NEWSLETTER

WHO COLLABORATING CENTRE FOR AIR QUALITY
MANAGEMENT AND AIR POLLUTION CONTROL

at the

FEDERAL ENVIRONMENTAL AGENCY
GERMANY

No. 29 June 2002

CONTENTS

C.A.F.E.: "Clean Air for Europe" Programme of the EU

- AIRNET -

A THEMATIC NETWORK ON AIR POLLUTION AND HEALTH

Marjan Tewis, Leendert van Bree and Bert Brunekreef

Objectives

In the last decade, the health effects of air pollution have attracted much attention. Effects of particulate matter, ozone and some other gaseous pollutants on (premature) mortality as well as morbidity have been documented in a large number of epidemiological studies. Toxicological concepts on causal components and involved biological mechanisms are being developed. Many studies found effects at concentrations well below current standards or guidelines, and even though the relative risks may be considered as small, there is a serious public health problem because of the large number of people exposed and the existence of specific subpopulations that are at increased risk. New air quality standards have been promulgated or proposed in response to such findings. Stakeholders such as policy makers, consumer organizations, environmental NGOs, car manufacturers, and the oil and gas industry are all trying to come to grips with the new findings.

Various uncertainties complicate health risk assessment and standard settings as well as development of cost-effective emission and risk control strategies. Such strategies should be ideally targeted on responsible agents and their most important sources and emissions. Therefore data should be extracted and discussed from recent and ongoing studies on health effects in relation to exposure and air quality, and emissions and sources, in a coherent and integrated way. This will substantially strengthen integrated health risk assessments and evaluations of the scientific basis for control strategies to reduce health risk.

The Thematic Network on Air Pollution and Health **(AIRNET)** will serve as a forum within Europe to integrate the scientific, public health, control policy, industry as well as consumer issues which are involved. It will develop a framework for the (final and intermediate) collection, discussion, and interpretation of results of research supported by the FP4 and FP5 programmes, as well as of nationally funded studies. It will draw policy-relevant recommendations from the activities mentioned.

Joint discussion and dissemination of the results of all these studies (as opposed to single study dissemination) have many benefits in terms of efficiency, transparency and coherence.

The Network, in this way, attempts to create a widely supported basis for public health policy related to improving air quality in Europe and regulatory needs to achieve that goal.

AIRNET has already brought together scientists from the field of air quality and health with stakeholders from industry, governments and NGOs. The Thematic Network consists of:

- coordinators and additional key investigators of EU funded projects that were (or are being) conducted within the 4th and 5th Framework Programmes
- key investigators of non-EU funded major recent or ongoing studies on air pollution and health
- WHO representatives, especially from the Rome and Bonn centres on Environment and Health
- UN-ECE and related bodies involved in environmental health impact evaluations
- policy makers at the EU and from some national governments
- representatives of the automobile, the oil and/or gas industry
- representatives of some key consumer organizations and environmental NGO's.

Role of Participants

There is one coordinating center (Institute for Risk Assessment and Sciences/IRAS, University of Utrecht) that works in close collaboration with the National Institute of Public Health and the Environment (RIVM, Bilthoven). There are seven contractors, representing the scientific community as well as various stakeholders. Next, there are fourteen members, all coordinators of ongoing or recently completed, EU funded studies on air pollution and health. In addition, there are many other "interested parties" active in the network that represent important recent work in this field, but who have not been in a role of coordinating EU funded research

Workpackages

To discuss specific topics in detail Working Groups were established. The work in AIRNET is concentrated in the following six working groups:

WP1: Interpretation of exposure findings
WP2: Interpretation of epidemiology findings
WP3: Interpretation of toxicology findings
WP4: Risk and health impact assessment
WP5: Policy/science interface
WP6: Combined analysis of results of work packages 1-5

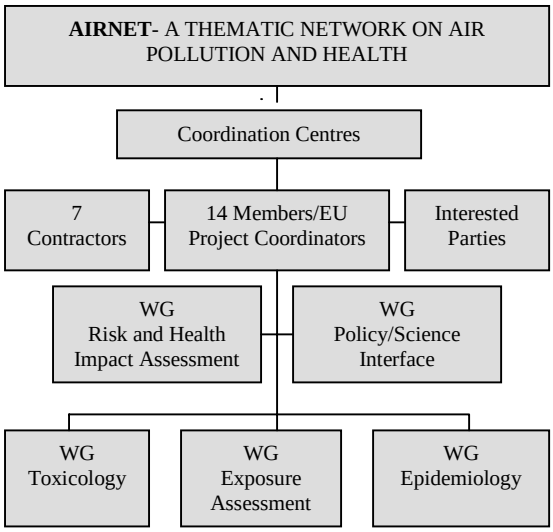

Figure 1: AIRNET–Participants and Working Groups

The objective of these workpackages is to facilitate an interactive communication and review forum to gather, discuss and interpret the findings of each topic (Figure 1).

AIRNET output and its relevance for EU/CAFE, WHO, EEA, and UN-ECE

Several (international) agencies and research centres focused on air pollution and its adverse impact on human health have shown their interest in AIRNET and want to use its output for guiding and structuring their integrated assessments and policy development.

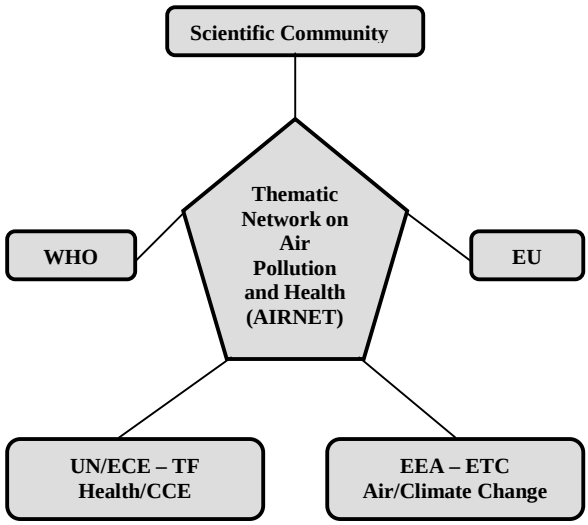

Figure 2: International Agencies and Research Centres using AIRNET and its output

Clean Air For Europe (CAFE)

The Commission of the European Union has initiated the Clean Air For Europe (CAFE) programme to strengthen their air pollution policy, based on the best available science and created in a broad, open, and transparent dialogue with a scientific community, as well as the public and the stakeholders. The objective of CAFE are:

- To review existing air quality standards and national emission ceilings as set out in recent legislation, and to contribute to the review of

international protocols on the basis of the best and most recent scientific and technical information, taking into account experience of implementation of existing legislation and protocols

- To develop new, flexible and comprehensive mechanisms for gathering information leading, in the longer term, to the further development of objectives and indicators for outdoor air quality

- To identify where there may be a need for additional measures to reduce emissions from specific sources

- To propose and update a strategy at regular intervals which defines appropriate air quality objectives for the future and cost-effective measures for meeting those objectives.

For further details on CAFÉ see: http://europa.eu.int/comm/environment/air/cafe.htm

It is clear that the proposed will be in a position to support the work in the CAFE programme considerably, by providing new research findings in a timely manner, in an interpreted manner, and as a result of a process in which various stakeholders have been incorporated explicitly. This will improve the two-way communication between CAFE and the research communities, improve the science - policy interface, and in particular transparency and trust, and to form a place and forum of peer-review. We plan to work in close co-ordination with the CAFE programme. There are several other international bodies which have expressed an interest to be linked to AIRNET as end-users of the eventual AIRNET products. These include:

- European Topic Centre for Air and Climate Change (ETC/ACC)
- UN-ECE Convention on long-range Transboundary Air Pollution
- World Health Organisation - European Center for Environment and Health (WHO/ECEH, Bonn and Rome offices)

To effectively disseminate and discuss the results when they come available and to facilitate discussion of important items, practical ways of communication were developed. As effective vehicle for all the participants to meet once per year and have interaction with each other, the Network has established an Annual Conference on Air Pollution and Health. The first Annual Conference will be held in London on 11 and 12, December 2002. Another tool to serve for communication and debate in between the Annual Conferences that was developed is the AIRNET website (http://airnet.iras.uu.nl). The different Working Groups use the website as a tool for communication and debate and will actively post the information on the website. Interested parties will also be able to register as user of the website, and to post information and views there.

The expected achievements include a generalized framework to interpret findings from studies on air pollution and health in a policy-relevant way. This will be achieved by linking data from exposure assessment, epidemiology and toxicology to risk and health impact assessment and subsequently policy issues (standard setting, abatement strategy, soured control etc.). The main result will be a transparent link between research data on the one hand, and policy implications on the other hand.

Authors

Marjan Tewis and Bert Brunekreef, Institute for Risk Assessment Sciences (IRAS)

Leendert van Bree, National Institute for Public Health and the Environment (RIVM)

Correspondence and request for materials should be addressed to:

Bert Brunekreef, PhD
Institute for Risk Assessment Sciences
Utrecht University
PO Box 80176, 3508 TD
Utrecht, The Netherlands

B.Brunekreef@iras.uu.nl

BLOOD LEAD LEVELS IN PRESCHOOL AND SCHOOL CHILDREN IN THREE URBAN AREAS OF ROMANIA

E. M. Niciu, V. Frunza, A. Chitu, M. Buzatu, M. Zurini, M. Balaceanu, C. Ionescu, M. Padureanu, V. Lazar, I. Roman, G. Mitroi, C. Secarea, O. Candrea, C. Dumitrache, C. Stanescu, A. Neamtu, V. Bunda and S. Sachelarescu

1. Introduction

In recent years lead exposure of young children tend to be of less interest in developed countries, as the exposure is significant declining especially due to the reduction of lead content of gasoline and usage. The introduction of EURO 2 and recently EURO 3 norms in Romania is in concordance with the European policies of reducing towards "zero" of environmental lead exposure in urban areas were traffic is one of the main air pollution source.

The project "Blood Lead Levels in Preschool and School Children in three Urban Areas of Romania" was proposed to be carried out within the National Environmental Health Action Plans, in the context of the harmonisation process of the Romanian legislation with the European Union's legislation. The main objective was to perform a baseline assessment of blood lead levels in young children aged 1 to 9 years, living in urban areas where traffic is the main source of environmental lead pollution, in order to support the legislative measure taken and assess the health risk in this sensitive population subgroup.

A former study was performed in the mid '80. Since then the traffic increased significantly, especially after 1990, mainly with cars using leaded gasoline. The main urban areas, especially county residence, were of special interest, as here traffic is expected to be the highest in the area. Three important urban areas in the southern part of Romania were taken under study during 1999 and 2000: Bucharest (capital of Romania), Constanza and Tulcea.

2. Air quality measurements

Bucharest

Bucharest has approximately 2 million inhabitants with 14% children 0 to 14 years. In Bucharest air pollution levels are measured and assessed by the air quality monitoring network of the Ministry of Health and Family (MoHF). Air quality measurement are performed at eight major traffic intersections spread over the whole area of the city on a weekly bases. The network monitoring data are 24h measurements four days a week (Monday to Thursday): particulate measurements (TSP gravimetric measurements), NO_2, SO_2, NH_3, aldehydes. Lead (Pb) is determined by Atomic Absorption Spectroscopy (AAS), from cellulose filters of the Total Suspended Particles (TSP). Apart from TSP and lead air concentrations, SO_2 and NO_2 levels were also measured. Air quality monitoring sites are situated at four locations, and can be characterised as mixed residential and traffic stations. Air quality measurements are taken with the same method: 24h measurements at four days (Monday to Thursday), for each of the eight intersections and a control area.
The measurements for this project were performed from May to June 1999 and 2000.

Constanza

Constanza is the residence city of Constanza Judet with a population of 340.000 inhabitants with 23% children 0 to 14 years. The city is situated at the Black Sea coast, being an important harbour in the region. Air quality (TSP, lead, SO_2, NO_2) is measured by the air quality network of the MoHF. Lead concentrations were specially measured at two main intersections in the city, on a

weekly bases, in the same way as in Bucharest. Measurements were performed from end July to the beginning of August 1999.

Tulcea

Tulcea is the residence city of Tulcea Judet, with a population of 19.500 inhabitants and with a considerably lower traffic intensity. Children aged 0 to 14 years are 20% of the total population. Tulcea is also situated on the Black Sea coast, in the Danube Delta. Air pollution (TSP, lead, SO_2, NO_2) was measured at one intersection in May 2000. Lead concentrations in ambient air were assessed in the same way as in the other two cities.

3. Health assessment

The health assessment was performed by examining children from day-care centres, kindergartens and schools (grade 1 and 2), situated in the vicinity of the monitored intersections. All children were taken into the study after a consent form was signed by the parents. The children's health status was assessed by means of a health questionnaire filled in by the parents, as well as a medical examinations, including somatometric development, blood pressure, additive and visual reaction time, psychological tests: Bender-Santuci and Wisc (IQ) . These will not be discussed in the present paper. Blood lead levels were measured by using a screening test LEADCARE, Blood Lead Test Kit (ESA Inc. and ANDCARE Inc., USA). These technique is rather new, based on electrochemistry and a unique sensor to detect lead in whole blood. It has the advantage that it needs a very small amount (50 µl) of whole capillary or venous blood, that can be obtained with a least stressful intervention from small children. The range of the test results is from 1.4 to 65 µg/dl blood lead (in whole blood). The accuracy of the method was determined comparison with Graphite Furance Atomic Absorbtion Spectroscopy (GFAAS), according to the producer, the correlation coefficient for whole venous blood is r = 0.97. For capillary blood an agreement of 95% was obtained with the GFAAS method. Analysis was performed by collecting 50 µl of whole fresh capillary blood, by a finger prick, and analysed the same day.

In Bucharest a number of 147 children aged 1 to 7 years from four day-care centres and one kindergarten, and 150 schoolchildren from three schools (grade 1 and 2) aged 8 to 9 years were examined. Blood lead analyses were performed in May to June 1999, and May 2000. In Constanza blood lead analysis was performed in September to October 1999 on 155 children aged 2 to 9 years old in one kindergarten and one school, when school started. In Tulcea 172 children were examined in June 2000, aged 5 to 9 years in one kindergarten and one school.

4. Results and Discussions

4.1 Lead concentration in ambient air

In Bucharest between 1995 and 2000 the air lead concentration measured by the local network are showing a possible decreasing trend (Figure 1). The annual mean levels of lead air concentrations are exceeding the WHO recommended guideline of 0.5 $\mu g/m^3$ in most of the years. The traffic in Bucharest is very intense all year over, summer holidays may be leading to a slight decrease. Constanza and Tulcea are situated at the Black Sea and Danube Delta, and summer holidays are leading to an increase of traffic activity during the summer season being one of the preferred summer vacation resorts. Unfortunately, there are no lead air concentration measurements available for these two areas from the local networks.

In case of the traffic measurements performed in Bucharest in 1999, the lead (24h) concentration in ambient air exceeded in 50% of the intersections the Maximum Admitted Concentration (MAC) of 0.7 $\mu g/m^3/24h$, as stipulated in the national standards (STAS – 12574/87) (Figure 2). Traffic measurement performed in Bucharest were less extensive in 2000, only at four of the nine intersections

performed in 1999 and due to technical reasons only two were validated. At both intersections the MAC (0.7 µg/m^3/24h) according to Romanian standards was exceeded (Figure 3). Meteorological conditions were similar in 1999 and 2000.

Traffic measurements performed in Constanza at two intersections in summer 1999 pointed out that lead concentrations in ambient air exceeded in 50% of days the MAC (Figure 4).

In Tulcea lead concentrations did not exceed the MAC (Figure 5).

The different study periods for the three cities (Bucharest, Constanza, Tulcea) were taken into consideration being forced due to logistic aspects. The chosen period of the project investigation covered the summertime from May to August with comparable meteorological conditions in all three cities (May to June in Bucharest, May in Tulcea and July to August in Constanza).

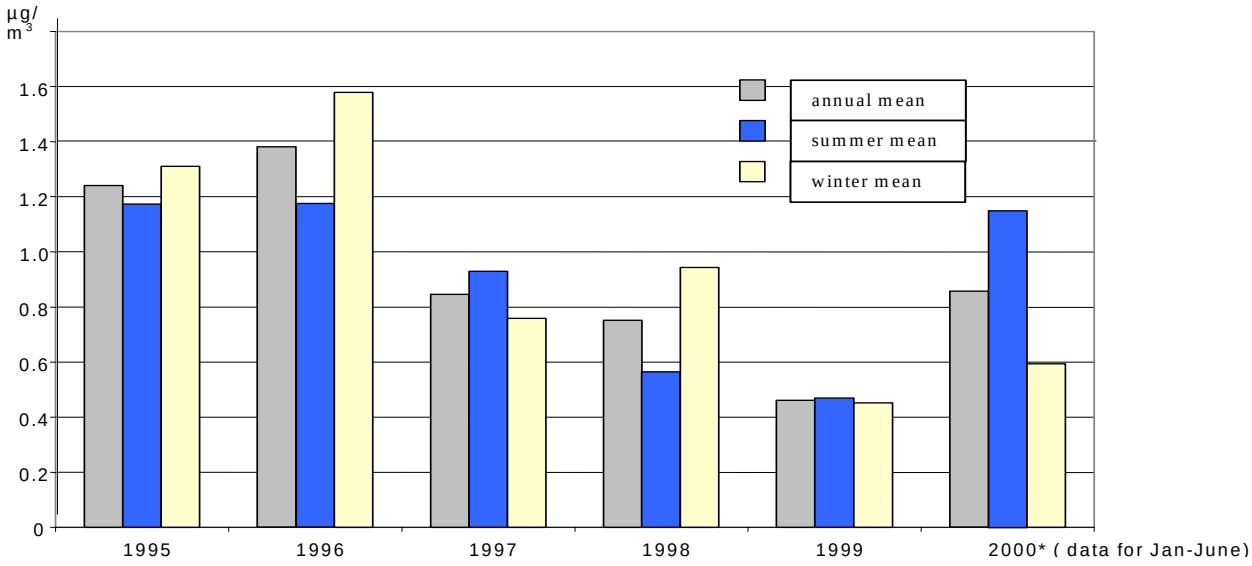

Figure 1: Bucharest - Air Lead Concentrations between 1995 and 2000

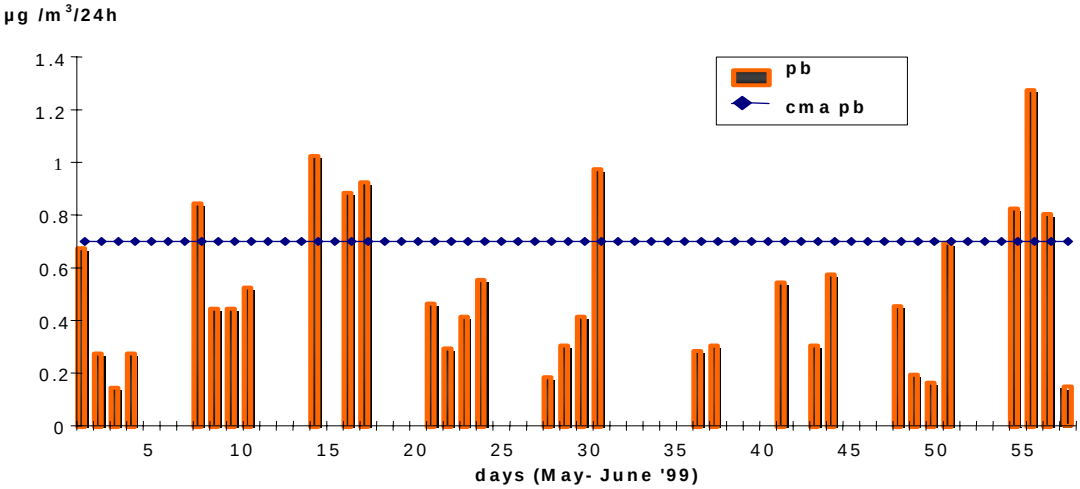

Figure 2: Bucharest – Air Lead Concentrations in 1999

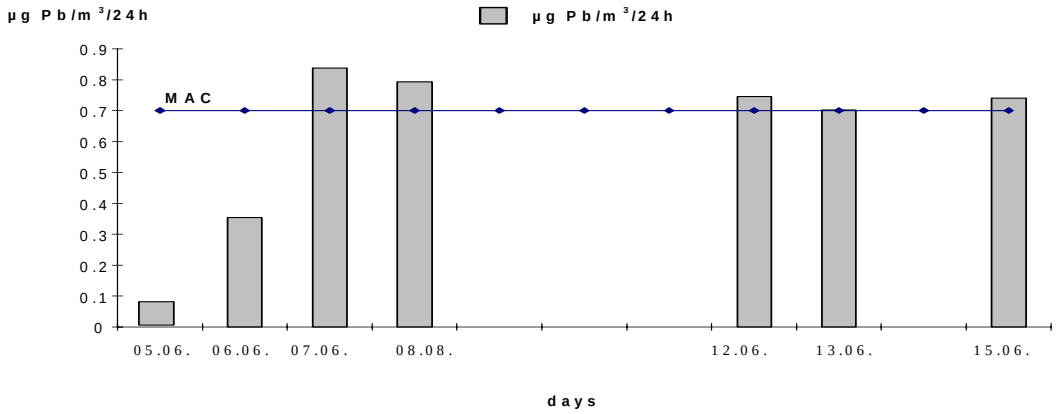

Figure 3: Bucharest - Air Lead Concentrations between May and June 2000

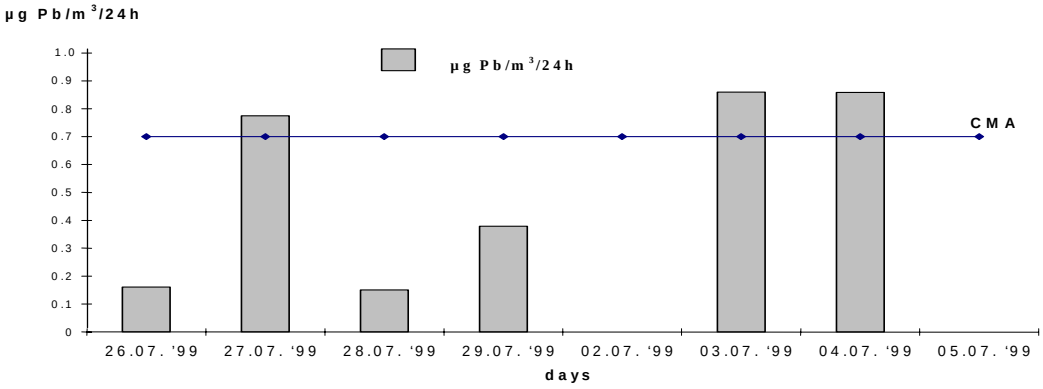

Figure 4: Constanza – Air Lead Concentrations in 1999

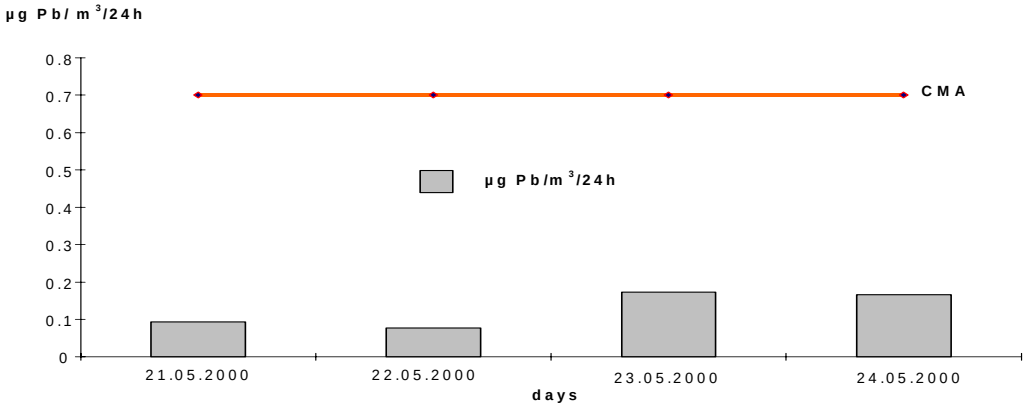

Figure 5: Tulcea – Air Lead Concentrations in 2000

4.2 Blood lead levels

Blood lead levels were assessed and interpreted according to the Centre for Disease Control (CDC, USA) risk groups (Table 1).

Table 1: CDC Risk Groups

CDC risk group	Blood lead concentration µg/dl	Action
I	< 10	Low risk
IIa	10-14	Community intervention
IIb	15-19	Environmental Investigations
III	20-44	Complete medical investigations
IV	45-69	Start of medical treatment and environmental assessment
V	> 69	Case of emergency

The safety level was considered to be 10 µg/dl. Values above this level are considered to produce harmful health effects.

In Bucharest blood lead levels exceeded the safety limit of 10 µg/dl (CDC risk group I) in 57% of children from day-care centres and Kindergartens, aged 1 to 7 years (Figure 6), and in 62% of cases for 7 to 9 years old schoolchildren (Figure 7).

In Constanza 45% of children aged 2 to 9 years, from kindergarten and school, exceeded the safety limit of 10 µg/dl blood lead (Figure 8).

In Tulcea 54 % of children aged 5 to 9 years were above 10 µg/dl blood lead (Figure 9). This was an unexpected finding as the air lead concentration were low and there are no other known sources of lead contamination of the environment.

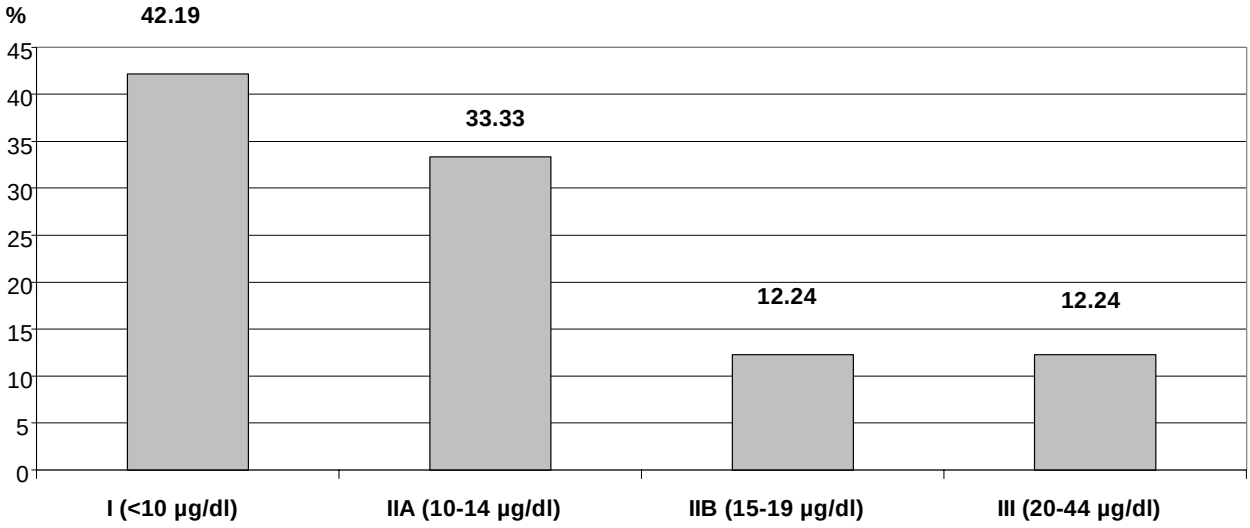

Figure 6: Bucharest – Distribution (%) of Preschool Children aged 1 to 7 years in CDC risk groups in 1999

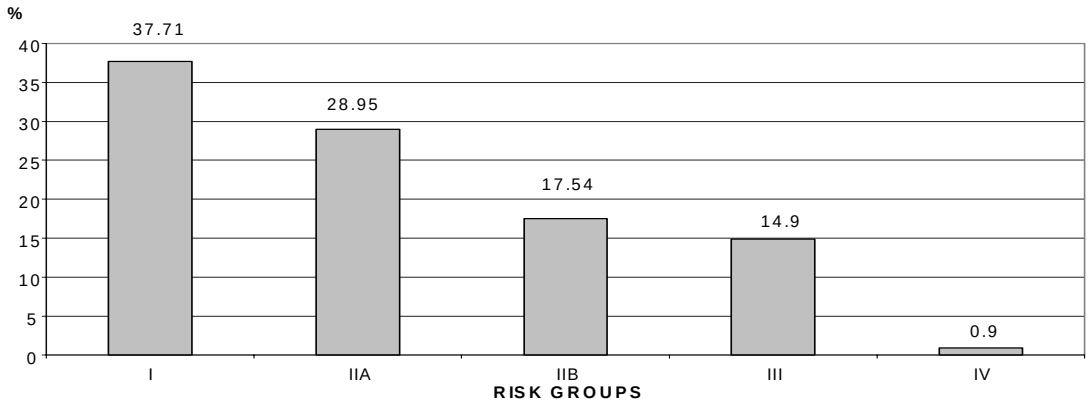

Figure 7: Bucharest – Distribution (%) of School Children aged 7 to 9 years in CDC risk groups between 1999 and 2000

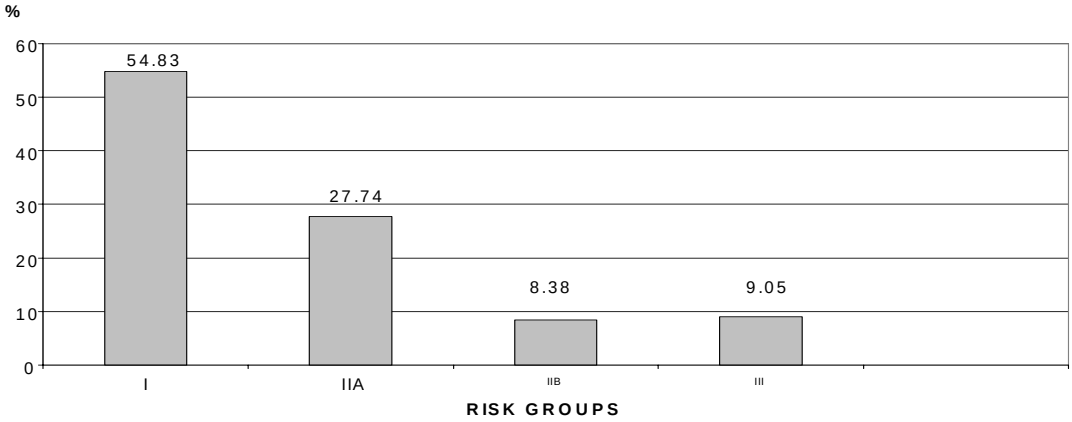

Figure 8: Constanza – Distribution (%) of Children aged 2 to 9 years in CDC risk groups in 1999

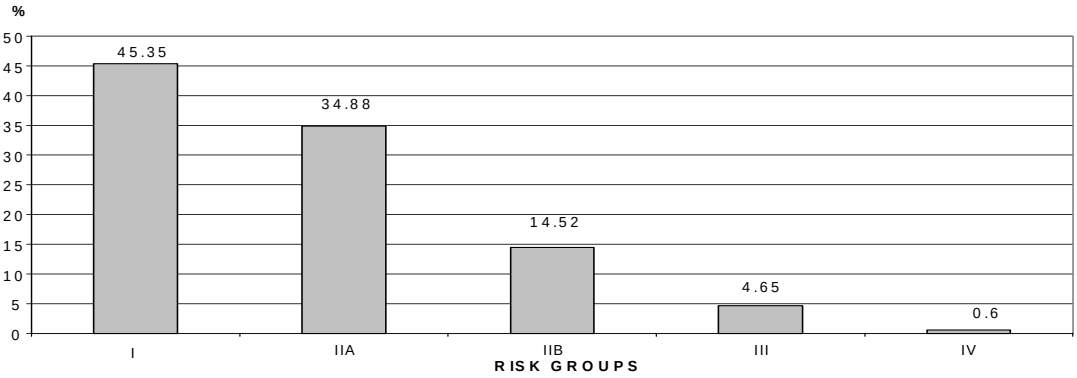

Figure 9: Tulcea – Distribution (%) of Children aged 5 to 9 years in CDC risk groups in 2000

Air lead concentrations are not considered to be the most significant ones in childhood lead exposure. Soil and dust lead concentrations having a greater impact on blood lead levels at this age, but due to technical problems such measurements were not available at this moment.

Lead poisoning is a result of lifetime exposure, and children's blood lead levels are a result of lifetime exposure in that locality, as the majority (with very few exceptions) lived there since they were born. Blood lead levels are not varying dramatically unless some intervention measures are taken. There are seasonal variation blood lead levels tending to be slightly higher in summer and fall, when the child is spending a lot of time outdoors. Even though not measured simultaneously in some cases, air lead concentrations and blood lead levels can be considered as describing the present situation in the three cities.

It can be concluded that this baseline study pointed out that even if air lead concentrations are declining, the exposure of young children to this systemic toxic air pollutant is still significant. Blood lead levels pointing out a high risk for preschool and school children, even in areas where air pollution is low. The results can be explained, taking into account that lead is a cumulative toxic element in the environment and human body. Soil and dust concentrations would be important to assess as this is one of the main exposure routs in young children, and could explain in our case the high blood lead levels in young children, even in a less polluted area.

These findings have to be the starting point for an extensive public health programme in order to reduce blood levels of young children to a safe levels. This will need a commune effort of health professionals and local decision makers in the future.

5. References

CDC (Center for Disease Control): Preventing Lead Poisoning in Young Children, 1991

CDC (Center for Disease Control) 1997: Screening young children for lead poisoning: guidance for State and Public Health Officials, Atlanta:CDC, 1997.

Grant L.D.: Lead Case Study (Part I, II), EPA, USA, 1991

LeadCare® User's Guide

NRC, AS USA: Lead poisoning in infants, children and other sensitive group populations, USA, NRC, AS, 1993.

Tarcher A.B. (ed.): Principles and Practice of Environmental Medicine, Plenum Medical Book Co., New York, 1992.

6. Authors

E. M. Niciu, V. Frunza, A.Chitu, M. Buzatu, V. Lazar, I. Roman, G. Mitroi, C. Dumitrache, C. Stanescu , A. Neamtu, V. Bunda, S. Sachelarescu; Institute of Public Health, Bucharest

M. Zurini, M. Balaceanu, M. Padureanu, C. Ionescu, Public Health Direction, Bucharest

O. Candrea, Public Health Direction, Constanza

C. Secarea, Public Health Direction, Tulcea

Correspondence and request for materials should be addressed to:

Emilia Maria Niciu
Institute of Public Health Bucharest
1-3 Dr. Leonte St.
76256 Bucharest
ROMANIA

emniciu@ispb.ro

NOTES AND NEWS

Systematic Review of Health Aspects of Air Quality in Europe
WHO Project implemented to support Clean Air for Europe programme of EC

In March 2001, the European Commission launched a programme "Clean Air for Europe" (CAFE). Its aim is to develop a long-term, strategic and integrated policy to protect against the effects of air pollution on human health and the environment (http://europa.eu.int/comm/environment/air/cafe.htm). The strategy will involve:

- A review of the implementations of air quality directives and effectiveness of air quality programmes in the Member States
- Improving the monitoring of air quality and the provision of information to the public
- Formulation of priorities for further actions, the review and updating of air quality thresholds, and national emission ceilings and the development of better systems for gathering information, modeling and forecasting.

As required by the EU Treaty, the policy will aim at a high level of environmental protection based on the precautionary principle, taking into account the best available scientific and technical data as well as the cost and benefits of action, or of lack of action. One of the specific objectives is to develop, collect and validate scientific information relating to the effects of ambient, i.e. outdoor air pollution.

WHO has agreed with EC to provide the CAFE with a systematic, scientifically independent review of the health aspects of air quality in Europe. This information will provide a starting point for integrated modeling and the decision making. There will be two-way communication between the CAFÉ and WHO:

- CAFE will ask WHO for advice on known priorities
- WHO will advice on these priorities as necessary
- WHO will advice on other issues, which CAFE might wish to consider.

CAFE Steering Group, at its meeting in December 2001, selected the review of health aspects of particulate matter, nitrogen oxides and ozone as the first priorities for which the WHO advice is requested.

The WHO project "Systematic review of health aspects of air quality in Europe" started officially in October 2001. Air Quality and Health Programme of WHO/Euro based in the WHO European Centre for Environment and Health, Bonn Office is responsible for the project implementation. The first activity was to establish a Scientific Advisory Committee (SAC), who will provide advice and coordinate the health risk evaluation. SAC will approve the protocol of the systematic review and supervise its implementation, and will identify priority issues for consideration by the project.

The SAC consists of the following nine distinguished experts, representing a broad range of research disciplines to be considered in the review:

- Tom Bellander, Stockholm City Council, Sweden
- Joseph D Brain, Harvard University, USA
- Bert Brunekreef, Utrecht University, The Netherlands
- Erik Dybing, National Institute of Public Health, Norway
- Stephen Holgate, MRC, Southampton General Hospital, UK
- Klea Katsouyanni, University of Athens, Greece

- Robert Maynard, Department of Health, UK
- Jonathan Samet, Johns Hopkins University, USA
- Bernd Seifert, Federal Environmental Agency, Germany.

Box 1: Questions to be addressed at the review of health aspects of air pollution with PM, NO_2, and O_3.

1) Is there new scientific evidence to justify reconsideration of the current WHO Guidelines for the pollutant?

2) Which effects can be expected of long-term exposure to levels of the pollutant observed currently in Europe (include both clinical and pre-clinical effects, e.g. development of the respiratory system)?

3) Is there a threshold below which no effects on health are expected to occur in all people?

4) Are effects of the pollutant dependent on subjects' characteristics such as age, gender, underlying disease, smoking status, atopy, education etc? What are the critical characteristics?

5) To what extent is mortality being accelerated by long- and short-term exposure to the pollutant (harvesting)?

6) Is the considered pollutant per se responsible for effects on health?

7) For PM: Which of the physical and chemical characteristics of particulate air pollution are responsible for effects on health?

8) What is the evidence of synergy/interaction of the pollutant with other air pollutants?

9) What is the relationship between ambient levels and personal exposure to the pollutant over short- and long-term (including exposures indoor)? Can the differences influence the result of studies?

10) Which are the critical sources of the pollutant (or, for PM, its components responsible for health effects)?

11) Have positive impacts on public health of reductions of emissions and/or ambient concentrations of the pollutant been shown?

SAC met in London on 15 January and in Brussels on 28 May. The reports from the meetings are available on the WHO web page. Based on the request of CAFÉ Steering Group, the SAC has formulated questions, which should be answered by the review (see Box 1). It has also approved the methodology of the review.

The systematic review of the research on health aspects of air pollution (PM, NO_2, and O_3) will be conducted by the "Centres of Excellence" (CE). The CEs are recruited from renowned academic and research institutions with a proven track records of past and current original research in the field subject to the review as well as participation in prior reviews and synthesis. CEs will prepare two Background Documents: one providing hazard characterization of particulate matter, the other NO_2, and ozone. The papers should be submitted to WHO in October 2002.

The general methodology of the review will follow the WHO Guideline Document "Evaluation and use of epidemiological evidence for environmental health risk assessment", WHO Regional Office for Europe, Copenhagen 2000 (E68940). This relates, in particular, to the methodology of literature review and its documentation, assuring the consistency, transparency and completeness of the review.

Based on the evidence reviewed by the CE and presented in the Background Document, the Working Group, consisting of the SAC members, representatives of various CE and other experts, will formulate the answers to the questions at a WHO meeting to be convened in January 2003. Comments on the background papers will be sought among a broad range of the experts, e.a. through the European Thematic Network on Air Pollution and Health, AIRNET (http://airnet.iras.uu.nl/ see also pages 2 to 4 this issue). The answers will be transferred in CAFE programme as WHO conclusions.

Current information on the progress of the project can be found on a new web page of the WHO/Euro Air Quality and Health Programme:

http://www.euro.who.int/eprise/main/WHO/Progs/AIQ/Home.

Michal Krzyzanowski
Regional Adviser for Air Quality and Health
WHO European Centre for Environment and Health
Bonn Office, Germany

MEETINGS AND CONFERENCES

11th WHO European Intercomparison Workshop on Air Quality Monitoring 12 to 17 May 2002 in Langen/Germany

The WHO Collaborating Centre for Air Quality Management and Air Pollution Control at the German Federal Environmental Agency (UBA), Berlin, continues to support international programmes of air quality assurance and control by conducting Intercomparison Workshops on Air Quality Monitoring for the WHO European Region. The 11th workshop was organized by the WHO Collaborating Centre in cooperation with the UBA Pilotstation and took place at the sample air manifold of the German National Reference Laboratory from 12 to 17 May 2002 in Langen. The workshop addressed laboratories responsible for air quality measurements and quality assurance and control procedures in national and international ambient air quality monitoring networks. The intercomparison measurements related to nitrogen oxides, sulphur dioxide, and ozone (NO, NO_2, SO_2 and O_3), and included automated, semi-automated and manual methods. Each participating laboratory carried out in situ calibrations of its analyser(s) with its national calibration method. The workshop brought together twenty-one experts from Albania, Bulgaria, Croatia, Czech Republic, Estonia, Lithuania, Romania, Russian Federation, Slovenia and Uzbekistan. Six of the participating laboratories belong to the environmental and four to the health-related sector. The publication of the results is foreseen in one of the next WHO Air Hygiene Report issues.

Hans-Guido Mücke
WHO Collaborating Centre
Federal Environmental Agency
Berlin, Germany.

PUBLICATIONS

WHO

WHO/Regional Office for Europe CD-ROM Air Quality Guidelines for Europe 2000

WHO Regional Office for Europe, Copenhagen 2001, ISBN 92 890 1082 7, Sw.fr. 92.-, in developing countries: Sw.fr. 64.40

The first edition of the WHO Air quality guidelines for Europe was published in 1987. Since then new data have emerged and new developments in risk assessment methodology have taken place, necessitating the updating and revision of the existing guidelines. This CD-ROM provides an introduction on the nature of the guidelines and the methodology used to establish guideline values for a number of air pollutants. It describes the various aspects that need to be considered by national or local authorities when guidelines are transformed into legally binding standards. Also included is all background information on exposure and on the potential health effects of pollutants. The CD-ROM provides full documentation for the sections on "Health risk evaluation" and "Guidelines", published in printed form as Air quality guidelines for Europe, 2nd edition. For the pollutants addressed, the sections on "Health risk evaluation" and "Guidelines" describe the most relevant considerations that have led to the recommended guideline values.

WHO/Environmental Issue Report No 29: Children's health and environment: A review of evidence-A joint report from the European Environmental Agency and the WHO Regional Office for Europe

G.Tamburlini, O. von Ehrenstein, R. Bertollini, Regional Office for Europe. Luxembourg, Office for Official Publications of the European Communities, 2002, 223 pages, ISBN 92-9167-412-5, EUR 19,-

This publication provides an overview of the available evidence of the relationship between the physical environment and children's health. It identifies both research needs and policy priorities to protect children's health from environmental hazards. The report was prepared by the WHO European Centre for Environment and Health, Rome Operational Division, with support from the European Environment Agency. It is based on background papers prepared for the Third Ministerial Conference on Environment and Health, held in London in 1999.

WHO/International Programme on Chemical Safety (IPCS) Concise International Chemical Assessment Document, No. 30: 1,3-Butadiene: Human Health Aspects

WHO Publications, Geneva 2001, 73 pages, ISBN 92 4 153030 8, Sw.fr. 21.-, in developing countries: Sw.fr. 14.70

1,3-Butadiene is a product of incomplete combustion resulting from natural processes and human activity. It is also an industrial chemical used primarily in the production and diesel powered vehicles, from non-transportation fuel combustion, from biomass combustion, and from industrial have been measured in air in cities and close to industrial sources. In this volume are assessed the risks to human health and the environment of this chemical. The general population is exposed to 1,3-Butadiene primarily through ambient and indoor air. Tobacco smoke may contribute significant amounts of 1,3-Butadiene. The available epidemiological and toxicological data provide evidence that 1,3-Butadiene is carcinogenic in humans and may also be genotoxic in humans.

WHO/International Agency for Research on Cancer (IARC) IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 79: Some Thyrotropic Agents

WHO Publications, Geneva 2001, 763 pages, ISBN 92 832 1279 7, US $ 49.50 / Sw.fr. 55.-, in developing countries: Sw.fr. 38,50

This Volume evaluates carcinogenicity to humans of 19 chemicals that are carcinogenic to the thyroid follicular-cell epithelium in rodents. This included some so-called 'anti-thyroid' drugs (methimazole, methylthiouracil, propylthiou-racil and thiouracil); some sedatives (doxylamine succinate and phenobarbital); and some other drugs including the systemic antifungal antibiotic griseofulvin, the diuretic spironolactone, and the antibacterial sulfa drugs sulfamethazine and sulfamethoxazole. Five of the 19 compounds were evaluated for the first time: N,N'-diethylthiourea, doxylamine succinate, kojic acid, methimazole and sulfamethazine.
This series of evaluations specifically included agents for which mechanisms of carcinogenesis may operate in rodents that do not operate in humans, at least under conditions of realistic human exposure. Evidence from

epidemiological studies and from toxicological studies in experimental animals provide compelling evidence that rodents are substantially more sensitive than humans to the development of thyroid tumours in response to thyroid hormone imbalance. From the available epidemiological studies, there was no indication of excess thyroid cancer risk in humans exposed to any of these agents. Amitrole, ethylenethiourea and sulfamethazine, all with sufficient evidence of carcinogenicity in experimental animals, were placed in Group 3 (not classifiable as to carcinogenicity to humans), because the carcinogenic effects observed in animals would not be expected to occur in humans. Amitrole, ethylenethiourea and sulfametazine produce thyroid tumours in mice and rats by a non-genotoxic mechanism, which involves interference with the functioning of thyroid peroxidase. This results in reduction of circulating thyroid hormone concentrations and increased secretion of thyroid-stimulating hormone, which is not expected to occur in humans under realistic conditions of exposure.

WHO/International Programme on Chemical Safety (IPCS) Environmental Health Criteria, No. 222: Biomarkers in Risk Assessment: Validity and Validation

WHO Publications, Geneva 2001, 238 pages, ISBN 92 4 157222 1, Sw.fr. 42.-, in developing countries: Sw.fr. 29.40

This publication seeks to provide a framework for selecting and validating biomarkers for risk assessment. Initial chapters consider the role of biomarkers in risk assessment and their validity. Biomarkers can be classified into markers of exposure, effect and susceptibility. If biomarkers are to contribute to environmental and occupational health risk assessments, they have to be relevant and valid. Relevance refers to the appropriateness of biomarkers to provide information on questions of interest and importance to public and environmental health authorities and other decision-makers.

OTHERS

In Search for Epidemiologic Evidence on Air Quality and Health in Children and Adults

W. Jedrychowski et al., Chair of Epidemiology and Preventive Medicine, Jagiellonian University, Collegium Medicum, 7a, Kopernika street, 31-034 Krakow, Poland 2000, ISBN 83-904896-4-3, 450 pages, free copies may be obtained upon request

The monograph “In Search for Epidemiologic Evidence on Air Quality and Health in Children and Adults” is summing up the results of epidemiologic studies carried out in Krakow over the last three decades. The results of these studies may be of importance for the public health strategy in prevention of respiratory diseases. The broad purpose of the Krakow epidemiologic research was to understand better the consequences of human exposure to air pollution at regular ambient levels. A second purpose was to provide an objective, scientific evidence for legislative and regulatory decisions. Regulatory agencies responsible for protecting public health seek an unbiased evidence of demonstrable health effects to make judgements about the likelihood of risk in the population at large. At the beginning of the new Millennium, many respiratory hazards have already been recognized. Concern remains, however, about the safety provided by existing standards for environmental exposures and the risks of new and unevaluated agents.

System of Monitoring the Environmental Impact on Population Health of the Czech Republic - Summary Report 2000

National Institute of Public Health, Prague 2001. 108 pages, ISBN 80-7071-171-X., Full text available at www.szu.cz/chzpa/sumrep.htm

The Summary Report of the Monitoring System recapitulates the results obtained within the individual subsystems in 2000 and compares them with those of the previous year. Aggregated results are presented as background information for the national authorities making decisions on environmental health, for the Public Health Service, cooperating departments and institutions and for the interested public. The results are provided in detail in the Special Reports of the individual subsystems, as in previous years.

Hazardous Air Pollutant Handbook: Measurements, Properties, and Fate in Ambient Air

Ch.W. Spicer et al.. CRCPress, London, UK, 2002, 240 pages, ISBN 1566705711, GB £ 87,-

This Handbook contains the first comprehensive review of 188 ambient air toxics that have regulatory status under the Clean Air Act and presents a wide variety of information on hazardous air pollutants, including chemical and physical properties, existing and potential measurements in ambient air, methods, lifetimes and fate in ambient air and atmospheric transformation products. Providing a basis for understanding current data on the concentrations and fate of toxic pollutants in urban air and for evaluating potential health effects, the

Hazardous Air Pollutant Handbook addresses the needs of a broad range of professionals responsible for ambient air monitoring, emissions monitoring and control, risk assessment, and permitting and compliance requirements.

Fate of Pesticides in the Atmosphere – Implications for Environmental Risk Assessment

H.F.G. van Dijk, W.A.J. van Pul, P. de Voogt. Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999, 280 pages (Hardbound), ISBN 0-7923-5994-1, US $ 115,- / GB £ 66,-

This Volume contains the proceedings of an international workshop held in 1998 in The Netherlands. Topics include emission, dispersion, transport and transformation of pesticides in the atmosphere, and the ecotoxicological risks of pesticides in remote areas. Laboratory and field measurements are reviewed, and modelling of the atmospheric that affect pesticides are discussed. Various risk assessment approaches are presented, and possible statutory environmental criteria that could be incorporated into pesticide regulation in order to limit their atmospheric dispersion are explored. This is the first book to present a complete review of the science of this subject with the aim of investigating the possibilities of incorporating long-range transport potential of pesticides into protocols for estimating their environmental risks and their registration. This book addresses to atmospheric and pesticide scientists, pesticide manufacturers, pesticide regulators, and risk assessors.

Urban Air Quality: Measurement, Modelling and Management

R.S. Sokhi et al.. Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000, 492 pages, ISBN 0-7923-6676-X, Printing on Demand, EUR 187,-

This is the proceedings of the Second International Conference on Urban Air Quality – Measurement, Modelling and Management, held at the Technical University of Madrid, 3-5 March 1999. The book contains peer-reviewed papers on the latest advances in the urban air quality research field. It will be suitable for researchers including students, consultants, local authority officers, and environmental scientists working in industrial sectors (chemical, environmental, and transport). Very few scientific international conferences specifically address the area of air pollution in cities and towns. This is despite the growing concern about the health and environmental impacts that result from air pollutants in urban areas. The need to have a forum for discussing and exchanging scientific results in this field is hence overwhelming. It is clear from the response of scientists and other experts working in this area that these conferences are helping to address this need.

A Vision of Car Free Cities in Central and Eastern Europe

Berlin, 2001, European Academy of the Urban Environment, A4, 167 pages**,** ISSN 0949-5029, EUR 12.50 plus EUR 2.30 for postage

Quality of life in major town and city centres in EU candidate countries has deteriorated dramatically due to air and noise pollution as a result of increasing volumes of urban road traffic. This publication highlights initiatives, projects and effective public information campaigns which support and showcase sustainable mobility in central and eastern European towns and cities. New impulses in developing innovative strategies and designs are given. Of course, the pan-European Car Free Day represents a vital jumping off point and coordination element. Selected western and eastern European case studies are included, implementation approaches are described, and attention is drawn to the essential topic of improving communications with the public.

Air Quality in the Mexico Megacity: An Integrated Assessment

L.T. Molina. Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002, 408 pages, Hardbound: ISBN 1-4020-0452-4, EUR 140.-, Paperback: ISBN 1-4020-0507-5, EUR 55,-

The quality of the air we breathe is fundamental to the quality of life for the growing millions of people living in the world's burgeoning megacities. In this book, experts in atmospheric sciences, human health, economics, social and political sciences contribute to an integrated assessment of the complex elements needed to structure air quality policy in the 21st century. The analysis is developed through a case study of the Mexico City Metropolitan Area – one of the world's largest megacities in which air pollution grew unchecked for decades. The international research team is led by Luisa T. and Mario J. Molina, Nobel Laureate in Chemistry. Improvements in Mexico City's air quality in the last decade testifies to the power of determined and enlightened policy making, and throws into relief the tough problems that remain to be solved. The volume's first six chapters, including the contributions of over 50 distinguished scholars from Mexico and the U.S., outline the fundamental areas of knowledge policy makers must accommodate. The message is that only good science and well-chosen technologies can direct the way to corrective regulatory measures; but without strong commitment from government, no amount of science or technology can help. In presenting what is known about the causes and consequences of air pollution in this megacity, the authors highlight what needs to be done. Many key areas of measurement and methodology for consistently and accurately assessing air quality and its effects still require refinement. The volume concludes with an extensive list of policy recommendations, emphasizing the value of integrated assessment and a long term-perspective. Intended for the guidance of policy makers

in the Mexico Megacity, these recommendations form a provocative challenge to the leadership of other megacities with looming air pollution issues. While each city – its problems, resources, and perspectives – is unique, the need for an integrated assessment or complex environmental problems is the same. The case study presented in this book demonstrate ways to work toward the comprehensive knowledge needed to build robust policy.

Guidelines

DIN-Taschenbuch 223: Qualitätsmanagement und Statistik, 3. Auflage

Deutsches Institut für Normung e.V.. Beuth Verlag GmbH, Berlin, Wien, Zürich, 2001, 192 Seiten, ISBN 3-410-15136-2, EUR 37,-

Das Taschenbuch enthält z.B. DIN EN ISO 9000:2000 „Qualitätsmanagementsysteme – Grundlagen und Begriffe“, das Nachfolge-Dokument zu DIN EN ISO 8402. Die abgedruckten Normen gelten fachübergreifend für alle Branchen und Bereiche aus Wirtschaft und Gesellschaft, für alle Unternehmen, Behörden, Vereine usw. – für alle Organisationen, egal welcher Größe und Zielsetzung.

DIN-Taschenbuch 226: Qualitätsmanagement, 3. Auflage

Deutsches Institut für Normung e.V.. Beuth Verlag GmbH, Berlin, Wien, Zürich, 2001, 448 Seiten, ISBN 3-410-14990-2, EUR 82,60

Zu folgenden Themen werden 12 Normen wiedergegeben: Planung und Aufbau eines QM-Systems (z.B. DIN EN ISO 9001:2000), Aufrechterhaltung und ständige Verbesserung eines bestehenden QM-Systems (z.B. DIN EN ISO 9004:2000), Darlegung eines QM-Systems gegenüber Stellen innerhalb und außerhalb des Unternehmens (z.B. Geschäftsleitung und Kunden) und Werkzeuge des QM, vor allem Auditierungen und Messmittel (z.B. E DIN ISO 19011:2001).

VDI-Berichte “Reinhaltung der Luft“, Nr. 1373: Gerüche in der Umwelt – Innenraum- und Außenraumluft

Beuth Verlag Berlin, 1998, EUR 117.-

VDI-Berichte “Reinhaltung der Luft“, Nr. 1443: Neuere Entwicklungen bei der Messung und Beurteilung der Luftqualität

Beuth Verlag Berlin, 1998, EUR 144.-

COMING EVENTS

2002

July 2002

Air Pollution 2002 10th International Conference on Modelling, Monitoring and Management of Air Pollution

1-3 July, Segovia, Spain.
For information, contact:
AIR02, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO407AA, UK,
phone: +44 238 029-3223, fax: -2853,
e-mail: Isouthcott@wessex.ac.uk,
www.wessex.ac.uk/conference/2002/air02

August 2002

12th Conference of the International Society of Exposure Analysis (ISEA)/14th Conference of the International Society for Environmental Epidemiology (ISEE)

11-15 August, Vancouver, Canada.
For information, see:
www.conferences.ubc.ca/iseaisee2002 and
www.iseepi.org/index1.htm

Federation of the European Chemical Society (FECS): 8th Conference on Chemistry and the Environment

31 August – 4 September, Athens, Greece.
For information, see: www.eex.gr/conference2002

September 2002

IGAC/CACGP: Atmospheric Chemistry within the Earth System: From Regional Pollution to Global Climate Change
18-25 September, Crete, Greece.
10th Scientific Conference of the Commission for Atmospheric Chemistry and Global Pollution (CACGP) and 7th Scientific Conference of the International Global Atmospheric Chemistry Project (IGAC).
For information, see:
http://atlas.chemistry.uoc.gr/IGAC2002/

October 2002

16th International Congress of Biometeorology
28 October – 1 November, Kansas City, Missouri, USA.
Hosted by: International Society of Biometeorology,
For information, see: www.mcc.missouri.edu/icb2002/

November 2002

EuroBionet2002
Conference on Urban Air Pollution, Bio-indication and Environmental Awareness
5-6 November, Stuttgart, Germany.
EuroBionet is a network of local governments and research institutes from 12 cities and regions in eight member states of the European Union. The project is backed by the LIFE Environment Programme of the European Commission and coordinated by the University of Hohenheim, Stuttgart.
For information, see:
www.eurobionet.com

2003

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

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
Contact: jasmina.bolfek-radovani@iop.org

PM 2003
4th International Colloquium on Particulate Air Pollution and Human Health Conference
31 March - 4 April, Pittsburgh, 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

June 2003

14th International Congress of the International Society for Aerosols in Medicine (ISAM)
14-18 June, Baltimore, Maryland, USA.
The Congress will feature important clinical and basic research developments in aerosol medicine. All ISAM members and non-member clinicians and scientists from around the world are encouraged to attend.
Contact: cmenet@jhmi.edu

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.

Cover cartoon by Prof Michael Wagner, Berlin

Published by

WHO COLLABORATING CENTRE FOR AIR QUALITY
MANAGEMENT AND AIR POLLUTION CONTROL

at the

FEDERAL ENVIRONMENTAL AGENCY
Germany

Postal address:
P.O. Box 330022
14191 Berlin
Germany

Office:
Corrensplatz 1
14195 Berlin
Germany

Telephone: + 49-30-8903-1280/81/82
Telefax: + 49-30-8903-1283

www.umweltbundesamt.de/whocc/titel/titel21.htm