NEWSLETTER

WHO COLLABORATING CENTRE FOR AIR QUALITY MANAGEMENT
AND AIR POLLUTION CONTROL at the FEDERAL ENVIRONMENT AGENCY, GERMANY

No. 51 - June 2013

EDITORIAL

WHO presented findings on health effects of air pollution on regional and global events

Each year, the European Commission organizes a major conference focusing on environment policy, known as „Green Week". This year's edition of Green Week is part of the European Union Year of Air 2013. "Cleaner air for all" is the title of the Green Week conference on European environment policy that took place from 4 to 7 June in Brussels, Belgium (http://greenweek2013.eu/). The Green Week offers a unique opportunity for debate and the exchange of experiences and best practices.

The air quality in the EU has been significantly improved over the last two decades, mainly due to significant emission reductions at the source of emissions from industry, transport and energy production. Despite such progress, several air quality standards as well as the WHO Air Quality Guidelines are still widely exceeded in the EU's most densely populated areas, especially from pollutants such as particulate matter, ground-level ozone, and nitrogen dioxide. The latest scientific evidence indicates that more needs to be done: air pollution still poses an unacceptable threat to our health, causing unnecessary premature deaths as well as respiratory, cardiovascular and cancer diseases, with associated human suffering. It also generates high economic costs for society linked to e.g. hospital admissions, lost working days and damage to ecosystems through eutrophication and acidification. 2013 will be a year in which the European Commission's current air policy is reviewed, with a focus on finding ways to improve the quality of the air we breathe.

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WHO/Europe had organized two sessions of the 2013 Green Week Conference, on „Evidence on health effects of air pollution“ and on „Quantifying the impacts of air pollution on human health – 20 years of method development in the European Union and internationally“, where present findings from its latest work on health aspects of air pollution were presented. WHO's evidence-based advice will support the comprehensive revision of EU air quality policies taking place in autumn 2013.

Furthermore, at the sixty-sixth World Health Assembly officials from 194 Member States have met at WHO Headquarters in Geneva from 20 to 28 May 2013, to review their annual activities, and set new priorities for the future. During the WHA a side event was linked to the health risks of air pollution and climate change. This has been seen as an excellent opportunity to bring air pollution interventions, back to the attention of health ministries and stakeholders. Interventions to reduce air pollutants, including short lived climate pollutants, should be part of the core interventions to prevent over 6 million deaths a year, mostly from non-communicable diseases as well as from childhood pneumonia, attributed to this risk factor. A leaflet can be found at the web page: http://www.who.int/hia/green_economy/ccac_world.health.assembly_flyer.pdf.

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ABOUT

The NEWSLETTER is published twice a year by the
WHO COLLABORATING CENTRE FOR AIR QUALITY MANAGEMENT AND AIR POLLUTION CONTROL, located at the FEDERAL ENVIRONMENT AGENCY, GERMANY.
It is circulated in 2000 issues and distributed to readers in more than 50 countries.
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SUMMARY OF EVIDENCE ON HEALTH ASPECTS OF AIR POLLUTION – THE WHO/EC PROJECTS "REVIHAAP" AND "HRAPIE"

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Introduction and context

The World Health Organization (WHO) is coordinating two important international projects, "Evidence on health aspects of air pollution to review EU policies – REVIHAAP" and "Health Risks of Air Pollution in Europe – HRAPIE". These projects will provide the European Union (EU) with information on the evidence of health aspects of air pollution, in support of the comprehensive review of EU's air quality policies scheduled for 2013. The advice provided is formulated in the form of responses to 26 key policy-relevant questions asked by the European Commission (EC). This advice is grounded on a review of the latest scientific evidence of the air pollutants regulated in the EU Air Quality Directives, specifically particulate matter (PM), ozone (O_3), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), as well as emissions to the air of individual metals (arsenic, cadmium, nickel, lead, and mercury) and polycyclic aromatic hydrocarbons (PAHs) (European Commission, 2013). The responses are directed at policy makers, and are therefore short and concise in order to be useful during the policy process. Even though some of the questions directly asked for the assessment of individual policies or policy instruments, the REVIHAAP discussion and answers covers only the scientific evidence underlying the policy and has not addressed political arguments.

The text in response to the questions was developed by a large group of invited experts from top institutions across the world, representing various relevant scientific disciplines. These experts, working in small groups, reviewed the accumulated scientific literature, drafted succinct answers to the questions and longer rationales in support of the answers. The process was overseen by a Scientific Advisory Committee (SAC) consisting of experienced leading scientists representing key areas relevant for the project. A formal external review of the material was conducted. In addition to the discussion conducted by electronic means of communication, direct discussion on the answers and evidence in their support was held at two WHO Experts Meetings which took place in WHO/ECEH office in Bonn, Germany on 21-23 August 2012 and 15-17 January 2013. The conclusions reflect the collective expert judgment of specialists in the field, and the final text of the answers was adopted by consensus of experts present at the meeting. A full list of SAC members, expert authors, and external reviewers is provided in the project reports for REVIHAAP (WHO, 2013 a, b).

Main results

A summary of the main results is presented below. The reader is referred to the publications stemming from this project for comprehensive, evidenced-based rationales in addition to the text of the answers (WHO Regional Office for Europe, 2013 a, b).

Evidence on health effects of PM: Since the last WHO Air Quality Guidelines (AQG) (WHO, 2006), many new studies from Europe and elsewhere have been published on both short and long-term exposure to $PM_{2.5}$. These studies provide considerable support for the scientific conclusions in the AQG and suggest additional health outcomes to be associated with long-term exposure to $PM_{2.5}$,

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such as atherosclerosis, adverse birth outcomes, childhood respiratory disease, neurodevelopment and cognitive function and diabetes. As well, recent long-term studies are showing associations between PM and mortality at levels well below the current annual WHO AQG level for $PM_{2.5}$ which is 10 µg/m^3. The effects of long-term exposure are much greater than those observed for short-term exposure, suggesting that effects are not just due to exacerbations but may be also due to progression of underlying diseases. While acute and long-term effects are partly interrelated, the long-term effects are not the sum of all short-term effects.

PM sources, fractions and components: A considerable number of new studies have been published, providing evidence on the health effects of size fractions, components or sources of PM. There are three important components – black carbon, secondary organic aerosols, and secondary inorganic aerosols – for which there is substantial exposure and health research finding associations and effects. They each may provide valuable metrics for the effects of mixtures of pollutants from a variety of sources. As well, short-term exposures to coarse particles (including crustal material) are associated with adverse respiratory and cardiovascular effects, including premature mortality. There is increasing, though as yet limited, epidemiological evidence on the association between short-term exposures to ultrafine (<0.1 µm) particles and cardio-respiratory health as well as the central nervous system.

Proximity to roads: Health effects of proximity to roads were observed after adjusting for socioeconomic status and for noise. Elevated health risk is unlikely to be explained by $PM_{2.5}$ mass since this is only slightly elevated near roads. In contrast, levels of pollutants such as ultrafine particles, carbon monoxide, NO_2, black carbon, PAHs and some metals are also more elevated near roads. Individually or in combination, these are likely to be responsible for the observed health effects. Current available evidence does not allow discernment of the pollutants or pollutant combinations that are related to different health outcomes, although association with tail pipe primary PM is increasingly identified. Exhaust emissions are an important source of traffic related pollution and several epidemiological and toxicological studies have linked such emissions to adverse health effects. Road abrasion, tire wear and brake wear are non-exhaust traffic emissions which become relatively more important with progressive reductions in exhaust emissions.

Evidence on health effects of O_3: The WHO AQG from 2005 found support only for short-term effects of ozone on mortality and respiratory morbidity. This evidence has strengthened and, since then, several cohort analyses have also been published on long-term ozone exposure and mortality. Also there is some evidence for an effect on mortality among persons with potentially predisposing conditions (chronic obstructive pulmonary disease, diabetes, congestive heart failure, and myocardial infarction). Additionally, several new follow-up long-term exposure studies have reported adverse effects on asthma incidence, asthma severity, hospital care for asthma and lung function growth. The evidence for a threshold for short-term exposure is not consistent, but where a threshold is observed, it is likely to lie below 45 ppb (90 µg/m^3) (max 1-hr). New epidemiological and experimental data have also arisen suggesting an effect of ozone exposure on cognitive development and reproductive health, including preterm birth.

Evidence on health effects of NO_2: Recent short- and long-term studies have found associations of adverse effects with NO_2 at concentrations at or below the current EU limit values and the WHO AQG. Chamber and toxicological evidence provides some mechanistic support for a causal interpretation of the respiratory effects, at concentrations not far from those that can take place at the roadside or in traffic for multiple hours. The associations between NO_2 and short-term health effects in many studies remain after adjustment for other pollutants. This does not prove that these associations are completely attributable to NO_2 per se, but it is reasonable to infer that NO_2 has some direct effects as there is consistent short-term epidemiological evidence and some mechanistic support for causality, particularly for respiratory outcomes. It is much harder to judge the independent effects of NO_2 in the long-term studies because the correlations between concentrations of NO_2 and other pollutants

are often high. However, some epidemiological studies do suggest associations of long-term NO_2 exposures with respiratory and cardiovascular mortality, and with children's respiratory symptoms and lung function, that were independent of PM mass metrics. Together with the mechanistic evidence, particularly on respiratory effects, and the weight of evidence on short-term associations, these studies are suggestive of a causal relationship.

Conclusions and future work

The evidence review concludes that a considerable amount of new scientific information on health effects, especially of PM, O_3 and NO_2, has been published in the recent years. Significant health effects of air pollutants are observed at levels commonly present in Europe. This new evidence supports the scientific conclusions of the WHO AQG, last updated in 2005, and indicates that the health effects in some cases occur at air pollution concentrations lower than those serving to establish the WHO 2005 Guidelines. It also provides scientific arguments for taking decisive actions to improve air quality and reduce the burden of disease associated with air pollution in Europe. It further recommends that the EC ensures that the evidence on the health effects of air pollutants and the implications for its air quality policy is reviewed regularly.

Further work proceeds under project HRAPIE in order to document emerging issues on health risks from air pollution related to specific source categories, gaseous pollutants or components of PM. As well, concentration-response functions to be included in cost–benefit analysis in support of the EU air quality policy will be identified.

Acknowledgements

The authors gratefully acknowledge the contribution of the experts who have been involved in the projects REVIHAAP and HRAPIE. Both REVIHAAP and HRAPIE projects were carried out with funding from the European Union and World Health Organization Regional Office for Europe. The World Health Organization retains copyright and all other rights in the manuscript of this article as submitted for publication.

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AirMonTech - Current and Future Air Quality Monitoring in Europe

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How to monitor air quality in Europe in future? This (and other questions) are answered by 'AirMonTech' (http://www.airmontech.eu), the EU FP7 project that started in December 2010 and ended its work in May 2013 (with a final conference in Brussels on 16 May). AirMonTech has developed recommendations on future urban air quality monitoring and strategy, aimed at the revision of the European thematic strategy "Clean Air for Europe", and discussions on the revision of the Ambient Air Quality Directive coming up after 2013,.

The AirMonTech consortium started with an inventory of the current and near-future state of air quality instrumentation. The project compiled a great deal of information on air quality metrics, as well as on current and future measurement technologies regarding performance, tests, operating procedures etc, with an emphasis on automatic instruments for urban monitoring. All these documents have been checked and finally stored in a specifically-designed database which is freely accessible: http://db-airmontech.jrc.ec.europa.eu. It now offers a unique source of knowledge for all stakeholders, such as air monitoring networks, non-governmental organisations, manufacturers, scientists, developers, policy advisers and all others interested in air quality monitoring. The readership is invited to have a look at the database content from where any document that is of interest can be downloaded. Also, if relevant documents or essential information is missing, please contact info@airmontech.eu. The AirMonTech database will remain available even after the end of the project and, obviously, adding relevant information will be an on-going process.

Recommendations regarding instrumentation, monitoring practice, and necessary research for regulatory monitoring in future are presented in a dedicated report: 'Key findings relating to the regulatory monitoring of urban air quality in Europe' which can be downloaded from the AirMonTech website. In brief, it concentrates on the question of how today's monitoring practice can be developed more effective and, very important in these day, more cost-efficient. Obviously, before drawing conclusions on instrumentation the relevant metrics need to be identified first. It is broadly acknowledged that network monitoring would be far more effective if it is explicitly providing information to clarify health effects (without neglecting the legislative task of ensuring compliance with air quality standards). Considering the work done by WHO-REVIHAAP, as well as by the European Network on Atmospheric Composition Change (ACCENT-plus) and the European Network of National Air Quality Reference Laboratories (AQUILA), it becomes apparent that valuable extra air quality data related to health effects could be gained

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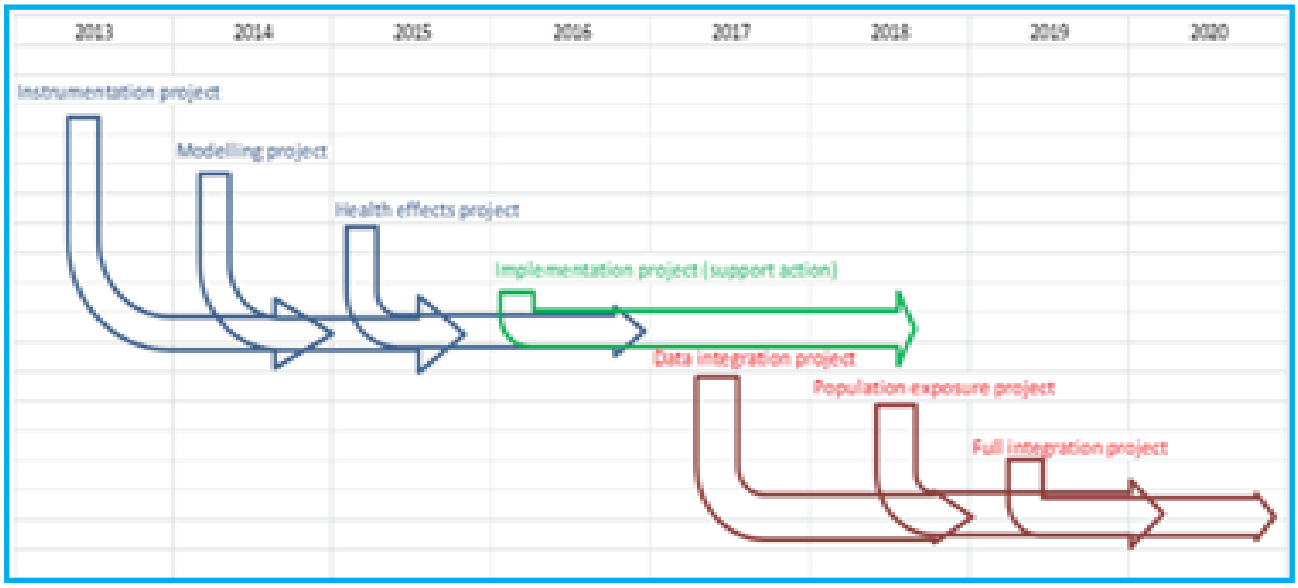
from the regulatory monitoring without a significant increase in costs. This "health aim" clearly affects the choice of new (additional) metrics.

As regards gaseous pollutants, there is little reason to change the monitoring methods for those already regulated in the EU Ambient Air Quality Directive. A gaseous pollutant that might deserve additional attention in the urban environment is ammonia, which, being released from waste storage sites and vehicle exhaust, will have an impact on the secondary particulate matter (PM).

Looking at PM constituents, the measurement of the regulated particle metrics PM10 and PM2.5 will continue. However, the investigation of related but better-defined metrics, such as separate chemical components of the same size fractions, or their non-volatile components, is encouraged. There are various new metrics possible, like Black Carbon (BC), particle number concentration and particle surface area concentration. BC is a strong candidate for future regulatory measurements, as a proxy for combustion products ('soot'). In its favour are the reliability of the measurement technology, and its relevance to both health effects and climatic radiative forcing.

On-line methods for metals and polycyclic aromatic hydrocarbons are becoming available, but there are no strong regulatory reasons for changing from the current manual reference methods. However, source attribution will benefit from the use of automated methods with higher time resolution. Organic carbon (OC) and particle reactivity (such as Reactive Oxidative Species/ROS) would be strong candidates for future measurement, due to early indications of health relevance. Research-based automated monitoring instruments have been developed, but network-ready instruments are not yet available.

Future monitoring should address a balance of regulatory and scientific purposes, which include the assessment of population-based exposure, sources, and effects of control measures. Harmonisation of methods and QA/QC procedures with for example EMEP and other networks is encouraged, with an open mind for new technologies to respond to changing priorities and to reduce "monitoring inertia". New monitoring should be a combination of permanent "supersites" measuring a large range of pollutants at carefully-chosen sites, supplemented by other techniques and modelling, in close collaboration with health effect research, such as cohort studies. Complementary monitoring techniques could take the form of low-cost instruments, and



used in short term measurement campaigns rather than for permanent monitoring. Low-cost gas sensors would enable a high spatial density monitoring, but these need more convincing evidence of their sound "real world" performance.

The research roadmap as designed by AirMonTech is pictured schematically below. It schedules focussed projects timed to maximise the use of the available expertise and to fit EU funding cycles. It is proposed to have three projects in an early "data acquisition phase" (in blue), and three in a later "integration phase" (in red), with a dedicated supporting action linking these two phases (in green).

The "data acquisition phase" concentrates on the collection of data about new metrics with improved monitoring technologies, the development of a modelling and data integration tool, and of robust methods to achieve a European-wide routine health-effect monitoring. Based on the results of the first phase, the supporting action develops implementation strategies of new AQ network designs with the inclusion of new metrics. The three projects in the "integration phase" should improve the use of monitoring data and modelling outputs and the estimation of population exposure as given by the projects in the acquisition phase. In the end, the process should improve knowledge of health effects, sources, abatement techniques and compliance assessment. The full integration project implements the air quality and health monitoring together with supplementary aims at selected cities.

From the nature of the proposed projects it is evident that defined Areas of Research and Monitoring of Air Quality (ARMAQs) in urban agglomerations are needed to facilitate the development of future air quality monitoring. ARMAQs should be representative of the variations across Europe in, for example, climate, socio-economic factors, and genetics. The ARMAQs should be established as soon as is practical, and, for example, be part of a specific Infrastructure call.

The database, recommendations and draft roadmap were presented and evaluated at the 3rd AirMonTech workshop in Duisburg (March 2013) and at the final conference in Brussels (May 2013), as part of a continuous interactive dissemination process involving the relevant stakeholder groups. Dedicated Newsletters and the presentations of the individual speakers (on health issues, personal monitoring, new metrics, usage of sensors and other innovative techniques) are available for download at http://www.airmontech.eu/publications. Other interesting information regarding AirMonTech and its work can be obtained from this webpage too.

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Attitudes of Europeans towards air quality

This survey has been requested by the European Commission DG Environment. As a general public survey it is focused on matters of air quality and air pollution (Flash Eurobarometer 360). Flash Eurobarometers are ad hoc thematical telephone interviews conducted at the request of any service of the European Commission. Flash surveys enable the EC to obtain results relatively quickly and to focus on specific target groups, as and when required. The questions in this Eurobarometer survey are designed to support this work by providing greater insight into views and perceptions of European public on matters of air quality and air pollution.

The survey covers the European population in all 27 EU member states and it was conducted in autumn 2012, the report has been published early 2013. The results of more than 25,500 telephone interviews have shown that a strong majority of European citizens ask for a stronger EU air quality policy. An average of 56% of Europeans think that air quality has deteriorated in the last ten years. Biggest challenges have been identified for central and southern Europe - in Cyprus, France, Greece, Hungary, Italy, Romania and Spain this percentage is between 70 to 80%. About 90% of respondents believe that air quality related impacts such as respiratory and cardiovascular diseases are serious problems, as well as asthma and allergies. Nearly four of five think that the EU should take additional measures to address air pollution, including an improvement regarding ways of information and communication.

More information, including country specific results, can be obtained from:
http://ec.europa.eu/environment/working_en.htm

Air quality improvement in Northwest Europe is targeted by JOAQUIN

JOAQUIN (Joint Air Quality Initiative) is a EU project supported by INTERREG IV-B Northwest Europe programme (http://www.nweurope.eu/) in the field of air quality. The aim of this project is to facilitate the development of greater health relevant air quality policies in the 'hot spot' region of Northwest Europe, by (1) providing the necessary evidence and data to understand the current local and regional situation; (2) providing best practice to assist and deal best with the local and regional situation; and (3) engaging and creating a broad support base of stakeholders, including policymakers and the general public, to encourage adaptation or adoption of air quality policies that achieve greater health outcomes.

One of the project goals is to develop and implement new monitoring infrastructures to measure novel health-related air quality parameters, such as ultrafine particles (UFP; particle number concentration and surface area) and black carbon (BC), in conjunction with comparative assessments of PM10 and its composition. Besides, evidence on health impacts of these metrics will be generated through extensive chemical and toxicological characterizations. In addition, pollution sources will be identified and categorized.

The project is lead by the Flemish Environment Agency (VMM), and runs between September 2011 and September 2015 in cooperation with 13 partner institutions from Belgium, France, the Netherlands and United Kingdom.

For further details of JOAQUIN project, see:
http://www.joaquin.eu/

Indoor air quality in modern offices

OFFICAIR is a European collaborative project, which has received funding from the EU FP 7 programme. The overall objective of the OFFICAIR project is twofold. Firstly, to establish a framework that will provide new knowledge in terms of databases, modeling tools and assessment methods towards an integrated approach in assessing the health risk from indoor air pollution, focusing on modern office buildings. Secondly, to support current EU policies, such as, the Thematic Strategy on Air Pollution and the European Environment and Health Strategy and Action Plan.

Air conditioning and mechanical ventilation systems, coupled with the intense use of electronic equipment and often extensive levels of artificial lighting, require high levels of energy in modern office buildings. At EU level, the Directive 91/2002 (EPBD), is a major step towards rational energy use. An important issue to consider regards indoor air quality. It is anticipated that developments in the field of energy use in offices will lead to its reduction through various strategies, including comfort/health standards and ventilation levels. There are difficulties to launch solid policies on indoor air quality, both generally and specifically in offices, related simultaneously to ventilation, energy and health. The uncertainties that justify those difficulties are derived from the lack of information concerning the toxicity of a number of indoor air pollutants. Furthermore, the lack of knowledge of their indoor concentrations and exposure in the current conditions means that the real impact of these compounds on health, comfort and productivity in offices is unknown.

To achieve the overall objective of OFFICAIR, the following scientific and technical objectives have been devised, each corresponding to a specific, scientific Work Package envisaged by the proposal.

- Develop of a European database on indoor air pollution and its impact: concentrations, sources and emissions, exposures and health effects.
- Identify new, health relevant, primary and secondary pollutants originated from indoor sources and present in typical modern office environments, using novel detection methods and analysis techniques.
- Inventory and identify associations (events and sources) that have been identified as possible sources of indoor air quality problems in European modern offices, via field investigations, questionnaires and monitoring.
- Assess possible synergies of ozone-initiated pollutants (i.e. combined exposure) emitted from equipment. In vitro and in vivo studies on potential toxicity of indoor air pollutants, acute and long-term.
- Set up an integrated modeling system to link emissions of key pollutants (ozone, primary VOCs and particles) and major secondary indoor pollutants known for their adverse health effects to their concentrations assessment of office workers exposure.
- Evaluate the health effects of indoor air pollution under different conditions in modern office buildings in Europe.
- Make recommendations for indoor air quality policies in modern European office buildings; propose adjustments to the current practices and techniques; identify of research gaps related to health and the indoor environment.

OFFICAIR has officially started on 1 November 2010 under the coordination of UOWM (University of West Macedonia), and will end on 31 October 2013.

For further information see: www.officair-project.eu

Latest News on Health Effects of Air Pollution 30 – 31 January 2013 in Brussels, Belgium

The European Commission/EC has declared 2013 as the 'Year of Air' to focus on the importance of clean air for all and action to improve air quality across the EU. During 2012 and early 2013, the EC in partnership with the WHO Regional Office for Europe is reviewing the latest health science on major air pollutants such as particulate matter (PM), ground level ozone, and nitrogen dioxide as a key step in evaluating whether to update Europe's air quality policies. This can be seen as part of the current updating process of the EC Thematic Strategy on Air Pollution, which was adopted in 2005 and meant to serve as guidance the EU's air quality policy.

On 30/31 January the workshop 'Understanding the Health Effects of Air Pollution: Recent Advances to Inform EU Policies' was co-organized by EC's DG Environment, DG Research and Innovation, the WHO Regional Office for Europe and the US Health Effects Institute. The event was addressed to public authorities responsible for air policy development, adoption or implementation, the broader stakeholder community; researchers and the media, it was attended by 200 participants. The overall workshop goal was to inform regulatory and other decisions on air quality and its significance for public health, due humans can be adversely affected by exposure to air pollutants in ambient air. It included around 30 presentations on findings of recent research studies, meta analysis and key reviews from Europe and North America, and first results from the WHO project 'Review of evidence on Health Aspects of Air Pollution (REVIHAAP)', which has been carried out under EC request (http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/air-quality/publications/2013/review-of-evidence-on-health-aspects-of-air-pollution-revihaap).

The EC Air Quality Directive of 2008 is mainly based on the recommendations of the WHO Air Quality Guidelines (2005). At that time human health impacts of air pollution indicated associations of respiratory and cardiovascular effects with exposure to PM2.5 respectively. The present review reports evidence that it also can trigger atheriosclerosis, adverse birth outcome and childhood respiratory diseases. Furthermore, the review also suggests a possible link with neurodevelopment, cognitive function and diabetes. This new evidence supports the scientific conclusions, and indicates that the effects can occur at air pollution concentrations lower than those serving to establish the 2005 Guidelines. It also provides scientific arguments for the decisive actions to improve air quality and reduce the burden of disease associated with air pollution in Europe.

The workshop addressed several important questions, including (1) whether there is a concentration below which no advers health effects are to be observed for the major air polltutants, and (2) whether specific sizes, sources or constituents of PM can be indentified – such as traffic, black carbon, fine and ultra fine particles, and diesel exhaust, that are associated with adverse health outcomes. Additionally the workshop has indicated and summarized how science has advanced our understanding on air pollution related health impacts, remining uncertainties, and identify key areas for future research, e.g. within the upcoming new EC research programme HORIZON 2020.

Hans-Guido Mücke
WHO Collaborating Centre

MEETINGS AND CONFERENCES — MEETINGS AND CONFERENCES

20th "WaBoLu" Conference on Indoor Air Quality 7 - 8 May 2013 in Berlin, Germany

This year, the traditional "WaBoLu" Conference on Indoor Air Quality was held for the 20th time. Current topics on indoor air quality were presented and lively discussed in five different sessions.

In the first session, "Results from chamber and real room investigations" current results from chamber experiments with compact fluorescent lamps were presented. The bad smell of some 'energy saving lamps' was the reason for these experiments. Various hazardous substances (VOC / SVOC) were detected. Furthermore, an ongoing study was presented, in which the effects of particulate emissions from various indoor activities such as toasting and burning candles are examined. These effects will be described with the help of a study on test persons and toxicological investigations. In another presentation, first exploratory emission measurements during operating state of ethanol and wood stoves showed significant increases in concentrations of air pollutants that are likely to depend on the operating resources. Particularly critical were the high concentrations of formaldehyde measured during the experiments.

In the second session, „Investigations on indoor air quality in new and energy-efficient buildings" data from indoor air studies in new and renovated schools and kindergartens were presented. Increased $C0_2$-levels and VOC-concentrations above guideline values occurred in rooms where health complaints have also been described. Such problems can be solved by choosing low-emission building products. A possible way in this direction was described by the internet platform Baubook. A further contribution showed that targeted chemical management cannot replace ventilation.

Session III, „Indoor air problems in planes" picked out the air quality on board as a central theme again. Results of a study showed that Tricresylphosphate from oil stabilizers could be detected in indoor air in low concentrations. But whether these are the cause for the aerotoxic syndrome remains questionable. In another presentation BHT (butyl hydroxyl toluene) was proposed as a non-toxic oil stabilizer for the avoidance of toxic fume events.

In Session IV, "Current developments" some problems during the development of a new reference material with reproducible VOC emissions were presented. This material is aimed to be used in the future for quality control for chamber emission measurements. The first round robin test on the introduction of odor measurements for the assessment of building product emissions showed good results. However it still requires practical experiences before the odor test will be included as an evaluation criterion in the AgBB-scheme.

In Session V, „Measurement data and evaluation" a VOC data collection was presented, which is intended to illustrate the conflict energy-efficient buildings vs. good indoor air quality. However the results clearly show that it is „not a question of energy efficiency vs. indoor air quality, but a question of ventilation behavior and potential of sources vs. indoor air quality". In addition, issues referring to the Indoor Air Quality Guideline Values which are currently discussed in the Ad hoc working group of the Federal Environment Agency's Indoor Air Hygiene Commission (IRK) were presented. Also further results of odor measurements on building products in the test chamber and real rooms were described.

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All about Ultrafine Particles 16 – 17 May 2013 in Brussels, Belgium

The European Federation of Clean Air and Environmental Protection Associations (EFCA) conducted another International Symposium on sources, effects, risks and mitigation strategies of Ultrafine Particles (UFP). It was the 4th EFCA-UFP International Symposium which has reflected the most recent scientific progress in the field and aimed to contribute to the dialogue with policymakers in Europe. Launched in 2007 in Karlsruhe, Germany, the EFCA-UFP Symposium has gained visibility by moving to Brussels. EFCA and the Karlsruhe Institute of Technology (KIT) together with Society for Environmental Engineering (GUS) and Confederation of European Environmental Engineering Societies (CEEES) jointly featured this event. The two days Symposium was hosted by Representation of the State of Baden-Württemberg at the European Union, and attended by 100 participants from research institutions, administrative authorities, industry, non-governmental bodies, stakeholders from Europe and North America, and conducted in parallel sessions with around 50 oral and poster presentations.

UFP are the smallest constituents of airborne particulate matter (PM), and are considered to be an important factor in causing serious health problems and environmental effects. They may nucleate as a result of combustion processes or form from volatile precursor gases via atmospheric photochemical reactions, thus showing a clear link to gaseous pollution. More recently, the direct emission of man-made nanoparticles in the various stages during their lifecycle has attracted considerable attention. The effects of UFP on air quality, atmospheric processes such as cloud formation and precipitation, climate influence and human health are by far not finally investigated to proven evidence. Therefore the conference have been concentrated besides on (a) emissions sources; (b) characterization, such as particles size, shape, chemical composition, and oxidative capacity; (c) air quality measurement methods and techniques, modeling, monitoring and data; (d) in vivo and in vitro toxicology, pathomechanisms; and (e) abatement strategies and policies, including cost-effective PM mitigation concepts and strategies.

Targeting on the decrease of PM exposure, European regulations have been set but focused on the larger fraction of PM, certainly due to a lack of awareness, knowledge and measurement technology on UFP. Because of their relative small contribution to the PM mass concentration gravimetric monitoring may not properly reflect its risk. Therefore, EFCA has recently recommended to include black carbon particles (BC) as an additional indicator for public health protection in the European Air Quality Directive, also considering the contribution of BC to global warming.

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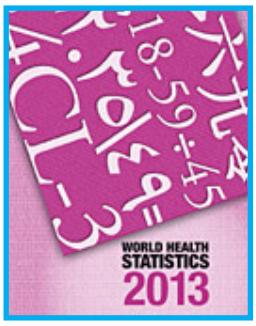
World Health Statistics, 2013

by WHO Headquarters Geneva, Switzerland, May 2013. Available in English (PDF), French and Spanish



World Health Statistics 2013 contains WHO's annual compilation of health-related data for its 194 Member States, and includes a summary of the progress made towards achieving the health-related Millennium Development Goals (MDGs) and associated targets.

This year, it also includes highlight summaries on the topics of reducing the gaps between the world's most-advantaged and least-advantaged countries, and on current trends in official development assistance (ODA) for health.

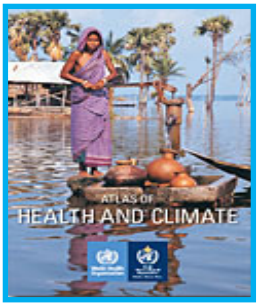
Health effects of particulate matter. Policy implications for countries in Eastern Europe, Caucasus and Central Asia

by WHO, Regional Office for Europe, Copenhagen, Denmark, 2013, ii + 14 pages, ISBN 978 92 890 0001 7, free of charge. Available in Englisch (PDF), 359.9 KB; Русский (PDF), 490.4 KB

Despite some improvements, current levels of air pollution still pose a considerable risk to the environment and to human health in the WHO European Region. One issue of concern is that monitoring of particulate matter is very limited in the countries of eastern Europe, the Caucasus and central Asia. This paper summarizes the evidence about the health effects of air pollution from particulate matter and presents the policy implications, the aim being to stimulate policy-makers to develop more effective strategies to reduce air pollution and its health effects in those countries.

Atlas of health and climate

by WHO/WMO, Geneva, Switzerland, 2012, ii + 68 pages, ISBN 978 92 4 156452 6. Available in English (PDF), 17.97 MB

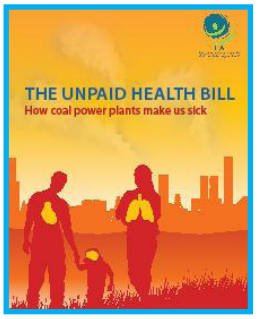


The Atlas of health and climate is a product of this unique collaboration between the meteorological and public health communities. It provides sound scientific information on the connections between weather and climate and major health challenges. These range from diseases of poverty to emergencies arising from extreme weather events and disease outbreaks. They also include environmental degradation, the increasing prevalence of noncommunicable diseases and the universal trend of demographic ageing.

Other Publications:

How is coal pollution making us sick?

by HEAL (Health and Environment Alliance), 2013. Available in English (PDF)



A new report launched on 7 March 2013 by the Health and Environment Alliance (HEAL) aims to provide an overview of the scientific evidence of how air pollution impacts health and how emissions from coal power plants are implicated in this. It presents the first-ever economic assessment of the health costs associated with air pollution from coal power plants in Europe as well as testimonies from leading health advocates, medical experts and policy makers on why they are concerned about coal.

The report develops recommendations for policy-makers and the health community on how to address the unpaid health bill and ensure that it is taken into account in future energy decisions.

The impact of international shipping on European air quality and climate forcing (Technical report No 4/2013)

by EEA (European Environment Agency), 2013. Available in English (PDF)

This EEA Technical report provides an overview on the state of knowledge on the impact of international shipping in European waters to air quality and climate change. Based on literature review and model assessment studies information is provided on past and future emissions of air pollutants and greenhouse gases, monitoring of ship emissions, emission mitigation policies and impact on European air quality and radiative forcing.

Air pollution by ozone across Europe during summer 2012 (Technical report No 3/2013)

by EEA (European Environment Agency), 2013. Available in English (PDF)

The report provides an overview of exceedances of EC ozone threshold values for April - September 2012. Ozone pollution still exceeded target levels in Europe during summer 2012, but the number of exceedances of the alert threshold was lower than in any year since monitoring started in 1997. However, almost all EU Member States failed to keep levels of the pollutant within targets set to protect human health.

COMING EVENTS — COMING EVENTS — COMING EVENTS — COMING EVENTS — COMING EVENTS — COMING EVENTS

2013

Environment and Health - Bridging South, North, East and West Conference of ISEE, ISES and ISIAQ
19-23 August, Basel, Switzerland, http://www.ehbasel13.org

Air Protection 2013 - 8th Croatian Scientific and Professional Conference (CAPPA) with a special EFCA session on "Carbon in particles"
9-14 September, Sibenik, Croatia, http://www.huzz.hr/skupovi_eng.html

21th International Conference of Environmental Indicators ICEI 2013
23-26 September, Trier, Germany, http://www.biogeographie.uni-trier.de

16th IUAPPA World Clean Air Congress
29 September-4 October, Cape Town, South Africa, http://www.iuappa2013.com

Sustainable City 2013
3-5 October, Putrajaya, Malaysia, http://www.wessex.ac.uk/13-conferences/sustainable-city-2013.html

IAQ 2013 - Environmental Health in Low Energy Buildings
15-18 October, Vancouver, British Columbia, Canada, http://www.ashrae.org/membership--conferences/conferences/ashrae-conferences/iaq-2013

2014

9th International Conference on Air Quality - Science and Application
24-28 March, Garmisch Partenkirchen, Germany, http://www.airqualityconference.org/

2nd International Conference on Environmental and Economic Impact on Sustainable Development - Environmental Impact 2014
14-16 May, Ancona, Italy, http://www.wessex.ac.uk/14-conferences/environmental-impact-2014.html

Urban Transport 2014 - 20th International Conference on Urban Transport and the Environment
28-30 May, The Algarve, Portugal, http://www.wessex.ac.uk/14-conferences/urban-transport-2014.html

Air Pollution 2014 - 22nd International Conference on Modelling, Monitoring and Management of Air Pollution
7-9 July, Opatija, Croatia, http://www.wessex.ac.uk/14-conferences/air-pollution-2014.html

Indoor Air 2014 - 13th International Conference on Indoor Air Quality and Climate
7-12 July, Hong Kong, China, http://www.indoorair2014.org/

26th Conference of the International Society for Environmental Epidemiology
24-28 August, Seattle / Washington, USA, http://www.iseepi.org