World Health Organization

Public Health & Environment

Strategy Overview
Public health and environment: Rising health expenditure

World-wide, total health expenditure has been increasing as a share of GDP.

Source: WHO GHO database
Public health and environment: **Health expenditure/GDP**

By 2008, 23 countries across the world were spending at least 10% of GDP on health. Continuing at the same growth rate, in ten years these same countries would be spending close to 15% of GDP on average, posing a real problem of sustainability.

**Total Expenditure on Health as % of GDP 2008**

Source: WHO GHO database
Public health and environment: Expenditure on health

Despite very strong growth in expenditure on health over the past decade, life expectancy has improved only marginally.

Source: WHO GHO database
Public health and environment: Chronic conditions

A major factor in the overall rise in expenditure on health is the increasing prevalence and rising treatment costs for chronic conditions.

10 chronic conditions accounted for 51% of the growth in spending

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[1] Medicare is a social insurance program administered by the US government that provides health insurance for Americans over age 65

Source: Chronic Conditions Account For Rise In Medicare Spending From 1987 To 2006, Health Affairs 29, no. 4, 2010
Public health and environment: **Chronic conditions**

The increasing importance of chronic conditions is an issue world-wide.

![Graph showing total projected deaths due to chronic conditions by region from 2005 to 2015.](image)

Source: WHO chronic disease report
Public health and environment: Communicable diseases

_In developing countries, much of the higher spending over the past decade has been driven by increased donor assistance to communicable diseases._
Public health and environment: Health determinants vs. spending

The sad fact is that very little is spent on primary prevention despite huge potential to reduce the growth in health expenditures.

Source: Estimated from OECD, WHO, and Prevention Institute data
Public health and environment: **Focus on primary prevention**

*PHE is focused on the primary prevention of environmental hazards to eliminate unnecessary illness, injury and death.*

- Eliminating lead in paint
- Stop use of asbestos
- Eliminating mercury in medical devices
- Eliminating indoor smoke

*Primary prevention means unhealthy condition never occurs*
Public health and environment: Chronic conditions

*Environmental risk factors are known to contribute significantly in half of the major chronic conditions driving rising expenditures.*

Contribution to Medicare\(^1\) Spending Growth 1997-2006

- Diabetes Mellitus
- Osteoarthritis, Other Joint Disorders
- Hyperlipidemia
- Kidney Disease
- Trauma Related Disorders
- Hypertension
- Mental Disorders
- Cancer
- COPD, Asthma
- Heart Conditions

\(^1\) Medicare is a social insurance program administered by the US government that provides health insurance for Americans over age 65

Source: Chronic Conditions Account For Rise In Medicare Spending From 1987 To 2006, Health Affairs 29, no. 4, 2010
Public health and environment: Impact of environmental factors

More broadly, environmental factors influence over 80% of the diseases and injuries monitored by WHO, spanning communicable diseases, noncommunicable diseases and injuries.

Source: WHO Burden of Disease statistics
Public health and environment: **Burden of disease**

*Overall, environmental hazards are responsible for about one-fourth of the total burden of disease worldwide, with communicable diseases being of much greater prevalence in developing countries.*

![Disability-Adjusted Life Years (DALYs) Attributable to Environmental Factors](image-url)

- **Diarrhoeal Diseases**
- **Other Infectious & Parasitic Diseases**
- **Lower Respiratory Infections**
- **Perinatal Conditions**
- **Nutritional Deficiencies**
- **Neuropsychiatric Conditions**
- **Cancer**
- **Cardiovascular Diseases**
- **COPD & Asthma**
- **Other Noncommunicable Diseases**
From an economic and ethical perspective, focusing on primary prevention is good policy. By focusing on reducing environmental risk factors, nearly a quarter of the burden of disease can be prevented, helping ensure the sustainability of health expenditures while improving life expectancy.

DALYs attributable to environmental risk factors

- Other
- Water Supply, Sanitation & Hygiene
- Indoor Air Pollution
- Occupational Risks
- Transport
- Selected Chemicals
- Water Resource Management
- 2nd Hand Smoke
- Urban Outdoor Air
- Climate Change
- UV Radiation
- Radon

Source: WHO Burden of Disease statistics
Public health and environment: **Primary prevention is common sense**

If I told you we could prevent YOU from ever getting:
- “fish fog” from mercury tainted fish
- asbestosis from breathing insulation dust
- asthma or chronic bronchitis from air pollution
- cholera from excrement tainted water, or
- cancer from exposure to radon or excess UV

what would YOU say?

*Most people would say “SIGN ME UP”.*

For most people, investing in primary prevention seems an obvious thing to do!
Public health and environment: *Value for money*

*Primary prevention of environmental hazards delivers great value for money.*

<table>
<thead>
<tr>
<th>Program</th>
<th>Savings for every dollar spent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immunizations (reference value)</td>
<td>$27</td>
</tr>
<tr>
<td>Lead paint hazard</td>
<td>$17- $221</td>
</tr>
<tr>
<td>Improved water &amp; sanitation</td>
<td>$3 - $34</td>
</tr>
<tr>
<td>Investment in bike &amp; pedestrian trails</td>
<td>$2.94</td>
</tr>
<tr>
<td>Chronic disease</td>
<td>$5.60</td>
</tr>
</tbody>
</table>

Most investors would love to get 100%+ returns on investment!
Public health and environment: **Primary prevention multiplier effect**

*Primary prevention yields value for money that goes well beyond the direct costs of the target condition.*

**Investment:** Primary prevention of a disease, injury or condition

**Improved Health:** Reduction in incidence or severity of target condition

**Savings:** Increased productivity or attendance

+ **Savings:** Reductions in health care expenditures to target condition

+ **Savings:** Increased productivity or attendance

+ **Savings:** Reductions in health care expenditures to associated conditions

Source: Prevention Institute health policy reform brief
Public health and environment: Wider benefits example

In the area of climate change for example, good preventive policies needed to meet greenhouse gas emissions targets can significantly impact heart disease and respiratory illness.

Wider health benefits of good climate change preventive policies:

Sustainable urban transport: Could cut heart disease by 10% - 25%

Clean household energy: Improved stoves in India could save 2 million lives over 10 years

Food and agriculture: 30% reduction in animal fat intake could cut heart disease by 15%.

Lancet, 2009
Public health and environment: Our focus

PHE is focused on developing and advocating effective policies to prevent environmental risks to human health based on improved scientific understanding.

IMPROVED SCIENTIFIC UNDERSTANDING

HUMAN HEALTH LINKAGES ENVIRONMENT

EFFECTIVE RECOMMENDATIONS & ADVOCACY
Public health and environment: A long history

Over the years, PHE has made many important contributions to primary prevention:

- Water quality standards to protect water resources and eliminate water borne diseases
- Chemical safety guidelines to minimize risks of exposure to numerous classes of chemicals
- Housing standards and policies to reduce exposure to radon, lead, asbestos and other harmful chemicals
- Prevention policies for UV and electromagnetic radiation exposure
- Standards and toolkits for occupational risk reduction and healthy work environments
- Evidence to eliminate exposure asbestos
- Campaigns to eliminate lead in paint and mercury in medical devices
- Policies to adapt to and mitigate effects of climate change

Examples:
Public health and environment: Water, sanitation & hygiene

PHE’s biggest area of focus is on reducing water and waste related disease and optimizing the health benefits of sustainable water and waste management. PHE has played a key role in setting water quality standards.

Major areas of work:

- Supporting health sector actions and building understanding in non-health sectors.
- Revitalizing WATSAN – Health networks & refocusing on primary prevention
- Setting water quality standards
- Monitoring MDG (JMP/Glaas)
- Health impact assessments of water resources (water-borne/vector-borne)
- Cholera – surveillance/emergency
- Hospital WATSAN/other settings
- Economics – benefits, burden of disease
- Emergencies

2.8 million deaths (4.9% of total) and 114 million Disability-Adjusted Life Years (DALYs) (7.5% of total) were attributable to environmental exposure to water and waste related diseases in 2004.
Public health and environment: **Chemicals management**

*PHE works to reduce the risks and burden of disease from chemical exposure. PHE chemical safety guidelines are the internationally recognized reference point in the field.***

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**Major areas of work:**

- Risk assessment of priority chemicals and setting WHO guidelines
- Tools for chemical risk assessment and building country capacities
- Strategic Approach to International Chemicals Management – SAICM
- Global alliance to eliminate lead paints
- Global initiative to substitute mercury-based medical devices in health care
- Establishment of poisons centres
- Chemical emergency response

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4.9 million deaths (8.3% of total) and 86 million DALYs (5.7% of total) were attributable to environmental exposure and management of selected chemicals in 2004. The total burden from all chemicals is higher.

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1 includes overlap with other environmental risk factors
Public health and environment: Occupational Health

In occupational settings, PHE works to reduce the risks and burden of disease from ergonomic, psychosocial, chemical and physical hazards.

Major areas of work:

- Integrating essential interventions & basic services to prevent occupational diseases and injuries integrated into primary health care
- Scaling-up access to essential interventions for prevention of occupational and work-related diseases and injuries in high priority settings
- Health care workers – HIV, TB prevention
- Toolkits for risk reduction
- Nanotechnology guidelines

1.1 million deaths (1.8% of total) and 26 million DALYs (1.7% of total) were attributable to occupational injuries and conditions in 2004. Each year 160 million cases of work related illnesses occur with a big role in chronic conditions.
Public health and environment: Radiation

PHE works to reduce the risks and burden of disease from ionic and non-ionic radiation. PHE publications have had an important influence on radon and sunbed regulation.

Major areas of work:

- Global initiative to optimize radiation exposure in health care settings
- Chernobyl – communication with affected communities
- International regulation and standards
- Prevention of Radon risks
- Assessing and updating health risks from electromagnetic fields
- Promoting prevention policies for UV
- Radiation emergencies preparedness and response (IHR)

180 thousand deaths (0.3% of total) and 4.5 million Disability-Adjusted Life Years (DALYs) (0.3% of total) were attributable to radon and UV radiation in 2004.
Public health and environment: **Climate change**

PHE is focused on ensuring health considerations are central to climate change mitigation and adaptation strategies. PHE advocates for health action which can save lives now and protect from future climate change.

**Major areas of work:**

*Improve evidence:* Through funding and technical support for assessments of health co-benefits of climate change mitigation (e.g. 2009 Lancet series)

*Improve policy:* Providing guidance on how to achieve "healthy mitigation" in key sectors, such as agriculture, household energy production and transport

*Support health-sector leadership:* New initiatives on "Green and safe hospitals," and improving environmental performance of national health services - and WHO itself.

118 thousand deaths (0.2% of total) and 6 million Disability-Adjusted Life Years (DALYs) (0.4% of total) were attributable to climate change in 2004. These figures are projected to increase significantly.
Public health and environment: Air quality

PHE is focused on improving indoor and urban outdoor air quality to reduce the burden of respiratory and other disease.

Major areas of work:

- Building a solid evidence base including risks to health and effectiveness of interventions
- Creating a solid fuel use database with modelling of expected health impacts from interventions
- Global cookstove alliance to upgrade 100 mm cookstoves
- Tools for cities to assess the health impacts of transport policies before and after interventions & models to estimate expected impacts, case studies

3.1 million deaths (5.3% of total) and 50 million Disability-Adjusted Life Years (DALYs) (3.3% of total) were attributable to indoor and outdoor air quality in 2004. Air quality is a major factor in chronic conditions.
Increasing environmental risks

Many of the environmental risk factors we work on are increasing in importance.

- **Increasing urbanization** is driving greater exposure to/increasing the intensity of air quality, water, and waste management risks
- **Rise of employment in informal sector** exposing more and more people to occupational hazards
- **Continued growth of chemicals industry** (especially in lower and middle income countries) and **broader assessment of chemical risks** is raising chemicals management threats
- **Rising oil prices and efforts to improve energy efficiency** have potentially perverse effects – (e.g. higher exposure to radon gas in energy efficient homes, increased particulates from switch to diesel engines)
- **Climate change** exacerbating a whole range of risks
Public health and environment: Emergency response

PHE provides assistance and guidance in responding to environmental emergencies around the world.

Hungary - mud spill, 2010
Nigeria - heavy metal poisoning, 2010
Haiti earthquake – sanitation & water, 2010
Angola – mass bromide poisoning, 2007
Cote d'Ivoire – toxic waste dumping, 2006
Russia wildfires – toxic air, 2010
Public health and environment: **Balancing science & policy**

*PHE's ability to have an impact depends on maintaining a balance of strong scientific and policy capabilities as well as emergency response capacity across a constellation of technical areas.*
Public health and environment: **Departmental initiatives**

*Our advocacy efforts are driven by a series of time-limited initiatives we develop which target policy makers in specific sectors and regions.*

- African Master Plan on Health & Environment - “Libreville Declaration”
- Air Quality & Health - Indoor Air Pollution / “Global Cookstove Alliance”
- Healthy Housing
- “Greening” the Health Services
- Health in the Green Economy
- Linking Environmental Health to Noncommunicable Diseases

**Agenda – Environmental and Occupational Determinants of Cancer**
Public health & environment: Health & environment strategic alliance

- First Inter-Ministerial Conference on Health & Environment in Africa, Libreville, 2008 (WHO & UNEP) – The Libreville Declaration
  - 52 African governments committed to establishment of Health & Environment Strategic Alliance as basis for National Plans of Joint Action to protect health & preserve ecosystems in Africa

- Two Meetings of Partners (UN agencies, donors, African countries), Windhoek 2009 & Nairobi 2010, to agree on roadmaps & workplans for implementation

- 18 countries have completed or near completed Situation Analyses & Needs Assessments (SANAs) - 5 drafting National Plans of Joint Action

- Second Inter-Ministerial Conference on Health and Environment in Africa, Luanda, November 2010 – The Luanda Commitment
  - Endorsement of conclusions & recommendations of 1st regional SANA synthesis report, institutionalisation of Health & Environment Strategic Alliance, adoption of common position for Africa on climate change & health
Public health and environment: «Greening» the health services

A package for health facilities

Energy Access & Efficiency

Green Buildings

Chemicals

Health Care Workers

Medical Waste and water

Vector control
PHE’s role is to promote a healthier environment by:

• influencing public policies to address the root causes of environmental threats to health; and

• intensifying primary prevention
PHE influences policy by:

- **Managing evidence-based risk assessments, formulating updated norms and guidance on major environmental hazards to health.**

- **Creating guidance, tools and initiatives to facilitate healthy policy decision-making in priority sectors.**
Public health and environment: definition of environmental health

PHE actions are framed by a clear definition of environmental health

Environmental health comprises of those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social, and psychosocial factors in the environment.

It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations.
Public health and environment: **Global differences**

*Environmental hazards are not the same everywhere.*

- **Local**
  - Water quality
  - Adequate sanitation
  - Indoor air pollution

- **Transboundary**
  - Chemicals
  - Outdoor air
  - Workplace hazards

- **Global**
  - Climate change
  - UV Radiation
  - Ecosystem change

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Environment & health damage

- High mortality
  - Developing countries

- Low mortality
  - Developing countries

- Developed countries

GDP
Public health and environment: **Burden of disease**

*Overall, environmental hazards are responsible for about one-fourth of the total burden of disease worldwide, and nearly 35% in sub-Saharan Africa.*

Source: WHO Burden of Disease statistics
Public health and environment: Epigenetic programming

Emerging evidence of prenatal environmental origins of chronic diseases reinforces the case for focusing on primary prevention.

Source: Developmental origin of chronic diseases: toxicological implication, Interdisciplinary Toxicology, Vol 1 2008