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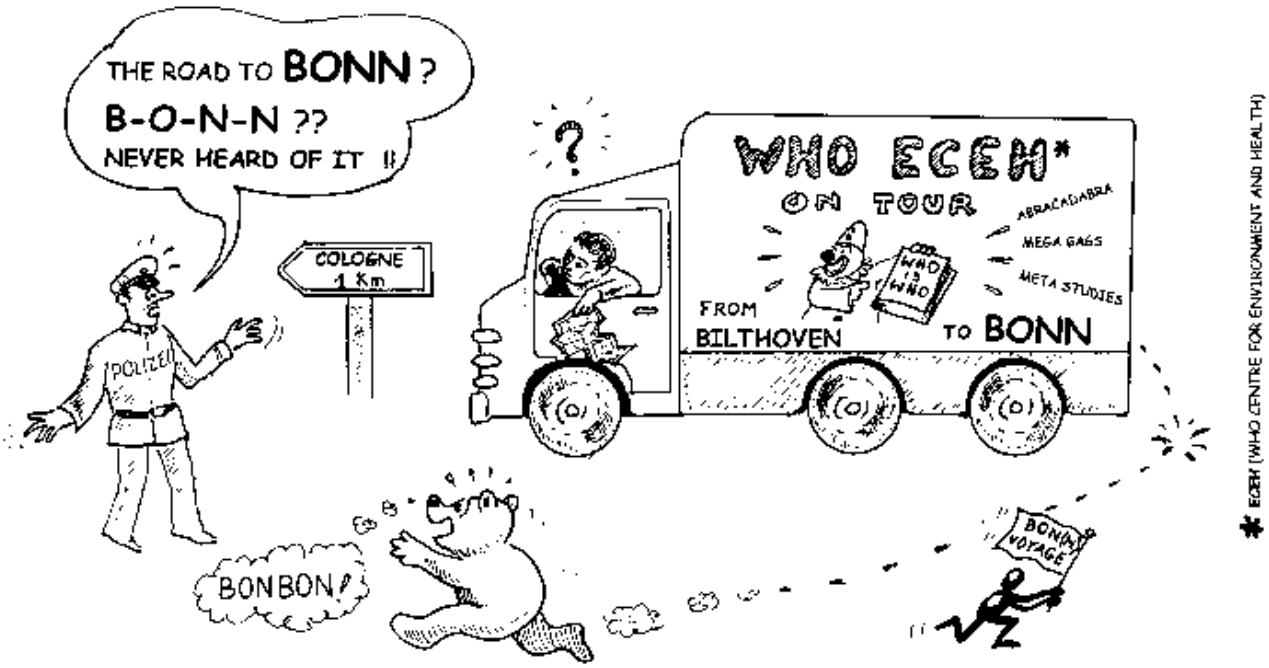


"A MOVING MOMENT" Mike

URBAN BENZENE POLLUTION AND POPULATION EXPOSURE

Vincenzo Cocheo, Paolo Sacco, Caterina Boaretto, Emile De Saeger, Pascual Perez Ballesta, Henrik Skov, Eddy Goelen, Norbert Gonzalez and Antonia Baeza Caracena

Benzene is among the gasoline components and is airborne by vehicular traffic. It is a myelo-toxic and leukaemia-inducing compound (Snyder et al., 1993; Ward et al., 1992; Vigliani and Saita, 1964). The risk level, expressed as myeloid leukaemia cases increment estimate among the population not professionally exposed to benzene, has been stated to range 3.8 to 7.5 cases every million people exposed during the lifetime to 1 $\mu g/m^3$ (Rinsky et al., 1981; Bond et al., 1986; WHO, 1996). All the estimates deal with exposure, not with environmental concentration. Since the two parameters can be not coincident, the citizens' risk level, which depends on actual exposure, can not be simply estimated by means of urban pollution. Therefore, once a socially acceptable exposure risk level is stated by a political decision, one can set a limiting value for benzene concentration in urban air only if the relationship between personal exposure and urban pollution is known. We find the citizens' exposure level, whatever their occupation or the fraction of time spent outdoors, is higher than urban average level and is equal, on average in Europe, to twice its value.

To establish this relationship, six towns and a sample of their citizens and their homes have undergone environmental monitoring for an entire year. The towns were distributed among the Northern, Central and Southern European countries, comprising a wide range of different lifestyles, climates and development features.

In each of the towns of Antwerp (Belgium), Athens (Greece), Copenhagen (Denmark), Murcia (Spain), Padua (Italy) and Rouen (France), one hundred sampling sites on average have been chosen. The sampling sites were distributed along the knots of a multi-scale grid drawn over the town map. A multi-scale grid is characterised by a variable mesh size: closer where pollution sources density is higher, progressively looser elsewhere. While maintaining tolerably little the number of sampling sites, this approach provided very similar results to those one would have obtained by covering the whole town with the closer mesh size grid (Kumar et al., 1996). Within each town, the sampling sites have been divided among an 85% of background sites, a 10% of hot spots and a 5% of periurban sites. The background sites were open spaces as squares or parks or streets apart from the intense traffic. The hot spots coincided with road crossings or roads with intense or slowed down traffic. The periurban sites were chosen in peripheral areas with scarce or very flowing traffic. The percentage distribution was based on the idea that people spend their time, on average, in the different kinds of places more or less with the same distribution.

Once each two months, from September 1997 to September 1998, the sampling sites have been uninterruptedly monitored, from Monday morning to Friday afternoon, by means of radial symmetry passive samplers (Cocheo et al., 1996), developed by ourselves and named *radiello*. This device relies on spontaneous diffusion of gaseous molecules driven by a concentration gradient across a diffusive barrier. Diffusing molecules are captured by an adsorbing material with a constant uptake rate which, in the case of benzene, is $80 \cdot 10^{-6}$ $\mu g/min$ each $\mu g/m^3$ in air. To obtain concentration values one just needs to know the collected amount and the exposure time. The authors tested the sampler reliability both in standard atmosphere chamber and in the actual sampling sites. We found a maximum bias value of 4.45% and a coefficient of variation of 2.5 - 22.0% for 120 samplers exposed for 4.5 days to benzene concentrations in the range from 1.5 to 47 $\mu g/m^3$.

At the same time fifty volunteers have undergone personal sampling for the same duration. The volunteers were non-smoking and equally divided into exposed and non-exposed people. Actually, any citizen is exposed to

benzene: the distinction is between people who, due to the duties of their job, spend a lot of time outdoors, and people who spend more time indoors, in schools or offices. In the first group policemen, postmen, street sweepers, stall-holders, bus and taxi drivers were comprised. The second group was composed of students, teachers and clerks. The volunteers' movements within the town area have been checked by an individual diary. The monitoring activity has been extended to the volunteers' homes also, furnishing surprising outcomes about the domestic pollution contribution to the overall personal exposure level. Personal and home monitorings have been carried out by the same technique and for the same duration of the environmental ones.

Both environmental and personal data relative to volunteers and their homes have been subjected to strict validation procedures. Environmental samples coming from spoilt samplers or giving uncertain analytical results have been rejected: 3147 data have passed the validation tests. The validation procedure regarding the volunteers' and homes' data has been more selective, since also the volunteer behaviour had to be considered. This has been accomplished both by the detailed examination of the personal diary and, in case of controversy, by conversation with the volunteer. At the end of the validation process, 1559 data of personal exposure and 1499 of indoor home sampling have been accepted. Therefore, the experimental data base is made of 6205 measurements, quite equally distributed over the six towns.

All the results are summarised in Figure 1. The proposed data represent the average of the mean values measured during all of the six campaigns in each town. The urban pollution means were obtained averaging all the data collected over each whole city territory.

A first interesting observation is that the urban pollution level, as an annual average, increases in Europe from North to South as shown in Figure 2.

Figure 1: Annual values for benzene concentration as averages of the six monitoring campaigns, concerning urban pollution, home concentration and personal exposure levels. Figures express concentrations in $\mu g/m^3$.

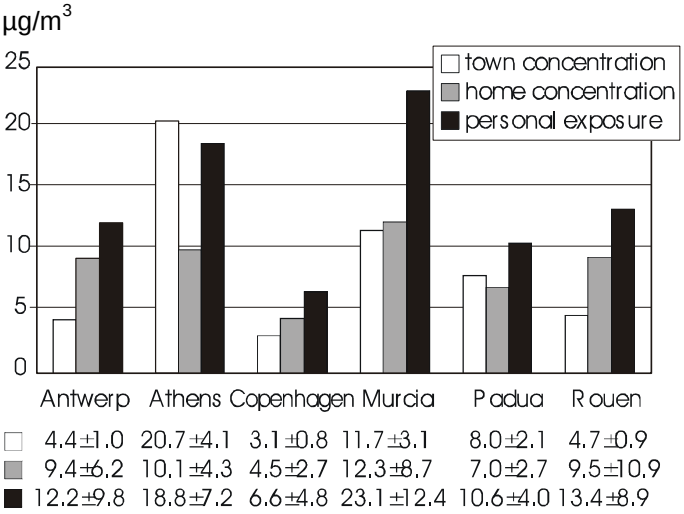
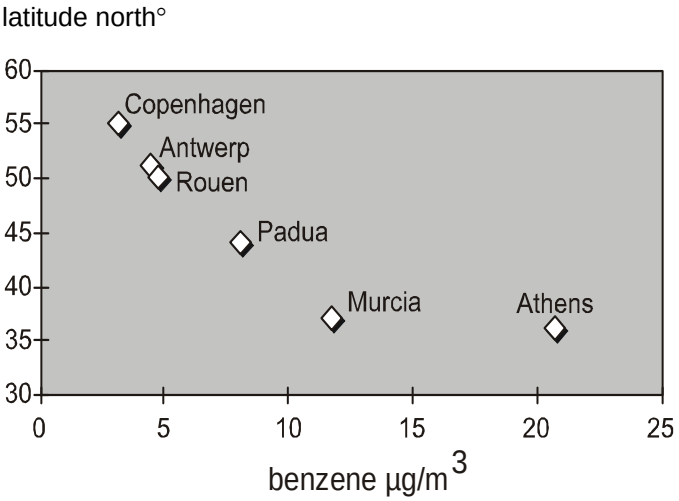
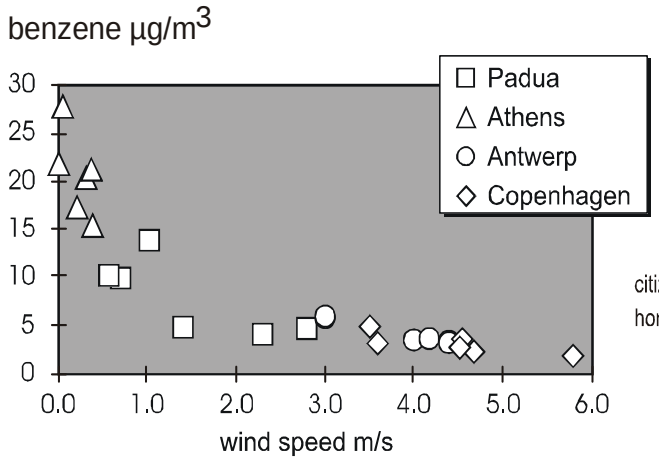


Figure 2: Annual average urban pollution levels as a function of city latitude.



Several reasons might be brought forward to explain this experimental finding, one of which is the difference in meteorological conditions. A decrease of the average pollution level has been measured experimentally in correspondence with the increase of average wind speed during each sampling campaign (Figure 3).

Figure 3: Effect of ventilation on urban pollution for the towns where reliable meteorological data were available. Poor ventilation seems to play a determining role in the establishment of high urban contamination levels, as is shown by the differences between two towns under Mediterranean weather regime and two towns under the Atlantic one (wind speed is the average value measured in each campaign).



Towns in Northern Europe are constantly windy, being subject to the passage of Atlantic atmospheric disturbances, whereas the Mediterranean towns (Padua, Murcia and Athens) have weather conditions influenced by the persistent anticyclone regime.

Nevertheless, personal exposure and home monitoring data do not reflect the differences observed between Northern and Southern European towns in urban pollution levels. The ratio between the most polluted town, as an annual average, and the least polluted one is equal to 6.7, but the same ratio between personal exposure average values drops to 3.6 and even to 2.7 when indoor home measurements are concerned.

The results appear to be even more interesting if one compares citizens' exposure and indoor pollution levels with urban pollution values. As is clear from Figure 4, benzene exposure level of European citizens is higher than the average urban pollution level, except for Athens due to the reasons that will be clearer later. This is true for all the citizens' categories, non-exposed included (Figure 5).

Figure 4: Personal exposure and home pollution level ratios with urban pollution as annual averages for each town. On European basis, average citizens' exposure/town pollution ratio value was 2.00. On the same basis and omitting Athens (see text), average homes'/town pollution ratio value was 1.51.

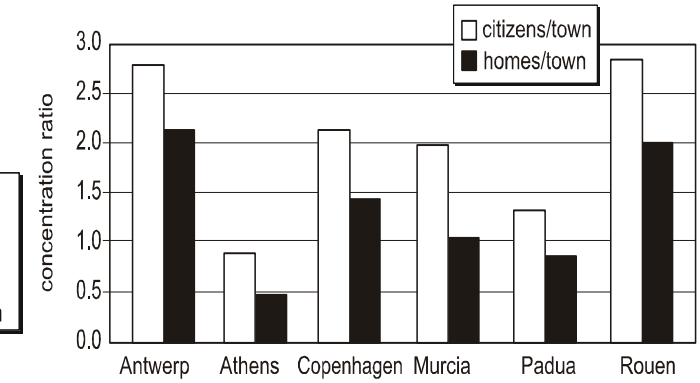
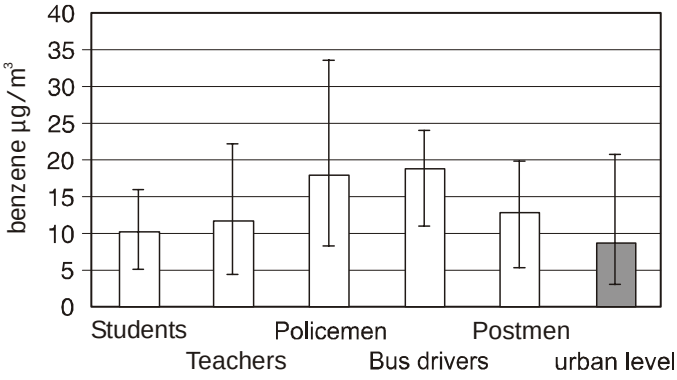
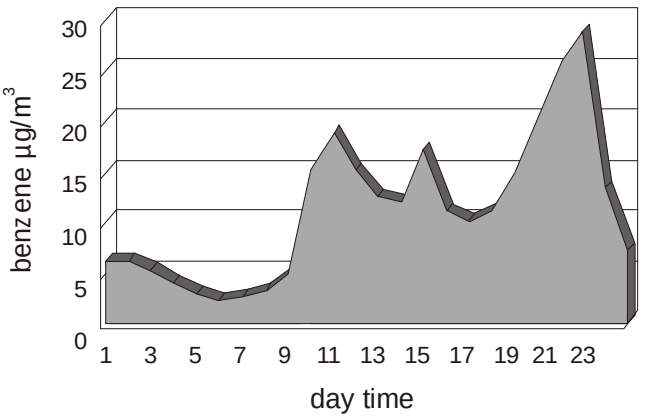


Figure 5: Annual European average of exposure levels for some selected citizen categories, compared with the annual European average urban pollution level (grey bar). Vertical lines show the range between minimum and maximum. As one can see, the personal exposure resulted higher than the urban pollution level also for the so-called non-exposed categories.



The experimental data suggest an explanation of the phenomenon. As far as the daily concentration profile is concerned (Figure 6), benzene concentration oscillates between very low values during night time and very high in the middle of the day and in the evening. Since most people get about in the streets when benzene concentration is 1.5 - 2.5 times higher than daily average, one can estimate that the actual outdoor exposure is about twice than that calculated basing on the daily urban average concentration and the time spent outdoors.

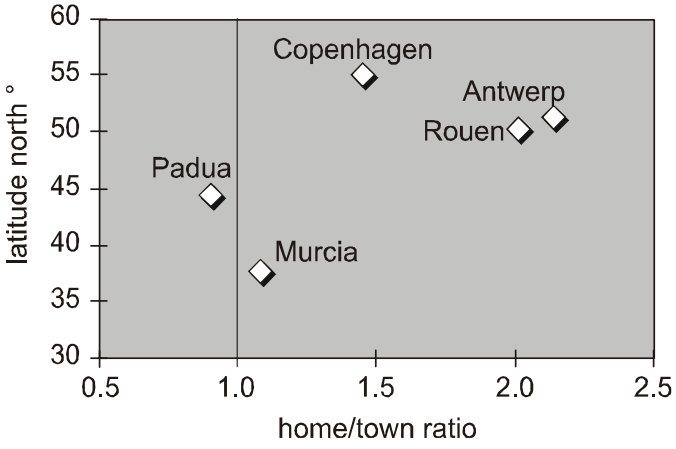
Figure 6: Typical daily profile of benzene hourly average concentrations, obtained by a BTX automated analyser. Data refer to the last campaign in Padua; each hourly value is the average over the whole monitoring campaign. Similar profiles have been obtained in other towns equipped with the same instrumentation, with minor variations in the peak time, depending on local lifestyles.



Nevertheless, this contribution is only a fraction of the total. By reconstructing the exposure history of the volunteers by means of their diaries, one realises that people spend, on a European average, 21.6 % of their time outdoors (for work, shopping, transportation, spare time activities, etc.), 59.1% of the time at home and the remaining 18.3% in indoor places different from home (schools, offices, pubs, restaurants etc.). Therefore, the contribution due to staying at home becomes very important. On a European basis, excluding Athens, the average pollution level at home has come out to be 1.51 times the urban level: this means that homes are more heavily polluted than towns! This experimental finding is surprising since it was intuitively reasonable to suppose that home pollution came from outdoor pollution, and should not have been therefore higher than that.

As shown in the Figure 7, the value of domestic to urban pollution ratio tends to rise from Southern to Northern Europe. This peculiar tendency levels out the differences of exposure compared to urban levels: as soon as outdoor exposure ceases, citizens are subject to domestic exposure for a longer time, and it has a worsening effect in Antwerp, Rouen and Copenhagen, is neutral in Padua and Murcia, and has an improving effect in Athens. Athens's data are particular and are useful to confirm the great importance of the home exposure. While in all of the other towns the volunteers' homes were inside the monitored area, in Athens volunteers have been chosen that live in quarters far from it and with less automotive traffic (Athens has therefore not been considered in Figure 7). This choice resulted in measuring a home pollution level a little bit higher than the European average (10.1 $\mu g/m^3$ instead of 8.5 $\mu g/m^3$) facing the urban pollution level which is more than three times as high as the European average (20.7 $\mu g/m^3$ instead of 6.4 $\mu g/m^3$). Well, as can be seen from the Figure 1, the overall personal exposure level in Athens turned out to be 18.8 $\mu g/m^3$, that is only a 40% higher than the European average (13.2 $\mu g/m^3$).

Figure 7: Home to urban pollution ratios as a function of latitude.



The gathered data allow us to put forward some hypotheses about the reason why Northern European towns suffer from an indoor pollution level higher than the outdoor one. The main source of indoor pollution is demonstrated to be the urban one, as shown in Figure 6 by the good overlaying of respective seasonal trends. The reason why, in general, indoor pollution is higher than the outdoor one, even if it reflects its seasonal trend, might be due to a lack of balance among input from outside and inside removal. In other words, the house itself might act as a flywheel because of the adsorbing

power of the surfaces of walls, floors, furniture and various furnishings. The hypothesis is likely, since the phenomenon is negligible in Southern European towns while is noteworthy in Northern European countries. In Northern towns moquette, linoleum and wood linings often replace tiling, marble and bare walls typical of Southern towns. Whatever the reasons be (it is worthy investigating), paradoxically, people in Northern Europe, who spend longer time indoor at home, are more exposed to benzene coming from the street.

Acknowledgements

This research reports the results of the MACBETH (Monitoring of Atmospheric Concentrations of Benzene in European Towns and Homes) project, co-financed by the European Commission in the frame of the Life programme.

References

Bond, G.G., McLaren, E.A., Baldwin, C.L., and Cook, R.R. (1986). An Update of Mortality among Chemical Workers Exposed to Benzene. Brit. Jour. Ind. Med., 43, pp 685-691.

Cocheo, V., Boaretto, C. and Sacco, P. (1996). High Uptake Rate Radial Diffusive Sampler Suitable for Both Solvent and Thermal Desorption. Am. Ind. Hyg. Assoc. J., 57, pp 897-904.

Kumar, N. and Russel, A.G. (1996). Multiscale Air Quality Modeling of the Northeastern United States. Atmospheric Environment, 30-7, pp 1099-1116.

Rinsky, R.A. et al. (1981). Leukemia in Benzene Workers. Am. J. Ind. Med., 2, pp 217-245.

Snyder, R., Witz, G. and Goldstein, B.D. (1993). The Toxicology of Benzene. Environmental Health Perspect., 100, pp 293-306.

Vigliani, E.C. and Saita, G. (1964). Benzene and Leukemia. New Engl. J. Med., 271, pp 872-876.

Ward, J.B. et al. (1992). The Mutagenic Effects of Low Level Sub-acute Inhalation Exposure to Benzene in CD-1 mice. Mutation Res., 268, pp 49-57.

World Health Organization (1996). Updating and Revision of the Air Quality Guidelines for Europe. EUR/ICP/EHAZ9405/MT 12. WHO Regional Office for Europe, Copenhagen.

Correspondence and request for materials should be addressed to:

Vincenzo Cocheo
Fondazione Salvatore Maugeri-IRCCS
via Svizzera, 16
35127 Padova
Italy
Phone : +39-0498-064-511
Fax : +39-0498-064-555
E-mail : vcocheo@fsm.it

Authors

Vincenzo Cocheo, Paolo Sacco and Caterina Boaretto, Fondazione Salvatore Maugeri-IRCCS, via Svizzera, 16, 35127 Padova, Italy

Emile De Saeger and Pascual Perez Ballesta, Joint Research Centre, 21020 Ispra, Italy

Henrik Skov, National Environmental Research Institute, Frederiksborgvej 399, 4000 Roskilde, Denmark

Eddy Goelen, Vlaamse Instelling voor Technologisch Onderzoek, Boretang 200, 2400 Mol, Belgium

Norbert Gonzalez, Institut National de l'Environnement Industriel et de Risques, 60550 Verneuil-en Halatte, France

Antonia Baeza Caracena, Departamento de Ingenieria Quimica-Murcia, Universidad de Murcia, 30071 Murcia, Spain

INVESTIGATION OF THE RISK OF CYANIDE IN GOLD LEACHING ON HEALTH AND ENVIRONMENT IN CENTRAL ASIA AND CENTRAL EUROPE (IRCYL)

Jean-Baptist du Prel, Beate Pesch, Ulrich Ranft, Radu Rautiu, Vladimir Troitsky
and the IRCYL Team

Cyanide Spills Continue to Threaten Environment and Health in Gold Mining Regions

Gold is one of the rarest elements on earth. Sodium cyanide (NaCN) is used to leach gold from rock in very low concentrations in a chemical process. This common method of gold extraction for large-scale mines is considered a low-cost technology, but an environmentally dangerous chemical method (Korte and Coulston, 1998; Korte et al., 2000), where the probability and expenses of potential disasters have to be taken into account. Since the introduction of cyanide for the extraction of gold, accidental CN spills, dam ruptures and leakages frequently occurred (Website 1; Website 2; Website 3).

Main environmental hazards are the storage of CN-loaden tailings in large open tailing ponds and the transport of NaCN powder. NaCN is easily soluble in water, generating the highly volatile hydrogen cyanide (HCN), especially if accidentially spilled into natural waters. To avoid HCN emissions of CN-loaden tailings into the ambient air, the ponds are kept under alkaline conditions, but air quality data for such ponds are still limited. In a case study, the annual emisson of HCN for such a pond was estimated with 22 tons (Korte on Website 4). If referred to the annual global gold production, this would result in the release of 20 000 tons of HCN into the ambient air (Korte on Website 4). For cyanide destruction, alkaline chlorination has been most generally used. If pH cannot be controlled, especially in a case of CN spill into natural waters, the generation of thiocyanate and other toxic compounds as well as the emission of free chlorine into the ambient air can cause severe side-effects.

Considering possible health hazards, CN compounds are one of the most toxic substances known. CN poisoning results from inhaling HCN or ingesting NaCN in small amounts, but also poisoning by skin contact is possible (Website 5). Cyanide binds irreversibly to the iron atom in hemoglobin, making it unavailable to transport the vital O_2 to the body's cells and tissues (Website 6). It acts as a cellular asphyxiant by inhibiting cytochrome oxidase in mitochrondria, thus preventing the intracellular oxygen utilization (Website 5).

Gold deposits are often located in regions of high ecological and cultural priority. In 1994, the European Parliament debated the environmental problems of cyanide-based gold mining, resulting in prohibition of gold mining exploration in Turkey (European Parliament 1994). On the other hand, rich gold resources are a relevant economic potential of Russia, the Newly Independent States (NIS) of the former Soviet Union and of Central and Eastern European countries (CEE, Map 1). These deposits are going to be explored by joint venture with Western mining companies with financial support by international banks. The European Bank for Reconstruction and Development (EBRD) is especially active in the gold mining sector, supporting the Canadian-Kyrgyz gold mine KUMTOR in Kyrgyzstan, the Kubaka project in Russia, and the Zarafshan-Newmont joint venture in Uzbekistan, which is one of largest heap-leaching operations of the world (Website 7). Table 1 lists the gold mining enterprises of Russia and NIS operating with CN.

The inadequate infrastructure of these regions can additionally enhance the high baseline risk of this technology. The International Commission for the Protection of the Danube River prepared an inventory of potential

accidental risk spots in the Tisa catchment area (International Commission for the Protection of the Danube River 2000), and a sequence of CN spills in Romania was reported by Greenpeace (Website 8). The largest CN spill occured at the Aurul gold mine, near Baia Mare, on 30 January 2000, causing a transboundary complex disaster (Table 2).

Table 1: Gold Mining Enterprises Operating with CN in Russia and the Newly Independent States

Enterprise	Country	Region (*oblast)*	Deposit
Yuzhuralzoloto (Kocharskaya plant)	Russia	Urals	Svetlinskoe
Yuzhuralzoloto (FZTzO)	Russia	Urals	Kocharskoe
Berikul' mine	Russia	Western Siberia	Berikulskoe
JSC "Polyus"	Russia	Eastern Siberia	Olimpiadninskoe
Kommunarovsky mine	Russia	Eastern Siberia	Kommunarovskoye
JSC "Zolotaya zvezda"	Russia	Eastern Siberia	Chazy-Gol
Artel "Sayany"	Russia	Eastern Siberia	Mayskoe
JSC Buryatzoloto (Samartinskaya plant)	Russia	Eastern Siberia	Zun-Kholba, Irokinda
JSC "Aldanzoloto"	Russia	Eastern Siberia	Kuranakh
Artel "Seligdar"	Russia	Eastern Siberia	Samolazovskoe
Pokrovsky mine	Russia	Far East	Pokrovskoe
Artel "Amur"	Russia	Far East	Ryabinovoe Yubileinoe
Nizhneamurzoloto (Mnogovershinnaya plant)	Russia	Far East	Mnogovershinnoe
Omolonskaya goldmining company	Russia	Far East	Kubaka
Mine Matrosov	Russia	Far East	Natalkinskoe
Susuman combine	Russia	Far East	Svetloe, Shkolnoe
JSC "Kazakhaltyn" (Zholymbet plant)	Kazakhstan	Akmola	Zholymbet, Bestobe, Aksu, Kvartsytovye Gorki
JSC "Maikainzoloto"	Kazakhstan	Pavlodarskaya	Maikain V, Alpys, Suvenir
GRK "Balkhash"	Kazakhstan	Karaganda	Pustynnoe, Dolinnoe, Ushshaky
Navoi combine	Uzbekistan	Navoi	Muruntau, Kokpatas
JV "Zeravshan-Newmont"	Uzbekistan	Navoi	Muruntau
JV "Angren Gold"	Uzbekistan	Tashkent	Kochbulak, Kyzylalmasai
Uzalmzoloto	Uzbekistan	Dzhizak	Mardzhanbulak, Chadak
JV "Zamitan Gold"	Uzbekistan	Samarkand	Zarmitan, Guzhumsai
JV "Zeravshan Gold"	Tajikistan	Leninabad	Dzhilau, Taror
JV "Kumtor Gold"	Kyrgyzstan	Issyk-Kul	Kumtor
JV "Kvartzit"	Georgia		Madneuli
Armzoloto	Armenia		Zod, Megradzor
Ukrainskie Polimetally	Ukraine	Zakarpatie	Muzhievskoe, Saulyak

Map 1: Location of Gold Mining Companies in the CIS (Except Russia)

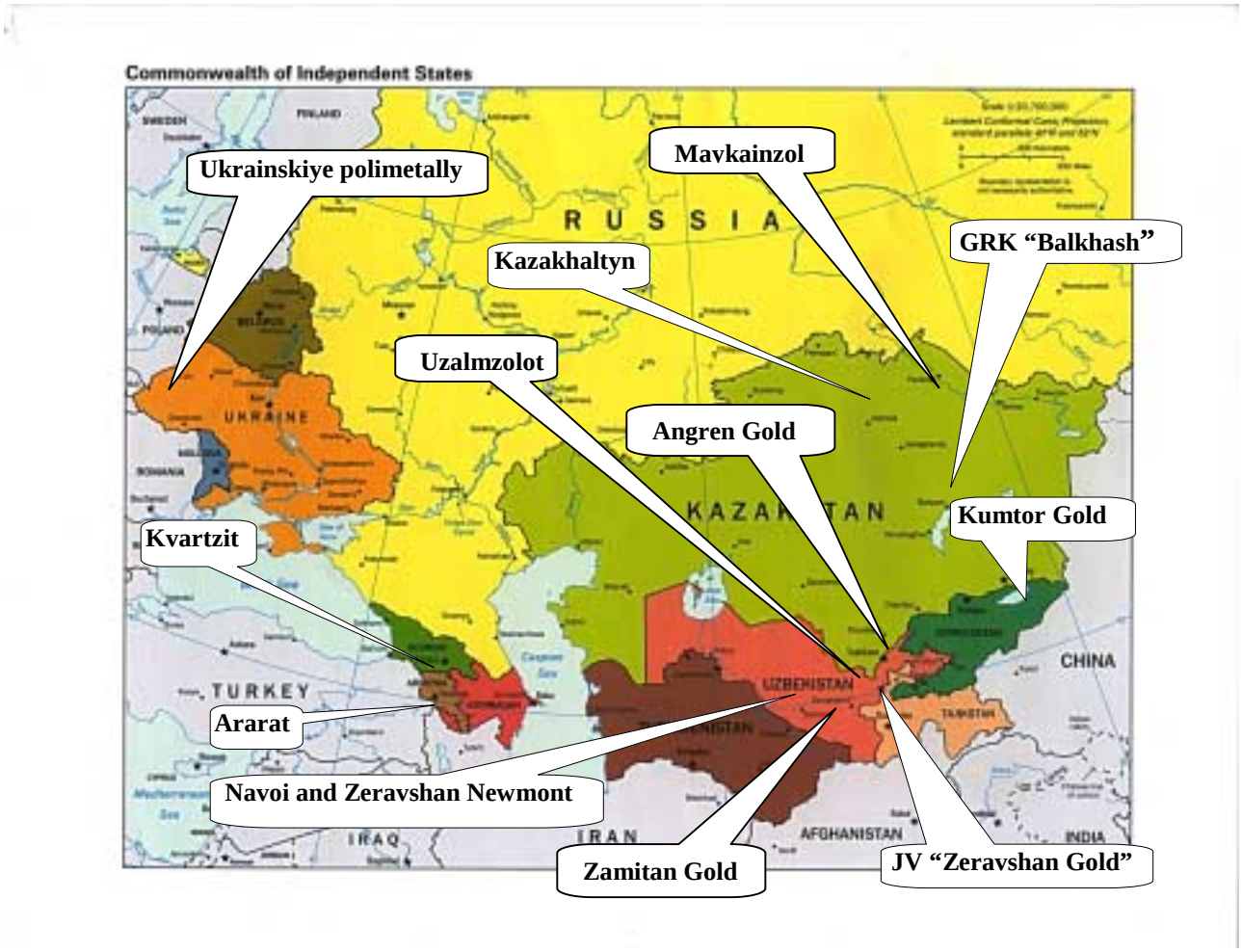


Table 2: The Cyanide Spill near Baia Mare (Romania) on 30 January 2000 (The Baia Mare Task Force 2000; Csagoly on Website 9)

Gold mine:	Aurul SA, Romania
Date of initial spill:	30 January 2000
Duration of spill:	11 hours
Place of spill:	Bozanta Mare / Baia Mare region, Romania
Type of spill:	Overflow / leakage of tailings dam
Rivers:	Sãsar ->Somes/Szamos ->Tisa/Tisza > Danube -> Danube Delta -> Black Sea
Causes:	Construction disorders and heavy rain
Emission of tailings	100 000 m^3
CN emission	50-100 tons
Initial CN concentration:	19.4 mg/L near spill site; 0.8 mg/L in private wells
Other Pollutants:	Heavy metals (especially copper)

Cyanide Mining Accidents Need Preparedness in Disaster Management

Besides technical shortcomings, insufficient preparedness to manage mining-related emergencies may additionally increase the impact of spills on health and environment. The investigation of the management of historical spills can serve to develop a best CN disaster management plan, with the CN accident in Kyrgyzstan as an example for improvements in preparedness. A Community and Business Forum was formed with assistance of international institutions, including EBRD and NGOs, to prepare, release and host KUMTOR's updated emergency plan (KUMTOR emergency plan at Community and Business Forum on Website 10). The KUMTOR gold project is owned two-thirds by the Kyrgyz government and one-third by the Canadian company CAMECO. It ranks among the 10 largest gold mines of the world. The mine is located in the mountains of Tien Shan, which belongs to a protected biosphere reservation according to the UNESCO 'Man and Biosphere Programme'. CN is transported with truck convoys to the mine into the mountains. On 20 May 1998, a truck en route on the Barskaun pass crashed into the Barskaun river (Table 3). An estimated 1762 kg of sodium cyanide was spillt into the river. The accident was reported with a delay of 6 to 8 hours after it took place. A large fraction of the local population had sought medical care, but no consensus has been reached on the exact number of intoxications and fatal outcome. WHO experts from the European Centre of Environment and Health, Bilthoven/The Netherlands, and a commission of Canadian and Russian scientists investigated the accident in 1998 (Cleven and van Bruggen, 2000; Hynes et al., 1998) where the scene was assessed and CN was measured in the environment. The commission recommended a follow-up on patients who reported symptoms, and local health personnel should be trained in environmental medicine. WHO experts recommended also to establish the structures for risk communication to achieve a proper balance between the different stakeholders on governmental and economic priorities in relation to societal and environmental interests.

Table 3: The Management of the CN Accident in Kyrgyzstan on 20 May 1998 (KUMTOR emergency plan at Community and Business Forum on Website 10; Cleven and van Bruggen, 2000)

Gold mine:	KUMTOR, Kyrgyzstan
Date of CN spill:	20 May 1998, 12:15 p.m.
Type of spill:	Truck accident with a spill of 1762 kg of sodium cyanide into Barskaun river
Causes:	Unfortified pass road and high velocity of the truck
Information dissemination:	Delay of 6-8 hours
Neutralization of CN:	Information on application and whereabouts limited
Antidotes:	Widespread treatment
Evacuation:	4000 - 5000 persons several days after incident
Environmental impact:	Measurements by WHO experts, International Commission
Health impact:	Limited data

What are the IRCYL Objectives?

IRCYL is outlined to ***I***nvestigate the ***R***isk of ***CY***anide in Gold ***L***eaching on Health and Environment in Central Asia and Central Europe supported in the fifth framework programme of European Community for research, technological development and demonstration actions (INCO II Programme COPERNICUS 2). The project is structured by four workpackages (Figure 1) with focus on the CN incidents in Kyrgyzstan and in Baia Mare (Romania):

WP1 is to investigate the health effects of the two accidents. Epidemiological studies in Kyrgyzstan and Romania on vulnerable groups will be performed by stratifying for exposure level. Exposure data on CN and other agents gathered from a questionnaire, the analysis of biomarkers and environmental samples (WP4) will be used to estimate the health impact. Two cohorts will be established to allow a follow-up for possible chronic effects.

WP2 is to analyse the management of both accidents. Recommendations for a best CN disaster management will be developed, focusing on the informational and organisational needs. An expertise in disaster medicine for CN intoxications will be established to minimize health effects in any future case of an accidental cyanide spill. Results will be presented via internet for rapid access.

WP3 is to develop a comprehensive review of the gold extraction technologies and their risks and costs for environment and health. Of special interest are alternatives of the cyanide leaching technology. Recommendations for a best environmental practice will base on case studies, on measurements of toxic compounds in waste waters of gold mines, and on the evaluation of the emission of toxic compounds into the environment (soil, air, water). Risk communication will be established between stakeholders on workshops in Romania, Kyrgyzstan and London and through networking.

WP4 will assess the transboundary impact of the Baia Mare spill with respect to environment, economy and environmental legislation in Central Europe. The task will comprise a brief estimation of the rivers ecosystem damage, pathways of pollutants into the life cycle and into the food chain and estimation of ground water and wells contamination in the Baia Mare area with cyanide and heavy metals. National and European legislation and policy will be considered with an emphasis on transboundary issues.

Who Participates in IRCYL?

In a first turn of assembling teams, IRCYL focused on the Kyrgyz accident with Kyrgyz scientists, researchers from Kazakhstan and mining consultants from Russia together with German and British scientists.

When submitting the proposal, the Baia Mare spill occurred, and the European Commission upgraded this project to allow Romanian teams to participate. Now 12 teams co-operate in the work for IRCYL (Table 4).

Figure 1: Thematic Structure of the IRCYL Project: Workpackages, Objectives and Deliverables

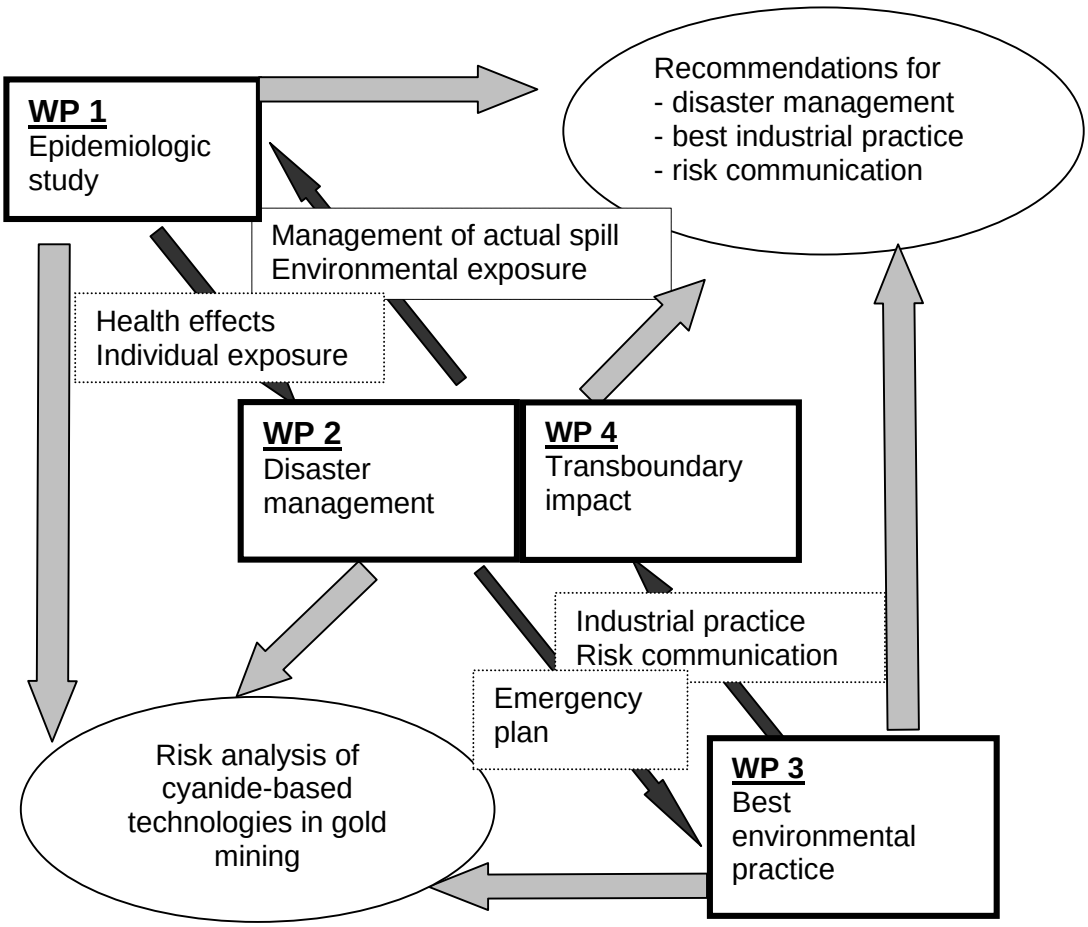


Table 4: IRCYL partners

Medical Institute for Environmental Hygiene (Co-ordinator)	Düsseldorf, Germany
IC Consultants Ltd./Imperial College of Science Technology & Medicine	London, United Kingdom
InfoMine	Moscow, Russia
Kyrgyz Research Institute of Oncology and Radiology	Bishkek, Kyrgyzstan
Kyrgyz Scientific Center of Haematology	Bishkek, Kyrgyzstan
Institute for Regional Studies	Bishkek, Kyrgyzstan
Physico-chemical Methods Analysis Center	Almaty, Kazakhstan
University Babes Bolyai	Cluj, Romania
Institute of Public Health 'Prof. Dr. Iuliu Moldovan'	Cluj, Romania
Research Institute for Analytical Instrumentation	Cluj, Romania
North University of Baia Mare	Baia Mare, Romania
Mining Consortium - Research and Companies	Deva, Romania

What IRCYL Has Done so Far?

Starting in September 2000, thus far was done:

- the presentation of the planned work on a first workshop in Romania with a visit of the AURUL gold mine near Baia Mare, as well as conducting a meeting with local authorities and NGOs
- the preparation of study protocols for each workpackage
- the presentation of the project and its objectives in the Internet (www.icconsultants.co.uk/ircyl.html)
- the development of questionnaires for the epidemiological studies in Romania and Kyrgyzstan to assess exposure and health status in both study regions
- the preparation of the field work on environmental and health variables.

What Will IRCYL Do in the Future?

- In 2001, the major task is to perform the field work in the study regions of Romania and Kyrgyzstan for environmental and health investigations. The epidemiological study will enrol 450 vulnerable persons in Romania and 900 persons in Kyrgyzstan, and environmental samples will be analysed from both regions. In March 2001, the Romanian teams have already started the field work. Another milestone will be a workshop held in Kyrgyzstan on the results of the field work and of the other workpackages.
- In 2002, chemical, biological and other investigations will proceed, as well as a detailed statistical analysis of the epidemiological and environmental data. The inventory of gold mines operating with CN in CEE and NIS, including environmental fact sheets for gold mines, and the review of spills will be updated. The Internet presentation of guidelines for disaster management in CN spills will be developed.
-
- In 2003, a final workshop will be held in London, with an open platform for discussion of the results among a broad auditorium of stakeholders, including representants from mining companies, financial institution, political instances as well as NGOs and the public.
- Based on the results of the project and the discussions at the workshop, the final report will be prepared and submitted to the European Commission.

Acknowledgements

Financial support from the European Commission, CEC contract No ICA2-1999-10065, is gratefully acknowledged.

References

Cleven, R.F., van Bruggen, M. (2000). The Cyanide Accident in Baskaun (Kyrgyzstan). National Institute of Public Health and the Environment, RIVM, Bilthoven, NL. Investigation performed by order and for account of the Directorate of Health Policy, project 609026.

Csagoly, P. (ed.) on Website 9. The Cyanide Spill at Baia Mare, Romania. Before, During and After. http://www.rec.org/REC/Publications/ CyanideSpill/

European Parliament (1994). Resolution (B-0410/94) adapted on November 17, 1994. OJEC C 341 of Dec 5, 1994 - 1995 Minutes Sitting of Thursday, November 17, 1994. http://www.wiz.uni-kassel/ ochem/Minutes.html

Hynes, T.P., Harrison, J., Bonitenko, E., Doronina, T.M., Baikowitz, H., James, M., Zinck, J.M. (1998). Kyrgyzstan Cyanide Spill. The International Scientific Commission's Assessment of the Impact of the Cyanide Spill at Barskaun, Kyrgyz Republic, May 20, 1998. August 1998. http://envirolab.nrcan.gc.ca/spill-e.htm

International Commission for the Protection of the Danube River (2000). Regional Inventory of Potential Accidental Risk Spots in the Tisa Catchment Area of Romania, Hungary, Ukraine and Slovakia. http://www.zinke.at

Korte, F. on Website 4. Ökologisch-chemische Betrachtungen zum vorgeschlagenen Goldgewinnungsprojekt unter Anwendung der Cyanidlaugung in der Türkei durch die Tüprag Metal Mining LTD. www.infu.uni-dortmund.de/korte-goldmining/Expert.html

Korte, F., and Coulston, F. (1998). Some Considerations on the Impact on Ecological Chemical Principles in Practice with Emphasis on Gold Mining and Cyanide. Ecotoxicology and Environmental Safety, 41, pp 119-129.

Korte, F., Spiteller, M., Coulston, F. (2000). The Cyanide Leaching Gold Recovery Process Is a Nonsustainable Technology with Unacceptable Impacts on Ecosystems and Humans. The Disasters: The Disaster in Romania. Ecotoxicology and Environmental Safety, 46, pp 241-245.

KUMTOR Emergency Plan at Community and Business Forum on Website 10. www.kyrgyzstan-cbf.org

The Baia Mare Task Force [Garvey, T., Barlund, K., Mara, L., Marinov, E., Morvay, K., Verstrynge, J.F., Weller, P., Kocsis-Kupper, Z., Murphy, A., Mayhook-Walker, A. et al.] (2000). Report of the International Task Force for Assessing the Baia Mare Accident. http://europa.eu.int/comm/environment/enlarg/

Website 1
http://www.greenpeace.de/GP_DOK_3P/HINTERGR/C06HI18.HTM

Website 2
http://www.antenna.nl/wise/uranium/mdaf.html

Website 3 http://www.fian.de/foodfirst/food002.htm

Website 5
http://www.ch.ic.ac.uk/vchemlib/mim/bristol/hcn/hcn_text.htm

Website 6
http://206.39.77.2/DMCR/NBC/chemcas/Cyanide.htm

Website 7
http://www.ebrd.com

Website 8
http://www.greenpeace.de/GP_GRAFIK/KARTEN/THEISS1.JPG

Correspondence should be addressed to:

Beate Pesch
Department of Environmental
Epidemiology and Biomonitoring
Medical Institute for Environmental Hygiene
Auf'm Hennekamp 50
40225 Duesseldorf
Germany
Phone: +49-211-3389-282,
Fax: +49-211-3190-910,
beate.pesch@uni-duesseldorf.de

Authors

Jean-Baptist du Prel
Medical Institute of Environmental Hygiene
Address see above
Phone : +49-211-3389-304
Fax : +49-211-3190-910
Jean-Baptist.DuPrel@uni-duesseldorf.de

Beate Pesch
Medical Institute for Environmental Hygiene
Address and numbers see above

Ulrich Ranft
Medical Institute of Environmental Hygiene
Address see above
Phone: +49-211-3389-287
Fax : + 49-211-3190-910
ulrich.ranft@uni-duesseldorf.de

Radu Rautiu
IC Consultants Ltd.
47 Prince's Gate, Exhibition Road
London SW7 2QA
United Kingdom
Phone: +44-207-5946567
Fax: +44-207-5946570
r.radu@ic.ac.uk

Vladimir Troitsky
INFOMINE Research Group
Donskaya street, 3
117049 Moscow
Russia
Phone: +7-95-2378033
Fax:+7-95-2378033
Infomine@deol.ru

NOTES AND NEWS

World Health Organization Establishes New Office in Bonn

On 8 March 2001, the German Ambassador Dreher and Dr Marc Danzon, Director of the WHO Regional Office for Europe (WHO EURO), signed an agreement in Copenhagen, Denmark, on the establishment of a new WHO EURO office in Bonn, Germany. The new office started work in Bonn on 12 March 2001, with a workshop on ″Health and Environment Information Systems″. The office is part of the European Centre for Environment and Health of WHO. It has its seat in the ″Bundeshaus″ (Hermann-Ehlers-Str. 10, 53113 Bonn, Germany) where the Members of Parliament had their offices before the German Government moved to Berlin. It is planned to employ about 20 staff members.

The WHO Bonn office is the technical and scientific unit of the WHO Environment and Health Programme, with a clear regional focus. It supports, at the same time, the global aims of WHO. The office will provide expert knowledge for the region and foster the development of effective environment and health policies based on scientific knowledge. At the beginning of its first working period, emphasis will be laid on the topic urban environment with special focus on population groups particularly affected by environmental health.
WHO in Bonn will concentrate on the following working areas:

1. Air quality – air pollution in urban areas, air pollution in buildings, schools and in work places
2. Noise pollution
3. Housing and the environment – construction of buildings, building materials and urban infrastructures

The German Government has provided from the budget of its Federal Ministry for the Environment, Nature Conservation and Nuclear Safety a single payment of one million DM in 2001 for the establishment of the WHO Bonn office. An additional sum of 2 million DM will be supplied as a voluntary contribution to WHO annually, determined for the purpose of supporting the Bonn office.

Federal Environment Minister Trittin said: ″The establishment of the WHO office in Bonn expresses the reinforced engagement of the German Government in the United Nations, especially in global health and environment issues. For Germany, the foundation of this office is a further step towards the establishment of international institutions in Bonn, in order give this town a new, attractive profile and continuing its development into a centre for international co-operation, particularly in environment and health affairs.″

Source: Press Release of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, of 12 March 2001

Survey of Allergies and Respiratory Diseases in Aachen District, Germany

The collection and assessment of environmental health data is an essential task of public health services, and in the frame of public health documentation and reporting it can provide an information basis for health policies decision making. The resolution of the 8th Regional Conference on Public Health of 16 June 1999 on ″Health Preservation for Children and Teenagers in North Rhine-Westfalia″ pointed out that health preservation, particularly for children and teenagers, is a public health concern of high priority.
For more than five years, the public health department of Aachen district, together with the Institute for Hygiene and Environmental Medicine of the Technical University of Aachen, conducted investigations via questionnaire survey of all 6- and 7-year old children in order to determine

occurrences of allergies, respiratory diseases and complaints. The survey aimed at an overview of the state of health of the population living in the region of the Aachen public health department. Especially of interest were the spatial distributions and trends of diseases. The investigation served exclusively for the estimation of the frequencies of diseases. It did not deal with causes of diseases.

The results of the survey showed that in two sub-districts the frequencies of diseases and complaints were higher compared to other sub-districts. As a consequence, an epidemiological study of environmental factors has been carried out in 2000, in order to investigate the causes of the relatively high frequencies of diseases and complaints in some areas. As the region of investigation is structured heterogeneously, causes may also be diverse. Associations between this type of diseases and complaints on the one hand and effects of air pollution on the other hand have, however, already been established before and have been reported widely.

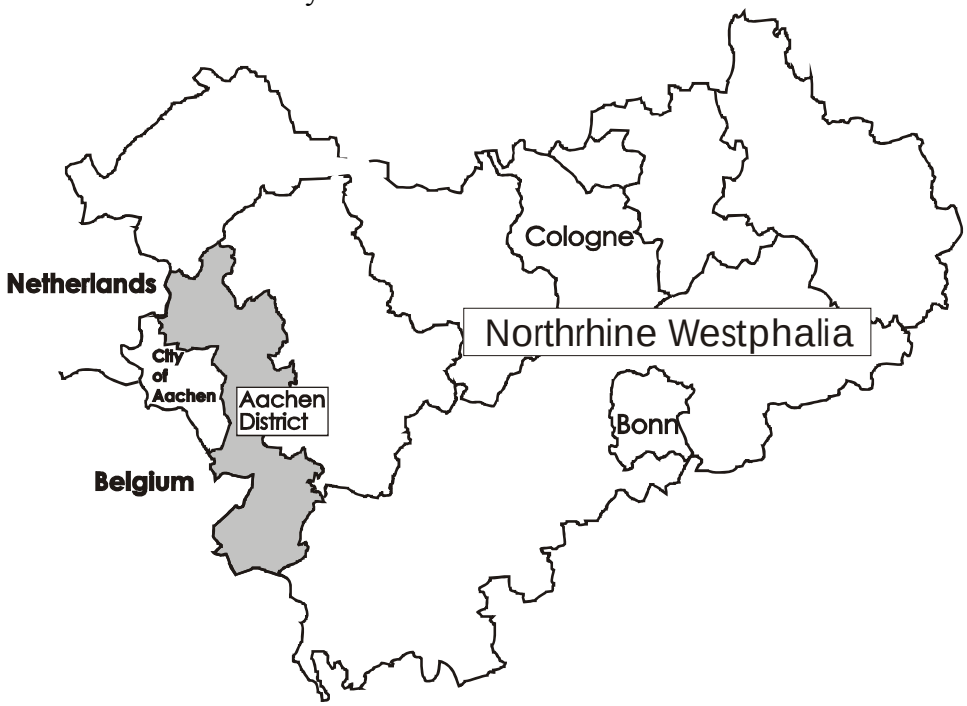
There are large industrial enterprises in the district, among others heavy metal smelting and industries, chemicals and pharmaceuticals producers, power plants and cable production. In other parts of the district, coal mining predominated in the past. At present, a reorientation process is taking place followed by the settlement of mostly smaller or medium-sized enterprises working in different areas, as there are: medical, bio- and measurement techniques, technologies development and microelectronics.

In February and March 2000, altogether 654 children participated in the study, from two conspicuous sub-districts and another district that served as a control group. Allergological investigations (″skin-prick tests″) and an extended questionnaire will help to find the causes of relatively elevated frequencies of diseases and complaints.

The study is presently in the data analysis. Results will be published in the middle of 2001. In the long term, preventive medical strategies should be developed and put into practice on the local level in order to reduce the frequency of allergies, as well as respiratory diseases and complaints.

Thilo Koch, Kreisgesundheitsamt Aachen, Steinstraße 87, 52249 Eschweiler, Germany, phone: +49-2403-860-206,
e-mail: gesundheitskonferenz@kreis-aachen.de

Map 1: Aachen District – the Survey Area



German Environmental Survey of Children and Teenagers

The German National Health and Environmental Survey of children and teenagers started in February 2001 with a pretest. The Survey is co-ordinated by the Robert Koch-Institute (Health Survey) and the Federal Environmental Agency (Environmental Survey).

The general objectives of the Environmental Survey of children and teenagers are similar to those of the German Environmental Surveys for adults, carried out in 1985/86 (GerES I) and 1990/92 (GerES II).

- to generate representative data on the distribution of environmental pollutants concentrations in biological samples from children and teenagers
- to establish a database in order to derive reference values
- to get insight into the contribution of different compartments (air, food, water) to the body burden
- to document spatial and temporal differences in population exposure.

Representative data for children in the age group
0 to 5 years are not yet available in Germany. For children and teenagers from 6 to 14 years data collection will follow the data collection principles as applied in GerES II, in order to update information and identify trends.

References

Hoffmann, K., Becker, K., Friedrich, C., Helm, D., Krause, C., and Seifert, B. (2000). The German Environmental Survey 1990/1992 (GerES II): Cadmium in Blood, Urine and Hair of Adults and Children. Journal of Exposure Analysis and Environmental Epidemiology, 10, pp 126-135.

Hoffmann, K., Krause, C., Seifert, B. and Ullrich, D. (2000). The German Environmental Survey 1990/1992 (GerES II): Sources of Personal Exposure to Volatile Organic Compounds. Journal of Exposure Analysis and Environmental Epidemiology, 10, pp 115-125.

Seifert, B., Becker, K., Helm, D., Krause, C., Schulz, C. and Seiwert, M. (2000). The German Environmental Survey 1990/1992 (GerES II): Reference Concentrations of Selected Environmental Pollutants in Blood, Urine, Hair, House Dust, Drinking Water and Indoor Air. Journal of Exposure Analysis and Environmental Epidemiology, 10, pp 552-565.

Seifert, B., Becker, K., Hoffmann, K., Krause, C. and Schulz, C. (2000). The German Environmental Survey 1990/1992 (GerES II): A Representative Population Study. Journal of Exposure Analysis and Environmental Epidemiology, 10, pp 103-114.

For more information, see:
http://www.umweltbundesamt.de/survey-e/index.htm

MEETINGS AND CONFERENCES

1st Meeting of German WHO Collaborating Centres
20 March 2001 in Eschborn, Germany

A first national meeting of WHO Collaborating Centres (CCs) took place at the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ; the German Society for Technical Cooperation) in Eschborn, Germany, on 20 March 2001. The meeting was organized and conducted by the WHO CC for Health Development Systems at GTZ. Participants from 25 CCs of a total of 41 German CCs attended the meeting, two participants came from the WHO Headquarters, Division of Evidence and Information for Policy, Geneva, Switzerland.

One major aim of this meeting was to inform WHO Headquarters about the various scientific activities at the national level performed by German CCs in their co-operation and collaboration with WHO. Besides, this first meeting was an opportunity to build up a network of German CCs to promote a more harmonised collaboration process with WHO.

Another aim was the presentation of recent experiences and statistics of worldwide collaboration between WHO and scientific institutions, designated as CCs. A set of statistics by programme subjects, regions and countries shows that nearly half of the CCs (524 of 1185) belong to the WHO European Region. In particular, the 41 German CCs deal with 22 of 71 programme subjects. The following table gives an overview on WHO programme subjects and the number of participating CCs in Germany, in the WHO European Region and worldwide.

WHO Programme Subject	CCs in: Germany	EURO	Worldwide
Health Systems Research and Development	3	13 (10)	32 (22)
Human Resources	1	10 (8)	35 (22)
Health Education	3	13 (7)	26 (16)
Research Policy	1	5 (4)	7 (5)
Reproductive Health	1	16 (13)	48 (31)
Occupational Health	3	34 (18)	60 (34)
Ageing and Health	1	4 (4)	13 (12)
Mental Health	3	40 (17)	70 (30)
Water Supply and Sanitation	1	11 (7)	19 (14)
Chemical Safety	1	5 (4)	6 (5)
Environmental Health *(incl. the WHO'CC for Air, Berlin)*	3	26 (12)	45 (21)
Food Safety	1	13 (12)	27 (22)
Health Laboratory Technology	1	5 (5)	12 (11)
Radiation Medicine	3	9 (6)	21 (15)
Emerging Diseases	5	28 (13)	53 (23)
Vaccine Research and Development	1	14 (10)	19 (12)
Virus Diseases	1	35 (15)	74 (31)
Oral Health	2	22 (13)	33 (19)
Cancer	1	11 (7)	27 (14)
Cardiovascular Diseases	2	5 (3)	22 (11)
Diabetes	1	17 (12)	32 (22)
Prevention and Control	2	11 (8)	17 (13)

( ) number of countries with CCs

For detailed information on CCs globally, readers are referred to the homepage: http://whocc.who.int

Besides WHO health and research activities the programme 'Scientists for Health and Research and Development – SHARED' was introduced by GTZ. SHARED started in 1996 as a European Commission concerted action. SHARED's objective is to share essential information on health research and development for developing countries. It enables web-based networking and communication among health professionals and aims to bridge the knowledge gap through fast access to information. Until now, some 3500 scientists conducted about 2000 health projects in 159 countries funded by more than 350 agencies. Further information on and how to join the programme can be obtained by the homepage: www.shared.de

Hans-Guido Mücke, Federal Environmental Agency, Berlin, Germany

International Conference on Monitoring Indoor Air Pollution 18 to 19 April 2001, Manchester, UK

The international conference on ″Monitoring Indoor Air Pollution″ was organised by ISBE, the **I**nternational **S**ociety of the **B**uilt **E**nvironment, with the support of ARIC, the Manchester Metropolitan University and the Royal Society of Chemistry (Analytical Division). More than 65 delegates from 13 countries attended the conference. Countries represented were: Australia, Chile, Czech Republic, Denmark, France, Korea, Lebanon, Lithuania, Poland, Sweden, Turkey, UK, USA. The disciplines were varied and included analytical, pharmaceutical and industrial chemists, microbiologists, environ-mental scientists, journal editors, health professionals, equipment manufacturers, engineers and PhD students.

The papers given at the conference focused on monitoring indoor air pollution, particularly on themes as: homes, public environment, new monitoring techniques and developments, health, personal exposure and modelling. Additional six papers were presented in a poster session. The opening conference speech was held by G. Leslie (ISBE) who welcomed the conference participants.

All presented papers would certainly deserve to be mentioned here but the author of this article was especially interested in a few of them. The first conference session *″Homes″* covered issues like types of housing, variety of sources, variability of concentrations and social-economic factors relevant to indoor environment. J. Hoskins (ISBE) spoke on ″Mineral Fibres and Health″. He demonstrated that the widespread use of fine inorganic fibrous materials is a comparatively new phenomenon with possible impact to human health. D. Crump (Building Research Establishment, UK) presented a comprehensive review on ″Strategies and Protocols for Indoor Air Monitoring of Pollutants″. It included a compendium of the current state of development of European and international standards for measurement methods of indoor air pollutants.
In the paper ″Monitoring of Population Health in Relation to the Environment – Monitoring Outdoor and Indoor Air″ participants from the Czech Republic presented initial data and the experiences of a long-term project. The aims of this project were to determine, describe and analyse pre-school children (aged 3 to 7 years) exposure to indoor pollutants in four urban areas of more than 100 000 inhabitants.

During the session *″Public Environments″* exposure to moulds, control of airborne asbestos in schools and levels of exposure to organic compounds (TOC) were discussed by J. Singh (EBS, Environmental Building Solutions Ltd, Bedfordshire, UK), I. Alameddine (American University of Beirut), J. Lange (Envirosafe, Pittsburg, USA) and P. Siskos (University of Athens).

The last session of the first day focused on new monitoring techniques and developments and contained papers by L. Larson (University of Lund), K.F.E Pratt (Capteur Sensors and Analysers Ltd.), E. Woolfenden (Marks Int. Ltd) and G. O´Brien (Glasgow Caledonian University). Topics discussed included the application of the GC-MS system for monitoring of micro-organisms, hand held ozone monitoring instruments, optimising the analytical performance and extending the application range of thermal desorption, and using electro-growth curves of bioindicators for sick building syndrome diagnostic.

The second day opened with the fourth session *"Health"*. The presentations comprised "The Prediction of Nasal Pungency, Eye Irritation and Odour Thresholds for VOC" by M. Abraham (University College London), followed by a short discussion about "The Mutagenicity of Airborne PM_{10}" by A. Curnow (Royal Cornwall Hospital), "Implications of Particle Sources in the Calculation of Dose Arising from Exposure to Radon Progeny" by G. Tymen (Université de Bretagne, Brest, France) and some experiences from monitoring offices' environments at "The Quality of Air in Office Buildings" by C. Vitel (Healthy Buildings International, Wood Berkshire, UK).
The papers given by S.-O. Baek (Yeungman University, Kyungsan, Korea), M. Ashmore (Bradford University) and J. Carrington (MMU, Manchester Metropolitan University) in the fifth session *"ETS/Personal Exposure/Modelling"* summarized actual experiences in monitoring tobacco smoke and VOC by personal monitors, the modelling of indoor and personal exposures to NO_2, CO, $PM_{2.5}$ and PM_{10} and discussed the application of ETS/RSP (environmental tobacco smoke/respirable suspended particles) particulate marker factors.

The last conference session *"Home 2"* consisted actually of two parts. In the first part a paper was presented about monitoring sixteen VOC in 25 homes in the Athens area – "Volatile Organic Compounds in Homes" given by A. Siskos (University of Athens) and a second one on "Determination of CO Toxication Risks in Houses with Geysers in Bathrooms" from S.A. Vaizoglu (Department of Public Health, Turkey). The last two papers focused on health impacts of indoor pollution, "Indoor Air Pollution inside Dwellings with Respiratory Insufficients" by L. Chalan (University of the Mediterranean, Marseille) and "Monitoring Indoor Air in the Homes of Children with Asthma" by A. Watson (MMU, Manchester Metropolitan University).

The themes addressed during this conference clearly indicate that "pollution" is a complex subject. In individuals exposed to various pollutants the effects are cumulative and some constituents may even potentiate the effects to others. The papers and consecutive discussions confirmed continual consequence of social-economic factors, especially smoking, to quality of indoor environment.

Comparison of experiences acquired during studies focused on evaluation of indoor environment quality in apartments (Chile) and school classes (Greece), with a long-term project of monitoring (Czech Republic), where monitoring of indoor air quality is a integral part, were very estimable.

Bohumil Kotlík, Department of Air Hygiene, National Institute of Public Health, 10042 Prague 10, Czech Republic, fax: +420-2-67-08-23-03 or: 420-2-67-08-24-54, e-mail: hygiena.ovzdusi.szu@telecom.cz.

NEW PUBLICATIONS

WHO

Air Quality Guidelines for Europe, 2nd ed.

WHO Regional Publications, European Series No. 91, WHO Regional Office for Europe, Copenhagen 2000, 273 pages, ISBN 92-890-1358-3, 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. The Bilthoven Division of the WHO European Centre for Environment and Health undertook this process in close co-operation with the International Programme on Chemical Safety (IPCS) and the European Commission.
It is the aim of these guidelines to provide a basis for protecting public health from adverse effects of air pollutants and to eliminate or reduce exposure to those pollutants that are known or likely to be hazardous to human health or wellbeing. The guidelines are intended to provide background information and guidance to (inter)national and local authorities in making risk assessment and risk management decisions. In establishing pollutant levels below which exposure - for life or for a given period of time - does not constitute a significant public health risk, the guidelines provide a basis for setting standards or limit values for air pollutants.

It is a policy issue to decide which specific groups at risk should be protected by the standards and what degree of risk is considered to be acceptable. These decisions are influenced by differences in risk perception among the general population and the various stakeholders in the process, but also by differences in social situations in different countries, and by the way the risks associated with air pollution are compared with risks from other environmental exposures or human activities. Therefore, national standards may differ from country to country and may be above or below the respective WHO guideline value.
This publication includes an introduction on the nature of the guidelines and the methodology used to establish guideline values for a number of air pollutants. In addition, it describes the various aspects that need to be considered by national or local authorities when guidelines are transformed into legally binding standards. 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. For detailed information on exposure and on the potential health effects of the reviewed pollutants, the reader is referred to the Regional Office's website, where the background documents on the individual air pollutants can be accessed.

Orders may be addressed to any of the WHO sales agents or directly to: World Health Organization, Marketing and Dissemination, 1211 Geneva 27, Switzerland to place orders: bookorders@who.ch. For questions about publications: Publications@who.ch

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Environmental Health Services in Europe 5

Guidelines for Evaluation of Environmental Health Services.
C.H. Drew, J. van Duivenboden and X. Bonnefoy (eds.). WHO Regional Office for Europe, Copenhagen 2000, 185 pages, ISBN 92-890-1357-5, Sw.fr. 45.-, in developing countries: Sw.fr. 31.50.

This publication aims to fill a gap identified by Member States: to provide a practical introduction for environmental health professionals and managers to evaluate their services. The first task is to review the most critical components and aim of an evaluation, to see how these relate to the overall framework of environmental health service management. Evaluation of health services is an established field. Several books and reports have been published on the subject, both inside and outside of WHO. This publication does not intend to rewrite these documents or restate their arguments. Its goal is to introduce environmental health professionals to evaluation principles, tools and examples from which they can pick and choose elements to suit their specific needs.
The book is designed to guide practitioners towards questions that must be answered to evaluate and improve services. With this in mind, references and suggestions for further reading appear at the end of each chapter, and key recommendations are presented in boxes throughout the text. This is the fifth in a planned series of six books on environmental health services in Europe. The first four books are:

1. An Overview of Practice in the 1990s
2. Policy Options
3. Professional Profiles
4. Guidance on the Development of Educational and Training Curricula.

Russian editions of the first three books are due out soon.

Asthma, Respiratory Allergies and the Environment

Pamphlets for Local Authorities no. 22. WHO Regional Office for Europe, Copenhagen.

Asthma and respiratory allergies are not modern diseases; references have been made to them from the ancient Greeks, throughout the centuries. However, since the middle of the 20th century, worldwide prevalence and severity have started to increase considerably, especially among children - approximately 5% of Europe's population now suffers from asthma.
Asthma is one of the most common chronic diseases worldwide, and represents a significant medical, public health and social problem. By reducing exposure to allergens and other sensitizing substances, the prevalence of these diseases can be controlled.

Indoor Air Quality

Pamphlets for Local Authorities no. 23. Principal advisor:
B. Seifert. WHO Regional Office for Europe, Copenhagen 2001, 28 pages.

A large proportion of the European population spends more of their time indoors than outdoors. While outdoor air and the work place are generally subject to legislation intended to minimise the exposure to air pollutants, the quality of the air in private and public buildings is not regulated to the same extent, if at all.
This document is intended to inform local authorities about indoor air pollution: what it is; where it comes from; its health risks, and how to avoid or minimize it. With the exception of industrial workplaces, statements apply to all indoor spaces, such as private homes, schools, day-care centres, assembly halls, offices, and transport facilities.

Transport, Environment and Health

C. Dora and M. Phillips (eds.). WHO Regional Publications, European Series No. 89, WHO Regional Office for Europe, Copenhagen 2000, 82 pages, ISBN 92-890-1356-7, Sw.fr. 35.-, in developing countries: Sw.fr. 24.50.

Transport eases access to jobs, education, markets, leisure and other services, and has a key role in the economy. Nevertheless, road users generate excessive costs to themselves, other individuals and society - through noise, pollution and accidents - in the form of illness, injuries, deaths and damage to mental health and social relationships. The continuing expansion of motorized transport in Europe today raises crucial questions about the efficiency and the environmental, health and social implications of land-use and transport policies. Too often, such policies disregard these implications.
The challenge is to promote healthy and sustainable transport alternatives to prevent the negative effects of transport systems on human health. Meeting this challenge requires commitment and action from governments. This book summarises the key facts on which countries should act. It summarises the latest scientific evidence on the impact of transport-generated air pollution, noise and accidents on behaviour and physical and mental health. The book also highlights the considerable potential health benefits from non-motorised forms of transport, such as cycling and walking.
This book can alert policy analysts, decision-makers and politicians to current knowledge, and point the way to action for sustainable transport. It calls for policies that require the creators of transport-related costs to pay for them, and take proper account of environment and health implications in decisions on transport infrastructure and urban development. These and other steps are needed if Europe is to reduce ill health and realise the potential for transport to serve society's needs and promote people's health.

Climate Change and Stratospheric Ozone Depletion - Early Effects on our Health in Europe

S. Kovats, B. Menne et al. (eds.). WHO Regional Publications, European Series No. 88, WHO Regional Office for Europe, Copenhagen 2000, 120 pages, ISBN 92-890-1355-9, Sw.fr. 35.-.

People are concerned about the impact on their health of the climate warming and stratospheric ozone depletion that Europe has been experiencing for the last century. This publication attempts to clarify what early effects these environmental changes are having on our health, and what further effects they may have in the future.
What is certain is that more frequent thermal stress, associated or not with air pollution, causes illness and death, especially among the elderly; extreme weather events such as floods cause death, illness and material damage; some water- and foodborne diseases increase during extreme weather conditions, such as heavy rainfall and heat waves; malaria could increase with climate warming; and ozone depletion increases skin cancer and weakens the immune system. While much is still uncertain about the precise relationship between changes in the climate and changes in disease patterns, the need for action is clear: action either to reduce the climate change itself, or to reduce its harmful effects.

Healthy Urban Planning

H. Barton and C. Tsourou. Spon Press, London 2000, 184 pages, ISBN 0-415-24327-0 (paperback), 0-415-24326-2 (hardback), £21.99 (paperback), £65 (hardback). E-mail: info.sponpress@ sponpress.com

Healthy urban planning means planning for people. It promotes the idea that the city is much more than buildings, streets and open spaces, but a living, breathing organism, the health of which is closely linked to that of its citizens.
Conditions in cities, sometimes compounded by urban planning practices, can be detrimental to health.

Healthy urban planning focuses on the positive impact that urban planning can have on human health, wellbeing and quality of life, and reflects WHO's broad definition of health. The book explains concepts and principles, and draws on the experiences of cities and towns throughout Europe, many of which are part of the Healthy Cities movement. It then goes on to suggest an approach which puts a desire for healthy citizens back at the very heart of urban planning practice.

Professionals involved in the planning, design and regeneration of the urban environment will find the ideas and approaches contained in this book refreshing and stimulating. It will also enable public health professionals to learn more about the role urban planners can play in promoting health.

Others

Workshop on Urban Air, Indoor Environment and Human Exposure

Future Needs for Policy-Science Interface in the EU. Proceedings. Makedonia Palace, Thessaloniki, Greece, 16-18 April 2000.
S. Kephalopoulos, M. Jantunen and D. Kotzias (eds.). EUR 19646 EN. For more information, contact: S. Kephalopoulos or D. Kotzias, EC Joint Research Centre, Environment Institute – ERLAP, TP 050, 21020 Ispra, Italy, fax: +39-0332-78-99-56.

The focus of this Workshop as well as the ECA (European Collaborative Action ″Urban Air, Indoor Environment and Human Exposure″- formerly ″Indoor Air Quality and its Impact on Man″) was multidisciplinary with due consideration to technical, scientific and societal aspects. From the policy point of view a new piece of information is significant, if it necessitates a policy change – or adds needed strength to the existing policy. The workshop concentrated on significant scientific information. The key questions addressed were:

1. What are the main pollutant sources in the different regions of Europe? What similarities and differences do exist? What are the causes of differences? What types of source control are to be recommended first?
2. What ″tools″ for monitoring do we have at hand? What can the ″tools″ tell? Are they used in all regions, if not why, which are the possible obstacles? How does monitoring link into regulatory work?
3. What modelling tools are at hand and what others need to be developed?
4. What else is lacking from adequate outdoor and indoor air quality characterisation for decision models?
5. What is the optimal balance for technical and non-technical pollution control measures? Could this balance look different in different regions? Why?
6. What margins of protection are needed in the technical measures and what can be left to non-technical (e.g. occupant behaviour) adjustment?
7. For control of human exposure to air pollutants, where should the emphasis be; outdoors, indoors or in combination? For different pollutants? Regions? Target populations? Are rules harmonised?

Indoor Air Quality Issues

D. L. Hansen. Routledge, London and New York 2000, ISBN 1560328665, 160 pages, £ 24.99.

″Indoor Air Quality Issues″ is a guide to non-industrial indoor environments and how they relate to the welfare and well-being of the occupants. This multi-disciplinary book is designed for all those working in the environmental sciences/health field and ergonomists, and it examines the cause and effects of the interactions between occupants and the non-industrial environment (i.e. offices and homes). The approach encompasses medical aspects, chemical and microbial concerns, building design and ventilation systems and psychological aspects. Proactive programmes to mitigate and prevent problems are presented and evaluation and investigative techniques and methods used by practitioners and non-professionals are also discussed.

Engineering Solutions to Indoor Air Quality Problems

Proceedings of a Symposium Held in Raleigh, North Carolina, 17-19 July 2000.
Air and Waste Management Association, Sewickley 2000, 503 pages, US $ 45.00. Available through: Air and Waste Management Association, Publications Department, P.O. Box 1020, Sewickley, PA 15143-1020 USA, phone : +1-412-741-1288. See also: www.awma.com.

These proceedings include information about source characterisation, risk management, and exposure and children's issues in public housing, office buildings, and institutions around the world.

Air Distribution in Rooms. Ventilation for Health and Sustainable Environment - ROOMVENT 2000

Proceedings of the 7th International Conference
Elsevier, Amsterdam 2000, 1304 pages, ISBN 0-08-043017-1, US $ 196.50, Euro 170.17.

The air distribution in occupied spaces is a major issue of public concern. It is widely recognized that the quality of air and the nature of airflow can affect the health of occupants and the energy consumed in buildings and transport vehicles.

ROOMVENT was first initiated in 1987 by SCANVAC, the Scandinavian Federation of Heating, Ventilating and Sanitary Engineering Associations in Denmark, Finland, Iceland, Norway and Sweden. The aim of the Conference was to bring together researchers from universities and research institutes, engineers from industry and government officials and policy makers, with the goal of experiencing the latest techniques for measuring and analysing indoor air flow, the visualization of indoor air flow patterns, the evaluation of ventilation parameters and the most recent developments in computer simulation techniques of room airflow.

Health Effects of Ambient Air Pollution - How Safe is the Air We Breathe?

J.Q. Koenig. Kluwer Academic Publishers, Boston, UK, 1999, 280 pages, ISBN 0-7923-7719-2, EUR 122.50

Health Effects of Ambient Air Pollution provides the reader with an overview of the health effects of the air pollution in human subjects. The majority of the book is devoted to the discussion of the health effects of common widespread air pollutants regulated by the U.S. Environmental Protection Agency through national ambient air quality standards.
The book reviews the sources and fate of common air pollutants in ambient air and researches the adverse effects of these outdoor and indoor air pollutants in ″in vivo″ cell systems, animals and humans. Research for the book was conducted in controlled laboratory studies and epidemiologic studies. Special emphasis is placed on the effects of air pollution in subject with asthma.

PM 2000: Particulate Matter and Health – The Scientific Basis for Regulatory Decision-Making

Air and Waste Management Association, Sewickley 2000, Compact Disk, US $ 40.00. Available through: Air and Waste Management Association, Publications Department, P.O. Box 1020, Sewickley, PA 15143-1020 USA, phone : +1-412-741-1288. See also: www.awma.com.

This compact disc features the extended abstracts from the PM 2000 specialty conference. Divided into tracks covering atmospheric science, epidemiology, exposure, and toxicology and dosimetry, the conference abstracts provide a timely review of scientific information that might impact the revision of the PM standards coinciding with the release of the final public review draft of the US EPA's "Air Quality Criteria for Particulate Matter."

Persistent Organic Pollutants – Environmental Behaviour and Pathways of Human Exposure

S. Harrad. Kluwer Academic Publishers, Boston, UK, 2000, 288 pages, ISBN 0-7923-7227-1, EUR 143.00, US $ 125.00, GB £ 88.00.

Persistent Organic Pollutants (POPs) continue to be the subject of concern amongst the public, as well as the scientific and policy-making communities. These concerns are exemplified by the international efforts co-ordinated by the United Nations' Environment Programme and the Economic Commission for Europe. Whilst the ultimate origin of this concern is the adverse effects of persistent organic pollutants on both humans and the environment, there are other factors involved. Species at the top of the ecological pyramid – including humans – can be exposed to concentrations of concern via their diet. Furthermore, the ability of POPs to undergo long-range atmospheric transport means that they represent a truly cross-boundary problem.
The book focuses on the sources, atmospheric behaviour, terrestrial and aquatic food chain transfer, and human exposure of this important class of chemicals.
Other topical issues are addressed, namely: temporal trends in contamination; transport of POPs to polar regions; and the significance of the former Warsaw Pact nations of Central and Eastern Europe as both a global reservoir and source of POPs. Whilst the main focus is on PCDD/Fs, PCBs, and PAH, other organochlorine POPs such as DDT, lindane, and dieldrin are also covered.

International Symposium on the Measurement of Toxic and Related Air Pollutants

Proceedings of a Symposium Held in Research Triangle Park, North Carolina, 12-14 September, 2000.
Air and Waste Management Association, Sewickley 2001, Compact Disk, US $ 80.00. Available through: Air and Waste Management Association, Publications Department, P.O. Box 1020, Sewickley, PA 15143-1020 USA, phone : +1-412-741-1288.
See also: www.awma.com.

The proceedings cover ambient monitoring, indoor air, ozone, and international issues.

Decision-making in Environmental Health – from Evidence to Action

C. Corvalan, D. Briggs and G. Zielhuis. Routledge, London and New York 2000, 296 pages, ISBN 0419259406, £ 70.00.

″Decision-Making in Environmental Health″ examines the need for information in support of decision-making in environmental health. It discusses indicators of environmental health, methods of data collection and the assessment of exposure to and the health impact of different environmental risk factors.
Contents: Health and environmental analysis for decision making - the HEADLAMP project. Requirements for successful environmental health decision making. The need for information: environmental health indicators. Environmental health indicators: methods for data collection. Exposure and

health effects assessment. Approaches to linkage analysis for grouped environment and health data: statistical and epidemiological data. Linkage analysis: Geographical information systems. Application of HEADLAMP in the field. The HEADLAMP project: a conclusion.

Air Quality Assessment and Management - A Practical Guide

O. Harrop. Routledge, London, New York, October 2001, ISBN 0415234107, £ 75.-, 504 pages. E-mail: info@routledge.co.uk

″Air Quality Assessment and Management: A Practical Guide″ describes the techniques available for an assessment while detailing the concepts and methodologies involved. It reviews the principles of air quality management; primary sources of air pollution; impact of emissions on human health, flora and fauna; scoping of air quality impacts; baseline monitoring; impact prediction; impact significance; and pollution mitigation and control. Emphasis will be placed on the practical side of AQA, with numerous international case studies and exercises to aid the reader in their understanding of concepts and applications.

Air Pollution Modelling and its Application XIV

Proceedings of the Millennium NATO/CCMS International Technical Meeting on Air Pollution Modelling and its Application, held May 15-19 in Boulder, Colorado

S.-E. Gryning and F. A. Schiermeier (eds.). Kluwer Academic Publishers, Boston, UK, 2001, 778 pages, ISBN 0-3064-6534-5, EUR 266.48.

Contents: Role of Atmospheric Models in Air Pollution Policy and Abatement Strategies. Integrated Regional Modelling. Global and Long-Range Transport. Regional Air Pollution and Climate. New Developments. Model Assessment and Verification.

Common Report on Air Quality in the Black Triangle Region 1999

J. Abraham et al. ČHMÚ, WIOŚ, LfUG, UBA, Jelenia Góra, Poland, 2000, 117 pages, ISBN 83-7217-124-6. Report in Czech, German and Polish language. Also available in PDF format via CD-ROM and via internet: www.env.cz (Czech), www.uba.de and www.lfug.de (German), www.jgora.pios.gov.pl/wwm.htm.

This publication is the second joint trilateral report describing and evaluating the air quality in the Black Triangle Region (Northern Bohemia, parts of Lower Silesia and Saxony) based on the results of the Joint Air Monitoring System. Following the description of monitoring sites, geographical, climatological and meteorological conditions in the Black Triangle region, the report focuses on measured values for atmospheric pollutants for the year 1999. Additionally, the episodes of January, May and July 1999, the emission trends since 1989 and the development of the ambient air quality since 1996 are described. The monitoring data presented in the report are structured according to major air pollutants. For each air pollutant, the emissions and ambient air concentrations are presented, followed by comparison to the EU limit values, and the national standards.

For the first time, this report presents measurements of benzene and the polycyclic aromatic hydrocarbons, substances undergoing an air-hygienic regulation in the form of further directives in the frame of the Council Directive 96/62/EC on Ambient Air Quality Assessment and Management.

Air Pollution by Ozone in Europe in 1998 and Summer 1999

Prepared by F. de Leeuw, R. Sluyter and A. Camu, European Topic Centre on Air Quality. Topic Report 2000/10. European Environment Agency, Office for Official Publications of the European Community, Luxembourg 2000, 68 pages, ISBN 92-9167-399-4.

Air Quality – Annual Topic Update 1999

Prepared by B.A. Bannink. European Topic Centre on Air Quality. Topic Report 2000/7. European Environment Agency, Copenhagen 2000, 25 pages. An electronic version of this report is available on: http://reports.eea.eu.int:80/Topic_report_72000/en/toprep07_2000.pdf

Guidelines

VDI 4280, Blatt 2

Planung von Immissionsmessungen. Regeln zur Planung von Untersuchungen verkehrsbedingter Luftverunrei-nigungen an Belastungsschwerpunkten.
(Planning of Ambient Air Quality Measurements. Rules for Planning Investigations of Traffic Related Air Pollutants in Key Pollution Areas).
Berlin, Beuth Verlag, Dezember 2000.

VDI 4300, Blatt 6

Messen von Innenraumluftverunreinigungen, Messtrategie für flüchtige organische Verbindungen (VOC). (Measurement of Indoor Air Pollution. Measurement Strategy for Volatile Organic Compounds (VOCs)). Berlin, Beuth Verlag, Dezember 2000.

DIN ISO 16000-1E

Innenraumluftverunreinigungen – Teil 1: Allgemeine Aspekte der Messstrategie. (Indoor Air – Part 1: General Aspects of Sampling Strategy).
Berlin, Beuth Verlag, November 2000.

DIN ISO 16000-2E

Innenraumluftverunreinigungen – Teil 2: Messstrategie für Formaldehyd. (Indoor Air – Part 2: Sampling Strategy for Formaldehyde).
Berlin, Beuth Verlag, November 2000.

DIN ISO 16000-6E
Innenraumluftverunreinigungen – Teil 6: Bestimmung von VOC in der Innenraumluft und in Prüfkammern, Probenahme auf TENAX TA, thermische Desorption und Gaschromatographie/MSD bzw. FID. (Indoor Air Part 6: Determination of Volatile Organic Compounds in Indoor and Chamber Air by Active Sampling on TENAX TA, Thermal Desorption and Gas-Chromatography MSD/FID).
Berlin, Beuth Verlag, November 2000.

COMING EVENTS

2001

August 2001

IUAPPA 2001 – 12th World Clean Air & Environment Congress
26-31 August, Seoul, Korea.
For information, contact: K.C. Moon, Korea Institute of Science and Technology (KIST), P.O. Box 131, Cheongryang Seoul, Korea, phone: +82-2958-5823, fax: +82-2958-5805, e-mail: iuappa@kistmail.kist.re.kr.

September 2001

IGES 2001 - 10th Conference of the International Genetic Epidemiology Society
2-4 September, Garmisch-Partenkirchen, Germany.
Hosted by: GSF - National Research Center for Environment and Health, Institute of Epidemiology, Neuherberg (www.gsf.de/epi).
For information, contact: Conference Secretariat Interplan, Albert-Rosshaupter-Strasse 65, 81369 München, Germany, phone: +49-89-54-82-34-0, fax: +49-89-54-82-34-44, e-mail: gap2001@i-plan.de.

ISEE 2001
13th Conference of the International Society of Environmental Epidemiology
2-5 September, Garmisch-Partenkirchen, Germany.
Hosted by: GSF - National Research Center for Environment and Health, Institute of Epidemiology, Neuherberg (www.gsf.de/epi).
For information, contact: Conference Secretariat Interplan, Albert-Rosshaupter-Strasse 65, 81369 München, Germany, phone: +49-89-54-82-34-0, fax: +49-89-54-82-34-44, e-mail: gap2001@i-plan.de.

DAE 2001 - 9. Jahrestagung der Deutschen Arbeitsgemeinschaft für Epidemiologie
6-7 September, Garmisch-Partenkirchen, Germany.
Hosted by: GSF - National Research Center for Environment and Health, Institute of Epidemiology, Neuherberg (www.gsf.de/epi). For information, contact: Conference Secretariat INTERPLAN, Albert-Rosshaupter-Strasse 65, 81369 München, Germany, phone: +49-89-54-82-34-0, fax: +49-89-54-82-34-44, e-mail: gap2001@i-plan.de

GHU/ISEM
The 9th Conference of the 'Gesellschaft für Umwelthygiene und Umweltmedizin' / The 5th Conference of the International Society of Environmental Medicine
6-8 September, Garmisch-Partenkirchen, Germany.
Hosted by: GSF - National Research Center for Environment and Health, Institute of Epidemiology, Neuherberg (www.gsf.de/epi)
For information, contact: Conference Secretariat INTERPLAN, Albert-Rosshaupter-Strasse 65, 81369 München, Germany, phone: +49-89-54-82-34-0, fax: +49-89-54-82-34-44, e-mail: gap2001@i-plan.de

Airborne Infectious Diseases: Prevention by Indoor Air Hygiene
8-9 September, Budapest, Hungary
For information, contact: Congress and Hobby Service, P.O. Box 1022, 6701 Szeged, Hungary, phone: +36-62-484-531, fax: +36-62-450-014,
e-mail: congress@mail.tiszanet.hu. See also:
www.tiszanet.hu/~congress/2001/air-2001/index.htm

ENVIRONMENTAL HEALTH RISK 2001: International Conference on the Impacts of Environmental Factors on Health
10-12 September, Cardiff, UK.
For information, contact: Sally Walsh, Conference Secretariat, ENVIRONMENTAL HEALTH RISK 2001, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO7 AA, UK, phone: +44-238-029-3223, fax: +44-238-029-2853, e-mail: slwalsh@wessex.ac.uk. See also: www.wessex.ac.uk/conferences/2001/envh01/

15th Biannual World Congress and Exhibition of the International Ozone Association (IOA), incorporating: Conference on Ozone in Medicine and Environment and Health
10-15 September, London, UK.
For information, contact: International Ozone Association, York Road, Burgess Hill, West Sussex RH15 9TU, UK, fax: +44-1444-230431, e-mail: 106543.420@compuserve.com. See also: www.int-ozone-assoc.org.

Air Pollution 2001

12-14 September, Ancona, Italy.
For information, contact: Sally Walsh, Conference Secretariat, AIR POLLUTION 2001, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO7 AA, UK, phone: +44-238-029-3223, fax: +44-238-029-2853, e-mail: slwalsh@wessex.ac.uk
See also: www.wessex.ac.uk/conferences/2001/air01/

Transport and Air Pollution 10th International Scientific Symposium

17-19 September, Boulder, Colorado, USA.
For information, contact: Sandra Petrie, National Center for Atmospheric Research, P.O. Box 3000, 1850 Table Mesa Drive, Boulder, Colorado, 80307-3000, USA, e-mail: sjp@ucar.edu, phone +1-303-497-1117.
See also: www.ncar.ucar.edu/TAP/TAP2001.html

Clima 2000 World Congress on Indoor Environment Technologies

15-18 September, Naples, Italy.
For information, contact: Jean Pierre Minne, 3 Rue Rawenstein, 1000, Brussels, Belgium, e-mail: rehva@srbii.be

6th International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe

23-26 September, Prague, Czech Republic.
For information, contact: Institute for International Cooperative Environmental Research, Florida State University, 2035 East Paul Dirac Drive (226 HMB), Tallahassee, FL 32310-3700, USA, fax: +1-850-574-6704, e-mail: IICER@mailer.fsu.edu

Second International Symposium on Air Quality Management at Urban, Regional and Global Scales

25-28 September, Istanbul, Turkey.
For information, contact: Professor S. Incecik, Istanbul Technical University, Dept. of Meteorology, Faculty of Aeronautics and Astronautics, Maslak-Istanbul 80626, Turkey, phone: +90-212-285-31-43, fax: +90-212-285-31-39 or: +90-212-285-31-29, e-mail: aqm2001@itu.edu.tr
See also: http://atlas.cc.itu.edu.tr/~aqm2001

Measuring Air Pollutants by Diffusive Sampling – International Conference

26-28 September, Montpellier, France
For more information, contact: Julien Theunis, EC Joint Research Centre, Environment Institute - Air Quality Unit, European Reference Laboratory of Air Pollution (ERLAP), T.P. 050, 21020 Ispra (VA), Italy, phone: +39-0332-786098, fax: +39-0332-789364.
See also: www.ei.jrc.it/aq/events/montpellier

October 2001

Pilot Study Meeting on Environmental Decision-making for Sustainable Development in Central Asia

1-2 October, Almaty, Kazakhstan.
For information, see: Institute for International Cooperative, Environmental Research, Florida State University, 2035 East Paul Dirac Drive (226 HMB), Tallahassee, FL 32310-3700, USA, fax: +1-850-574-6704, e-mail: IICER@mailer.fsu.edu

NATO/CCMS Advanced Research Workshop: Risk Assessment as a Tool for Environmental Decision-making in Central Asia

3-5 October, Almaty, Kazakhstan.
For information, see: Institute for International Cooperative, Environmental Research, Florida State University, 2035 East Paul Dirac Drive (226 HMB), Tallahassee, FL 32310-3700, USA, fax: +1-850-574-6704, e-mail: IICER@mailer.fsu.edu

November 2001

IAQ 2001 - ASHRAE Conference – Moisture, Microbes and Health Effects: Indoor Air Quality and Moisture in Buildings

4-7 November, San Francisco, California, USA.
For information, contact: ASHRAE, Manager of Technical Services, 1791 Tullie Circle, NE Atlanta, GA 30329, USA, fax: +1-404-321-5478, e-mail: techserv@ashrae.org

ISEA 2001: ISEA Meeting on Exposure Analysis - an Integral Part of Disease Prevention

4-8 November, Charleston, SC, USA.
For information, contact: Medical University of South Carolina, Office of CME, 261 Calhoun Street, Suite 301, Charleston, SC 29425, USA, fax: +1-843-876-1931. See also:
http://www.iseaweb.org/isea2001/isea2001.html

2002

World Congress of the International Federation of Environmental Health

2002, California, USA.
For information, contact: International Federation of Environmental Health, Directory Editor, 26 Grebe Close Stockport SK12 1HU, UK

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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WHO COLLABORATING CENTRE FOR AIR QUALITY
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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

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