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WHO COLLABORATING CENTRE FOR AIR QUALITY
MANAGEMENT AND AIR POLLUTION CONTROL

at the

FEDERAL ENVIRONMENTAL AGENCY
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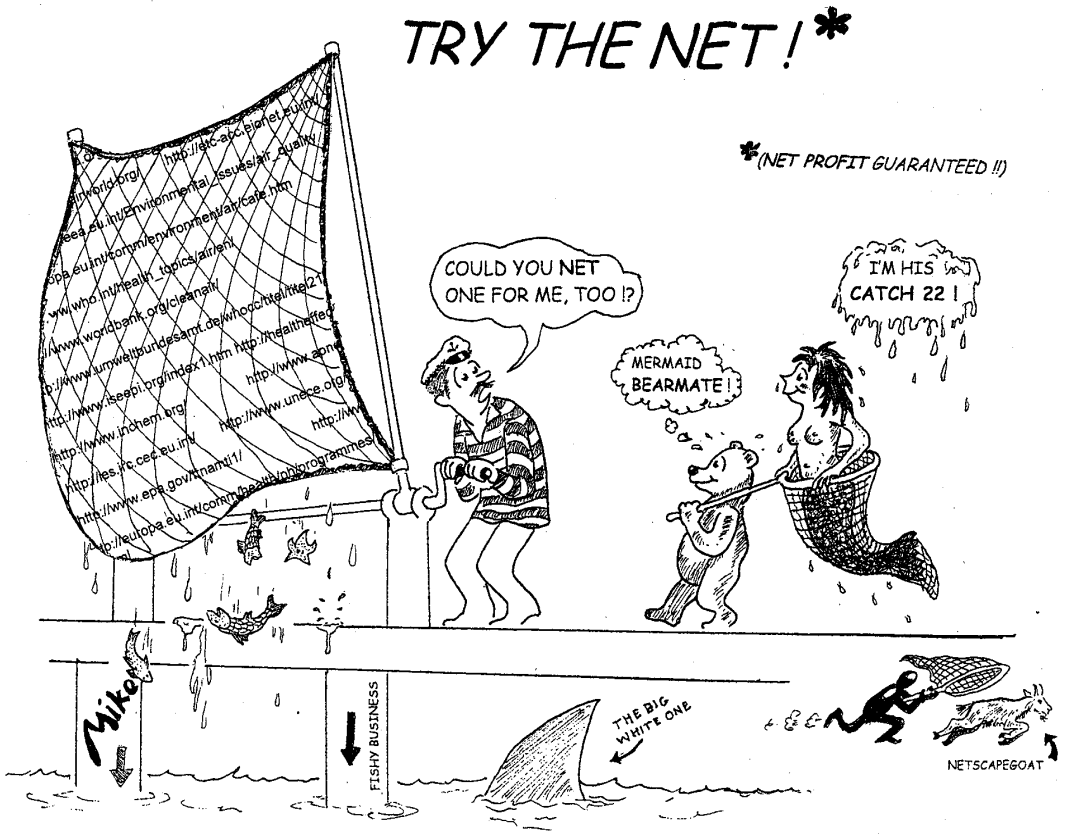


HEALTH IMPACT ASSESSMENT OF AIR POLLUTION IN 26 EUROPEAN CITIES

- FIRST RESULTS OF THE APHEIS STUDY -

Sylvia Medina, Antoni Plasència, Hans-Guido Mücke
and contributing members of the APHEIS group

Release of the second-year Report

The APHEIS programme, funded by the European Commissions' Health and Consumer Protection DG, recently released the findings of a health impact assessment of air pollution which was conducted in 26 cities in 12 European countries during 2001.

The APHEIS (Air Pollution and Health: A European Information System) study revealed in particular that air pollution continues to pose a significant threat to public health in urban environments in Europe despite tighter emission standards, closer monitoring of air pollution and decreasing levels of certain types of air pollutants.

As part of APHEIS' objective to bridge the gap between research findings and decision making, the second-year report, which uses the same standardized methodology in all its cities, constitutes the first Health Impact Assessments (HIA) of particulate matter conducted simultaneously at both local and European levels.

The APHEIS programme also fosters ongoing cross-fertilization between multiple disciplines and regions to create skilled, local teams and to enrich methodology, know-how and the quality of its findings (see WHO Newsletter No. 26, December 2000, 4-8).

APHEIS is a collaborative undertaking of the EC's Joint Research Centre in Ispra, WHO's European Centre for Environment and Health in Bonn, and the many environment and public health organisations and institutions from 12 countries totaling 26 cities in Europe: Athens, Barcelona, Bilbao, Bordeaux, Bucharest, Budapest, Celje, Cracow, Dublin, Gothenburg, Le Havre, Lille, Ljubljana, London, Lyon, Madrid, Marseille, Paris, Rome, Rouen, Seville, Stockholm, Strasbourg, Tel Aviv, Toulouse and Valencia.

Following, some descriptive findings of the second-year report are compiled.

Concentration of Particulate Matter

In APHEIS air quality data of areas representative for the exposure of the population at large were used. Most of the time, this choice limits the measurement stations to urban background locations.

In most European cities particulate air pollution (or very small particles) is measured daily using one of two metrics: PM_{10} (particles less than 10 micrometers in size); or black smoke (black particles, roughly less than 4 micrometers in size).

Levels of particulate air pollution, including PM_{10} and black smoke, vary widely across Europe. The annual average levels in APHEIS cities range from 14 to 73 $\mu g/m^3$ for PM_{10} (Figure 1) and from 8 to 66 $\mu g/m^3$ for black smoke (Figure 2).

Numerous studies conducted in Europe and other parts of the world have shown that such pollution levels constitute a health risk. The APHEIS report demonstrates that reducing these levels, even by a small amount, could produce significant benefits to public health.

Figure 1: Annual mean, 10th and 90th percentiles of PM_{10} concentration

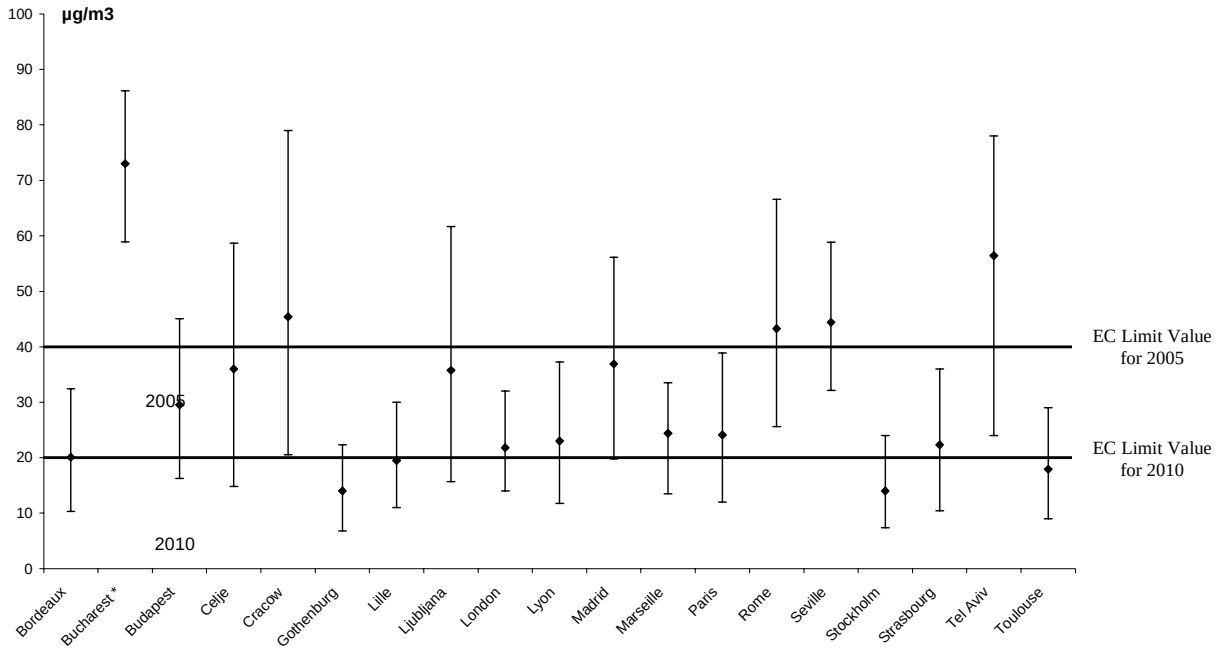
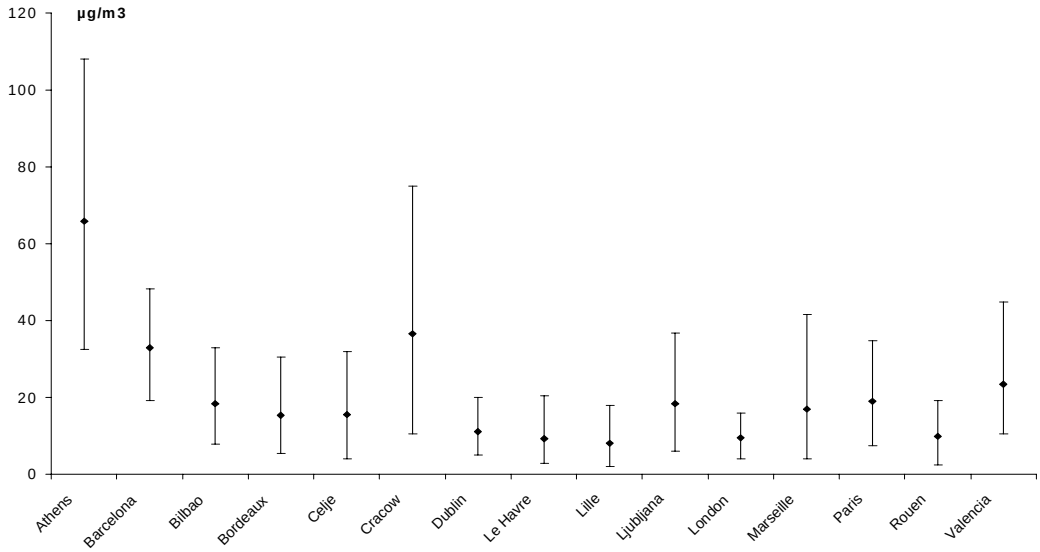


Figure 2: Annual mean, 10th and 90th percentiles of black smoke concentration



Health Impact of PM_{10}

The report indicates that 2,653 premature deaths (or 9 premature deaths per 100,000 inhabitants) could have been prevented annually if long-term exposure to annual mean values of PM_{10} had been reduced to 40 $\mu g/m^3$ in the 19 cities that measured PM_{10} particles and whose populations total nearly 32 million inhabitants. The level of 40 $\mu g/m^3$ is the limit value set by the European Commission for all member states which is to be attained by 2005.

If the more ambitious limit value of 20 $\mu g/m^3$ set for 2010 had been achieved in the same cities, 11,855 premature deaths (or 43 premature deaths per 100,000 inhabitants) could have been prevented annually.

Furthermore, the report shows that reducing long-term exposure to outdoor PM_{10} by just 5 $\mu g/m^3$ would have prevented 5,547 premature deaths annually (or 19 premature deaths per 100,000 inhabitants) in all the cities, including those with the lowest pollution levels. It should be noted that at least 832 (or 15%) of these 5,547 deaths (due to long-term exposure to PM_{10}) could have been prevented by reducing short-term exposure to PM_{10} by 5 $\mu g/m^3$.

Health Impact of Black Smoke

Concerning black smoke, according to a Dutch cohort study just published, the effects on mortality rates of long-term exposure to this pollutant should be similar to the effects of PM_{10}. However, since no exposure-response functions were available for the chronic, long-term effects of exposure to black smoke when the APHEIS study was conducted, the second part of Health Impact Assessment was limited to acute, short-term effects, and thus addressed only a small fraction of the total long-term impact of black smoke.

The assessment conducted in the 15 cities in which black-smoke particles was measured and whose populations total almost 25 million inhabitants, revealed that nearly 577 premature deaths (or 3 premature deaths per 100,000 inhabitants) could have been prevented annually if short-term exposure to outdoor concentrations of black smoke had been reduced by 5 $\mu g/m^3$.

Conclusion of the Report

The APHEIS report findings show that even very small reductions in air pollution levels of particulate matter, such as 5 $\mu g/m^3$, have a beneficial impact on public health, and thus justify taking preventive action in all cities, no matter how low their levels of air pollution.

The findings are also consistent with those of other organisations, and add one more brick to the wall of evidence that air pollution continues to have an impact on public health.

As another key point, the APHEIS report, entitled “A Health Impact Assessment of Air Pollution in 26 European Cities”, states that the major reason air pollution exposure results in important health impacts is the ubiquity of the exposure, over which individuals have little control. This contrasts with other health-risk factors, such as cigarette smoking and diet, which individuals can control more readily.

APHEIS Today and Tomorrow

The APHEIS programme aims to provide European decision makers, environmental-health professionals, the general public and the media with an up-to-date, easy-to-use information resource to help them make better-informed decisions about the issues they face concerning air pollution and public health.

To meet these goals, during its first and second years the APHEIS programme assembled a network of environmental and health professionals in the above 26 European cities, created an epidemiological surveillance system that generates information on an ongoing basis, and conducted the present HIA of particulate matter in these cities.

The second-year report constitutes the initial step in meeting the information and decision-making needs of the different audiences the programme serves.

As the next steps in fulfilling its mission, during its third year APHEIS is now researching key European policy makers and influencers concerned with the impact of air pollution on public health to understand how the programme can better meet their information needs.

Within APHEIS years of life lost, or reduction in life expectancy, in order to estimate the health impacts of long-term exposure to air pollution will also be calculated.

In the future to collaborate with economists on calculating the costs to society of the health effects of air pollution in the cities participating in the programme is planned too.

Within APHEIS a more closely collaboration with local, regional, national and European programmes is foreseen to share its latest findings with them. These programmes include NEHAPS (National Environmental Health Action Plans); the European Union's AIRNET (A Thematic Network on Air Pollution and Health); WHO's European programme on air pollution and health; and the European Union's CAFE (Clean Air for Europe) programme, and EUROHEIS (A European Health and Environment Information System for Disease and Exposure Mapping and Risk Assessment), and Air Quality-Related actions of the European Environment Agency.

The APHEIS programme is coordinated by Institut de Veille Sanitaire (InVS) in Saint-Maurice, France and by Institut Municipal de Salut Publica de Barcelona (IMSPB) in Spain.

For further results and information, visit: www.apheis.org.

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PRESENT CONDITIONS AND PROBLEMS OF AIR POLLUTION IN BULGARIA

Milena Ilieva Parvanova

Introduction

Bulgaria is situated in South-East of Europe, in the middle of the Balkan peninsula. The territory of Bulgaria is 111 000 km^2. About 40% from the territory of the country are flat and hilly lands, the others 60% are mountainous. The climate of the country is moderate-continental.

The population of Bulgaria soon became over nine million inhabitants. The country is divided in nine administrative districts. The average density of population is about 80 people per km^2. Bulgaria can be considered as highly urbanized country, as more than 67% of the population lives in big cities.

After 1989 the political changes have led to fundamental re-organization of economic policy. Bulgaria is classified as country with transitional economics. In the period of last five years a significant decrease in the industrial production can be seen. In the structure of Bulgarian industry the chemical and oil manufacturing industry have the biggest fraction (35.6%). Other important branches are ferrous metallurgy (16.6%) and food processing industry (11.2%).

Bulgaria is poorly endowed with mineral recourses. Domestic oil and gas production covers barely 1% of requirements, black and anthracite coal - less than 20%, iron - less than 1%. In addition, the quality of some of Bulgaria's minerals is below the international average. Bulgarian lignite has one of the worlds lowest calorific values and contains a high percentage of ash and sulphur.

The power production is characterized with a high percentage of production from thermo-electric power-plants (58%). The production of nuclear power-plants is about 37%, and the production of hydroelectric power-plants is about 5%.

Environmental decision making in Bulgaria is carried out principally by the central Government. With respect to environmental protection, the most significant central government institution is the Ministry of Environment and Water, which has 15 Regional Environmental Inspections.

Present Conditions and Problems

The most serious environmental problems in Bulgaria are localized in specific areas, so-called hot spots, where point sources or groups of sources of pollution cause hazards to the health of the local population. Pollution in hot spots areas is mostly due to the heavy industry, ferrous and non-ferrous metallurgy, chemical and cement factories, and is as severe as in the most polluted areas of Central Europe. About 12% of Bulgaria's population live in hot spot areas.

The geographic areas of severe pollution and priority area for action in Bulgaria, mainly from industrial plants are:

- Plovdiv, Kurdjali and Pirdop are locations of large non-ferrous metal smelters
- Fertilizer and cement plants at Dimitrovgrad/Galabovo emit dust, SO_x, hydrogen sulfide and other pollutants;
- In Pernik, an iron and steel plant and a cement plant are large sources of air pollution;
- Bourgas is burdened by an oil and petrochemical complex;
- Pleven is affected by a site of a cement plant and refinery;
- In Kremikovtsi, near Sofia, Bulgaria's largest iron and steel plant is located.
- Devnya, near Varna, is seriously affected by chemical, cement and power plants.

2. Measured annual average concentrations of dust in the air of many large Bulgarian cities are above acceptable levels. These high concentrations of particulates in ambient air are due to:

- emissions from high stacks of power plants and large industrial factories;
- emissions from household and small industrial boilers using coal as fuel;
- dust due to traffic pollution.

3. Although less widespread, high concentration of sulphur dioxide in the air is a serious problem in many Bulgarian cities as well. It is caused by emissions from:

- heavy industrial factories;
- thermal power plants;
- domestic heating with coal and briquette.

While 75% of total SO_2 emissions are discharged from power plants, they have very high stacks and are located in less populated areas, so they cause less health problems than other industries and domestic heating.

4. There are significant air pollution problems associated with the traffic of private cars, busses and trucks in the major urban centres. The levels of lead and dust are quite high along major urban corridors. These levels appear to be closely associated with the traffic, and highly polluting nature of the vehicles. Most of them are old and poorly maintained and have no pollution control equipment.

Air Pollution Control - Strategies and Policies

1. Bulgaria has signed and ratified several international agreements concerning air pollution policy:

- transboundary air pollution convention, including the Helsinki Protocol calling for 30% reduction of SO_2 emissions by 1993;
- the Sofia Protocol on NO_x emission;
- Vienna convention and the Montreal Protocol on the protection of the ozone layer;
- Oslo protocol for SO_2 emission reduction to 2010 year by 45%; as well as stringent uniform emission standards for both new and existing power plants;
- Geneva protocol for 30% VOC emission reduction by 1999;
- Kyoto protocol on reduction of total greenhouse gas emission under the Framework Convention on Climate Change;
- Bulgaria acceded to the Framework Convention of Climate Change.

2. The New Air Quality Law has been adopted in May 1996. It indicates the pollutants to be measured, air quality guidelines and emission reduction measures to be undertaken regarding stationary and mobile emission sources. This Air Quality Law concerns designed plants, transport facilities and other potential sources of air pollution, as well as those under construction and in operation. In the current decade Bulgaria started to enact a modern legislation for environment protection, which is being updated and harmonized with the corresponding European Union (EU) legislation. The new Environmental Protection Act was adopted in 1991 and amended in 1992. The Executive Agency of Environment (EAE) is involved in the approximation of the Bulgarian legal regulatory framework with EU laws, regulations, norms and standards. EAE experts participate in the establishing of all legislative projects and acts, national standards, marginal acceptable standard requirements for pollution and other norms and regulations pertaining to environmental protection and preservation.

3. Environmental impact assessment is implemented for all existing and operating plants and facilities, as well as for those under construction, development or reconstruction.

4. Self emission monitoring for all point sources is in preparation to be introduced. In this way the burden of the emission inventory will fall upon the emitter in relation with the principle “polluter pays”.

Air Quality Monitoring System - Main Features

In accordance with the new Environmental Protection Act (adopted in 1991 and amended in 1992) the Ministry of Environment and Water (MEW) is in charge of organizing and conducting to monitor the environmental components including air quality which is of great importance to the human health and sustainable development. One of the main functions of the MEW and its bodies, the Executive Agency of Environment (EAE) and 15 Regional Environmental Inspections (REI), is to collect, handle and store air and water quality data and to provide the interested governmental institutions and general public with relevant information. For this purpose, EAE and REI have set up specialized structural units and laboratories. The information obtained through the air quality monitoring system is used as a basis for setting a national policy and strategy on air quality management as well as undertaking appropriate pollution abatement measures. Air quality monitoring has been conducted in Bulgaria since 1975. The involved institutions at national and local levels are MEW respectively EAE and REI and National Institute for Meteorology and Hydrology (NIMH).
EAE is composed of the following main departments:

1. Environmental Monitoring and Sustainable Development Department;
2. Analytical Laboratory Department;
3. Information Assurance and Publishing Department.

Scope of Major EAE Activities:

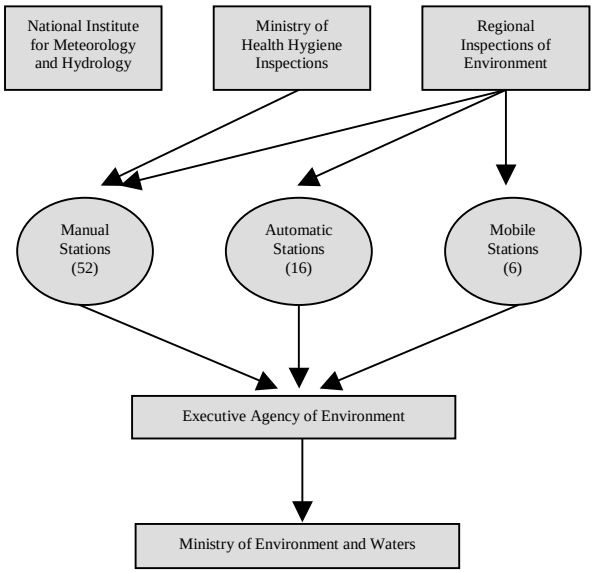
- To develop, operate and maintain the National System for Environmental Monitoring;
- To execute key projects form the Bulgarian National Strategy for the Environment and Sustainable Development;
- To participate in international projects with similar environmental agencies, organizations and institutions, in compliance with MEW overall control and policy guidelines;
- To plan and implement educational programmes and staff activities as well as on-the-job training using complex technical means of NASEM within the system of the MEW;
- To acquire, store, process, analyse and distribute of system-wide internal/external information, referring to the environment of the Republic of Bulgaria for the purposes of MEW, other State Entities and Institutions, as well as national and international agencies, partners and customers through conventional and on-line publication of research data: bulletins, annotations, bibliographies, references etc.

Ambient Air Quality Monitoring Network

Nation-wide air quality monitoring in our country started in 1975. Since than significant transformations and changes have been done in the institutional structure of these monitoring system. After 1995 the network is supplied with sophisticated sampling and laboratory equipment by the EC PHARE programme. Air quality monitoring and emission inventory are financially ensured by the state budget and partially by the National Fund at MEW. Because of economic difficulties, the allocated finances from the budget for the air quality monitoring are limited, which results in decreasing the number of manual stations since 1995.
The database information system was started in January 1986. Monthly averaged data had been received from the institutions, responsible for the monitoring. For every station and every pollutant the information includes four values: number of samples per month, maximal short term (30 min, 60 min) concentration per month, monthly averaged value and percentage of samples with short term (30 min, 60 min) concentration above the limit value.
After March 1991 a new database has been created. Air quality data management is in the responsibility of EAE. Input data are collected

from: laboratory analysis made by REIs, EAE, NIMH and Hygienic Inspections; stationary automated stations; mobile automated stations. The information path is illustrated on the chart below:

Figure 1: Information path of the data in the National Air Monitoring Network



The network consists of 68 stationary stations, of which 16 automated (on-line) and 52 with manual sampling and chemical analysis, as well as 6 mobile automated stations. The stations are placed in 37 settlements all over the country - urban, living, high traffic and industrial areas.

All the manual stations operate in unified sampling regime and standardized analytical procedures in accordance with Bulgarian National Standard "Basic rules for air quality sampling". The sampling frequency is 4 times per day, 5 days per week.

The basic measured parameters are: TSP, Pb aerosols, SO_2, NO_2, H_2S. In relation with specific industrial activities, additional pollutants are also measured, such as: NH_3, phenol, arsenic aerosols, HCl, Cl_2, HF and fluorides.

The automated stations operate continuously. They supply the network with data for: dust, SO_2, CO, NO, NO_2, H_2S, THC, O_3 and meteorological parameters (air temperature, wind speed, wind direction, relative humidity and atmospheric pressure).

Six OPSIS systems operate continuously as well, situated in the most affected industrial areas in the country. In addition another seven OPSIS systems are working in Danube area in relation with transboundary air pollution between Bulgaria and Romania.

In the air quality laboratories of EAE and REI chemical analysis are performed in accordance with standardized analytical methods. A Quality Handbook, which is periodically updated, is also available. Control of the measurement accuracy is performed (calibration curves setting, verification with standard samples, prepared in the laboratory). Comparative assessment of the results of the chemical analysis from different measuring devices is done. The laboratories of EAE are accredited by Bulgarian Accreditation Body.

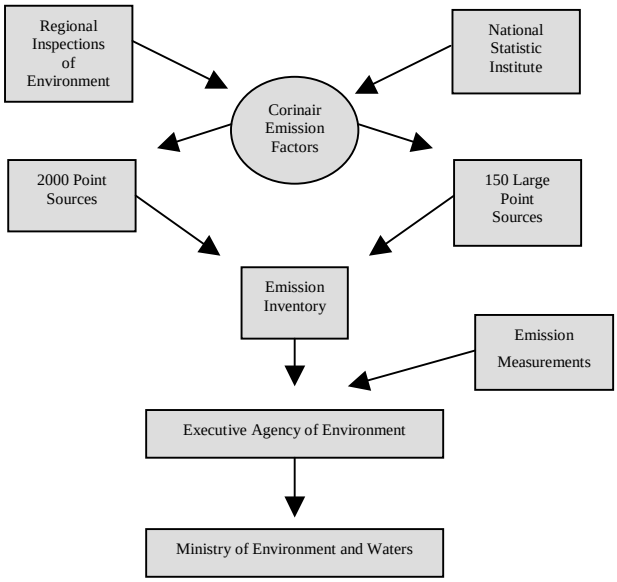
Air quality data management is another responsibility of EAE. Raw and aggregated data are stored in local databases of all REI. The data from REI are sent to the national database at EAE. Before storage in the database checking for outliers is performed.

Emission Inventory System

Establishing of a well-working emission inventory system is the main successful experience in the air pollution control programme. The main task of the emission inventory system is to provide objective, reliable and timely information for industrial emission sources and their emission into air for framing, implementation and further developing of a national environmental policy; optimizing emission reduction strategy; identifying, preparing and evaluating guidelines and legislation on the emission management.

The inventory system covers the whole territory of the country and all stationary point sources. The information is acquired according to the chart below:

Figure 2: Path of acquiring information for the inventory system of the industrial emission sources



Two parallel emission inventory programmes take place in Bulgaria. The first one covers 150 large point sources and is performed by REIs. The second one covers nearly 2000 point sources and is conducted by National Institute of Statistics (NSI). Both are under the guidance of MEW. Air pollution control facilities and their efficiency, technological and production data, data for fuels used and fines are the most important data, collected under that programmes. For both programmes the emissions are calculated in accordance with CORINAIR methodology. Local databases are created in the REIs and NSI. Both institutions provide emission data to the national database at EAE. The data are updated every year.

Emission measurement are performed according to approved by MEW lest of the major emission sources, twice per year. NCESD and REIs provide data for TSP, soot, SO_2, NO_2 emissions and some other specific pollutants in order to assess compliance with National Emission Standards.

At the present stage the emission monitoring system is organized successfully and operates satisfactory. The strength of the programme is the collection of statistic data. The weakness is insufficient emission measurements. Because of the limited funding, it does not cover all emitted pollutants that threaten human health at all point sources and with required measuring frequency because of the limited funding. The burden of emission inventory falls upon the state budget and the national fund at the MEW, where all air pollution fines are collected.

Bulgarian Implementation Programme for Approximation of EU Environment Legislation

This section concerns the efforts of Bulgaria to approximate legislation and practices concerning air quality assessment and management, and emissions from mobile sources i.e. transport related emissions from motor vehicles, non-road mobile machinery and fuels.

The Air Quality Framework Directive (96/62/EC) provides a comprehensive strategy for the management of air quality in EC Member States linking controls on emissions with the attachment of the air quality objectives. This Directive is progressively taking effect as its daughter Directives are adopted and enter into force. A revised range of air quality standards for specific pollutants are foreseen as daughter directives under the framework directive.

The first daughter directive has been adopted in the Community at the end of April (1999/30/EC). The Directive (COM(97)500) will replace the three existing Directives, which establish air quality standards for sulphur dioxide, particulates, lead and nitrogen oxides. The most recent daughter Directive proposals submitted by the Commission aim to set the air quality standards for benzene and carbon monoxide as well as ozone. The later proposal, which the Commission published in March 1999, aims to establishing limit values for tropospheric ozone in the air together with very precise monitoring requirements. This proposal is intended to eventually replace the existing Directive 92/72/EEC.

A series of Directives control emissions from motor vehicles, non-road mobile machinery and fuels through technical requirements on the vehicles and through limits on the presence of substances such as lead and sulphur in fuels. This Directives have recently been significantly revised with the passage of the "Auto-Oil" as well as other amending Directives.

Existing Bulgarian legislation transposes very well the EU requirements on air quality assessment and management. Relevant Bulgarian legislation consist of the following main instruments (laws and associated lower level instruments):

- Ambient Clean Air Act, 1996 (ACAA);
- Regulation N7 on ambient air quality assessment and management, from May 3, 1999 (into force on January 1st, 2000);
- Regulation N9 on limit values for sulphur dioxide, nitrogen oxides, find particulate matter and lead in ambient air from May 3, 1999 (into force on January 1st, 2000; but arts. 4, 5, 8 and 21 on January 1st, 2003, and arts. 11 and 12 - find particulate matter on December 31st, 2003);
- Regulation N8 on ambient air quality limit for ozone from May 3, 1999(into force on May 22st, 1999, but art. 5 (3)- on December 31st, 2001 and art.7 December 31st, 2003);
- Environmental Protection Act, 1991 (EPA);
- Regulation N16 on the control of VOC_s emissions resulting from the storage, loading or unloading and transportation of petrol.

The Environmental Protection Act is the Framework act in Bulgarian environmental legislation and it is thus relevant also in the air quality sector. Its role in the transposition of EU air quality legislation is more or less limited to various information procedures.
The Air Quality Framework Directive is transposed into Bulgarian legislation mainly by Regulation N7 on ambient air quality assessment and management.

Air Quality Standards

As mentioned above, Bulgarian air quality standard legislation is drafted with the aim of transposing forthcoming EU legislation.
Therefore the compliance of Regulation N9 with the air quality standard Directives still existing at the moment and in the scope of the project is not very relevant. Regulation N9 on limit values for sulphur dioxide, nitrogen dioxide, particulate matter and lead in ambient air should fully transpose the first daughter Directive to the Air Quality Framework Directive. In any case the field of air quality standards is exhaustively covered by Bulgarian Legislation, and no additional instruments need to be created to transpose the currently existing Directives establishing the air quality standards.
Directive 92/72/EEC on tropospheric ozone pollution is also fully transposed into Bulgarian legislation. The main instrument is Regulation N8 on ambient air quality limit values for ozone. The Bulgarian requirements on the ozone monitoring network comply well with the provisions of the Directive. No additional transposition measures are needed.

Priority Areas of Action

Ambient air is one of the five key-sectors identified in the scope of the National Development Plan until the year 2006, based on the Bulgarian National Programme for Adoption of the Acquis (NPAA). The general objective is to reach the limits for harmful substances in ambient air, and the limits (thresholds) for health and planned protection for ozone. In order to achieve that, the following short and middle term priorities have been set:

- Limitation of air pollution from sulphur, lead and other harmful emissions from liquid fuels;
- Establishment of measures for restriction of harmful emissions from specific production activities, like installations for storage and transportation of petrol;

- Effective implementation of by-laws to the Ambient Clean Air Act (ACAA), related to evaluation and management of air quality;
- Effective implementation of by-laws to ACAA, related to prevention and restriction of emissions from specific production activities;
- Restriction of air pollution from harmful emissions from non-road mobile machinery.

Conclusions and Recommendations

The priority actions to fill the gaps identified in the ambient air sector are the following:

- Compare the existing air monitoring system and methods with the air quality Framework Directive requirements, establish national database relevant to be reported to the European Commission and EEA, end assess and estimate the needs of new monitoring stations;
- Accreditation of the laboratories and monitoring network;
- Adopt Type Approval procedure and vehicle emissions standards, issue licenses for Type Approval and establish authorities to inspect the activities on Type Approval;
- Establish procedures for inspection and control of the quality of the fuels on the market, and programmes for inspection and self-control for the content of lead, sulphur, etc.; adopt new standards limiting the pollutants content in fuels;
- Develop programmes to reduce ambient air pollution and improve air quality in areas and agglomerations where air quality does not meet limit values;
- Adopt new emission limits.

The Ministry of Environment and Water, in its Environmental Strategy, has identified air pollution as the country's most important environmental problem and proposed priorities for improving air pollution management. While some progress in implementing policy measures has been made, most measures are only just being designed or beginning to be implemented. Important actions require enabling legislation.

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NOTES AND NEWS

Air Management Information System (AMIS 3.0)

The third CD-ROM of the Air Management Information System (AMIS) has recently been published. The CD-ROM contains the AMIS Databases with summary of air pollution data in 150 cities and with information on air quality management capabilities in 70 cities. In addition, the CD-ROM contains the WHO Guidelines for Air Quality, the WHO-UNEP-WMO Health Guidelines for Vegetation Fire Events (English, French and Spanish version). Moreover, training material for a Training Course on Air Quality and Health (Power Point slides in PDF format and handouts in PPT format) and for a Training Course on the Guidelines for Vegetation Fire Events (Power Point slides in PPT and PDF formats, handouts in PPT format, in English and Spanish) is available from the CD-ROM.
The various files can be addressed under the operating systems Windows NT, Windows 2000, and Windows XP.

For Information, please contact:

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Nine-Cities Air and Health Surveillance Programme (PSAS-9)

The Institut de Veille Sanitaire published its first results on the French Nine-Cities Air and Health Surveillance Programme (PSAS-9) in March 1999. Phase I pointed out that it was possible for various specialists in the field of air pollution and health to gather around a common set of problems. They also found a link between the daily variations of all the urban air pollution indicators and the total, cardio-vascular and respiratory mortality data.
The recently published report presents the results of phase II of the PSAS-9 programme which essentially aimed at assessing the short-term exposure-risk relationships between pollution indicators and hospital admission indicators.
The second phase also allowed to confirm the results of phase I on the short-term effect of air pollution on mortality due to longer periods of study.
Exploratory analysis using new indicators and sensitivity analysis on the pertinence of results were also conducted. Finally, methodological tools were developed in order to optimise data collection and statistical modelling. All these results enabled the quantification of the short-term impact of air pollution on population health in the PSAS-9 cities (Bordeaux, Le Havre, Lille, Lyon, Marseille, Paris, Rouen, Strasbourg and Toulouse).
PSAS-9 is now an ongoing epidemiological surveillance programme on the effects of urban air pollution on health, providing information tools to decision-makers and the general population.

For information, please contact:
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Selected Internet Links on Air Pollution and Health Actions

Organizations

WHO/HQ Air Quality Management
http://www.who.int/peh/air/airindex.htm
http://www.who.int/health_topics/air/en/

WHO/EURO Air quality and health programme
http://www.euro.who.int/air

UNECE
http://www.unece.org/env/welcome.html

Worldbank
http://www.worldbank.org/cleanair/

European Commission
http://europa.eu.int/comm/environment/air/cafe.htm

European Environment Agency
http://themes.eea.eu.int/Specific_media/air

ETC/Air and Climate Change
http://etc-acc.eionet.eu.int/

ISEE
http://www.iseepi.org/index1.htm

IUAPPA
http://www.iuappa.fsnet.co.uk

Institutions

EC-JRC
http://ies.jrc.cec.eu.int/

HEI
http://healtheffects.org/

STAPPA/ALAPCO
http://www.cleanairworld.org/

Umweltbundesamt (UBA)
http://www.gein.de/index_de.html

US EPA
http://www.epa.gov/ttnamti1/

Projects

AIRNET (A Thematic Network on Air Pollution and Health)
http://airnet.iras.uu.nl

APHEIS (Air Pollution and Health: A European Information System)
http://www.apheis.net/

APNEE (Air Pollution Network for Early Warning and On-line Information Exchange in Europe)
http://www.apnee.org/

ARPED (UK Air Pollution Research Database)
http://wads.le.ac.uk/ieh/apred/index.htm

ECRHS (European Community Respiratory Health Survey)
http://www.ecrhs.org/

HEAVEN (Healthier Environment through the Abatement of Vehicle Emissions and Noise)
http://www.rec.org/heaven/

HEPMEAP (Health Effects of Particles from Motor Engine Exhaust and Ambient Air Pollution)
http://www.hepmeap.org/

IERIE (Inventory of European Research on the Indoor Environment)
http://wads.le.ac.uk/ieh/ierie/index.htm

PEOPLE (Population Exposure to Air Pollutants in Europe)
http://www.people-pt.net/eindex.html

RAIAP (Respiratory Allergy and Inflammation Due to Ambient Particles)
http://www.raiap.org/

UBA-Diesel (Traffic-related outdoor and indoor concentrations of fine particles)
http://www.gsf.de/epi/de/index_netw_kora.htm

MEETINGS AND CONFERENCES

EEA/WHO Workshop on Health-Related Indicators of Air Quality 19/20 September 2002 in Berlin, Germany

Human health is in the focus of European regional and urban air quality management, and of key interest in the European Commissions Clean Air for Europe (CAFE) programme. Comprehensive assessment of the level of health protection achieved by the local, national and European actions on air quality might be improved by implementation of a set of indicators relating health impacts to air quality. Such indicators should be based on a thorough understanding of the links between health and air quality, be feasible for generation using existing air quality assessment systems and be easy to communicate with policy makers and the public. Some of such indicators have been proposed by WHO in its project on a broader set of Environmental Health indicators prepared in the process leading to the 4th Ministerial Conference on Environment and Health 2004 in Budapest. EEA has also developed relevant exposure indicators built from data reported under EU legislation. Both systems rely on the availability of adequate air quality information collected by air quality monitoring networks throughout Europe as well as on standardized data processing and reporting procedures. Such information is available in the European air quality information system AIRBASE.

To review the proposed approaches and the necessary input data, as well as to agree on further steps necessary for the generation of the core indicators in the Member States, WHO/EURO programme on Air Quality and Health and the European Environment Agency convened this joint workshop. It was hosted by the WHO Collaborating Centre on Air Quality Management at the German Federal Environment Agency in Berlin. 83 participants from 28 countries participated in the meeting, responding to invitation distributed through the networks of WHO, EEA, CAFE, and AIRNET. The participants represented public health and environmental agencies, as well as research institutions.

The workshop stressed the importance of indicators reflecting population exposure to (outdoor) air pollutants. The existing knowledge on exposure-health associations can be used to link these indicators with the magnitude of heath impacts. The exposure indicators are already feasible for construction in most countries of Europe using existing information from air quality monitoring and modelling. Further development of the harmonized approaches to air quality assessment, including monitoring of PM10 and PM2.5, will further enhance the ability for generation of comparable, health-relevant air quality indicators.

There is also a need to continue harmonization of registration and surveillance of non-fatal health outcomes associated with exposure to air pollution to allow construction of morbidity-based indicators and assessment of total burden of air pollution on health in the future.

Development, update and application of the indicators will require strengthened co-operation of public health and environmental experts, agencies and decision makers.

For further information, see: www.eea.eu.int

Michal Krzyzanowski
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WHO European Centre for Environment and Health (Bonn Office)
Workshop "Environmental Health Indicators", 28/29 October 2002 in Bonn, Germany

The WHO/Euro project "Environmental Health Indicators" organized by the WHO European Centre for Environment and Health (WHO/ECEH, Bonn Office) entered the stage of pilot testing the developed Environmental Health core indicator system in several European countries (www.euro.who.int/Ehindicators).

To discuss the progress of the pilot studies in the countries and to agree on follow-up actions 38 experts from 14 European countries and collaborating institutions took part at a two-day Workshop in Bonn. The participants from the pilot countries (Armenia, Bulgaria, Czech Republic, Estonia, Finland, Germany, Hungary, Lithuania, The Netherlands, Poland, Romania, Slovakia, Spain and Switzerland) presented some of their experiences made during the pilot phase and discussed the main problems they encountered. While five countries already finished their data collection phase the others will complete this task until December 2002. It became obvious that some of the indicators still need further refinement to facilitate the data collection and to obtain international comparable results.
To serve the different requirements of policy oriented reporting the structure of the products to be delivered for the next Ministerial Conference on Environment and Health 2004 in Budapest was a main focus during the workshop sessions. To present the gathered information to policy makers and stakeholders in the field of environmental health short information will be made available in the form of fact sheets which summarise the environmental health and policy context of a specific indicator that represents the underlying themes (e.g. air pollution, housing and settlement, traffic, noise).

A comprehensive report on national and sub-national data will be provided mainly for national purposes and to demonstrate the use of the core indicator set on a national level. Because environmental issues have to be discussed in an international context a drafting group for an international report will be established. The international report to be prepared for the Budapest conference will present an assessment based on the data from the countries participating in the pilot study.

Another focus laid on the discussion of the structure of the data streamlining and data processing routines to be established for the future. The software "EuroIndy" developed by a project team of the participating national institutions so far serves as a basic data collection tool (MS Access 2000 database).
The experts discussed their experiences and problems made with "EuroIndy" and gave recommendations for further developments. The idea of national data repositories that are supplied by those national agencies that collect and store data were seen as an ideal. Such sources of national data that could serve different purposes are developing in the European Union (EU) where member countries deliver their mandatory required data. Furthermore, the European Environment Agency presented the approach developed for European-wide environmental reporting mechanisms.

The workshop report will be available at the beginning of 2003 and can be obtained from the WHO/ECEH, Bonn Office (contact: dda@ecehbonn.euro.who.int).

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PUBLICATIONS

WHO

The World Health Report 2002: Reducing risks, promoting healthy life

WHO Publications, Geneva 2002, Copies of this publications could be ordered from: bookorders@who.int

The World Health Report 2002 measures the amount of disease, disability and death in the world today that can be attributed to some of the most important risks to human health. It then goes on to calculate how much of this present burden could be avoided in the next 20 years. Although the report carries some ominous warnings, it also opens the door to a healthier future for all countries - if they are prepared to act boldly now.

The findings are exciting. The report shows that a relatively small number of risks cause a huge number of premature deaths and account for a very large share of the global burden of disease. Reducing these risks would result in significant gains in healthy life expectancy for people in all countries. These gains could be achieved through the greater use of existing cost-effective interventions and population-wide risk reduction strategies.

More than 20 major risks are examined in the report. They range from underweight and unsafe water, sanitation and hygiene, to high cholesterol, high blood pressure, tobacco and obesity. The findings give an intriguing - and alarming - insight into not just the current causes of disease and death and the factors underlying them, but also into human behaviour and how it may be changing around the world.

WHO Regional Publications, European Series, No. 97: The European Health Report

WHO Regional Office for Europe, Copenhagen, 2002, 166 pages, English (French, German and Russian edition in preparation), ISBN 92 890 1365 6, Sw.fr. 42.-, in developing countries: Sw.fr. 29.40

The European Health Report responds to the statutory requirement to provide the Member States with essential public health information. It provides a broad but concise picture of the health status and health determinants in the Region, and identifies areas for public health action for the Member States and the European public health community. The report focuses on concrete evidence useful for decision-makers in public health. Its role is to summarize and feed back the Member States the information created, deposited and "accredited" during the Regional Office's work with Member States on key topics and issues in public health in Europe, in the context of the values and principles of WHO as "one Organization".

Children in the New Millenium: Environmental Impact on Health

WHO Publications, Geneva 2002,
142 pages, ISBN 92 4 159016 5
Sw.fr. 15.-, in developing countries: Sw.fr. 10.-

In the context of examining progress made since the 1990 World Summit for Children and the 1992 United Nations Conference on Environment and Development, this book provides an overview of key environmental risks to children's health and the underlying causes. Highlighted are children's special vulnerability and susceptibility to environmental threats at each developmental stage, during pregnancy, infancy and early childhood, through the school age and adolescence. Specific environmental threats of major importance to children are described, including lack of safe water and sanitation, chemical pollution and radiation, indoor and outdoor air pollution and natural source degradation. A series of recommendations are proposed for action at the local, national, regional and international levels to improve children's environmental health.

Healthy Villages – A Guide for Communities and Community Health Workers

Guy Howard et al., WHO Publications, Geneva 2002, ISBN 92 4 154553 4, US $19.80, for developing countries US $15.40

Health is determined by many factors, including income, environmental conditions – such as access to adequate sanitation and safe water supplies – individual behaviour, and health services. More than half of the world's population lives in villages and rural areas and most of those without access to safe water sources or basic sanitation are rural dwellers. Enabling rural populations to protect and improve their health is a major challenge worldwide. In response to this, an informal "healthy villages" movement has evolved. A healthy villages project promotes local actions by community members, mobilizing human and financial resources to build healthy environments and promote healthy behaviours. This guide is intended to provide community leaders with information to assist them in implementing and sustaining a healthy villages project. It covers topics such as water and sanitation, drainage, waste management, housing quality, domestic and community hygiene, and provision of health services, providing extensive source materials for adaptation to local needs and conditions.

OTHERS

Air Pollution Science for the 21st Century

J. Austin, P. Brimblecombe, W. Sturges (eds.), Pergamon 2002, 350 pages, ISBN 0 08 044119 X, EUR 140,-

Acid rain, photochemistry, long-range transport of pollutants, greenhouse gas emissions and aerosols have dominated tropospheric air pollution for the last 30 years of the 20th century. At the start of the 21st century, acid rain is subject to planned improvement in Europe and North America, but is still a growing problem in Asia. Tropospheric ozone is understood much better, but the problem is still with us, and desirable levels are difficult to achieve over continental Europe.
There is also increasing interest in indoor air quality, and the origin and health implications of atmospheric particles. Perhaps most important on a global perspective, intensive research has not yet determined the relationship between green house gases, aerosols and surface temperature. The climatic implications of these are now more urgent than ever.
This book, the first in the Developments in Environmental Science series, consists of a collection of authoritative reviews and essays on the science and application of air pollution research at the start of this new century.

Handbook of Air Pollution Prevention and Control

N. Cheremisinoff, Butterworth-Heinemann (publ.), 2002, 576 pages, ISBN 0750674997, £ 75.-

This handbook provides a concise overview of the latest technologies for managing industrial air pollution in petrochemical, oil and gas, and allied industries. Detailed material on equipment selection, sizing, and troubleshooting operations is provided along with practical design methodology. Unique to this volume are discussions and information on energy-efficient technologies and approaches to implementing environmental cost accounting measures.

Cross-sectional Environmental Study comparing two highly polluted areas in East Germany (Bitterfeld and Hettstedt) with a Control Region

J. Heinrich et al., Berlin 2002, WaBoLu-Heft 4/02, ISSN 0175 4211, 299 pages (in German only), published and disseminated by the Federal Environmental Agency, Berlin.

The aim of the epidemiologic study was to determine possible negative effects on the health of children in the very polluted areas of Bitterfeld and Hettstedt in comparison to the less polluted areas of Anhalt-Zerbst (Eastern Germany). The changes over time of the health parameters (respiratory tract and allergy symptoms and diseases) were recorded along with the running re-developments during the time period of 6 years. The study design consists of three repeated regional cross sectional studies in 1992/93, 1995/96 and 1998/99.

Jahresbericht der Luftgütemessungen in Österreich 2001

W. Spangl, J Schneider, Umweltbundesamt Österreich, Wien 2002, 120 pages, ISBN 3-85457-654-4, EUR 7.27

Jahresbericht 2001 – Luftgütemessungen des Umweltbundesamtes und meteorologische Messungen

W. Spangl, Umweltbundesamt Österreich, Wien 2002, 110 pages, ISBN 3-85457-655-2, EUR 7.27

COMING EVENTS

2003

February 2003

5th International Austrian-Israeli Technion Symposium: Particular Matter and Health
24-26 February, Vienna, Austria
For information, see: http://www.technion.org/

March 2003

Urban Transport 2003
10-12 March, Crete, Greece.
The 9th International Conference on Urban Transport and the Environment in the 21st Century is organised by the Wessex Institute of Technology, UK.
For information, see:
www.wessex.ac.uk/conferences/2003

8th International Conference on Atmospheric Sciences and Applications to Air Quality
11-13 March, Tsukuba Science City, Japan.
For information, see:
http://unit.aist.go.jp/emtech/topics/asaaq2003/index.html

(un)Healthy Housing: Promoting Good Health
19-21 March, University of Warwick, Coventry, UK.
For further details contact:
mailto:alison.solman@warwick.ac.uk

4th International Conference on Urban Air Quality – Measurement, Modelling and Management
25-28 March, Prague, Czech Republic.
Organised by the Institute of Physics, the Carolinum University, and the University of Hertfordshire in collaboration with SATURN and COST715. Supported by AWMA and IUAPPA.
For details contact: jasmina.bolfek-radovani@iop.org

PM 2003 - 4th International Colloquium on Particulate Air Pollution and Human Health Conference
31 March - 4 April, Pittsburgh, Pennsylvania, USA.
For more information, contact: American Association for Aerosol Research (AAAR), 1330 Kemper Meadow Dr, Cincinnati, OH 45240, USA, fax: +1-513-742-3355, e-mail: mail@aaar.org

May 2003

QA/QC of Emissions and Air Quality Measurements: Harmonization, Standardization and Accreditation
21-23 May, Prague, Czech Republic
For information, see:
http://ies.jrc.cec.eu.int/Units/eh/events/EAQH/

26th ITM-NATO/CCMS International Technical Meeting on Air Pollution Modelling and its Application
26-30 May, Istanbul, Turkey
For information, see: http://www.dao.ua.pt/itm

June 2003

Symposium on Transport and Air Pollution
16-18 June, Avignon, France.

Symposium on Environment and Transport
19-29 June, Avignon, France.
For information, see :
http://www.inrets.fr/services/services.e.htnl

July 2003

Healthy Buildings 2003: Official Conference of International Society of Indoor Air Quality and Climate (ISIAQ)
13-17 July, Singapore.
For information, see: http://www.HB2003.org

September 2003

Air Pollution 2003 - 11th International Conference on Modelling, Monitoring and Management of Air Pollution
17-19 September, Catania, Italy.
For information, see:
www.wessex.ac.uk/conferences/2003

Environmental Health Risk 2003 - 2nd International Conference on the Impact of Environmental Factors on Health
17-19 September, Catania, Italy.
For information, see:
www.wessex.ac.uk/conferences/2003

October 2003

13th Regional IUAPPA Conference on Air Quality of Urban, Regional and Global Scales
6-10 October, Dubrovnik, Croatia.
Contact: vadic@imi.hr

EDITORS' NOTE

We appreciate submissions to NOTES AND NEWS regarding programmes and projects within the field. Notes (100-500 words) should be sent directly to the WHO Collaborating Centre for Air Quality Management and Air Pollution Control.

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