Assessment of Human Exposure to Air Pollution in Health Assessment studies

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Role in COST Action: WG Leader

Measurements from routine monitoring programmes often used in dose-response studies: six cities study etc.

Particulate matter responsible for most of the negative health effects

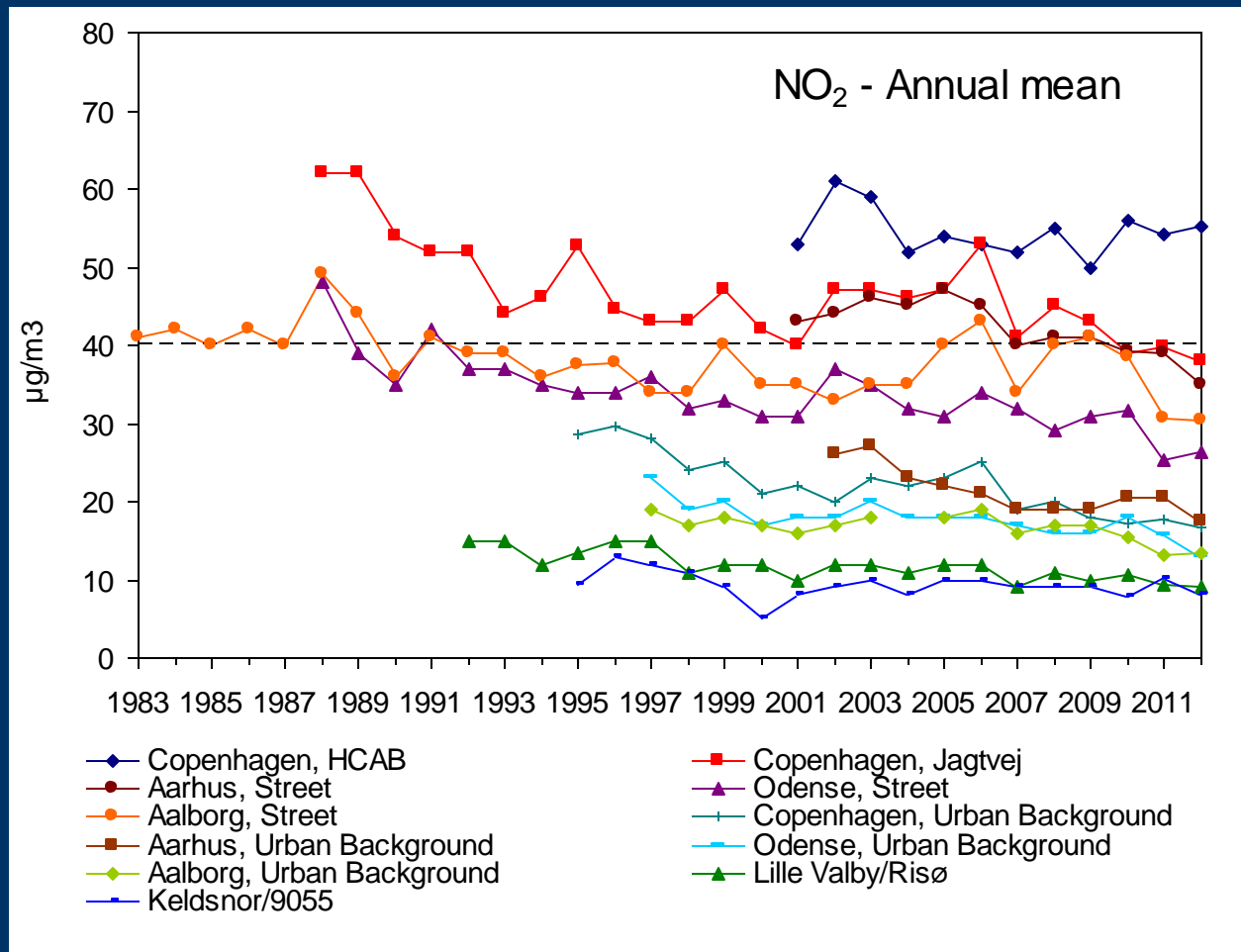Since the 1990ties focus on short-term but also long-term effects

Long term effects according to Hoek et al. (2013)

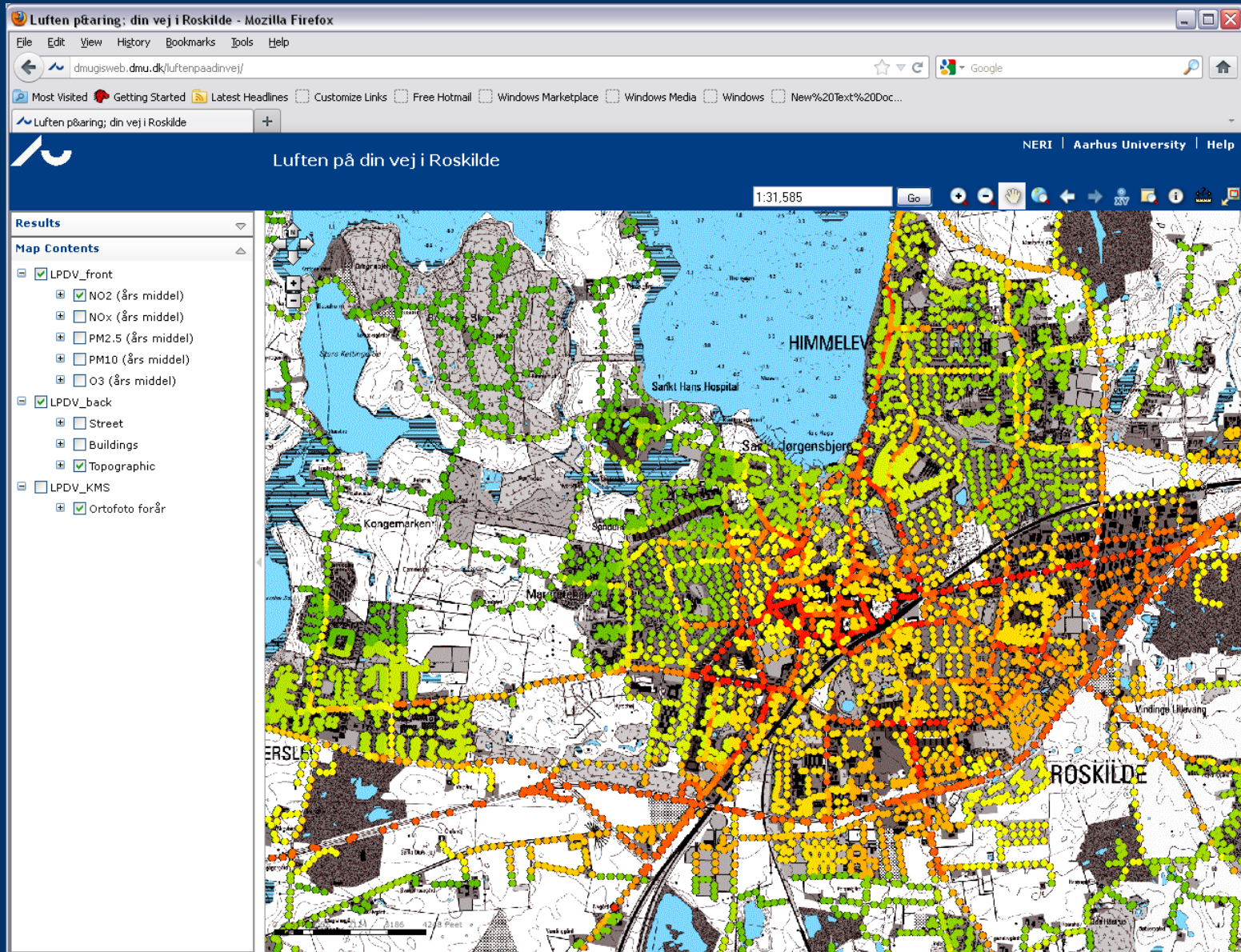| Health effects	PM_{10} per 10 µg/m³	$PM_{2,5}$ per 10 µg/m³	EC/BC per 1 µg/m³	NO_2 per 10 µg/m³
Total deaths	3,5% (0,4 - 6,6%)	6,2% (4,1 - 8,4%)	6,1% (4,9 - 7,3 %)	5,5% (3,1 - 8%)
Cardiovascular deaths	2 to 8% ($PM_{10-2,5}$)	15% (4 - 27%)	4 to 11%	2 to 36%
Respiratory deaths	4 to 67%	2,9% (6 -13%)	11%	3 to 197%

Concentration

Regional

City area

Distance

Trends in nitrogen dioxide in Danish cities

Department of Environmental Science, Aarhus University, Denmark

Mapping address level exposure in Danish city

Department of Environmental Science, Aarhus University, Denmark

Priorities and roadmap

- What do we want to provide on the long term – in relation to routine monitoring and public information?

- Micro-sensors should not substitute but supplement routine monitoring devices

- Future routine networks may look very different from todays and include low cost sensors!?

- The green route through the city or access to information about pollutant load at address might be future goals

Priorities and roadmap

- Still many unknowns in respect to health effects – e.g. what in PM is causing negative health effects – constituents, ultrafine?

- Airborne allergens may also be an issue of interest – >20% suffer from hay fever but monitoring still based on 1950/1960 technology

- Assessment of health effects of emissions from agricultural sources (fungal spore, animal material, ammonia)

- Assessment of health effects from wood stoves – 600.000 wood stove devices in DK (biggest single source of PM in DK)