

The health benefits/damages and costs of response measures

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**World Health
Organization**

Mandate for Health Assessment

UNFCCC Article 1: “Adverse effects of climate change” : *changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on **human health and welfare**.*

UNFCCC Article 4.1 (f): *All Parties...shall: ...f. Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, **on public health** and on the quality of the environment, of projects and measures undertaken by them to mitigate or adapt to climate change; **4.8***

Issues and constraints in modelling health damage/benefit of response measures

**GHG emission
reduction
measures in
multiple
sectors**

**Health
impacts**

**Economic
impacts**

Uncertain relation-
ship between GHG
emissions and health

Uncertain impact of
mitigation measures
Limited amount of
studies

Uncertain human
behaviours and
economic values

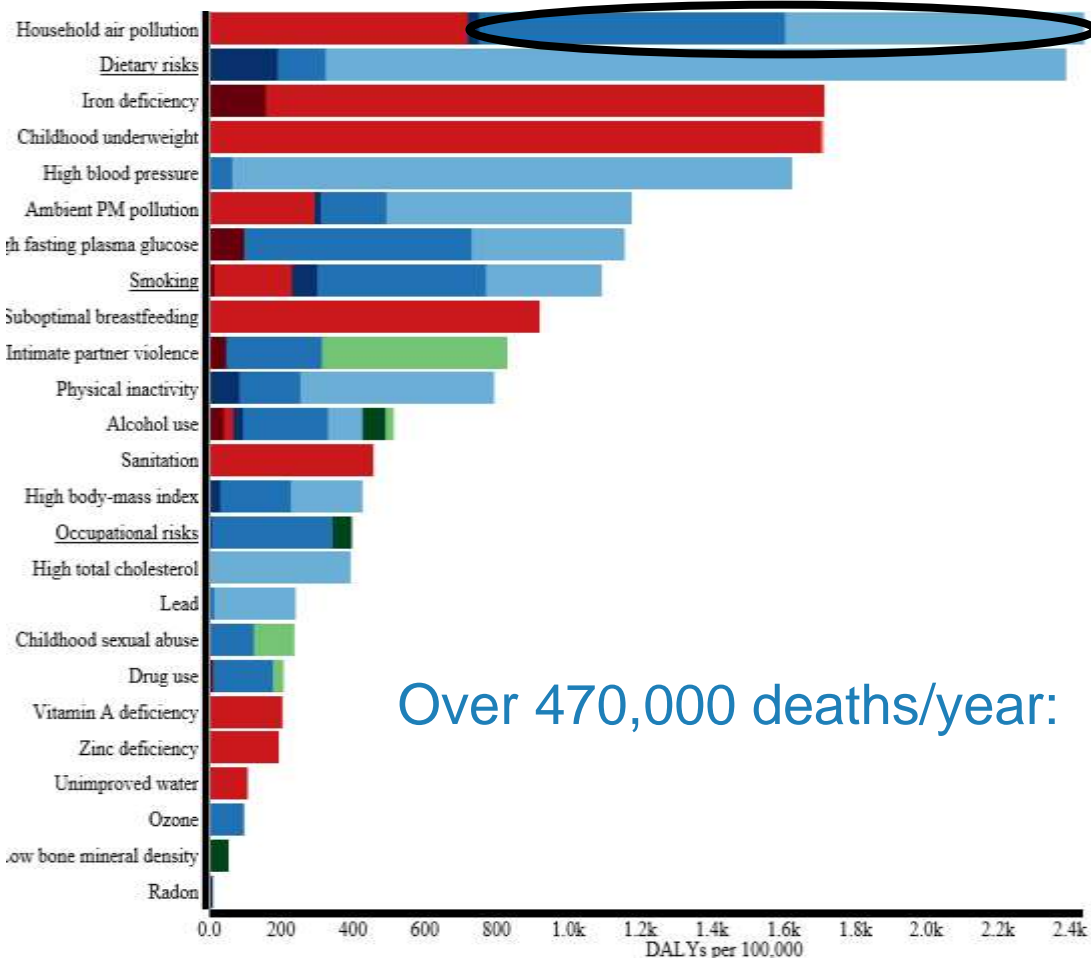
Immediate and local benefits of GHG reductions in various sectors

Transport
Agriculture
Sewage, waste
Energy
Buildings
Health sector



Households: Health Benefits of Response Measures

Top risk factors for health of women in India:



Globally:

- Over 3.5 million deaths per year (malaria is < one million)
- Contributes up to 45% of outdoor air pollution in some countries

At national level (e.g. of India):

- Over 1 million deaths / year
- Top health risk factor for women, 2nd for men

Main GHG emitting sectors contribute to the global burden of disease, through multiple pathways

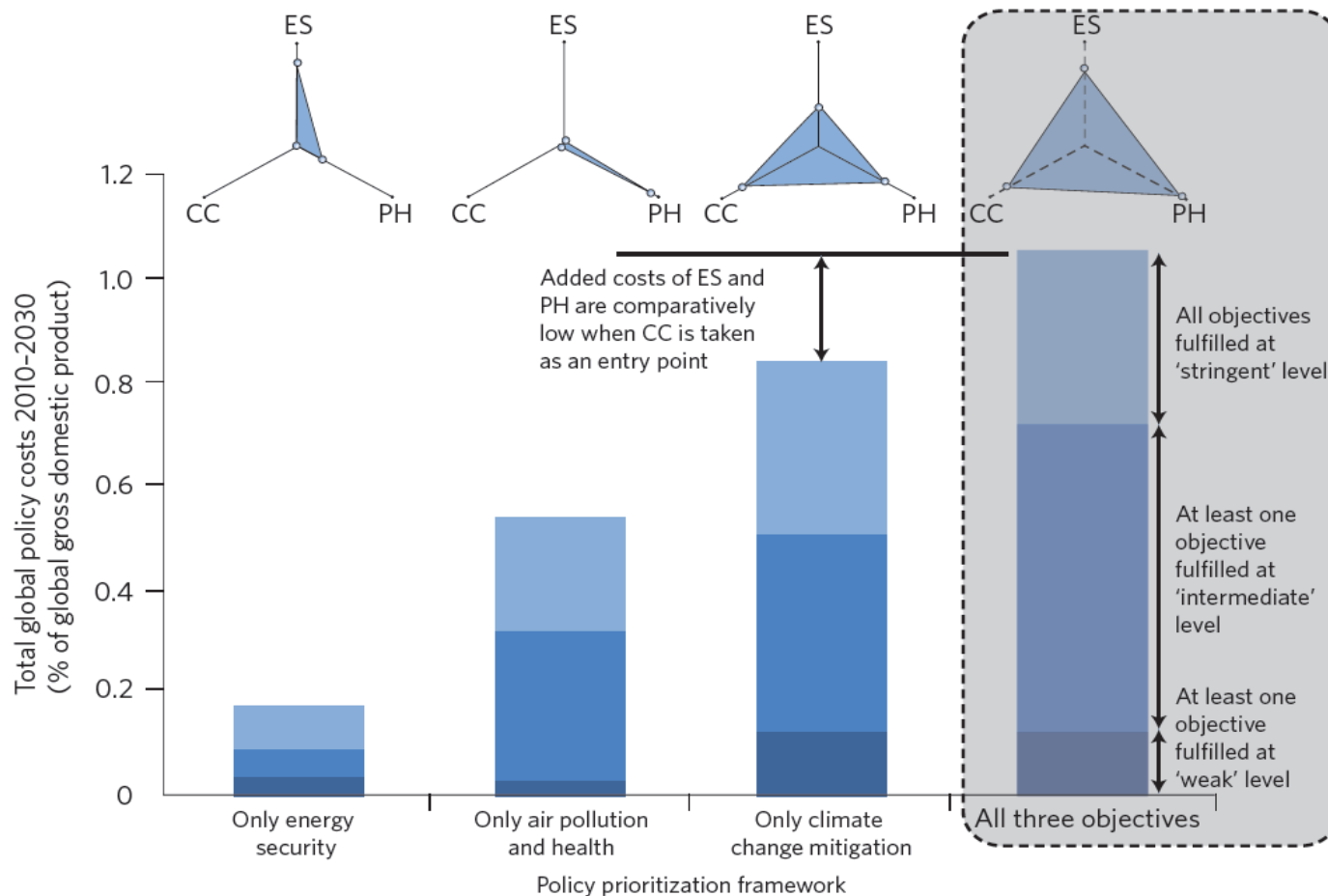
Main GHG emitting sectors (IPCC, 2007)	Annual deaths attributed to selected related risks (WHO 2008, 2009)
Industry	1 million/yr deaths occupational risks
Building power & heating/cooling inefficiencies; reliance on HFC-intensive AC/HVAC systems)	Heat stress, hypothermia, allergies, asthmas, chronic respiratory & airborne disease transmission
Transport – dirty fuels & vehicles, fuels, lack of transit, walking/cycling & urban sprawl)	1.3 million/yr traffic deaths; some % of the 3.2/yr deaths from physical inactivity
Agriculture (e.g. food waste, overproduction and consumption in affluent countries of meat)	2.8 million/yr deaths from obesity

Health co-benefit valuation studies

Measure	Health outcomes affected	BOD*	Cost (US\$)
Housing-related energy efficiency (UK)	Lung cancer (radon), acute and chronic respiratory disease, cardiovascular disease, winter/cold-related death	850 DALY	\$5,000–50,000, with saving \$500 per year in fuel costs
Lower carbon, more active transport (London, UK)	Ischaemic heart disease, cerebrovascular disease, dementia, cancer (breast, lung, colon), road traffic injuries, diabetes, depression	7,400 DALY	Unclear: possibly negative (cost-saving) to households
Lowering consumption of animal products (UK)	Ischaemic heart disease	2,900 DALY	Unclear: possibly cost-saving to society
Low-carbon fuels / technologies (EU)	Cardiopulmonary, lung cancer, occupational mortality	100 DALY	\$140 per tonne carbon dioxide

These are among 1st of their kind, and can be easily replicated

Energy: Energy, major health benefits if health benefits from air pollution considered



“Energy: 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

McCollum et al, Nature Climate Change, October 2011

Transport: Walking and cycling



Health economic assessment tools
(HEAT) for walking and for cycling



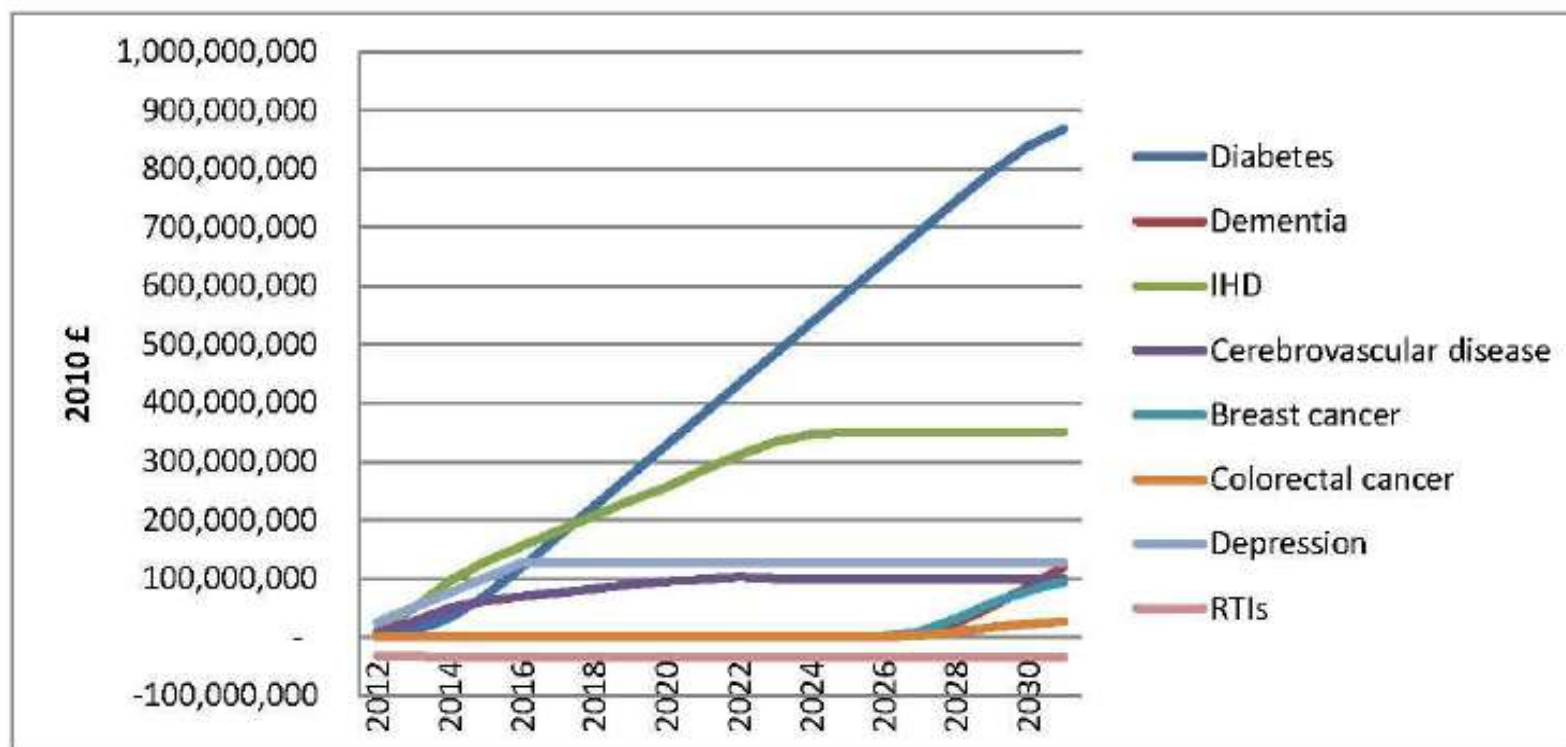
ECONOMIC ASSESSMENT OF
TRANSPORT INFRASTRUCTURE
AND POLICIES

- EU: across 13 cities, every €1 invested in public transport provided €2 to €2.5 in local GDP (2005).
- Switzerland: the economy benefited from an added value of €4.6 for every €1 spent on public transport.
- Australia: Auckland shifting 5% of short urban trips by private motor vehicle to bicycles would save each year about 22 million litres of fuel and 0.4% of transport-related greenhouse emissions.
- Czech Republic: an increase of 2% in cycling would lead to reduced mortality, which in turn would result in discounted annual savings of €882,000.



Transport: potential government savings from active transport

Figure 1: Potential annual NHS expenditure averted by year and health outcome from Increased Active Travel scenario



James Jarrett, James Woodcock, Ulla K. Griffiths, Zaid Chalabi, Phil Edwards, Ian Roberts, Andy Haines Lancet 2012

Urban development



"while the climatic effects of mitigation measures are long-term and dispersed throughout the world, the health benefits are immediate and local" – WHO director-General Margaret Chan, 2009

- Reducing greenhouse gas emissions in Europe by 20% in 2020 would improve life expectancy by 3.3 months and reduce health damage costs by between €12 and €29 billion.
- The Clean Air for Europe (CAFE) Programme estimates a benefit-cost ratio of between 6 and 19 for achieving air quality targets for Europe.

Biofuels: health impact assessment and economic cost estimations

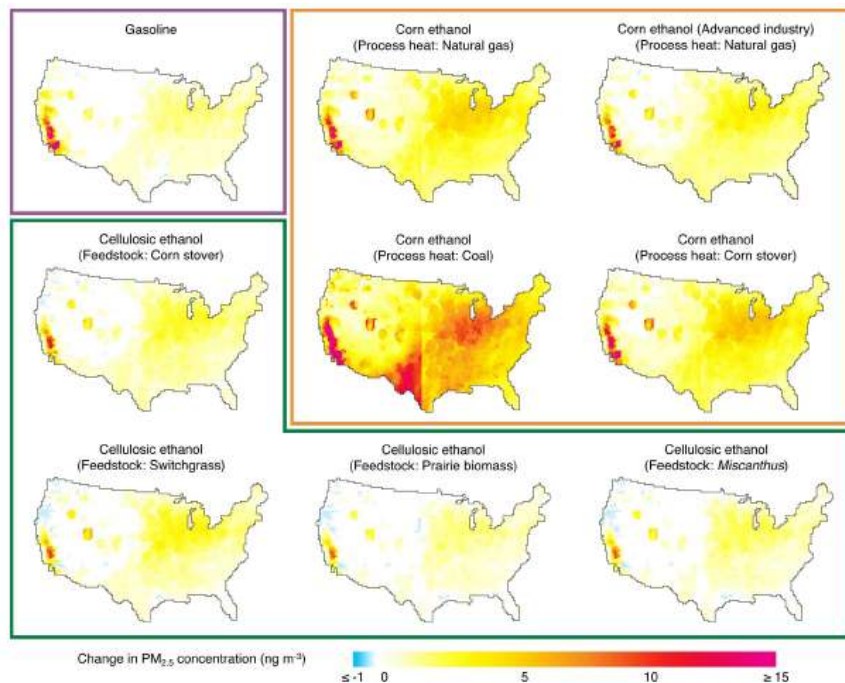


Fig. 3. Change in average annual atmospheric $PM_{2.5}$ concentration from producing and combusting an additional billion gallons of ethanol or an energy-equivalent volume of gasoline.

- The total climate-change and health costs of lifecycle GHG and $PM_{2.5}$ emissions for an increase of 1 billion gallons of corn ethanol are
 - \$614 million with natural gas for biorefinery process heat and current technology,
 - \$589 million with stover,
 - \$952 million with coal, and
 - \$472 with natural gas and advanced technology on both the farm and biorefinery

Hill et al, PNAS, 2010

Health care: leading by example

The health sector is a key economic sector : 8-10% of the global GDP and an estimated 2.6% of the total GHG emissions (in the European Region it is 4.2% of total GHG emissions).

170,000 hospitals & clinics worldwide have no reliable electricity.

Access can be improved through renewable/solar electricity for basic lighting, refrigeration, and medical equipment.



Linkages with ongoing developments

Health and Sustainable Development

Sustainable Cities:

% of urban population exposed to air pollution above recommended WHO Air Quality limits.

Safe and Healthy transport:

% of the population with access to (living within 1km) rapid transit/public transport.

% of urban roadways with dedicated walking and cycling infrastructure.

Energy - % of health care facilities with access to reliable energy supply

Green jobs - % of green workplaces/jobs meeting basic occupational health and safety standards – including air, water, exposure to chemicals and radiation, lighting & ventilation.

Food - % of population with access to healthy foods, % undernourished; % obese; % inadequate micronutrients and dietary balance.

Governance – % of large projects integrating health co-benefits considerations into their planning and implementation, e.g. through a health impact assessment (HIA).

Issues to be addressed

- Adverse health effects of measures
- Inequalities
- Immediate and community benefits of action
- Develop more case studies of health related economic benefits; regional estimates
- Insertion of health outcomes in SDGs
- Aiming at health when assessing policies
- WHO ready to assist MS

Thank you !

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Climate change, green health services and sustainable development

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