Evidence on health effects of air pollution

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Presentation outline

• Recent evidence on health effects of air pollution
  • Results from Global Burden of Disease Project
  • IARC Carcinogenicity assessments
  • WHO/Europe REVIHAAP and HRAPIE projects
• Recent TFH activities
  • Workshop on health aspects of wildfire smoke (May 2012)
  • Brochure on health effects of PM and policy implications for EECCA countries
  • Review paper on health aspects of biomass combustion for residential heating
RECENT EVIDENCE ON HEALTH EFFECTS OF AIR POLLUTION
Ambient air pollution (PM$_{2.5}$):  
- Globally: 
  - 3.1 million deaths 
  - ~3.0% of all DALYs 
- In Western, Central and Eastern Europe: 
  - 430,000 premature deaths; 
  - over 7 million years of healthy life lost
Years of life lost due to PM – GBD 2010 project

 Europeans lost 10 million years of life due to PM pollution in 2010.
The PM$_{2.5}$ estimates are generated from the grid cell average of SAT and TM5 and calibrated with a prediction model incorporating surface measurements.
Next upcoming IARC monograph
Ambient air pollution
(WG meeting 8-15 October 2013)
WHO review of evidence on health aspects of air pollution for guidance of EU policy: REVIHAAP and HRAPIE Projects

OBJECTIVE:
To provide the European Commission and its stakeholders with scientific evidence-based advice on health aspects of air pollution in support of the comprehensive review of air quality legislation due in 2013.

*While some of the questions directly address policies, the recommendations from the projects are based solely on scientific conclusions on health aspects of air pollution, and do not consider other issues which are relevant for policy formulation.*
Context for REVIHAAP and HRAPIE work

DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 21 May 2008

on ambient air quality and cleaner air for Europe

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 175 thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Economic and Social Committee (1),

In order to protect human health and the environment as a whole, it is particularly important to combat emissions of pollutants at source and to identify and implement the most effective emission reduction measures at local, national and Community level. Therefore, emissions of harmful air pollutants should be avoided, prevented or reduced and appropriate objectives set for ambient air quality taking into account relevant World Health Organisation standards, guidelines and programmes.
- Jointly financed WHO and EC
- Coordinated by WHO/Europe
- Provide answers to 26 key questions posed by the EC
- More than 60 international experts involved

<table>
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<tr>
<th>REVIHAAP</th>
<th>HRAPIE</th>
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<td>(24 questions)</td>
<td>(2 questions, building on REVIHAAP work)</td>
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- **Evidence review on health aspects of air pollution**
  - Oct 2011 to April 2013 (18 months)

- **Identification of CRFs for cost-benefit analysis of EU policies**
  - Emerging issues on risks to health from air pollution (survey)
  - Sept 2012 to Sept 2013 (12 months)
26 Key policy-relevant questions

- PM, ozone, NO$_2$, SO$_2$, metals (As, Cd, Hg, Pb, Ni), PAHs
  - New findings regarding health effects
  - Concentration-response functions and thresholds
  - Air pollution constituents and sources
  - Integration of evidence and policy implications
    - WHO air quality guidelines
    - EU policies
  - Critical data gaps
Main conclusions from REVIHAAP

• Considerable amount of new scientific information on health effects of PM, ozone and NO₂
  – Evidence has *strengthened*
  – Effects observed *at levels commonly present in Europe*
  – Supports the scientific conclusions of the WHO AQG 2005
  – Indicates that the *effects can occur at air pollution concentrations lower* than those serving to establish the 2005 Guidelines

• Provides scientific arguments for the decisive actions to improve air quality and reduce the burden of disease associated with air pollution in Europe

• HRAPIE Project ongoing until September 2013
RECENT TFH ACTIVITIES
TFH discussions on health aspects of wildfire smoke

- Workshop held on 21 May 2012, jointly organized with THL (Finland)
- Modelling and forecasting of concentrations for public health response
- Associations between PM from landscape fires and various health parameters (reliever medication use, hospital visits, asthma, increased mortality)
- Mitigation measures (building shell, mechanical ventilation, air conditioning, HEPA filters)
- Need for strengthened interdisciplinary collaboration
TFH brochure “Health effects of particulate matter - Policy implications for EECCA countries”

- Levels, health effects, burden of disease
- Evidence on effects of air quality improvements
- Air quality management and policy
- **Expected launch: May 2013**
- Available in English and Russian
Health aspects of biomass combustion for residential heating

• Context for review
• Emissions from residential wood heaters
  – Contribution to local air pollution and to population exposure
• Health aspects:
  – Mechanisms of action, toxicity and adverse health effects in controlled exposure studies
  – Epidemiological studies
• Abatement measures and interventions
• National and international measures and regulatory aspects
• Data gaps, conclusions and recommendations
Next TFH meeting 11-12 June 2013, Bonn

- Presentation of TFH brochure on PM
- Discussion of review paper on biomass combustion for residential heating
- Presentation of results from REVIHAAP and HRAPIE and discussion of implications for the current revision of the EU air quality policies
- Methodologies and approaches for quantification of burden of disease due to air pollution
- Monitoring and modeling of air pollution and its health impacts in countries of eastern Europe, the Caucasus and central Asia