



Air pollution: economics and urban health

Economics plays a vital role in health policy-making and investments to reduce air pollution; in helping to understand the costs of health care; and in determining nations' wealth and ability to invest in health and well-being.

Urban Health Initiative

a model process for catalysing change

Healthy individuals, wealthy cities

Air pollution affects the current and future workforce of a city as ill-health compromises individuals' ability to perform their work and household activities, enjoy leisure time, and continue with their educational and professional training. Low productivity contributes to the cycle of poverty affecting individuals suffering from air pollution-related diseases.

Assessing and testing alternative scenarios addressing the impacts of air pollution to estimate potential health and economic benefits is crucial for health policy-making.

The Urban Health Initiative supports cities in producing contextual and meaningful information on the health and economic impacts of air pollution to enable cities to make the case for investments in interventions to tackle the problem of poor air quality.

Air pollution contributes to poverty

Poor individuals are more likely to live or work in areas with high levels of air pollution and bear severe health risks as air pollution leads to many noncommunicable diseases, including cardiovascular and respiratory diseases, cancers and diabetes.

A vicious poverty circle is formed. Poor individuals or households cannot afford to pay for food and care for their well-being. Therefore, they are exposed to severe health risks. In getting sick, they are unable to attend school and professional training, or do not have enough energy to work - a downward spiral into deepening poverty.

Air pollution prevents cities achieving the Sustainable Development Goals

Air pollution pushes individuals into poverty (SDG 1.1.1) and makes them spend too much of their household budget on health care expenses (SDG 3.8.2). Data from Accra (2016) shows that at least 15% of individual and family budgets were used to pay for health care, and that people were pushed into extreme poverty due to these health expenditures and ill-health.



Economic evaluations for urban health interventions

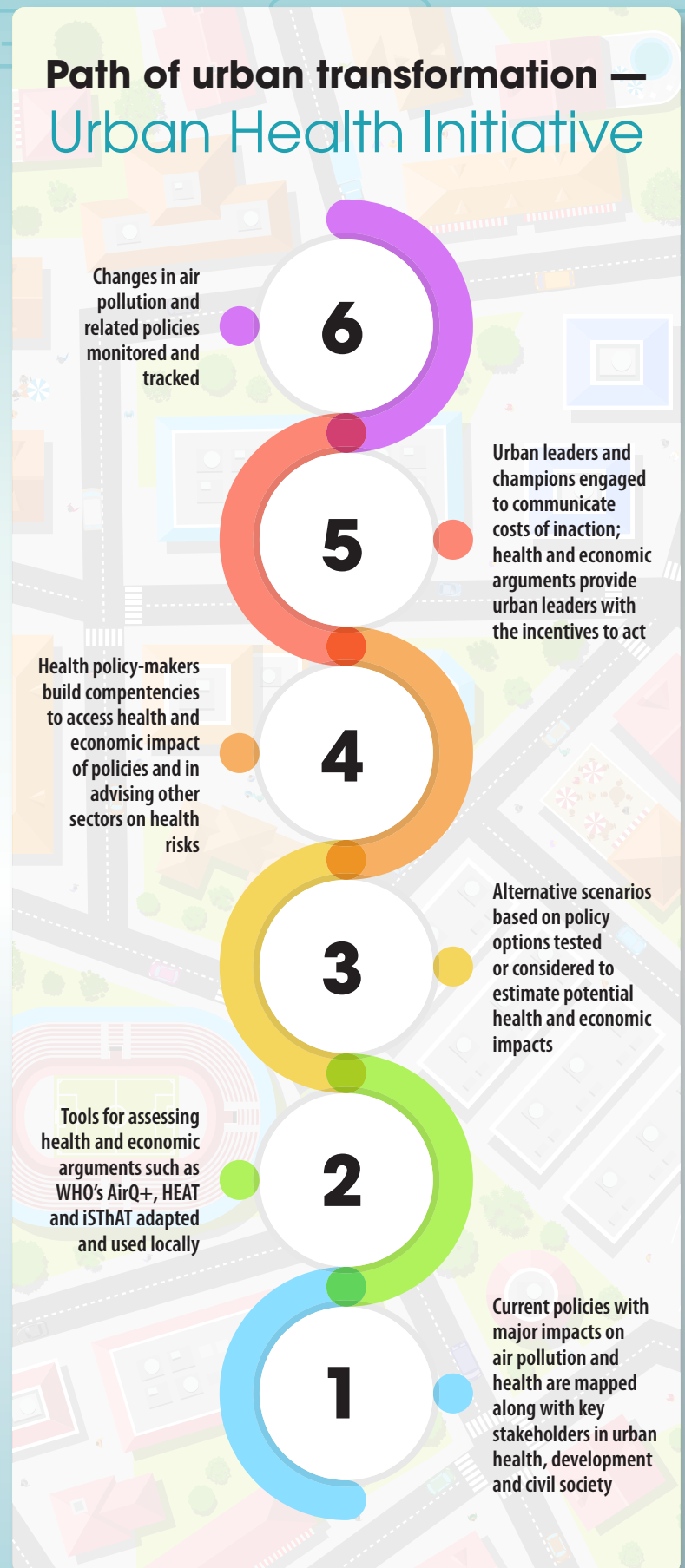
Economic evaluations can provide important information to those making decisions about the allocation of limited human, environmental, material and health resources. In particular, economic evaluations can be used to identify interventions that are good value for money and to prioritize investments.

Economics provides us with instruments (e.g. partial economic evaluation) to understand the cost of not acting to tackle the problem of air pollution, by estimating:

- the cost of direct medical care to the public health system;
- the direct and indirect costs of ill-health to individuals and their families (medical treatment, transport and loss of income); and
- the impact on the nation's wealth.

Other economic tools (e.g. full economic evaluations such as cost-effectiveness or cost-benefit analysis) allow decision makers to compare costs and prioritize alternatives which are good value for money, to overcome regional variations in access, and to contain costs and manage demand for health care.

The Urban Health Initiative uses a range of different approaches to assess the economic impact of air pollution in cities. The initiative trains local teams, and develops instruments for the collection of local data for cost estimations, and for analysis. It also adapts and uses WHO tools and others that provide full or partial economic evaluations of interventions against air pollution, such as WHO's AirQ+, Health Economic Assessment Tool (HEAT) for walking and cycling, Integrated Sustainable Transport Health Assessment Tool, and One Health.



Reducing air pollution makes sense health-wise, now and as an investment in a clean and liveable future.

PILOT PROJECT

URBAN HEALTH INITIATIVE PROCESS IN ACCRA, GHANA

In Accra, the Urban Health Initiative team collected data from individuals and their families attending a referral hospital to treat air pollution-related diseases, and found that 45% of the sampled individuals came from a poor background, with 51% working in the informal sector, i.e. more than half of socioeconomically deprived individuals depended on their good health to produce income for their family – daily!

One day out of work meant a day with no or reduced income. Patients spent, on average, 18 days hospitalized, per referral, with the number of days varying by health condition. Sampled individuals and their families lost, on average, US\$ 355 in income per hospitalization.

Air pollution leads to catastrophic health expenditure for individuals and families

The Urban Health Initiative team also collected and analysed data on the direct costs to individuals and their families of hospital medical costs. **On average, uninsured individuals paid US\$ 1090 per hospitalization**, depending on their health condition. But even for those who were insured, co-payments were required.

Taking into consideration that about 51% of individuals in our sample work in the informal market, and have an average annual income of US\$ 612–857, a single hospitalization could represent a complete loss of income, with some individuals mentioning they needed to rely on loans and sell their assets to cover medical costs due to ill-health.

For those with chronic conditions (e.g. cancers or severe cardiovascular and respiratory diseases), average medical costs were estimated at US\$ 2146, per hospitalization. With an average of four hospitalizations per year, these medical costs corresponded to 67% of their annual net income. These expenditures qualify as a catastrophic, based on any international threshold.

A total health expenditure of 10% or more of household consumption or income is considered a catastrophic expense. SDG 3.8.2 is the proportion of the population suffering financial catastrophe when accessing health services and it is one of the indicators for universal health coverage.

Tackling air pollution makes cities wealthier

Evaluations for Accra showed that when air pollution is reduced to WHO guideline levels, some 1790 deaths could be averted, and around US\$ 247 million in welfare costs saved could be generated (2018 figure).

The economic costs of implementation of an intervention in transport, for example, the Bus Rapid Transit, was estimated at US\$ 117 million for Accra (2018 prices). The economic welfare benefits well outweigh the costs of the intervention, with a benefit-cost ratio of 2.1. This means that the benefits generated by controlling air pollution are over two times the cost of the intervention, making investment in improving air quality highly cost-effective.

The way forward for economic evaluation in Accra

Economic evaluation is a powerful process for decision-making and can be used to assess a broad range of interventions (individual or integrated), and help policy-makers to make the investment case against air pollution. Waste management, the creation and expansion of green spaces, and the costing of alternative transport provision – including walking and cycling – and household energy, are some of the areas that can be explored in Accra using economic evaluation. In order to deepen such analysis, more action is needed, including:

- The collection of better quality data on health morbidity and mortality, which requires the training of data collectors and a better definition of health indicators.
- Promotion of better collaboration between high-quality academic work at local universities and government agencies to train stakeholders in economic evaluation and analysis.
- Encourage research and data collection on social conditions and economic behaviour (e.g. individuals' willingness to pay to reduce a small risk of death to assess the societal costs of air pollution).
- Cost-effectiveness and cost-benefit analysis of a variety of individual and integrated interventions, including an equity assessment of the benefits generated, to make the investment case for air quality interventions in urban settings.
- Development of a financial framework to help cities assess potential sources of finance, both local and international.

Source: Economic analysis of air pollution in Accra: results. WHO, in preparation.

