Air Pollution – still a Pan-European Concern?

Prof. Nino Künzli, MD, PhD
Deputy-Director Swiss Tropical and Public Health Institute Basel
Head Departement of Epidemiology and Public Health
Chair of Social and Preventive Medicine / Public Health, University Basel, Switzerland

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Green and health-friendly mobility for sustainable urban life
WHO Regional Office for Europe and Economic Commission for Europe
Geneva November 14, 2012
Policy Briefing – 15:30-16:00

Swiss TPH is an associated Institute of University of Basel
Air Pollution in Europe damages health!

- Premature death
- Chronic diseases
- Acute health problems, e.g. myocardial infarction

Brochure available in English, French, German, Italian, Turkish, Catalan

PDF online at www.ERSnet.org

EU Air Quality Standards for Particulate Matter (PM10) do not protect public health

<table>
<thead>
<tr>
<th>WHO Guidelines</th>
<th>EU (2008) under revision</th>
</tr>
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<tbody>
<tr>
<td>PM$_{10}$ standard (annual mean)</td>
<td>20 µg/m$^3$</td>
</tr>
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</table>
Estimated benefit of a 30 μg/m³ reduction of PM10
The Barcelona example (~4 Mio inhabitants)
(Perez et al, , Gac Sanit 2009)

### DEATH
- **long-term effects** (age ≥30)  3,500 (2,200-4,800)
- **Infant mortality** (<1 yrs)  15 (7-22)
- **Change in life expectancy** (months)  14 (9-20)

### HOSPITALIZATIONS
- **cardio-respiratory causes** (all ages)  1,770 (940-2,600)
- **CHRONIC BRONCHITIS** in adults (≥25)  5,100 (550-8,500)
- **BRONCHITIS episodes** in children (<15)  31,100 (17’500-40’500)
- **ASTHMA attacks**
  - adults (≥25)  41,500 (21,000-60,500)
  - children (<15)  12,400 (6,400-15,200)

**ECONOMIC impact**
3,000 - 6,400 Million € per yr.
or 1’600 € per person per year
Paradigm of spatial distribution of near-road traffic-related pollutants along busy roads (e.g. diesel soot, elemental carbon / black smoke, nano-particulate matter, NOx, CO)
Distribution of chronic cough in the Swiss population living along the North-South Transit highway (~1’800 adults, age 15-70)

Hazenkamp et al, Env Health 2011 – online open access

Adjusted prevalences (%) of respiratory health as a function of the residential distance from highway [m] (Switzerland)

- **Wheezing with breathing problems**
- ▲ **Wheezing w/o colds**
- ★ **Chronic cough**
- † **Chronic cough or phlegm**
Animal experiment:

Fine and ultrafine particle exposure from *Highway 405* caused Atherosclerosis in mice (calcification and stiffening of arteries)

Same in HUMANS…: Living within 50 meters of busy traffic in Ruhr Area (Germany) increased risk for CALCIFICATIONS of arteries by ~60%
Living close to streets with >10,000 vehicle/d

<table>
<thead>
<tr>
<th>City</th>
<th>Population (Million. Hab)</th>
<th>% population within 75m (average 29%)</th>
<th>% population within 150m (average 52%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granada</td>
<td>0.24</td>
<td>14%</td>
<td>28%</td>
</tr>
<tr>
<td>Ljubljana</td>
<td>0.27</td>
<td>23%</td>
<td>47%</td>
</tr>
<tr>
<td>Bilbao</td>
<td>0.31</td>
<td>29%</td>
<td>59%</td>
</tr>
<tr>
<td>Sevilla</td>
<td>0.7</td>
<td>20%</td>
<td>38%</td>
</tr>
<tr>
<td>Valencia</td>
<td>0.74</td>
<td>44%</td>
<td>71%</td>
</tr>
<tr>
<td>Brussels</td>
<td>1.03</td>
<td>37%</td>
<td>64%</td>
</tr>
<tr>
<td>Stockholm</td>
<td>1.3</td>
<td>14%</td>
<td>30%</td>
</tr>
<tr>
<td>Barcelona</td>
<td>1.53</td>
<td>56%</td>
<td>77%</td>
</tr>
<tr>
<td>Vienna</td>
<td>1.66</td>
<td>36%</td>
<td>62%</td>
</tr>
<tr>
<td>Rome</td>
<td>2.81</td>
<td>22%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Perez at al (APHEKOM Team) – in press 2013
Percent of diseases attributed to traffic-related air pollution in 10 cities of the APHEKOM Project (EU)

**Attributable to near-road pollution:**
1. Asthma cases in children 14%
2. Coronary heart diseases: 28%

**Attributable to urban air pollution**
- Episodes with asthma symptoms 15%
- Asthma hospitalisations 15%
- Non-fatal myocardial infarctions 31%
- Hospital admission for infarctions 29%
- Hospital admission for stroke 27%

Perez at al (APHEKOM Team) – in press 2013
Disability Adjusted Life Years (per 100,000) due to road traffic accidents (2004, WHO)

Driving has become safer than walking and biking...!
CONCLUSION on Traffic and public health

- More streets need to be free of automobiles – reserved for pedestrians and bikes (NOT ONLY IN HISTORIC CITY...!)

- Promote bike use to promote health (*net health benefit even in polluted European cities*)

- Vehicles on streets must become ZERO or NEAR-ZERO EMISSION
Why not in Europe?

CHINA: Motor-bikes, scooters, „vespas“ : ALL ELECTRIC !
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- Vehicles on streets must become ZERO or NEAR-ZERO EMISSION

- Speed reductions on streets shared with pedestrians and bikes to reduce accident & NOISE related health burden
Thank you – and
WELCOME IN BASEL 20-23 Aug 2013
Swiss Tropical and Public Health Institute welcomes you in Basel

Nino.Kuenzli@unibas.ch

www.EHBase13.org

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