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Report on the

INTERCOUNTRY WORKSHOP ON HEALTH EFFECTS OF ENVIRONMENTAL CONDITIONS FOR THE EASTERN MEDITERRANEAN COUNTRIES

Damascus, Syrian Arab Republic, 22–25 September 2002

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CONTENTS

1. INTRODUCTION

The World Health Organization (WHO) convened the Intercountry Workshop on Health Effects of Environmental Conditions for the Eastern Mediterranean Countries in Damascus, Syrian Arab Republic from 22 to 25 September 2002. Seventeen environmental health and biostatistics experts from 12 Eastern Mediterranean Region countries (Bahrain, Egypt, Djibouti, Lebanon, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates) participated in the workshop, in addition to staff from WHO headquarters, the Regional Office, and the Regional Centre for Environmental Health Activities (CEHA). His Excellency Dr Mohamed E. Chatty, Minister of Health, Syrian Arab Republic, inaugurated the workshop. After formally opening the session, Dr Hussein Abouzaid read out a message from the WHO Regional Director for the Eastern Mediterranean, Dr Hussein A. Gezairy. Dr Misbah Ghali, was elected Chairman, and Dr Naila Khalil Rapporteur. Dr Houssain Abouzaid and Mr Hamed Bakir served as secretaries of the meeting. The agenda, programme and list of participants are presented in Annexes 1, 2 and 3, respectively.

In his message, Dr Gezairy thanked the Government of the Syrian Arab Republic, especially the Minister of Health for agreeing to host the workshop in the Syrian Arab Republic and for his valuable support. He expressed his gratitude to all national experts participating in the workshop, and acknowledged the generous financial support of the AGFUND.

He recognized with concern that the environmental effects on health were associated with absent or inadequate environmental health services, such as water supply, sanitation, waste management and shelter, environmental degradation such as pollution of air, water and soil, food contamination, global environmental problems, such as reduction of biodiversity and degradation of ecosystem through deforestation, global warming, ozone layer depletion and contamination by persistent organic chemicals, and industrial accidents.

He said that according to a WHO published report entitled *Health and environment in sustainable development–Five years after the Earth Summit*, 23% of the total disease burden in the world measured by disability-adjusted life years (DALYs) was directly attributable to degraded environment. This percentage was higher in children since two-thirds of all DALYs lost due to environmental conditions occurred among children aged 0–14 years. He underscored the need for a renewed overall health and environment strategy to satisfy the rising health needs of a growing population. Policies should be drafted on the basis of principles laid out in the Beirut Declaration on Action for Healthy Environments adopted in 1995; using this set of principles, shared agendas and action plans can be developed for common goals and action by the ministries of health and the environment.

In the context of developing a linkage between environment and health, he added that a set of environmental health indicators must be developed and used for decision-making. The new concept of assessing the burden of disease would go a long way in helping to prioritize

the health and environmental issues in the respective countries and, consequently, resources could be adequately earmarked.

After welcoming the participants to the Syrian Arab Republic, H.E. Dr Mohamed E. Chatty, Minister of Health, Syrian Arab Republic, emphasized that environmental conditions were posing a health hazard to a growing number of populations worldwide. He thanked WHO and all the experts involved in the workshop for their interest in and support for the issue, and expressed his hope that the meeting would make some concrete recommendations that might result in tangible benefits for the Region. He complimented the Regional Office for initiating the assessment of the environmental burden of disease and for tailoring it to the needs of the Member States. He confirmed that the Syria Arab Republic faced serious threats to the health of people from environmental factors, such as water pollution, air pollution, and industrial pollution. Awareness of these threats as well as a vision and strategies had been developed and were being implemented to combat and manage them. The Ministry of Environment had been established to coordinate and motivate the work of line ministries whose action was essential in that regard. The Ministry of Health in the Syrian Arab Republic was working closely with the Ministry of Environment to address the environmental threats to health.

2. BACKGROUND

The aim of the workshop was to support the Eastern Mediterranean countries to incorporate effective health dimensions into national development policies. In this workshop, environmental health personnel and biostatisticians in the Ministries of Health and officials from the Ministries of Environment and of departments in charge of statistics were to become familiarized with concepts and techniques used to evaluate the health effect of environmental conditions.

The assessment of environmental burden of disease (EBD) is the quantification of the amount of disease at the population level due to environmental risks, and ideally this should be done in a comparable and internally consistent way applied not only to various diseases and risk factors but also amongst countries. The environmental burden of disease provides a formalized, explicit approach, which serves as a tool to improve understanding of environmental health and to facilitate communication. EBD information supports decision-making on priority actions in health and environment and on allocation of resources.

Alongside EBD information, cost-effectiveness information needs to be taken into account for decision-making on prioritizing interventions to reduce health problems associated with environmental exposure.

3. TECHNICAL PRESENTATIONS

3.1 Programme and method of work

Dr H. Abouzaid

Environmental health issues have been the focus of increasing concern in recent years, particularly after the 1992 Earth Summit in Rio de Janeiro and subsequent developments, including the adoption of the WHO global and regional strategies for health and environment in 1993 and the Beirut Declaration on Action for a Healthy Environment in 1995. As a result, a large number of Member States have finalized, or are in the process of finalizing, their national strategies and plans of action for health and environment, and some countries are developing national guidelines for environmental health impact assessment.

Priority-setting processes within the national strategies and plans of action proved, however, to be weak; in no country of the Region was there a clear, rational and convincing priority-setting process. In fact, differences in approaches and in the ranking of priorities by representatives of various ministries was reported by one of the Member States as the main constraint facing the preparation of its national plan of action for health and environment. This is largely due to the fact that the health effect of environmental conditions is still poorly documented and quantified in the Region.

The workshop was meant to provide information on methods used for the evaluation of environmental health risk factors, through practical exercises using software developed under Excel, focusing on three risk factors: exposure to lead, water supply, sanitation and hygiene, and indoor air pollution. These factors are discussed in sections 3.6, 3.7 and 3.8, respectively. The entire WHO team supported the participants in performing these exercises. Participants used any relevant data they had brought with them; otherwise, they used global and/or Regional data that had been compiled beforehand for this purpose.

3.2 Overview of health effects of environmental conditions

Dr H. Abouzaid

Accurate data on the health impact of environmental factors in the Eastern Mediterranean Region are scarce, a fact which has limited the role of the health sector in promoting effective corrective measures to reduce this impact. It is clear, however, that populations in the Region continue to be exposed to traditional environmental health risks, such as diarrhoeal diseases, especially in infants, due to a lack of clean water and unsanitary conditions, and acute respiratory infections in children and women due to indoor air pollution. At the same time, populations are increasingly exposed to modern environmental risks. Air pollution, principally due to traffic emissions, is a source of concern in large cities, large quantities of unwanted and obsolete pesticides and other chemicals are accumulating in some Member States, and proper chemical management has been implemented in only a few countries. Solid and hazardous waste disposal is unsatisfactory, particularly in secondary cities. The environmental health deficit in the Region is quite evident; 29.5% of the population has no access to improved water sources and 40% has no access to sanitation

facilities. There are also risks to future generations due to unsustainable consumption and production patterns, such as unwise and wasteful use of scarce water resources.

From a human health perspective, the presence in the environment of high concentrations of a pollutant is not significant unless people are exposed to such concentrations for a period sufficient to affect health. For this reason it is important not only to know where concentrations of pollutants are high but also to know where people are and for how long. Pollution can be measured at any point along the environmental pathway that leads from a pollution source to human health, i.e. the store of potential pollutants, actual emissions, ambient concentration, exposure of people, dose actually imparted (perhaps to a critical organ) and final health impact.

Member States should collect information and conduct studies on the environmental burden of disease, introduce health concerns within environmental impact assessments, establish strong alliances between health and environment sectors and between these and other sectors, with particular focus on children. Objectives should also be set for national environmental health programmes, and awareness among all sectors of the community should be raised.

The discussion focussed on the scarcity, adequacy and quality control of data related to the health effects of environmental conditions in the Region, the lack of coordination between different bodies concerned with environmental health monitoring and on the insufficient tools available to do the job.

3.3 The global burden of disease (GBD) concept

Dr Annette Prüss

Summary measures of population health combine information on mortality and non-fatal health outcomes to represent the health of a study population as a single number. Several such measures have been devised. The disability-adjusted life year (DALY), a unit combining years of life lost and years lived with disabilities, is currently the most widely used measure. The DALY measures health gaps as opposed to health expectancies.

The global burden of disease (GBD) aims at quantifying the burden of premature mortality and disability for major diseases or disease groups. It constitutes the most comprehensive and consistent set of estimates of mortality and morbidity by age, sex and region ever produced. It introduces a summary measure of population health, making use of the disability-adjusted life year.

WHO is regularly developing estimates at the regional and global levels for about 135 diseases or disease groups, and this is published every year in the annex of The World Health Report. Many countries have begun to establish their own National Burden of Disease (NBD) study to obtain country-specific estimates as input for national policy setting. Such a national study is a valuable basis for an environmental burden of disease assessment, which then analyses the contribution of each environmental risk factor to the disease burden estimated within the NBD study.

3.4 Why assess environmental burden of disease?

Dr Annette Prüss

EBD is the quantification of health impacts caused by various environmental risk factors at population level, using a comparable framework, definitions and outcome. EBD expresses the impact of environment in health measures, and displays the preventive potential of environmental action. Estimates of the burden of disease caused by the environment provide an important input to the rational development and evaluation of policies by the health sector and of activities of other sectors that directly manage or influence the determinants of health.

EBD information supports decisions on priority actions in health and environment. Resources are limited, and informed choices about health have to be made. Burden of disease assessments assist in assessing the performance of a country or region in terms of health-supporting systems and environments. If performed with the necessary resolution power, they map out geographical or population-specific differences, and monitor trends. EBD information provides the possibility of estimating the health gain that can be achieved by an action in environmental management or related behaviour change.

3.5 Methods for estimating environmental burden of disease

Dr Annette Prüss

The estimation of burden of disease caused by environmental risk factors relies on the evaluation of a fraction of the population corresponding to different exposure levels (or exposure scenarios), and the expression of risk for each exposure level. The fraction of a disease burden caused by the risk factor is then estimated on the basis of an impact fraction. The impact fraction is applied to the disease estimate, expressed in DALYs, mortality and/or morbidity.

While the basic concept is relatively simple, the quality of the results will largely depend on the assessment of the exposure data, and on the evidence that is currently available on the exposure–response relationship. WHO is currently developing guidance on 15 environmental risk factors for application of EBD at national and local levels. The first ones should become available by the end of 2002.

WHO has recently performed the assessment of disease burden caused by about 25 risk factors at global level, including seven environmental risk factors. Other risk factors included behavioural, lifestyle, substance abuse and nutritional risk factors. In developing countries, underweight represents the highest risk, water, sanitation and hygiene and indoor air each claim between 1% and 5% of the total disease burden. In developed countries, tobacco use, overweight and alcohol are estimated to represent the highest risks to health.

Discussion touched upon the relation between the NBD and EBD exercises. It was agreed that the NBD is quite an involved and resource-intensive exercise. It is of course highly desirable that the two exercises be conducted in conjunction. But the existence of a NBD exercise is not considered to be a prerequisite to initiating an EBD approach,

particularly since the EBD assessment may be a phased exercise, building on whatever data is already existing in the country on the environmental condition and health status and on known linkages between them.

3.6 Risk factor 1: Exposure to lead in the environment

Dr Annette Prüss

Lead exposure occurs via various environmental pathways including air, water, dust and food. Lead affects almost any system in the body, and has been associated with systemic effects, immunological effects, neurological, developmental and genotoxic effects. For the purpose of estimating environmental burden of disease, the selected exposure variable is the distribution of blood lead levels in the study population. Quantified health effects include the loss of IQ points resulting in mild mental retardation caused by lead exposure in young children. Also the increased systolic pressure in adults can be quantified, and results in increased risks of ischaemic heart disease, cerebrovascular disease, hypertensive disease and other cardiac diseases. These health effects start to occur at relatively common levels of blood lead, which are often exceeded by more than half of the population in urban settings where leaded gasoline is still in use.

At the global level an estimated 120 million people have blood lead levels between 5 and 10 μg/dl in the year 2000, and about the same number have levels above 10 μg/dl. 40% of all children have blood lead levels above 5 μg/dl and 20% above 10 μg/dl. 97% of these children live in developing regions. The disease burden from lead-induced mental retardation due to loss of IQ points results in 9.8 million DALYs, and the burden from cardiovascular diseases due to elevated blood pressure to 250 000 premature deaths and 3.5 million DALYs. In total, these two outcomes alone amount to about 0.9% of the global burden of disease. Several outcomes caused by lead could not be quantified in this analysis. This entire burden is preventable and interventions that have proven effective are readily available.

The software was found to be user friendly. The assumption that the loss of IQ points due to exposure to lead translates in DALYs only if leading to mild mental retardation was questioned. The "actualization" of the data on lead exposure gathered in previous years was the subject of repeated requests of clarification. Also the scarcity of health data to translate the effect of the increase in blood pressure due to exposure to lead into different kinds of cardiovascular disease outcomes was underlined.

Finally, it should be noted with regret that even though one of the most complete studies used for the modelling was from one of the EMR countries (Saudi Arabia), this study was hardly known to the concerned specialists in the Region.

3.7 Risk factor 2: Water, sanitation and hygiene

Dr Annette Prüss

This risk factor includes risks caused by the ingestion of unsafe water, lack of water resulting in inadequate hygiene, poor personal and domestic hygiene and agricultural practices, contact with unsafe water and inadequate development and management of water

resources or water systems. This method estimates the part of the burden of disease of infectious diarrhoea that is caused by the impact of water, sanitation and hygiene (WSH). For estimating this disease burden, typical exposure scenarios are established according to the water supply and sanitation infrastructure and the level of faecal–oral pathogens in the environment and populations assigned to these scenarios. The attributable fraction is determined by combining the exposure prevalence and relative risks for each risk scenario, which is then related to the total disease burden from diarrhoeal disease in each region. In addition to diarrhoea, WSH is an important contextual determinant in a large number of additional diseases, such as malaria, yellow fever, filariasis, dengue, hepatitis A and E, typhoid fever, arsenicosis, fluorosis, legionellosis, trachoma, schistosomiasis, ascariasis, trichuriasis, hookworm disease and others, some of which present a high disease burden at the global level.

The disease burden from WSH at the global level was estimate at 1.9 million deaths in the year 2000 and 86% of the global burden of diarrhoeal disease. Typically, the fraction of diarrhoeal disease attributed to WSH in developed countries is approximately 60%, whereas in developing countries as much as 85%–90% of diarrhoeal illness can be attributed to WSH. The major part of this burden is borne by children in developing countries. More refined guidance for the application of the method at the national level is expected to become available by the end of 2003.

The fact that only diarrhoeal disease was taken into consideration to evaluate this EBD related to WSH was strongly questioned, as neither the health effects due to chemicals like arsenic and fluoride nor the other health effect due to microbes like the respiratory infection due to legionella, for instance, were considered.

It was explained that at the present stage the EBD assessment tool in relation with WSS is still preliminary.

During the implementation of this exercise, it was noted that the assignment of percentages of the population falling under the six categories of coverage and the adequacy of water supply and sanitation was somewhat arbitrary, while the associated burden of disease was highly sensitive to the distribution of population between these categories.

3.8 Risk factor 3: Household use of solid fuels—a source of indoor air pollution

Dr Annette Prüss

The use of solid fuels as energy for cooking can generate high concentrations of smoke, composed by a complex mixture of pollutants impacting on health. These concentrations often greatly exceed outdoor air pollution levels, women and children being the most exposed due to the longer time spans they spend in their homes. Exposure is defined as living in a household using solid fuel as the primary energy for cooking, adjusted by an estimate of ventilation of the household. It is estimated that about half of the world's households use solid fuels, and its use is generally most frequent in lower income countries. A household fuel use database that documents exposure data for 52 countries, supplemented by exposure data

modelled for additional countries based on gross national product, female literacy and other variables, can be combined to produce a global analysis.

Such exposure to indoor air pollution has been associated with a variety of health outcomes. The outcomes supported by the strongest evidence include acute respiratory illness (ARI) in children under age five, and chronic obstructive pulmonary disease (COPD) and lung cancer in adult women. Other outcomes supported by moderate or weak evidence include tuberculosis, blindness from cataract and asthma. Meta-analyses have been performed to summarize the outcomes with the strongest evidence.

The global analysis resulted in a disease burden of 980 000 deaths from ARI in children under age five and 670 000 deaths resulting from COPD in women caused by solid fuel use in households, which represents a very important disease burden and is a major killer of children.

3.9 EBD and guidelines, cost–effectiveness of interventions and evaluation of policies

Dr Annette Prüss

The concept of EBD should be closely linked to other environmental health tools and activities. The EBD assessment provides the potential for improving the information for rational policy-making. For example, the recently published WHO guidelines for safe recreational-water environments provide information on the expected disease burden expressed in terms of gastroenteritis events at various water quality levels using the concentration of faecal streptococci as an indicator. In addition to the information on safe levels for health, policy-makers are provided with information on the amount of disease that is caused at various observed levels, and the health gains that could be achieved by lowering those levels.

EBD is also a basis for estimating the cost–effectiveness of interventions, which is another important input to rational policy-making. It shows the health gain that could be achieved for certain expenses. WHO is currently investigating cost–effectiveness in various areas, and countries would also benefit from generating such information.

Alongside EBD and cost–effectiveness information, policy-makers also need to take into account information such as budget availability, and ethical, social and equity considerations. The risks perceived by the population may also play a role. Once the burden of disease caused by various diseases and risk factors is assessed, priorities may be defined and effective policy actions and interventions may be selected and implemented.

3.10 Environmental health indicators and information needs

Mr Hamed Bakir

An environmental health indicator is an expression of the link between environment and health, targeted at an issue of specific policy or management concern, and represented in a form that facilitates interpretation for effective decision-making. Indicators show time trends for early warning and for monitoring the outcome of interventions. Indicators can show

spatial patterns to highlight hotspots, identify who is at risk, and compare between countries. In addition, indicators can help define and motivate action by specifying problem causes, attributing blame, prioritizing issues, identifying and assessing choices, and informing the stakeholders.

Several sets of environmental health indicators have been developed. The exposure indicators relate to the exposure of humans to various environmental risks (e.g. unsafe water supply, unsafe sanitation, air pollution, food contamination) in the home, community, or ambient environment. The health effect indicators relate to the mortality and morbidity outcomes of exposure. The action indicators relate to both remedial interventions and preventative interventions aimed at controlling the exposure to environmental risks.

Indicators can help direct and support policy but are only a part of an effective environmental health policy. To be effective, indicators must:

- be embedded within the process of problem-solving and decision-making,
- be embedded within a process of routine health surveillance and environmental monitoring,
- be applied as part of a systemic (dynamic, process-based) approach to environmental health,
- form part of a listening- and information-based policy system,
- be designed, used and interpreted intelligently, and
- be seen as tools, and not as an end by themselves.

3.11 Getting started

Dr Annette Prüss

Before initiating EBD activities, the needs and aims of the countries need to be defined in terms of time frame, study population, etc. In the short term, preliminary or even full assessments can be performed based on existing data sets. In the longer term, additional data could be collected for the purpose of EBD assessments. One of the first steps could therefore consist of convening a multidisciplinary committee of epidemiologists, public health professionals and others, and relevant stakeholders in the area of health and environment and health statistics. Basic steps may then include: (a) the designation of a responsible office, (b) a review of existing data, (c) the performance of a preliminary assessment, (d) the inclusion of required data into data monitoring programmes and (e) the performance of more refined assessments. Raising awareness among the public, policy-makers and the media, and risk communication should also be considered as further steps.

The general discussion touched basically on the feasibility and usefulness of initiating the EBD assessments in the participating countries. Participants were requested to formulate individually one conclusion and one recommendation based on the contents of the general discussion and deliberation of the workshop. Most of these resulting conclusions and recommendations are noted under the respective country presentations that follow.

3.12 Country presentations on data monitoring and environmental health linkages

Egypt

Egypt faces several environmental health problems. Air pollution is considered one of the main problems in Egypt and is due to urbanization and industrialization. The main sources of the air pollution in Cairo are vehicles, industries in the Helwan region south of Cairo, and other industries in the north Cairo district of Shoubra El Kheima. Blood lead levels higher than acceptable standards have been recorded. Egypt has initiated the phasing out of leaded fuel in Cairo.

Heavy metal concentrations in the environment are another concern with potential health effects such as acute toxicity, liver cancer, haemolysis and blood cancer. High heavy metal concentrations have been recorded in many fish species in Egyptian waters. Tobacco smoking is the single most preventable cause of death and disease in Egypt. Most people begin using tobacco at an early age (by 16 years old). The Ministry of Health and Population reported a total consumption of 60 billion cigarettes annually. The number of deaths due to smoking in Egypt reached 893.3 deaths per 100 000 in females in 1992.

Lebanon

Lebanon is still experiencing classic environmental health problems such as those associated with unsafe water supplies and inadequate sanitation, especially in small rural areas. An outbreak of Hepatitis A in a small village was due to cross-contamination of drinking water with sewage. The problem was controlled within 24 hours but the effect on health was not investigated.

Vehicular emissions are the main source of air pollution in Lebanon. Lebanon banned the use of diesel vehicles as a measure to control rising air pollution. Two studies were conducted to assess the concentration of blood lead in children in Beirut. Recorded blood lead levels were generally higher than safe limits. The studies found that working children had higher blood lead levels than students did.

Morocco

The eco-epidemiological study, CASA-AIRPOL, was conducted in 1998-99 to evaluate the levels of urban atmospheric pollution and to quantify the number of deaths from asthma, bronchitis, conjunctivitis rhinitis, in the population older than 4 years of age, and incidence of upper and lower respiratory infections in children less than 5 years of age. The atmospheric pollutants of black smoke, NO_x and SO_2 were measured. Health information was collected from 21 urban health care centres, 7 tuberculosis centres, 5 emergency service centres in public health hospitals and from 7 divisions of civil registry that collect mortality data.

Black smoke measured in Casablanca during the study period was 50% higher than that measured in Paris between 1991 and 1995.

The CASA-AIRPOL study indicated a statistically significant association between the atmospheric pollution level and increased mortality and adverse health effects on the population.

Oman

About 10 years ago, a sanitary landfill was established near a small village called Sonob. Since then the local population has been lodging complaints that their health is being effected, death rates have increased in their animals and the plant life is being destroyed in the area. In response to these complaints a study was conducted to estimate the prevalence of allergic respiratory diseases in Sonob compared to other villages in the area and to examine the association between the landfill and these disease.

The study recorded increased incidence of allergic respiratory diseases amongst the population living in the vicinity of the landfill. The study also recorded a high concentration of landfill gases in the vicinity of the landfill. The study suggested a close association between the concentration of landfill gases and the higher incidence of allergic respiratory diseases.

Pakistan

In Pakistan, unsafe drinking water leads to 30% of morbidity and 40% of mortality, and is the cause of 60% of hospital admissions. Diarhoea is the leading cause of morbidity and mortality in children under five years of age. Hepatitis B is one of the emerging public health problems, due to the reuse of syringes.

Indoor and outdoor air pollution remains a problem. Indoor air pollution leads to acute lower respiratory tract infections in children under five years of age. In 1999 a study found that the average total suspended particulate matter in Karachi exceeded permissible levels by a factor of four to eight. This has been linked with the steady increase in cases of asthma. Leaded petrol has been partially phased out. High levels of arsenic and chromium, and fluorosis and fluoride deficiency have also been implicated as health concerns resulting from air pollution.

Pesticides are used over a large part of the country. Its extensive use and frequent spraying without proper protective measures has led to pesticide poisoning and other health hazards.

Saudi Arabia

Saudi Arabia embarked on a comprehensive programme for a clean environment in 1960 in response to a ministerial decree that established the Executive Council of Environmental Health. The Ministry of Health established the Department of Environmental Health on 15 August 1975. This department was attached to the preventive medicine department.

A comprehensive programme for the reduction of air pollution includes the monitoring and early detection of air pollution, identification of the sources of air pollution, pollution control through the closure of emitting sources, toxic raw materials substitution, improved waste disposal practices and periodic examination of cars to control hazardous car exhaust.

Food sanitation is maintained through legislation and surveillance and quality control of food importation, manufacturing and storage.

Safe water supplies are available to most citizens through piped water networks. Sanitary sewers are available to urban populations while other safe sanitation facilities are available to other populations.

Syrian Arab Republic
Dr Misbah Ghali, WHO Temporary Adviser

The country report contained demographic and environmental information, including the number of cities and population density, the number of vehicles registered, the climate, national energy production and consumption, estimated emissions inventories, population growth and demand on electric power, quantities of heavy oil and natural gas, and consumption of oil products and natural gas. Typical amounts of municipal solid wastes, health indicators, and causes of mortality and morbidity were also presented.

3.13 Presentation of the outline of plans of action for national EBD assessments

Participants from Morocco, Oman, Qatar, and UAE prepared draft plans of action for initiating work at the national level for environmental burden of disease analysis. The individual plans of action are attached as Annex 4.

4. CONCLUSIONS

1. Participants recognize the importance of environmental burden of disease (EBD) as a powerful tool for estimating the effects of environmental conditions on population health.

2. Participants realize through practical EBD exercises that preventable environmental causes contribute noticeably to the burden of disease.

3. Participants consider EBD a priority to highlight the significant potential of environmental action to protect health. Incremental introduction of EBD should start with selected priority health risks. Preliminary analysis is generally feasible using existing data. In the longer term, environmental health programmes may be designed to generate the required data sets for refined EBD assessment. The use of the national burden of disease process along with the EBD process is highly recommended but not considered a prerequisite to initiating the EBD process.

5. RECOMMENDATIONS

To Member States

1. Establish national EBD teams/committees to spearhead the EBD assessment process. All the health and environment stakeholders should be adequately represented in such teams/committees. Member States are encouraged to conduct the necessary training for these teams.

2. Strengthen the existing programmes of EBD assessments in those Member States that have already begun such assessments, while other Member States are encouraged initiate and implement EBD assessments.

3. Identify priorities for EBD assessments, including potential health gains and environmental risk factors, and consider environmental media (such as water, food, indoor and outdoor air) and individual risk factors (such as smoking, noise, ergonomic stressors resulting in back pain, exposure to chemicals, radiation, electromagnetic fields) while WHO guidance becomes available.

4. Introduce the EBD assessment process into the environmental health impact assessment for existing and future development projects, programmes and policies.

5. Generate health and environment data, particularly those that can be directly converted into EBD information, develop and use environmental health indicators and widely disseminate these to stakeholders.

6. Review Environmental Health Information Systems (EHIS) and adapt these to support the EBD and environmental health risk assessment. In this regard, greater emphasis should be placed on the environmental health indicators of exposure that are so critical to EBD assessment.

7. Convene national/subregional (e.g. Gulf Cooperation Council countries) workshops for national experts representing the health, environment and other sectors to review available studies, identify suitable indicators, prioritize issues and develop plans of action to initiate and implement national/subregional EBD assessments.

8. Support the active participation of the populace in the protection of their health and environment through education and awareness raising involving community and nongovernmental organizations.

9. Use EBD and cost–effectiveness information to prioritize, target and intensify pollution control programmes in ministries of health and environment.

To WHO

10. Encourage ministries of health and environment to initiate environmental burden of disease studies in close collaboration and partnership with other line ministries.

11. Support capacity building in Member States, particularly through human resources development, to address priority environmental threats to health, especially those related to water, air and food.

12. Provide support to national and subregional workshops and activities to develop national/subregional plans of action for EBD assessments.

13. Prepare, translate to local languages and disseminate practical and concise guidance documents and tools on EBD assessment and its use for policy development with the introduction of the DALY concept.

14. Facilitate information exchange and networking between Member States and professionals involved in EBD assessments in the Region.

Annex 1

AGENDA

1. Opening
2. Programme and method of work
3. Overview of health effects of environmental conditions
4. Why assess environmental burden of disease (EBD)?
5. Country presentations on data monitoring and EH linkages
6. Introduction to burden of disease assessment
7. Approaches and methodologies for determining the environmental burden of disease
8. Environment disease burden assessment—examples from the WHO Health Report 2002
9. Cost–effectiveness of environmental health interventions
10. Where to start for the evaluation of national environmental burden of disease?
11. Closure

Annex 2

PROGRAMME

Sunday, 22 September 2002

09:30–10:00	Registration
10:00–10:30	Opening ceremony
11:00–11:15	Programme and method of work
11:15–12:15	Overview of health effects of environmental conditions
12:15–13:00	Why assess environmental burden of disease (EBD)?
14:30–16:00	Country presentations on data monitoring and EH linkages
16:30–17:30	Country presentations on data monitoring and EH linkages (continued)
17:30–18:00	General discussion

Monday, 23 September 2002

08:30–09:15	The global burden of disease (GBD) concept
09:15–10:00	Methods for estimating environmental burden of disease (EBD)
10:30–11:15	EBD of risk factor 1
11:15–12:15	Practical exercise for risk factor 1
13:45–14:30	EBD of risk factor 2
14:30–15:30	Practical exercise for risk factor 2
16:00–16:45	EBD of risk factor 3
16:45–17:30	Practical exercise for risk factor 3

Tuesday, 24 September 2002

08:30–10:00	Report and discussions of practical results
10:30–11:00	EBD and guidelines, cost–effectiveness of interventions and evaluation of policies
11:00–11:30	Environmental health indicator and information needs
11:30–12:30	General discussion: • Usefulness of EBD assessment • Feasibility
12:30–14:00	Getting started Short presentation and discussion
16:00–17:00	Individual work to outline a plan of action for starting national EBD assessment

Wednesday, 25 September 2002

09:00–10:30	Presentation of the outline of a plan of action for national EBD assessments
10:30–11:00	Discussion
11:30–12:00	General discussion and recommendations
12:00–12:30	Closure

Annex 3

LIST OF PARTICIPANTS

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Annex 4

OUTLINE PLANS OF ACTION FOR INITIATING ENVIRONMENTAL BURDEN OF DISEASE ASSESSMENTS

Bahrain

1. Obtain prior commitment at the beginning from top authorities.
2. Designate a focal point (person at a Director level) from each GCC country.
3. Form interdisciplinary committee to review existing data and undertake national preliminary assessment of environmental burden of disease. Members of the committee:
   - epidemiologist and/or statistician,
   - public health professional: physician, hygienist,
   - policy-maker,
   - others.
4. Convene regional committee to decide on the core sets of indicators and the priority list.
5. Refine the basic assessment done on the national and regional levels.
6. Decide on short- as well as long-term work plans.
7. Decide on the plan of action for health education of the public and retain the commitment of the top authority.

Egypt

1. Obtain commitment at the highest authority level.
2. Establish a national EBD team with membership including:
   - epidemiologist and/or statistician,
   - public health professional: physician, hygienist,
   - policy-maker,
   - others.
3. Review available information from data sets and the literature.
4. Undertake a preliminary assessment of the situation and identify priority issues.
5. Establish governorate/regional committees to decide on the core sets of indicators and the priority list.
6. Refine the preliminary assessment on the national and regional levels.
7. Develop short- as well as long-term work plan.
8. Undertake EBD assessments of priority issues.
9. Communicate the outcome of the assessments to decision-makers for policy development and for public awareness raising.

Qatar

1. Get commitment of higher authorities.
2. Designate the Public Health Department as the responsible office.
3. Establish a committee responsible for EBD, with members from the Public Health Department, the environment ministry and municipalities.
4. Review existing data in Qatar.
5. Perform preliminary assessment.
6. Decide on essential indicators.
7. Refine the basic assessment.
8. Raise public awareness through the media.

Tunisia

1. Establish a technical committee at the highest level to insure coordination and advocacy.
2. Designate a focal point in the Ministry of Health.
3. Designate focal points in the departments and ministries concerned: environment, interior and others.
4. Establish an information system and a database on environmental health indicators useable in the EBD process.
5. Analyse the situation and identify priority issues.
6. Develop a plan for action for EBD assessment of each specific problem.
7. Establish monitoring tools to follow up the plan of action and evaluate the different stages and results.
8. Communicate information and results to the decision- and policy-makers for strategy development and to the population for awareness raising.