Coordinating and Harmonizing Long Term Cohort Studies of Children’s Environmental Health

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How much disease could be prevented by modifying the environment?

Current evidence - best conservative estimate 24%

Diseases with largest environmental contributions (I)

Source: Preventing disease through healthy environments, WHO, 2006
Diseases with largest environmental contributions (II)

<table>
<thead>
<tr>
<th>Disease</th>
<th>% of global disease burden in DALYs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malnutrition</td>
<td>4%</td>
</tr>
<tr>
<td>Cerebrovascular dis.</td>
<td>3%</td>
</tr>
<tr>
<td>Asthma</td>
<td>2%</td>
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<tr>
<td>Tuberculosis</td>
<td>2%</td>
</tr>
<tr>
<td>Suicide</td>
<td>2%</td>
</tr>
<tr>
<td>Depression</td>
<td>1%</td>
</tr>
<tr>
<td>Poisonings</td>
<td>1%</td>
</tr>
<tr>
<td>Falls</td>
<td>1%</td>
</tr>
<tr>
<td>Hearing loss</td>
<td>1%</td>
</tr>
<tr>
<td>Violence</td>
<td>1%</td>
</tr>
<tr>
<td>Lymphatic filariasis</td>
<td>1%</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>0%</td>
</tr>
</tbody>
</table>

Environmental fraction
non-environmental

Percent of DALYs attributable to 19 risk factors, 2004
Source: Global Health Risks, WHO, 2009

Environmental risks to health

Source: Global Health Risks, WHO, 2009
NEW OR "RE-EMERGING" THREATS TO CHILDREN'S HEALTH AND DEVELOPMENT

- Ozone depletion
- Radiation
- Persistent organic pollutants
- Endocrine disruption
- Obesity
- Others...

Environmentally-related illnesses have high social and economic costs

- Increased medical expenses
- Sickness, disability and death
- Sick days away from school
- Productivity lost by parents away from work
- Personal agony of families and communities
- Reduced long-term productivity of the country

Longitudinal cohort studies

- Identify causal relationships
- Can determine factors relating to many different outcomes (therefore cost-efficient)
- Minimise recall bias

Guide to Undertaking a Birth Cohort Study
A six-year WHO effort guided by Professor Jean Golding at University of Bristol in the UK

- WHO consultation in Montreux, Switzerland in Oct 2003
- WHO consultation in Washington, DC in August 2004
- WHO consultation in Cuernavaca, Mexico in November 2004
- WHO consultation in Bangkok, Thailand in August 2005
- Final publication in July 2009
Why should we harmonize birth cohort studies?

- Common protocols will enable data to be combined to look at rare diseases
- Even large cohorts (100,000 children) cannot study diseases occurring at 1 in 100,000 children
- Common protocols will allow comparison of results

Comparison of results

A finding in one area can be investigated in another
- if similar results, the findings are strengthened
- if different results, this may indicate an interacting environmental or genetic effect
- Need for set of “core” measurements
  - Specific questions and biological tests

Why should we harmonize birth cohort studies?

- Huge burden with regard to choice of protocols, biological and environmental measurements, experience in piloting and validation, reviewing the literature
Why should we harmonize birth cohort studies?

• Most experience in the industrialized countries

• Great need in low and middle income countries

Death and disability from environmental causes is preventable

• There is much we still do not understand about the effects of chemicals in the environment on child health and development

• Longitudinal cohort studies can help us to learn more

• Harmonized studies will be most efficient use of resources