Water & Sanitation and Household Energy - Two Critical Determinants of Children’s Health

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Global burden of disease attributable to selected major risk factors

Water, sanitation and hygiene (5.5%)
Indoor air (3.7%)

Developing countries (high mortality)

Developed countries

Percent of total burden (within region)

Zinc deficiency
Tobacco
Overweight
Ambient air
Lead
Occupational injuries
Climate change
Alcohol
Tobacco
Overweight
Ambient air
Water, sanitation and hygiene
Unsafe sex
Physical inactivity
Occupational risks
Lead

Unsafe sex
Tobacco
Alcohol
Climate change
Ambient air
Water, sanitation and hygiene
Access to water supply and sanitation

- 2.4 billion people lack access to basic sanitation
- 1.1 billion people lack access to improved drinking water sources
- 3.4 million people, mostly children, die annually from water-related diseases

Access to safe water supply and sanitation is fundamental for better health, poverty alleviation and development.
Selected water-related diseases

Diarrhoea:
- 2.1 million people, mostly children, die of diarrhoea every year
- Interventions reduce incidence by 26% and mortality by 65%

Malaria:
- 1 million people, mostly children, die of malaria every year
- Better management of water resources reduces transmission

Schistosomiasis:
- 200 million are infected, 20 million suffer severe consequences
- Basic sanitation reduces the diseases by up to 77%
The bigger picture

- Inadequate water supply
- Unsafe water resources
- Lack of basic sanitation
- Inequitable access

- Time burden and lost educational opportunities
- Financial cost
- Disease burden
- Health care costs

POVERTY
Household energy, indoor air pollution and health

- Some 3 billion people rely on solid fuels (e.g. dung, wood, agricultural residues, charcoal, coal) for their basic energy needs.

- Cooking and heating with solid fuels leads to high levels of indoor air pollution (IAP), a complex mix of health-damaging pollutants (e.g. PM, CO).

- Women and young children, who spend most time at home, experience the largest exposures and health burdens.
Indoor air pollution and health – status of evidence

<table>
<thead>
<tr>
<th>Health outcome</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALRI (children &lt;5yr)</td>
<td>Between 10 - 20 studies</td>
</tr>
<tr>
<td>COPD (adults)</td>
<td>Few measured exposure</td>
</tr>
<tr>
<td>Lung cancer (coal)</td>
<td>Confounding problematic</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Several consistent studies (more conflicting for asthma)</td>
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<tr>
<td>Cataract</td>
<td></td>
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<tr>
<td>Upper airway cancer</td>
<td></td>
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<tr>
<td>Asthma</td>
<td></td>
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<tr>
<td>Low birth weight</td>
<td>Very few studies, support from ETS and/or ambient air pollution studies</td>
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<tr>
<td>Perinatal mortality</td>
<td></td>
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<tr>
<td>Otitis media</td>
<td></td>
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<tr>
<td>Cardiovascular disease</td>
<td>No studies, but suggestive</td>
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</tbody>
</table>
Health, environment and development impacts of household energy use

**INCOME**
- Simple fuel and appliances are limiting

**HEALTH**
- Indoor air: ARI, COPD, &c
- Burns
- Poisoning

**WOMEN**
- Opportunity cost of lost time
- Injury & violence
- Decision making

**ENVIRONMENT**
- Local - supply and erosion
- Global (GHGs)
## What interventions are available?

<table>
<thead>
<tr>
<th>Source of pollution</th>
<th>Home environment</th>
<th>User behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved stoves</td>
<td>• Hoods and chimneys</td>
<td>• Fuel drying</td>
</tr>
<tr>
<td>• Cleaner fuels</td>
<td>• Windows, ventilation holes, eaves spaces</td>
<td>• Use of pot lids</td>
</tr>
<tr>
<td>(kerosene, gas,</td>
<td>• Separate kitchen</td>
<td>• Good maintenance</td>
</tr>
<tr>
<td>electricity)</td>
<td></td>
<td>• Keeping children away from smoke</td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hand-washing</td>
</tr>
<tr>
<td>Source of pollution</td>
<td>Home environment</td>
<td>User behaviour</td>
</tr>
<tr>
<td>• Improved drinking water source</td>
<td>• Household water treatment</td>
<td>• Hand-washing</td>
</tr>
<tr>
<td>• Improved sanitation facilities</td>
<td>• Safe water storage vessel</td>
<td></td>
</tr>
<tr>
<td>• Water resources management</td>
<td>• Privacy of sanitation facilities</td>
<td></td>
</tr>
</tbody>
</table>
Conclusions and outlook

- In developing countries, water & sanitation and solid fuel use are responsible for:
  - More than 9% of the burden of disease
  - More than 1.6 million deaths in children under five
- Effective and cost-effective interventions are available.
- Improving people’s access to safe water, adequate sanitation and clean energy sources contributes to achieving the Millennium Development Goals, in particular Goal 9 *To Ensure Environmental Sustainability* and Goal 4 *To Reduce Child Mortality.*