The ECHI project
Health indicators for the European Community

PIETER G.N. KRAMERS *

Background: Within the EU Health Monitoring Programme (HMP), the ECHI project has proposed a comprehensive list of ‘European Community Health Indicators’. Methods: In the design of the indicator set, a set of explicit criteria was applied. These included: i) be comprehensive and coherent, i.e. cover all domains of the public health field; ii) take account of earlier work, especially that by WHO-Europe, OECD and Eurostat; and iii) cover the priority areas that Member States and Community health policies currently pursue. Flexibility is an important characteristic of the present proposal. In ECHI, this has been emphasized by the definition of ‘user-windows’. These are subsets from the overall indicator list, each of which should reflect a specific user’s requirement or interest. Results: The proposed indicators are, in most cases, defined as generic indicators, i.e. their actual operational definitions have not yet been attempted. This work has been, and is being carried out to a large part by other projects financed under the HMP, which cover specific areas of public health or areas of data collection. Apart from indicators covered by regularly available data, indicators (or issues) have been proposed for which data are currently difficult to collect but which from a policy point of view would be needed. Conclusion: All this points to the fact that establishing an indicator list which is actually used by Member States is a continuously developing process. This process is now continued by the first strand of the new EU Public Health Action Programme.

Keywords: EU, health determinants, health policy, health status, health systems, indicators, public health

WHY EC HEALTH INDICATORS!

The ECHI project within the European Commission’s Health Monitoring Programme (HMP)

This paper presents the results of the project ‘Integrated approach to establishing European Community Health Indicators’ (ECHI). Its objective was formulated as: ‘To propose a coherent set of European Community Health Indicators, meant to serve the purposes formulated for the HMP, selected on the basis of explicit criteria, and supported by all Member States’.

The project has defined its approach to this objective as: i) to define the areas of data and indicators to be included, following a set of explicit criteria; ii) to define generic indicators in these areas, again following these criteria; and iii), as a novel element, to imply a high degree of flexibility in the indicator set, by defining subsets of indicators, or ‘user-windows’, tuned to specific users. Examples of such users are strategic planners, people involved in local health promotion actions, etc.

As to the use of the indicator list, the following was envisaged:
- to provide the frame for comparable data collection in the public health area, in all EU Member States,
- thus to consider indicators as the meeting point between information needs on the one hand, and data collection on the other,
- to identify data gaps and thereby help to indicate priorities for data collection and harmonisation, also as guidance for other projects under the HMP,
- to provide a guiding structure for the production of public health reports at (inter)national or regional levels,
- to provide the logical framework for the development of electronic information systems and databases,
- to serve as a guiding framework for follow-up, especially in the frame of the European Commission’s new Public Health Action Programme.

The first phase of the project was concluded by a report dated 15 February 2001. A second phase of ECHI is currently under way. This paper largely refers to the results of the first phase.

METHODS

Which health indicators? Prerequisites, criteria, backgrounds

Three general objectives of a European health indicator set were defined by the HMP, i.e. monitor trends throughout the EU, evaluate EU policies, and enable international comparisons. This calls for the explicit definition of a set
of criteria. Thus, the indicator set should:

- be comprehensive, i.e. the multi-purpose nature of the monitoring objectives require the coverage of all domains which are normally included in the public health field; in addition, the indicator set should be coherent, in the sense of conceptual consistency,
- take account of earlier work in the area of indicator selection and definition, especially that by WHO-Europe, OECD and the Commission Services in Eurostat; thus avoiding duplication of effort and promoting cooperation between international organizations,
- cover the areas in the public health field which Member States want to pursue (MS policy priorities; also regions within MS may have their own health policies); in addition, it should meet the needs of Community policies (Community policy priorities).

In terms of the selection of indicators at the detailed level, the following prerequisites are formulated in addition:

- the actual selection and definition of indicators within a specific public health area should be guided by scientific principles,
- indicators (and underlying data) should meet a number of methodological and quality criteria concerning e.g. validity, timeliness, sensitivity and comparability etc.,
- the probability of changing policy interests calls for a high degree of flexibility, made possible by current electronic database systems,
- selection of indicators should be based, to start with, on existing and comparable data sets for which regular monitoring is feasible, but should also indicate data needs and development areas.

**Comprehensiveness and conceptual consistency**

Health is a broad issue and the eventual health indicator set should constitute a balanced collection, covering all major areas within the field of public health. Based on the HMP’s Annex 2 and many other sources and considerations, four main categories of indicators were proposed as below:

1. Demographic and socio-economic factors,
2. Health status,
3. Determinants of health,
4. Health systems.

The further division is given below under ‘the proposed list of EC health indicators’.

**Taking account of earlier work**

As a precursor of the HMP, a study was carried out by the ‘Working Party on Community Health Data and Indicators’, chaired by the Danish Ministry of Health. In this study, an inventory was made of data available at WHO-Europe, the Commission and the OECD. This effort was followed up by WHO-Europe (with Commission support) in ‘ICHI’: International Compendium of Health Indicators. In addition, the current updating of WHO’s HFA 21 indicators, the 2000 version of OECD health indicators and the developments in the Commission’s data collection at Eurostat have been closely taken into account.

**Coverage of Member States’ health policy priorities**

Increasingly, EU Member States, or regions within MS, have formulated priority areas or targets for their health policies. From these sources, a short list of items appears to occur very frequently:

- increase the number of healthy years lived, by tackling the main causes of death, ill-health and functional limitations (including physical and mental health aspects),
- reduce health inequalities, by means of health policies but also by social policies,
- improve effective health promotion and disease prevention especially aiming at lifestyle and at young people,
- improve the quality and accessibility of care, including community care,
- improve the quality of life and participation of the elderly.

**Meeting the needs of Community Policies**

In the first EU ‘Framework for action in the field of Public Health’ eight action programmes were proposed (AIDS and other communicable diseases, cancer, drug dependence, pollution-related diseases, injuries, rare diseases, the Health Promotion Programme and the Health Monitoring Programme). In 2002, the new Programme of Community Action in the Field of Public Health has been adopted. Basically, three ‘strands’ of action have been addressed:

- improving health information and knowledge,
- responding rapidly to health threats,
- addressing health determinants.

The work plan of the new Action programme has been set up to accommodate the continuation of relevant activities under the former eight programmes.

Another valuable source has been the publication ‘Priorities for public health action in the European Union’, which states the following Community priorities: Social gradients, alcohol, illicit drugs, tobacco, health surveillance, quality of health care, mental health, environment and food/nutrition.

**Scientific principles and quality aspects**

In working out the indicator selection, quantitative principles such as the size of a health problem, its total costs, or the degree of preventability of the problem have served as criteria. This particularly applies to the selection of cause-specific mortality, of disease-specific morbidity, and to the selection of indicators in the area of health determinants.

It is evident that in the actual operational definitions of the indicators, certain quality criteria should be met. In the Danish Ministry of Health Study, nine such criteria were formulated. In short, an indicator should measure what we think it measures (validity), be sensitive to changes over time or by place, and be comparable between countries or regions, to mention the three most important aspects.
**Flexibility and the continuous improvement of indicators and data collection**

Basically, flexibility means that a system of data and indicators should never be fixed, and is never final. Policy interests change, scientific views and electronic tools evolve, with associated shifts in data collection activities. Many indicators currently in use reflect the availability of more or less comparable data sources. In some areas, however, data are not readily available in many Member States, even though the need for fully comparable information is strongly felt. These areas deserve extra efforts in R&D. They include, among others:

- disease-specific morbidity at population level,
- integrated measurement of generic health status (functional limitations, health-related quality of life, composite health measures),
- health inequalities,
- determinants of mental health, social determinants of health,
- increasing comparability of health care data (cf. ref. 11),
- indicators of the performance of health (care) systems.

**Working procedures in the ECHI project**

In the project team, experts participated from all EU Member States, Norway and Hungary. Participants came from national public health institutes or the like (Belgium, Finland, Germany, Greece, Hungary, Italy, the Netherlands, Norway, Portugal, Sweden), from health ministries (Denmark, France, Ireland, Luxembourg, UK), statistical agencies (Austria) or research institutes (Spain). The international organizations WHO-Europe and OECD were represented from their current databases. The Commission was represented by experts from DG Sanco and Eurostat.

The team has met five times between February 1999 and October 2000. Draft texts were prepared by the project co-ordinator and were subject of substantial amendment and detailed discussion during these meetings. Also between meetings, there was much bilateral communication. In the early stages the discussion was focused on the basic frame of the indicator list, the criteria and the concept of user-windows. During the second year, it shifted towards the selection and definition of the indicators. Many indicator proposals were taken from existing lists of WHO-Euro and OECD, when there seemed no reason to deviate from these. The Member State policy profiles were used to also include new proposals for which no regular data collection is still available. In a final stage, the list was integrally checked with Eurostat to ensure a sufficiently realistic approach. During the second half of the project period and thereafter, the ECHI results were discussed intensely in the HMP project co-ordinators meetings, and they increasingly served as a frame of reference for work in other projects. The final results were presented in the Eurostat meeting on public health statistics, and were taken up as a preliminary guideline for further developments in European health statistics.

**RESULTS**

**The proposed list of EC health indicators**

In table 1, the list of proposed indicators is given in a condensed form. It shows the categories and the issues for which indicators have been proposed. In the report itself mostly generic names of the indicators are given. The report also gives suggestions on age/gender/SES/etc. stratification, remarks on similarities with existing indicators, on possible data sources, and on the HMP projects from which recommendations are derived.\(^1\)

**Flexible approach to indicators: user-windows**

Clearly, the criteria mentioned have resulted in a quite extended indicator list. Yet, it is limited for each of the areas covered. It is anticipated that the system will be used by many different users, for many different purposes. This may require specific subsets from the total array of indicators. These subsets are named ‘user-windows’. Technically, a modern database system should allow this sort of use. Specific user perspectives could be: i) areas of health policy interest; ii) thematic entries such as age groups, iii) disease groups with their determinants and costs, etc. Examples are:

- cockpit information; to have a quick view on the major trends in public health, including recent relevant signals, for medium or long-term policy strategies,
- EU priority list; to follow developments for specific EU policy areas or targets, programmes or projects; this user-window can be shaped as a guide or tool for EU action; the same can be envisaged for Member States’ priorities,
- the WHO/HFA21 indicator set; to follow this list of indicators for the countries of the EU,\(^4\)
- health and services for mother and child; to focus on reproductive health, health of children and family structure. The user-window concept is a more flexible approach of the original idea of ‘core indicators’. Yet, policy development as well as focusing R&D activities need the formulation of priorities. We may in fact move in two divergent directions simultaneously:

1. Choose a user-window named ‘EU-priority list’ as a set of ‘core indicators’, to focus on a limited set of issues thought the most important in EU public health policy and therefore as a priority focus for work on data harmonisation.

2. At the other extreme, consider the entire ‘multipurpose’ indicator set or whatever user-window not as a fixed entity as such, but mainly as a reflection of what is possible on the basis of existing or future databases. This implies that we are also defining comparability of data sources besides that of indicators.

**FOLLOW-UP IN ECHI-2, AND THE NEW EU PUBLIC HEALTH PROGRAMME**

For the second phase of ECHI, started October 2001, five main areas of work were formulated, as outlined in the sections below.

**Upgrading the indicator list**

The ambitions of the second phase include i) to have more operationalizations of indicators and ii) an assess-
ment of (preferred) data sources for the indicators, all of which to be derived from relevant HMP projects and other sources. Over the years, the coherence and communication between HMP projects serving adjacent or overlapping areas have improved a lot. This implies that many more results and new proposals for indicators and data sources have been presented, e.g. in the following areas:

**Table 1** List of indicators proposed by the ECHI project

**Class 1: Demography and socio-economic situation**
These indicators provide a general picture of the situation in a country or region, and a frame of reference for many of the other health indicators. Moreover, the population data provide the denominator for calculating many other indicators.

1. **Population**
   - Population composition and change; births, deaths, migration, regional distribution, projections

2. **Socio-economic factors**
   - Education, employment, occupations, ethnic origins, household situation, income distribution, gross economic indicators

**Class 2: Health status**
This section contains indicators on various aspects of the actual health situation of the population. Disease groups have been selected because of their substantial share in the total burden of ill-health or because of their reference to known risk factors or to identified activities in prevention and health care (e.g. avoidable mortality). In this context we have not used the term ‘Health outcomes’. We prefer to reserve this term for situations where a clear link can be made to an intervention.

1. **Mortality**
   1.1 Life expectancy & related indicators
   1.2 General mortality
   - Crude, standardized death rates; perinatal and child mortality; inequality in deaths
   1.3 Cause-specific mortality
   - Crude, standardized death rates, years of life lost, for a) the ‘main causes of death’, in terms of size, using the European shortlist of 65 causes; and b) a limited set of causes of death selected as relevant for certain risk factors or issues of prevention or health care

2. **Morbidity, disease-specific**
   - Incidence/prevalence of selected diseases/conditions; analogous to ‘mortality’, proposed are a) diseases that are responsible for a large share of the burden of ill health (large impact) in the population (based on Burden of Disease studies and WHO HFA list; base list of 28 disease/disorder groups), and b) a limited set of diseases selected as relevant for certain risk factors or issues of prevention and health care (five items proposed). Disease definitions should coincide with the causes of death, were applicable.

3. **Generic health status**
   - Perceived health; chronic conditions general; functional limitations; activity restrictions; general mental health; general quality of life; absenteeism from work; inequality measure

4. **Composite measures of health status**
   - Disability free life expectancy; other health expectancies

**Class 3: Determinants of health**
This group contains all factors determining health, outside the health care system. It includes i) the ‘personal and biological factors’; ii) health behaviours (lifestyle factors) and iii) living and working conditions, more to be viewed as the wider environment. For all these categories of determinants, selection criteria have been: their importance in determining a substantial share of (ill-)health; the degree to which they can be influenced, and the cost-effectiveness of the interventions involved.

1. **Personal and biological factors**
   1.1 Biological (risk) factors
   - Body mass index; birth weight; blood pressure; serum cholesterol; nutritional status indicators
   1.2 Personal conditions
   - Coping ability; sense of mastery; other mental conditions

2. **Health behaviours**
   2.1 Substance use
   - Smoking; alcohol use; (il)licit drug use
   2.2 Nutrition
   - Energy from food components; consumption of specific food items; breastfeeding; contaminants
   2.3 Other health-related behaviours
   - Physical activity; sexual behaviour; induced abortions; traffic behaviour; other?

3. **Living and working conditions**
   3.1 Outdoor environment
   - Physical/mental workplace exposures; work accidents; occupational diseases
   3.2 Working conditions
   - Social & cultural environment
   - Social support/isolation/networks; life events/violence

To be continued
There is increasing interest in what is called ‘health system performance assessment’ (HSPA), and international benchmarking of health systems.\textsuperscript{12,13} Also in more general terms, it appears that in spite of the subsidiarity principle there is a slow but steady move of the Commission’s activities towards health care, prompted by issues like medical personnel exchange, cross-border care, links with social policies and issues of compliance of national health care systems with EU market regulations. All this will require an innovating approach, especially in the indicators concerning health systems.

Table 1 continued List of indicators proposed by the ECHI project

<table>
<thead>
<tr>
<th>Class 4: Health systems</th>
</tr>
</thead>
</table>

This group includes indicators on the health services system, as well as on prevention and health promotion. In some areas indicator definition is tentative only.

4.1 Prevention, health protection and health promotion

4.1.1 Disease prevention
- Vaccination coverage; cancer screening; screening for blood pressure/cholesterol; prenatal/neonatal screening; general preventive examination; integrated children’s health monitoring

4.1.2 Health promotion
- Campaigns on health behaviours; mental health promotion

4.1.3 Health protection
- Regulations on public smoking; measures on advertising/prices of tobacco/alcohol; regulations on alcohol and driving, seat belts, cycle helmets; regulations on food safety and quality, on air/water quality

4.2 Health care resources

4.2.1 Facilities
- Hospital beds in various settings/functions

4.2.2 Manpower
- Various medical staff employed; staff ratios

4.2.3 Education
- Numbers of various medical staff graduated

4.2.4 Technology
- Number of units of specified equipment

4.3 Health care utilization

4.3.1 In-patient care utilization
- Beddays; occupancy rates; average length of stay; discharges, by disease group

4.3.2 Out-patient care utilization
- Out-patient contacts

4.3.3 Surgical operations
- Numbers of selected operations

4.3.4 Medicine use/medical aids
- Medicine use; total and by some 10 specific important groups

4.4 Health expenditures/financing

4.4.1 Health care system
- Key indicators for the structure/financing of the national health care system; insurance coverage; distribution of household expenditures on health

4.4.2 National expenditure on health
- Expenditures by categories of the System of Health Accounts\textsuperscript{10}

4.4.3 Expenditure on medical services
- Expenditures by categories of the System of Health Accounts\textsuperscript{10}

4.4.4 Medical goods dispensed to out-patients
- Expenditures by categories of the System of Health Accounts\textsuperscript{10}

4.4.5 Total health expenditure by age group

4.4.6 Health expenditure by fund source

4.5 Health care quality/performance

4.5.1 Subjective indicators
- Perception of the health system; complaints

4.5.2 Health care process indicators
- Autopsy rate; waiting lists/times; surgeries/interventions considered inappropriate; variations in specific surgeries/interventions; quality of blood products

4.5.3 Health outcomes
- Avoidable deaths; iatrogenic disease/death; 30-days in-hospital mortality; 28-day readmission rate; surgical wound infection; incidence of end-stage renal failure; antibiotic resistance; cancer survival rates
Revising the links with EU and MS policy priorities
The relevance of this work is to stay up-to-date in terms of the needs side of information production. A very preliminary view revealed some issues not yet expressed so clearly in earlier documents, such as the monitoring of health promotion activities, and involvement of citizens/patients in health care delivery.

Implementing the user-window concept
The above work will tend to expand the indicator list. With this expansion, the issue is more often raised of proposing a restricted 'core' list aimed at the quick overview glance of the policy-maker. Along this line, a few user-windows will be selected, based on a few rigid policy-oriented criteria. This process is being undertaken with the close co-operation of the HMP project co-ordinators and Eurostat services.

Updated inventory of indicator definitions (ICHI-2)
In 1999, the 'International Compendium of Health Indicators' (ICHI) was produced by WHO-Euro and the Commission. Within ECHI-2, work has been started to prepare an updated version of this (ICHI-2). The goal is to create a readily accessible (and updateable) database of all current indicator definitions in the public health field, as used by the international organizations WHO-Euro, OECD and Eurostat. In this way, it would be much more easy for national authorities to directly compare indicator definitions and their backgrounds, and to find out formats for sending data to the international organizations.

ECHI and the new EU Public Health Programme
In the information strand of the EU Public Health Programme 2003–2007, the further development and implementation of indicators is an explicit issue. Timewise, the ECHI project is among various projects under the old HMP which extend into the new Public Health Programme. In this way, there is time for a careful handover of the accomplishments of the HMP project series to the working structures under the new programme. It should be remembered again, that even an upgraded indicator list will not be definitive, but will need continuous and stepwise improvement. At the same time, it may become a desire of the Commission to give some features of the list a legal/formal status. Here, the balance between flexibility and the possibilities to reinforce comparable data collection should be carefully chosen.

For the coming period, it is envisaged that the projects under the HMP and initiatives under the new Programme will work together not only on the operationalization and harmonization of selected indicators, but also on the definition of comparable data sources and data collection methods. All this work should be co-ordinated closely with the Commission’s Services at Sanco and Eurostat, with WHO/Euro and OECD.

For the longer term, the maintenance of a system of indicators and data on health requires an infrastructure which has sufficient expertise and continuity. In the new Public Health Programme this has been named 'structural arrangements', a concept which is currently being worked out. Whatever the solution will be, it is obvious that, in order to create and maintain an EU health information system, there is no alternative to a sustainable and committed expert core providing adequate critical mass.

The ECHI team acknowledges the funding by the EU Health Monitoring Programme, and especially the supporting role of Dr Henriette Chamouillet from the side of the Commission, DG Sanco.

The results of the ECHI project are based on many discussions within the ECHI project group, with the HMP project co-ordinators, and with many others. They primarily reflect the opinion of the ECHI project group.

Since the present status is not the final stage in indicator establishment, readers are invited to send their comments to the first author.

REFERENCES

3 Commission, Employment and Social Affairs, 1999.
4 Ministry of Health, Denmark. Annex A: Assessment of available health data in the EC; Annex B: Description of indicators; Annex C: Health resources and price statistics.