Chemicals & Children: Evaluation of Environmental Health Risks and Risk Management Strategies

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Trends in children’s health; developed countries

- Increasing congenital anomalies
doubled over 25 years

- Decrease of male:female sex ratio at birth
partially in industrial zones

- Increasing asthma and obesity
  X 3 over 20 years; X 1.5 over 30 years respectively

- Increasing developmental disorders
  X 3 over 30 years
Children’s Environmental Health (CEH)

- **G8** Environment Ministers Meeting (Siracusa, Italy, 2009): Children’s health session co-chaired by Japan and USA

- **DO MORE to investigate links between environment & health**

- Global Conference on CEH (Busan, Korea, 2009)
Children’s Environmental Health Global Plan of Action 2010 - 2015

1. Data and measurement
2. Collaborative research
3. Advocacy
4. Capacity development
5. Clinical services

http://www.who.int/ceh
Current study

Japan:

• Birth-age 13 cohort study, 100,000 children recruiting 2011-14, core hypothesis:
  – Exposure to chemical substances at fetal and early development states affects areas such as physical and mental development giving rise to congenital, endocrinological, immunological, metabolic and development anomalies

UNEP:

• Prepare annotated bibliographies of published literature, compendium of policy actions, proposals for further actions in developing countries

• Identify & rank chemicals risks upon the health of children in developing countries; identify risk management strategies; assist policy makers make effective decisions

WHO:

• Review progress since 1997 in advocacy, awareness raising and education
Complex causal factors influencing development outcomes

Causes (Exposure)
- Environmental Chemicals
- Genetics
- Socioeconomics
- Lifestyles

Effects (Outcome/Endpoint)
- Physical Development
- Congenital Anomalies
- Psycho-neuro Development
- Immunologic Impairment
- Metabolic/Endocrinologic Impairments
Birth and longitudinal cohort studies

- Decreasing prevalence requires increasing cohort size
  - $10^5$ a minimum cohort size for diseases with prevalence $\sim 0.1\%$

- Large-scale birth cohort studies only in OECD countries;
  - Cohorts most $10^{3-4}$, only a few $10^5$

- International collaboration between Japan and US studies to increase confidence:
  - Harmonized exposure and outcome measures, standard protocols for QA/QC of analysis, nutrition, development measurement
  - Outreach and concerted assistance to developing countries
Literature Review

- **Asia:** ≈ 100 full text studies, 200 abstracts. Examples:

- **Latin America:** ≈ 125 studies. Examples:
  - Effect of PM10 and O3 on infant mortality ... in Mexico city... Carvajal- Arroyo et al., J Epidemiol of Public Health
  - Exposure of children to Pb and Cd from a mining area of Brazil, Bastos MM et al., 2002, Environ Res.
  - Elevated blood Hg and neuro-toxicological observations in children of the Ecuadorian gold mines, Counter SA et al., 2002, J Toxicol Environ Health A.

- **Africa:** ≈ 100 studies. Examples:
Limitations identified in the annotated bibliography

- Longitudinal cohort studies are lacking; monitoring data mostly donor project-related
- Developing country community health practitioners are ill-equipped to gather, interpret and publish health monitoring studies
- Published studies principally of health effects from known chemicals of concern; supporting ‘infill’ evidence rather than emerging issues
- Lack of harmonized data for both exposure and outcome measures - impediment to chemicals risk assessment and management
Key Messages

- Broader networks with harmonized measures are needed to engage and empower developing country practitioners; including through the use of regional collaborating centres for laboratory monitoring of chemicals exposure.

- Achieving the goals of children’s environmental health requires the Health and Environment sectors to work closely together.

- The role of the environment sector in the prevention of chemicals releases is crucial to reducing children’s exposure risks.

- Improving environmental conditions upstream is likely to be a cost-effective strategy to prevent environment related health outcomes.
Implementing Sound Chemicals Management

- International regulation through Multilateral agreements addressing global concerns
- National regulatory and administrative frameworks
- Industry engagement towards responsible production and use of chemicals,
- Civil society engagement towards responsible use, informed choice
- Development assistance addressing priority problems
‘Travellers without passports’: Addressing Global concerns; bringing local benefits

- Persistence in the environment
- Bio-accumulation
- Significant negative effects on human health and the environment
- Long-range atmospheric transport
Rotterdam Convention:
Prior informed consent

Basel Convention:
Control of Transboundary Movements of Hazardous Wastes and their Disposal

Montreal Protocol:
Ozone Depleting Substances

Stockholm Convention:
Persistent Organic Pollutants

SAICM:
Strategic Approach To Chemicals Management

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Other chemicals of concern

Chemical ‘coverage’

Specific Halogenated Compounds

Heavy metals

Production
Trade
Use
Waste & disposal

Also:
ILO 170 (Safe use of Chemicals at work); 174 (Major industrial accidents), UNECE agreements: LRTAP, Aarhus, Kiev
Major regional and national responses: REACH, TSCA …
Key Partnerships for Implementation

Inter-organization Programme for the Sound Management of Chemicals (IOMC): established 1995, initiating, facilitating and coordinating international action towards achieving the WSSD 2020 goal

FAO, ILO, OECD, UNDP, UNEP, UNIDO, UNITAR, WB, WHO

GHS (ILO+UNITAR); Mainstreaming (UNDP+UNEP); Pesticide Code of Conduct (FAO+WHO+UNEP); Health Environment Strategic Alliance (WHO+UNEP); Cleaner Production (UNIDO+UNEP)


Emerging issues – actions being taken through partnerships:

Lead in Paint (UNEP+WHO); Chemicals in Products (UNEP); Nanomaterials (OECD+UNITAR); e-waste (UNIDO +Secretariat Basel Convention); PFCs (OECD+UNEP)
Chemicals Outlook: use and production trends

- Increase in number of individual chemicals and mixtures
- Product Complexity
- Production and consumption shifting to developing countries and CEITs
- Loss of regulatory control; increased government responsibility?

Source: OECD Environmental Outlook Baseline.
Thank you

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One of the 6 themes that make up UNEP’s Programme of Work

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