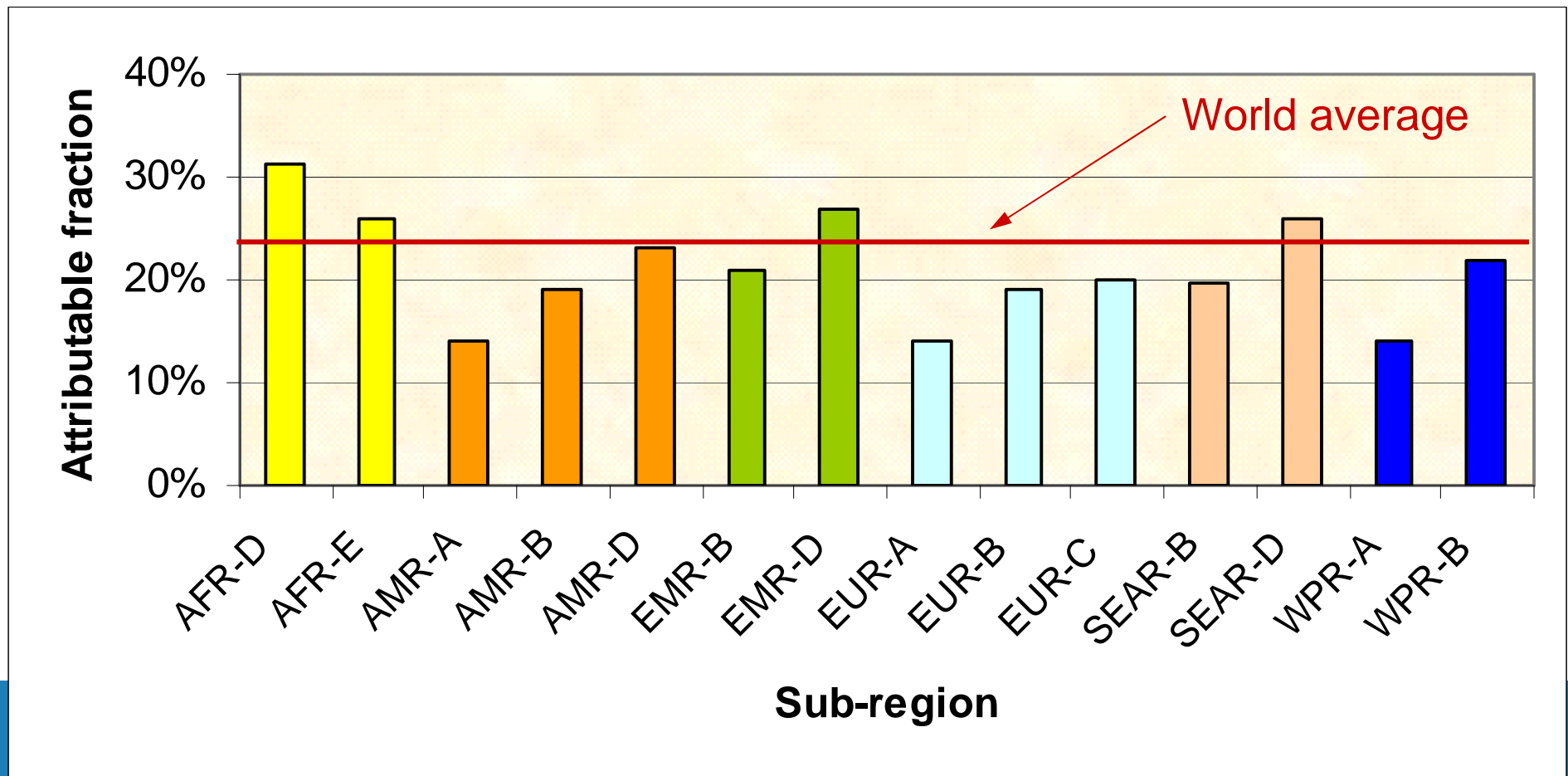
A, B, C, D, E Probability distribution of each individual expert reply
F Probability distribution of pooled estimates



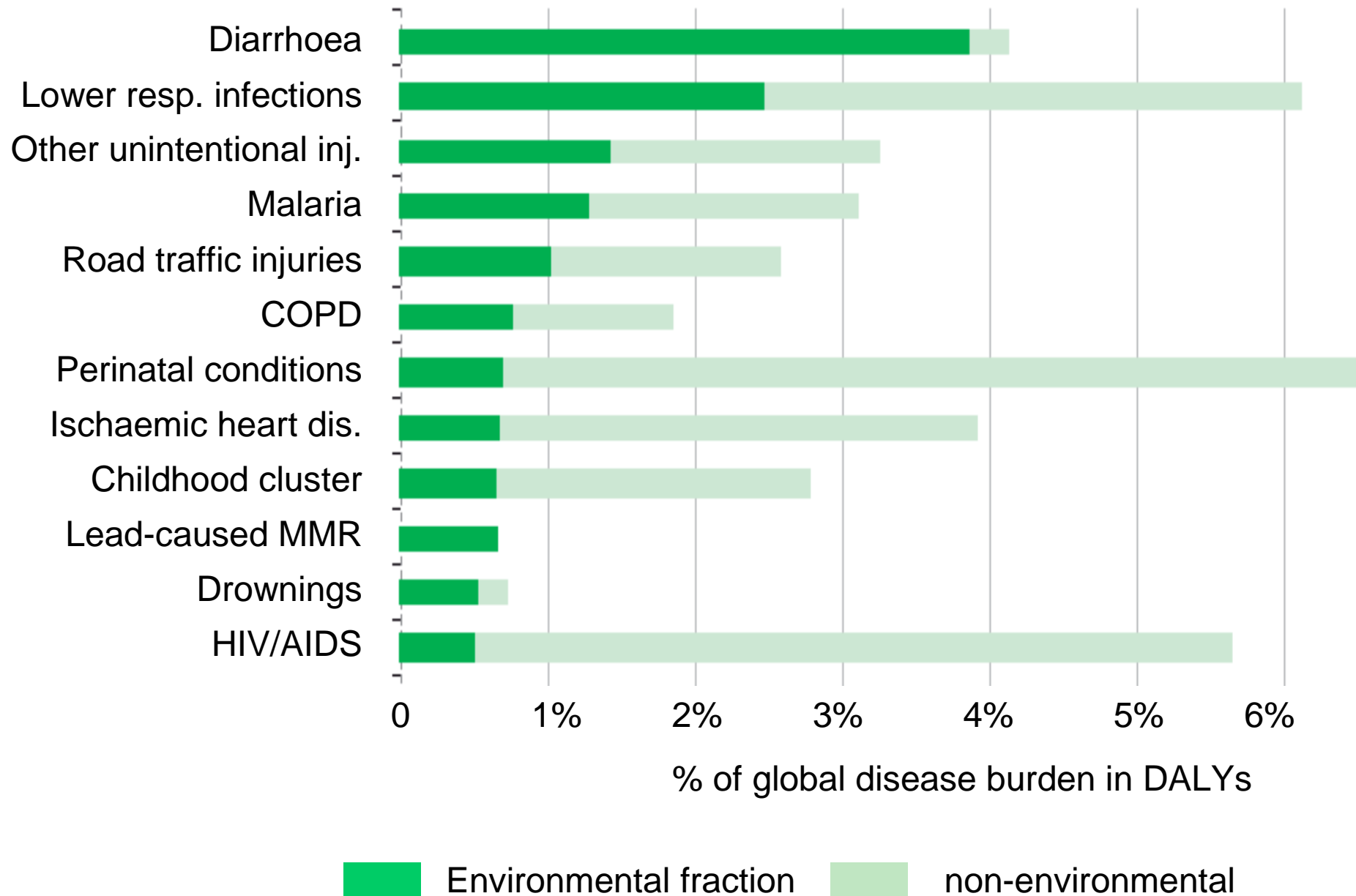
Study results

How much disease could be prevented by modifying the environment ?

Current evidence - best conservative estimate 24%



Diseases with largest environmental contributions (I)



Diseases with largest environmental contributions (II)

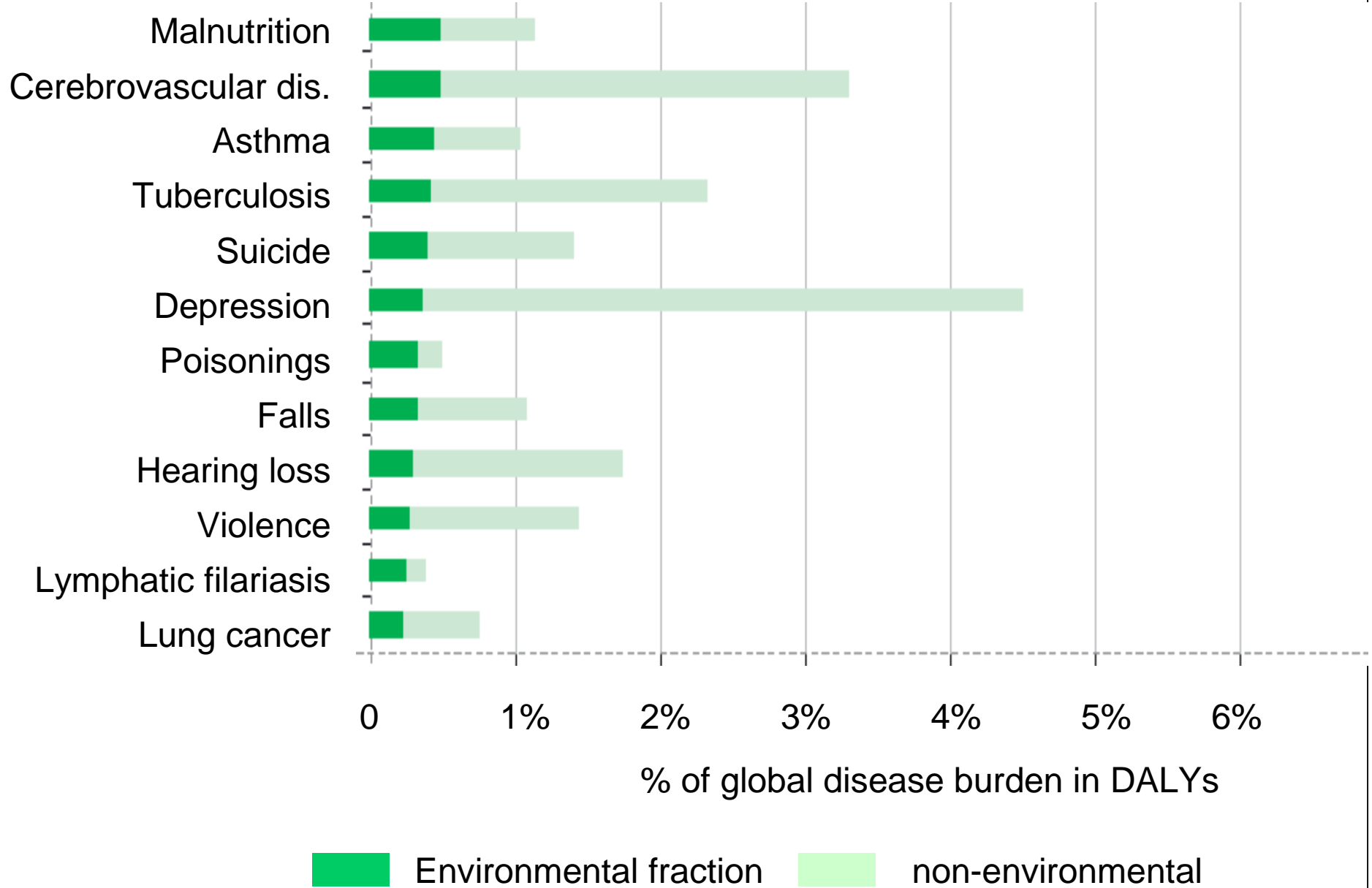


FIGURE 6 ENVIRONMENTAL DISEASE BURDEN IN DALYS PER 1000 PEOPLE, BY WHO SUBREGION (2002) ^a

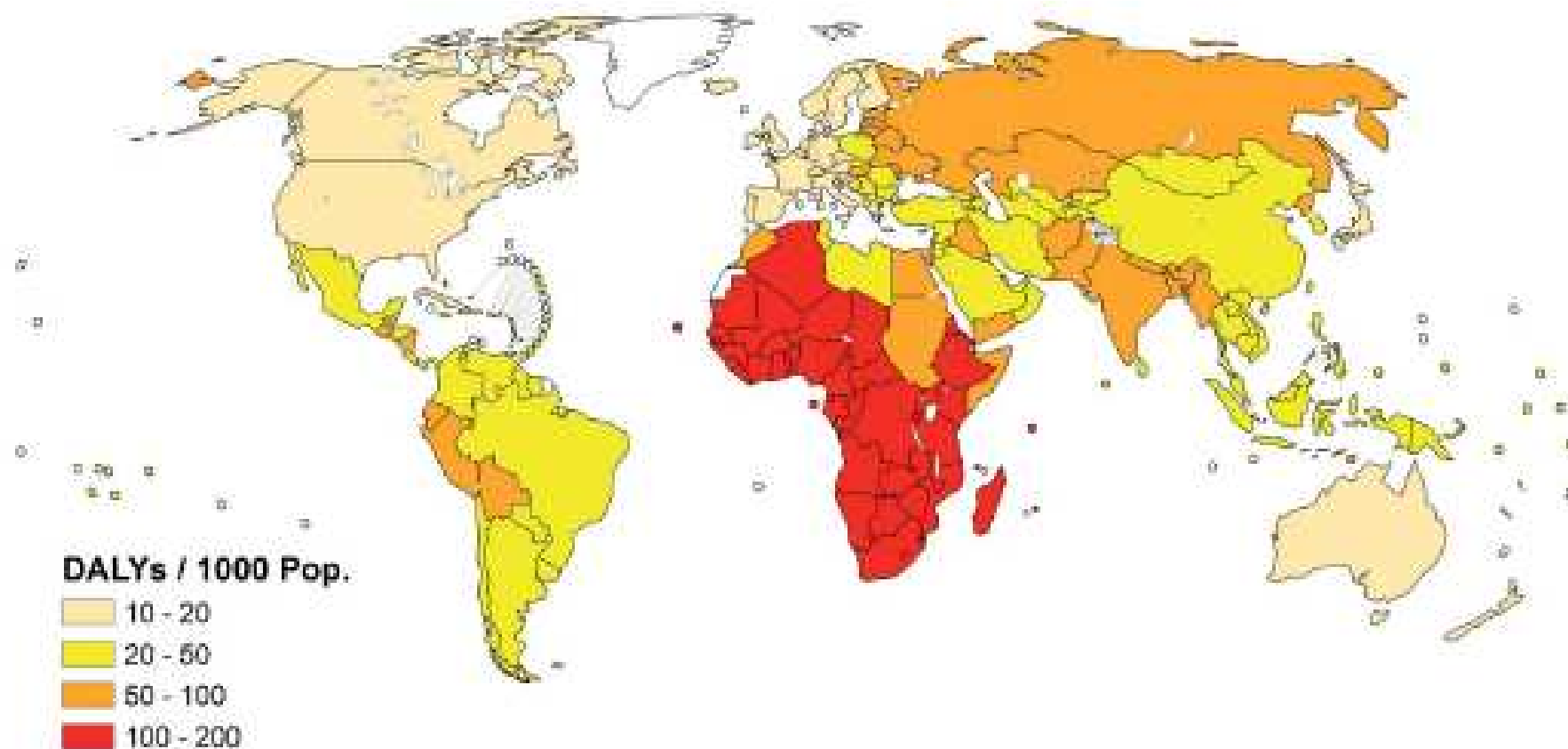
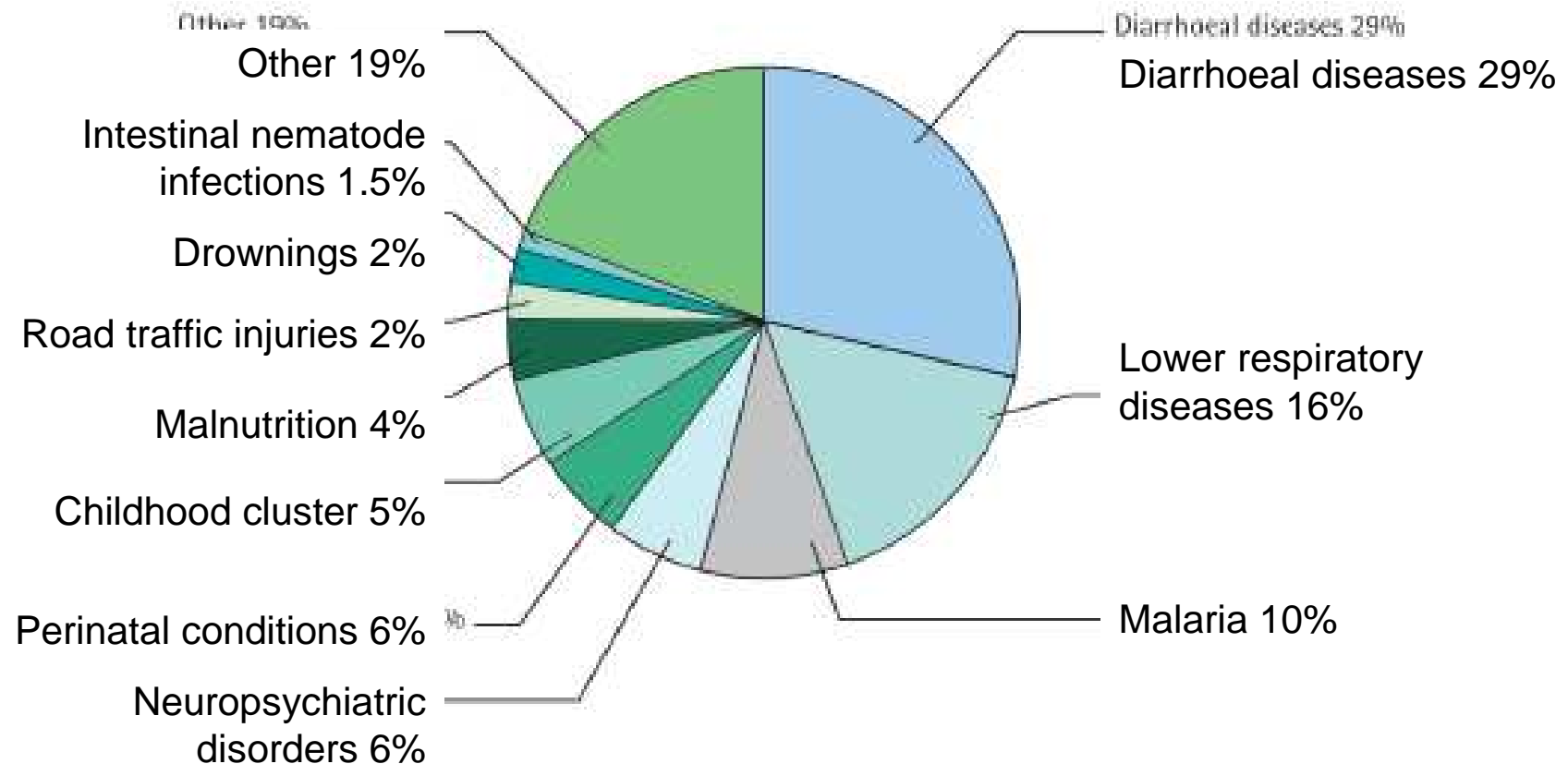
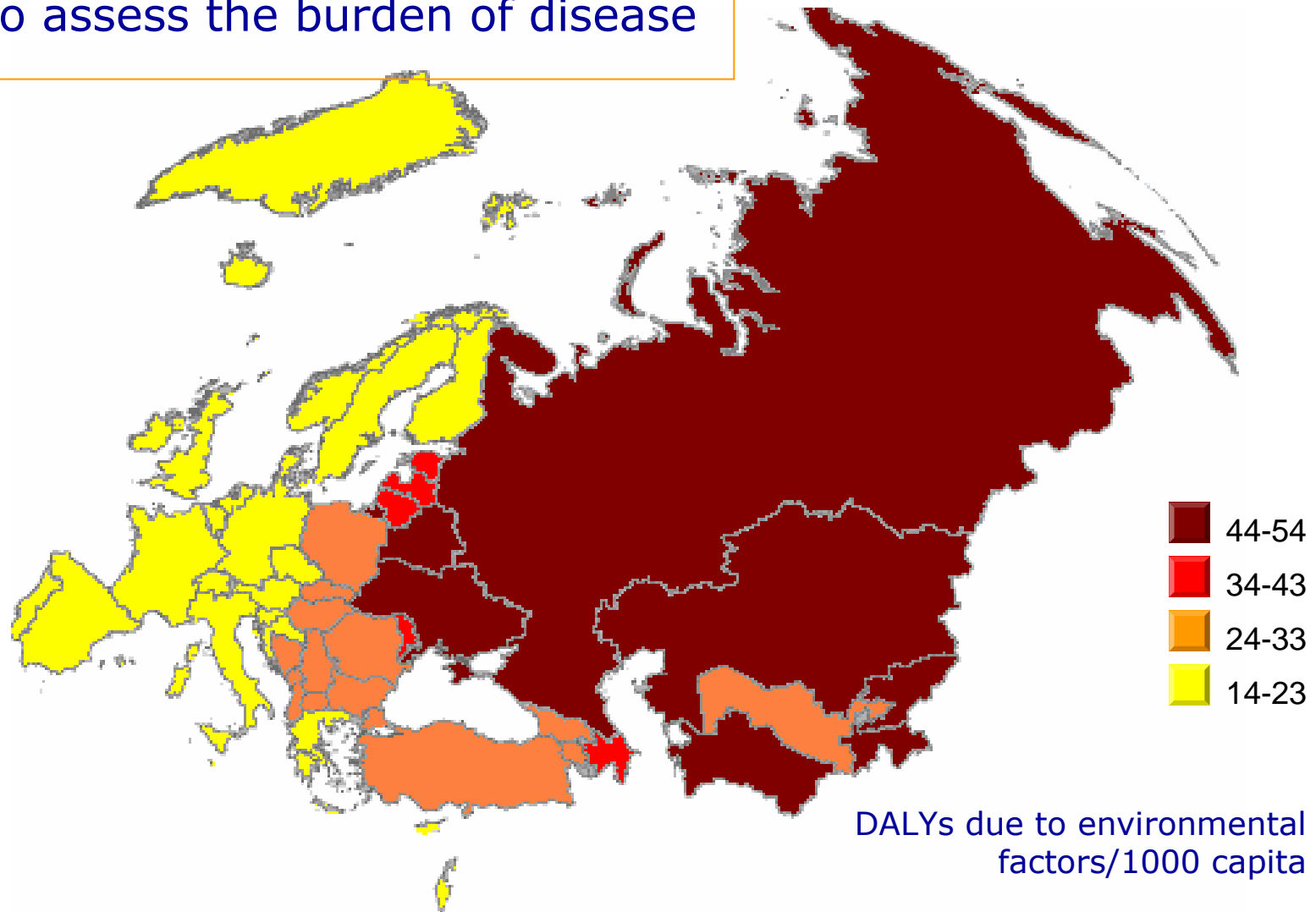


FIGURE 9 MAIN DISEASES CONTRIBUTING TO THE ENVIRONMENTAL BURDEN OF DISEASE, AMONG CHILDREN 0-14 YEARS ^a



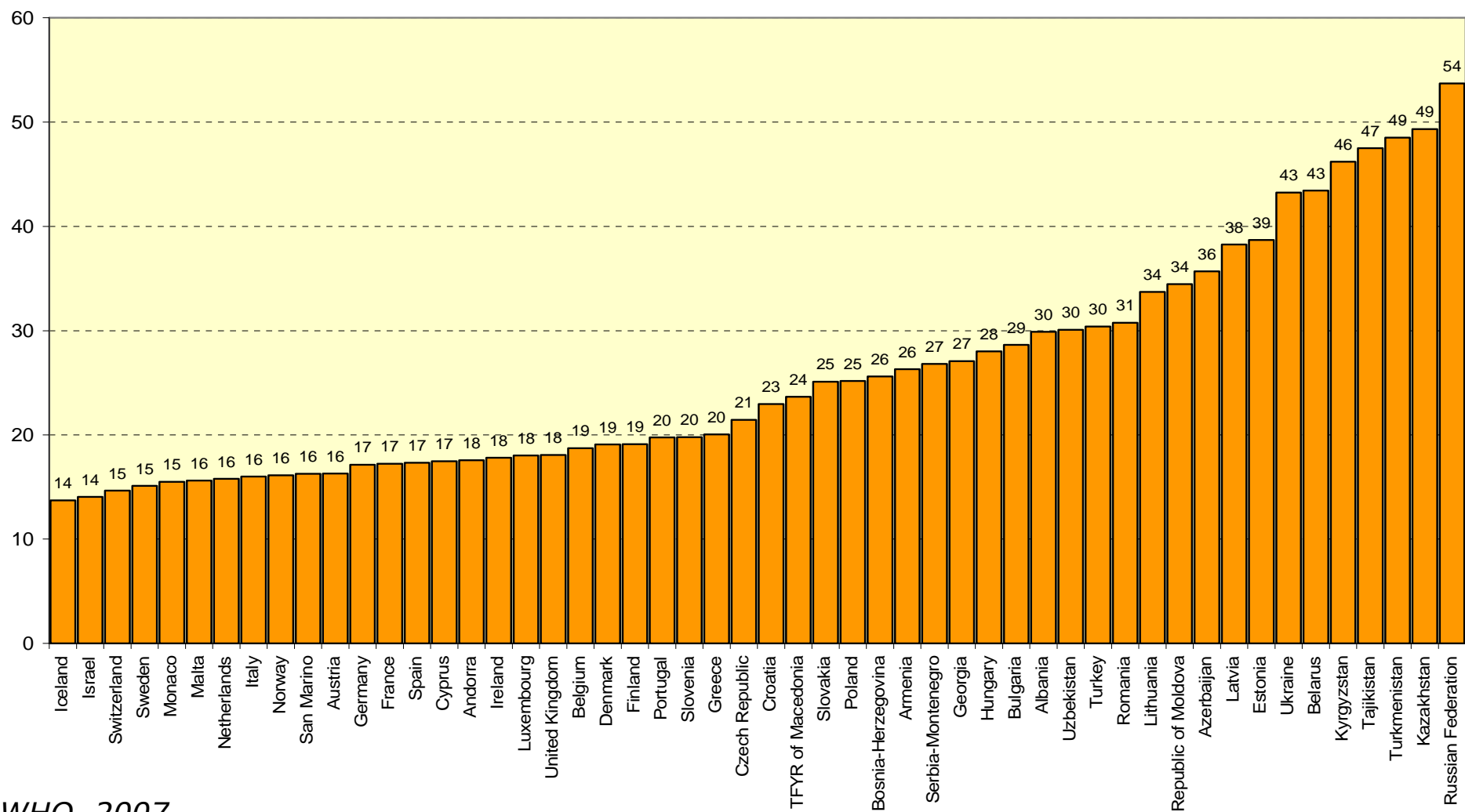
Inequalities

Ability to assess the burden of disease



Health inequalities in Europe

DALYs due to environmental factors/1000 capita by country, 2002



Within Region BoD differences in children 0-19



- Outdoor and indoor air pollution, lack of water and sanitation
- Injuries

Summary findings

- Nearly one quarter of disease burden is due to the environment
- Over one third in children of 0-14 years
- 85 of 102 diseases (reported in the WHR) had environmental links

Per capita results:

- 15 times more infectious diseases in developing than in developed countries
- 2x more injuries per capita in developing countries
- 2-3x more cancers and CVD in developed countries
- More than 100x more diarrhoeal and LRI burden if comparing worst and best performing regions





Study implications

Environment and MDG achievement

- *Goal 1: Eradicate extreme poverty and hunger*

Many environmentally-caused diseases cause lost earnings; malnutrition is 50% attributable to the environment

- *Goal 2: Achieve universal primary education*

Providing clean water and sanitation encourage school attendance (especially for girls) and freed time for water and fuel collection could be spent for education

- *Goal 3: Promote gender equality and empower women*

Similarly to goal 2, women generally are the ones collecting water and solid fuels, and looking after children that are sick. Time could be freed for income generation and improving the nutritional standard and health of the family



Environment and MDG achievement

- *Goal 4: Reduce the child mortality*

The environment is an important contributor to the main diseases affecting children in developing countries, with 180-fold difference between worst and best performing regions

- *Goal 6: Combat HIV/AIDS, malaria and other diseases*

Over half a million environmentally preventable deaths from malaria, over quarter from occupationally-cased HIV/AIDS; 3 million deaths each year from LRI (AF=42%) and diarrhoea (AF=94%)

- *Goal 7: Ensure environmental sustainability*

Providing sustainable sources of water and clean energy would not only save many lives but also greatly contribute to a sustainable environment



Misconceptions about health & environment

- Environment is a luxury, it is for developed countries

Highest in developing countries

- e.g. >30% of Africa's burden attributable to the environment

- Environment mainly affects adults, after many years of exposure

Attributable fraction of 37% in the age group 0-4 years

- We reduce the environmental disease just by increasing GNP ?

A health enhancing environment can be achieved through education, technology and good management

- Environmental interventions are expensive

seven fold return investment from water and sanitation; three fold return for improved household energy



1) Raising awareness:

*With impoverished populations in the developing world the first and hardest hit, climate change is very likely to increase the number of preventable deaths. The gaps in health outcomes we are trying so hard to address right now may grow even greater.
This is unacceptable.*

Climate change and health: preparing for unprecedented challenges.

**WHO Director General Margaret Chan.
December, 2007**



Climate change hurts

World Health Day 2008:
Protecting health from climate change.

www.who.int/world-health-day/en/



World Health Organization

A new opportunity: improving health while reducing greenhouse gas emissions

"Health benefits from reduced air pollution as a result of actions to reduce greenhouse gas emissions... may offset a substantial fraction of mitigation costs" – IPCC, 2007

We have an opportunity to reduce:

The 800,000 annual deaths from urban air pollution, and the 1.6 million from indoor air pollution

The loss of 1.9 million lives, and 19 million years of healthy life, from physical inactivity

The 1.2 million deaths and over 50 million injuries from road traffic accidents





**Climate change and health:
preparing for unprecedented
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**WHO Director General
Margaret Chan.**

December, 2007

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Thank you