Burden of Disease from Traffic Noise: Still a pan-European concern!

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Causal web linking noise and health
Percentage of urban population, $L_{den} > 55$ dB

Source: EEA Noise database (2012)

Percentage of urban population, $L_{night} > 50$ dB

Source: EEA Noise database (2012)
WHO Guidelines for Community Noise

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Increase in effects due to aircraft noise at night

- Average motility
- Infants
- Highly sleep disturbed
- Awakenings
- Completers

L_{night}, outside in 5 dB classes

% increase/ % in population vs number awakenings/year
WHO Night Noise Guidelines for Europe

- No substantial biological effects up to 30 dB $L_{\text{night}}$
- Night Noise Guideline (NNGL) 40 dB $L_{\text{night}}$
- Interim Target (IT) 55 dB $L_{\text{night}}$
  – Public health concern due to increased risk of cardiovascular diseases

Burden of disease from environmental noise

Health outcomes considered
- Cardiovascular disease
- Cognitive impairment
- Sleep disturbance
- Tinnitus
- Annoyance
Method of calculating burden of disease

Exposure distribution in the population → Exposure-response relationship → Impact fraction

\[ IF = \frac{\sum(P_x \cdot RR_x) - 1}{\sum(P_x \cdot RR_x)} \]

Disease burden attributable to risk factor → Disease burden estimates per disease

Attributable incidence, mortality, DALYs

Relative risk (or absolute risk)

DALYs (Disability-Adjusted Life Years)

The sum of years of life lost due to ill-health, disability or early death

\[ \text{DALYs} = \text{YLD} + \text{YLL} \]

Years Lived with Disability + Years of Life Lost

One DALY is equivalent to one year of healthy life lost.
Results of WHO study on disease burden

Every year in the EU cities, at least:

- 903 000 DALYs for sleep disturbance
- 654 000 DALYs for annoyance
- 61 000 DALYs for ischaemic heart disease
- 45 000 DALYs for cognitive impairment
- 22 000 DALYs for tinnitus

1–1.6 million healthy life years are lost every year from transport noise in the EU cities.

Sleep disturbance and annoyance related to road transport noise comprise the main burden.

Conclusion

- Transport noise is still a pan-European public health concern.
  - Only second to air pollution in terms of disease burden
- Existing WHO guidelines need to be observed in noise policies.
  - WHO Guidelines for Community Noise (1999)
- WHO will update guidelines on noise according to the Parma commitments by 2014.
- Policy makers need to pay special attention to the combined effects of noise and air pollution from transport, and promote health-friendly mobility.
Thank you very much for your attention!

For further information

WHO/Europe Noise and Health Programme
http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/noise

Burden of disease from environmental noise
http://www.euro.who.int/__data/assets/pdf_file/0008/136466/e94888.pdf

Night noise guidelines for Europe
http://www.euro.who.int/noise

Guidelines for community noise
http://whqlibdoc.who.int/hq/1999/a68672.pdf