

Smoke – the killer in the kitchen

Poverty condemns half of humanity to cook with solid fuels on inefficient stoves. Smoke in homes from these cook stoves is the fourth greatest risk factor for death and disease in the world's poorest countries, and is linked to 1.6 million deaths per year. Yet the international community has largely neglected it. Women and children are most at risk from the killer in the kitchen, as they spend considerable time around the cooking fire. Reducing indoor air pollution across the developing world would contribute significantly to achieving the internationally agreed Millennium Development Goals, in particular the aim to reduce child mortality by two-thirds by 2015.

More than a third of humanity, 2.4 billion people, use biomass (wood, crop residues, charcoal and dung) for cooking and heating.³ Of these, approximately 800 million depend solely on crop residues and dung.⁴ It is a technology that has changed little since the Stone Age. When coal is included a total of 3 billion people – approximately half the world's population – cook with solid fuel.⁵

The smoke from burning these fuels in the home is one of the four leading causes of death and disease in the world's poorest countries.⁷ The indoor air pollution from the burning of solid fuels is linked to the deaths of over 1.6 million people, predominately women and children, each year. This is more than three people per minute.⁶ It is a death toll almost as great as that caused by dirty water and poor sanitation, and greater than malaria.

Smoke in the home is one of the world's leading child killers, claiming nearly one million children's lives each year. Illness caused by smoke kills more children annually than malaria or HIV/AIDS.

The most recent figures from the World Health Organization (WHO) show that in developing countries where mortality is high, the four greatest risks leading to death, disease and injury are being underweight, unsafe sex, unsafe water, sanitation and hygiene and smoke from solid fuel.

Three of these risks are the subject of wide-ranging campaigns and programmes, albeit massively under funded. Being

underweight, unsafe sex, and unsafe water and sanitation are well known as the principal causes of death and disease.⁷ It is an international scandal that relatively little is known and done about the impacts of indoor air pollution.

The World Health Report 2002 carries a breakdown of the causes of death and disease around the world. Figure 1 indicates the total number of deaths in the world attributable to these leading health risks, and also shows the impact of ill health and disability (measured in DALYs) in the world's poorest countries where mortality is highest.

Disability-adjusted life years (DALYs)

The WHO and World Bank measure health risks according to a disability-adjusted life years (DALYs) formula. DALYs estimate life years lost from disease and injuries and the subsequent disability over the remaining years. It is a measure that allows comparison of health interventions across various life threatening diseases.



A woman cooking on an open fire in Sudan.

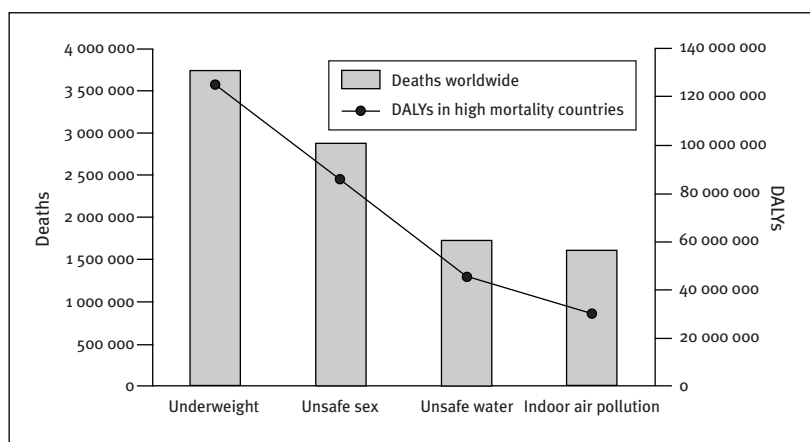


Figure 1: World Health Report's estimates of death and ill-health (DALYs) from leading risk factors in the year 2000.⁷

The main victims of death from exposure to indoor air pollution are women and children. Children aged under five account for 56 per cent of total deaths from indoor air pollution. The main cause of children's death from indoor air pollution is acute lower respiratory infections (ALRI). At 2.1 million deaths a year, ALRI is the world's leading killer of children under five. More than 50 per cent of these deaths are caused by indoor air pollution, lack of adequate heating and other precarious living conditions.⁴

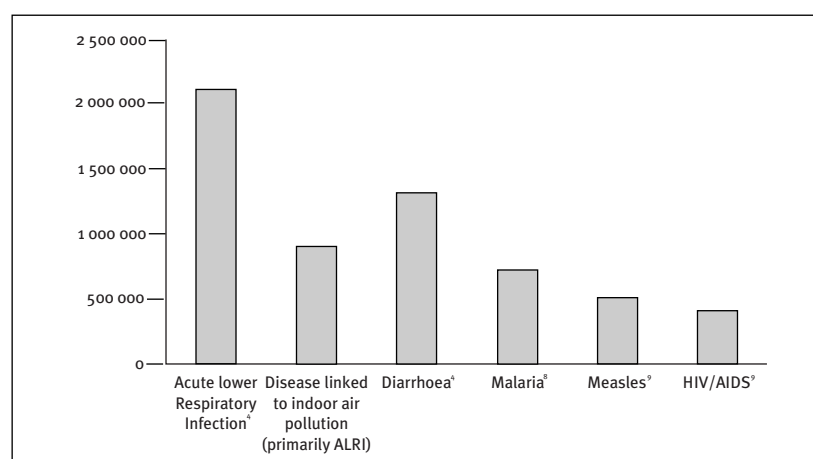


Figure 2: Deaths in the under-fives by various causes.¹⁰

Recently the UN General Assembly restated their aim to control malaria. It is interesting to parallel the scale of the problems presented by malaria and indoor air pollution. Twenty per cent of the world's population are at risk from malaria; almost 50% are at risk from

indoor air pollution. Malaria kills about one million people per year; indoor air pollution kills over 1.6 million.^{6,11,7} Quite rightly there is a major international campaign to fight malaria. This report argues for a similar worldwide campaign for healthy indoor air.

A crisis affecting mainly poor women and children

Indoor air pollution is nothing new. As the smoke-stained walls and ceilings of caves occupied by prehistoric man attest, smoke has been a fact of life for millennia. Living without smoke is inconceivable for many people in developing countries. The vast majority of staple foods, 95%, need cooking before they can be eaten.¹¹ Cooking needs energy.

This is not an indiscriminate killer. Indoor air pollution is strongly related to poverty. It is the poor who rely on the lower grades of fuel and have least access to cleaner technologies.

Indoor air pollution affects women and small children far more than it affects any other sector of society. In developing countries cooking is the preserve of women. This means that of all family members they have the greatest exposure to indoor air pollution.¹³ Women typically spend between three and seven hours per day by the fire, longer when fires are also used for heating the home.

Children under the age of five are also particularly at risk because they spend most of their time with their mothers; often very young ones are strapped to their mother's body. The impact this length of exposure has on small children is exacerbated by a number of factors. Children's airways are smaller, therefore more susceptible to inflammation. Their lungs are not fully developed until they are teenagers, so they breathe faster. Also, their immune systems are not fully developed – a process that may be further delayed by malnutrition. These facts mean that children absorb pollutants more readily than adults and also retain them in their system for longer.¹⁴

Cultural practices may promote the exposure of the elderly and the sick to high levels of indoor air pollution if they end up spending extended periods of time close to the fire.¹⁵

Women carry a double burden

The impact on women is more than just from the smoke. In most societies it is also the women's responsibility to provide the biomass fuel. The time cost alone, in rural areas, can be extreme. Estimates range from two to twenty hours per week spent collecting fuel, and the distances covered over difficult terrain can be considerable. In Nepal, for example, women can walk over 20 km per journey in search of wood. This level of work not only reduces the amount of time women can spend on other activities, such as earning money or resting, but it contributes to a range of additional threats to health and well-being. Women are vulnerable to back problems from carrying heavy loads, frequently in the order of 20 kg, and they are more at risk of violence – rape, beating, injury and snakebites. Girls are often removed from school to assist in wood collection.¹⁶

A DFID-sponsored study concludes: 'The burden of biomass fuel use is a major aspect of most poor women's lives. It absorbs large amounts of time in heavy work, it can have negative effects on health, and, although this problem has been recognized for 30 years, very little has been done about it.'¹⁷

But it is also clear that women are not passive victims of biomass use. Women have developed strategies to cope with shortages of fuel, including shortening cooking times, changing food processing techniques, cooking fewer meals and changing the types of food eaten. They are essentially managers of the natural resource of biomass.¹⁷

As biomass in rural areas is collected at no financial cost, mainly by women and children, it falls outside national energy accounts. It is therefore essentially invisible as an issue. Decision makers need to be aware of the extent of women's effort. But women's input of their own



time and energy is, like biomass, invisible in energy statistics and therefore remains low on the agenda.¹⁸

A great deal can be learnt from the decisions women make regarding biomass, and these lessons should be incorporated into any proposed effort to reduce indoor air pollution.

Smoke and the Millennium Development Goals

The international community has pledged to reduce poverty by 2015 through what have been called the Millennium Development Goals (MDGs). The MDGs have set targets for a reduction in poverty, improvements in health and education, and protection of the environment, and are commonly accepted as a framework for measuring progress towards poverty alleviation.

The MDGs concentrate the efforts of the world community on achieving significant, measurable improvements in people's lives. They establish yardsticks for measuring progress towards poverty reduction in developing countries, and have become the focus of much of the overseas aid funding of rich countries and multilateral institutions.

Reducing the level of indoor air pollution is included in MDG7, ensuring environmental sustainability, as an indicator to monitor the proportion of people using solid fuels.

Smoke affects the lower status members of the community – women and children.

'If people do not have fuel for lighting, they must sit in the dark; if they do not have fuel for cooking, quite simply, they starve.'¹²

'We will spare no effort to free our fellow men, women and children from the abject and dehumanising conditions of extreme poverty, to which more than one billion of them are currently subjected.'

United Nations
Millennium Declaration²²

Measuring the proportion of people relying on solid fuel may turn out to be a very blunt instrument for monitoring indoor air pollution. Though cooking with a cleaner fuel is by far the least polluting option, switching to higher quality fuel is out of reach for the vast majority of people at risk. Poverty will continue to condemn many households to cook on traditional fuel. In the short to medium term, the most feasible option for these homes is to get smoke safely out of the house.

What is required within the Millennium Development Goals is a more realistic method of measuring progress towards reducing indoor air pollution that takes into account the realities of poor people's economic choices and ways of reducing levels of smoke in their homes.

Nevertheless reducing levels of indoor air pollution could contribute to the achievement of most of the MDGs. Most significantly, MDG 4 has a target to reduce by two-thirds the under-five mortality rate between 1990 and 2015.

Millennium Development Goals

In September 2000 the member states of the United Nations unanimously adopted the Millennium Declaration that set in place the Millennium Development Goals of reducing poverty by 2015. The goals are:

- MDG 1: Eradicate extreme poverty and hunger
- MDG 2: Achieve universal primary education
- MDG 3: Promote gender equality and empower women
- MDG 4: Reduce child mortality
- MDG 5: Improve maternal health
- MDG 6: Combat HIV/AIDS, malaria and other diseases
- MDG 7: Ensure environmental sustainability
- MDG 8: Develop a global partnership for development

The UK's Department for International Development (DFID) acknowledges that energy plays a crucial role in underpinning efforts to achieve the MDG. 'Lack of access to adequate, affordable, reliable, safe and environmentally benign energy is a severe constraint on development.'¹⁸

At the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002 there was acknowledgement that the vicious cycle of energy poverty needs to be broken in order to achieve the Millennium Development Goals for reducing world poverty. A lack of access to clean and affordable energy can, and should, be considered a core dimension of poverty.¹⁹

Reducing exposure to indoor air pollution will help meet seven of the goals

MDG 1 – Healthier families mean a healthier workforce, and therefore a greater potential for undertaking income-generating activities from farming to small industry.

MDG 2 – Girls often have to spend considerable time collecting fuel for cooking – time that could be better spent in school.

MDG 3 - Women are the primary targets of intervention. Any improvement in the conditions in which women live and work promotes gender equality and empowerment. Interventions that have reduced indoor air pollution have been shown to increase women's social capital and provide opportunities to develop new skills and increase income levels.

MDGs 4 and 5 – The two groups of people most affected by indoor smoke are women and children under the age of five. Interventions that reduce exposure will improve the health of mothers and children.

MDG 6 – The improved conditions within the home provided by interventions to reduce indoor air pollution would help to mitigate the effects of HIV/AIDS and other illness. More efficient use of fuel means that less needs to be collected, reducing the work burden. Also, the reduction of exposure to smoke will reduce the more vulnerable person's risk of illness.

MDG 7 – Some of the interventions to reduce indoor air pollution can result in the more efficient use of wood fuel and therefore contribute to a lessening in greenhouse gas emissions and the conservation of forest areas – thereby contributing to environmental sustainability.²⁰ Surprisingly, even switching from inefficient use of biomass to fossil fuel (kerosene or LPG) can reduce climate impact, as it can conserve forestry and emit less greenhouse gas than inefficiently burned biofuels.²¹