

Smart Mobility with a Health Perspective

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WHO's longstanding work in the field

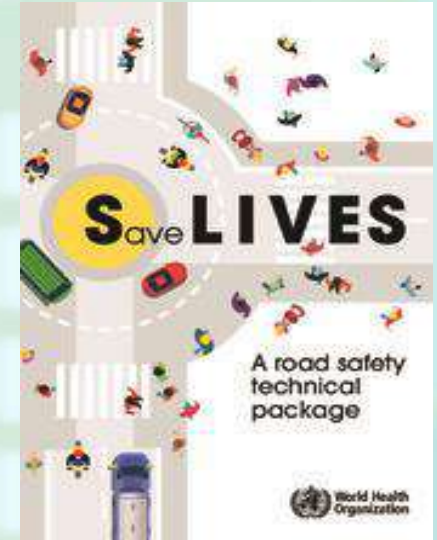
Division 44
Water, Energy, Transport



Urban Transport and Health

Module 5g

Sustainable Transport: A Sourcebook for Policy-makers in Developing Cities



<https://apps.who.int/iris/handle/10665/44732>

COVID-19 and mobility



Supporting healthy urban transport and mobility in the context of COVID-19

Strengthening Preparedness for COVID-19 in Cities and Urban Settings

Interim Guidance for Local Authorities



Moving around during the COVID-19 outbreak



Whenever feasible, consider riding bicycles or walking.

This provides physical distancing while helping you to meet the minimum requirement for daily physical activity, which may be more difficult due to increased teleworking, and limited access to sport and other recreational activities.



More info: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

Smart mobility - several potential pathways to improved health and liveability



- **Air pollution**
- **Physical Activity**
- **Noise**
- **Interpersonal violence**
- **Social Interaction & exchange**
- **Food environment**



DETERMINANTS OF TRAVEL

PHYSICAL ENVIRONMENT

Weather and climate
Topography
Green space, greenery and public space

SOCIAL ENVIRONMENT

People travelling together
Social norms
Police and enforcement practices
Information about and marketing of travel modes

LAND USE

Density, diversity and design
Location choices for residences, employers/businesses, educational institutions, other services, other amenities

INDIVIDUAL AND FAMILY CHARACTERISTICS

Attitudes, perceptions, preferences, habits
Information, knowledge, awareness
Time constraints
Financial constraints
Fitness
Health status

CONTEXT OF TRAVEL

TRAVEL NEEDS

Trip purposes
Trip distance
Trip chaining

VEHICLE FACTORS

Vehicle design/characteristics
Vehicle ownership
Driver licensing

FEATURES OF EACH TRAVEL MODE

Cost
Fear of harassment, interpersonal violence and traffic injury
Travel time and predictability
Hours of availability
Aesthetics, comfort, amenities en route
Stress during travel
Condition of infrastructure
Communicable disease risk
Accessibility for people with diverse needs

TRAFFIC FACTORS

Congestion
Volume
Speed
Mix of vehicles

AMOUNT OF TRAVEL BY EACH MODE

Walking
Cycling
Public transport
Car
Water transport
Freight
Informal transport
Other modes
Transportation mode

A global framework on transport, health and health equity

OUTCOMES OF TRAVEL

ACCESS

Access to water, food, household fuel
Access to health services
Access to social services
Social severance barriers to access
Participation in society
Other access

INTERMEDIATE AND PROXIMAL RISK FACTORS

Physical activity
Air pollution
Noise
Diet/nutrition
Social interactions, networks, isolation, assistance
Independent mobility for children
Body mass index/obesity

HEALTH AND WELLBEING OUTCOMES

Road traffic injuries
Non-communicable diseases
Mental health
Mortality
Other health and wellbeing outcomes
Health costs

NON-HEALTH OUTCOMES

Climate change
Availability of urban space for non-transport purposes: social, ecological
Experience of travel
Employment in transport services and construction
Other outcomes

What is the role of the health sector to promote healthy and liveable cities through sector policy change?

Energy

Housing

Climate
Action

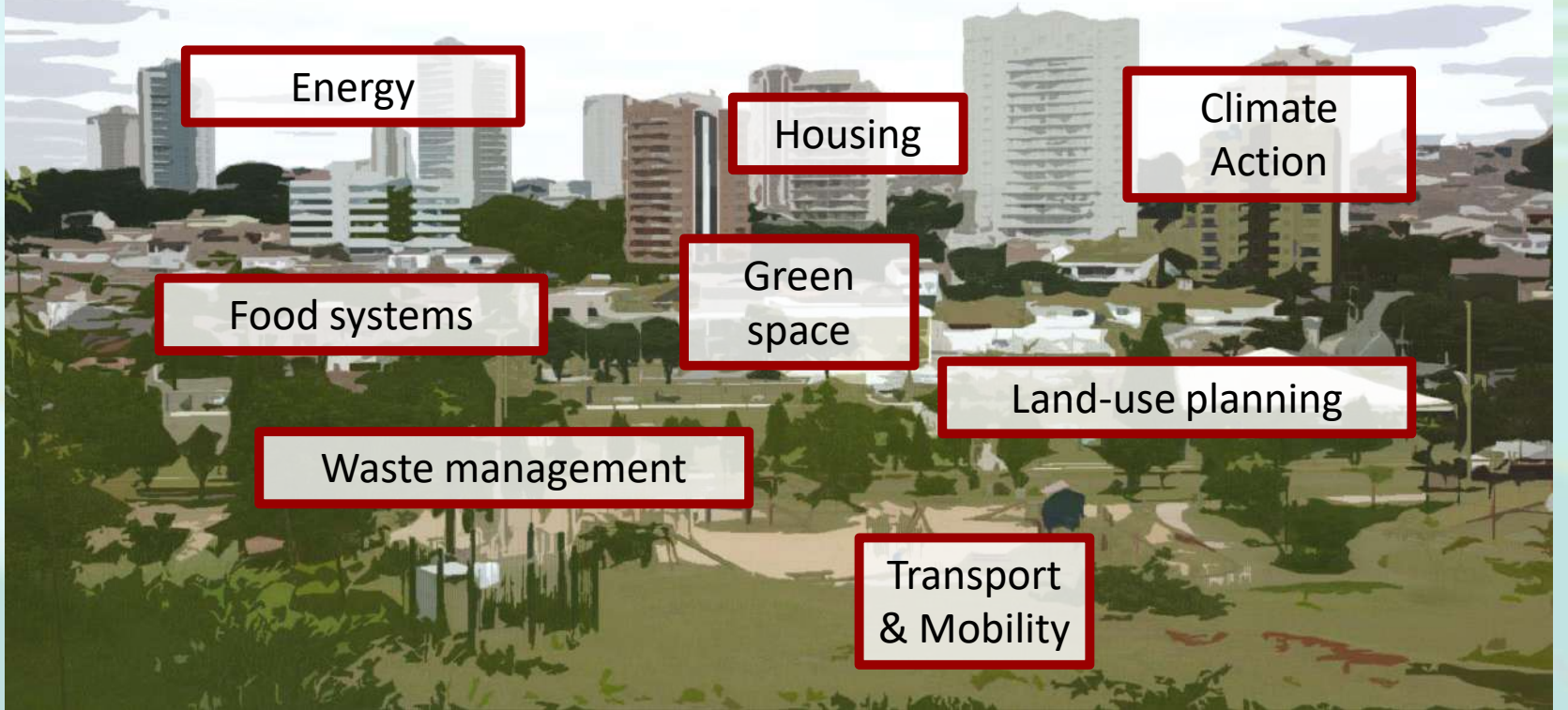
Food systems

Green
space

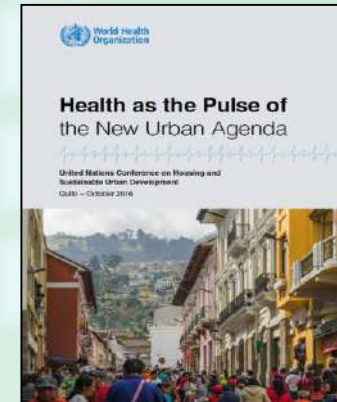
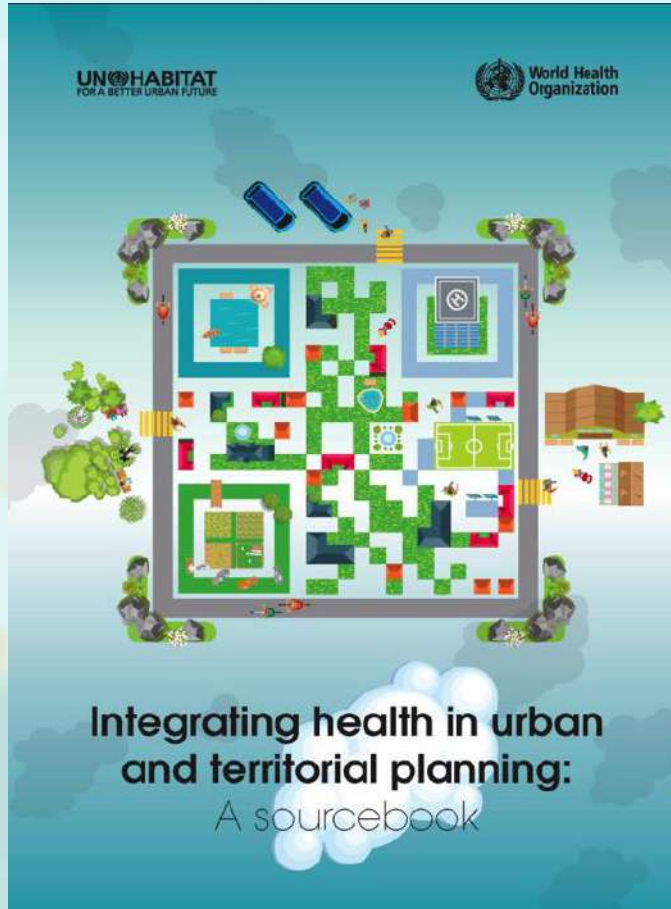
Land-use planning

Waste management

Transport
& Mobility



Integrating health in urban and territorial planning



<https://apps.who.int/iris/handle/10665/331678>



If the purpose of planning is not for
human and planetary health,
then what is it for?

SMART-MR

Integrating Europe



European Union
European Regional
Development Fund

TRANSFORMING EUROPEAN METROPOLITAN REGIONS

*Smart mobility
for better liveability*

SMART-MR: Sustainable Measures for
Achieving Resilient Transportation in
Metropolitan Regions

Table 2: Set of activities that could lead to greater liveability in metropolitan regions.

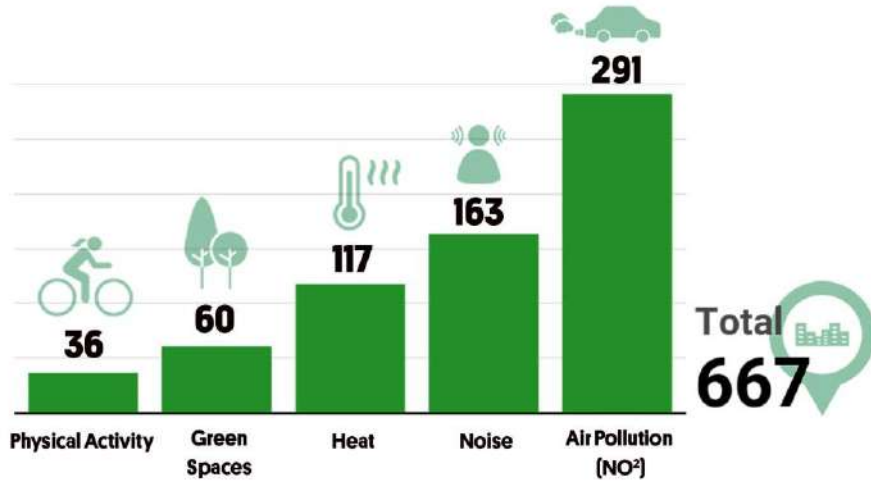
| Field of intervention | Activity | Short-term effects/wins | Long-term effects/wins | Indicators for measuring progress on the activity |
|----------------------------------|--|--|---|---|
| Participatory transport planning | Public consultation | <ul style="list-style-type: none"> - Less physical inactivity - Less harassment and violence - Less traffic injuries | <ul style="list-style-type: none"> - Higher health and wellbeing net benefits from mobility - Higher NCD prevention through mobility | <ul style="list-style-type: none"> - Number of consultation rounds - People attending the consultations - General acceptance of the plan |
| Creating a mobility plan | Promotion and implementation of interventions to organize and manage the demand for mobility of people and goods | <ul style="list-style-type: none"> - Less community severance / more social interaction and exchange - Better access to (health) services, jobs, education and leisure opportunities | <ul style="list-style-type: none"> - Mobility systems better prepared to respond and recover from stresses and shocks (e.g. infectious diseases outbreaks) | <ul style="list-style-type: none"> - Number of travellers on public transport - Number of private goods transport operators involved |
| | Regulation of access in some zones (and/or parking) | <ul style="list-style-type: none"> - Optimization of land use dedicated to transport infrastructure | <ul style="list-style-type: none"> - Lower environmental impact from mobility - Better traffic flows | <ul style="list-style-type: none"> - Number of travellers on public transport - Shortening the time of trips - Measurable lower levels of pollutants in the air |
| | Support for intermodal nodes and infrastructure planning for both passengers and freight (transport) | <ul style="list-style-type: none"> - Less traffic - Less pollution | | <ul style="list-style-type: none"> - Number of travellers on public transport - Number of private goods transport operators' trips, last mile - Time of trips - Levels of pollutants in the air |

Indicators for measuring liveability, health and wellbeing

- Perceived levels of quality of life
- Populations levels of happiness
- Number of deaths or DALYs averted
- Number of mobility-related hospitalizations
- Cost of mobility-related diseases and conditions
- Equitability on the distribution of health and wellbeing impacts across the population and the metropolitan area (measured e.g. through Gini or concentration index)

Case: Health and economic impacts of the Superblock project (Barcelona, Spain)

Annual Premature Deaths that the "Superblocks" Model Could Avoid in Barcelona

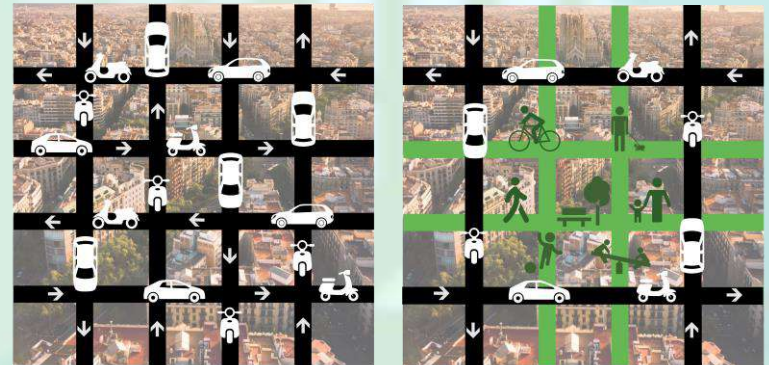


Source: Mueller et al. Changing the urban design of cities for health: the Superblock model. *Environment International*. 2019

ISGlobal

“The findings indicate that the original Superblocks project (over 500 superblocks) could prevent 667 [premature deaths](#) every year, increase life expectancy by almost 200 days on average per inhabitant, and generate an annual economic saving of 1.7 billion euros.”

ISGlobal - Barcelona Institute for Global Health



Analytical applications to enable health calculations

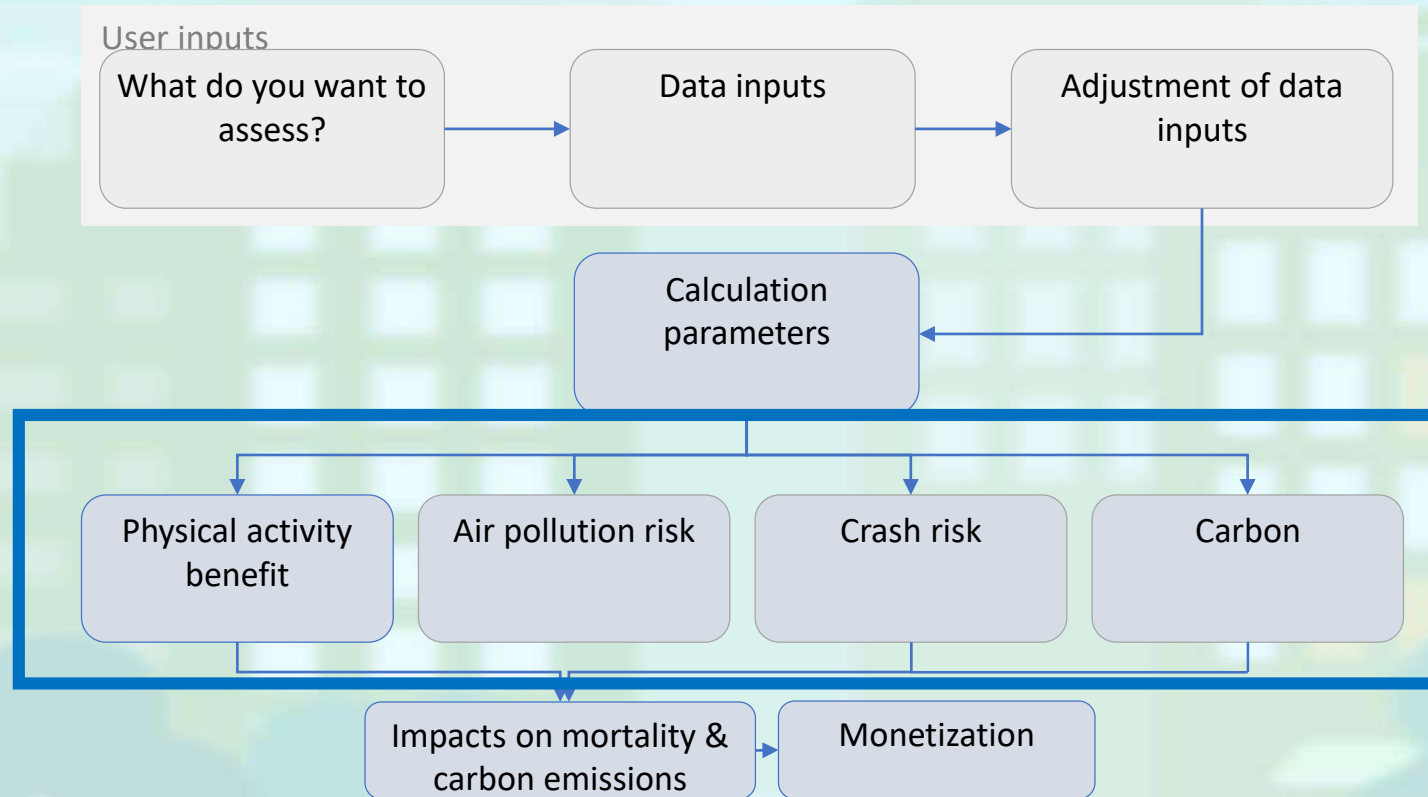


WHO Health and Economic Assessment tool for walking and cycling

- Health and economic assessment of health impacts of walking or cycling
- Online application www.heatwalkingcycling.org
- Originally designed for transport planners, but suitable for a broad audience of non-health experts
- Originally designed for the European context, global adaptation currently ongoing

A simple tool to allow consideration of health in planning decisions that affect walking or cycling

HEAT workflow – integrated assessment



Urban Health Initiative

A model process for catalyzing change



The role of the health sector: 3 pillars to catalyse policy change

Health
evidence

Health
competency

Health
communi-
cations

Levels of urban transformation

6

Urban leaders act - changes in policies, air quality, climate & health indicators are tracked

5

Communications intensify demands for change

4

Alternative scenarios tested – vision for healthy urban future articulated

3

Tools for assessing health and economic benefits

2

Health policymakers build competencies

1

Current policies assessed and mapped

Pilot projects in **Accra** and **Kathmandu**, with air pollution as the entry point

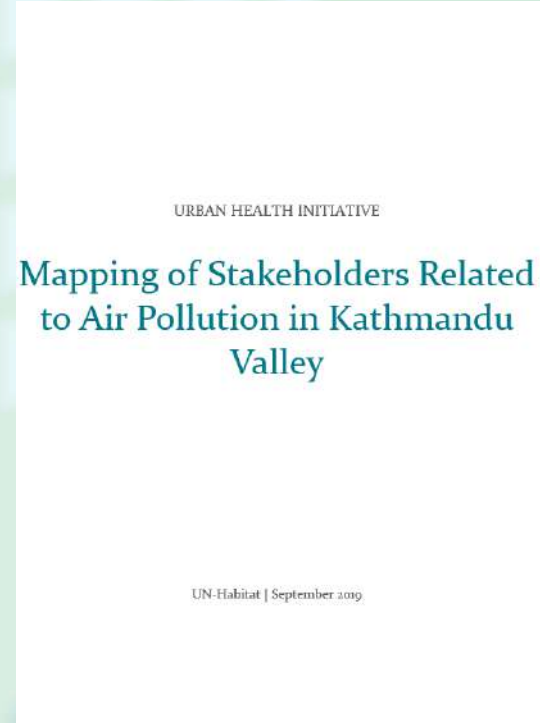
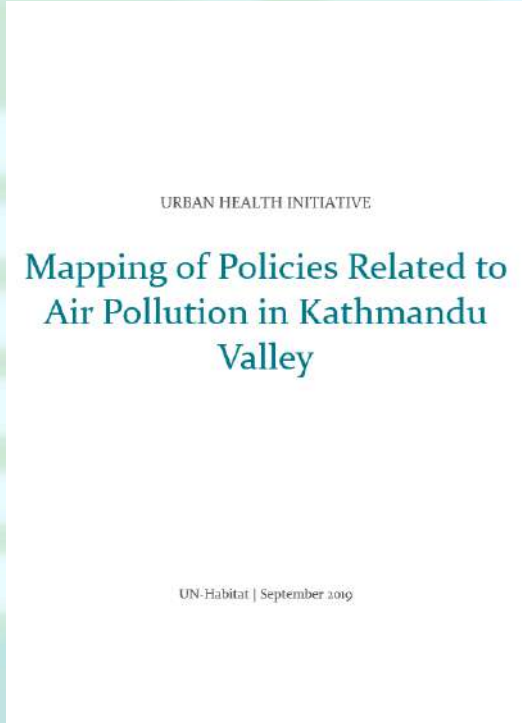
Main partners include WHO, MoHP Nepal, Ghana Health Service, Kathmandu Valley municipalities, Accra Metropolitan Assembly, CCAC, Government of Norway, ICIMOD, UN-Habitat, Kathmandu University, University of Ghana Legon, ICLEI, SEI, Ghana EPA, among others.

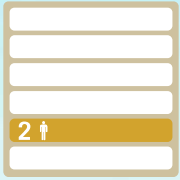




1

Current policies assessed and mapped





2

Health professionals build competencies

**Air pollution and health
capacity building material
for the health workforce**

Instructions for contributors

Working group on air pollution and health training modules



*Development of capacity building material
for health practitioners, ongoing*



Capacity building activities as part of Urban Health Initiative pilot project in Kathmandu, 2018



Regional training workshop on Environmental Health Impact Assessment, CEHA, Amman, Jordan, 2017



Capacity building activities as part of Urban Health Initiative pilot project in Accra, 2018



Urban Health Initiative and BreathLife training event at the World Urban Forum, Kuala Lumpur, Malaysia, 2018



3

Tools for assessing health and economic benefits

HEAT v4.2

Welcome to the Health Economic Assessment Tool (HEAT) for walking or cycling in Europe

→ This 2023 update to HEAT v4.2 with new data input pages, revised log files, and an updating note (see News for details) →

The HEAT tool is designed to enable users, without expertise or input assistance, to conduct a health impact assessment of walking or cycling. The tool is based on the best available evidence on movement interventions. It is intended to be employed by public health professionals at both national and local levels. These include primarily transport planners, health promotion and special interest groups working on transport, walking, cycling in the environment.

The HEAT references the value of reduced mortality that results from specified amounts of walking or cycling across the following question:

If a people regularly walk or cycle or instead of, what is the economic value of the health benefits that occur as a result of the reduction in mortality due to their physical activity?

In addition, HEAT can now estimate and estimate the health effects from road safety and air pollution, and effects on carbon emissions.

The tool can be used for a number of different assessments, for example:

- assessment of current (or past) levels of cycling or walking, e.g. showing why cycling or walking are worth it given city or country
- assessment of changes over time, e.g. comparisons of 'before and after' situations, or 'scenario A vs. scenario B' (e.g. with or without measures taken)
- evaluation of new or existing projects, including benefit cost ratio calculations.

HEAT can be used to evaluate the tool or to provide health info. more comprehensive economic appraisal needed, or unresponsive health impact assessments.

What kind of results can you produce with your tool data or scenario? See scenarios here.

Annual information on how HEAT works can be found here. A detailed description of the development process, assessment used and many other things as well as a step by step guide can be found in the technology and user guide.

More information and materials are also available at <http://www.who.int/europe/air-quality/air-quality-impact-assessment-tool>

For questions or comments on HEAT please email to beat@who.int.

Start using the tool



World Health Organization Europe

Home Health topics Countries Publications

Health topics > Environment and health > Air quality > Activities > AirQ+: software tool for health i

Air quality

- News
- Events
- Policy
- Activities
- Data and statistics

AirQ+: software tool for health risk assessment of air pollution

WHO/Europe is interested in gathering information about where and how AirQ+ is used, to improve its assistance. Please share information on your use of AirQ+. We will use the survey data in aggregated form for a general overview and statistical analysis of AirQ+ users.

Quantifying the effects of exposure to air pollution in terms of public health has become a critical component in policy discussions. WHO/Europe

Take our AirQ+ survey

Start the survey

AirQ+: software tool for health risk assessment of air pollution

- the effects of short-term changes in air pollution (based on risk estimates from time-series studies);
- the effects of long-term exposures (using life-tables approach and based on risk estimates from cohort studies)

For each type of estimate, separate HELP files explain details of calculation.

Methodology and scientific basis for the risk estimates are summarized in the documents listed below.

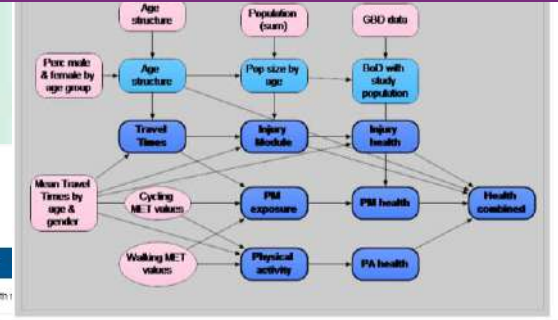
AirQ+ download, set up and examples

AirQ+ can be used, with some limitations, for cities, countries or regions to estimate:

Integrated Transport and Health Impact Modelling Tool (ITHIM)

ITHIM refers to a range of related models and tools developed at CEBAS to perform integrated assessment of the health effects of transport scenarios and policies at the urban and national level. The health effects of transport policies are modelled through the changes in physical activity, road traffic injury risk, and exposure to fine particulate matter (PM2.5) air pollution. Some versions of ITHIM also predict changes in CO2 emissions. ITHIM is being used in research and by health and transport professionals to estimate the health impacts of scenarios, compare the impact of travel patterns in different places, and model the impact of interventions. ITHIM works either as a stand-alone model, or it can be linked with other models (e.g. transport, health, economic).

Integrated Transport and Health Impact Modelling Tool (ITHIM)





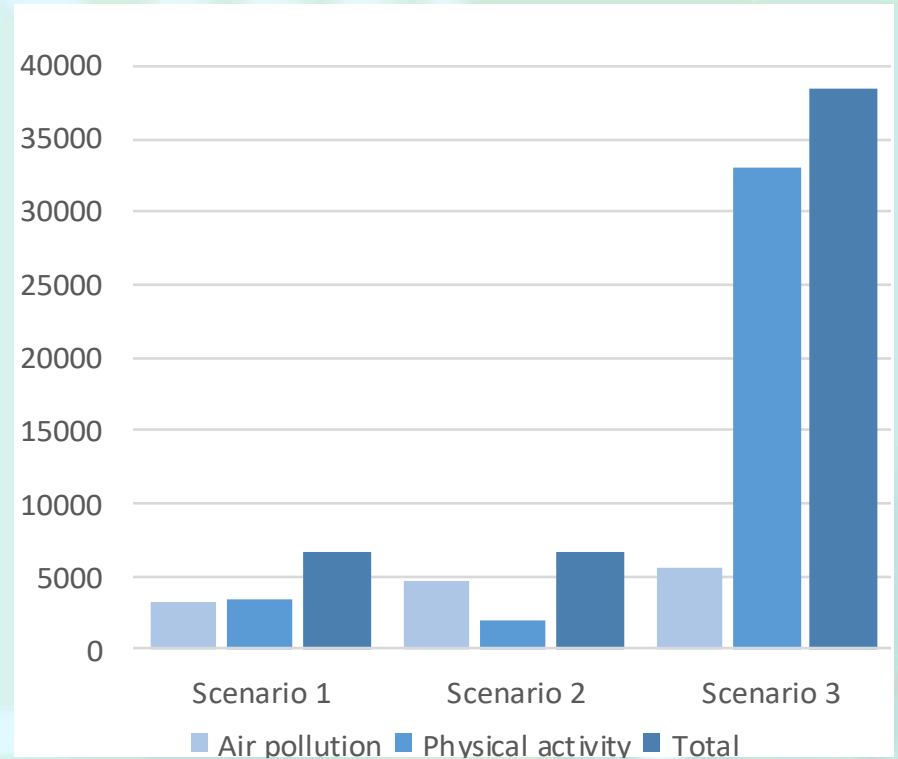
4

Alternative scenarios assessed and tested

Deaths averted from changes in transport policies

Preliminary estimates found **5,500** averted deaths from reduced air pollution, and an additional **33,000** averted deaths from increased physical activity in the most aggressive policy scenario projected over the next 35 years — including increasing public transport, fleet fuel economy, and infrastructure for walking and cycling, while reducing reliance on cars — resulting in an economic health benefit of almost **USD 14 million**.

Averted Deaths





4

Alternative scenarios assessed and tested

Improving local health and economic evidence to inform policy decisions

Cost of selected diseases in Accra (mean, in US\$)

| Cost Category | COPD | IHD | Lung Cancer | Pneumonia | RTI | Stroke |
|-------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Medical staff | 28.4 (10.7%) | 25.7 (11.3%) | 30.4 (6.3%) | 19.2 (18.0%) | 15.0 (14.4%) | 22.7 (7.3%) |
| Laboratory tests | 140.4 (52.9%) | 97.1 (42.9%) | 84.0 (17.5%) | 50.2 (47.0%) | 38.2 (36.6%) | 180.8 (58.2%) |
| Medication | 53.10 (20.0%) | 62.3 (27.5%) | 283.4 (59.1%) | 22.1 (20.7%) | 28.3 (27.1%) | 64.0 (20.6%) |
| Materials | 40.31 (15.2%) | 38.1 (16.8%) | 78.2 (16.3%) | 12.0 (11.2%) | 19.6 (18.8%) | 39.8 (12.8%) |
| Overheads | 3.20 (1.2%) | 3.2 (1.4%) | 3.2 (0.7%) | 3.20 (3.0%) | 3.2 (3.1%) | 3.2 (1.0%) |
| Cost per day | 265.4 (100%) | 226.5 (100%) | 479.2 (100%) | 106.8 (100%) | 104.3 (100%) | 310.6 (100%) |
| <i>Length of Stay (mean)</i> | <i>24.7</i> | <i>15.1</i> | <i>33.3</i> | <i>8.5</i> | <i>22.6</i> | <i>14.0</i> |
| TOTAL COST per patient | 6,548.6 | 3,411.4 | 15,973.4 | 907.8 | 2,362.3 | 4,363.8 |



4

Alternative scenarios assessed and tested

Local estimates with local data informing local policy-based scenarios, led by local stakeholders



Health and economic impacts of transport interventions in Accra, Ghana

Daniel Essel
Joseph V Spadaro

WHO URBAN HEALTH INITIATIVE





5 for change

Multi-sectoral communication materials

Communications intensify demands

Urban Health Initiative

A model process for catalysing change

Making health a priority in the design of all public-sector facilities

The Urban Health Initiative (UHI) goes beyond improving access to health care and promoting healthy behaviours, and focuses on how to build cities that enable and encourage good health.

Urban planning - a health issue

As public-sector facilities are built, health considerations are increasingly being factored into the design process. This is a positive trend, as it allows for the integration of health considerations into the design of public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

Bringing health to the policy table

The health sector is integral to the economic, health, education, and social development of a country. Health is a priority in the design of all public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

Health - a priority in the design of all public-sector facilities

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Health is a priority in the design of all public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

TACKLING AIR POLLUTION IN GHANA

Communicating air pollution solutions

Improving access to community members on the health impacts of air pollution and the health benefits of clean air. This involves developing communication materials for policy change in cities.

Policy brief

Policy briefs are concise summaries of research findings that provide decision-makers with the information they need to make informed decisions. They are typically one to two pages long and include a clear message, evidence, and recommendations.

Health - a priority in the design of all public-sector facilities

Health is a priority in the design of all public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

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PLANNING FOR AIR POLLUTION IN GHANA

Overview

Air pollution is a global health issue that is becoming increasingly prevalent in Ghana. This is due to a combination of factors, including rapid urbanization, industrial growth, and the use of fossil fuels for energy and transport. Air pollution has a significant impact on human health, contributing to respiratory and cardiovascular diseases, as well as premature deaths. It also has a negative impact on the environment, contributing to climate change and acid rain. This document provides an overview of the current situation in Ghana and offers recommendations for how to address the problem.

Health - a priority in the design of all public-sector facilities

Health is a priority in the design of all public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

Health - a priority in the design of all public-sector facilities

Health is a priority in the design of all public-sector facilities, ensuring that health is a priority in the design of all public-sector facilities.

Tools for modelling health and environment

Air pollution data

Use of air quality data and modelling for the design of health interventions. This involves using data from air quality monitors and modelling software to estimate the health impacts of air pollution. This information can be used to develop targeted interventions to reduce air pollution and improve public health.

Green spaces

Green spaces provide a range of health and environmental benefits. They improve air quality, reduce noise, and provide a place for recreation and relaxation. Green spaces also contribute to the urban environment, making it more attractive and livable. This document provides information on the benefits of green spaces and offers recommendations for how to increase their availability in urban areas.

Urban transformation - Path of Urban Health Initiative

Economic evaluation for urban health interventions

Economic evaluation is a process that assesses the costs and benefits of different interventions. It is used to determine the most cost-effective way to improve public health. This document provides information on the economic evaluation of urban health interventions and offers recommendations for how to conduct such evaluations.

Walking

Walking is a simple and effective way to improve health and reduce the risk of chronic diseases. It is also a sustainable mode of transport that can help reduce traffic congestion and air pollution. This document provides information on the benefits of walking and offers recommendations for how to encourage more people to walk.

URBAN HEALTH INITIATIVE

Sustainable transport for health in Accra

Sustainable transport systems can protect and promote people's health, reducing risks from vehicular air pollution, physical inactivity and traffic injuries, and garner climate and environmental benefits for Accra.

Transport is a determinant of health

Transport systems connect people socially and economically, and have environmental, social, economic impacts on the communities they serve. Transport systems can either enhance health or, conversely, increase health risks by shaping exposure to air pollutants, noise emissions from motorized vehicles, congestion, and risks of road traffic injuries.

Accra is one of the fastest urbanizing cities in Africa

With a population growth rate of 2-3% in recent decades, more than 4.5 million people live in the Greater Accra Metropolitan Area (GAMA), with a daily influx of 2.5 million business commuters. GAMA is expected to grow to 6.3 million people by 2030, and 9.6 million people by 2050.¹

This rapid growth places higher demand on transport, and action in the sector is even more important to promote health. The transport sector is responsible for a large and growing proportion of urban air pollutants that impact health. Air quality data indicate that 75% of samples collected at roadside locations in Accra exceed the national 24-hour mean PM10 limit of 70 µg/m³ (WHO limit is 50 µg/m³).²

Car ownership is outpacing population growth

As personal incomes have risen, with over 1.2 million cars registered in 2017 (60% of national registration), Greater Accra Metropolitan Area has over 7,500 km of roads, from which 6,900 km are urban roads with limited pedestrian and cycling infrastructure.

Public transport in Accra, mostly diesel buses, are largely operated by private individuals, companies, and quasi-government entities.

Active mobility can improve health

Significant health benefits can be realized if travel involves physical activity such as cycling to work or walking to a transit stop.

However, policies and infrastructure that improve access for one type of travel, particularly car and motorcycles, may create barriers for those travelling by other modes e.g. train, bus, bicycle or on foot.

In Accra Metropolitan District (one of the fifteen municipalities in GAMA), footpaths account for less than 4% of the total length of over 2700km, yet offer an opportunity to improve active mobility in urban and transport planning.



5

Communications intensify demands for change

Community Health Workers, School Health Education Coordinators and Environmental Health Workers sensitization materials

URBAN HEALTH INITIATIVE

Transport systems impact health

91% of people are exposed to air pollution levels above WHO guidelines

Transport benefits people by providing access to:

- employment
- education
- food safety
- recreational activities
- health services

Solutions for reducing air pollution from transport

- Provide transport alternatives and reduce vehicle emissions
- Develop infrastructure for active walking and cycling
- Provide safe routes for transport services
- Use low-emission transport services

World Health Organization

let's make greenways for safe walking to school

Let's go green for health

BREATHE LIFE
Clean Air. Healthy Future.

World Health Organization UN



5

Communications intensify demands for change

Community & media engagement



Akweteyman: EPA orders toffee company to cease operation over air pollution



Street theater, popular education and **awareness raising**

Community, religious and traditional Chiefs and Queen Mothers have been engaged in **8 sub-metro areas**



Student engagement at **10 community schools**



7 editors and publishers of major media houses have committed to follow the Accra air pollution story. Hundreds of earned media pieces in over 20 TV, radio and newspaper outlets.



6 Urban leaders act

Health and economic arguments provide urban leaders with incentive to act; changes in related policies monitored and tracked



Mayor of Accra, Mohamed Adjei Sowah, launching the BreatheLife Accra in 2018 as part of the UHI pilot project.

Accra presents its work to tackle air pollution and improve urban health at the First WHO Conference on Air Pollution and Health (October, 2018)



Milestones and lessons learned

- Officials more willing to share knowledge, data and resources
- Strong community mobilization
- Interest from sectors (e.g. Ghana Ministry of Transport) to incorporate health assessments into their regulatory framework
- Inclusion of UHI recommendations in Accra's local strategies:
 - Air Quality Management Plan
 - Resilience Strategy
 - 2020 Climate Action Plan
- Interest from other cities in applying the UHI model process in both pilot countries
- Strong interest in UHI model process from cities and regions beyond the pilot context

Articulating a new approach for the links between health and mobility in urban environments

“Health as an outcome + Health as an input”



A stylized, low-poly illustration of a cityscape in shades of teal and light green. The buildings are simplified with rectangular windows, some of which are highlighted in a slightly darker shade. The overall style is clean and modern, with a soft, hazy atmosphere.

Thank you