Stakeholder Expert Group on the Review of the EU Air Policy
First meeting 6/7 June 2011, Brussels

Aphekom

Improving Knowledge and Communication
for Decision Making on Air Pollution
and Health in Europe

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Aphekom's ultimate goal

Deliver new information and tools on the health and monetary impacts of urban air pollution that help:

- decision makers set more effective European, national and local policies

- health professionals to better advise vulnerable individuals

- and the general public to better protect its health

Aphekom scientific questions

Q1. What are the latest findings on the health impacts and monetary costs of air pollution in European cities?

Q2. How can we make HIAs more meaningful and actionable for developing policies and recommendations on air pollution for urban populations?

Q3. Do policies designed to reduce air pollution and its health impacts and monetary costs really work?

Q4. How can we improve communication both among and between scientists and stakeholders concerned with the impact of air pollution on health?

Q1. What are the latest findings on the health impacts and monetary costs of air pollution in European cities?

Christophe Declercq, Mathilde Pascal, Magali Corso, InVS
Olivier Chanel, CNRS
on behalf of the Aphekom WP5 team and of
all the Aphekom centres

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Objectives

- To assess health impacts of urban air pollution in 25 European cities
  - update of Apheis/Enhis results
  - using latest scientific evidence for particulate matter and ozone
  - performing standardised health impact assessment (HIA)

- To develop and disseminate methods, guidelines and online tools to perform HIA in other European cities

http://si.easp.es/aphekom/

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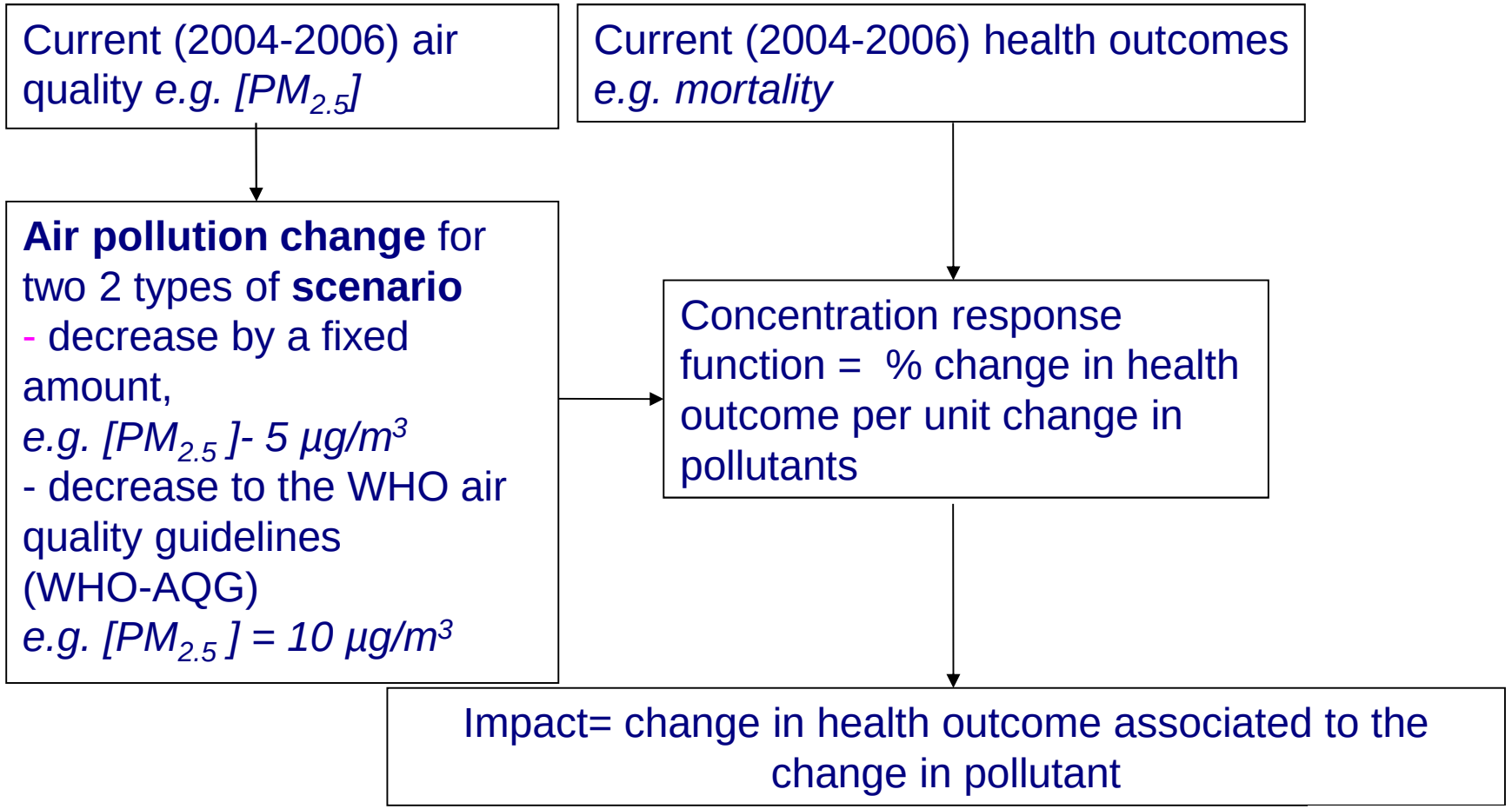
About local HIAs



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Impact of Particulate Matter (PM2.5) on mortality

- For PM2.5 , only one city complied with the WHO-AQG (annual=10 µg/m^3): Stockholm

- A decrease of annual PM2.5 levels to 10 µg/m^3
  - could add up to 22 months of life expectancy depending on the city
  - equivalent to a total burden on mortality of nearly 19,000 deaths annually in the 25 Aphekom cities more than 15,000 of which are caused by cardiovascular diseases
  - could total some €31.5 billion annually, including savings on health expenditures, absenteeism and intangible costs such as well being, life expectancy and quality of life

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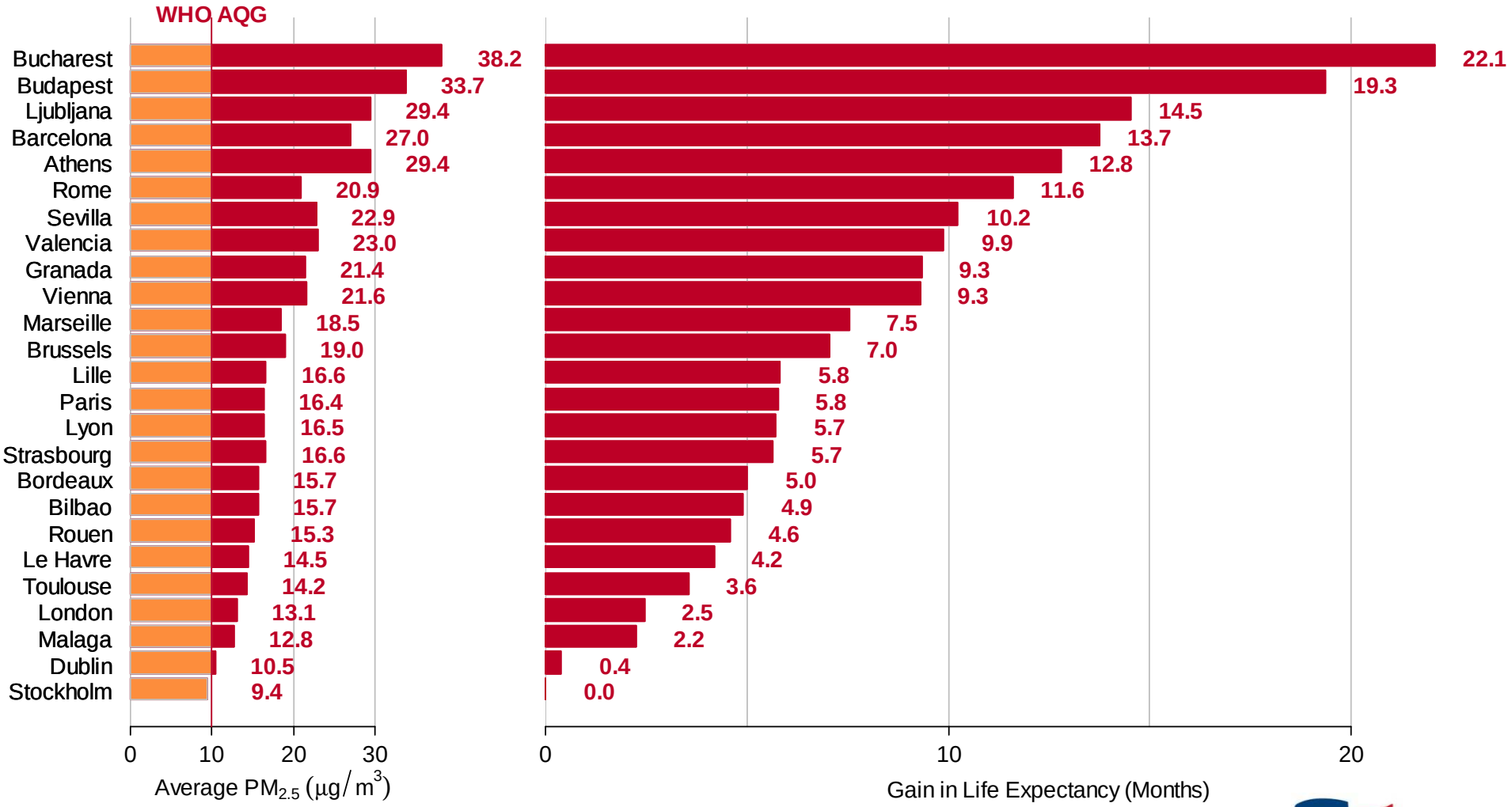
Predicted average gain in life expectancy (months) for persons 30 years of age in 25 Aphekom cities for a decrease in average annual level of $PM_{2.5}$ to 10 µg/m³



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Impact of Particulate Matter (PM10) on Morbidity

- Only two cities complied with the WHO AQG (annual=20 µg/m^3): Malaga and Stockholm
  - Average annual levels of PM10 varied from 16 to 55 µg/m^3 depending on the city

- In 22 cities, a decrease of annual PM10 levels to 20 µg/m^3 could lead to a decrease:
  - by more than 2,500 in the annual number of cardiac hospitalisations
  - by more than 5,300 in the annual number of respiratory hospitalisations

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Impact of Ozone on Mortality and Morbidity

- The proportion of days exceeding the WHO AQG (daily 8h-maximum levels of ozone=100 µg/m^3) varied from 1 to 30% (average: 12%) depending on the city

- Compliance with WHO-AQG could lead to:
  - the postponing of more than 200 deaths annually in 25 Aphekom cities
  - a reduction of 150 respiratory hospitalisations annually in 22 Aphekom cities

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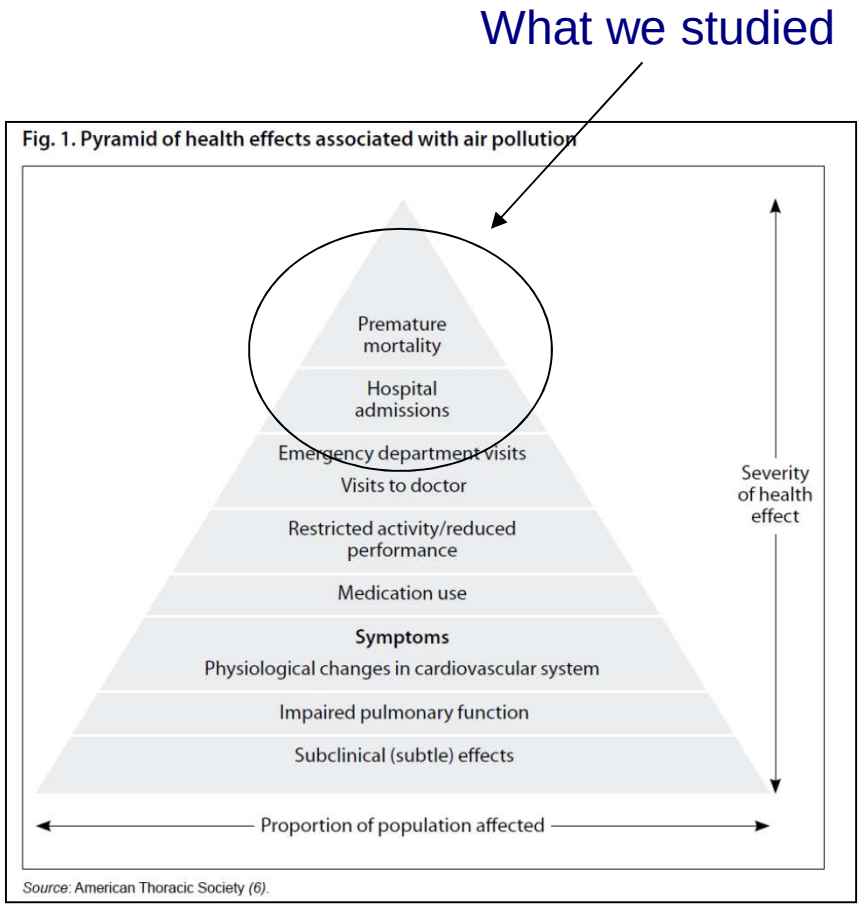
Only the tip of the iceberg

- Our results give a robust estimate produced in a standardised way in each Aphekom city
- Yet they are likely to underestimate the total impact of air pollution
- Aphekom also explored new avenues (chronic diseases and exacerbations, within-cities contrasts of exposure)



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Q2. Health Impact and Policy: novel approaches

How can we make HIAs more meaningful and actionable for developing policies and recommendations on air pollution for urban populations?

Nino Künzli, Laura Perez
Swiss Tropical and Public Health Institute, Basel, Switzerland
And University of Basel, Switzerland

Olivier Chanel, CNRS

on behalf of the Aphekom WP4 team and of all the Aphekom centres

Swiss TPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Objectives
for 10 European cities

- Estimate the number and fraction of population that may have developed their chronic disease due to chronic exposure to local traffic-related pollution, represented by living at proximity of busy roads
  - children with asthma
  - older adults with chronic obstructive pulmonary disease (COPD) and
  - older adults with coronary heart disease (CHD)

- Among those, estimate the number and fraction of exacerbations (i.e. hospitalisations and symptoms) due to both chronic exposure from local traffic-related pollution and additional day-to-day exposure to urban air pollutants above WHO recommended levels

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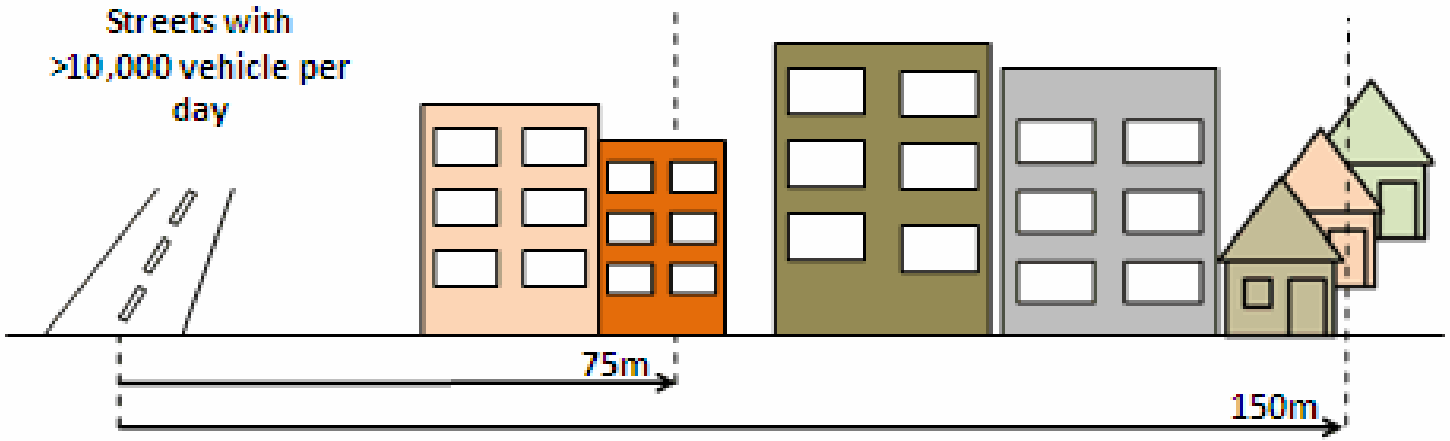
Percentage of population living near busy roads in 10 Aphekom cities



City	Population (Million. Hab)	PM_{10} annual average (ug/m^3)	% population within 75m (average 29%)	% population within 150m (average 52%)
Granada	0.24	34	14%	28%
Ljubljana	0.27	32	23%	47%
Bilbao	0.31	27	29%	59%
Sevilla	0.7	41	20%	38%
Valencia	0.74	46	44%	71%
Brussels	1.03	29	37%	64%
Stockholm	1.3	17	14%	30%
Barcelona	1.53	33	56%	77%
Vienna	1.66	25	36%	62%
Rome	2.81	37	22%	43%

Figure 9 – Estimated percentage of people leaving near busy r

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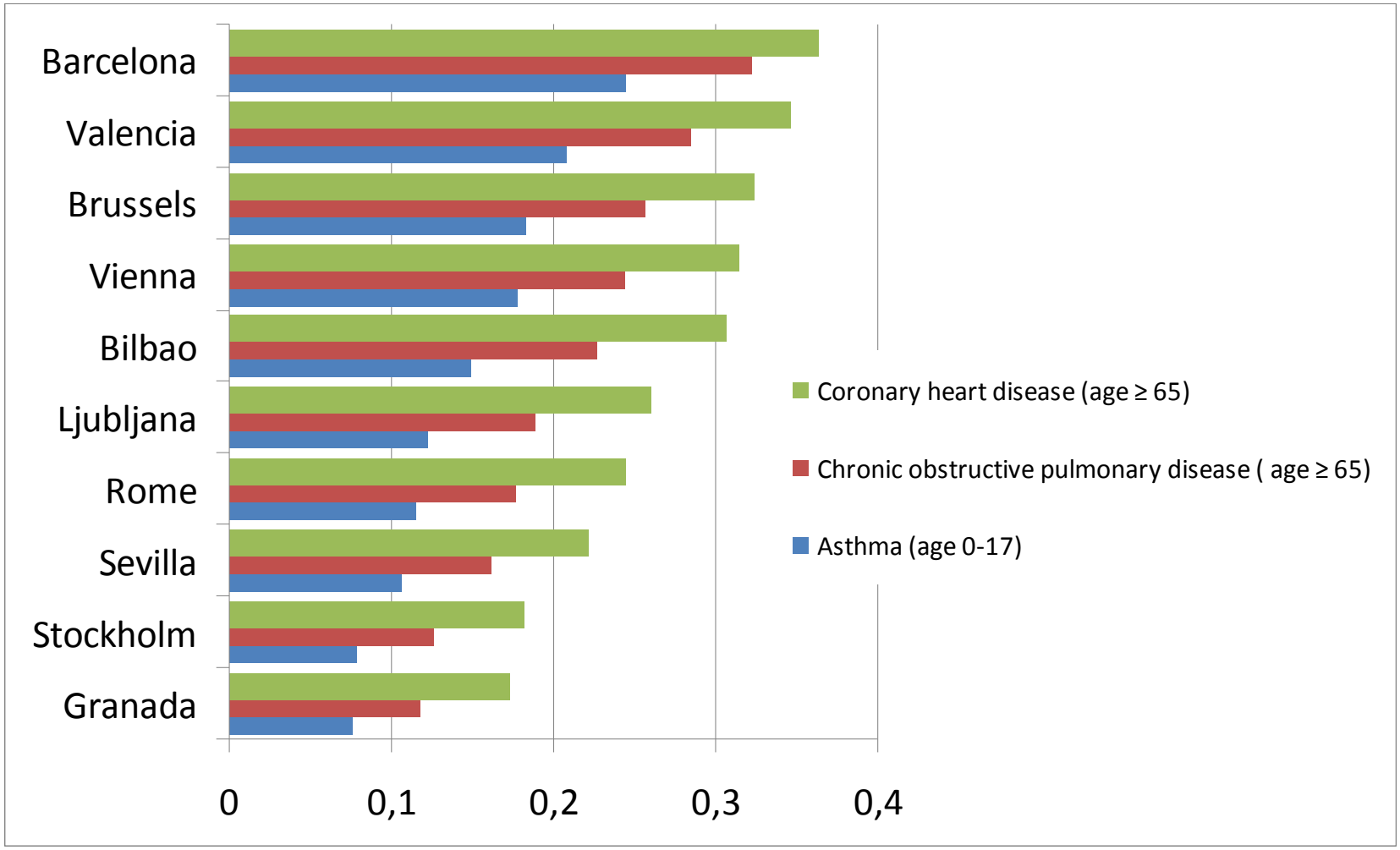
Percentage of chronic diseases attributable to local traffic-related pollution in 10 Aphekom cities

(assumes causality)



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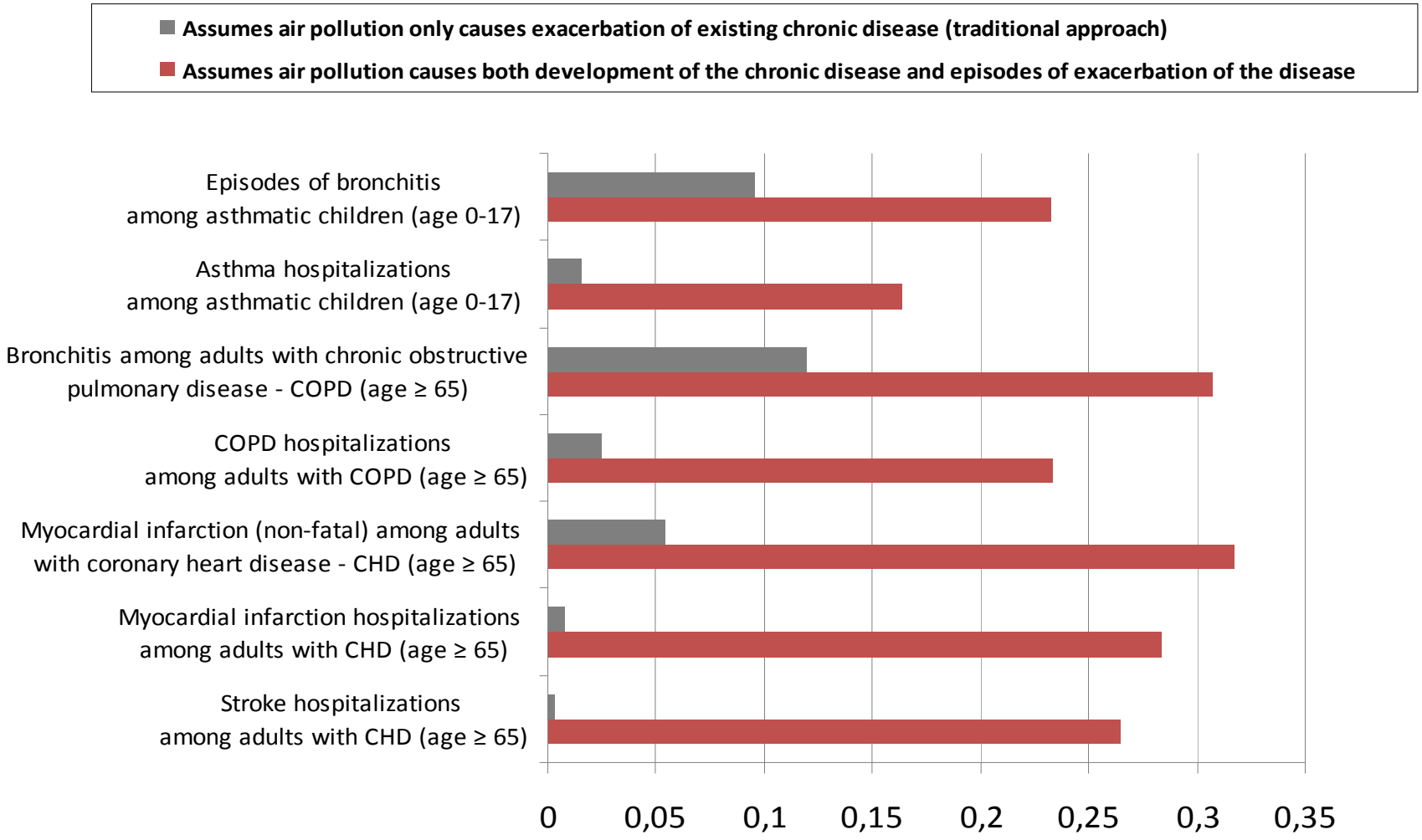
Comparison of impact of air pollution on chronic diseases using two different HIA approaches in Aphekom



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Q3. Do policies designed to reduce air pollution and its health impacts really work?

Air Pollution health impact assessment and monetary costs of a strategy already implemented to reduce air pollution in Europe

Patrick Goodman, Susann Henschel,
Dublin Institute of Technology, Ireland

Olivier Chanel
CNRS

on behalf of the Aphekom WP6 team and of all the Aphekom centres

Objective

Review of EU air quality legislation with respect to sulphur content in fuels

Aims

- Analysis as to whether the legislation improved air quality
- Assessment if there is a subsequent positive health impact
- Tracking related effect modifiers overtime

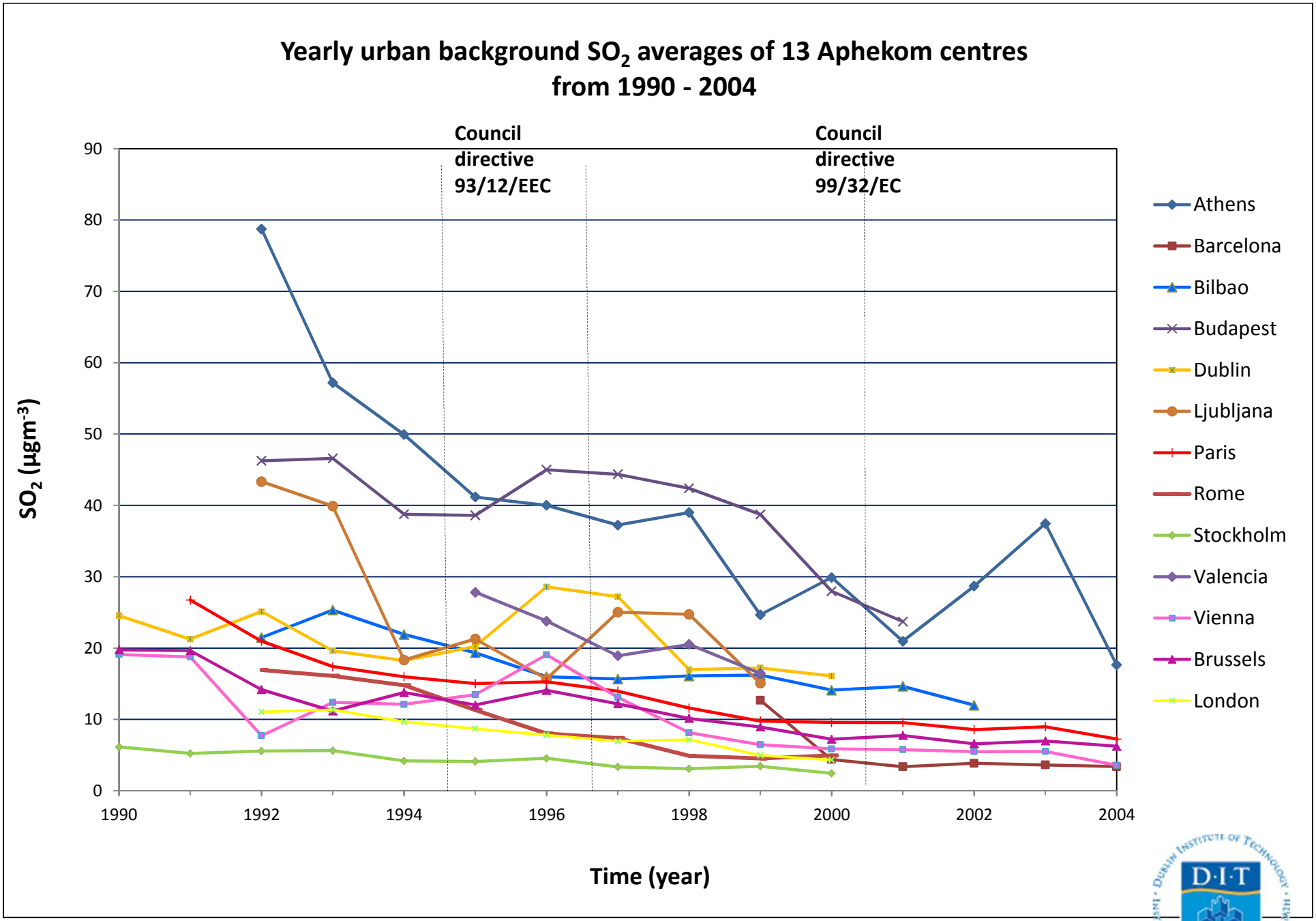
  e.g. co-pollutants, Temperature, Humidity

- Quantification of monetary costs of health impacts of the implemented regulation

Overall outcomes based on data from 20 Aphekom cities from year 2000 onwards compared to the pre-Directive period

Air quality

- Overall a drop in SO_2 levels by ~ 66% overtime


Yearly urban background SO_2 averages of 13 Aphekom centres from 1990 - 2004
Council directive 93/12/EEC
Council directive 99/32/EC
SO_2 (µgm^{-3})
90
80
70
60
50
40
30
20
10
0
1990
1992
1994
1996
1998
2000
2002
2004
Time (year)
Athens
Barcelona
Bilbao
Budapest
Dublin
Ljubljana
Paris
Rome
Stockholm
Valencia
Vienna
Brussels
London

Health

- 2212 (95% CI: 772; 3663) lives per year were prevented from all causes

- 154 (95%CI: -50; 360) lives per year were prevented from respiratory causes

- 1312 (95%CI: 386; 2247) lives per year were prevented from cardiovascular causes

Costs

The 2212 lives per year saved attributable to reductions in ambient SO2 for 20 European cities, spread all over Europe, from year 2000 onwards were valued at €191.6 million in monetary costs.

This underscores the health and monetary benefits from drafting and implementing effective EU policies on air pollution and ensuring compliance with them over time!

Q4. How can we improve communication both among and between stakholders concerned with the impact of air pollution on health?

Yorghos Remvikos
UVSQ, France

on behalf of the Aphekom WP7 team and of all the Aphekom centres

- To help decision makers draft policies on air quality and related environmental-health issues, Aphekom has developed a process, based on a deliberation-support tool, that helps frame and structure exchanges between stakeholders involved in developing policy options

- This type of multi-criteria assessment enables highlighting divergences of opinion, focusing discussions on critical points and bridging differences among stakeholders from differing backgrounds

- As a result, this process facilitates both communication and decision-making

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Synthetic presentation of the individual assessments

Performance issue	sub-categories	Options																				
		Agrofuels							Types of vehicles							Low emission zones						
Equity and social aspects	Vulnerable or deprived sub groups	0	0	0	-1	0	0	0	0	1	0	1	-1	0	2	0	2	2	-1	-1	-1	1
	Equitable access to measures and services	0	0	-1	1	0	1	0	-1	1	2	1	-1	0	1	-1	-1	1	0	0	1	1
	Environmental justice	0	0	0	1	0	1	0	0	1	1	0	0	0	2	0	-1	2	NR	-1	1	1
	Distant consequences	-1	-1	-1	-1	-1	-1	-1	1	1	0	1	0	0	1	2	-1	0	NR	0	0	0
Economic development	Creation of wealth	1	0	1	1	1	2	1	1	2	0	1	2	0	2	1	2	0	1	0	1	1
	Job opportunities	1	1	1	1	1	2	1	1	2	0	1	2	1	2	1	2	0	0	0	1	1
	Economic attractivity	0	0	0	0	1	0	0	1	1	1	1	0	0	2	2	2	2	1	2	1	1
Health and quality of life	Impacts on living environments	0	0	-1	-1	-1	0	0	1	1	0	1	1	2	2	2	2	1	1	2	2	1
	Attractivity of the living environment	0	0	0	-1	0	0	0	1	2	2	0	1	1	2	2	2	2	1	2	2	1
	Individual aspects	0	-1	0	0	0	0	1	1	0	0	1	0	1	1	2	2	2	-1	2	2	2
Equilibrium of the environment	Direct impacts	0	-1	-1	0	0	1	0	1	0	2	1	0	1	2	2	1	1	1	2	2	2
	Indirect impacts	-1	-1	0	-1	-1	0	1	1	1	2	0	1	1	2	1	1	1	0	0	1	1
Institutional aspects	Incomplete responsibility	1	-1	1	-1	-1	-1	1	1	0	-1	0	-1	-1	1	2	2	2	0	0	2	1
	Strategies and political priorities	2	-1	1	-1	-1	1	1	2	0	0	0	0	1	1	2	-1	1	0	-1	1	1
	Implementation	2	NR	2	0	-1	1	1	2	0	NR	0	-1	1	1	2	2	2	NR	0	2	1

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- To test use of the process and tool, Aphekom conducted **two case studies in Brussels and in Paris** during the development of local air-quality action plans (a case study in Athens is ongoing)

- The case studies demonstrated the ability of the method and tools to structure discussions and highlight differing views, as confirmed by participants' satisfaction with their use

- We also developed an **online tool** to familiarise users with the deliberation-support process used in the case studies and to enable them to create their own deliberative forums

http://aphekom.kertechno.net/

Aphekom outcomes and tools

- Review of literature and guidelines on innovative methods that integrate emerging evidence of air-pollution health effects into HIAs
- Application of the above to HIA case studies that use traffic exposure and sub-clinical impacts of air pollution
- Guidelines and tools (including online tool) for performing local HIAs of air pollution in European cities
- Guidelines on monetary cost calculations related to the health impacts of air pollution
- Report on health impacts of air pollution in 25 European cities
- Report on monetary costs of the health impacts of air pollution in the 25 Aphekom cities
- Review of literature on intervention studies
- Guidelines for conducting intervention studies, for determining health impacts and for calculating monetary costs of health impacts of a strategy implemented to reduce air pollution in Europe
- Report on health impacts of the chosen strategy to reduce air pollution in Europe
- Report on monetary benefits from implementing the chosen strategy
- Guidelines on tools for better dissemination of scientific findings for use by policy makers and other stakeholders in decision making processes
- Interactive online tool for multiparty discussions in decision making processes