

# A Swedish Environmental Health Report with focus on Children



Performed on behalf of the Swedish government

Initiated and funded by

The National Board of Health and Welfare

Drawn up by

The Institute of Environmental Medicine, Karolinska Institutet, in cooperation with

The Department of Occupational and Environmental Health, Stockholm County Council

## Target groups

The Swedish government

Authorities responsible for environmental health protection at local, regional and central levels

Stakeholders within the health care system

Students

NGO:s

The general public

## Aim

To compile present knowledge about environmental risk factors and the impact on children's health

- Children's exposure to environmental factors
- Health risks
- To what extent are health effects in children due to environmental factors?



## Differences between children and adults

Children may be more vulnerable and exposed than adults

- Sensitive organs
  - The brain
  - The hormonal system
  - The reproductive organs
  - The immune system
- Exposure situations
  - Higher exposure per kg body weight in children
  - In utero exposure and breast feeding
  - Hand-to-mouth behaviour

## Environmental health questionnaire

National study with extended county participation

- Environmental health questionnaires in cooperation with Statistics Sweden
- Children 8 months, 4 years and 12 years of age
- Approx. 40 000 families invited. Response rate 71 %
- Equally distributed between the 21 Swedish counties
- (Sweden has 1.5 million children up to the age of 12)



## What did we ask about ?

About 100 questions concerning:

- Health (health status, allergies, symptoms from the airways)
- Family (education, smoking habits, pets)
- Home - facts and conditions
- Annoyance to smell and exhausts
- Hearing and exposure to noise
- Sun protection
- Food habits (fish consumption)



## Diseases where little is known about the influence of environmental factors

- Malformations
- Effects on the central nervous system
- Cancer
- Hormone disruption

## Allergic diseases

- The number of children with allergy has doubled over the last decades
- Both lifestyle and environmental factors
- Indoor and outdoor pollutants, passive smoking, fur-bearing pets, pollen and moulds, nickel and other chemical products are important
- 25 % of Swedish children have eczema, asthma, hay fever or food allergy
- 6 % has asthma. Many of them report symptoms from air pollutants, odours and smell

## Indoor environment

- 19 % of families report damp or mould damage in their homes
- > 1,000 cases a year of lower airway symptoms in children up to the age of 4 (infant asthma) can be linked to damp problems in the home
- Adequate ventilation in schools is important
- 5 % of children are exposed daily to tobacco smoke
- >500 cases a year of infant asthma and > 500 cases of ear inflammation are caused by parents smoking

## Ambient air pollution

- Air quality in Sweden has improved. Road traffic and small-scale wood burning are major sources
- Air pollutants inhibit the development of children's lungs (2-fold increased risk in inner-city children in Sweden)
- Symptoms in the airways are likely to occur
- Children with asthma are a particularly vulnerable group

## Metals

- Methyl mercury
  - Dietary recommendations due to high concentrations in fish from Swedish lakes
  - Unborn children are especially vulnerable to CNS effects
  - Small safety margin
- Lead
  - Blood lead levels have decreased.
  - Still relatively small safety margin (2-5) to CNS effects in unborn children (Cadmium, Arsenic, Copper)

## Persistent organic pollutants

- Dioxins and PCB
    - Dietary recommendations due to high concentrations in Baltic fish
    - The general population in Sweden is exposed to levels close to subtle effects on foetal development
    - Unborn children are particularly vulnerable
    - Breastfed babies have the highest exposure. Still, breastfeeding is recommended
- (Brominated flame retardants, phthalates, alkyl phenols)

## Noise

- 10 % of all children sleep in bedrooms exposed to traffic noise. 3 % report difficulties falling asleep.
- 25 % of 12-years-old report discomfort by noise in or near the school.
- In kindergartens and schools, noise levels can exceed working limits
- The noise sources that produce discomfort in most 12-years-olds are noise from other children and loud music
- 3-4 % of 12-years-old children report that they have tinnitus.

## Ionising and non-ionising radiation

- Radon
  - 200,000 children live in homes with radon levels above 200 Bq/m<sup>3</sup> (the Swedish guideline value)
- UV radiation from sunlight
  - Causes 80-90 % of all skin cancer in Sweden
  - The skin of small children is especially vulnerable
- Electromagnetic fields
  - Less than 0.5 % of leukemia in children can be explained by living close to powerlines (<1 case per year in Sweden)
  - The use of mobile phones is increasing. Very limited support for any health risks. Effects of long-term exposure are hard to assess