



CAIR4HEALTH NEWS www.cair4health.eu

Editorial

The CAIR4HEALTH Project (Clean Air for Health), is funded by the European Commission under the Sixth Framework Programme (Specific Support Action). The Project was launched on the 1st of February 2007, and will be completed by February 2009.



In the first two Issues of the CAIR4HEALTH electronic Newsletter the project and its participants were introduced and the project progress was followed. In this third and final Issue, the main conclusions from the project and its reception by stakeholders and experts will be presented.

In this issue...

- What is CAIR4HEALTH? 1
- The CAIR4HEALTH Approach 1
- Main Outcomes 2
- Conclusions from Final Workshop 3
- News on Air Quality & Health 4
- Who are we? 4

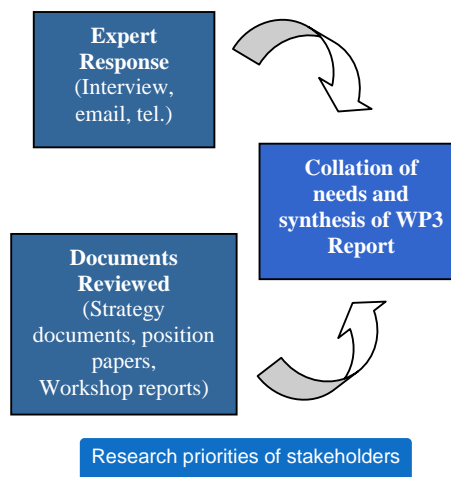
What is CAIR4HEALTH?

In direct response to the increased need for a community-wide procedure for reciprocal exchange of information and data relating to ambient air quality, CAIR4HEALTH was envisaged by six research institutes as a comprehensive effort to “*strengthen and exploit research results obtained by European and other projects related to air quality and health impact in relation to key European sustainable development action plans and strategies*”. Now in its final stage before completion, CAIR4HEALTH has succeeded to identify and analyse the knowledge gaps and research needs in the field of air quality and health, in relation to key action plans including the Environment and Health Action Plan. The outcomes from the project form a scientifically-sound basis to support the official European air quality and health management policy development.

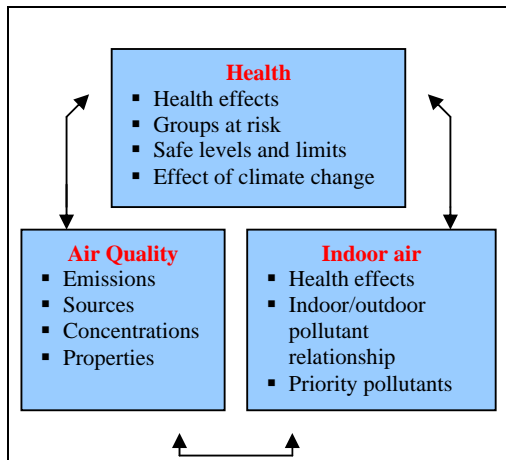
More information on the aims, structure and action plan of the project can be found in the CAIR4HEALTH web-portal:
<http://www.cair4health.eu>

The CAIR4HEALTH Approach

The project has reached its final stage and soon the outcomes of the systematic review and analysis of the research needs in the field of air quality and health will be publicized through the project web portal. In order to successfully fulfill its initial aim and objectives, a methodology was developed and followed by all working groups. Regarding the first stage of the review, which was based on the views of main stakeholders, several communication methods were used, as shown in the following figure.



The second stage of the project focused on the identification of the current knowledge gaps and related future research needs through the review of scientific papers and reports. The resulting document where the findings are presented was structured around a number of scientific questions in the field of air quality and health. The health related impacts of indoor air pollution were also considered.



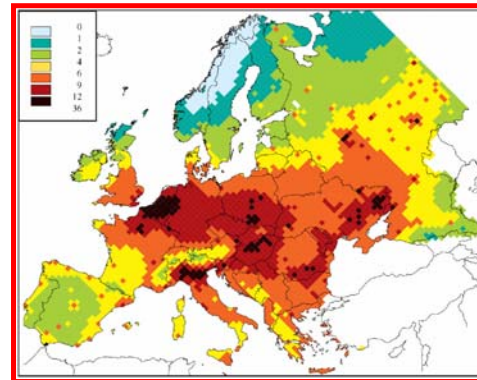
The aim was to provide relatively short, accurate and up-to-date answers to the selected questions in a document that was used as a reference point for discussions with experts. Therefore, this report that will soon be publicly available through the CAIR4HEALTH website reflects the current state-of-the-art research in the field of air quality and health. In order to extract and articulate suggestions for future research stemming from the questions and stakeholder needs examined during the project, communication with scientific experts and policy makers was considered to be crucial. Thus a series of dissemination and communication events were organized, including initially a users meeting and feedback followed by an external experts meeting, then a first stakeholders' workshop and a final workshop for stakeholders.

Main Outcomes

The main findings of the review regarding Air Quality are the following:

1. Regarding air quality the main knowledge gaps and research needs relate to the issue of particles, including both the coarse and fine size fractions. Due to their complexity resulting from their diverse chemical composition and the variety of sources, particles are still a challenge for researchers regarding their composition, chemical transformation and physical properties. Their emissions from anthropogenic and natural sources are still not accurately understood and quantified. However, an increasing number of epidemiological studies confirm their adverse health impacts. Particles emitted from different sources may induce different health problems. This is a research field that should be further investigated in order for policy makers to

impose more efficient management strategies and measures.



As shown in the above figure (obtained from IIASA), exposure to fine particles may result in considerable loss in life expectancy in different areas in Europe.

2. Another important issue of increasing interest is the impact of climate change on health due to its effect on air pollution emissions and concentrations. This is particularly the case for ozone and particles. Increased temperatures are associated with ozone episodes, and several studies analyzing future scenarios suggest that climate change will generally result in more frequent ozone episodes and increased concentrations. In terms of particles, natural emission sources are expected to contribute to a higher rate in the future concentrations, due to climate-related events such as wild-land fires.



Increased temperatures and reduced rainfall are the main meteorological factors considered. In contrast, increased temperatures in winter may result in lower concentrations of particles, as dispersion phenomena will be favoured. However, further research is required as the exact magnitude and, in some cases, net direction of these effects is still unknown.



Also, a significant knowledge gap exists in relation to the climate change induced changes in the length of the pollen season and geographic distribution of allergenic plant species.

3. The CAIR4HEALTH review reveals that integrated modeling systems are not fully exploited in the field of air quality and health. For a comprehensive understanding of the issues related to air quality induced health problems, the entire causal chain from emissions and air pollution to health effects has to be considered. Multi-scale, multi-pollutant models should be used, particularly in the case of complex pollutants, such as particles. Air quality, health and climate change assessment should be integrated and ideally, future scenarios and their effects on the economic, social and environmental development have to be considered.

Regarding health questions the main issues were:

1. Further development and adaptation of exposure models. Horizontal resolution was found to be an important parameter controlling perception of the situation, as higher resolution models tend to predict higher exposure levels and, subsequently, increased risk. This is also an important issue for policy purposes.

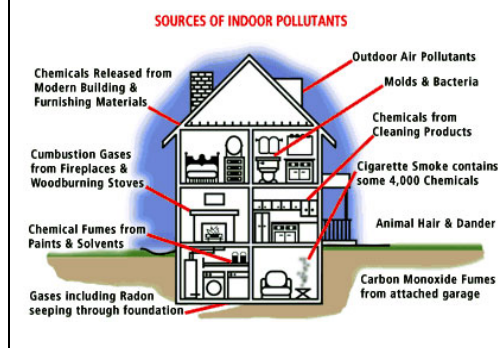
2. There are recent findings suggesting a genetic influence on sensitivity to air pollution, such as the role of glutathione S-transferase P1 on the development of childhood allergic disease to traffic-related air pollution. Further research is needed to identify the importance of genetic background on air pollution related health problems. The role of other parameters controlling the sensitivity to air pollution such as social, economic, dietary parameters and life-style choices has to be qualified and quantified.

3. New evidence indicates a relationship between air pollution and cognitive deficits and brain abnormalities in children. The entire range of effects on health induced by air pollution is clearly not yet conceived by researchers.

Indoor air pollution has been considered in this project, as 90% of our time is estimated to be spent indoors. Thus, indoor air quality is particularly important for our health. The main issues that were considered are the following:

1. Indoor air pollution may result both in acute (CO, household pesticides, biocides are the main culprits) as well as chronic health effects, such as asthma (VOC, inorganic substances, fungi), cancer (asbestos, radon, metals) and respiratory and cardiovascular disease (particles are primarily responsible). There are still uncertainties regarding the exposure-effect-functions, particularly for vulnerable groups, and the analysis of mechanisms of action for indoor carcinogenic pollutants. Toxicological studies based on chronic low dose exposure are required to provide more in-depth information on possible long term effects of air contaminants at concentrations typical for indoor environments.

2. The main sources of indoor air pollutants are shown in the following figure. However, more accurate source apportionment for different indoor environments and more realistic predictions of indoor pollutant transport and dispersion are necessary. A crucial step in this direction would be the identification, evaluation and harmonization of existing models.



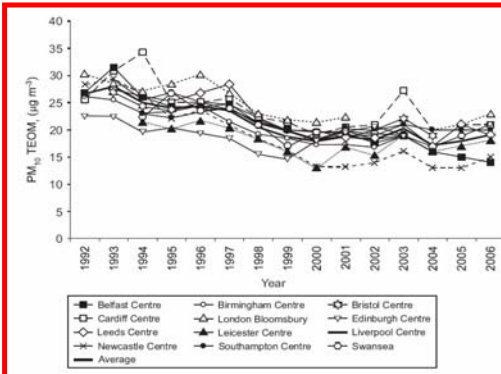
Conclusions from Final Workshop

The Final CAIR4HEALTH Workshop was organized back-to-back with the CONCAWE Meeting in Brussels, Belgium, on the 19th of January. Some of the experts who participated have been present in previous project meetings and could thus form a more comprehensive idea of the progress of CAIR4HEALTH. In general, comments from both national experts and policy makers were very positive and confirmed that all important relevant stakeholders and research needs have been considered by the project. The main issues that were raised during the discussion included:

1. The issue of why PM levels are not falling in many urban areas in Europe, in contrast to



other traditional pollutants, as reported in some recent studies, was discussed. The following figure indicates this trend for PM₁₀ concentrations in several London stations, however there is evidence for similar patterns in other European cities.



Some suggestions are that this could mainly be attributed to incorrect emission databases and inaccurate model representation of chemical transformations, as well as on knowledge gaps regarding secondary aerosols that can be an important contribution and increased traffic flows that result to an increase of not easily regulated non-exhaust particle emissions. It was pointed out that this is an important research need to be considered, as policy makers need to know whether the adopted measures are ineffective and should be modified.

2. Another issue was the use of integrated and more complicated modelling systems for air quality assessment purposes. Although there is a general preference by the scientific community and a justification that higher resolution and better representation of scale interaction processes, for example, are important to correctly estimate exposure and improve the understanding on health effects, policy makers are not yet convinced of the benefits of using more advanced modelling methods. An important research need is, consequently, to quantify these benefits.

Overall, CAIR4HEALTH has successfully identified the main needs in air quality and health research, and these results are expected to have important implications for the planning of future strategies and action plans.

News on Air Quality and Health

01 December 2008

EU to exceed air pollutant limit due to growth in road transport

Despite significant emission reductions in recent years, only 11 EU Member States expect to remain within their emission limits for all four air pollutants set by the EU National Emission Ceilings Directive (NEC Directive). The nitrogen oxides ceiling remains the most difficult to comply with.

Read more...

<http://www.eea.europa.eu/highlights/eu-to-exceed-air-pollutant-limit-due-to-growth-in-road-transport>

16 October 2008

EU-15 on target for Kyoto, despite mixed performances

The EU-15 should meet its collective target of cutting greenhouse gas emissions by 8 % for the period 2008–2012.

Read more...

<http://www.eea.europa.eu/pressroom/newsreleases/eu-15-on-target-for-kyoto-despite-mixed-performances>

Related Events:

Air Quality Conference 2008, 24 - 27 March 2009, Istanbul, Turkey

This is the 7th International Conference on Air Quality – Science and Application, dealing with Modelling, Monitoring and Management of Air Pollution.

More information...

www.airqualityconference.org

Who are we?

The partners in CAIR4HEALTH are scientists from the Universities of **Hertfordshire** (UK), **Utrecht** (Netherlands), the **Aristotle University of Thessaloniki** (Greece), the **Finnish Meteorological Institute**, the **Netherlands Research Organisation - TNO** and the **Joint Research Centre** (Italy).

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