

**Introduction to the Environment and Child
Health International Birth Cohort Group**

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**An effort to bring together the
next generation of large-scale
birth cohorts from different parts
of the world**

Japan

Germany

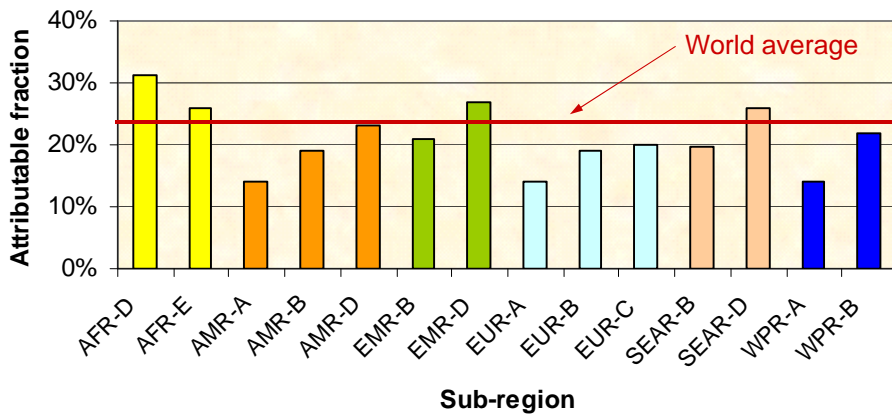
USA

Shanghai, China

France

How much disease could be prevented by modifying the environment ?

Current evidence - best conservative estimate 24%



Source: Preventing disease through healthy environments, WHO, 2006

NEED TO KNOW ABOUT EMERGING ISSUES

New or "re-emerging" threats to children's health and development

- ❖ Persistent organic pollutants
- ❖ Endocrine disruption
- ❖ Global climate change
- ❖ Mycotoxins
- ❖ Ozone depletion
- ❖ Others...



WHO

WHO

Environmentally-related illnesses of children have high social & economic costs



WHO

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

Large-scale longitudinal birth cohort studies are being planned or launched in several countries

- **Identify causal relationships between environmental exposures and child health outcomes**
- **Determine factors relating to many different outcomes (therefore cost-efficient)**

- **Nutrition experts conduct longitudinal cohorts – evaluate multiple aspects of child nutrition (but neglect to include chemicals and environmental factors)**
- **Social scientists conduct longitudinal cohorts – evaluate multiple aspects of stress (but neglect to include chemicals and environmental factors)**
- **Environmental scientists conduct longitudinal cohorts– evaluate multiple aspects of exposure to lead (but neglect to include exposure to mercury)**

We cannot solve our problems with the same thinking we used when we created them.

Albert Einstein

Moving from “boutique” to “harmonized” studies

"Window of susceptibility" for the next generation of large-scale birth cohort studies

- **Protocols are being shaped**
- **Biomarkers are being selected**
- **Measurements are being validated**

- **This window will close soon and the chance to influence their development will disappear**

What are the advantages of coordinating birth cohort studies?

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- **Common protocol elements will enable data to be combined (if desired) to look at rare childhood outcomes**
- **Even large cohorts (100,000 children) cannot study very rare diseases**
- **Common protocol elements allow comparison of results**

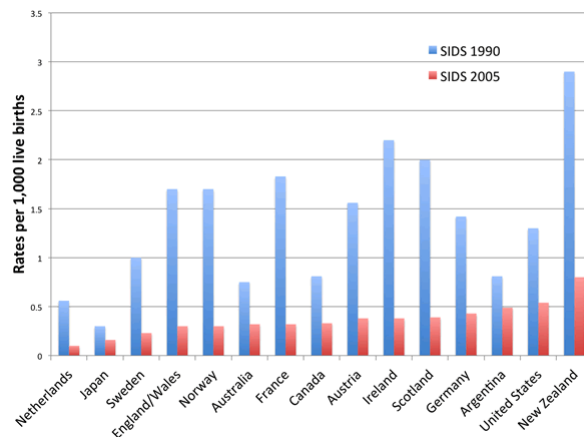
Comparison of results

There are striking differences in some child health outcomes between countries

Example:

- **Sudden Infant Death Syndrome**

Sudden Infant Death Syndrome Rates for 15 countries



Problem of small numbers in sudden infant deaths

Japan: 0.16 per 1000 16 deaths in 100,000

Germany: 0.43 per 1000 43 deaths in 100,000

USA: 0.54 per 1000 54 deaths in 100,000

Total SIDS 113 deaths in 300,000

Need for Coordination

- **Case definitions of SIDS are not uniform**
 - More than 3 "accepted" definitions of SIDS
 - Some require infant autopsy, some do not
 - Some require death scene investigation
- **Age of inclusion is not uniform**
 - Japan: birth to 1 year +
 - Germany: 1 week to 1 year
 - USA: birth to 1 year

Exposure Measurements in Studies of SIDS Differ

- **Measurement of exposure to tobacco smoke**
 - Single question about maternal smoking during pregnancy
 - Questions about any smoking by mother / father in the home after birth
 - Thiocyanate or cotinine in maternal / paternal serum
 - Cotinine in infant urine or hair
- **Makes it difficult to pool results of different studies**

Comparison of Results

- **Need for set of “core” measurements**
 - **Specific questions and biomarkers of exposure**
 - **Measured at same time period in infant's life**
 - **Using same case definition**
 - **Using same age of inclusion**
 - **Using similar analytical methods**

What are the advantages of coordinating birth cohort studies?

Huge burden with regard to choice of protocols, biological and environmental measurements, experience in piloting and validation, reviewing the literature

Process of Coordination

- **February 2011, Tokyo, JECS international workshop**
- **September 2011, Barcelona, International Society of Environmental Epidemiology**
- **October 2011, Baltimore, International Society of Exposure Science**
- **December 2011, Bonn, Germany**
- **February 2012, Kitakyushu, Japan**
- **June 2012, Shanghai, China**
- **September 2012, Seattle, Washington, USA, International Society of Exposure Science**
- **May 2013, Bethesda, Maryland, USA**
- **August 2013, Basel, Switzerland**
- **November 2013, Nagoya, JECS international workshop**

Discussing the possibility to coordinate on diverse issues:

- **Case definitions**
- **Collecting, storing and processing biological samples**
- **Timing of collection of environmental samples**
- **Data organisation**
- **Statistical analyses**
- **Information technology**
- **Building capacity**
- **Ethical issues**

Today is November 15

Shichi –Go-San (Seven-Five-Three): Festival day to celebrate the growth and well-being of young children

Chitose Ame (thousand year candy) symbolizes healthy growth and longevity

A day to celebrate the JECS and hope for it to be successful and contribute to children's health and well-being