TRANSPORT SECTOR  Preliminary findings – initial review

Health in the green economy

Co-benefits to health of climate change mitigation

Key messages

Health gains/risks

• A shift to active transport (walking and cycling) and rapid transit/public transport combined with improved land use can yield much greater immediate health “co-benefits” compared with improving fuel and vehicle efficiency, yet the latter has been the mitigation strategy most emphasized by the Intergovernmental Panel on Climate Change (IPCC).1

• Potential health gains of a shift from private motorized transport to walking, cycling and rapid transit/public transport include reduced respiratory and cardiovascular disease from air pollution and less exposure to traffic injury risks and noise stress. In addition, large benefits are expected from increased physical activity leading to the prevention of obesity, diabetes, heart disease and cancer, as well as greater health equity achieved by better access to goods and services among groups without private motor vehicles.2–4

• Shifting from gasoline- to diesel-powered engines to lower CO₂ emissions could increase emissions of health-damaging small particulates (PM₁₀, PM₂.₅) per unit of travel.5 IPCC’s review of diesel technology’s potential does not consider potential health impacts; yet large shifts to diesel fuels in European cities in the last decade are considered to be a cause of stable (not lower) PM₁₀ levels in European cities in the last decade and no decline in the health impacts of air pollution – despite the introduction of cleaner diesel technologies.6

• Transport-related health risks currently affect millions of people. For example, urban air pollution (much of it transport-generated) and traffic injuries together kill about 2.5 million people every year, mostly in low- and middle-income countries. Active transport can help prevent the 3.2 million deaths annually attributable to physical inactivity.7,8

The climate footprint of transport

Global transport emissions comprised an estimated 23% of direct CO₂ emissions in 2008, with land transport accounting for the largest share (16%). Under “business as usual” scenarios, emissions are projected to rise rapidly in absolute terms.1

“Win-win” health and transport mitigation strategies

• Health co-benefits (and potential risks) of transport mitigation strategies have not received systematic analysis, as reflected in IPCC’s Fourth Assessment Report on mitigation options for the transport sector.1

• Improved active transport, rapid transit/public transport and land use strategies can be cost-effective in many settings, including rapidly developing cities. For instance, relocating educational facilities in proportion to residential locations in Santiago, Chile, was estimated to potentially reduce transport emissions by 12% at a cost of only US$ 2 per ton of carbon reduction over 20 years.10

About Health in the Green Economy

Many strategies to reduce climate change have large, immediate health benefits. Others may pose health risks or tradeoffs. Examined systematically, a powerful new dimension of measures to address climate change emerges.

WHO’s Health in the Green Economy series, to be published in spring 2011, is reviewing the evidence about expected health impacts of greenhouse gas mitigation strategies in light of mitigation options for key economic sectors considered in the Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007 (IPCC).9

The aim is to propose important health co-benefits for sector and health policy-makers, and for consideration in the next round of IPCC mitigation reviews (Working Group III – Fifth Assessment Report [AR5]). Opportunities for potential health and environment synergies are identified here for key economic sectors, including transport.
• Land use planning that increases density and diversity of uses must be a core principle in design of mitigation strategies with greater health co-benefits. Emphasis on “proximity planning” can improve access to goods and services via walking, cycling and public transport infrastructure. Reducing the need to travel by car will reduce transport-related emissions and lead to long-term co-benefits to health and climate change.10

• Well-tested tools exist for considering health in transport and land use policies, including health impact assessment (www.who.int/hia). These tools can be applied more widely in developed countries and in developing cities.

• Investments in active transport and rapid transit/public transport can assist the transport sector to achieve its own objectives by reducing congestion and the need to fund costly road infrastructure.11 Transport systems with strong walking, cycling and public transport provision are also less vulnerable to future interruptions in supply of oil or other fuels.

Health equity

• Healthy transport mitigation can improve access to jobs, goods and services for disadvantaged economic and social groups. Most of the world’s people have limited access to private motorized transport, yet are exposed to transport-related risks such as air pollution and traffic injury. Cities that are accessible by walking, cycling and public transport can particularly improve access to safe mobility and basic services for women, older adults and children, thus improving health equity.11–13 The same strategies also generate better health for all socio-economic groups.

• Transport mitigation strategies that emphasize biofuels production may pose a challenge to health equity. Biofuels demand can be a threat if the result is decreased food availability and price increases due to diversion of food crop lands to fuel production.14,15 This may in turn compromise the right to food.26

• Older, more polluting vehicles that are exported from developed countries pose health risks to developing countries. Resale of such vehicles at low prices has facilitated their export to low-income countries and cities that lack infrastructure and capacity for adequate vehicle maintenance as well as control of fuel quality.17 This contributes to high air pollution exposures and injury rates as well as generally greater traffic-related health impacts among residents of developing countries. Sooty particles emitted by diesel vehicles largely in the form of PM$_{2.5}$ also contain black carbon, a short-lived global warming pollutant, although biomass combustion is a more important black carbon source.16,19

BACKGROUND AND RATIONALE

As transport has several powerful impacts on health, changes in transport policy and infrastructure can lead to far-reaching reductions in health risks related to air and noise pollution exposures and traffic injuries. Cycling, walking and using rapid transit/public transport can greatly enhance levels of physical activity, helping prevent a range of chronic diseases including cancer, heart disease and diabetes.

In addition to these health implications, the transport sector offers major potential for climate change mitigation. Mitigation policies therefore need to be examined in light of both these impacts to identify mitigation strategies with the greatest potential to reduce climate change and gain health co-benefits.

In light of this need, WHO undertook a review of potential health co-benefits (and risks, where relevant) of transport mitigation strategies. This review focuses on the mitigation categories as reviewed in the IPCC’s Fourth Assessment Report – Working Group III.1

SCOPE AND METHODS

This analysis reviews potential health impacts of mitigation strategies and technologies highlighted in IPCC’s Working Group III – Fourth Assessment Report. It draws on an extensive review of nearly 300 peer-reviewed and health-relevant scientific articles and reports. The focus was on studies of the health impacts of mitigation strategies as implemented in real-life settings, as well as evidence on risk factors associated with transport. Existing tools for assessing health impacts of transport decisions were described, as were case studies of climate- and health-friendly transport policies.

The review was limited to land transport, which has the greatest direct implications for health and is responsible for the greatest portion of transport’s greenhouse gas emissions. Our search strategy used keywords related to the strategies examined in the IPCC review of mitigation approaches for transport. These included studies on the health impacts of:

1) modified vehicles and fuels;
2) promotion of non-motorized transport, public transport and more compact land use;
3) pricing strategies for any of the above, or for car use.

Based on these findings, we classified the likely health effects of a given mitigation strategy, or package of strategies, from “--” (strongly negative for health) to “++” (strongly positive for health). Summaries of evidence on the health effects of key transport-related policies and risk factors (e.g. air pollution and traffic injuries) were also presented. Evidence on the health equity effects of each factor was difficult to quantify using this methodology and was described qualitatively (Table 1).
SUMMARY OF INITIAL FINDINGS

The major focus of the IPCC mitigation review is improved fuels and vehicle technologies. To obtain greater health co-benefits, transport mitigation strategies should place greater emphasis on land use planning that makes cities more accessible by walking, cycling and improved rapid transit/public transport. These may also enhance the mitigation potential of transport strategies. Also needed are land use strategies that reduce the need for motorized travel while promoting access. A systematic evaluation of potential health benefits should be included in the next evaluation of mitigation strategies involving transport and land use, so as to ensure “win-win” outcomes for health, the environment and transport.

Overarching goals of healthy transport include: a) increasing equity through better access to goods and services; b) increasing physical activity through safe walking and bicycling; c) increasing safety and physical activity and reducing air pollution through use of mass transit/public transport; d) reducing deaths and diseases from pollution (noise, air, water) and traffic injuries.

These goals can be achieved via four main strategies:

- Land use systems that increase density and diversity of uses;
- Investment in and provision of transport network space for pedestrian and bicycle infrastructure;
- Investment in and provision of transport network space for rapid transit/public transport;
- Engineering and speed reduction measures to moderate the leading hazards of motorized transport.
Health-oriented strategies can be supported by tested policy-support tools such as:

1) Health impact assessment that considers health co-benefits and risks at the planning stage, as well as measures to improve health and reduce health inequities for children, women and low-income groups, who are typically exposed to higher air and noise pollution and face greater injury risks.

2) Strengthened land use/transport planning codes and enforcement; for example, ensuring universal access to safe cycling and pedestrian routes and to rapid transit/public transport for basic routines.

3) Development and monitoring of healthy transport criteria and indicators.

Key messages presented here summarize initial findings of this review, and should be regarded as indicative rather than definitive. A full report will be published in spring 2011.

SELECTED REFERENCES


Public Health & Environment Department (PHE)
Health Security & Environment Cluster (HSE)
World Health Organization (WHO)
Avenue Appia 20, CH-1211 Geneva 27, Switzerland
www.who.int/phe/en/
www.who.int/hia/green_economy/en/index.html

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A modern tram line in Greece provides clean transport. (©Bigstock)