European Union Community Health Monitoring Programme

Child Health Indicators of Life and Development

(CHILD)

Report to the European Commission

September 2002

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1. Introduction

The Child Health Indicators of Life and Development (CHILD) Project is a third-wave project in the European Union Community Health Monitoring Programme. It is the first project to cover a particular population group, namely children. It has provided an important opportunity whose significance is seen to unfold as other partner projects within the Health Monitoring Programme (HMP) have concluded their initial work, and realised that the health and information needs of children are different.

We follow precedent and use the term "child health" when looking at the needs of persons up to adulthood, and thus this encompasses the alternative of "child and adolescent health". Indeed, infants, young children, older children, and adolescents are very distinct sub-groups, with different dependencies and health determinants, requiring different services, and needing different measures of health. Throughout, therefore, our reference to "child health" should be read as fully inclusive unless specified otherwise, and we give equal weight and recognition to each of thee four sub-groups.

There are some 70 million children aged under 18 years in the Member States of the European Union, and almost another million more in the three European Economic Area countries. It is a serious responsibility to seek to have a beneficial impact on their health and development, primarily by identifying current weak areas and deficiencies, yet that is the task we have addressed. Even a marginal improvement will have tremendous positive yield in term of human benefit.

We recognise that our recommendations will require investment by Member States, and by health providers and others, in developing new data gathering mechanisms and surveys. We have picked our proposed new indicators carefully, to seek to have maximum impact in areas from policy development to service delivery, from environment to societal support, whilst minimising the need for extra data collection resources. We believe this is an important opportunity, within the framework of the Health Monitoring Programme, to benefit Europe's children. We hope that policy makers agree that this is too important an opportunity, and responsibility, to merely read and put to one side.

2. The CHILD Project

2.1. Context and Terms of Reference

Being a third wave project of the Health Monitoring Programme (HMP), the CHILD Project came into existence in a developing context. Previous or contemporaneous projects including framework projects, of which the most relevant was the European Community Health Indicator (EHCI) project, which set a broad framework for a complete set of indicators. Other projects fall broadly into two categories – those looking at health topics or disease groups ranging from

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nutrition to cardiovascular disease and cancer; and those looking at data sources and methodologies such as Health Surveys and Primary Care Sentinel Practices.

Most significant for the CHILD project was the simultaneous establishment of a project on maternal and perinatal health entitled PERISTAT. This project was set up to cover the period spanning from pregnancy through delivery to the end of the first week of life. Thus the formal terms of reference of the CHILD project were for the total period from the first week of life to age fifteen years (as being the end of the last quinquennial age band solely within childhood). We return to the issues of the age group later.

The Child project was established to run from the period 1ˢᵗ October 2000 to 30ᵗʰ September 2002. However, formal exchange of contracts did not occur until January 2001, giving an effective period of twenty months. As the first full meeting of the Project Team could not be fixed on a mutually convenient date until April 2001, in effect the project has been undertaken over eighteen months.

The project has been satisfactorily extensive in coverage. All fifteen EU member states had representation, as did two - Iceland and Norway - of the three European Economic Area States. These were the only two categories of country eligible to take part in this phase.

2.2.   Membership and Process

The membership of the full Project Team is given in Appendix 1. There was an overall high level of commitment and activity, giving a satisfying quality and richness to the results. Some countries' membership changed once the project had established its approach, when the active detail of the work became appreciated and more topic-specific alternate members were nominated.

The full Project Team met as planned on eight occasions and took responsibility for planning and undertaking the work. Individual members volunteered to undertake particular tasks, in line with the division of topics devised, and reported back to the main project. This has resulted in a high degree of corporate ownership of process and results throughout. A number of countries' delegates provided additional resource from their own local organisations, which significantly enriched the project.

The project also benefited from an Expert Review Group of four members, which met four times (one more than originally planned) to review the material from an informed outside view point, to ensure overall balance, strength and credibility and to give feedback on the presentation of findings as they emerged. The schedule of meetings was also designed to give good opportunity for interface and exchange with local approaches and expertise across Europe – the locations of meetings are given in Appendix 2.

3.   The CHILD Project Approach and Values

3.1.   The CHILD Project Philosophy

The CHILD Project was commissioned within the Health Monitoring Programme, which is an important and ambitious programme within the European Commission's Public Health

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Strategy. The opportunity and responsibility of promoting the interests of children within this programme are important.

At the same time, though, from its first meeting the CHILD project members looked not just to producing a recommended set of indicators, but to seeking to stimulate understanding of and commitment to their positive use by child health professionals and the child health community in each member state across Europe. Therefore the health professional readership was viewed as strategically important throughout the work. Project members felt that there would be comparatively little value in producing a report unless it led to pressure for adoption of the indicators at national level within a child health context: bottom-up pressure is needed to match the hoped for top-down policy.

The project therefore resolved from the outset to work to the philosophy that:

> **"The CHILD work should be in the centre of Child Health, not in the periphery of health monitoring."**

Whilst this approach has sprung naturally from the professional commitment of members to children and child health, we were also encouraged by other important congruent influences. Most important of these was the United Nations Declaration on the Rights of the Child, endorsed by virtually all countries in the international community, not least by its unequivocal commitment to the rights of health, safety, and equity regardless of circumstance and background. This commitment was supported by other initiatives, such as the experience of Children's Ombudsman post-holders acting as advocates to review policies and services to ensure they adequately addressed the needs of children.

Consequently, the project has sought to be **child-focused and child-centric** in all its work. This has determined the approach, the analyses and indicators recommended, and the presentation of material.

3.2.   Priorities within Child Health Indicators

Child health is a large topic, but existing precedent has led to the development of a number of well known indicators including infant mortality. Other topics such as child abuse, and unhealthy behaviour such as tobacco use, substance abuse, or excessive alcohol consumption, attract popular attention. It would have been comparatively easy to concentrate on such populist and "obvious" topics, though some of these are in fact difficult to measure meaningfully at the population level. However, it was felt that a traditional approach would not have the appropriate impact upon child health itself. Instead, the project resolved to take an approach which was potentially more difficult, yet should have much greater impact in terms of health gain, namely to address the determinants of child health. In essence, the philosophy of the project has been that:

Health Status Measures alone are not sufficient to describe the whole range of phenomena of health and development, not least as many address negative aspects such as mortality and morbidity, which measure damage already suffered by a generation of children. Positive aspects of health and well-being are also important to measure, and we have sought to achieve a balance.

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Health Process Measures have their own value, but where addressing therapeutic services many in essence focus on minimising damage to children whose health is already compromised. Measurement of positive process is also important, if challenging.

Measures of Determinants are most valuable, as they give a chance of reducing or protecting against risk and thus damage to health.

This view held by the project has helped shape the approach to the final selection of indicators.

3.3.　An Overview of Child Health Determinants

Children are born and grow up in a complex environment – physiological, familial, domestic, social, and physical.　All these elements can have positive, or negative, influences on health. Health services, and social welfare services, are among those charged with protecting health, and addressing specific population and individual problems.

The overall determinants of the child health and development context can be viewed as shown in Figure 1.　This is the domain which the CHILD Project sought to address, with a particular focus on responsibilities within the health sector, but with a strong inter-sectoral viewpoint as to other policy and service responsibilities too.
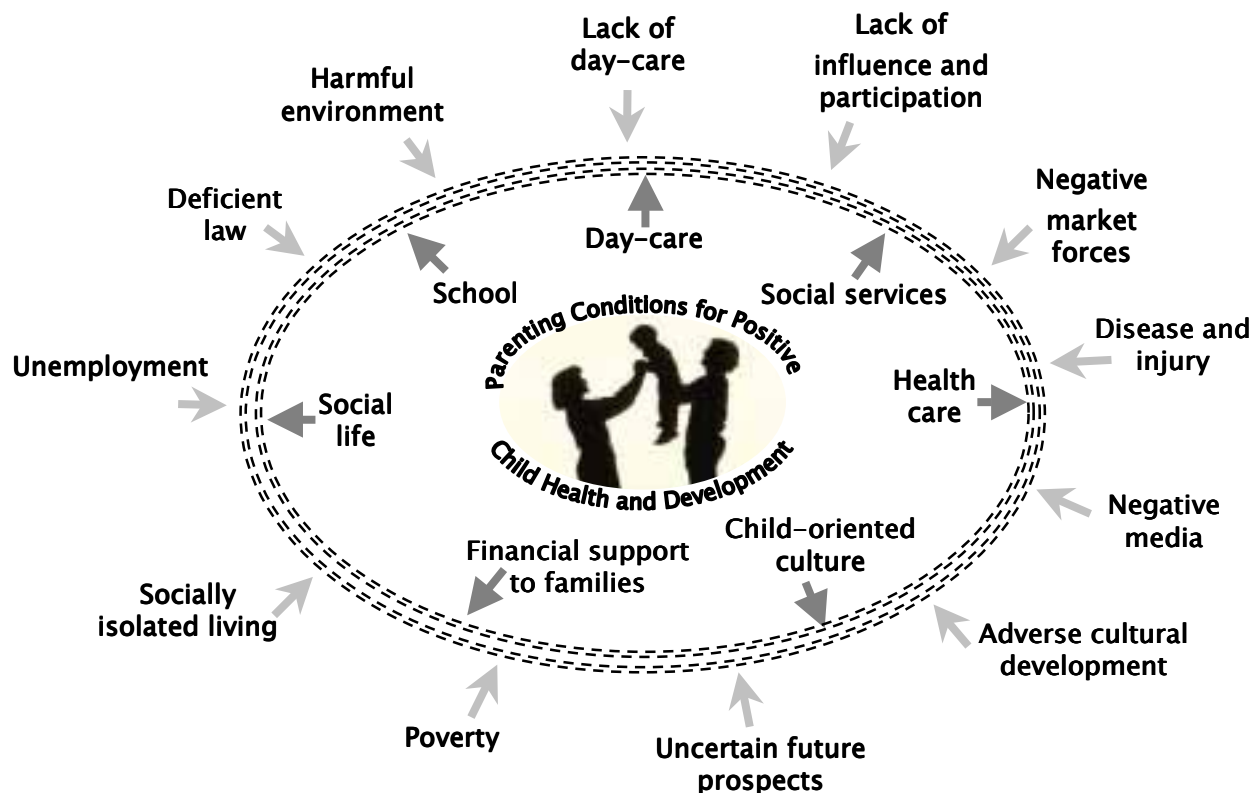
Adapted by Gunnlaugsson G and Rigby M from Skolhälsovården 1998. Underlag för egen kontroll och tillsyn. Stockholm: Socialstyrelsen, 1998.

Figure 1: Determinants of the Child Health and Development Context

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3.4   Risk and Child Health

Inherent in this understanding of child health determinants is the concept of risk. This itself is a complex area, with an inter-reaction of general and individual-specific risks creating personal patterns of health determination; a similar mix of inter-actions occurs at the population level. Environmental exposures, societal contexts, household setting, and behavioural lifestyles are just some of the principle elements of risk affecting child health. Whilst it was outside the scope of the project to calculate risk itself, the approach we have taken to indicators has included the importance of taking a barometric reading approach to key risk aspects.

3.5.   The Burdens of Child Ill-health

The project philosophy was also underscored by recognition of the multiplier effect of the burden of ill health in children, when compared with that upon adults. It can have not only a much longer life-time effect given the greater lifespan ahead for a child, but will also have an extended impact upon parents, families, and society. In essence, ill health in children, particularly when it is medium to long term or produces impairment and disabling effects, has the following potential generation of burden:-

- Burden of discomfort and pain on the child
- Burden of anxiety, distress, and possibly loss of earnings for the parent(s) looking after the sick child
- Burden on society funding the health services, and on occasion special education and social services support
- Burden in more severe cases on the social welfare system, potentially for a lifetime.
- Burden caused by medium or long term illness causing loss of normal play and socialisation, thus impeding normal development with potential life long effects
- Burden caused by lost education which may jeopardise career and thus income potential for a lifetime
- Burden on future generations, as the child with an extended ill health burden becomes a parent with restrictions on their parenting skills, and becomes an older family member dependent on their successor generation.

In essence, the responsibility of child health services is an exponential one – not just to maintain and protect the health of the child for the immediate benefit of health in childhood, but with recognition that failure in this respect can have life-long health, lifestyle, social and economic impacts. Whilst Disability Adjusted Life Years (DALYs) have been postulated as a means of calculating ongoing burden of illness or accident, they are not adequate alone in the child health context.

3.6.   Child Integrity and the Right to Childhood

At the same time, the project has adopted the position that the child is an individual and a citizen in their own right, and that childhood should be healthy, constructive, and enjoyable. There are some approaches which appear to see childhood merely as a training period for

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adulthood or as an apprenticeship for a maximised economic or social contribution to society later. The CHILD Project rejects this concept of childhood as a lesser period to be passed through on the way to more important adulthood.

The child is a person, a citizen, and an individual in his or her own right, of equal value to any other individual. The difference is that children may not be able to express themselves or represent their own interests at the time when they are vulnerable to the actions or inactions of others, or to the effects of adverse social or physical environment. The United Nations Declaration and Convention on the Rights of the Child are important internationally endorsed statements, the values and content of which have been sources of encouragement for the project.

Thus the concept of Child Health indicators has an enhanced value and importance as representing the needs of a sector of the population not able to express their own interests and concerns.

3.7. A Focus on the Most Vulnerable

We recognise fully that most children are fortunate enough to lead a healthy life, and to live in families where there is natural concern to maximise health and to address any apparent signs of health or developmental problems. It is the children who do not have the advantage of this caring environment who are most vulnerable.

Therefore, we have sought to develop an innovative set of indicators, which give greatest focus to those children most at risk of compromised health, care, and development by virtue of their grouping in society or the illnesses from which they are at risk.

3.8. … and on the Protection of the Interests of All

At the same time, new challenges to health, or changes to health determinants, can occur and not be noticed other than at the individual level, and thus the overall patterns of change of determinants may pass undetected and unaddressed. The CHILD project has therefore also been aware of the importance of a broad framework of ongoing surveillance, to monitor changes over time or affecting the overall population structure, in the interests of ensuring the health of the whole child population.

3.9 The Child Health Domain

The totality of child health, its determinants and related services, is clearly extremely large. Moreover, there are significant differences between infancy and adolescence in terms of health and its determinants, types of service, and data sources. It was recognised also to be important to achieve a balance between description of broad health determinants, and measurement of some of the preventable childhood diseases and less common but generally serious illnesses in childhood. It was also important to ensure representation across the entire child age-range from infancy to adolescence.

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In order to seek a balanced overall coverage, at its first meeting the project membership considerd a paper identifying the principal topics within population-level child health and the approaches to be taken. As a result, the project identified the following topic areas, for each of which a lead investigator was identified from among the project members:

Demography
Socio-economic Status and Inequity
Social Cohesion/Capital
Migrants
Marginalised Children
Family Cohesion
Mental Health
Quality of Life
Well-being
Lifestyles
Health Promoting Policies
Nutrition and Physical Growth,
Development (including Intellectual and Social)
Mortality, Morbidity, Injuries
Environment
Access and Utilisation of Services

Each of these topics formed a focus for study, to identify key issues and their measurement. Subsequently, the ideas emerging from these groups were merged into a single integrated set of proposed indicators. This in turn was matched to the framework of the European Community Health Indicators (ECHI) umbrella project, which is intended to act as the vehicle for integrating the recommendations form all the individual Health Monitoring projects.

3.10   Health Impact

In identifying measures of child health and its determinants, the project recognised the importance of ensuring a sound spread across all aspects of child health, from upstream environmental and other determinants, to the actions and behaviour of the child in the family and immediate social group setting. All these impact health, and health services seek to provide positive education and prevention, and therapeutic care when needed. Policies – health policies and other social policies – are over-arching determinants. Thus health is subject to many pressures, intentional and incidental. Though indicators require numeric data for their creation, many aspects are more amenable to qualitative measurement.

Given the importance of the qualitative areas, but the necessity for quantitative measures, not least in the important area of policy impact, we have sought quantification of coverage and effect of focussed policy outcome measures. We recognise the need to develop further measures of qualitative areas, not least in behavioural and attitudinal areas which are important in child health, and for this reason we identify that further work is necessary before our task can be fully completed.

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4.   Technical Criteria for Child Population Health Indicators

4.1   Evidence and Confidence Framework

The project recognised that indicators must have the fundamental attributes of being scientific, robust and comparable. This presents a number of challenges.

The **scientific** evidence needs to be grounded in research which demonstrates a strong causal or correlation relationship between the topic and the health of children. Moreover, this must be measurable at the population level.

The **robustness** means that the aspect being measured and then used as an indicator must be strong in its effect, and resilient to extraneous changes in organisation, treatment, or other similar factors. In some areas of health there may be a number of multi-variant factors, in which circumstance a compiled composite indicator might be more robust, but the project did not have time to consider creation and validation of composite indicators, other than in the specific area of policy analysis.

The **comparability** requirement is challenging in a different way, given the variations of demography, culture, and health systems across Europe, and bearing in mind that the indicators are designed only to compare between countries. A number of indicators which are valued *within* countries, or between countries in a similar region such as Scandinavia or the Mediterranean states, could not be sustained as relevant measures across the whole of Europe.

4.2.   Essential Intrinsic Characteristics of Indicators

At its inaugural meeting, the project discussed and accepted a recommended set of technical criteria for indicators within child health. These became guidelines for the rest of the project. They are that indicators must be:

- **Valid** in a number of respects:
    - Face validity pertains to the indicator's ability to measure what it says it measures
    - Content validity means that an indicator takes into account the qualities that its definition implies
    - Construct validity means that the indicator demonstrates an expected empirical relationship with other related indicators
- **Consistent:**   having reliability in measurement, so that variation in value is true variation not random error.
- **Sensitive:** in order to register appropriate change
- **Feasible:** reliable source data must be available
- **Defined:** unambiguous in its data construct:
    - topic definition: e.g. immunisation status is different from immunological status
    - measure definition: e.g. weight – naked or in indoor clothes?
    - measurement definition: e.g. measure/tests/methods used, e.g. for height, colour-blindness
    - data capture definition: e.g. automated capture, routine manual recording, visual or pathological diagnosis, exception reporting.

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4.3.   The Target Child Health Age Group

As indicated earlier in Sections 1 and 2, the Terms of Reference of the CHILD project were set to cover the age group post-perinatal to fifteen years of age, and indeed this fits with the usual population age groupings. However, we found this restrictive in a number of respects. Most important was that childhood is generally considered to extend to the onset of adulthood at eighteen years of age. The United Nations Convention on the Rights of the Child confirms the importance this 0-17 years inclusive age group definition, and the rights to health and welfare in this total period. Teenage and adolescent health has its own needs and characteristics, which should not be lost through statistical convention. Yet at the same time we recognise that many existing statistical sources work in quinquennial age groupings. (Indeed, the World Health Organisation Headquarters programme for Child and Adolescent Health and Development covers the period 0-19 years inclusive.)

In general, it is remarkable and worrying, but not a surprise to those working in this field, to find how difficult it is to obtain even basic analyses for children as normally considered, and as enshrined by the United Nations Convention to which virtually all states are signatories, namely persons 0-17 years inclusive. Even the basic population figures, as in the Introduction to this report, are informal estimates derived from quinquennial groupings as the total number of children is not a readily available figure, and the challenge regarding other data is even greater. By definition it is adolescents who are most disadvantaged by this, as the lost and thus unrepresented group. We find this situation highly inappropriate

Therefore, in general, we have sought to recognise four age-groups – 0-4, 5-9, 10-14, and 15-17 years inclusive. A top age grouping of 15-17 years represents the upper end of the child health period, to cover adolescent health, and this group must not be disenfranchised. Where this age-group is not possible because of established structure in data sources, the normal preference is for a 15-19 years upper age group, in line with WHO, as although this extends into adulthood it is predominantly the upper childhood period, and in the final two years' health status and behaviour are significantly determined by the childhood period.

At the lower end of the scale, the perinatal period (the first week of life), as the outcome of pregnancy and birth, is a clearer boundary. However, there are also measures and observations prior to the end of the first week of life which are significant indicators for health and risk of ill health in childhood, and we return to this theme later. The boundary should be flexible to permit specific measures.

4.4.   Socio-economic Groupings and Health Inequality

It is well known that socio-economic factors are major determinants of health. They act directly on determinants of health ranging from social support to nutrition, and indirectly through aspects such as differential access to health care. There are known strong effects ranging from birth effects to the incidence of many childhood diseases and health-related behaviours. For this reason we have sought to encourage socio-economic subdivisions in the great majority of our indicators. For this we have been guided by the ECHI project into use of a six category grouping based on ISCO classification.

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At the same time, we recognise that for many if not all countries socio-economic data are not currently included in the basic data sets which in other respects could support many of our indicators, such as those based on hospital data. We have therefore indicated the desirability of socio-economic sub-grouping in most of our indictors, but recognise that this may take time to implement, and that in the meantime the basic indicators without that element must perforce suffice. But we emphasise that we exhort the Health Monitoring Programme and Member States to move to inclusion of socio-economic data as soon as possible – failure to do so will merely condone the continuation of known but inadequately quantified health inequalities, which cannot be ethically justified.

4.5.   Gender

We have also included gender analysis in the majority of our topic indicators. For many aspects of child health, its determinants and risks, there are known gender differences. However, we are aware from ongoing studies that in many other situations there is a gender gradient that is not reported merely because it has not been researched or identified – absence of evidence does not mean absence of a problem. We therefore advocate gender breakdown of child health indicators as a norm, but recognise that it will take time before data sources and feeder systems can include this routinely in their feed into the indicators database.

5.   The CHILD Project Process

5.1.   Overall Process

Following the identification of the topics and themes, individual members from within the project led on specific topics. This then enabled the project to establish a logically progressive method of working, with its planned full meetings providing reporting and decision-making points. These steps, which led from initial assembly of the project members through to unanimous agreement on a recommended set of indicators, comprised:

1.   Agree key principles on child health and the characteristics of the indicators.
2.   Literature research into each topic, identifying key issues, health determinants, and measurable features.
3.   Listing for each topic of items which appeared relevant and measurable as potential indicators.
4.   Assembly of a first Long List of candidate indicators.
5.   Distillation in group discussion down to a Medium List of potentially robust items.
6.   Production of initial draft definitions and evidence bases for this Medium List.
7.   Consideration of each of these potential indicators against objective criteria.
8.   Plenary discussion and critical review to distil down to the final list of potential indicators.
9.   Scrutiny of the resultant list for balance, robustness, and comparability.
10.   Assembly of the final definitions, evident templates, and supporting report.

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5.2   Structured Selection Criteria

Objective selection criteria were applied to every short listed indicator, to ensure its fitness for purpose. The criteria were:

1. **Evidence-based**, underpinned by research
2. Significant **Burden to Society**
3. Significant **Burden to Family**
4. Significant **Burden to Individual**
5. **Representative** of **Significant Population Groups**
6. **Regularity** and **Repeatability**, to enable trend analysis
7. Data **Availability**
8. Topic amenable to **Effective Action**
9. **Understandable** to broad audience.

For each criterion, broad categories from low value to high value were applied on a 0-4 Likert-type scale. Whilst the resultant scores were crude and not intended for compilation into a weighted ranking, they did enable more objective debate and identification of strengths and weaknesses. It is believed that the consequence is a set of indicators which is adequately fit for purpose.

5.3.   Additional Pragmatic Criteria

Two other determinant criteria for selection of indicators were important:

International availability varied significantly between potential indicators.   Some strong indicators could only be obtained in the foreseeable future from a minority of countries. Whilst the CHILD project has sought to be progressive and to encourage new forms of information gathering where this would be valuable, at the same time it was felt that indicators had to be available from a sufficient number of countries in the short term to make them seen to be as valuable and attractive, and thus to encourage development of data collection systems in the balance of countries. In broad terms we have sought not to include any indicator where we think that the principal source data, if not the specific format of analysis, are currently non-existent in more than half the Member States.

This feature is closely linked also to **information technology** aspects. Where computerised or other automated systems exist, whether they be hospital administrative systems, disease registers, or computerised primary care practices, they form a potentially extremely rich and comparatively low cost and accurate data source for health indicators. However, the pattern of computerisation varies significantly across Europe, and it is fully recognised that the production of data for indicators alone would not be a strong enough driving force to speed this process, though it might well form a contributory argument in some situations. Thus, though there are strong arguments for using computerised data sources such as sentinel primary care practices, we have turned away from these if they would be unlikely to be generally available across Member States in the near future. Clearly, the implication of this is that the indicator lists would benefit from review in five-ten years time, as health information systems progress within the countries of Europe.

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6.   Data Sources

Indicators are only of use if the data can be assembled. We considered that aspect at a high level, within the constraints of our resources.

6.1.   Routine or Special Data?

Wherever possible, use of routine statistical data as a by-product of other processes is a desirable characteristic. However, not least within child health, the variation in health, welfare, and civil registration systems across Europe is significant. Examples of this include, but are not restricted to, different patterns of primary care, different interfaces between primary and social care, and different responsibilities of agencies for supporting services.

Because of this, and because many of the indicators need an understanding of social environment, health related behaviour, and attitudes, surveys feature strongly as a data source. There is a recognised weakness in this, as the design and execution of surveys across all Member States, preferably with annual application, and with consistency over time, is a significant challenge. To some degree we have been reinforced in this direction by the fact that a number of partner Health Monitoring Programme projects are also identifying a dependency on surveys, increasing the likelihood of a robust health survey process within Europe. However, we recognise that this is a significant challenge to the overall Health Monitoring Programme if an effective and reliable indicators series is to be established.

6.2.   Survey Tools in Child Health

Regarding child health and surveys two other aspects are important and worthy of mention. First is the Health Behaviour of School-aged Children (HBSC) survey, which operates over some thirty countries under the aegis of the World Health Organisation's Regional Office for Europe. It is recognised as widespread, and methodologically sound. These factors are both potentially assets, in that they give a large and experienced framework for collection of survey data for older school children, but also disadvantages in its comparatively narrow age range, but more significantly in that even if all Member States participated they would still constitute a minority of participants, and therefore the survey questions are vulnerable to majority-voted change regardless of whether they are used as data sources for a European Health Indicator Programme. Moreover, it is only undertaken every fourth year which, coupled with the time required for analysis and publication, seriously reduces its value for trend analysis and the initiation of effective action where necessary. Also, the HBSC analyses and reports on its own data, rather than making a database available, and this is a distinctly different approach to feeding data into an indicators system.

The second development of note is the sponsorship by the Research Directorate-General of the European Commission of a project in the Quality of Life programme called Kidscreen. This is a three year project, still ongoing, to devise and validate in field trials means of measuring the health perceptions and behaviour of younger children. We are excited by this and other potential research in this area, and see this as a future way forward to cover current deficits in data availability which has led to the reluctant exclusion of indicators of certain aspects of the health of younger children. Again, however, though creation and validation of a tool is a vital and invaluable first step, it is significantly different from the creation of a co-ordination mechanism to ensure comparable use of the tool, not least to feed into an indicators system.

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We acknowledge that there are national health surveys in a number of countries, and that the EUROSTAT organisation has a programme to seek to co-ordinate national health surveys where possible to ensure maximum comparability. This is important and to be welcomed; at the same time, we emphasise that surveys of child health need to ensure collection of child-centric data, and to seek children's views rather than solely adults' views.

6.3.   Child-Focused Analysis

We also commend and argue for further research and development of child-focussed analysis of existing data. Many data sources, for instance household surveys, ask health questions which are then analysed from a household or adult perspective. We believe that there is significant added value and utility in re-analysing and re-presenting these data from a child viewpoint, as a matter of routine. For instance, "percentage of households in which one or more adults smokes" can be re-analysed as "percentage of children, by five year age bands, living in a household in which they are exposed to tobacco smoke". This apparently radical yet technically simple re-presentation of existing potentially available data of many kinds would do much to identify local variation and determinants of child health, at modest cost.

7.   Recommended Child Health Monitoring Indicators

7.1.   The ECHI Framework

The project was strongly guided by European Commission officers to use the framework already devised by the partner project on European Community Health Indicators (ECHI), which has produced a robust meta-analysis framework. The four top-level categories of the ECHI framework are:-

1. Demography and Socio-economic Situation
2. Health Status
3. Determinants of Health
4. Health Systems

We did find this helpful. At the same time, it is a list created from an adult viewpoint of health. For application to child health we have taken the liberty, at least for our working deliberations, of modifying the terminology as follows:-

A. Demographic and Socio-Economic (Upstream Health Determinants)
B. Health Status and Well-being
C. Determinants of Health, Risk and Protective Factors
D. Health Systems and Policy

7.2.   Recommended Indicators

Out of the CHILD project process, we have worked harmoniously and reached a strong consensus. The topic study leadership has been instrumental in our work, and is acknowledged

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in Appendix 3, but as indicated earlier the final conclusions and recommendations have been the result of discussion and agreement in the full team, drawing on the evidence supplied. All members have consulted widely during the project process, and some countries have had opportunity to put the firm draft proposals to national opinion leader meetings, as shown in Appendix 4. We suggest that this gives a robustness and credibility to our recommended indicator list.

We have sought to be sound and realistic in our approach, drawing on existing data sources, yet being progressive where we believe there are important issues for which measurement is desirable and feasible. For each recommended indicator below, there is a Template in the Technical Annexe. This template gives the full data definition, the rationale and evidence, and appropriate references.

Our recommended indictors, within this framework, are:

A. Demographic and Socio-Economic Determinants of Child Health

Whilst the demographic distribution of children is an important descriptor, it is adequately covered in the generic demographic proposals of the ECHI project. Our recommendations for child-specific indicators focus on socio-economic factors that are health determinants.

Children's Socio-economic Circumstances
Percentage of children living in households in each of the six socio-economic categories of upper non-manual, lower non-manual, skilled manual, unskilled manual, self-employed, and farmer, derived from the International Standard Classification of Occupations (ISCO) classification, and determined by resident parental occupation (highest of father or mother, or single parent), as a percentage of all children, in age groups 0-4, 5-9, 10-14, 15-17.

Children in Poverty
Percentage of children living in households with a household income below the national 60% median, equivalised using the modified OECD equivalence scale, in at least two of the previous three years, in age groups 0-4, 5-9, 10-14, 15-17.

Parental Educational Attainment
Percentage of children whose current "mother" had attained Elementary / Lower Secondary / Upper Secondary/ Tertiary education, as a percentage of all children, in the age groups 0-4, 5-9, 10-14, 15-17.

Children in Single Parent Households
Percentage of children who live in family household units with only one parent or primary care-giver resident, by male, female, and total, in age groups 0-4, 5-9, 10-14, 15-17.

Asylum Seeking Children
Rate of children seeking asylum, alone or as part of a family, per 1,000 resident children, by male, female, and total, in age groups 0-4, 5-9, 10-14, 15-17.

B. Child Health Status and Well-being

In this important section we have more indicators on health status than on the equally important topic of well-being because further work is needed to develop measures of the latter. Death and cancers are subjects of major

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interest and generate high distress and health burden; and diabetes and asthma are increasing modern diseases creating serious medium- or long-term burdens. Infectious diseases are largely preventable: we have selected three, of which measles is vaccine preventable and will act as a tracer for all vaccine-preventable childhood diseases as it is generally the one with the lowest uptake, and the incidence of tuberculosis represents current public health issues. We have selected tracer conditions for injuries in childhood, and sought to address the important topic of child mental health with one objective indicator while recommending more work on other key aspects where measures need developing or validating.

Child Mortality

Child Mortality Rates
(a) Total Infant Mortality Rate (IMR) between birth and exactly one year of age expressed per 1,000 live births, by male, female, and total, and by socio-economic group when available;
(b) Total Mortality Rate between birth and exactly five years of age (U5MR) expressed per 1,000 live births, by male, female, and total, and by socio-economic group when available.
(c) Total Under-20 years Mortality Rate per 100,000 population, by male, female, and total, and by socio-economic group when available.

Selected Cause-specific Child Mortality Rates
Cause-specific mortality rates per 100,000 population for:
  a) Infectious diseases
  b) Congenital malformations
  c) Malignant neoplasms (cancers)
  d) Unintentional Injuries
      i. Burns
      ii. Poisoning
      iii. Transport accidents
      iv. Drowning
  e) Suicide
  f)   Assault and homicide
  g) Perinatal causes
by male, female, and total, in age-groups under 1, 1-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Child Morbidity

Incidence of Childhood Cancer
 Annual incidence of childhood cancer per 100,000 population, for
  a) Leukaemia
  b) Malignant Brain/CNS tumours
  c) Other malignant tumours
in the age-groups 0-14, 15-17 and in total.

Incidence of Childhood Diabetes
Annual incidence of Type 1 insulin-dependent diabetes per 100,000 population, in age-groups 0-4, 5-9, 10-14, 15-17 and in total.

Prevalence of Childhood Asthma
Prevalence of asthma, by gender, in age-groups 0-4, 5-9, 10-14, 15-17, by socio-economic group.

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Incidence of Specific Childhood Infectious Diseases
Annual incidence per 100,000 population of
      a) Measles
      b) Bacterial meningitis
      c) Tuberculosis
in age-groups 0-4, 5-9, 10-14, 15-17, by socio-economic group.

Child Dental Morbidity
Mean dmft index for 5 year old children and mean DMFT index for 12 year old children respectively, by socio-economic group when available.

Injuries to Children

Burns to Children Necessitating Hospital Admission
Annual rate of overnight hospital inpatient admissions of children suffering burns, per 100,000 population, by male, female and total, in age-groups 0-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Poisoning of Children Necessitating Hospital Admission
Annual rate of overnight hospital inpatient admissions of children suffering from poisoning, per 100,000 population, by male, female, and total, in age-groups 0-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Fracture of Long-bones in Children
Annual incidence per 100,000 population of fracture of long-bones defined by specific ICD10 code, by male, female and total, in age-groups 0-4, 5-9, 10-14, 15-19, and by socio-economic group when available.

Mental Health of Children

Attempted Suicide by Children
Annual incidence of attempted suicide, defined by inpatient hospital stays with a discharge diagnosis of attempted suicide, per 100,000 population, by male, female, and total, in age-groups 10-14 and 15-17, and by socio-economic group when available.

The following are subjects for which we believe indicators are important, but where further work is needed to define the indicator and its data sources -

Child Abuse
This a crucial yet notoriously difficult field to measure at the individual level, as well as at the population level, yet there is a major need to monitor and understand, and thus seek to reduce, the injury, distress, and indeed death resulting. Some interesting possibilities for indicators are emerging and were considered by the project, including fracture of the skull in infants, and subdural haematoma. Each currently has limitations preventing our recommending it at this stage, not least differential reporting because of different treatment practices, but we strongly recommend this as an area for further research to seek an effective validated indicator.

Childhood Behaviour Disorders
Childhood behaviour disorders create heavy burdens, but are not currently easy to measure at the population level. We commend the development of indicators of:
    a) Hyperactivity

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b) *Conduct disorder*
c) *Adolescent depression*
d) *Adolescent anxiety*

We believe it appropriate to await evaluation of the Kidscreen Project; we recommend international analytic standardisation of the relevant Health Behaviour of School Children (HBSC) questions; and follow-up of current national research e.g. in Sweden; and that these should form a priority for further health monitoring research.

Learning Disorders/Intellectual Disability
An indicator is needed, but requires further research on assessment and reporting methods, and the national recording of registers or epidemiological data.

Educational Development
Intellectual development is important and we believe a suitable indicator of educational outcome at 15 years, by gender, is needed. The Programme for International Student Assessment (PISA) methodology of the OECD appears a potential measure, but needs validation as to sequential use and as an international comparator.

Perceived Well-being, Quality of Life and Positive Mental Health
It is important to define an indicator and then measurement tools, including feelings of health, well-being and quality of life; existing work includes the HBSC for older school children, the Child Health Questionnaire (CHQ) and other less-known but validated tools, Child Health and Illness Profile (CHIP-CE), Kidscreen, and national initiatives regarding younger children (e.g. in France, Germany, Netherlands, Sweden).

Children with Permanent or Severe Disability
These are another important and under-represented group. However, there are currently difficulties in defining handicap, whilst international initiatives in this respect are as yet unproven in operational practice. The issue of integration of such children into education and society, which is the core objective, are also difficult to measure. We had considered a potential measure as being children and young persons in long-term receipt of practical or financial assistance because of permanent or severe disability, but could not validate this within our time and labour resources. This too therefore becomes an area in urgent need of further empirical study in a population health measurement context.

C. Determinants of Child Health, Risk and Protective Factors
Parents, children themselves, and other influences all contribute to the factors which determine health. We have identified indicators relating to nutrition, lifestyle, the physical environment, and other identified factors.

Parental Determinants

Breastfeeding
(a) Percentage of newborn children exclusively breastfed at hospital discharge or immediately
     after birth.
(b) Percentage of all 6 month old children exclusively breastfed at 6 months.
(c) Percentage of all 12 month old children receiving breastfeeding at 12 months.

Exposure of Children to Household Environmental Tobacco Smoke
Percentage of children aged 0-4 living in households where any member of the household smokes, by socio-economic group when available.

Parental Support for Children
Percentage of children who report that they find it easy or very easy to talk with their parents when something is really bothering them, as a percentage of all children, by male, female and total, at ages 11,13 and 15, and by socio-economic group when available.

Child Lifestyle Determinants

Physical Activity by Children
Percentage of children reporting that that they undertake vigorous activity outside of school hours for at least two hours a week, by male, female and total, at ages 11, 13, 15, and by socio-economic group when available.

Tobacco Smoking by Children
Percentage of children reporting that they smoke every week, by male, female and total, at ages 11, 13, 15, and by socio-economic group when available.

Alcohol Abuse by Children
Percentage of children aged 15 reporting that they have been drunk from alcohol consumption on two or more occasions, by male, female and total, and by socio-economic group when available.

Substance Misuse by Children
Percentage of 15-year old school children who report that they have:
(a) used cannabis more than twice during the last 30 days;
(b) ever used heroin; and
(c) ever used ecstasy,
by male, female and total, and by socio-economic group when available.

Other Health Determinant Factors

Childhood Overweight and Obesity
Percentage of children at school entry who are overweight or obese as measured by the age- and sex-specific international reference standards for Body Mass Index; optionally also at 10 and 15 years.

Children in Care
Percentage of children who are under the care or formal supervision of statutory Social Welfare or Social Services agencies, by male, female and total, and age groups 0-4, 5-9, 10-14, 15-17.

Early School Leavers
Percentage of children who leave school (voluntarily or by exclusion) before the statutory school leaving age, by male, female and total.

Pre-primary Educational Enrolment
Percentage of children aged 3 and under 5 years enrolled in a Level 0 (pre-primary) education or kindergarten programme, by male, female and total, and by socio-economic group when available.

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Air Pollution Exposure of Children
Percentage of children aged 0-14 living in localities with an annual mean concentration of > 40 ppm of PM10.

The following are subjects for which we believe indicators are important, but where further work is needed to define the indicator and its data sources –

Family Cohesion and Social Cohesion
These concepts are recognised in Europe, USA, and Australia as important health determinants, but are difficult to measure, though featuring in the HBSC survey. It is recommended that further research is needed to establish feasible population-level indicators relating to children.

Nutritional Habits
Indicators are needed for younger and older children's nutrition and food consumption. This should link to the HBSC, and the work of EFCOSUM and relevant food and nutrition projects in the Health Monitoring Programme related to data on children.

D. Child Health Systems and Policy

Health systems and their quality are important in protecting and promoting the health of children. One selected policy indicator is focused on marginalized population groups in which children find themselves through no choice or fault of their own, the other on not exacerbating the distress of hospital admission. The health service quality indicators address immunisation as a major preventive service, and leukaemia survival as a known context-neutral measure of quality of clinical treatment. As children cannot be their own advocates in all social and other respects, legally backed policies and services are important in key areas, and we recommend indicators on several – these are expressed in percentage cover terms where provision may be at regional or local level and thus possibly not cover the complete national child population.

Health Systems Policy

Marginalised Children's Health Care
Is it national policy that children in all ages in the following groups have access to both immunisation and to non-emergency diagnostic investigations comparable to that offered the general resident child population?
    a) Asylum seekers
    b) Children of illegal immigrants / illegal residents
    c) Homeless children
    d) Culturally itinerant children (gypsies, Romany, etc.)

Parental Accompaniment of Hospitalised Children
Percentage of inpatient bed days of children aged under 16 occurring in hospitals where accompanying by 'parents' day and night is offered, as a percentage of all bed days for this age-group.

Health System Quality

Childhood Immunisation Coverage
Immunisation rates for childhood immunisation, expressed as children aged 24-35 months inclusive having completed primary courses of immunisation as a percentage of all children in that age-group, separately for the following antigens:

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diphtheria, pertussis, tetanus, poliomyelitis, haemophilus influenza type b, measles, mumps, rubella, hepatitis B, meningococcus C.

Survival Rate of Acute Lymphatic Leukaemia in Childhood
Five year survival rate for acute lymphatic leukaemia, in age-groups at diagnosis 0-4; 5-9; 10-14; 15-19.

Social Policy Indicators

Physical Punishment of Children
Percentage of children in the country protected by law against physical punishment, expressed as a percentage of the national child population,
  a) in schools and other places where children are looked after
  b) in the home or by parents and family members.

Anti-bullying Policies in Schools
Percentage of children attending schools with a written anti-bullying policy in operation, as a percentage of all school children.

Physical Protection Policy

Child Transportation Safety
Existence and actual enforcement of legislation and regulations establishing mandatory requirements for safe mobility and transport for children.

Policies to Protect Children from Exposure to Lead
Existence of legislation and regulations that limit the use of lead in building and decorating materials and establish bio-monitoring of babies and children at high risk.

Policies to Protect Children from Exposure to Potentially Hazardous Noise
Existence of policies aimed at assessing and reducing the exposure of babies and young children to potentially harmful noise in ICU units, day-care centres, schools and kindergartens.

Policies to Reduce Exposure of Children to Environmental Tobacco Smoke
Existence and enforcement of laws and regulations aimed at protecting children from exposure to environmental tobacco smoke in public places.

The following are subjects for which we believe indicators are important, but where further work is needed to define the indicator and its data sources –

Health Care Access
It is important that children have free and unrestricted access to the full range of health care, including
  a) Preventive health care
  b) Curative health care
  c) Dental health care
  d) Psychiatric health care
However, before objective indicators can be defined, further consideration needs to be given regarding delays or waiting list barriers to timely access, and concerning pay-and-refund systems where the need for initial payment may be a barrier to access.

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Inpatient Service Quality
It is important that admissions of children to hospital should be in paediatric departments with appropriate facilities. We think an important indicator would be the percentage of inpatient days of children aged under 14 years taking place in paediatric departments (defined as having child-oriented physical design and sanitary facilities, paediatric-trained doctors, specialist nursing staff, play/learning facilities, and extended hours sibling visiting) related to total inpatient days in the age-group. However, we think that further work is needed to produce a definition which is clear, feasible, and applicable across Europe. Also, further work is needed on how to consider departments which only partly fulfil the criteria listed.

Health Service Access for Socially Restricted Children
Two groups of already disadvantaged children have further practical restrictions placed on their access to the full range of therapeutic, preventive, and advisory health services. They are young offenders who are in institutions which by definition and function restrict their freedom, and children in the care or supervision of social services or child protection agencies, particularly if they have frequent changes of address. Measurement of the quality of their health care access and benefits is difficult, but is important as it is known that the adverse health effect of their initial marginalisation is multiplied by their reduced or compromised access to effective health services, particularly promotional ones.

Medication
There is a need for indicator(s) on levels of medication of children, and potential over-prescribing e.g. of antibiotics and psychotropic drugs – this needs liaison with the partner HMP project in this field, and further research. Secondly, attention needs to be addressed to measuring the high rate of medicines prescribed for children which are not specifically approved or formulated for the age-group, in order to quantify the risk and seek to remedy the situation.

Play and Leisure
The existence of facilities which are safe and available to children is important for their physical and social development, but further research needs to be undertaken to enable the definition of a comparable indicator, and whether it should focus on provision, perception, or participation. It might be a survey question such as: Percentage of children who/whose parents reported the availability of a free access safe outdoor play space within 100 metres, 400 metres of the home, by gender, five year age group, but validation is needed.

Assessment of Children with Special Needs
The right to statutory assessment procedures to assess, and meet, the requirements of children with Physical, Social, or Educational Special Needs is important, but needs further study as to suitable definitions and measures.

Integration of Children with Special Needs
The integration of children with special educational needs into normal schools is important but requires in many cases appropriate additional support if the child, and/or their classmates, are not to be disadvantaged. These factors make definition of an indicator difficult, but no less essential, thus requiring further study.

Healthy Parenting
An indicator on the percentage of children under 1 year of age whose parents have access to a programme of education, psychological, and social support in parenting during the first year of life is desirable, but requires study to define such programmes.

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Mental Health Education
The provision of a nationally endorsed or recognised curriculum or programme provision of education-based programmes designed to develop self-esteem, problem solving skills, emotional literacy, respect for difference and understanding of how to access support is important, but requires further definitional study.

7.4   Indicators within the Responsibility of other HMP Projects
We have sought to address the full range of child health and its determinants, but in the large and complex field of comprehensive health monitoring there cannot be rigid boundaries. Some areas were specifically outside our terms of reference as they were the task of other HMP projects; in some areas we acknowledge the need for particular specialist measures or other expertise, and defer to these projects' technical competence whilst drawing attention to the necessity of their recognising the importance of the specific interests of children

Perinatal Determinants and Indicators
Many aspects of child health are determined or measured in the antenatal, delivery and perinatal periods, and our reviews of evidence reinforced this. We could not pursue these further as they fell outside our terms of reference, falling within the remit of the PERISTAT project, with whom we have contact. However, for the completeness of our report we list below topics where the determination of child health or the delivery of appropriate services is dependent on aspects monitored in the earlier period. Some measures span a continuum across the time periods.

The principal items of interest from the later child health perspective are:

Mother's age
Uptake of antenatal care
Medication in pregnancy
Smoking in pregnancy
Parental health
Births to asylum seekers/migrants/temporary residents
Birthweight
Gestational age
Congenital infections
Apgar score
Guthrie testing
Hearing testing in first 28 (7) days
Phenylketonuria (PKU) testing
Hypothyroidism screening
Breastfeeding
Baby friendly hospitals

The Fields of other HMP Projects
We recognise that child health issues also fall within the remit of other Health Monitoring Programme Projects. Below is a list of topics to which we look to other designated projects for inclusion of suitable indicators regarding children:

ECHI   Age/gender structure of the population
Ethnic structure of the population
Structure of the population by the six occupational categories.
Social support

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Food Availability   Availability of correct range of food to households with children

Food Intake   Intake of food by children, by age group.

Health Promotion   Programmes on parenting
Programmes for children (in different age-groups)
Programmes addressing child mental health

Medicines   Rates of prescribing of antibiotics and psychotropic drugs for children
Proportion of prescriptions of drugs not explicitly licensed for children

Mental Disability   Mental disability in children, and patterns of change
Integration into education and society

Nutrition   Breastfeeding
Nutrition in childhood
Nutritional deficiencies in childhood, esp. iron deficiency, and the possibility of blood sampling.

Oral Health   Child oral health within the overall context

Reproductive Health   Teenage pregnancies
Under 18 years sexual behaviour

We also recognise the work being undertaken by data source related projects within the HMP, and the need for our recommendations to be integrated with their work. Most important will be the work on **Health Interview Surveys and Health Examination Surveys (HIS/HES),** but also **Hospital Data**, **Primary Care Data**, and **Information Systems**, and **Policy Benchmarking**. We hope we have set a framework of need and definition, which can be incorporated into ongoing data supply development work.

7.5   Assessment of Spread and Balance of Recommended Indicators

It is important that our proposals are reviewed for spread and balance. This we have attempted in Figure 2 on the next page.

Aspects
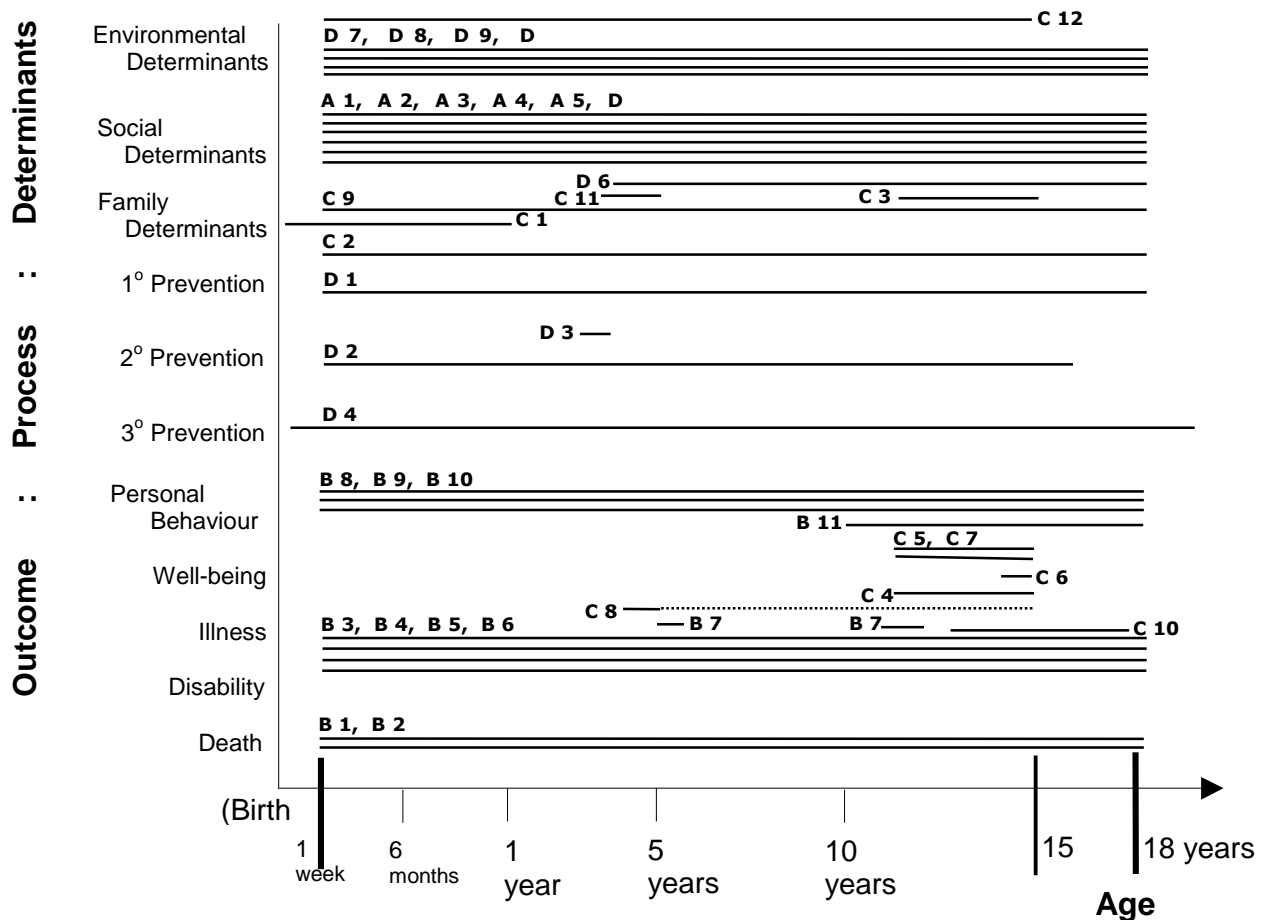
Figure 2: Spread and Balance of Proposed Child Health Indicators

ABBREVIATED KEY TO INDICATORS (See pages 14-21)

A. Demographic & Socio-Economic
A 1 Socio-economic Circumstances
A 2 Children in Poverty
A 3 Parental Educational Attainment
A 4 Child in Single Parent Households
A 5 Asylum Seekers

B. Child Health Status, Well-being
Child Mortality
B 1 Child Mortality Rates
B 2 Selected Cause-specific Mortality

Child Morbidity
B 3 Cancer
B 4 Diabetes
B 5 Asthma
B 6 Infectious Diseases
B 7 Dental Morbidity

Injuries to Children
B 8 Burns Necessitating Admission
B 9 Poisoning Necessitating Admission
B 10 Fracture of Long-bones

Mental Health of Children
B 11 Attempted Suicide

C. Health Determinants, Risk, and Protective Factors
Parental Determinants
C 1 Breastfeeding
C 2 Household Environmental Tobacco
C 3 Parental Support

Child Lifestyle Determinants
C 4 Physical Activity
C 5 Tobacco Smoking
C 6 Alcohol Abuse
C 7 Substance Misuse

Other Factors
C 8 Overweight and Obesity
C 9 Children in Care
C 10 Early School Leavers
C 11 Educational Enrolment
C 12 Air Pollution Exposure

D. Child Health Systems & Policy
Health Systems Policy
D 1 Marginalised Children's Health Care
D 2 Parental Inpatient Accompaniment

Health System Quality
D 3 Immunisation Coverage
D 4 Leukaemia 5-year Survival

Social Policy Indicators
D 5 Physical Punishment
D 6 Anti-bullying policies in schools

Physical Protection Policy
D 7 Child Transportation Safety
D 8 Exposure to Lead
D 9 Exposure to Hazardous Noise
D 10 Environmental Tobacco Smoke

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8.   Further Work

We feel we have achieved all that can be done in the time and with the resources available, and specifically without undertaking direct research. We believe our proposed indicators are robust, but perforce incomplete. Moreover, further work is desirable to ensure maximum application and thus impact, and to raise interest, awareness, and commitment in professional, political and public arenas.

8.1.   Research

First and foremost, our proposed indicator list itself contains identification and specification of topics which are important health determinants or potential measures, but where the means of measurement needs further consideration and research in order to develop mechanisms. We believe these must be addressed before the spread of indicators of child health for Europe can be considered anything like adequate.
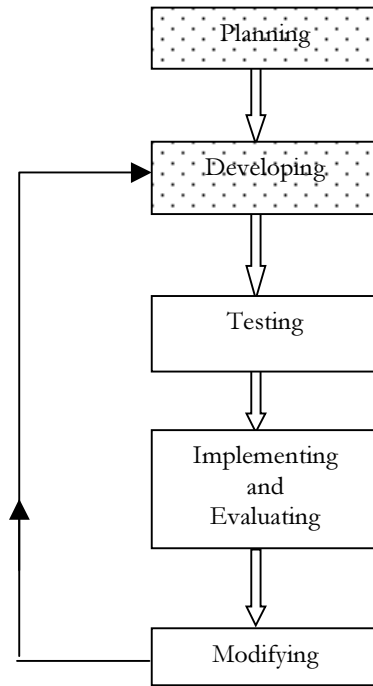
Additionally, we think that there are several wider generic areas where deeper research would be beneficial, including:

- Ascertaining the views of children and young people to these proposals, possibly through Children's Parliaments or similar, and through local cross-sectional discussions.
- Calculation of the impact of the burden of illness on children and families, and extension also into later life – building on the concept of Disability Adjusted Life Years (DALYs), but reflecting the wider multiplier effect of illness in childhood referred to earlier in this report.
- Further study of health determinants and related risk, and thus of measures capable of yielding indicators.
- Cascading and disaggregation of the indicators down to sub national and local levels, through study of the issues and opportunities to enable greater use and utility, recognising the potential conflict between the additional utility of regional and more local information, and the reduced reliability of smaller volume data.
- Researching health-related decision making at local level – agents, decisions, and information sources
- Potential feed of indicators from operational systems such as immunisation systems, primary care, and hospital systems, not least through definition of standard common data sets which could operate within different national delivery systems.
- Consideration of the development of composite or multi-factorial indicators (adopting models such as those used to measure deprivation), to apply to aspects such as service quality or health of marginalised children.

8.2.   Testing and Evaluation

Additionally, we believe that any initiative, including new indicators, needs evaluation so as to undertake any necessary fine-tuning. Implementation of the Health Monitoring Programme indicators will be a large and important task. We commend a sub-focus on child health within that activity. One aspect would be the incorporation of the CHILD data sets into feeder systems, not least into co-ordinated activities such as surveys.

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The other essential activity would be practical evaluation studies on the suitability and impact of our indicators. Figure 3 shows the indicator development cycle we acknowledged at our first meeting. Our task so far has been only to address the first two steps.

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        │    Planning     │
        └─────────────────┘
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        ┌─────────────────┐
  ┌────▶│   Developing    │
  │     └─────────────────┘
  │              │
  │              ▼
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  │     │     Testing      │
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  │     │  Implementing    │
  │     │      and         │
  │     │   Evaluating     │
  │     └─────────────────┘
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  └─────│    Modifying     │
        └─────────────────┘
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Figure 3. Indicator Development Cycle

9.   Conclusion

The CHILD Project on developing recommendations for Child Health indicators for Europe has been exciting, challenging, and enjoyable. The subject – Europe's children – is critically important. We hope our recommendations stimulate wide interest and lead to action.

Appendix 1

CHILD Project Participants

Project Leaders

Project Manager	Michael Rigby	Senior Lecturer Centre for Health Planning and Management, Keele University, UK
Project Chair	Prof. Lennart Köhler	Former Dean and Professor of Child Health Nordic School of Public Health, Gothenburg, Sweden
Deputy Project Manager	Dr. Reli Mechtler	Head, Abteilung für Pflege- und Gesundheissystemforschung, Johannes-Kepler University, Linz
Chair, Expert Review Panel	Dr. Mitch Blair	Reader in Child Public Health; Consultant Paediatrician Imperial College, London

Country Members

Austria	Dr. Reli Mechtler	Johannes Kepler University, Linz
Belgium	Prof. Sophie Alexander *from December 2001*	Free University of Brussels
Denmark	Dr. Anne Nielsen	Danish Institute for Clinical Epidemiology
France	Prof. Marc Brodin	University of Paris V; Hôpital Robert Debré, Paris
Finland	Prof. Matti Rimpela *to September 2001*	STAKES, Helsinki
Germany	Dr. Gerhard Brenner	Zentralinstitut für die kassenärztliche Versorgung
Greece	Prof. Andreas Constantopoulos *to May 2001* Prof. Chryssa Bakoula *from June 2001*	Dept. of Paediatrics, Athens University Athens University - "Aghia Sophia" Children's Hospital
Italy	Dr. Giorgio Tamburlini	Istituto per l' Infanzia IRCCS Burlo Garofolo, Trieste
Ireland	Dr. Orlaith O'Reilly	South Eastern Health Board, Kilkenney
Luxembourg	Dr. Yolande Wagener	Direction de la Santé, Luxembourg
Netherlands	Prof. Dr. S.P. Verloove-Vanhorick *to June 2001*	TNO Prevention and Health, Leiden
Portugal	Prof. Dr. Mário Cordeiro *to November 2001*	General Directorate of Health Head, Portuguese Health Observatory
Spain	Prof. Julio Moreno González	Preventive Medicine Service, Public Health Unit, University Hospital "Virgen Macarena", U. Sevilla
Sweden	Prof. Claes Sundelin alternative Dr. Anders Hjern	University Hospital, Uppsala
UK	Dr. Mary Cotter *to June 2001* Dr. Ruth Parry *from December 2001*	Health Solutions Wales North Wales Health Authority
Iceland	Dr. Matthias Halldorsson *to June 2001* Dr. Geir Gunnlaugsson *from June 2001*	Deputy Director of Health, Iceland Centre for Child Health Services, Reykjavik
Norway	Dr. Rannveig Nordhagen	Norwegian Institute of Public Health

Expert Review Panel Members

Dr. Mitch Blair	Reader in Child Public Health	Imperial College, London
Dr. Sven Bremberg	Associate Professor Expert	Karolinska Institute Swedish National Institute of Public Health
Dr. Concha Colomer	Head, Health Promotion Unit	Valencian School of Public Health, Spain
Dr. Manuel Katz	President	Union of European Paediatric Societies and Associations (UNEPSA)
Dr. Aidan Macfarlane	International Consultant	Oxford

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Appendix 2

CHILD Project Schedule of Meetings

Main Project

April 2001	European Commission	Luxembourg
22/23 July 2001	National Board of Health and Welfare, Stockholm	Sweden
30/31 August 2001	STAKES, Helsinki	Finland
1/2 October 2001	Sintra	Portugal
8/9 December 2001	Brussels (after EUPHA Conference)	Belgium
14/15 March 2002	Trieste	Italy
20/21 June 2002	Centre for Child Health Services, Reykjavik	Iceland
12/13 September 2002	Athens	Greece

Expert Panel

11 May 2001	Royal College of Paediatrics and Child Health, London	U.K.
8 October 2001	Nordic School of Public Health, Gothenburg	Sweden
31 May 2002	Macfarlane Study Centre, Oxford	U.K.
19/20 July 2002	Valencian School of Public Health, Valencia	Spain

CHILD Project Topic Leaders

The work of the following in leading the topic literature searches and subject reviews, and producing subsequent internal reports, guidance and draft indicators, is gratefully acknowledged. This work has been instrumental in ensuring the success, coverage, and quality of the report and recommendations.

CHILD TOPIC	CHILD TEAM LEAD and Support
Demography	*Prof. Matti Rimpela **
Socio-economic Status and Inequity	Dr. Orlaith O'Reilly; Dr. Deirdre Murray, Ms Mairead Fennessy
Social Cohesion/Capital	Dr. Anne Nielsen
Migrants	Dr. Anders Hjern
Marginalised Children	Dr. Ruth Parry, Ms. Denise Alexander
Family Cohesion	Dr. Yolande Wagener
Mental Health	Dr. Ruth Parry, Ms. Denise Alexander
Quality of Life	*Prof. Matti Rimpela **
Well-being	*Prof. Matti Rimpela **
Lifestyles	Dr. Anders Hjern
Health Promoting Policies	Prof. Giorgio Tamburlini
Nutrition and Physical Growth	Dr. Rannveig Nordhagen
Development (including Intellectual and Social)	Prof. Lennart Köhler
Mortality, Morbidity, Injuries	Dr. Rannveig Nordhagen
Environment	*Prof. Mario Cordiero *** Prof. Giorgio Tamburlini
Access and Utilisation of Services	Dr. Gerhard Brenner, Dr. Reli Mechtler

* To September 2001
** To November 2001

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Appendix 4

CHILD Project National Consultation Meetings

CHILD project members have sought to keep the work of the project congruent with work and data sets in their own countries, as well as having a European comparative focus and being progressive in addressing issues in measurement of child health at the population level. Many members work in national organisations, are members of national bodies, or are involved in national development projects in this field.

In addition to this ongoing linkage between the project and operational developments, even within the tight timescale of the project some members have had opportunity to organise national consultation meetings to consider the list of firm draft indicators prior to the final consideration and endorsement by the Project Team at its last meeting in Greece in September 2002.

These meetings included the following:

AUSTRIA
19 July 2002 - University Paediatric Clinic, University of Graz
National expert meeting chaired by the academic paediatrician who is Head of the Child Health Commission of the Austrian Ministry of Health.

FRANCE
20 September 2002 – Statistical Department, Ministry of Health
In this case not a meeting, but a formal consultation response from a top official on behalf of the statistical function of the Ministry of Health. General support stated, including that the choice of the child-centred concept "judicieux". Some specific issues were raised which reflected other feedback and the consequent modification of some details.

ICELAND
23 August 2002 – Centre for Child Health Services, Reykjavik
Special inter-disciplinary meeting with national and expert members of CHILD, attended by senior health professionals including the national Chief Medical Officer, a psychologist recruited by the Office of the Prime Minister to serve the National Committee on Child Issues (a committee newly appointed by the PM at parliamentary level), university staff and health professionals from different sectors within the national child health services. (It had been preceded tow months earlier by a briefing of the President of Iceland by senior project members, and an open national meeting attended by over a hundred academic and service professionals to raise awareness of the project prior to the draft list being available for comment.)

UNITED KINGDOM
3 September 2002 – Office for National Statistics, London
Special meeting involving, among others, senior representatives of the health services of England, Wales, Scotland (by correspondence) and Northern Ireland, the Department of Health, and the Office of National Statistics. Potential sources of data for most proposed indicators identified.

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All of these meetings considered the firm draft set of indicators individually and as an overall group, and in general fully endorsed them, whilst at the same time putting forward some constructive comments of detail, many of which have been incorporated into this final set of recommendations.. Given the variety of these countries, this would indicate a high degree of acceptance amongst field specialists of the proposals now put forward unanimously by the project.

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Technical Annex

European Union Community Health Monitoring Programme

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to the

Report to the European Commission

Templates for the Recommended Indicators

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Technical Annexe

Introduction

The Child Health Indicators of Life and Development (CHILD) Project is a third-wave project in the European Union Community Health Monitoring Programme. It has undertaken a thorough review of the domain of child health, and from this recommended a set of indicators which cover health determinants, health status, and well-being of children. The process and rationale, and an overview of the recommended indicators and suggested further research, are explained in the main report.

This Technical Annexe contains a more detailed template for each proposed indicator. These templates are in a standard format recommended by the Commission's officers, and include the Definition of the indicator, further Technical aspects, the Justification or rationale for selection, and References citing the key supportive literature.

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Indicator: Children's Socio-economic Circumstances

Operational definition

Percentage of children living in households in each of the six socio-economic categories of upper non-manual, lower non-manual, skilled manual, unskilled manual, self-employed, and farmer, derived from the International Standard Classification of Occupations (ISCO) classification, and determined by resident parental occupation (highest of father or mother, or single parent), as a percentage of all children, in age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection

- Occupation determines people's place in the social hierarchy, as it reflects educational attainment and earning power and offers other benefits accruing from the exercise of specific jobs, such as prestige, privileges, power and social and technical skills.
- Occupation is convenient for statistical measurement and analysis, as data are relatively easy to collect and to classify.
- Socio-economically deprived children are marginalized, and the indicators that apply to socio-economically deprived children are pertinent to marginalized children.
- Socio-economic factors are strongly linked with health and welfare, including childhood accidents.
- Children are traditionally classified according to the occupation of their parents.
- Occupation is closely related with a cluster of other variables known to be related to socio-economic position and health such as income and income security, working conditions, level of skill, education and style of living
- It is proposed to gather information on occupation within the ECHI framework, but to monitor parents, households with children will need to be identified.

Technical criteria

- The CHILD project recognises that the ECHI project has advocated six socio-economic groups based on a classification using the International Standard Classification of Occupations (1998).
- The socio-economic strata that are described above are derived from stratifying data on occupation.
- There may be limits to the ISCO classification, particularly its lack of classification of persons who have not entered the labour market, which will affect younger single parents in particular, and also the long-term unemployed, refugees, and other already disadvantaged groups.

Data sources

Population censuses; household surveys; labour force surveys

Data availability

Variable across member states.

References

Cooper J, Botting B (1992). Analysing fertility and infant mortality by mother's social class as defined by population. *Population Trends,* **70,** 15 – 21.

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International Standard Classification of Occupations, 1998.

Kunst A, Mackenbach J. (1995) *Measuring Socioeconomic Inequalities in Health.* Copenhagen: World Health Organization.

UNICEF Innocenti Research Centre – www.unicef-icdc.org

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Indicator: Children in Poverty

Operational definition

Percentage of children living in households with a household income below the national 60% median, equivalised using the modified OECD equivalence scale, in at least two of the previous three years, in age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection

- It is suggested that higher family income leads to greater child well-being through increased parental purchasing power to invest in food, housing, medical care and education. Economic deprivation may affect a child's well-being because of diminished parental ability to provide stability, adequate attention, supervision and cognitive stimulation to their children.
- Socio-economically deprived children are marginalized, and the indicators that apply to socio-economically deprived children are pertinent to marginalized children.
- Children view poverty as deprivation, perceive social messages as disparaging of the poor and have some difficulty holding on to positive views of themselves – has consequences for marginalisation and mental health (Weinger).
- Persistent poverty has detrimental effects on IQ, school achievement and socio-emotional functioning than transitory poverty. The link between socio-economic disadvantage and children's socio-emotional functioning appears to be mediated partly by harsh, inconsistent parenting and elevated exposure to acute and chronic stressors (McLoyd).

Technical criteria

Income is defined as the annual disposable income in the previous year. According to the European Community Household Panel Survey (EHCP), disposable income includes all net monetary and non-monetary incomes of the household and is most relevant concerning the distribution of individual welfare. Apart from incomes in kind and operating surplus of owner occupied dwellings, all required income components are contained in the ECHP, i.e.:

+ Income from Activity: (1) Compensation of employees,
                             (2) Income from self-employment,
                             (3) Operating surplus of owner occupied dwellings,
                             (4) Income from activity not elsewhere covered.
+ Income from Property
+ Transfer income received: (6) Social security benefits, social welfare assistance,
                             (7) Other money income
- Compulsory payment transfers: (8) Taxes on income and wealth,
                             (9) social security contributions,
                             (10) Other disbursements
-   Voluntary Transfer payments   (11) Inter household transfers received
_____
                        = Disposable Income

Normative equivalence scales are used, which basically express intuitive feelings of some experts. Once established, they remain quite unquestioned standard in poverty and income statistics. One example is the so-called "Oxford scale" which was adopted by the OECD in 1982 (OECD

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1982). This scale assigns a weight of 1.0 for the first person, 0.7 for each additional adult and 0.5 for children. It was criticised that these weights would put too much emphasis on the cost of children in highly industrialised countries. This criticism was reflected also by EUROSTAT which adapted a modified OECD scale in which additional adults are weighted by 0.5 and children by 0.3

There are some recognised limitations, as below, which may qualify the results but which do not outweigh the importance of a broad indicator measure.

- Income is measured over a relatively short period of time. Fluctuations in income during this period may blur the connection between income and the average long-term ability to consume and accumulate resources.
- Access to non-monetary resources is ignored.
- The ability to convert money into economic standard is not uniform across the population.
- Individuals' costs of living can differ — for example; health problems can result in different levels of economic standard among people with the same amount of economic resources.
- Another difficulty is the high non-response rate to questions about family/personal income and the inaccuracy of such reporting.
- It is proposed to gather information on income within the ECHI framework, but in order to monitor children, households with children will need to be identified.

Data sources
Household surveys

Data availability
Income survey data are not available in every Member State.

References
European Community Household Panel

Gauthier AH. (1999). Inequalities in Children's environment: The case of Britain. *Childhood: A Global Journal of Child Research*. 6(2): 243-260.

McLoyd VC. (1998). Socioeconomic disadvantage and child development. *American Psychologist*. 53(2): 185-204.

Meltzer H, Gatward R, Goodman R, Ford T (2000). *Mental Health of children and adolescents in Great Britain*. Office for National Statistics, London.

Weinger S. (1998) Poor children "know their place": Perceptions of poverty, class and public messages. *Journal of Sociology and Social Welfare*. 25(2): 100-118.

UNICEF Innocenti Research Centre – www.unicef-icdc.org

Indicator: Parental Educational Attainment

Operational definition

Percentage of children whose current "mother" had attained Elementary / Lower Secondary / Upper Secondary/ Tertiary education, as a percentage of all children, in the age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection

- The level of parental education (particularly maternal) has been shown to be a predictor of child health
- Educational attainment is one of three indicators identified by the European Community Health Indicators (ECHI) project to measure educational achievement.
- This indicator is extremely pertinent to marginalized children. Those children who have parents who are badly educated are more likely to be marginalized / socio-economically deprived.
- The prevalence of mental disorders increases with a decrease in the educational level of the interviewed parent. 15% of children of interviewed parents with no qualifications had a mental disorder compared with 6% of those whose parents had at least a degree level qualification (Meltzer et al., 2000, p. 28).
- It has been shown that individuals with low or limited literacy experience significant obstacles in gaining access to and using health care services – parents with low literacy may be unable to access services for their children also (Christensen & Grace).
- Educational level indicators apply with equal validity to retired, unemployed and working men, and to all women including housewives and lone mothers.
- They are stable over time and relatively easily available.

Technical criteria

- UNESCO have devised a classification to enable the assembly of statistics on educational enrolment and attainment in a standard and internationally comparable form, irrespective of the structure of the education system or kinds of education existing within a country.
- Each country is required to examine its educational programmes and map its programme onto the UNESCO classification system
- At a local and EU level, such information is very useful in policy formulation and decision-making on educational issues.
- Relates to the lead female primary carer in the household, who may be step-parent, aunt, or other.

Data sources

Population censuses, household surveys

Data availability

May not be available in all Member States.

References

Arntzen A, Moum T, Magnus P, Bakketeig LS (1996). The association between maternal education and postneonatal mortality. Trends in Norway, 1968-1991 *Int. J. Epidemiology,* **25,** no. 3, 578 – 584.

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Bobak M, Kriz B, Leon DA, Danova J, Marmot MG. Socio-economic factors and height of pre-school children in the Czech Republic. *Am J Public Health* 1994; 84: 1167-1170.

Christensen, Richard C & Grace, Glenn D. (1999) The prevalence of low literacy in an indigent psychiatric population. *Psychiatric Services* 50(2): 262-263.

International Standard Classification of Education, UNESCO, 1997

Meltzer, H, Gatward, R, Goodman, R & Ford, T. (2000). *Mental Health of children and adolescents in Great Britain.* Office for National Statistics, London

Indicator: Children in Single Parent Households

Operational definition
Percentage of children who live in family household units with only one parent or primary care-giver resident, by male, female, and total, in age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection
- Being brought up in a birth family with presence of both parents is a protective factor against mental ill-health in children (adapted from Buchanan quoted in North Wales Health Authority, 2001).
- Much of the evidence suggests a cross-over with the issues surrounding poverty and single parenthood.
- Children of lone parents - 16% of children of lone parents had mental health problems compared to 8% of children who lived with married or cohabiting couples. This is probably not to do with quality of care, but the fact that single parent families often have to deal with relationship, social, and financial problems, all of which are contributory risk factors for mental health difficulties (Meltzer et al., 2000, p. 28):
- Relates to other issues - educational qualification of parent – as lone parents tend to have fewer educational qualifications. 15% of children of interviewed parents with no qualifications had a mental disorder compared with 6% of those whose parents had at least a degree level qualification (Meltzer et al., 2000, p. 28).

Technical criteria
Measures resident primary carer.
Absentee parents, even if contributing financially, do not count in this measure.

Data sources
Censuses, household surveys

Data availability
Will need analysis of census or survey data.

References
Jackson AP, Brooks-Gunn J, Huang CC, Glassman M (2000). Single mothers in low-wage jobs: Financial strain, parenting, and preschoolers' outcomes. *Child Development* 71(5): 1409-1423.

Meltzer H, Gatward R, Goodman R, Ford T. (2000). *Mental Health of children and adolescents in Great Britain*. London, Office for National Statistics.

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Indicator: Asylum Seeking Children

Operational definition
Rate of children seeking asylum, alone or as part of a family, per 1,000 resident children, by male, female, and total, in age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection
- Migrant children are at particular risk for mental health problems as well as infectious disorders such as hepatitis B, tuberculosis and measles. Thus, they constitute an important target group for public health interventions for their own sake as well as to prevent the spread of communicable disorders into the general population.
- Due to the large number of illegal immigrants there are no accurate approximations of the total number of migrant children in the European Union. However, the European Union is rapidly moving towards a common immigration policy with a shared responsibility for asylum seekers. This makes statistical data on the population of asylum seekers readily available. Therefore we suggest asylum seekers as tracer for the total population of migrants.
- All refugee children in exile have experienced forced migration; many have been exposed to incidents of political violence. Scandinavian studies of mental health in newly settled non-European refugee children have demonstrated that as many as 40-50% have signs of poor mental health (Hjern *et al* 1998; Montgomery 1998).
- Populations of migrant children, if left outside of national vaccination programmes, may cause epidemics of measles, rubella, mumps and whooping cough that may spread into the general population.
- Migrant children in Europe are a high risk population for infectious disorders such as tuberculosis (Van den Brande *et al* 1997; Romanus 1995), hepatitis B (Lindh *et al* 1993) and gastrointestinal parasites (Benzeguir 1999). Some children arrive in Europe as carriers of these diseases, but for tuberculosis and hepatitis B a considerable number of migrant children are also infected in Europe, usually because of exposure to these infections in the home (Lindh *et al* 1993; Romanus 1995).
- Most families in exile leave their social support systems in the home country. This makes refugee children dependent on their parents to help them adapt to their new environment; unfortunately many refugee parents themselves suffer from poor mental health that makes this task all the more difficult (Hjern *et al* 1998). Thus there is considerable evidence that migrant children who arrive in Europe as refugees should be targeted for mental health interventions.
- The principle of "non-discrimination' in article 2 in the United Nation's Convention on the Rights of the Child implies that asylum-seeking children should have the same access to care as everyone else in that society, but in fact access to care differs greatly between different countries in the EU.
- The project 'Health for all, all in health - European experiences and strategies against social exclusion of immigrant people by health care services' is coordinated by Pietro Vulpiani of the University of Rome and funded by the European Commission Directorate-General Employment and Social Affairs (DGV/D/4).
- Due to the large number of illegal immigrants there are no accurate approximations of the number of migrant children in the European Union available. According to data from the United Nation's High Commission for Refugees (UNHCR) some 88 000 applications for asylum were received in the EU during the first four months of 2001, thus making it probable that the number of migrant children in the EU has to be counted in the tens of thousands per year since 25-30% of all asylum seekers are children.

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Technical criteria

The relation between the number of asylum seekers and the number of illegal immigrants varies between the north and the south of the EU. Thus, the number of asylum seekers is to be regarded as an imperfect tracer of an important population.

The key aspect is that the persons and families have no national status in the country of current residence.

Data sources

National immigration data

Data availability

These data should be readily available from the government in each EU country

References

Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. (1999) *Migration and Health - Draft Report*. Luxemburg, European Commission.

Hjern A, Angel B, Jeppson O. (1998) Political violence, family stress and mental health of refugee children in exile. *Scandinavian Journal of Social Medicine,* 26:18-25.

Montgomery E. (1998) Refugee children from the Middle East. *Scand J Soc Med.* 54 Suppl., 1-152.

Vulpani P, Comelles JM, van Dongen E. (2000) Health for all, all in health. European experiences on health care for migrants. *Perugia*; Cidis/Allida.

Zehetner E, Wallner GW. (1994) [Migration and tuberculosis in Austria] *Gesundheitswesen.* 56 (4):208-10.

Vulpani P, Comelles JM, van Dongen E. (2000) Health for all, all in health. European experiences on health care for migrants. *Perugia*; Cidis/Allida.

Zehetner E, Wallner GW. (1994) [Migration and tuberculosis in Austria] *Gesundheitswesen.* 56 (4):208-10.

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Indicator: Child Mortality Rates

Operational definition
(a) Total Infant Mortality Rate (IMR) between birth and exactly one year of age expressed per 1,000 live births, by male, female, and total, and by socio-economic group when available;
(b) Total Mortality Rate between birth and exactly five years of age (U5MR) expressed per 1,000 live births, by male, female, and total, and by socio-economic group when available.
(c) Total Under-20 years Mortality Rate per 100,000 population, by male, female, and total, and by socio-economic group when available.

Justification for selection
- Death is the ultimate adverse health outcome. Moreover, it juxtaposes with the UN Declaration on the Rights of the Child, which emphasises the Right to Life. Higher mortality rates indicate avoidable deaths, and are thus an important indicator even given the comparatively low rates in Europe compared with other regions of the world.
- Infant Mortality (IMR) is used world wide, for instance in all United Nations statistics.
- Infant Mortality (IMR) has shown a strong association with living conditions in the different countries' statistics, and thus also has been used as an indicator of the general state of health and living conditions globally.
- However, IMR is also important for child health per se, and we should look at the importance for child public health in the countries.
- Under 5 mortality rate (U5MR) is also an indicator used world wide, especially by UNICEF, in parallel with IMR. The indicator is critical because it depicts child mortality in a period where the children are most vulnerable.
- Childhood death may continue to create a burden on parents and siblings for many further years.

Technical criteria
The international standard definitions should be used.

Data sources
National statistical offices

Data availability
Basic data readily available
May be variation in availability of socio-economic breakdown.

References
UNICEF: The State of The World's Children 2001.

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Indicator: Selected Cause-specific Child Mortality Rates

Operational definition
Cause-specific mortality rates per 100,000 population for:
a) Infectious diseases
b) Congenital malformations
c) Malignant neoplasms (cancers)
e) Unintentional Injuries
   i. Burns
   ii. Poisoning
   iii. Transport accidents
   iv. Drowning
e) Suicide
h)   Assault and homicide
i) Perinatal causes

by male, female, and total, in age-groups under 1, 1-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Justification for selection
- Deaths from communicable diseases are nearly eradicated. However, with a rapid communication and physical contact between people in the different countries around the world we must keep in mind that new, or reappraisal of old, communicable diseases might arrive and the present picture change rapidly. Therefore, it is of importance to have a constantly alert eye on the mortality of communicable diseases, "new" or old, especially in the most vulnerable groups: the small children.
- Congenital malformations are a relatively frequent cause of IMR..
- Malignant neoplasm is one of the most important causes of death in the 1- 4 years age-group.
- Across all age groups in children, injuries represent a major cause of death. Accidental fatal injuries are classified under ICD 10 as Death by accidents (unintentional).
- According to EURORISC, suicides were the second leading cause of injury death in the age group 15-24. Thus, we have no separate currently published statistics for the age group 15-17, but this is possible to calculate from existing databases.
- Suicide is an issue of concern, is potentially avoidable, and reflects a much higher burden of mental illness (Blumenthal, 1990).
- There is limited data on homicide and fatal assault on children in the European countries, but in 1997 CDC performed a study of homicide/violent MR in US compared with several European and other countries. The results showed a five-fold rate in US compared to the other countries. The MR by homicide in infants seems to account for a rather large proportion of this number (Centre for Disease Control and Prevention, 1997).
- Deaths from assault and homicide are avoidable, and reflect aspects of society and its view of children.
- Sudden Infant Death Syndrome (SIDS) might be considered, but the picture has changed dramatically during the last ten years, after changing the policy of sleeping position of the children, as well as other intervention measures. We still do not know the real causes of SIDS and the diagnosis is not easy, and requires a thorough post mortem examination to ascertain. Therefore we do not consider the SIDS Mortality Rate (MR) as an indicator.

Technical criteria
Defined by ICD 10 codes:

    a) Infectious diseases (ICD 10 Codes A00-B99)
    b) Congenital malformations (ICD 10 Codes Q00-Q99)
    c) Malignant neoplasms (cancers) (ICD 10 Codes C00-C97)
    f)   Unintentional Injuries (ICD 10 Codes V01-X59, Y85-Y86)
        i.   Burns: T20-T32, T95.
        ii.   Poisoning: T36-T65, T96, T97.
        iii.   Transport: V0n - V99, Y 85.
        iv.   Drowning: W7n
    g) Suicide (ICD 10 Codes X60-X84,Y87.0)
    h) Assault and homicide (ICD 10 Codes X85-Y09, Y87.1)
    i)   Perinatal causes

An exact definition of fatal injuries should be included if the data are to be of value. There is no international agreement on any definition, but the United Nations Economic Commission for defining fatal road accidents states such an accident as "…any person who was killed outright or who died within 30 days as a result of that accident". This might be applied also for other injuries.

The 15-17 year age-group is highly desirable, to reflect adolescent deaths. In the short-term, given the current extensive use of quinquennial age bands, it may be necessary to use 15-19 inclusive.

Data sources
Death registration systems

Data availability
High, though not all may currently have social class.

Not all sources may have the 15-17 years inclusive category, but we think it important to achieve this as soon as possible, to represent adolescent interests.

References
Blumenthal S.J., Kupfer D. J. (eds) (1990) Suicide over the life cycle. Washington: American Psychiatric Press.

Centre for Disease Control and Prevention . Rates of homicide, suicide and firearm-related death among children – 26 industrialised countries. Morbidity and Mortality Weekly Report 1997; 46: 101-5.

Indicator: Incidence of Childhood Cancer

Operational definition
Annual incidence of childhood cancer per 100,000 population, for
- a) Leukaemia
- b) Malignant Brain/CNS tumours
- c) Other malignant tumours

in the age-groups 0-14, 15-17 and in total.

Justification for selection
- The most serious diseases for children born healthy are probably any form of malignant disease that would be deadly without treatment. The most common childhood cancers are leukaemia.
- Of solid tumours, brain, or central nervous system tumours dominate. The rest is a mixture of other, more or less rare forms.
- The causes of childhood cancer are still incompletely understood, but a proportion are environmentally related.
- The seriousness of childhood cancer should provoke the necessity of a constant surveillance.
- This surveillance at population level is also important to identify correlation with possible new causes.
- This is a set of conditions which has a high personal, family, and social burden.

Technical criteria
Defined by ICD 10 codes:
- a) Leukaemia (ICD10 codes C91-95)
- b) Malignant Brain/CNS tumours (ICD10 codes C69-C72)
- c) Other malignant tumours (ICD10 codes C00-C68, C73-C90, C96-C99)

Data sources
Cancer registries

Data availability
Available in most European countries for age-group 0-14 years; 15-17 may need new database analyses (pending which 15-19 may have to be used)..

References

Indicator: Incidence of Childhood Diabetes

Operational definition
Age-specific annual incidence of Type 1 insulin-dependent diabetes per 100,000 population, in age-groups 0-4, 5-9, 10-14, 15-17 and in total.

Justification for selection
- Diabetes is a group of disorders of different aetiology, characterised by a high level of glucose in blood. We focus on childhood diabetes, Type 1 diabetes, characterised by lack of insulin production, and one of the most common chronic and life-long diseases acquired in childhood, with a significant ongoing ill-health burden.
- The seriousness and burden of the disease, the changing panorama around the world and the questions of aetiology, warrant a good surveillance among children.
- The seriousness of the disease, and the amount of complications from the disease at older ages, have brought WHO to organise a group of researchers to study the global incidence and burden of the disease: The Diabetes Mondiale (DiaMond) Project Group (Karvonen *et al*, 2000).
- The incidence in Europe is highest in the north, especially in Finland (36.5/100000 per year), and in Norway and Sweden it is about 20. The incidence decreases towards the south, apart from Sardinia, which matches Finland in incidence.
- The age of onset is rarely before 5 years of age, and there is a peak before 15 years.
- Many countries in the world have now established registries for diabetes, and it is possible to keep a surveillance of the incidence (Anon., 2000; Green, Patterson, 2001; Karvonen, 2000)

Technical criteria
There are ethnic differences which ought to be taken into account, but we record elsewhere the current difficulty in reaching effective European definitions.

The incidence is usually presented as number of cases per 100,000 person years (PYR), but we have opted for the simpler to calculate incidence rate.

A dedicated HMP project is addressing diabetes, but primarily from the adult treatment and disease sequellae viewpoints. It is believed that this indicator complements their work, but this should be verified at the time of integration into the overall ECHI indictors set, b y addressing onset in childhood.

Data sources
Diabetes registers

Data availability
Many European countries

References
Anonymous. Variation and trends in incidence of childhood diabetes in Europe. EURODIAB ACE Study Group. Lancet 2000; 355: 873-6.

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Green A. Patterson CC. The EURODIAB TIGER Study Group. Europe and Diabetes. Trends in the incidence of childhood onset diabetes in Europe 1989-98. Diabetologica 2001; suppl 3: B3-8.

Karvonen M, Viik-Kajander M, Moltchanova E, Libman I, LaPorte R, Tuomilehto. Incidence of childhood type 1 diabetes worldwide. Diabetes Mondiale (DiaMond) Project Group. Diabetes Care 2000; 23: 1516-26.

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Indicator: Prevalence of Childhood Asthma

Operational definition
Prevalence of asthma, by gender, in age-groups 0-4, 5-9, 10-14, 15-17, by socio-economic group.

Justification for selection
- Asthma is the most prevalent chronic condition in childhood (Gröholt *et al*, 2001).
- This illness (along with the other atopic conditions of eczema and allergic rhinitis) are chronic conditions that have increased rapidly in all western countries.
- The condition does not necessarily become life-long and the mortality seems to have decreased, but due to the vast number of children being affected, and the steadily rising prevalence, it is an important condition to monitor.
- Because of the difficulties in the surveillance of asthma, an international effort has been taken in order to obtain comparable results in the different countries: The International Study of Asthma and Allergies in Childhood (ISAAC) (1998).
- The aetiology is at present very unclear, even if there are atopic components. Even if the disease has a genetic component, there is every reason to believe that environmental factors are important.
- The causes are not fully understood. However, this underpins the importance of effective surveillance.

Technical criteria
There is no standard definition. The data will need to be collected by survey question.

Data sources
National health or household surveys.

Some registers currently exist, but are not appropriate as data sources for surveillance – they are local, usually based on secondary care and thus more serious cases, and definitions may not be standard.

Data availability
Variable at present

References
Gröholt E-K, Stigum H, Nordhagen R, Köhler L. Children with chronic health conditions in the Nordic countries in 1996 – influence of socio-economic factors. *Ambulatory Child Health,* 2001; 7: 177-89.

International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. Worldwide variations in the prevalence of asthma symptoms: the International Study of Asthma and Allergies in Childhood (ISAAC). *European Respiratory Journal*, 1998; 12:315-35.

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Indicator: Incidence of Specific Childhood Infectious Diseases

Operational definition
Annual incidence per 100,000 population of
>   a) Measles
>   b) Bacterial meningitis
>   c) Tuberculosis

in age-groups 0-4, 5-9, 10-14, 15-17, by socio-economic group.

Justification for selection
- Vaccine programs for the most important childhood infections have been introduced in most European countries. In principle, diseases such as diphtheria, tetanus, measles, pertussis, mumps, rubella, poliomyelitis and haemophilus influenza type b should be eradicated. However, there are children who are missed in the programme, for instance due to certain vaccine resistance in the population, as well as philosophical or religious reasons. We also know that some vaccines might not be adequately protective, so that even if good vaccine coverage surveillance systems exist, as well as measures of immunity in the population, a surveillance of the occurrence of any of these diseases might in addition be necessary.

- Two tracer vaccine-preventable infectious diseases are selected - measles because of its lower immunisation rate and other controversies; meningitis because of its potential seriousness.

- A hundred years ago, tuberculosis was the great killer among children and youths, in infancy, as well as for older children. Therefore, thorough surveillance systems for tuberculosis were established.

- Tuberculosis in children has been nearly eradicated during the last century. However, new cases of have been reported in Europe lately. Many (but not all) the cases were reported in immigrants, mainly from Asia and Africa.

- It is still a reason for keeping the surveillance systems alert, especially since resistant bacteria are occurring.

- HIV would be desirable to measure, as it has a heavy illness burden, is a modern disease, and reflects other issues including the quality of ante-natal care, but adequately reliable data cannot be assured at this stage.

Technical criteria
EU case definitions were published in the Official Journal of the European Communities, L86, 3.4.2002, pp.44-62, as follows:

General Principles for the Application of Case Definitions
1. Unless specifically stated, only symptomatic cases are to be reported. Asymptomatic infections are to be regarded as cases, however, if the infection has therapeutic or public health implications.

2. A "case with an epidemiological link" is a case that has either been exposed to a confirmed case, or has had the same exposure as a confirmed case (e.g. eaten the same food, stayed in the same hotel, etc).

3. A 3-tiered system with following levels is used:
   - Confirmed case: verified by laboratory analysis;

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- Probable case: clear clinical picture, or linked epidemiologically to a confirmed case;
- Possible case: indicative clinical picture without being a confirmed or probable case;

The classification on these different levels might vary according to the epidemiology of the individual diseases.

-Clinical symptoms listed are only given as indicative examples, and are not exhaustive.

-For most diseases, several 'criteria for laboratory diagnosis' are listed. Unless otherwise stated, only one of these is needed to confirm a case.

Measles (EU definition)
Clinical description
Clinical picture compatible with measles i.e. a generalised erythematous rash lasting >3 days and a temperature >38.0 C and one or more of the following cough, coryza (rhinitis), Koplik's spots or conjunctivitis

Laboratory criteria for diagnosis
- Detection of measles IgM antibody in absence of recent vaccination,
- Demonstration of a specific measles antibody response in absence of recent vaccination
- Detection of measles virus (not vaccine strains) in a clinical specimen.

Case classification
Possible: A case diagnosed by a physician as measles
Probable: A clinically compatible case
Confirmed: a case that is laboratory confirmed or a clinically compatible case
with an epidemiologically link. A laboratory-confirmed case does not need to meet the clinical case definition.

Meningococcal Disease (EU definition)
Clinical description
Clinical picture compatible with meningococcal disease e.g. meningitis and/or septicaemia that may progress rapidly to purpura fulminans, shock or death. Other manifestations are possible.

Laboratory criteria for diagnosis
-isolation of *Neisseria meningitides* from a normally sterile site (e.g. blood or cerebrospinal fluid(CSF) or, less commonly, joint, pleural or pericardial fluid)
-detection of *N. meningitides* nucleic acid from normally sterile site
-detection of *N. meningitides* antigen from normally sterile site
-demonstration of gram-negative diplococci from normally sterile site by microscopy

For probable case
-single high titre of meningococcal antibodies in convalescent serum.

Case classification
Possible: N.A.
Probable: A clinical picture compatable with invasive meningococcal disease without any laboratory confirmation or with *N. meningitides* identification from a non-sterile site, or with high levels of meningococcal antibodies in convalescent serum
Confirmed: A clinical compatable case that is laboratory confirmed

(note that asymptomatic carriers should not be reported)

Bacterial Meningitis (Other) (proposed project definition; no existing EU definition)
Clinical description

Bacterial meningitis manifests most commonly with fever, headache, and a stiff neck; the disease may progress rapidly to shock and death. However, other manifestations may be observed.

Laboratory criteria for diagnosis
Isolation of a bacterial species from the cerebrospinal fluid

Case classification
Possible: N/A
Probable: N/A
Confirmed: Isolation of a bacterial species from the cerebrospinal fluid. If a diagnosis meningococcal, pneumococcal or *haemophilus influenzae* B meningitis has been made see definition for particular organism

Tuberculosis (EU Definition)

Clinical criteria
A clinician's judgement that clinical and/or radiological signs and/ or symptoms are compatible with tuberculosis
and
A clinician's decision to treat the patient with a full course of anti-tuberculosis therapy.

Laboratory criteria for diagnosis
Isolation of *Mycobacterium tuberculosis* complex (except *M bovis* BCG) from any clinical specimen by culture, or
Evidence of acid-fast bacilli (AFB) at microscopic examination of spontaneous or induced sputum

Case classification
Classification according to laboratory criteria
Definite:
A case with isolation of *M tuberculosis* complex (except *M bovis* BCG) from any clinical specimen. In countries where culture is not routinely available, a case with sputum smear examinations positive for AFB is also considered to be a definite case.

Other than definite:
A case that meets the clinical criteria above but does not meet the laboratory criteria of a definite case.

Classification according to the site of disease
Pulmonary tuberculosis
Tuberculosis of the lung parenchyma or the tracheo-bronchial tree

Extrapulmonary tuberculosis
Tuberculosis affecting any site other than pulmonary as defined above

Classification according to previous anti-tuberculosis treatment
Never treated

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A case who never received a treatment for active tuberculosis in the past or who received antituberculosis drugs for less than one month.

Previously treated
A case who was diagnosed with active tuberculosis in the past and received anti-tuberculosis drugs (excluding preventive therapy) for at least one month

Bacterial meningitis should include all causative agents.

Data sources
Infectious disease notification systems; public health laboratories

Data availability
Generally available in all countries, but not homogenous.

References

Indicator: Child Dental Morbidity

Operational definition
Mean dmft index for 5 year old children and mean DMFT index for 12 year old children respectively, by socio-economic group when available.

Justification for selection
- Dental health is a health problem in its own right. It is also associated with other health problems.
- Dental morbitity demonstrates an easily accessible and distinct social gradient: the higher the family socio-economic grouping, the lower morbidity. "Open the child's mouth and look at his social class".
- The surveys on dental health are built on an international classifications system, recorded as dmft/DMFT (decayed, missing, filled teeth) of milk teeth (small letters) and permanent teeth (big letters), respectively, per individual.
- The dmft have usually been recorded at 5 years of age, and the DMFT at the age of 12.
- There are great differences between European countries during the 1980's and 1990's, but all countries seem to show a downward trend.
- WHO has included data on oral health in reports from "Global Oral Data bank". The data have been obtained by standard surveys assisted by WHO, and might be found on the WHO web (WHO).
- An important project "Children's Dental Health in Europe" has been carried out in Sweden (Bolin, 1997). The study comprises data from 5- and 12-year old children from eight EU countries/cities.

Technical criteria
WHO definitions should be used.

Data sources
School health services, surveys.

Data availability
Currently variable.

References
Bolin A-K. Children's Dental Health in Europe. An epidemiological investigation of 5- and 12-year-old children from eight EU countries. Thesis, Stockholm 1997. The Institute for Postgraduate Dental Education. Swedish Dental Journal 1997; suppl. 122: 1-88.

WHO Oral Health Country/Area Profile programme. Chosen region: Europe – "EURO".www.whocollab.od.mah.se/euro.html

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Indicator: Burns to Children Necessitating Hospital Admission

Operational definition

Annual rate of overnight hospital inpatient admissions of children suffering burns, per 100,000 population, by male, female and total, in age-groups 0-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Justification for selection

- They may be caused by dry heat, scalds, chemicals and (rarely in children) radiation.
- In Germany, for example, 20 000 children are suffering by burns per year which represent avoidable injuries.
- In Austria, hospital diagnosis related statistics show that about 1 600 hospitals admissions are caused by burns. About 1/3 concern children in the age <5 years. Unfallstatistik 2000)
- Other countries too have data from national published studies.
- Major burns (II + III) can have serious effects, and may necessitate lengthy and painful treatment, and create a lasting burden.

Technical criteria

Based on overnight inpatient admission, for 1 or more nights.

Defined by a discharge diagnosis of burn (by ICD10 codes T20-T32, W8n, X0n, X3n, X1n),

Data sources

Hospital discharge data

Data availability

Generally available, if not currently analysed in this form.

References

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Myklestad I, Engeland A. Home accidents among small children and preventive potential. *Tidsskr Nor*, 2000; 120: 3376-9.

Ptridou E, Trichopoulos D, Mera E, Papadatos Y, Papazoglou K, Marantos A, Skondras C. Risk factors for childhood burn injuries: a case-control study from Greece. *Burns*, *1998*; 24: 123-8.

Indicator: Poisoning in Children Necessitating Hospital Admission

Operational definition

Annual rate of overnight hospital inpatient admissions of children suffering from poisoning, per 100,000 population, by male, female, and total, in age-groups 0-4, 5-9, 10-14, 15-17, and by socio-economic group when available.

Justification for selection

- Poisoning represents avoidable injury. It may be self-administered, accidentally or intentionally (self-harm). Standards of safety in the home or elsewhere may be a contributory factor.
- 26% of poisonings in childhood are caused by plants, followed by chemicals, medicines and food
- For instance, in Austria there are about 1 600 hospital admissions per year caused by poisoning (excluding Industrial accidents!). About 20% of these concern children in the age 1<5, about 6% 5<15 years. Main substances are medicines, vegetable poisoning (plants) and chemicals (Institut Sicher Leben, Unfallstatistik 2000)
- Forms of poisoning can have serious effects, and may necessitate lengthy and painful treatment, and create a lasting burden.
- Any avoidable hospital admission has a traumatic effect, particularly as an emergency.

Technical criteria

Based on overnight inpatient admission, for 1 or more nights.

Defined by a discharge diagnosis of poisoning (by ICD10 codes T65.9, X40-49),

Data sources

Hospital discharge data, national statistics for accidents

Data availability

Generally available, if not currently analysed in this form.

References

EURORISC. Newsletter 3. http://www.euro.risc.net

Institut Sicher Leben, Unfallstatistik 2000 .68-71

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Mühlendahl KE, Oberdisse U, Bunjes R, Ritter S: Vergiftungen im Kindesalter. Stuttgart 1995; 3. Auflage: 301-303

Österreichische Ärztegesellschaft für Homotoxokologie

Indicator: Fracture of Long-bones in Children

Operational definition
Annual incidence per 100,000 population of fracture of long-bones defined by specific ICD10 code, by male, female and total, in age-groups 0-4, 5-9, 10-14, 15-19, and by socio-economic group when available.

Justification for selection
- Fracture of a longbone is a tracer condition for moderate or severe trauma. It is selected for comparability of diagnosis, lack of observer/clinician bias, and broad similarity of treatment – namely that hospital admission is nearly always needed.
- Accident and trauma are by definition stressful conditions for children. Hospital admission, usually through a casualty or accident department, deepens this.
- Treatment will be impairing in the short term. A not insignificant proportion of cases may have enduring functional impairment.

Technical criteria
ICD 10 codes: S421- S424, S427, S429-S529, S720-S724, S728-S729, S820-S829, T10, T12, T022-T026, T028-T029.

Data sources
Hospital discharge data

Data availability
Generally available, but may need special analyses.

References
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Martin JS. Marsh JL. Current classification system of fractures. Rationale and utility (Review) Radiologic Clinics of North America 1997; 35: 491-506.

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Indicator: Attempted Suicide by Children

Operational definition
Annual incidence of attempted suicide, defined by inpatient hospital stays with a discharge diagnosis of attempted suicide, per 100,000 population, by male, female, and total, in age-groups 10-14 and 15-17, and by socio-economic group when available.

Justification for selection
- The World Health Organisation has stated that suicide is a major public health problem.
- Suicide is one of the three leading causes of death among young people.
- It is estimated that 14% of all suicides are committed by young people between the ages of 15 and 24.
- There is a major ongoing burden for the young person and their family.

Technical criteria
Defined by ICD10 codes X60-X84, Y87.0

Data sources
Hospital discharge data

Data availability
Good general availability.

References
Blumenthal S.J., Kupfer D. J. (eds) (1990) *Suicide over the life cycle.* Washington: American Psychiatric Press.

Brent D.A., Beugher M., Bridge J., *et al* (1999) Age- and sex-related risk factors for adolescent suicide. *Journal of American Academy of Child and Adolescent Psychiatry,* 38,

Cutler, DM, Glaeser, EL, Norberg, KE. (2001) Explaining the rise in youth suicide; in *Risky Behaivor among youths: An economic analysis.* Chicago, National Bureau of Economic Research, pp. 219-269.

Williams, Mark (1997) *Cry of Pain: Understanding Suicide and Self Harm.* London, Penguin.

Indicator: Breastfeeding

Operational definition

(a) Percentage of newborn children exclusively breastfed at hospital discharge or immediately after birth.
(b) Percentage of all 6 month old children exclusively breastfed at 6 months.
(c) Percentage of all 12 month old children receiving breastfeeding at 12 months.

Justification for selection

- Breastfeeding is a protective factor with positive impact on child health in the short term (e.g. diarrhoea), medium term (atopy) and long-term (e.g. obesity and diabetes type 1).
- Breastfeeding has shown to be important both as an indicator for optimal growth and development and as a preventive determinant against the development of obesity in childhood.
- Breastfeeding rates reflect national health promotional success in member states in support of breastfeeding.

Technical criteria

Exclusive breastfeeding: The infant receives breast milk (including expressed milk or from a wet nurse) and is allowed to receive drops and syrups (vitamins, minerals, medicines). The infant is not allowed to receive anything else (in particular water, non human milk, and food-based fluids).

Breastfeeding: The infant receives breast milk, and is allowed any food or liquid including non-human milk.

The pattern of breastfeeding established immediately after birth is very important. \given the difficulty of collecting domiciliary data, international convention is to collect data on the pattern of breastfeeding at hospital discharge, notwithstanding that this varies slightly as to elapsed days. For domiciliary births the established pattern of feeding after birth is recorded. The denominator is total live births.

These definitions are international ones from WHO initiatives.

Some commentators advocate measuring breastfeeding (partial or supplemented) at six months in addition to exclusive breastfeeding, but there are problems of definition and thus exclusive breastfeeding is seen currently as the sounder measure. It might be appropriate to permit recording of (any) breastfeeding at six moths in national data sets as an additional optional item.

The project has also collaborated with the Nutrition HMP project, which is recommending a similar indicator set for breastfeeding.

Data sources

Initiation from hospital data, surveillance data collected in child health services, and surveys at older ages

Data availability

Data on initiation are generally available in most countries. Data availability for other ages is variable.

References

Hanson LÅ, Korotkova M, Håversen L, Mattsby-Baltzer I, Hahn-Zoric M, Silfverdal SA, Strandvik B, Telemo E. Brestfeeding, a complex support system for the offspring. *Pediatr Int*, 2002;44(4):347-52.

Kramer MS, Kakuma R. *The optimal duration of exclusive breastfeeding: a systematic review.* Geneva: World Health Organization (WHO/NHD/01.08), 2002; 47 pages.

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Indicator: Exposure of Children to Household Environmental Tobacco Smoke

Operational definition
Percentage of children aged 0-4 living in households where any member of the household smokes, by socio-economic group when available.

Justification for selection
- ETS is the single most important indoor air pollutant in the developed countries
- Exposure to ETS is associated to a variety of acute and chronic health effects
- Exposure of children to ETS at home can be substantially reduced by information and education
- The vulnerability of children to the effects of ETS is highest in the first years of life.

Technical criteria
Exposure to ETS is defined as indoor exposure to any non-occasional (i.e. at least weekly) tobacco smoke. This will be ascertained through a survey question such as the following: "Does any member of the family smoke inside the house, at any time during the day, at least once weekly?" This criterion/question/indicator is more precise, easier to apply and actually more closely linked to actual exposure than other suggested indicators such as percentage of homes with children where at least one of the parents smokes. Stricter criteria, based on actual quantity of cigarettes smoked, cannot be based on any existing evidence about safe thresholds and are subject to variable interpretations when used in surveys.

Data sources
Household Surveys; ad hoc surveys

Data availability
Depending on the incorporation of the item in existing household surveys; alternatively, ad hoc surveys (telephone-based or interview based) on a sample of the population can be easily carried out as a separate initiative or within the well-child or immunisation visits.

Notes and comments
The indicator provides a good basis for temporal and geographical comparison of a relatively crude "yes/no" exposure measure. A more accurate quantitative assessment of exposure to ETS at home requires either more complex and expensive survey instruments, or direct biomonitoring, such as by cotinine measurements in children. Both approaches are recommended for research purposes, but at present are not suitable as a basis for an indicator system at population level.

References
DiFranza JR, Lew RA. (1996). Morbidity and Mortality in Children Associated with the Use of Tobacco Products by Other People. *Pediatrics*. 97(4):560-568.

Cook DG, Strachan DP. (1999). Health Effects of Passive Smoking -10: Summary of effects of parental smoking on the respiratory health of children and implications for research. Thorax 1999 Apr; 54(4):357-66

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European Environment Agency and WHO Regional Office for Europe "Children's environmental health: review of the evidence", Copenhagen, 2002

http://www.who.it/childrenhealth

US Environmental Protection Agency "America's children and the Environment: a first view of available measures. USEPA, 2000

Indicator: Parental Support for Children

Operational definition
Percentage of children who report that they find it easy or very easy to talk with their parents when something is really bothering them, as a percentage of all children, by male, female and total, at ages 11,13 and 15, and by socio-economic group when available.

Justification for selection:
The HBSC survey in 1997/98 found medium or strong associations between difficulties in talking to parents and the following health behaviours: drink alcohol more often, have more experiences of drunkenness, smoke more often (but not in boys 11 years old), and for the following social psychological/mental health indicators: difficulties in talking to friends and elder siblings; a low number of close friends, feel less happy, feel lonely more often, feel helpless more often (not in boys 11 years old and 15 years old) (WHO: 2000). HBSC 1993/94 found moderate or strong correlations between good communication with parents and some psychological and school factors: feel happy, positive attitude towards school, perceived parental support as to school problems, not feel helpless, feel confident, and in girls not having depression, not having sleep disturbances, and not feeling tired in the morning. There were week correlations with non-smoking in 15 years old of both sexes in a few countries (WHO:1998). A Danish study showed positive associations between good parental communication and daily breakfast, daily intake of fruit, daily intake of vegetables, always using sit-belts when in a car, organised sports and believing that you yourself can do something to keep in good health. Additionally, there was an association with personal and social competencies and with self-evaluated health, but not with symptoms or health evaluated by the school doctor. Pupils with good parental communication would less frequently than others smoke, drink alcohol or ever have used cannabis (Petersen et al, 2000). Earlier longitudinal studies have shown that a good relationship with at least one parent may be protective for children in risky environments against mental diseases, and problematic behaviours (Rutter, 1990).

Technical criteria:
Core questions in the HBSC

Data sources:
HBSC or similar surveys

Data availability:
Good in HBSC countries

References:
Currie C, Hurrelmann K, Settertobulte W, Smith R, Todd J. Health and health behaviour among young people. HBSC and WHO Regional Office, Copenhagen : 2000.

King A, Wold B, Tudor-Smith C, Harel Y. The health of youth. A cross-national survey. HBSC and WHO Regional Office, Copenhagen: 1996.

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Rutter M. Psychosocial resilience and protective mechanisms. *In:* Risk and protective factors in the development of psychopathology (editors: Rolf J et al). New York, Cambridge University Press, 1990. (p 181-214).

Indicator: Physical Activity by Children

Operational definition

Percentage of children reporting that that they undertake vigorous activity outside of school hours for at least two hours a week, by male, female and total, at ages 11, 13, 15, and by socio-economic group when available.

Justification for selection

Physical activity is a protective factor for health problems such as obesity, type 2 diabetes and overweight, and a range of chronic diseases.

Technical criteria

Data sources

HSBC is one data source

Data availability

Good in HBSC countries - Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Norway, Portugal, Spain, Sweden and United Kingdom

References

Department of Health and Human Services (1996). Physical activity and health. A report of the Surgeon General executive summary. Atlanta, GA: U.S Department of Health and Human Services, Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion. The President´s Council of Physical Fitness and Sports.

WHO (2000). Health and Health Behavior Among Young People. Copenhagen; WHO Regional Office in Europe.

Indicator: Tobacco Smoking by Children

Operational definition
Percentage of children reporting that they smoke every week, by male, female and total, at ages 11, 13, 15, and by socio-economic group when available.

Justification for selection
- Tobacco is a risk factor for many health problems including lung cancer and atherosclerosis.
- The national patterns of use of tobacco by adolescents do not necessarily correspond to those of current adults. Adolescent tobacco use is highly indicative of national patterns in the near future.
- Adolescents are a prime target group for tobacco use promotion.

Technical criteria
Has been evaluated in the WHO HSBC study.

Data sources
Surveys, including the HBSC

Data availability
HSBC survey includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Norway, Portugal, Spain, Sweden, and United Kingdom.

References
WHO. Health and health behavior among young people. WHO Regional Office in Europe, 2000.

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Indicator: Alcohol Abuse by Children

Operational definition

Percentage of children aged 15 reporting that they have been drunk from alcohol consumption on two or more occasions, by male, female and total, and by socio-economic group when available.

Justification for selection

- Alcohol is a risk factor for many health problems including liver disease, psychiatric disorders and injury morbidity.
- Excess alcohol is also closely associated with traffic and pedestrian accidents, other accidents, and violent behaviour.
- Excess use of alcohol, and binge drinking, is a much more significant risk factor than moderate regular consumption.
- The national patterns of use of alcohol of school children do not correspond to those of adults.

Technical criteria

Has been evaluated in the WHO HSBC study.

Data sources

Surveys, including the HBSC

Data availability

HSBC survey includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Norway, Portugal, Spain, Sweden, and United Kingdom.

References

Pape H, Hammer T. (1996) How does young people's alcohol consumption change during the transition to early adulthood? A longitudinal study of changes at aggregate and individual level. *Addiction*; 91: 1345-1357.

WHO. Health and health behavior among young people. WHO Regional Office in Europe, 2000.

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Indicator: Substance Misuse by Children

Operational definition

Percentage of 15-year old school children who report that they have:
(a) used cannabis more than twice during the last 30 days;
(b) ever used heroin; and
(c) ever used ecstasy,
by male, female and total, and by socio-economic group when available.

Justification for selection

- Experimental substance abuse is common in early adolescence, but only a minority become addicted to illicit drugs.
- Regular use of cannabis was associated with truancy and with alcohol use and smoking in a Danish study (Sabroe, 1996). Regular use of cannabis may result in truancy, poor school performances and poor school achievements partly because of the long duration of the effect of cannabis on the brain. Heroin is dangerous because users rapidly may become dependent and addicted, and because it is so expensive adolescents run a high risk for becoming involved in delinquency, drug dealing and prostitution. Ecstasy may result in acute psychosis.
- Substance abuse and dependence at the ages of 15-24 is frequently associated with mental disorders such as depression.
- In addition, substance use among young people presents a high risk of developing severe mental disorders in adulthood (European Commission, p28).
- An indicator is therefore important, but one which measures regular use, not isolated experimentation.
- These three substances are selected as tracers or representatives of the wide and constantly changing range of substances which may be misused.

Technical criteria

List of drugs and substances to include: amphetamines, anabolic steroids, barbiturates, cannabis, cocaine, ecstasy, glue, heroin, LSD, magic mushrooms, methadone, nitrates.

Has been evaluated in the WHO HSBC study.

Data sources

Core questions in the European School Survey Project on Alcohol and other Drugs (ESPAD) study.

Data availability

Good in ESPAD countries, ESPAD covers most European countries, Belgia and parts of Germany will probably enter the data collection in 2003. Data collection in 1995, 1999, 2003.

References

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Hibell B, Andersson B, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A., Morgan M. The 1999 ESPAD Report. Alcohol and other drug use among students in 30 European countries. The European School Survey Project on Alcohol and other Drugs, ESPAD; The Sweidish Council for Information on alcohol and other drugs, CAN; Council of Europe, Pompidou Group: Stockholm, 2000.

Roberts C, Kingdon A, Parry-Langdon N, Bunce J. (2002) *Young People in Wales: findings from the Health Behaviour in School-Aged Children (HBSC) study 1986-2000.* Health Promotion Division, Welsh Assembly Government, Cardiff.

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Schaar, I; Ojehagen, A. (2001) Severely mentally ill substance abusers: an 18-month follow-up study. *Social Psychiatry and Psychiatric Epidemiology.* 36(2**): 70-8.**

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Indicator: Childhood Overweight and Obesity

Operational definition
Percentage of children at school entry who are overweight or obese as measured by the age- and sex-specific international reference standards for Body Mass Index; optionally also at 10 and 15 years.

Justification for selection
Obesity is associated with both adverse physical and mental health status in childhood and in later adult life. The International Obesity Task Force (IOTF) standards have been used to compare prevalence of obesity across a number of countries (USA, Brazil, China, and Russia) already. The prevalence of child obesity is increasing rapidly worldwide, and it is a major child public health issue requiring preventive and curative action. In the USA, 5% of health care costs are spent on obesity related problems.

Technical criteria
- The cut-offs are the 91st. and 98th. centiles of the IOTF reference curves (namely those which at age 18 years intersect the 25 and 30 kg/m^2 BMI levels.
- Is dependent on reliable and consistent methods of measuring height and weight.

Data sources
Routine school health data collected at periodic examinations.
Special surveys.

At primary school entry as the core indicator; at 10 and 15 years also for those countries with adequate measurement and recording systems at these additional ages.

Data availability
Most European countries have school health surveillance programmes. The age at ascertainment or weight and height measures are likely to vary, and further standardisation across the EU would aid valid age-specific comparison.

References
Berenson GS, Srinivasan SR, et al. Obesity and Cardiovascular Risk in Children. *Annals of the New York Academy of Science*, 1993, 699, 93-103.

Cole TJ, Bellizi MC, Flegal KM, Dietz WH. Establishing a Stabndard Definition for Child Overweight and Obesity; *British Medical Journal*, 2000, 320, 1240-1243.

Must A, Jacques PF, et al. Long term Morbidity and Mortality of Overweight Adolescents: The Follow-up of the Harvard Growth Study 1922-1935; *New England Journal of Medicine*, 1992, 327, 1350.

Wang Y, Manterio C, Popkin B. Trends of Obesity and Underweight in Older Children and Adolescents in the USA, Brazil, China, and Russia; *American Journal of Clinical Nutrition*, 2002, 75, 971-977.

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Indicator: Children in Care

Operational definition
Percentage of children who are under the care or formal supervision of statutory Social Welfare or Social Services agencies, by male, female and total, and age groups 0-4, 5-9, 10-14, 15-17.

Justification for selection
- Children come into care for a multitude of reasons. However in most cases, the reasons may result from, or cause, some sort of distress or trauma for the child.
- Children may be abandoned, unwanted or removed from care of their parents because they have been abused, neglected or behave beyond their parents' control. In some cases, illness, disability or drug abuse may have precipitated family breakdown. These factors all have some effect on the mental or physical health of the child. This distress is often compounded once they are taken into care.
- This is an extremely vulnerable group of children, both before and after they come into the care of the statutory services. As a result they may be very disruptive, difficult to get on with, or not make friends easily – which damages their self-esteem further as well as increasing the likelihood of marginalization.
- Aggression and frustration may be manifested in risk taking behaviour such as drug abuse or illegal activities (Webb, 1998, p. 1590).
- Children in the public care system are expected to live independently earlier than other children, have lower educational attainments, more likely to be unemployed, experience homelessness once they leave the care system and become teenage parents (Department for Transport, Local Government and the Regions, 1999. p. 3).

Technical criteria
Regulations for taking children into care, and the role of statutory services, very between member countries.

Even within country, the boundary in terms of need or seriousness between offering support, and formal care, may vary.

Care may be devolved to a relative, or to a voluntary or commercial organisation – the selection criteria is that this is on a formal basis with legal direction or reallocation of parental duties.

Data sources
Agency statistical returns.

Data availability

References
Department for Transport, Local Government and the Regions (2001) *Preventing Tomorrow's Rough Sleepers: A Good Practice Guide.* London

Webb E. (1998). Children and the Inverse Care Law. *British Medical Journal* 316; 1588 – 91.

Indicator: Early School Leavers

Operational definition
Percentage of children who leave school (voluntarily or by exclusion) before the statutory school leaving age, by male, female and total.

Justification for selection
- Early school leaving is associated with mental health problems, anxiety, disruptive behaviour and delinquency.
- Poor reading/low school attainment, poor rates of achievement in schools are known risk factors for mental health problems in children (Adapted from Buchanan quoted in North Wales Health Authority, 2001, p. 13).

Technical criteria

Data sources
Education service statistics

Data availability
Varies by country.

References
North Wales Health Authority (2001). *Strategy for Child and Adolescent Mental Health*. Mold, Wales.

Indicator: Pre-primary Educational Enrolment

Operational definition
Percentage of children aged 3 and under 5 years enrolled in a Level 0 (pre-primary) education or kindergarten programme, by male, female and total, and by socio-economic group when available.

Justification for selection
- For children, participation in high-quality early childhood education programmes has been shown to have short-term positive effects on IQ and achievement.
- Such participation has also demonstrated long-term positive effects on children's school completion and home ownership.

Technical criteria
UNESCO have devised a classification to enable the assembly of statistics on educational enrolment and attainment in a standard and internationally comparable form, irrespective of the structure of the education system or kinds of education existing within a country. Each country is required to examine its educational programmes and map its programme onto the UNESCO classification system

For the definition of the beginning and end of pre-primary education, i.e. the boundary between pre-primary education and childcare or between pre-primary and primary education, the following criteria are defined by UNESCO:

> *Main criteria*
> The educational properties of the programme
> School or centre based
> The minimum age of the children catered for and
> The upper age limit of the children
>
> *Subsidiary criteria*
> The staff qualifications

For a programme to be considered as pre-primary education, it has to be school-based or centre-based. These terms are used to distinguish activities in settings such a s primary school, pre-schools and kindergartens from services provided in households or family settings.

Data sources
Population censuses, household surveys
Routine data sources – in countries where a registration system for pre-school exists.

Data availability
Varies by country.

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References

International Standard Classification of Education, UNESCO, 1997

Berrueta-Clement JR, Schweinhart LJ, Barnett WS, Epstein AS, Weikart DP. *Changed lives: the effects of the Perry pre-school program on youths through age 19*. Ypsilanti, MI: High Scope Press, 1984.

OECD. *Starting Young – Early Childhood Education and Care*, OECD, Paris, 2001.

Indicator: Air Pollution Exposure of Children

Operational definition
Percentage of children aged 0-14 living in localities with an annual mean concentration of > 40 ppm of PM10.

Justification for selection
- Exposure to air pollution is associated with adverse perinatal outcome, and with infant and child mortality and morbidity. Fine (diameter <10 microns) particulate matter (PM10) is the single air pollutant most closely associated with health effects in infants and children.
- The concentration of particulate matter under 10 microns (PM10) is routinely measured in most European countries, mainly in urban areas, by continuous fixed-site or movable monitors.
- The mean annual concentration is a widely used measure. 50 parts per million (50ppm) annual average concentration is the proposed threshold for the adult population and a lower threshold (40 ppm, although there is no safe threshold) has been proposed to take into account the higher vulnerability of children.
- The proportion of the population aged 0-14 living in areas where the annual mean concentration of the selected pollutant is above 40 ppm is the suggested indicator. An alternative indicator, proposed by WHO, is the population-weighted annual exceedance of reference concentration for a specific air pollutant (in this case the unit would be ppm/m3.). This indicator describes quantitatively the excess exposure, but fails to provide an immediately visible idea of the proportion of the population at higher risk.

Technical criteria
The annual mean PM10 concentration in as many as possible localities (urban or industrial zones) within a country and the demographic structure of the population living in these areas are the required data. The indicator will be calculated as a fraction with the numerator represented by the number of children population 0-14 living in geographical areas (cities or smaller residential areas) for which the annual mean is exceeding 40 ppm, and the denominator given by population 0-14 living in areas where the annual mean was below 40 ppm. When data are available for a limited number of areas within a country, it will be necessary to specify for what proportion of the total population the indicator can be considered valid.

Data sources
Local environmental air monitoring systems.
Local demographic offices.
Local Environmental Agencies and Health Authorities may have demographic data already incorporated in their data –bases.

Data availability
Linked to extension and quality of local environmental monitoring

Notes and comments
Due to insufficient spatial resolution of demographic data, it may not be possible to precisely define the population living in a specific area for which the air pollution data are available. In

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this case, the population can be estimated as an appropriate fraction of the population living in a larger area, assuming a homogeneous density and demographic structure.

Allowance needs to be made for the detection limits, accuracy and comparability of the measurement methods. In particular, care needs to be taken when comparing data from different monitoring networks, due to the possibility of differences in sampling or measurement techniques.

References
European Environment Agency and WHO, Regional Office for Europe. *Children's environmental health: review of the evidence*, Copenhagen, 2002
http://www.who.it/childrenhealth

WHO – EURO Environmental Health Indicators Core data set (2000)

US Environmental Protection Agency *America's children and the Environment: a first view of available measures.* USEPA, 2000

Indicator: Marginalised Children's Health Care

Operational definition
Is it national policy that children in all ages in the following groups have access to both immunisation and to non-emergency diagnostic investigations comparable to that offered the general resident child population?

- e) Asylum seekers
- f) Children of illegal immigrants / illegal residents
- g) Homeless children
- h) Culturally itinerant children (gypsies, Romany, etc.)

Justification for selection
a. The United Nations Declaration on the Rights of the Child emphasises the rights of all children to health and other care. By stating that all children under a state's 'jurisdiction' should be treated equally it sets out to protect the rights of all children who live on the margin of the society, such as war refugees or children of illegal immigrants. The term 'under its jurisdiction' is broader than residents and specifically chosen so that governments cannot exclude illegal or temporary residents. This principle of "non-discrimination' implies that migrant children should have the same access to care and educational institutions as everyone else in that society.

b. However, categories of disadvantaged children may not have equal access to services in the country in which they live. Their circumstances are beyond their individual control, and as children they cannot change their situation nor act as their own advocates. Their health is dependent upon a policy of equity and equal access by their host country.

c. The importance of herd immunity for the prevention of infectious disorders has been demonstrated in recent years with outbreaks of measles in the Netherlands (van den Hof et al 2001) and Great Britain (Hanratty et al 2000) in areas with low vaccine-coverage. Populations of migrant children, if left outside of national vaccination programmes, in the same manner may cause epidemics of measles, rubella, mumps and whooping cough that may spread into the general population. Thus, migrant children are important targets for vaccine programmes for their own sake as well as for the sake of the general population (Hjern & Allebeck 1995).

d. It is thought that around 35% of refugee children meet DSM-III criteria of mental/behavioural disorders, such as post traumatic stress disorder (PTSD) (Davies & Webb, 2000, p. 5) as a result of their experiences in their parent country and the many difficulties in settling in a new country.

e. The services selected are tracers. The importance of immunisation as a preventive service is clear. Non-emergency diagnostic investigations are usually subject to a formal referral and queuing mechanism whose equity may vary.

Technical criteria
This is a policy indicator, assessing eligibility. It does not seek to assess delivery of policies, because of the difficulties of defining and obtaining accurate data.

Data sources
Assessment of national policy

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Data availability
Response by national statistical office or policy unit for each country.

References

Davies, M & Webb, E. (2000). Promoting the psychological well being of refugee children. *Clinical Child Psychology and Psychiatry.* 5(4): 541-554.

Hanratty B, Holt T, Duffell E, Patterson W, Ramsay M, White JM, Jin L, Litton P. (2000) UK measles outbreak in non-immune anthroposophic communities: the implications for the elimination of measles from Europe. *Epidemiol Infect.*;125(2):377-83.

Hjern A, Allebeck P. (1997) Health examinations and health services for asylum seekers in Sweden. *Scand J Soc Med.*;25(3):207-9.

van den Hof S, van den Kerkhof JH, ten Ham PB, van Binnendijk RS, Conyn-van Spaendonck MA, van Steenbergen JE. (2001) [Measles epidemic in the Netherlands, 1999-2000] *Ned Tijdschr Geneeskd.*;145(52):2529-33.

Indicator: Parental Accompaniment of Hospitalised Children

Operational definition
Percentage of inpatient bed days of children aged under 16 occurring in hospitals where accompanying by 'parents' day and night is offered, as a percentage of all bed days for this age-group.

Justification for selection
- Hospitalisation is a traumatic and stressful event for children. In order to avoid the negative effects it is important to cope with the situation of stress during the hospital stay by the presence of a closely related person, normally a parent.
- Parents or other primary carers also can act as advocates for the child while present.
- There are current standards for child-friendly hospitals. Action for Sick Children (formerly National Association for the Welfare of Children in Hospital (NAWCH) in the UK, Améliorer les Conditions d'Hospitalisation des Enfants (APACHE) in France, and the Association Européenne pour l'Enfant à l'Hôpital (EACH) are specific examples.
- EACH is a strong European movement, having 11 Member States as members, plus Iceland, Norway, and Switzerland.
- At its first meeting in Leiden, Netherlands, in 1988, EACH adopted the Charte de l'Enfant Hospitalisé; this charter has the right to parental accompaniment day and night, regardless of age and condition, as its second right (second only to avoidance of unnecessary hospitalisation).
- The right to accompaniment by parents by day and night is a key feature of all these campaigns, and is a good tracer measure. (Older children may of course not wish to exercise this right – it is the existence of the right which is important as the policy assessment tracer, not the percentage uptake.)
- Accompaniment of the child in hospital is also an effective means of educating the parent into management of illness.
- This indicator thus measures progress in implementation of the European charter's objectives.

Technical criteria

Data sources
Hospital discharge data, mapped to knowledge of hospital policy.

Data availability
This is an example of where development of information sources is justified in terms of statistical evidence to protect the interests of children.

References
www.actionforsickchildren.org/

www.hospiweb.free.fr/APACHE

www.hospiweb.free.fr/APACHE/CHARTE.html

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wwww.icccpo.org/articles/psychosocial/charter_children_hospitals.html

Southall DP et al. (2000) The Child-Friendly Healthcare Initiative (CFHI): Healthcare provision in accordance with the UN Convention on the Rights of the Child. Child Advocacy International. Department of Child and Adolescent Health and Development of the World Health Organization (WHO), Royal College of Nursing (UK), Royal College of Paediatrics and Child Health (UK), United Nations Children's Fund (UNICEF), in: *Pediatrics*, 5, 1054-1064.

Indicator: Childhood Immunisation Coverage

Operational definition

Immunisation rates for childhood immunisation, expressed as children aged 24-35 months inclusive having completed primary courses of immunisation as a percentage of all children in that age-group, separately for the following antigens:

> diphtheria, pertussis, tetanus, poliomyelitis, haemophilus influenza type b, measles, mumps, rubella, hepatitis B, meningococcus C.

Justification for selection

- The importance of herd immunity for the prevention of infectious disorders has been demonstrated in recent years with outbreaks of measles in the Netherlands (van den Hof et al 2001) and Great Britain (Hanratty et al 2000) in areas with low vaccine-coverage.
- It is known to be disadvantaged or marginalized children who are most likely to miss out on immunisation services, although in some countries other negative factors prevail as well.
- Immunisation is one of the most powerful and cost-effective forms of primary prevention.

Technical criteria

This is the standard definition for immunisation uptake.

Data sources

National data sources

Data availability

References

Hanratty B, Holt T, Duffell E, Patterson W, Ramsay M, White JM, Jin L, Litton P. (2000). UK measles outbreak in non-immune anthroposophic communities: the implications for the elimination of measles from Europe. *Epidemiol Infect*.;125(2):377-83.

van den Hof S, van den Kerkhof JH, ten Ham PB, van Binnendijk RS, Conyn-van Spaendonck MA, van Steenbergen JE. (2001) [Measles epidemic in the Netherlands, 1999-2000] *Ned Tijdschr Geneeskd*.;145(52):2529-33.

Indicator: Survival Rates of Acute Lymphatic Leukaemia in Children

Operational definition
Five year survival rate for acute lymphatic leukaemia, in age-groups at diagnosis 0-4; 5-9; 10-14; 15-19.

Justification for selection
- The survival rate of leukaemia has improved, and is still improving, while this is not the case for other tumours.
- Quality of health services is known to vary. Many conditions are, in part at least, influenced by other factors, making general outcome measures difficult. Treatment of leukaemia is largely independent of such factors, making it a good tracer condition of health care outcome quality.
- The International Confederation of Childhood Cancer Parent Organisations (ICCCPO), a Europe-based international organisation, stated in its founding Valencia Declaration of May 1995, that "…child have, by established International right, the right to survive ..", and subsequently that "There is a dramatic drop in the survival rate in centers where care is sub optimal (even partially). This means that too many children that might be saved still die of cancer."
- This indicator thus combines measuring unnecessary deaths with monitoring children's fundamental rights.

Technical criteria
The internationally recognised five-year survival rate calculation method should be applied.

Acute leukaemia defined as ICD 10 codes C91-C95

Data sources
Cancer registries

Data availability
Good

References
www.icccpo.org/articles/general/valencia_declaration.html

Indicator: Physical Punishment of Children

Operational definition
Percentage of children in the country protected by law against physical punishment, expressed as a percentage of the national child population,
   c)   in schools and other places where children are looked after
   d)   in the home or by parents and family members.

Justification for selection
- Respect for children, and prohibition of physical punishment, is correlated with reduced abuse of children.

Technical criteria
Some laws are on a regional or local basis, so cover only a proportion of the national population.
Some laws only apply to certain types of school or other facility.

Data sources
Knowledge of statutes.

Data availability

References

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Indicator: Anti-bullying Policies in Schools

Operational definition
Percentage of children attending schools with a written anti-bullying policy in operation, as a percentage of all school children.

Justification for selection
- Bullying in school is a known risk-factor for mental health problems (Adapted from Buchanan quoted in North Wales Health Authority, 2001)
- Children who are chronically harassed by peers are more likely to contemplate suicide and to report physical as well as mental health problems. These relations were documented both concurrently and longitudinally over a 3-year period. Suicide ideation alerts one to look for serious mental health difficulties and physical symptoms can have cumulative effects such as poor school performance due to frequent absence (Rigby).
- Carney and Merrell found that data from large scale trials of comprehensive school wide programmes indicate that when used as a long-term ongoing solution rather than a quick fix in crisis situations, bullying behaviour can be reduced significantly. (Carney)
- Spivak – public health perspective on bullying – magnitude of its prevalence is considerable. Looks at relationship to short- and long-term risk of involvement in violence, evidence for effective strategies for prevention, intervention or both.
- Sheffield bullying project – funded by the Department for Education in 1991 – 1993. 23 schools in Sheffield developed anti-bullying policies and were supported in a number of other interventions such as playground improvements, staff training, curriculum anti-bullying project work and drama. Found that the interventions could successfully reduce bullying.
- Girls' bullying is less visible – and therefore harder to tackle. Popular stereotype of a bully is a male, but in the Sheffield bullying project it was found that 37% of girl victims were bullied only by boys, while 42% were bullied by girls and 22% by boys and girls. Girls do bully, and anti-bullying work must not have an unconscious emphasis on males (Eslea).
- The very existence of a written policy is an effective first step to addressing the problem.

Technical criteria

Data sources
Local education services

Data availability
In need of development

References
Cowie H, Olafsson, R. (2000) The role of peer support in helping the victims of bullying in a school with high levels of aggression. *School Psychology International*. 21(1): 79-95.

Eslea, M and Smith, PK. (1994) *Anti-bullying work in primary schools*. Poster presented at the Annual Conference of the Developmental Section of the British Psychological Society, University of Portsmouth, September 1994.

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Rigby, K (2001) *Health consequences of bullying and its prevention in schools* in Juvonen, Jaana (Ed) and Graham, Sandra (Ed) <u>Peer harassment in school: the Plight of the vulnerable and victimized</u> (pp.310-331) New York, US, The Guilford Press.

Spivak H, Prothrow-Stith D. (2001) The need to address bullying – an important component of violence prevention. *Journal of the American Medical Association.* 285(16): 2131-2132.

Indicator: **Policies to Promote Safe Mobility and Transport for Children**

Operational definition
Existence and actual enforcement of legislation and regulations establishing mandatory requirements for safe mobility and transport for children.

Justification for selection
- Injuries are the leading cause of death and disability in the European Union and the first cause of mortality after the first year of life in the European Region. Road traffic accidents represent the major cause of death and severe injury.
- Injuries in road traffic accidents in children are largely avoidable. Protection and restraint measures can reduce the death and damage rates, and legal mandates increase uptake significantly.
- Relevant outcome/health status indicators are included in the CHILD indicator set, but a policy indicator, besides being instrumental to policy promotion in this crucial area, may add value by allowing assessment and monitoring of the actual state of specific legislation.

Technical criteria

Existence and actual enforcement of national legislation and regulations and local plans establishing that:
   a) infants and young children must be transported in cars in approved child safety seats
   b) older children must wear safety belts
   c) children cyclists must wear safety helmets
   d) motorcyclist and motorcycle passengers under 18 must wear helmets
   e) speed limitation systems specifically aimed at protecting children are ensured in urban residential areas
   f) mobility plans are developed to promote safe walking and cycling to school

A composite index could be computed, by attributing a 0-2 score (0 not existing; 1 existing, clearly stated, partially implemented; 2 existing clearly stated and substantially enforced and implemented) to each of the six policy components.

Data sources
National Environment Agencies; Ministries of Transport.

Data availability
Given the qualitative character of the information required, availability should be good, with limitations essentially depending on the difficulty to assess the level of implementation for each area

References
Towner E. and Towner J. UNICEF's Child Injury League Table. An Analysis of Legislation.
Confederation of European Specialists in Paediatrics. EURECAAP Survey. European Evaluation of Children's and Adolescents' Accidents Prevention Policies. Luxembourg, 1997.

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European Child Safety Alliance. Priorities for Child Safety in the European unin:agenda fior Action. Amsterdam, 2001.

European Environment Agency and WHO, Regional Office for Europe "Children's environmental health: review of the evidence", Copenhagen, 2002.

Indicator: Policies to Protect Children from Exposure to Lead

Operational definition
Existence of legislation and regulations that limit the use of lead in building and decorating materials and establish bio-monitoring of babies and children at high risk.

Justification for selection
- Lead poisoning has adverse effects on child development, particularly on neurological and intellectual development. In the UK, 12% of children with developmental delay had lead level exceeding 10 micrograms\deciliter. In US children, where exposure to lead has been particularly high in the past due to the use of lead contaminated housing materials before the introduction of protective legislation in 1978, the lead - related burden of disease has been quantified as 4% of the total.
- After the phasing out of lead in gasoline, building and decorating materials are now the major source of lead pollution.
- Lead in plumbing, painting and other building materials can be phased-out through legislation and regulations.
- Where there is known to be a local high risk which cannot immediately be eliminated, bio-monitoring is an important secondary protection. exposure may be extremely variable depending on housing quality, and therefore on socio-economic status, and high risk households and communities should therefore be closely assessed through bio-monitoring even where the exposure of the general population to lead in very low.

Technical criteria

This is a qualitative composite indicator, based on three criteria :

- Existence of national legislation banning lead from building materials, plumbing and painting material.
- Actual enforcement of that legislation by periodic controls on old buildings.
- Existence of regulations establishing bio-monitoring of lead blood levels in children living in high risk areas due to poor housing conditions. For bio-monitoring, the threshold internationally accepted is 10 micrograms\deciliter, but there is consensus that this is not a "safety" threshold for children. The 0-5 age group should be given priority due to higher exposure and vulnerability.

A composite index can be computed, by attributing a 0-2 score (0 not existing; 1 existing, clearly stated, partially implemented; 2 existing clearly stated and substantially enforced and implemented) to each of the three policy components.

Data sources
National or local Environment Agencies. National Institutes of Health\Public Health Institutes.

Data availability
Depending on the quality of existing data bases, which is variable across countries.

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Notes and comments

The indicator suffers from the limitation of qualitative indicators, related to the variability of definitions and difficulties of precise assessment of actual implementation\coverage of programmes. Data on exposure to lead in European children are very scanty, therefore it is difficult to define the importance of protective measures. In the UK, 12% of children with developmental delay had lead levels exceeding 10 micrograms/deciliter. In US children, where exposure to lead has been particularly high in the past due to the use of lead contaminated housing materials before the introduction of protective legislation in 1978, the lead - related burden of disease has been quantified as 4% of the total.

It should be noted, however, that exposure may be extremely variable depending on housing quality, and therefore on socio-economic status, and high risk households and communities should therefore be closely assessed through bio-monitoring even where the exposure of the general population to lead in very low.

References

Banks E, Frretti L, Shucard D. Effects of low-level lead exposure on cognitive function in children: a review of behavioural neuropsychological and biological evidence *Neurotoxicity* 1997; 18:237-82

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http://www.who.it/childrenhealth

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EU Community Health Monitoring Programme
Child Health Indicators of Life and Development (CHILD) Project
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Indicator: Policies to Protect Children from Exposure to Potentially Hazardous Noise

Operational definition

Existence of policies aimed at assessing and reducing the exposure of babies and young children to potentially harmful noise in ICU units, day-care centres, schools and kindergartens.

Justification for selection

- Persistent loud noise is known not just to damage hearing, but to cause loss of concentration, behavioural change, and to adversely affect educational performance in children
- There is consensus on the need of better protection of children through the implementation of legislation and regulations to decrease noise pollution in residential areas and, in settings where the cause of noise cannot immediately be eliminated (for example external sources from high traffic highways, airports etc.), to decrease exposure through better isolation.
- An EU directive requires that cities over 250,000 inhabitants (later over 100,000) make a noise map. The EC is now working on harmonisation of calculation methods, data requirements, format and presentation of noise mapping information. Given the present very limited practice of noise monitoring in residential areas and public buildings, a policy indicator seems preferable to an indicator based on direct assessment of exposure (such as the percentage of children exposed to noise levels exceeding a defined level).

Technical criteria

1. Existence of written policies aimed to reduce the exposure of babies to noise in intensive care units (ICU).
2. Existence, implementation and enforcement of legislation and regulations aimed at reducing production of potentially harmful noise from transport systems or industries near residential areas.
2. Existence, implementation and enforcement of specified noise exposure parameters in such settings where children spend a substantial part of their time, such as day-care centres, schools and kindergartens
3. Existence of periodic assessment, at least in high-risk settings, of noise exposure in classrooms*.
4. Existence, implementation and enforcement of legislation and regulations aimed at reducing exposure through isolation measures in high risk buildings where children spend a substantial part of their time.

A composite index could be computed, by attributing a 0-2 score (0 not existing; 1 existing, clearly stated, partially implemented; 2 existing clearly stated and substantially enforced and implemented) to each of the five policy components.

* The WHO Guidelines for community noise recommend that during lessons the noise should not exceed 35 Laeq.

Data sources
National and Local Environmental Agencies.

Data availability
Given the essentially qualitative character of the information required, availability of information should be sufficient.

References
WHO Guidelines for Community Noise, WHO Geneva, 1999.

European Environment Agency and WHO, Regional Office for Europe "Children's environmental health: review of the evidence", Copenhagen, 2002
http://www.who.it/childrenhealth

WHO – EURO Environmental Health Indicators Core data set (2000)

Indicator: Policies to Reduce Exposure of Children to Environmental Tobacco Smoke

Operational definition
Existence and enforcement of laws and regulations aimed at protecting children from exposure to environmental tobacco smoke in public places.

Justification for selection
- Prenatal and post natal exposure to ETS is a well recognised risk factor for adverse perinatal outcome, infant and child respiratory morbidity, and possibly developmental delay
- Reduction of exposure of children to ETS can be effectively achieved through the adoption of policies aimed at protecting children from exposure to environmental tobacco smoke in public places.
- A composite index of the capability of countries to implement policies to reduce exposure to ETS has been proposed by WHO and can be slightly modified to better focus on the protection of children.

Technical criteria
The proposed index is computed as a sum of 10 subset variables, for each of which the following score is applied

> 0 not existing
> 1 existing, clearly stated, partially implemented
> 2 existing clearly stated and substantially enforced and implemented

1. Structured evidence-based programmes to reduce smoking during pregnancy and at home*
2. smoking prohibited in schools
3. " " day care centres
4. " " public buildings
5. " " public transport, urban areas
6. " " hospitals and clinics
7. " " cinemas theatres and museums
8. smoking prohibited or restricted (clearly separate areas for smokers) in long distance transport.
9. smoking prohibited or restricted (clearly separate areas for smokers) in bars and restaurants
10. advertisement for tobacco smoke prohibited

* routine information from health professionals and at all health services including written material

Unit for measurement: ordinal score 0-20

Data sources
Information on the existence, and on the actual enforcement and implementation, of the relevant legislation and programmes is usually collected by specific country programmes/ focal points/clearinghouses on tobacco.

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Data availability

Linked to the existence of the above entities. Most countries in western, central and eastern Europe have such entities within National Institutes of Health, Ministry of Health and/or Environment, etc.

Comments

This indicator suffers from the limitation of all policy (action) indicators, related to the semi-quantitative definitions and difficulties of precise assessment of actual implementation/coverage of programmes. It provides a general measure of the capability to implement policies for reducing environmental tobacco smoke exposure and promoting smoke free areas: an increase in the score should be taken as a broad indication of increased capability, a reduction the reverse. Like all compound indicators, it needs to be interpreted with care since the final score is the sum of many different components. Areas with the same indicator score, therefore, do not necessarily have the same capability profile. It is equally important to examine the indicator components before drawing conclusions

References

European Environment Agency and WHO, Regional Office for Europe "Children's environmental health: review of the evidence", Copenhagen, 2002

http://www.who.it/childrenhealth

US EPA Indoor Environments Division. Introduction to IAQ:
http://www.epa.gov/iaq/ia-intro.html.

US EPA Second Hand Smoke (SHS) also known as: Environmental Tobacco Smoke (ETS)
http://www.epa.gov/iaq/ets/index.html

WHO Publication E70610 *Policies to reduce exposure to environmental tobacco smoke:*
report on a WHO working group meeting, Lisbon, Portugal 29-30 May 2000
http://www.who.dk/document/e70610.pdf