

on biomass fuels appears to be growing as a result of population growth and the unavailability of, or the high price of, alternatives such as kerosene and liquid petroleum gas. Despite the magnitude of the problem and its predicted worsening, the health impacts of exposure to indoor air pollution have yet to become a central focus of research and of development aid or policy-making.

Tackling indoor air pollution in the context of household energy is inextricably linked to achieving the Millennium Development Goals, in particular to reducing child mortality (Goal 4), to promoting gender equality and empowering women (Goal 3), to opening up opportunities for income generation and eradicating extreme poverty (Goal 1) and to ensuring environmental sustainability (Goal 7). Yet, the central role of household energy is not currently reflected in the political responses to achieve the Millennium Development Goals.

Interventions to reduce indoor air pollution and associated health effects range from switching to cleaner alternative fuels, such as gas, electricity or solar energy, to improved stoves or hoods that vent health-damaging pollutants to the outside, to behavioural changes. There is an urgent need to investigate which interventions work and how they can be implemented in a successful, sustainable and financially viable way.

## GOALS



So what can be done to put an end to indoor air pollution? WHO, as the global public health agency, is in a unique position to advocate for the integration of health in international and national energy policies and programmes. WHO has a responsibility to collect and evaluate the evidence for the impact of household energy on health and for the effectiveness of interventions in reducing the health burden on children, women and other vulnerable groups.

WHO's programme on household energy and health rests on four pillars:

- **Documenting the health burden of indoor air pollution and household energy.** WHO provides regular updates on the links between household energy and health through the World Health Report, technical publications and a web portal and, where feasible, offers support to key research undertakings.
- **Evaluating the effectiveness of technical solutions and their implementation.** Developing simple tools for monitoring the effectiveness of interventions in improving health and building the capacity to conduct such evaluations will help generate much-needed information from current small- and large-scale projects. WHO is actively taking part in projects in Kenya, the Lao People's Democratic Republic, Mongolia, Nepal and Sudan, aimed at introducing improved stoves and other technical solutions to reduce indoor air pollution. And, WHO is a partner in the most sophisticated scientific study to date which is being undertaken in Guatemala to assess how an improved stove enhances children's and women's health.
- **Acting as the global advocate for health as a central component of international and national energy policies.** Ultimately, policy-makers will want to know whether it pays off to invest in large-scale operations to reduce indoor air pollution. In terms of health, a recent cost-effectiveness analysis of different interventions suggested that improved stoves and switching to kerosene

and gas were all cost-effective solutions. In addition, WHO is working on a cost-benefit analysis of interventions that — beyond health — will take into account all the benefits associated with improved household energy practices.

- **Monitoring changes in household energy habits over time.** Information about the energy habits of poor, mostly rural households is scarce and WHO has the responsibility for working towards progress in this area and for reporting, on a yearly basis, the Millennium Development Goal Indicator 29 “percentage of population using solid fuels”.



In implementing these objectives, WHO conducts activities with and through WHO regional and country offices, and works closely with other key partners including the Partnership for Clean Indoor Air, the United Nations Environment Programme, the United Nations Development Programme and the World Bank as well as

many research institutions and nongovernmental agencies around the world.

But this is just the beginning. Large-scale implementation of programmes requires political commitment and substantial funding. In the future, work will focus even more on those countries and populations with the most serious indoor air pollution problems. Lessons learnt from household energy projects now under way in various parts of the world will be synthesized by WHO, and will provide the basis for guidance to professionals and policy-makers on solutions that can make a difference to the health and well-being of some of the world's poorest and most vulnerable populations.

### Also available in this series

- Environmental change and health
- Science, tools and policies
- Occupational health

### For further information visit

<http://www.who.int/indoorair/en/>

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# ENERGY AND HEALTH



World Health Organization

OCCUPATIONAL AND ENVIRONMENTAL HEALTH

Energy is the fuel for everyday living. Energy is essential to health, development and livelihoods — whether used inside the home, for cooking and heating, or in our cities and towns, for transport and productive activities. Yet energy use can also be harmful to health — particularly in poor societies where inefficient or inappropriate methods of heating, cooking and transport may degrade home and community environments, and have severe impacts on health. The WHO programme on energy and health distils and disseminates knowledge and experience on energy solutions that can protect and improve the health of the poor, while at the same time supporting development and ways of using invaluable energy resources more sustainably. The programme focuses on two key areas: transport and health, and household energy and indoor air pollution.

## TRANSPORT AND HEALTH FOR THE DEVELOPING WORLD

### A GROWING BURDEN

#### ISSUES



Urban dwellers face a burgeoning range of environmental hazards from the impacts of transport upon health — including air pollution, noise, traffic injury and the lack of safe space for simple movement — as a result of unplanned and unsustainable patterns of development. Cities in Africa, Asia and Latin America, in particular, are

seeing an unprecedented growth in the number of motor vehicles and in urban traffic volumes. These trends can be expected to continue as, over the next 30 years, most of the world's population growth is projected to occur in the cities and towns of poor countries.

Globally, urban air pollution is responsible for approximately 800 000 deaths every year, and road traffic contributes a significant proportion of such pollution emissions. Worldwide, road traffic injuries cause 1.2 million deaths annually; low- and middle-income countries bear 90% of this death toll. Particularly in poor countries, pedestrians and cyclists are at high risk. Dependence on motorized transport, especially on private motorized vehicles, also appears to be a factor in increasingly sedentary lifestyles. Worldwide, physical inactivity is estimated to cause 1.9 million deaths every year.

For many poor countries, growth in the transport sector signifies economic development and increased employment opportunities. Yet when transport systems are poorly designed, members of the poorer socioeconomic groups may suffer the most. Such groups are usually the most dependent on non-motorized transport or on public transport — systems which may be neglected in strategies for transport development. Poor families often work and live directly in and along congested urban streets — and thus may be most directly exposed to the health hazards of road traffic. In particular, poor children, whose primary playground is the streets, are vulnerable to road traffic injury as well as to the effects on health and development of excessive air and noise pollution. The poor, however, are not the only population group at risk. Ultimately, traffic-generated air pollution, high levels of traffic congestion and traffic injury, and the related trends of urban degradation, touch the lives of all city residents.

Experience in a number of developed and developing countries has demonstrated that

there are cost-effective ways to promote healthier transport systems. Investment in more sustainable systems of urban transport can pay back many times over — both by improving public health and by making cities undergoing rapid development more attractive places in which to live, work and do business. Urban transport is thus a critical issue to be addressed by policy-makers as they seek to create urban environments for the future that are healthy, environmentally sustainable and economically successful.



#### CHALLENGES

For some years now, urban transport has been a focus of dialogue among health, environment and transport actors in developed countries, and at the regional level, e.g. in Europe. In developing countries, however, such dialogue has been rare. And when the health risks are addressed, too

often the focus is on individual issues, i.e. air pollution or traffic injury, rather than on the urban transport system as a whole and its impact on health, social welfare and mobility. In particular, there is a need to raise awareness among policy-makers and stakeholders about the ways in which a more integrated approach to transport and land use planning could potentially benefit both health and urban environments, while at the same time facilitating improved mobility and connectivity. Health systems face challenges in addressing the many health issues that have emerged over recent decades in relationship to transport policies — not a traditional area of health sector focus. Health policy actors need to be aware of the potentially significant gains for health that can be achieved by supporting healthier transport policies. Health professionals need to become adept at making use of the evidence and tools regarding transport and health to provide input into strategic policy debates about transport choices.

Finally, there is a need to facilitate science-to-policy exchange between different cities, countries and regions of the world regarding transport policy experiences and how transport policies may simultaneously support public health and environmental and economic development goals.

#### GOALS

The WHO programme on transport and health for the developing world addresses transport and health issues in an integrated manner, and advocates transport policies and investment choices that promote public health, and in particular the health of the poor, in the context of development aims. The WHO programme works with energy and transport actors globally and at the national level, as well as with current agency programmes for the reduction of ambient air pollution and unintentional injuries, and the promotion of physical activity. The WHO programme aims to promote a more holistic view of the issues by means of the following activities:

- Synthesize and disseminate sound scientific evidence on the health risks and benefits of different transport and policy choices.
- Provide tools for assessing and monitoring the health impacts of transport policies, particularly their impacts on poor and vulnerable populations in developing countries.
- Advocate for the inclusion of health as a central focus in the assessment of transport policy options.

- Support interaction and exchange between policy-makers and professionals in the health, environment and transport sector on good practice in the development and implementation of healthy transport policies.
- Facilitate creation of a web-based knowledge network and “community of practice” where professionals, policy-makers and civil society may exchange knowledge and practical experience on healthy and sustainable transport solutions.

## HOUSEHOLD ENERGY AND INDOOR AIR POLLUTION

### A NEGLECTED BURDEN

#### ISSUES



Cooking a meal in New York, Paris or Tokyo involves turning on a gas stove or an electric cooker. In stark contrast, more than half of the world's population rely on dung, wood, crop waste or coal to meet their most basic energy needs. Cooking and heating with such solid fuels on open fires or traditional stoves is the major

source of indoor air pollution in developing countries, leading to levels of pollution that can exceed accepted guideline limits 100-fold. Polluted indoor air contains a range of health-damaging pollutants, such as small particles that are able to penetrate deep into the lungs. Levels of exposure are particularly high among women and children, who spend the most time indoors near the domestic hearth. Every year, indoor air pollution is responsible for the death of 1.6 million people — that's a life lost every 18 seconds. This killer in the kitchen can double a child's risk of contracting pneumonia and is responsible for nearly half of the more than two million annual deaths from acute respiratory infections in children aged under 5 years. Indoor air pollution is also a serious risk factor for chronic bronchitis and other chronic obstructive pulmonary disease as well as for lung cancer in connection with coal use. In high mortality developing countries, indoor air pollution is responsible for an estimated 3.7% of the total disease burden; a figure that does not even take into account recent studies that indicate an association with low birth weight, asthma, tuberculosis, cataracts and cardiovascular disease. This makes polluted indoor air the most lethal killer after malnutrition, unsafe sex and lack of safe water and sanitation in these countries.

The use of inefficient, polluting fuels thus places a major burden on the health of poor families in developing countries. The dependence on such fuels is both a cause and a result of poverty as poor households often do not have the resources to obtain cleaner, more efficient fuels and appliances. Conversely, reliance on simple household fuels and appliances holds back economic development, continuing a vicious cycle of poverty.

#### CHALLENGES

According to the 2004 assessment of the International Energy Agency, the number of people relying on wood, dung, agricultural residues and other biomass fuels for cooking and heating will increase from 2.40 billion in 2002 to 2.55 billion in 2015 and, even further, to 2.63 billion in 2030. In sub-Saharan Africa, the reliance