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Annex 9
Report on the Bonn Meeting
July 2004

DEVELOPMENT
OF
ENVIRONMENT AND HEALTH INDICATORS
FOR
EUROPEAN UNION COUNTRIES

ECOEHIS

Grant Agreement SPC 2002300
Between the European Commission, DG Sanco
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WORLD HEALTH ORGANIZATION
EUROPE

Development of Environment and Health Indicators for European Union Countries: Results of a Pilot Study

Report on a WHO Working Group Meeting
Bonn, Germany, 7–9 July 2004

Cosponsored by the European Commission
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ABSTRACT

From October 2002 to September 2004, the WHO European Centre for Environment and Health implemented the project "Development of Environment and Health Indicators for the European Union countries (ECOEHIS)". The meeting in Bonn, 7–9 July 2004 was convened to review the results of the pilot study, testing the feasibility and applicability of proposed indicators in countries participating in the project. Based on national reports as well as the review of international databases and reporting systems, the meeting recommended a list of "core" indicators ready for inclusion in the European Commission Health Indicators core set. The meeting also identified issues that require further developmental work in order to allow for a more comprehensive monitoring and assessment of environmental health policies.

Keywords

ENVIRONMENTAL HEALTH
ENVIRONMENTAL MONITORING – METHODS
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Introduction

In the Declaration of the Fourth Ministerial Conference on Environment and Health in Budapest 23–25 June 2004, the proposed Environment and Health Information System was reaffirmed as an essential tool for policy-making, allowing priorities to be set on the basis of evidence, enhancing access to information, and facilitating communication with the public. Consequently, developing a well-designed pan-European EHIS based on a core set of environmental health indicators has become even a higher priority for the WHO, European Commission (EC) and the European Environment Agency (EEA), as well as for the Member States themselves. As a part of the concerted efforts towards the establishment of EHIS in Europe, the WHO European Centre for Environment and Health, Bonn Office, implemented a project "Development of Environment and Health Indicators for the EU countries" (ECOEHIS). The project was cosponsored by the EC DG SANCO under the Grant Agreement SPC 2002300 (1 October 2002–30 September 2004). The results of the project provide the input to the comprehensive list of European Community Health indicators (ECHI). Eleven countries – Austria, Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Portugal, Spain and Sweden – participated as partners of ECOEHIS project.

The previous meeting for the project in Luxembourg, from 29–30 January 2004, reviewed progress in the development of indicators methodology, agreed on the list of the indicators to be tested, and designed the pilot study. Since then, the study protocol has been set and the pilot study has been carried out in the participating countries. This involved five steps: building a team for the study in the country, developing criteria and tools, collecting meta-data and data, analysing the information, and determining the readiness for implementation of the indicators. Most of the partner countries had completed questionnaires to evaluate the necessary data elements of indicators tested in the pilot study and submitted national reports summarizing their experience and the major findings in their countries before the meeting in Bonn.

This meeting in Bonn on 7–9 July 2004 was convened to review the results of the pilot study. Based on national experiences of implementing the pilot study, and the results of a WHO review of the relevant international databases and reporting systems, the meeting recommended a list of "core" indicators ready for immediate inclusion to the Community Health Monitoring System and the ECHI list. The meeting also identified issues and indicators that require further developmental work in order to allow for a more comprehensive monitoring and assessment of environmental health policies. The meeting also discussed necessary follow-up actions for harmonization to be taken in the Member States in collaboration with WHO, EC, and other international organizations in order to allow implementation of indicators.

The meeting was attended by project partners, invited experts providing scientific advices on technical issues, observers from interested countries actively collaborating with WHO Environment and Health information projects, and representatives of the EC and EEA. This final report includes comments received in the review process. The methodology sheets for the accepted indicators included in this report reflect the changes recommended by the meeting.

Objectives of the meeting

In the framework of the ECOEHIS project, this meeting was considered to be the final step in agreeing the core set of environmental health indicators to be integrated into the comprehensive list of European Community Health Indicators (ECHI). The objectives of the meeting were:

- to assess the feasibility and applicability of the proposed indicators by reviewing results of the pilot study from national and international perspectives;
- to make a final agreement on the core set environmental health (EH) indicators for EU countries;
- to identify follow-up actions needed to enhance the use for the indicators.

Summary of the meeting discussion

The meeting agenda was accepted unanimously with an amendment proposed by Manfred Schmitz (Germany) on the sequence of discussions. As an introduction to the discussion of study results, overall progress of the project was reviewed. The international developments relevant to the ECOEHIS project at the European level were first discussed together with the overall ECOEHIS process, thus setting the scene for the technical discussion on the activities and achievements in the pilot study.

Discussion centred on the following issues:

- ECOEHIS in light of the recent international developments towards a European EHIS
- experiences in partner countries in testing feasibility of the proposed methodology
- criteria for evaluation of the EH indicators and selection of a core set
- agreement on core set EH indicators for EU countries and recommendations.

ECOEHIS in light of the recent international developments towards a European EHIS

The Fourth Ministerial Conference on Environment and Health in Budapest

Michal Krzyzanowski (WHO) presented the future of EHIS in light of the Budapest Conference. The Fourth Ministerial Conference on Environment and Health, held in Budapest on 23–25 June 2004, set out a road map for actions concerning environment and health in Europe. In the Declaration of the Conference, the policy-makers of European countries agreed to implement the Children's Environment and Health Action Plan for Europe (CEHAPE) and to develop a pan-European Environment and Health Information System (EHIS) as a tool for strengthening policy-making in Europe. By signing the Declaration, the Member States committed themselves to report on the progress of national actions at the mid-term review in 2007. In collaboration with Member States and other international agencies, WHO was expected to set international mechanisms for selection and approval of elements of EHIS supported by the Member States, develop guidelines for a core set of indicators, and build a network active in the Region.

Lis Keiding (Denmark) and Manfred Schmitz (Germany) were invited to give accounts of the Budapest Conference from the perspective of country delegates to the Conference.

Lis Keiding had a very positive outlook on the Budapest Conference. At side events the discussion was constructive, and the fora had an open atmosphere due to young participants from delegations and non-governmental organizations. The pre-planned national interventions were necessary at such a huge arrangement, but it meant that plenary discussions were not so lively. In addition to the first results of the environmental burden of disease study, EHIS was considered very necessary and important for international cooperation. Some Member States underlined the reporting fatigue and the need to limit it. Housing environment was viewed as a very important upcoming theme despite the fact that it was not widely accepted as a 'traditional' environmental issue and other ministries were in charge of it.

Manfred Schmitz (Germany) made a comment that EHIS was recognized as a very important area in Budapest, as was mentioned in the opening speech of the Deputy Federal Minister of Health and Social Security of Germany, Ms Caspers-Merk, at the session 'The state of health and the environment in Europe – an assessment'. Three main pillars for WHO/EC collaboration were identified: Children's health, Indicators, and Housing and health. The role of the WHO European Centre for Environment and Health in the preparation of the Budapest Conference was acknowledged in moving the agenda along at the Conference. There was a need for further strengthening the collaboration between WHO and the international organizations on the EHIS.

The initiatives of the EC

Antonio Doronzo (EC) briefed participants on the most recent developments of EHIS in the European Commission (EC), i.e. the Public Health Action Programme, and the Environment and Health Action Plan. It was at the core of the Public Health Action Programme 2003–2008 to develop and operate an information and knowledge system on health to inform policy-makers and the citizens. The DG SANCO had created mechanisms to ensure continuity between past and future projects as well as progress towards implementation. Seven working parties (WP) had been created (one of them was on environment and health information) to coordinate the projects and advise on technical issues. In addition, a network of the WP leaders had been created as an intermediary body to keep all interested parties up to date on the information and knowledge system. The National Competent Authorities (NCA) was an advising body designated by the health ministries. It met twice a year to advise on the work plan and its progress. All these were new mechanisms and were still in the process of finding their responsibilities and roles.

The NCA meeting was held in Luxembourg from 5–6 July 2004 to discuss the Work Plan for 2005. At the meeting the WP leaders reported on the progress of the working parties. Concerning the core/short list of 80 indicators coming from the ECHI project, discussions with Eurostat show that 45 of them are practically available for the 25 EU Member States, and that 35 are not available on a regular basis, therefore requiring considerable work over the next years. Three of the proposed indicators should be better defined. A limited number of 'preliminary' ECOEHIS proposed indicators were submitted to this NCA meeting. It was therefore the responsibility of the present meeting to recommend a definite set of indicators and approaches to data gathering.

The European Environment & Health Action Plan 2004–2010 set the framework for the relevant EC actions. It consisted of 13 actions; four of them focus on information and monitoring, five on research, and four on training and knowledge. DG SANCO has a good cooperation with Eurostat; strengthening the collaboration with EEA will benefit the Action Plan. Eurostat had recently launched a new policy of free dissemination on the Internet of the so-called '1000 Tables'. As of 1 October the Eurostat NewCronos Database should be fully open to free access.

One should keep in mind the two different types of existing data systems: the one imposed by laws and the other reported voluntarily. All health statistics were an example of the latter.

These EC activities gave a strong impetus to the entire European Region. Synergies between them and the actions arising from the Budapest Conference should be fully exploited, and the work should be carried out under close collaboration between the EC and WHO together with the EU Member States. WHO should make an effort to mobilize the eastern part of the Region and actively involve the EECCA (Eastern Europe, Caucasus and Central Asia) countries in the process.

Progress in ECOEHIS

The ECOEHIS project that WHO European Centre for Environment and Health, Bonn office, implemented with the support from EC DG SANCO was an important part of the process towards a European Community health information and knowledge system.

Rokho Kim (WHO) reported progress in the project activities since the meeting in Luxembourg. In that meeting, the set of indicators were selected to be pilot tested, the pilot study protocol was designed, and the criteria for evaluation were agreed. The objective of the pilot study was to test feasibility and applicability of the indicators selected at the meeting. The pilot study aimed at classifying the indicators into three groups according to the study results: indicators ready and recommended for implementation, those ready but not feasible for immediate implementation, and those desirable though requiring further developmental work.

According to the study protocol, methodology sheets and questionnaires were distributed among the partner countries in February and March 2004. The questionnaire focused on four criteria of evaluating indicators and data elements: availability, quality, comparability, and policy-relevance. In partner countries, data and meta-data were collected using the questionnaire from April to June. Since June, the national reports were prepared based on the data analysis, and the results would be discussed. WHO checked the availability of the indicators' data from the international data sources.

The ECOEHIS process had provided very good information on current status, the main drivers and how far the existing national information systems met these criteria. The work fed into the EU activities, but the decisions about the indicators were taken at the EC level. It was therefore necessary to assess the added value of every newly proposed indicator, and to consider the structure in charge of providing the data.

Experience in Partner Countries

Participating Member States presented main results and experiences in the pilot study. Using the protocol as a guideline, they undertook creative approaches in setting out the mechanisms for the pilot study. Despite the considerable time pressure and other limitations, most countries completed the pilot testing as planned.

Only Austria and Belgium were unable to complete the pilot study for different reasons. **Austria** withdrew from the study because of limited resources to perform the study. In particular, the cost of obtaining the data and collecting meta-data was prohibiting, since many of the environment and health data were held and managed by private institutes in Austria. Despite this situation, Austria confirmed that they welcomed the development of indicators for monitoring the relation

between health and environment, and in this respect fully supported the aims of the project ECOEHIS. **Belgium** organized a steering committee of the Communities and Regions for this project. However, it had to withdraw from the study because the national focal point was not replaceable when he was unable for health reasons to perform the pilot study.

Denmark evaluated the proposed EH indicators from the National Environmental Health Action Plans (NEHAP) perspective. In the Danish NEHAP, areas such as environmental tobacco smoking and accidents were not included. Thus the policy relevance of indicators on these items were judged limited in relation to the NEHAP, although they were regarded as very important from a broader public health point of view. The pilot study report was disseminated to the inter-ministerial group established to steer the NEHAP implementation but there was no time for discussion with the stakeholders. Most data were already reported to international organizations.

Finland checked thoroughly the data availability and accessibility as well as the methodology of the proposed indicators. Primary data were scattered among different organizations and collecting these seemed to work, although compiling data from various sources might require additional effort. There was a problem when data was collected on a local scale, e.g. restrictions related to environmental tobacco smoke, management of bathing waters, etc. In Finland, partly because of the climatic conditions, good housing systems were in place. Therefore, some housing indicators were not so relevant. Some water and sanitation indicators (e.g. population connected to wastewater treatment) were also considered not very useful because of the high standards already achieved in a number of EU countries. Gaps of information were reported in noise, housing and chemicals. What is the reason for these gaps? Was there simply no problem on this issue in Finland, or was there no institute that collects the data? Finland stated that the clarity of definitions should be improved in some of the methodology sheets when they are to be used as guidelines for implementation.

France undertook a multi-stakeholder process, creating a steering team from the main organizations concerned with data centralization and monitoring of the environmental or health area, and by collaboration with European organizations. The pilot study got a very positive resonance. It was a good opportunity to identify organizations in charge of the production of the data. It appeared that most data existed in the country albeit dispersed among many organizations. Most of them answered quickly, correctly and willingly despite the very short schedule. The willingness of tightening links between actors of monitoring in environment and health was also obvious. ECOEHIS facilitated the production of a programme of action for the French NEHAP concerning monitoring of indicators. A number of positive developments since the beginning of the ECOEHIS implementation made this possible. These included the establishment of the National Sanitary Security Agencies (AFSSA, AFSSE, AFSSAPS, InVS, etc.), the recently adopted NEHAP and the national public health law which set the regulatory framework for public health monitoring. Housing and indoor air qualities were priority topics in the French NEHAP and a national observatory on indoor air quality had been created. The pilot study had identified an obvious lack of data in the field of noise monitoring. It had also stressed the necessity of common work between experts from European countries to arrive at precise definitions and to standardize data collection for the development of housing indicators. Direct contact with relevant experts of databases owned by the Ministry of Interior was not possible. The result was that information on data availability and quality was difficult to obtain for traffic indicators and incomplete for crime and perception of crime. The steering committee agreed to continue to meet after ECOEHIS in order to optimize the participation of French organizations in European working groups in the area of environment and health monitoring.

Germany: The first step of the German participation to the ECOEHIS project was an analysis of existing EU-reporting obligations and current EU-indicators in the fields of interest for ECOEHIS. One of the main findings was that a number of very similar indicators was already provided by international data holders (e.g. structural indicators by Eurostat, TERM indicators by EEA). Therefore, German project participants did not undertake separate collection of data and meta-data on a national level. The basic understanding of German project participants of indicators suitable for implementation at EU-level was that there must be existing data flows from Member States to the European Union. This was a prerequisite in order to avoid duplication of work and unnecessary reporting obligations. Where there were no such data-flows yet, but nevertheless the ECOEHIS project identifies a priority area of environmental health, a cost benefit analysis needed to be provided for the European Commission. On the basis of this analysis, the European Commission would be able to decide on the initiation of an official decision making process. This approach was also favoured following previous experiences in the former project on Environmental Health Indicators coordinated by WHO-ECEH (EHI for the European Region). According to German participants, the results from the previous project indicated that the proposed indicators were only partly relevant for reporting on environmental health issues in the national context. It was emphasized that the exposure related indicators were the most useful indicators and could be combined with reasonable health impact assessments if appropriate risk estimates and data on the related health outcomes existed. One of the objectives of the ECOEHIS project was to propose E&H indicators for the ECHI-short list. These proposals would be discussed by the working party on health and environment that has been set up under the ECHI process. Germany considered that many indicators proposed in the Luxembourg meeting should be discussed by the appropriate working party of the ECHI-process. For example, the working party on accidents and injuries were appropriate for indicators on traffic accidents and the housing indicator of injuries at home.

Taking full advantage of participating in the pilot study, **Italy** set up an extensive network of stakeholders and major players in the environment and health in the country. The environment and health project of the Italian Agency for the Protection of the Environment (APAT) through which the pilot study was conducted had created a very strong participatory process. It allowed for the involvement of all the stakeholders at national and regional levels, creating an appropriate forum for a constructive discussion, sharing of information, and common approach in evaluating the proposed environment and health indicators. Such a process would make possible a cost-effective plan to further strengthen the integrated reporting between environment and public health institutions, promote the achievements, and evaluate the actual and potential capacity of building a shared information system. Creating a network which was operational at national and international levels ensured the successful implementation of harmonized European activities, bringing European strategies and policy targets while taking into consideration national and local priorities. The pilot study demonstrated that the current national data-flow system was not efficient and that more information was needed for an in-depth cost-benefit analysis. In follow-up, there would be good visibility of the pilot study and the overall ECOEHIS project: officially launching the pilot report, publishing selected ECOEHIS indicators in Italian Environmental Protection Agency (APAT) yearbook, both in paper and on the web and further harmonizing and strengthening the activities towards integrated environment and health reporting. There was a strong will to further expand the WG participatory process in a planned activity and building and maintaining a national network with the Agency in its 'core'.

The National Institute for Public Health and the Environment (RIVM) of **the Netherlands** was developing a national EH information and monitoring system as part of the Dutch NEHAP. For

the pilot study, a steering committee was created as a temporary advisory body. In the future, the steering committee would be linked with the recently set up National Advisory Board on EH Monitoring. The board includes representatives of the ministries of environment, health, transport, as well as local health authorities, environment agencies and nongovernmental organizations. Furthermore, there was a plan for a permanent expert working group. Making the steering committee into a permanent body would ensure progress towards the establishment of the national EHIS. The Dutch NEHAP did not have clear targets, and therefore it was difficult to decide on the policy relevance of the ECOEHIS indicators. For that reason, evaluation of policy-relevance was mostly based on current policy and the usefulness for health impact assessment. It was stated that the evaluation of policy-relevance was very subjective. Overall readiness of some indicators was difficult to assess because these indicators consisted of many data-elements. The pilot study revealed extensive data collection activities in the field of environmental and public health but no integrated reporting, except as an *ad hoc* activity or as a part of existing environment or public health reporting systems (internet, reports). Some of the indicators were not considered very useful for the Netherlands, because the standards for these indicators were already very high. These indicators were probably more important to other countries. The Steering Committee also proposed a set of additional indicators that they thought missing in the proposed set (for example exposure indicators for radiation). The process of implementing EH indicators should start with the policy priorities, using the existing (international) reporting obligations, identifying the relevant national and international studies, and most importantly keeping the system regularly updated.

Portugal had limited the scope of the pilot study to noise, water and sanitation and housing, and they were shared between two agencies. One partner led by João de Quinhones Levy of Instituto Superior Técnico collected meta-data on the indicators for noise, and water and sanitation. Because the data was collected by a university which did not belong to any of the official organizations which held the information, the collection process was more time consuming as it was necessary to make enquiries at diverse institutions to ascertain where the information was being kept. On the other hand, once the data holders were known, the collection process was easier because it was not necessary to follow all the institutional steps normally necessary in the government. The other partner led by Jorge Mota Prego of the Directorate General of Health collected meta-data on housing-health indicators only.

Spain reported difficulty in assessing the policy relevance and the comparability. Because of the change of the government during the pilot study period, the networking was delayed and difficult. Information on indicators on housing and noise was particularly difficult to collect. It was often unclear whether Spanish data were available in the international databases. Some of the indicators were only partially available for certain regions.

In **Sweden**, the Board of Health and Social Welfare identified relevant indicators for monitoring the national environmental quality objectives. The approach in evaluating the indicators feasibility and relevance was to contact experts and data providers officially. The indicators on chronic exposure to PM10 and PM2.5, the associated years of life expectancy lost, indoor air quality in terms of ETS exposure, radon, and mould, disturbance from traffic noise, kin cancer divided into epithelial cancer and malignant melanoma were very useful in the Swedish context. The indicator on health effects from extreme temperatures was felt not relevant in Sweden. In the opinion of Sweden, housing was not a part of environmental health, except for dampness/mould and radon. Furthermore, the proposed chemical indicators were not found relevant in Sweden. It would be more interesting to have indicators linked to chemical exposure.

Presentations from **several countries** indicated that, although most of the data for indicators were electronically available, the current methodology sheets did not provide sufficiently detailed guidelines for users to find the information from the international databases quickly. Participants emphasized the need to supplement the methodology sheet with additional 'how-to' guides to access the international databases. Therefore, an example of a 'how-to' guide prepared by the WHO secretariat was presented and is attached as Annex 3. The meeting pointed out that international databases for some countries are sometimes incomplete. Furthermore, the question was raised whether data that is being reported to EC could legally be used in other systems. In other words: could WHO use the data at the same time? A problem could be that some statistical institutions sell their data and therefore they might not give permission to give the data to everyone. This issue remained unresolved.

Criteria for evaluation of the indicators

Considering the different needs and situations of environmental health policies in the Member States, the pilot study showed various approaches to the evaluation of **the policy relevance** of the proposed EH indicators by the partner countries. Denmark focused on the priority areas of the NEHAP. Sweden and Netherlands looked at the important public concerns. In France, experts focused essentially on their assessment of the importance of public health concerns, and the existence of a regulatory context or national action plans (NEHAP, laws etc.). Italy considered as most important the regulatory context and the existing reporting obligations for better data quality and availability. The decisions on many indicators in Finland were driven by 'bringing the public health argument' to multi-sectoral policies. In some cases, e.g. water and sanitation, the evaluation was based on assessment of the situation when high standards have already been achieved. German participants considered that the assessment of policy-relevance did not necessarily reflect the "real" relevance of a certain indicator but reflected the opinion of the expert answering the WHO questionnaire, and that experts' assessments on the relevance of a certain issue were biased by the belief in the relevance of their own field of work. They expressed their concerns that these expert assessments may not necessarily be in accordance with the burden of disease caused by the environmental factor under consideration, nor with the assessment of the national policy-makers. To avoid such problems in developing indicators, the Netherlands also let policy-makers and not only experts look at the indicators, and took into account the burden of disease estimates for the Netherlands. All the criteria applied by participating countries to consider the policy-relevance (e.g. important public health problem, useful for existing policies and/or NEHAPS, useful for future assessment, useful for assessment of burden of disease, useful for tracking of emerging issues) had been taken into account by the working group decisions at the meeting.

Checking **data availability** was easier and all participating countries had been checking the national (and for some indicators also sub-national) data holder agencies: environmental and/or health statistics. The practical approach used for multinational evaluation was to check data availability in the European databases e.g. Eurostat, WHO/Europe, EEA etc. Evaluating **the data quality** was not always straightforward because the determinants of data quality such as validity and reliability of the data elements were often hard to measure and not well documented. It was particularly challenging to assess the data quality when the indicator and data elements were not clearly defined. At the meeting **comparability** had been assessed from a multinational perspective and differences in the methods used for the data systems from the proposed methodology were taken into account. The primary focus of discussion at the meeting was on

exposure, effects and action indicators as available information about the upstream determinants and state of the environment was usually of reasonable quality and comparability.

The ECOEHIS project was part of a process that aimed to improve existing environmental monitoring systems and reporting for health assessments. The addressee of the project report was therefore very important. The results of the pilot study should be presented and discussed with the partner countries to check whether the proposed indicators were feasible and relevant in a national context and what should be done to make this data available. One way to do this might be to discuss the results in **the EU Working Party on Environment & Health** as had been planned.

There were a few remarks on the future use of the indicators, responsibility of analysis and policy-oriented reporting on public health and the environment, and existence of legal constraints for using and re-using data already submitted to the EC for other purposes than compliance.

From the EC point of view it should be clear that the indicators proposed for the core set should be **readily available in the international databases** such as Eurostat (the EU main source for routine data collection) and other services of the commission to which data were reported in accordance with the legislation. The ECOEHIS project should take into consideration that the definitions and all the data specification of the indicator methodology should be practically identical to the existing ones in Eurostat and the Commission. The methodology sheets would be updated in order to achieve this. It would be equally important to make a distinction between two levels of readiness of availability: when the indicator could be used exactly as was, and when it needs to be 'filtered' (i.e. only a few data elements were needed from an extensive database). The latter might require a little bit more effort than the former. If the indicator required some testing it should be done on a project basis. In this respect, activities of the WHO/Europe technical programmes and the implementation of ENHIS project provided a good opportunity to further advance the indicator developments.

To achieve the goals of protecting and promoting the population's health, the health information system primarily focused on the indicators regarding **Exposure (Ex), Health effects (E) and Action (A)** in the causal chain framework of DPSEEA. The indicators readily available and proposed by the projects would be directly used by the EC, WHO and other national and international organizations. The action indicators considering existing national regulations and policies should be compiled and reported by the EU Member States. The ECOEHIS indicator proposal considered these issues mentioned above.

Agreement on a core set of EH indicators for EU countries and recommendations

The participants reviewed and discussed the results of pilot study of each indicator extensively at this three-day meeting. As a main outcome of the meeting, the indicators were classified into the following categories.

1. *Readily and recommended for implementation:*
   These indicators were recommended for ECHI. Most of indicators in this category were directly available from international databases. For some indicators, the definition and methodology should be adjusted to make them easily available.

2. *Ready, but not feasible for immediate implementation:*
   These indicators were recommended for WHO use (i.e. ENHIS project). These were relevant indicators but require more effort in data collection, computation, and interpretation.
3. *Desirable though requiring further developmental work:*
   These indicators were recommended for further elaboration, and not ready yet for implementation.

The discussion and conclusion on the final classification of the indicators would be presented in the following by indicators and topic areas. The final classification of the indicators is presented in Annex 2.

Air

Seven indicators on the topics of air pollution were tested in the pilot study. The results of international testing and the understanding of the process from an international perspective were presented by Michal Krzyzanowski (WHO), followed by discussions and agreements among the participants. An overview of the indicators and recommendations is given in table 1.

Passenger transport demand by mode of transport (AIR_D1), *Freight transport demand by mode of transport* (AIR_D2), *Road transport fuel consumption* (AIR_D3), and *Emissions of air pollutants* (AIR_P1) were readily available and accessible in international databases such as Eurostat and UNECE/EMEP. Most countries reported good availability, quality, comparability, and policy relevance. Overall rating of readiness for implementation was also very good. A few countries experienced difficulty in accessing the data in Eurostat, suggesting the need for a 'how-to' guideline to access the international database for this indicator. These four indicators were recommended for ECHI.

Table 1. Air indicators classified at the meeting

Indicator Code	**Title**	**Final decision: *Recommended for***
Air_D1	Passengers transport demand by mode of transport	*ECHI*
Air_D2	Freight transport demand by mode of transport	*ECHI*
Air_D3	Road transport fuel consumption	*ECHI*
Air_P1	Emissions of air pollutants	*ECHI*
Air_Ex1	Exposure to air pollutants (Population-weighted annual average concentration of PM_{10}, $PM_{2.5}$, O_3; Exceedance of AQ limit values for NO_2, SO_2)	*ECHI*
Air_E1	Years of Life Expectancy Lost due to PM exposure	*ENHIS*
Air_A1	Policies to reduce environmental tobacco smoke exposure	*ECHI*

Exposure to air pollutants (AIR_EX1) has two components: *Population-weighted annual average concentration of PM_{10}, $PM_{2.5}$, O_3;* and *Exceedance of air quality limit values for NO_2, SO_2*. This indicator measured the outdoor levels of air pollution in urban areas representing a significant source of exposure and health risk. Most countries reported good availability, quality,

comparability, and policy relevance of pollutants concentration data (though the availability of $PM_{2.5}$ was still limited). Most countries agreed that this indicator was immediately ready for implementation. The information on the level of annual concentration of air pollutants was available in EEA/ETC-AQ AirBase, and the population data on 352 major cities were available in 20 countries in the Urban Audit as well as in the Eurostat–GISCO database. Because the population statistics were basic information in most urban areas, population-weighting did not add much complexity, although it required an expert input on a local level. A problem could be linking the population data with the air data, because information on population covered by the monitoring was not always reported, even though it was requested by the AirBase. However, the value added by this indicator was compared to the routinely reported frequency of exceeding the EC Directive Target Limit Value of the pollutant, i.e. compliance indicator. It was agreed that use of compliance data did not reflect the health impact of the pollutants for which health effects were observed at concentrations below TLV (e.g. PM and ozone). It was also pointed out that this indicator did not involve an additional burden of reporting to the member countries, since it relied on the same set of air quality data as used to generate compliance indicators. To limit the need for additional calculations and considering the highest health relevance of PM and ozone exposures, it was agreed that population-weighted mean concentration of PM_{10}, $PM_{2.5}$ and ozone would be recommended for the ECHI, while for SO_2 and NO_2 compliance indicators collected by EEA would be recommended for ECHI. It was also recommended to separately list pollutant-specific indicators:

- AIR_EX1_PM_{10}: population-weighted annual mean PM_{10} concentration
- AIR_EX1_$PM_{2.5}$: population-weighted annual mean $PM_{2.5}$ concentration
- AIR_EX1_O_3: population-weighted annual mean ozone concentration
- AIR_EX1_NO_2: population distribution of number of hours exceeding AQ limit values for NO_2 in urban areas (EEA AP13)
- AIR_EX1_SO_2: population distribution of number of days exceeding AQ limit values for SO_2 in urban areas (EEA AP11)

This set of indicators should adequately address health considerations and was easily available from currently collected data. Therefore, it was recommended for ECHI.

Years of Life Expectancy Lost due to PM exposure (AIR_E1) are calculated from the information from AIR_EX1 specific to particulate matter. Except for Germany, most countries gave fairly good scores to this indicator for all criteria. It was agreed that this indicator would not be included in the ECHI set, but would be recommended for further harmonization in the ENHIS set.

Many countries did not provide a complete answer to the questions on *Policies to reduce environmental tobacco smoke exposure* (AIR_A1). Countries usually had information on this indicator individually and currently there was no international reporting system on this topic. It was emphasized that this indicator should be coupled in the future with an indicator on children's exposure to ETS to provide information on policy effectiveness. There might be a comparability issue because of the different survey methods to get this information, which could be improved by international collaboration. The meeting considered that the indicator is easy to calculate, and has very high public health significance. Therefore, it was concluded that this action indicator be recommended for ECHI.

Noise

Six noise indicators were proposed for the pilot study. The results of the international testing and the understanding of the process from an international perspective were presented by Célia Rodrigues (WHO), followed by discussions and agreements among the participants. Overview of the indicators and recommendations is given in table 2.

Table 2. Noise indicators classified at the meeting

Indicator Code	**Title**	**Final decision: *Recommended for***
Noise_Ex1	Population exposed to various noise level ranges per source	*ECHI*
Noise_E1	Cardiovascular morbidity and mortality attributable to noise	*ENHIS*
Noise_E2	Annoyance and sleep disturbance due to noise	*Further elaboration*
Noise_A1	Policies to reduce exposure to leisure sounds	*ECHI*
Noise_A2	Existence and effectiveness of urban or national action plans to solve noise problems	*Dropped*
Noise_A3	Willingness to enforce and implement the environmental noise EU Directive and to apply noise abatement measures	*Dropped*

Population exposed to various noise level ranges per source (Noise_EX1) provided the percentage of population exposed to different noise levels resulting from the monitoring process integrated in the European directive 2002/49/EC for environmental noise. For the development of strategic noise mapping, the directive proposed two indexes L*den* (day-evening-night level) and L*night* (night level). The maps would be the common assessment method and should present an estimation of the number of people located in areas exposed to noise. The first maps had to be produced by June 30, 2007. Though countries reported that at present they did not collect this data (with the exception of Netherlands), almost all of them had estimates of people exposed in major cities, but not according to the directive methodology. Where it existed, this data had been rated as being of low quality and not internationally comparable. Nevertheless countries had classified the indicator as having "good policy-relevance" (with the exception of Italy and Sweden). In summary, this was considered an extremely important indicator, even if for the time being only few countries had reliable data available. It was well understood that this indicator was well related to a risk for a range of health effects. It was also well recognized that, in accordance with EC directive, the collection of data for this indicator was mandatory by 2007, and that some Member States had already started collecting the data as of 2004. The indicator was considered for "immediate implementation", even if some Member States would not have data representing the national level until 2007. Therefore, this indicator was recommended for ECHI at least for gradual adoption until 2007.

Cardiovascular morbidity and/or mortality attributable to noise exposure (Noise_E1) consisted of the number of cases of cardiovascular diseases and number of deaths attributable to noise exposure. This indicator was proposed by a group of experts at the first meeting of the noise and health indicators and had been very carefully discussed until its adoption in Bonn at a second meeting. The discussion around this indicator had a meta-analysis produced by RIVM as starting point. All the countries had demonstrated interest in and acknowledged the importance of, such an indicator. Some countries reported problems raised by their national officers regarding

uncertainty due to the existence of a small number of studies (Denmark, Italy) and reinforced what was stated before about exposure data. This indicator had been the subject of in-depth discussions among noise experts and epidemiologists, and it had been agreed that enough solid evidence existed although there was still discussion about the magnitude of the risk and the relative risks to be used for its calculation. Despite the fact that a certain level of uncertainty still remained, this indicator was considered very important and pertinent to public health. Therefore, this indicator was recommended for the ENHIS indicators set. WHO would develop the model for its calculation in the framework of ENHIS. When ready and agreed upon it would be proposed for immediate calculation to the Commission.

Annoyance and sleep disturbance due to noise (Noise_E2) was another "effect" indicator and translated the percentage of people reporting noise annoyance and sleep disturbance. This indicator had, like the exposure one, the 2002/49/EC Directive as its background. The directive states that dose-effect relationships could be used to assess the effect of noise on populations. Dose-effect relationships for L*den* and annoyance and L*night* and sleep disturbance existed (known as "Miedema-curves"). This indicator had initially been designed following the methodology of the directive (using dose-effects relationships). The noise expert group agreed at its second technical meeting to change its calculation method and to calculate it on the basis of results achieved through representative surveys. This indicator was rated with very "good policy-relevance", but not all the countries had carried out surveys. It was agreed that this indicator should be a potential candidate for the core set. In the meantime, this indicator would be recommended for further elaboration. It would also be proposed to the Commission that these surveys be included in the Health Interview Survey. The group requested fine-tuning of the use of existing and international agreed surveys (for example ISO annoyance survey). On the other hand, the Netherlands had shown interest in adding another indicator, using the European SILC questionnaire, for neighbourhood noise annoyance.

Policies to reduce exposure to leisure sounds (Noise_A1) were an indicator proposed by the noise expert group. The added value of this indicator was that it could allow country comparison and, when analysing differences and success stories, encourage policy action. It reflected the actions of a given country to avoid health problems resulting from high leisure sounds (tinnitus and premature hearing impairment were increasing strongly among young people). Countries reported that data was available with medium quality but international comparability was difficult. Problems encountered were due to the existence of different data holders, strongly depending on a country's legal organization. Some countries considered this indicator (France, Denmark and Sweden) as "very policy-relevant" because it reflected the concern of a given country regarding the risk of hearing impairment by high sound levels. It was agreed that this indicator would be recommended for ECHI.

The second "action" indicator *Existence and effectiveness of national, regional or local action plans for noise reduction* (Noise_A2) was a composite indicator that reflected the existence of noise in national, regional or local plans as a health determinant and the existence of noise reduction and prevention plans in major urban areas as well as around major transport infrastructures. This indicator was rated quite highly in all the categories that were proposed for the pilot study and it would be available for implementation quite soon (end of 2004). Countries still reported that data was dispersed in the country, being very difficult for one stakeholder to have full access to it, although it could be useful to identify trends. Therefore, this indicator was dropped from the list of indicators to be considered for recommendation.

Willingness to enforce and implement the Environmental noise European Directive and to enforce noise abatement measures (Noise_ A3) was also proposed by the noise expert group. This indicator was composed of two figures, the first showing how much the countries were following the directive and the second showing the percentage of population covered by a noise map. This indicator was rated rather low; the countries did not see the need for an indicator of this nature, seeing that the directive would become mandatory very soon. For the similar problems as Noise_A2, this indicator was not recommended at the meeting.

Housing

Matthias Braubach (WHO) summarized the international situation of the housing indicators, including the comments made by the countries involved, the realized challenges in data identification, and the potential ways forward to an updated indicator set. This was followed by discussions and agreements among the participants. Overview of the indicators and recommendations is given in table 3.

In summary, the participating countries reported a number of problems regarding the availability of data. Main challenges of the housing and health indicator piloting were:

- the limited use of data available from the European Commission in the framework of other projects and obligations (taking into consideration the new transparency policy allowing an extended access to Eurostat data)
- the complexity of some indicator computations, requiring a variety of data items to be related to each other and analysis steps to be undertaken on the level of individual households/persons
- the necessity of data collected at sub-national level which was not easily available
- the integration of data out of the traditional environment and health domain (e.g. climate data, socio-economic data)
- the holistic approach to environmental health indicators and the health relevance of housing, conflicting with national priorities of environment and health programmes in few countries
- the variety of aspects with large variation between European countries, making some indicators more or less policy-relevant based on the national context.

Meeting these challenges, WHO had supported the countries in the data identification process using the international network on housing and health, and summarized the comments in order to develop a second draft version of the indicators that would fulfil the priority needs:

- using European data whenever possible
- reducing the complexity of the indicators

In addition, the issues of data quality and policy-relevance variations were discussed at the meeting and considered in the selection process for the list of core indicators, aiming for identification of policy-relevance on the international scale and compromising with the varying individual priorities on the national scale. However, a general trend was recognized of allocating higher policy relevance to those indicators representing current issues (most often lacking adequate data), while traditional indicators with high data availability were estimated to be less relevant.

For the case of data quality, there were only minor problems expected when the data was available, and a better use of Eurostat data should improve data quality and comparability.

Table 3. Housing indicators classified at the meeting

Indicator Code	**Title**	**Final decision: *Recommended for***
HOUS_P1	Affordability	*ECHI*
HOUS_EX1	Crowding	*ECHI*
HOUS_EX2	Accessibility	*Further elaboration*
HOUS_EX3	Dampness/Mould Growth	*ECHI*
HOUS_EX4	Household hygiene	*ECHI*
HOUS_EX5	Indoor radon in dwellings	*ENHIS*
HOUS_EX6	Crime/Perception of crime	*ECHI*
HOUS_E1	Mortality associated with extreme temperature	*ECHI*
HOUS_E2	Housing safety and accidents	*ENHIS*

Affordability (Housing_P1) looked at the financial resources that were required for purchasing a square meter of construction, and combined this with the percentage of population living in absolute or relative poverty. Generally, the availability of data was good except for the construction cost. Policy-relevance was assessed as average. Several countries recommended the use of the Eurostat data on housing expenses. WHO suggested that this indicator should be updated, taking into account the existing Eurostat indicators coming closest to the concept of the original indicator. It was agreed that this indicator be recommended for ECHI after an adjustment is made on the methodology sheet.

Crowding (Hous_Ex1) combined data on households and residents with the statistical information on room number and floor area, identifying the number of households with less than one room per person and the number of households with less than 14 square meters per person. It was a traditional housing indicator with high data availability, although the policy relevance was deemed to be rather low. Also for this indicator, recommendations were made to use Eurostat data. WHO acknowledged the usefulness of using the Eurostat definition, which was most helpful in providing comparable data for all EU countries, based on widely accepted definitions, and offered to change the computation of this indicator. It was agreed that this indicator be recommended for ECHI after an adjustment was made on the methodology sheet.

Accessibility (Hous_Ex2) focused on the accessibility of the housing stock and compared the amount of physical environmental barriers with the number of persons with functional limitations, or elderly people. It also included policy guidelines on housing adaptation. Although it was common opinion that accessibility was a key issue for housing, a large number of countries faced considerable challenges in identifying the necessary data. Most difficult were the environmental barriers in the housing stock, which either did not exist at all (except local surveys etc.) or were only available in very different data formats that could not be easily merged. Another problem area was the identification of adapted dwellings in case policies existed. WHO research brought similar results, showing that many data items were available that showed the prevalence of handicaps and chronic limitations, but could not be related to housing conditions

due to a lack of relevant housing stock data. It was agreed that this indicator needed further elaboration.

Dampness/Mould Growth (Hous_Ex3, *former Hous_Ex4)*) used data on dampness and mould growth and tried to assess the amount of persons/dwellings being exposed. It received a very high assessment of policy-relevance, but was rarely available as it was currently not included in the national health or housing surveys, and data was often available only from local studies. It was considered one of the major indicators to be part of the housing and health indicator core set if adequate data availability was guaranteed. WHO identified, following the request of the countries to work with European data when possible, the European Community Household Panel (ECHP), continued by the SILC survey (Statistics on Income and Living Conditions), as relevant sources of information. It was agreed that the indicator on dampness/mould should be added to the core indicator list if an adaptation of the computation towards the data collection mechanism of the SILC were possible. The SILC would contain a variable on problems with dampness and mould within the house. It was confirmed that the indicator Hous_Ex3 on dampness and mould growth would be covered by the SILC which was a mandatory data collection mechanism for all EU countries, starting in 2004 with most EU-15 countries and being complete with contributions from all EU countries by 2005/2006. The relevant data item (HH040) was covering data on dampness problems in the house as a potential cause of mould growth in the format of a composite indicator: leaking roof, damp walls/floors/foundations, and rot in the window frames or the floor. With the national data availability being rather low, and the strong policy relevance attached to the issue of damp and mould, the indicator had been adapted towards the SILC data and then added to the core list of housing and health indicators to be proposed to the European Commission for the ECHI list.

Household hygiene (Hous_Ex4, *former Hous_Ex5, Housing hygiene*) aggregated data on the presence – and quality – of selected hygiene amenities such as water supply, shower/bath, or toilet. It included data on dwellings, households, or persons not being equipped with these amenities, and – if available – data on dwellings, households, or persons being equipped with substandard amenities that do not provide efficient service. Although most countries did have some data on sanitation equipment etc., the main challenge for this indicator was (a) the amount of data items needed; (b) the complex computation (relating all individual items to produce a composite hygiene score); and (c) the qualitative dimension of assessing the existing amenities as adequate or inadequate (for which no data was available). In addition, countries having high sanitation standards assessed the policy relevance as low. WHO identified two international sources (ECHP/SILC) and the WHO Health for All database with some relevant data items, although not covering the full range of data needs. It was therefore agreed to follow the data format provided by SILC for all EU countries, and leave options for national reporting of hygiene data that were not included in the minimum set of SILC. After the adaptation to the SILC data format as the minimum data set for this indicator, the household hygiene indicator would go to the ECHI list.

Indoor Radon in dwellings (Hous_Ex5, *former Hous_Ex6*) aggregated data from *in situ* Radon measurement and from mitigation work. It combined this quantification of exposure conditions with the existence of national policies on Radon in housing. The indicator received the highest policy relevance rating, but many countries encountered problems in identifying the data in the relevant format. In various countries, data on national scale was scarce. Due to the high policy relevance, it was decided to amend the indicator, splitting it into two areas (exposure surveillance and policy action) and taking into consideration comments from the countries. A

new version would then be sent out for review and approval, and may be taken into the core set. It was agreed that this indicator be recommended for ENHIS.

Crime/Perception of crime (Hous_Ex6, *former Hous_Ex7*) considered the occurrence of physical and mental health effects related to the occurrence of crime, and more generally fear of crime. It aggregated available data on crime rates within residential areas and distinguished between crime against persons and objects. Although the policy relevance of this indicator in the filed of environment and health was questioned by some countries, the meeting agreed that the indicator would be proposed for integration to the general European Community Health Indicators. Data availability may be a challenge in few countries, although most data items were available. WHO/Euro Housing and Health Programme presented the data kept by the International Crime Victim Survey (ICVS), which was held every four years and theoretically covered all the required data items for the indicator (to be used to substitute lacking national data). The next survey would be realized in 2004/2005 in all EU-15 countries. Still, the indicator depended on national crime and police records to (a) update the crime prevalence on an annual basis and (b) be more detailed/more valid in case the national data sources offer better data quality. It was agreed that this indicator be adjusted to fit with the new wave of ICVS, and then, be recommended for ECHI.

Mortality associated with extreme temperature (Hous_E1, *former Hous_Ex3, Extreme indoor temperatures*) combined data on extreme climate conditions with health data (mortality and hospitalization cases), assuming that housing quality would be an essential element in maintaining acceptable indoor temperature levels. For this indicator, the main issues were the identification of the climate data due to "unusual" collaboration with meteorological institutes (although it was agreed that such data does exist in every country), the exact definition of the morbidity and mortality cases looked at, and the availability of mortality by month. The assessment of policy-relevance varied strongly, showing national priorities and previous experiences with heat and cold wave effects. WHO acknowledged the complexity of the suggested indicator draft, and it was agreed to limit this indicator to mortality data only, as this was much easier to define, access and compute. Still, it was clear that for this indicator international data sources cannot be sufficient as (a) at international level, the relevant mortality data were only partially available and the required climate data very rarely existed, and (b) climate events and their effects may be regional. The definition would be revised to limit to mortality. It was agreed that this indicator be recommended for ECHI after an adjustment is made on the methodology sheet.

Housing safety and accidents (Hous_E2, *former Hous_E1*) dealt with the number of health effects and deaths as a result of accidents and injuries in and around the private home. This included (a) the occurrence of burns, injuries and poisonings, and (b) the occurrence of deaths by home accidents, poisonings and fires. Although many countries did have some information on accidents and their health effects, it seemed difficult to identify the required data due to the specific format and the detailed ICD groups that were requested. Also, many countries had different data formats based on varying survey schemes, and comparability was not always easy. In addition, it was suggested that next to simplifying the indicator it was useful to add age-specific data into the indicator as accidents were often linked to specific risk groups (children, elderly). WHO offered to work with the EC Working Party on Accidents and Injuries to get access to the EC database on home and leisure accidents, and draft a new indicator sheet based on the available data. However, it was clear that to some extent national data (especially on

mortality and morbidity) would be required as international data sources could only partially cover the data. It was agreed that this indicator be recommended for ENHIS.

Traffic accidents

Table 4. Traffic accidents indicators classified at the meeting

Indicator Code	**Title**	**Final decision: *Recommended for***
Traf_D1	Passenger transport demand by mode of transport	*ECHI*
Traf_S1	Age of vehicle fleet	*ECHI*
Traf_S2	Road accident rate	*ECHI*
Traf_S3	Speed limit exceedances	*Further elaboration*
Traf_Ex1	Person time spent on the road	*Further elaboration*
Traf_Ex2	Use of vehicle safety device	*Further elaboration*
Traf_E1	Mortality rate due to road traffic accidents	*ECHI*
Traf_E2	Potential Years of Life Lost due to road traffic accidents	*ENHIS*
Traf_E3	Injury rate due to road traffic accidents	*ECHI*
Traf_E4	DALY lost due to road traffic accidents	*Further elaboration*
Traf_E5	Mortality due to drinking driving	*Further elaboration*

Eleven traffic accidents indicators had been subject to the piloting phase in spring 2004. The international summary of the piloting phase was presented by Sara Farchi (Italy), followed by discussions and agreements among the participants.

Passenger transport demand by mode of transport (Traf_D1) could be considered as an exposure indicator from a traffic accident point of view. Therefore, it was also called Traf_Ex1. It was in fact the same as Air_D1. See the discussions and decisions on Air_D1. The feasibility study confirmed that the figures for this indicator were currently present in the international databases. The only limitation was that this indicator did not collect information on distances travelled by human-powered modes of transport.

Age of vehicle fleet (Traf_S1) and *Road accident rate* (Traf_S2) were both status indicators for traffic accidents, available in Eurostat. The first was reported and discussed on the EEA reports. The Traf_S2 was collected by almost all the European MS and was available in the CARE (Community Road Accident Database). Although some problems on comparability and quality of the Traf_S2 had arisen in the feasibility study, these two indicators were recommended for the ECHI set for their policy-relevance and readiness of implementation.

Exceeding of speed limit (Traf_S3) was an important primary and secondary risk factor for traffic accidents. Most countries considered this indicator relatively less comparable and less relevant for policy making. The low score for policy relevance was principally due to the problem that the National Action Plans had no aims regarding the prevention of road traffic accidents. There was no international database identified for this indicator. Therefore, it was

agreed that this indicator would be monitored as a pilot indicators on a voluntary basis. In the meantime, according to the relevance of this indicator with respect to the prevention of road traffic accidents, it was recommended that this indicator be proposed to the Eurostat survey to develop more standardized assessment.

Person time spent on the road (Traf_Ex1) and *Use of vehicle safety device* (Traf_Ex2) were both exposure indicators for traffic accidents. Some of the countries participating to the feasibility studies reported good scores for these indicators, but this result was not uniform in all the countries. The Traf_Ex1 was an important indicator because it was the only one that could give a measure of exposure of pedestrians and cyclists. For example, it was relevant in monitoring children's exposure. Eurostat reported the results of the "Time Use Surveys" in ten European Countries for the years 1998–2002. The Traf_Ex2 is fundamental in the monitoring process of the road traffic accident reduction. The lack of usage of safety devices, together with speed limit exceedances and drunk driving, was responsible for most of the road traffic accident death. The decision was to propose these two indicators for implementation to Eurostat and to collect them on a voluntary basis. These indicators were recommended for further elaboration.

Mortality due to road traffic accidents (Traf_E1) was the most important effect indicator. Most countries gave consistently good scores for availability, quality, and comparability. This indicator was readily available from Eurostat (CARE-Community Road Accident Database), and was agreed for recommendation to the ECHI.

Potential Years of Life Lost due to road traffic accidents (Traf_E2) was directly calculated from Traf_E1.. The life expectancy at every age was easily available from the demographic statistics. This indicator was recommended for further development in the framework of the ENHIS study.

Injury rate due to road traffic accidents (Traf_E3) was an important effect indicator readily available from CARE-Community Road Accident Database. Most countries gave fairly good scores for availability, quality, and comparability. Improvements in the quality and comparability were recommended. This indicator was agreed for recommendation to the ECHI.

DALY lost due to road traffic accidents (Traf_E4) was calculated from Traf_E1 and Traf_E3. To calculate DALY, disability weights for different countries were necessary. The World Bank had proposed an algorithm to calculate DALY. This indicator was recommended for further development.

Mortality due to drinking driving (Traf_E5) is a primary and secondary risk factor of traffic accident morbidity and mortality. Countries indicated relatively low comparability and policy-relevance. The low score for policy-relevance of this indicator was principally due to the fact that the National Action Plans/legislation were not involved in the prevention of road traffic accidents. Given the low scores and poor availability of this relevant indicator, it was recommended for further development.

Water, sanitation and health

Seven indicators were proposed for pilot study. The results of the international testing and the understanding of the process from an international perspective were presented by Dafina Dalbokova (WHO), followed by discussions and agreements among the participants.

The three upstream determinants indicators: *Wastewater treatment* (WatSan_P1), *Recreational water quality* (WatSan_S1) and *Drinking-water quality* (WatSan_S2) had a clear regulatory context and reporting obligations. WatSan_P1 and WatSan_S1 were publicly available from Eurostat and DG Environment. WatSan_S2would be reported to the EC in 2005. It was also pointed out that the EEA WaterBase was under construction. Therefore, all three of these indicators were recommended for ECHI.

Table 5. Water and sanitation indicators classified at the meeting

Indicator Code	**Title**	**Final decision:** ***Recommended for***
WatSan_P1	Wastewater treatment	*ECHI*
WatSan_S1	Recreational water quality	*ECHI*
WatSan_S2	Drinking-water quality	*ECHI*
WatSan_Ex1	Safe drinking-waters	*ECHI*
WatSan_E1	Outbreak of waterborne diseases	*Further elaboration*
WatSan_A1	Management of bathing waters	*ENHIS*
WatSan_A2	Water safety plans	*Further elaboration*

Safe drinking-waters (WatSan_Ex1) was meant to provide information about the monitoring/control coverage of the Drinking-water Directive and also about the populations which use small/individual water-well supplies and hence could be potentially exposed to water-related health risks (both microbiological and chemical). The policy relevance was rated 'poor' by Denmark, Italy (for national reporting means), and the Netherlands, 'fair' by France and Sweden, and 'good' by Portugal. Sweden reported about 1.6 million out of 9 million of their population without access to municipal water supply. The variability of evaluations was mostly related to the lack of 'direct' regulatory context (no reporting obligation about the monitoring coverage) and also because high standards had already been achieved in many countries especially for piped drinking water supply at home. Availability of data was evaluated 'good' as these are routinely collected statistics, however the quality and comparability of the indicator became questionable given the considerable differences in national definitions and estimation methods.. Within the structural indicators of economy and ecology/water, Eurostat produced a similar indicator using the definition of 'population connected to public water supply'. Given the ready availability, the indicator could be recommended for the ECHI list taking the Eurostat definition and refining the methodology. There might still be some problems with comparability because of differences in definitions and data collection methods used across Europe. Nevertheless, the indicator was proposed as the best available and relevant information and using it should drive the acquisition of better quality data.

The most intrinsic EH indicator of water and sanitation, *the outbreaks of waterborne diseases* (WatSan_E1), was rated as 'fair' to 'good' for the policy relevance by several participating countries (Denmark, Finland, France, Portugal). The data was considered available in Finland, Italy, Netherlands and Spain and partly available in Sweden but their quality – 'poor' (Denmark, Italy, Netherlands, Portugal, Sweden). Germany reported that the identification of waterborne diseases out of all reportable infectious diseases was at present not possible. The poor data quality is mostly due to the considerable underreporting, lack of sensitivity – characteristic for the notification systems, slow ways of discovering an outbreak and differences in diagnostic and

surveillance practices. A good example was Finland, where 32 outbreaks of (mostly recreational) waterborne diseases with a total number of 16 000 cases were detected during 1997–2002 after introducing a new surveillance system. The indicator was in need of considerable development, improvement, and harmonization of the diagnostics and reporting systems. As this work was beyond the scope of the project and the overall health information system activities and required involvement of other agencies e.g. the European Centre for Disease Prevention and Control (ECDC), this indicator was left for the time being for further elaboration.

The two action indicators, WatSan_A1 and WatSan_A2 provide information about implementation of a proactive approach to bathing and drinking-waters quality management.

Management of bathing waters (WatSan_A1) was considered to be policy relevant, readily available in Denmark, Portugal, Spain, and Sweden with a fair comparability. Italy reported non-availability and the Netherlands – partial. The bathing water directive had been recently revised to incorporate the WHO Guidelines for Safe Recreational Water Environments together with the beach management principles of the Annapolis protocol. The Council had adopted the amended proposal for a Directive of the European Parliament and of the Council concerning the management of bathing water quality on 23 June 2004. This indicator could be proposed to the ECHI list only after the methodology was refined to reflect the very recent finalization of the revised Directive and associated reporting obligations. In the meantime, this indicator was recommended for WHO use in the framework of ENHIS study.

Water safety plans (WatSan_A2) was considered potentially very useful for the future. The concept of water safety plans that encompassed all steps in water protection from catchment to the consumer was the most effective and protective means of consistently assuring drinking-water quality and the protection of pubic health. It had been introduced in the third revision of the WHO Drinking-water quality guidelines. Since this was not yet finalized it was difficult to provide clear guidelines on how to produce the indicator. In the meantime, this indicator was recommended for further development.

Out of the seven originally proposed indicators, three: *Wastewater treatment coverage* (WatSan_P1), *Recreational water quality* (WatSan_S1), and *Drinking-water quality* (WatSan_S2) were decided ready for immediate implementation. *Safe drinking-waters* (WatSan_Ex1) was also decided for the core set based on the indicator 'Population connected to public water supply' routinely collected by Eurostat. *Bathing water management* (WatSan_A1) was a potential candidate for the core set with slight refinement following the official publication of the revised and adopted by the Parliament Bathing Water Directive. *Water safety plans* (WatSan_A2) and *the outbreaks of waterborne diseases* (WatSan_E1) would require longer-term methodological development.

Chemical emergencies

Table 6. Chemical emergencies indicators studied and reviewed at the meeting

Indicator Code	**Title**	**Final decision:** ***Recommended for***
Chem_P1	Industrial facilities under Seveso II directive	ECHI
Chem_A1	Regulatory requirements for land-use planning	ECHI
Chem_A2	Chemical incidents register	ECHI
Chem_A3	Government preparedness	ECHI

The international summary of the pilot study of the four indicators for chemical emergencies was presented by Rokho Kim (WHO), followed by discussions and agreements among the participants.

All four indicators on chemical emergencies were recommended as part of a 'regulatory approach' to the topic by an earlier working group meeting in Berlin, in May 2003. All indicators for the topic of chemical emergencies were based on EU Seveso II Directive. Most countries scored the availability, quality, comparability, and policy-relevance as 'fair' to 'good.' It was agreed that all indicators be recommended to the ECHI. It was also noted that this was a minimum set and needed further development more focused on health aspects.

Radiation

Two indicators on radiation had been pilot tested according to the decision of the last meeting. The international summary of the piloting phase was presented by Rokho Kim (WHO), followed by discussions and agreements among the participants.

Table 7. Radiation indicators studied and reviewed at the meeting

Indicator Code	**Title**	**Final decision:** ***Recommended for***
Rad_E1	Incidence of malignant melanoma	ECHI
Rad_A1	Effective environmental monitoring of radioactivity	ECHI

Incidence of malignant melanoma (Rad_E1) was an effect indicator of ionising radiation. Malignant melanoma incidence was easily available with good quality and comparability through WHO/IARC. However, the incidence of other skin cancers was not reported regularly in many cancer registries. Therefore, it was recommended that the definition of Rad_E1 be changed to exclude 'other skin cancers.' With this modification, Rad_E1 was recommended to the ECHI.

Effective environmental monitoring of radioactivity (Rad_A1) is based on Euratom Treaty. Most countries reported a good score for this indicator on all criteria. Without modification, Rad_E1 was recommended to the ECHI.

Follow-up Actions

The meeting agreed on the follow-up actions to allow the completion of the ECOEHIS project by 30 September 2004. Participants also discussed the use of its results in the future programmes of WHO and EC.

Methodology sheets would be updated according to the meeting decisions and will be enclosed in the final project report. The 'how-to' guides to access international databases necessary for application of the indicators on international level would be developed in future projects.

The indicators recommended by the ECOEHIS project for inclusion to the ECHI short list are expected to be considered by the EC DG SANCO Health & Environment Working Party and the meeting of the Network of Competent Authorities before their inclusion to the ECHI Core List. However, independently of the final decisions in the EC process, the recommended indicators would be used by the follow up WHO projects, such as ENHIS, that would be implemented to establish the indicators and reporting system. These actions were considered to be a follow-up of the decisions of the Fourth Ministerial Conference on Environment and Health held in Budapest, June 2004, which requested WHO, EEA, and EC to further develop and manage the environment and health indicators, related data sets and the shared information infrastructure, and to report a progress in this process at an intergovernmental meeting by the end of 2007.

Annex 1

LIST OF PARTICIPANTS

WHO Temporary Advisors
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Annex 2

FINAL CLASSIFICATION OF RECOMMENDED INDICATORS

Table 1. Indicators recommended for ECHI

Indicator Code	**Title**	**Data availability**	**Comments**
Air_D1 (=Traf_D1)	Passenger transport demand by mode of transport	Readily available in Eurostat	Adjusted to Eurostat
Air_D2	Freight transport demand by mode of transport	Readily available in Eurostat	Adjusted to Eurostat
Air_D3	Road transport fuel consumption	Readily available in Eurostat	Adjusted to Eurostat
Air_P1	Emissions of air pollutants	UNECE/EMEP data	Sectoral breakdown according to SNAP
Air_Ex1	Exposure to air pollutants • Population-weighted annual average concentration of PM_{10}, $PM_{2.5}$, O_3 • Exceedance of air quality limit values for NO_2, SO_2	Concentration data in Airbase, population data in Urban Audit or GISCO database, and exceedance data as provided by ETC/AC	Five sub-indicators: –Air_Ex1_PM_{10}, –Air_Ex1_$PM_{2.5}$, –Air_Ex1_O_3, –Air_Ex1_NO_2, –Air_Ex1_SO_2.
Air_A1	Policies to reduce environmental tobacco smoke exposure	Each country to assess the composite score and voluntary report on the components	Needs to improve comparability through standardized surveys
Noise_Ex1	Population exposed to various noise level ranges per source	Mandatory reporting by 2007 according to EU Directive	Gradual reporting until EU Directive is fully implemented in 2007
Noise_A1	Policies to reduce exposure to leisure sounds	Countries will provide the data voluntarily.	Available when EU Directive is fully implemented
Hous_P1	Affordability	National statistics, EU ECHP/SILC	WHO adjustment to Eurostat data
Hous_Ex1	Crowding	National statistics EU ECHP/SILC	Using the Eurostat indicator
Hous_Ex3	Dampness/Mould growth	National statistics EU ECHP/SILC	WHO confirmed availability in SILC

Indicator Code	Title	Data availability	Comments
Hous_Ex4	Household hygiene	National statistics EU ECHP/SILC	WHO adjusted to Eurostat data as the minimum set
Hous_Ex6	Crime/Perception of crime	National crime records ICVS	WHO updated definition to reflect the new wave of the ICVS
Hous_E1	Mortality associated with extreme temperature	National mortality statistics Climate data archives	WHO Revised definitions and limitation to mortality data
Traf_D1 (=Air_D1)	Passenger transport demand by mode of transport	Available in Eurostat	Could be considered an exposure indicator in the traffic accident context
Traf_S1	Age of vehicle fleet	Available in Eurostat	
Traf_S2	Road accident rate	Available in Eurostat	The CARE (Community Road Accident database) reports detailed data at European and National levels
Traf_E1	Mortality due to road traffic accidents	Available in Eurostat	The CARE reports detailed data at European and National levels
Traf_E3	Injury rate due to road traffic accidents	Available in Eurostat	The CARE reports detailed data at European and National levels
WatSan_P1	Wastewater treatment	Available in Eurostat	Methodology sheet to be updated to the existing Eurostat indicator on urban population connected to wastewater treatment
WatSan_S1	Recreational water quality	Available in DG Env, EEA waterbase	Refinement of methodology: indicator 'as is' in DG Env reporting
WatSan_S2	Drinking-water quality	Available in EU Drinking-Water Directive from 2005	

Indicator Code	Title	Data availability	Comments
WatSan_Ex1	Safe drinking-waters	Available in Eurostat	Methodology in accordance with the existing Eurostat indicator 'Population connected to public water supply'
Chem_P1	Industrial facilities under Seveso II Directive	Available in Seveso Plant information retrieval system (SPIRS)	Based on Seveso II Directive
Chem_A1	Regulatory requirements for land-use planning	Countries score using methodology sheet	Based on Seveso II Directive
Chem_A2	Chemical incidents register	Available in Major Accident Reporting System (MARS)	Based on Seveso II Directive
Chem_A3	Government preparedness	Countries score using methodology sheet	Based on Seveso II Directive
Rad_E1	Incidence of malignant melanoma	WHO/IARC	Adjustment: limit to ICD 10 code C43
Rad_A1	Effective environmental monitoring of radioactivity	Countries score using methodology sheet	Euratom treaty

Table 2. Indicators recommended for WHO use (i.e. ENHIS)

Indicator Code	**Title**	**Comments**
Air_E1	Years of Expected Life Lost due to PM exposure	Calculated from Air_Ex1.
Noise_E1	Cardiovascular morbidity and mortality attributable to noise	Calculated from Noise_Ex1. Methodology to be developed for countries
Hous_Ex5	Indoor radon in dwellings	National surveys To be revised and split into two sections (exposure and action) to choose one
Hous_E2	Housing safety and accidents	EU Injury Database National survey data To be revised and amended by age-specific data computations
Traf_E2	Potential Years of Life Lost due to road traffic accidents	Calculated from Traf_E1
WatSan_A1	Management of bathing waters	Methodology adapted to the reporting obligations under the recently accepted revision of the EU Bathing water Directive

Table 3. Indicators recommended for further elaboration

Indicator Code	Title	Comments
Noise_E2	Annoyance and sleep disturbance due to noise	To be proposed to Eurostat Health Interview Survey
Hous_Ex2	Accessibility	National survey data/health
Traf_S3	Speed limit exceedances	Pilot voluntary reporting Propose to Eurostat survey
Traf_Ex1	Person time spent on the road	Pilot voluntary reporting Eurostat reports this indicator collected within the Time Use Surveys
Traf_Ex2	Use of vehicle safety device	Pilot voluntary reporting Propose to Eurostat survey
Traf_E4	DALY lost due to road traffic accidents	Calculated from E3. Further development of the method before putting on ENHIS
Traf_E5	Mortality due to drinking driving	Check EUROCARE, if not available, propose to Eurostat survey
WatSan_E1	Outbreak of waterborne diseases	Future, desirable but not available. Needs considerable development beyond the project scope
WatSan_A2	Water safety plans	Important and useful in the future: methodology to be proposed upon finalization of the WHO DWQ Guidelines third revision http://www.who.int/water_sanitation_health/dwq/guidelines3/en/

Annex 3

AN EXEMPLARY 'HOW–TO' GUIDE TO ACCESS DATA ON THE INTERNET

Example indicator: Hous_Ex6 (Crime and perception of crime)
According to the methodology sheet, this indicator of crime and perception of crime (Hous_Ex6) is defined as the incidence and perception of theft, robbery and vandalism in dwellings and public spaces. To compute this indicator, the following data elements are required.

Crime A – 1000 X number of thefts in dwellings/total number of dwellings B – 1000 X number of crimes against people in public space/total number of residents C – 1000 X number of crimes against private property in public space/total number of residents Fear of crime D – 100 X citizens reporting fear of crime in the immediate environment/total number of residents Prevention action E – 100 X number of dwellings with burglar alarms/total number of dwellings F– 100 X number of dwellings with special door locks/total number of dwellings

The current methodology sheet indicates International Crime Victim Survey (ICVS) as an international data source. The following example of 'how-to' guide will provide a step-by-step process of getting the data elements for the indicator. The how-to guide will be developed for all recommended indicators in the follow-up activities of ECOEHIS such as ENHIS project.

1. Visit http://www.unicri.it/icvs/index.htm.
2. Click on 'Publications' in the menu of left-hand side of the screen.
3. Click on Full text in PDF of in the yellow box at the centre of screen under the title of '2000 surveys'.

Van Kesteren, J.N., Mayhew, P. & Nieuwbeerta, P. (2000) 'Criminal Victimisation in Seventeen Industrialized Countries: Key-findings from the 2000 International Crime Victims Survey'. The Hague, Ministry of Justice, WODC. full text in PDF

4. Click 'Additional tables' under the heading of 'Appendices' near the bottom of the light blue window. This will lead to a pdf file on the right lower corner of the screen. The path and name of the pdf file is 'http://www.minjust.nl:8080/b_organ/wodc/publications/17-icvs-app4.pdf'.
5. Save the pdf file into your local drive by clicking on the diskette shaped icon of Adobe program.
6. Open the pdf file from your local drive.
7. Go to Table 2 and find the data on 'Crime' for the computation of the indicator elements A, B and C.

A) "number of thefts in dwelling" includes:

- burglary
- attempted burglary

B) "Number of crimes against people in public space" includes:

- robbery
- personal theft
- sexual incident
- assault & threats

C) "Number of crimes against private property in public space" includes:

- car theft
- theft from car
- car vandalism (taken out in 2004 survey)
- motorcycle theft
- bicycle theft

8. Go to Table 24 and find the data on "Feeling of safety when walking alone after dark in the area" for the indicator element D. Add the figures for "bit unsafe" and "very unsafe".

9. Go to Table 26 and find the data on 'Burglar alarms' and 'Special door locks' for the indicator elements E and F.