



The Health Nexus - Delivering Health through Sustainable Energy, Transport and Cities



Bus rapid transit in Curitiba, Brazil. (R. Gilling©Lineair/Still Pictures)

PUBLIC HEALTH AND ENVIRONMENT

Health through integrated development

Better health is a measure of progress in diverse dimensions of: sustainable energy, cities and transport systems

Energy access and health

An average of 26% of health facilities in 11 sub-Saharan countries recently surveyed by WHO had no electricity, rising to 58% in some countries — Access to sustainable energy is critical for emergency care, childbirth and other essential health procedures.¹ WHO is helping countries to expand energy assessment of health facilities through a freely-available Service Availability and Readiness Assessment (SARA).² The surveys will be included in the WHO global database on *Energy Access in Health Facilities*, tracking this “silent barrier” to universal health services.

Nearly 3 billion people cook on rudimentary biomass and coal stoves — smoke exposures cause nearly 1/2 of pneumonia deaths in children under 5; 1/3 of deaths from chronic obstructive pulmonary disease, and nearly 1/5 of deaths of ischaemic heart disease.³ Advanced biomass stoves and fuels such as biogas, ethanol and liquefied petroleum gas, can reduce risks. WHO’s *Global Household Energy Database*⁴ (155 countries) tracks trends. WHO *Air Quality Guidelines (2005)* and *Guidelines for Indoor Air Quality: Household Fuel Combustion* (in press) define health-protecting standards and strategies.

Energy efficiency and health in transport and city planning

Energy-efficient urban planning can reduce outdoor air pollution emissions — preventing respiratory and cardiovascular disease. An estimated 3.3 million people a year die from outdoor air pollution globally – outpacing deaths from many other major health risks.³ The most health-damaging pollutants are particulates under 10 microns in

diameter (<PM₁₀). As products of incomplete combustion, ambient PM₁₀ concentrations are an indicator of inefficient energy systems as well as of health risks. Compact, mixed residential and commercial development improves energy-efficiencies of housing, transport, electricity, water and sewage delivery – for greater health and health equity.

Inefficient home and office heating and cooling contribute to air pollution as well as to health risks from — hypothermia and heat-related illness, chronic and acute respiratory diseases, and health inequities related to fuel poverty, WHO’s *Health in the Green Economy: Housing Sector* study describes how energy efficient strategies for thermal design, passive solar heating, daylighting and use of natural ventilation for air circulation and cooling may reduce health risks as well as promote greater thermal comfort and mental health.⁷ Climate-resilient buildings also can contribute to structural soundness and thus safety.

Energy-efficient transport is a key determinant of healthy cities in multiple domains. Investments in rapid public transport and non-motorized travel networks can reduce air pollution risks as well as supporting safer walking, cycling and physical activity. These strategies can help reduce the global burden of physical inactivity (~3.2 million deaths/yr)⁵ and traffic injury (~1.24 million deaths/yr).⁶ WHO’s *Health in the Green Economy: Transport Sector* reviews health/equity co-benefits of such investments.⁷ Prioritized public transport for workers promotes safety and equity. Long-term studies in Shanghai and Copenhagen found cycle commuters had a 30% lower risk of premature death.⁷

The WHO Department of Public Health and Environment (PHE) works to promote a healthier environment, intensify primary prevention and influence public policies in all sectors in order to address the root causes of environmental threats to health.

Renewable energy and health

Renewable energy in homes, transport and urban planning — supports healthier lifestyles. WHO's *Health in the green economy* series illustrates how active and passive solar design related to heating/cooling, hot water, lighting and ventilation can support healthier homes. Green, "walkable" cities and neighbourhoods enable safer active travel (a renewable energy mode) – reducing air pollution, urban "heat island" effects; and climate-change health impacts, present and future. For the workforce, shifting to renewable energy may help reduce certain occupational health risks related to fossil fuel extraction and use, such as respiratory diseases related to coal extraction and cancers from diesel exposure.⁷

On-site, renewable energy for health facilities — Modular Photovoltaic solar packages for lighting, communications and basic health applications may improve resilience of small, off-grid health facilities. Hospitals in developed and developing countries are improving their efficiency with clean, on-site energy solutions, involving solar PV as well as passive solar design, and better use of natural daylighting and ventilation. WHO is analyzing how these trends may enhance critical services for childbirth and emergency response, as well as infectious and noncommunicable disease interventions.



"Lighting a billion lives" India. (TERI/Energy&Resources Institute)



Nigerian nurse operates "solar suitcase" for lights. (WeCareSolar)

Health Indicators of sustainable development

WHO is developing health-relevant targets and indicators to monitor progress in sustainable energy and cities.⁶ Examples include:

Target 1: Universal access to clean, sustainable energy in homes; Zero deaths from indoor air pollution Indicator 1: Deaths attributable to indoor air pollution; *Global monitoring data source:* WHO's *household fuel data base* (+150 countries) is a basis for measuring clean energy access and related disease burden;¹ it is being refined for even more sensitive tracking of trends.

Target 2: Universal Access to clean/sustainable energy in health facilities Indicator 2: Proportion of health clinics with sustainable access to electricity. *Global monitoring data source:* WHO's *Energy Access in Health Facilities* database tracks % of facilities with electricity; WHO is developing methods for assessing climate and health benefits of sustainable systems.

Target 3: Energy-efficient cities Indicator 3: Urban outdoor air quality complying with WHO air quality guidelines. *Global monitoring data source:* WHO has set guideline limits for PM₁₀, and monitors concentrations in + 1,100 cities⁸ worldwide. Lower ambient PM₁₀ concentrations also reflect use of more efficient energy technologies in buildings, transport and power generation.

Target 4: Access to sustainable and healthy transport – rapid transit, walking & cycling Indicators 4 & 5: Proportion of urban travel (trips/passenger kms) by dedicated walking and cycling routes and proportion of daily physical activity obtained through active transport. *Global monitoring sources:* WHO GPAQ/STEPS surveys monitor physical activity obtained from walking and cycling for transport; WHO's health economic tool, *HEAT* assesses health economic benefits of walking and cycling infrastructure investments.⁹

References

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- 8 *Exposure to outdoor air pollution*. Global Health Observatory. http://www.who.int/gho/phe/outdoor_air_pollution/exposure/en/index.html
- 9 *Global Physical Activity Surveillance*. <http://www.who.int/chp/steps/GPAQ/en/> & *Health Economic Assessment tool (HEAT) for cycling and walking*. <http://www.euro.who.int/en/what-we-do/health-tools/environment-and-health/Transport-and-health/activities/the-pep-clearing-house>

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