Health Surveillance in Europe

European Global Oral Health Indicators Development Project

Selecting Essential Oral Health Indicators in Europe

Report of

the Consensus Workshop

University of Granada,
Spain
7-8 May 2004

European Commission
Health and Consumer Protection Directorate-General
Community Action Programme on Health Monitoring

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Executive Summary

Numerous projects have been proposed by different teams from European countries within the framework of the Community action programme in the area of health surveillance. The major objective of this programme was to contribute to establish a community system for health surveillance. It embodied three specific objectives:

1- to develop community health indicators through a critical review of existing data and indicators;
2- to enable the realisation of a reliable communication system for data and health indicators transfer and sharing;
3- to define the necessary methods and instruments for analysis of activities and the production of reports on health status, trends, and policies' impact on health.

The project titled "European Global Oral Health Indicators Development" (SPC 2002472) has been developed under the auspices of this Programme. The first phase of the Project terminated and the final report was produced in February 2004. The second phase, including the workshop of Granada, is currently ongoing.

The purpose of the European project on Global Oral Health Indicators Development Project is to establish priorities for a specifically European context in coordination with the existing programme and to make new recommendations for improving health system performance when necessary. The goal of the first year of the EGOHD project was to initiate the long list of indicators, background document for the establishment of the major indicators.

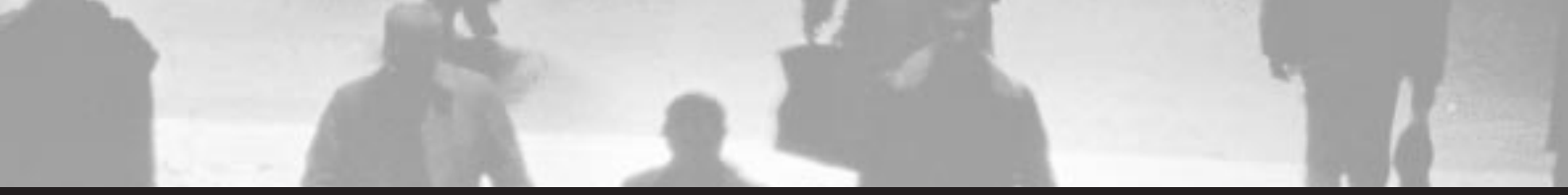
To facilitate the achievements of the global objectives of the Project, the second European "Consensus Workshops for Selecting Essential Oral Health Indicators" has been convened in Granada, Spain, 7-8 May 2004. The aim of the workshop was to proceed with the selection of essential specific and generic oral health indicators at national and regional levels in Europe. The major objectives of the meeting focused on:

1- the identification of a list of priority oral health problems, populations and high risk group;
2- the definition of a table of essential indicators in the following areas: indicators of priority oral health problem, indicators of service delivery, quality of care and indicators of critical health resources;
3- the validation of the final long list of oral health indicators and
4- a common understanding of terms and criteria for selection of indicators.

In May 2004, thirty-one participants from oral health institutions attended to the two-day meeting in addition to the project leader staff. Members or representatives from the Steering Group Committee were present. Representatives of Ministries of Health - Austria, Finland, Spain, Greece, Sweden, UK- , delegates of the Council of European Chief Dental Officers, the European Association of Dental Public Health assisted as the delegates - Czech Republic Latvia, Hungary - from news European countries. Members from European universities – Italia, France, Spain and UK -, WHO Collaborating Centers and officials from dental institutions were present.

After the official opening ceremony by Mr Diaz Carillo, Vice Rector for International Relations, University of Granada, Professor Cabello, Dean, Dental Faculty of Granada, Mr Mérida, vice Mayor, and introductory considerations by Professor Bourgeois, group leader, the first day, mainly focused on methodological considerations to select a short list of indicators from the initial long list. Ten presentations underlined point of views of European health policy requirements and decision makers expectations on short list of indicators in Europe. The major concept to define the criteria for priority indicators was that the choice of a short list of indicators was related to choices of health policy. Thus, in order to compare the situation and the concrete, current and future knowledge of their countries, decision-makers presented expectations and needs for the development of a national program on oral health surveillance based on a minimum list of information. A short 10-15 minutes talk was proposed around three strategic questions:
1- How does the monitoring currently occur;
2- Which are the positive and negative points of the system;
3- Which priority information do we want to obtain and for which priorities on health objectives.

The second day -"Long List as the starting point for selecting Core Indicators"- was focused on the harmonization of knowledge, validation and critical analysis of the final long list issued from the European consultation, September 2003-May 2004. Three working group by theme were formed to identify broad issues which, if applied, would provide the greatest oral health gain and prioritise each intervention. The issue of indicators concerning the health determinants, oral health and quality of life and oral health systems was discussed in three rotating working groups thus the report from theirs deliberations encompasses the views of all participants of the Granada workshop.



There was unanimous agreement that the Oral Health System has to have the ability to identify the at-risk groups of the population in a global context where risk criteria may differ for different age groups. Main indicators should focus on school-based programmes implying that school children are a major at-risk group. Eventually, the main factor/indicator which should be formulated is the outreach philosophy and practice of the system which must adopt the common risk factor / multidisciplinary approach.

From the discussions which took place it was suggested that the following five areas/topics are of key importance when collecting data on oral health care systems and that further work is necessary to develop methodologies and mechanisms which overcome current problems in implementing their national data collection in all the countries of the Union:

1- Workforce (number, need/demand, migration);
2- migration of oral health care workers and patients;
3- access to oral health care;
4- uptake/utilisation of oral health care services and
5- costs of oral health care.

The view was accepted that oral health determinants are considered important because they allow us to actually identify the at-risk groups. The discussion on relevant determinants for the identification of those groups of population showed considerable confusion in the use of terminology and in the consistent application of standards.

Furthermore, regularity of dental attendance may be determined differently in different member states and it strongly correlates with needs. Differences in the optimal regularity (frequency) of dental attendance were also discussed. Eventually, it was concluded that the most important determinant of utilisation of dental services from the point of view of the at-risk groups is the economic status. The role of tooth-brushing behaviour, eating and drinking patterns, smoking, alcohol consumption and medications for chronic conditions were discussed and underlined. Frequency of intake was examined as an indicator. An important consensus was reached when all the working groups agreed that there is need for measurement of the oral health related quality of life.

The working groups' reports and the general discussion provided the basis for the finalisation of the long list of oral health indicators.

Chapter 1
Objectives, models and expected products

Professor Denis Bourgeois, Group Leader[1]

Professor Bourgeois gave information on the recommendations and results of the first workshop, Lyon, September 2003. The objectives of the meeting of Lyon was achieved by the identification of the health information system problems relevant to the use of oral health indicators, the identification of the principles for guiding the selection and use of oral health indicators, the identification of the recent oral health indicator selection efforts, the identification of four indicators categories of oral health (Determinant and risk factors; Health services, Oral health status, QoL) and with the review the recent oral health indicator selection efforts.

The major recommendations/actions to be taken of the first European Workshop on Oral Health Statistics, Lyon were underlined:

- Statement of list indicators should be in line with the WHO S.U.R.F, NCD Info Base model
- All future goals and policies for oral health should fit within goals and policies for all aspects of health
- This will require agreement on a standard minimum set of indicators suitable to measuring population levels of oral health
- The outcome on essentials indicators for oral health determinants, risk factors and factors of prevention by hierarchical order was: Social class, eating/drinking frequency, brushing frequency with fluoridated toothpaste, tobacco use, and general health.
- There is a need for measurement of quality of life in relation to oral health
- Five areas within the topic of oral health systems that required indicators could be considered as "first level" topics for oral health care systems: Goals and policies; access and utilisation, effectiveness and outcomes, workforce and costs.

This was followed by a presentation on the "objectives, models and expected products" of the workshop.
The objectives of the Granada workshop were to:

1- process of selecting essential generic and specific oral health indicators at several levels and especially to valid the final long list of oral health indicators;
2- provide a common understanding of terms and criteria of selection of indicators and
3- list of priority oral health problems, populations and high risk group.

Agenda, methods, process and work plan of the Granada workshop were outlined.

Before open the discussion, Professor Bourgeois presented and analysed some potentials models of oral health indicators developed at international or national levels.

This meeting is opening with an introduction to the issue relating to the guiding criteria for the selection of oral health indicators. Before even starting to develop a list of existing indicators - a list that should be as comprehensive as possible - the following question should be raised "which of those indicators are we going to collectively retain on the final list".

As soon as a selection process is engaged, a consensus should be reached on: what will be the sorting criteria and their hierarchical order. The methodological aspects relating to these questions will be the object of specific working sessions during the course of the meeting. This introduction is restricted to underline the main characteristics for a selection, in relation to the various reference areas: European Community health policies needs, scientific definition, usefulness and feasibility, ethical demand.

European Community health policy requirements

The European Commision Health Monitoring Programme has as its main objectives to:

- Monitor the trends in the European community
- Evaluate Community Programmes and actions
- Provide Member States with appropriate health information to make international comparisons and to support their national health policies.

On this basis we may refer to the basic criteria proposed by the Group in charge of the ECHI project (European Community Health Indicators) which recommends that the indicator set should be:

1- coherent in the sense of **conceptual consistency,** this implies that a shortlist should nevertheless cover the multidimensional aspect of oral public health surveillance, all areas usually included in the field of oral public health. This is indeed the fact for the longlist already developed which is structured in the four main domains of reference;
2- **respond to oral health policy priorities,** acknowledging the fact that these will be defined by each Member State and adjusted at local or regional levels,
3- indicators should be **scientifically valid, reliable and relevant.**

[1] *Paper written in collaboration with Mrs Marie-Hélène Leclercq, Project coordinator*

Conceptual consistency

A set of indicators in oral public health, even restricted to a minimal essential list, has a time dimension and should cover the four major following dimensions:
- Demography and socio-economic factors
- Health status, morbidity and oral function status
- Determinants (behaviour, life habits.)
- Oral health system/promotion, prevention, access to care, quality care and system performance.

The number of indicators in each area will vary mainly in relation to health policy priorities and to feasibility aspects of data collection and processing.

The issue of health policies

Increasingly EU member States or regions within MS have formulated health priority areas or targets for health policies. There is a noticeable trend to broaden the spectrum of health objectives moving from simple morbidity measurements, or prevalence of specific diseases to objectives expressed in terms of quality of life improvements, reduction of health inequalities with reference to social policies enabling goals. For example health promotion and prevention tend to focus on specific population groups according to specific life-styles (specifically children or elderly), goals are formulated for quality of care and access to care, or in terms of social life involvement of entire groups of population such as the aging population.

For the oral health sector, this evolution implies a broader concept of the role of oral health professions and their contribution to general health. In addition, special attention should be given to the systematic integration of oral health indicators in any health surveillance system so that trends and changes in life-style and quality of life behaviour in relation to oral health can be monitored effectively.

If there is a general move of health strategies towards health promotion and prevention, consideration should nevertheless be given to the fact that the situation varies considerably from country to country. There will be situations for example, where the information priority will be given to the organisation (or the reorganisation) of the health system for a better quality of care. Clearly health priorities are considerably variable in time and from country to country.

Scientific value, reliability and relevance of selected indicators

As short as the list may be, nevertheless, all selected indicators should have the four basic scientific qualities universally accepted.

We propose to stick to the definitions given by the WHO health statistics programme:
- **Validity:** it is a true expression of the phenomena it is measuring
- **Objectivity:** it is able to provide the same result if measured by different people under similar circumstances
- **Sensitivity** it is capable of reflecting changes in the phenomena of interest and
- **Specificity** it reflects changes in only the specific phenomena of interest.

If the WHO recommendations respond to the necessity of the scientific requirements it is also associated to a deep sense of pragmatism. An indicator that would be qualified "impeccable" scientifically but too expansive to collect or even impossible to use in a given practical situation would be totally useless. Therefore additional criteria should be considered relating to the actual use of the indicator and to the methodology used to collect the data:

- The data required for the indicator are **useful** for case management or taking action in the community by the staff who originally recorded the data or the service unit from which the data originated.
- It should be **feasible to obtain** as far as possible through routine service processes or through easily and rapidly executable surveys
- It should be **simple and understandable,** measuring one health condition or aspect of the service
- The indicator and the process of collecting and processing the relevant data are **ethical.**

Lastly, in the elaboration of the indicators selection process, quantitative principles should be considered as important criteria such as: the frequency of a given health problem, its total costs, its avoidable characteristic (prevention, promotion). This is particularly relevant for indicators of high oral health morbidity and indicators in the field or oral health determinants.

A flexible approach to a shortlist of oral health indicators

In September 2003 on the occasion of the first meeting held in Lyon, Dr Ruth Bonita gave a detailed and comprehensive description of the "Stepwise" approach developed by the WHO. This is a practical example of a dynamic, multi-dimensional health data collection system, highly adaptable to the objectives and priority information required. In the same spirit, the ECHI group proposed the concept of "user-windows" based on the selection of subsets of indicators taken from the comprehensive list of indicators developed. The specific user's perspective for selecting user-window could be (i) specific areas of health policy interest (prevention oriented, services oriented, intersectoral policies), (ii) specific thematic entries such as age-groups, (iii) specific disease groups with their determinants and costs etc.. This concept offers a more "natural" approach than that of the "core" as the number of possible windows is countless with expansion of information at any level.

Whatever system is envisaged, this notion of flexibility is essential.
Whatever the final content of the list of oral health indicators will be, it will need revisions and updates as the diagnosis methods develop, as the care techniques evolve, as the knowledge on oral diseases progresses, as the information technology changes. Profound modifications will also occur in the way of thinking, in health values and quality of life behaviour, a number of living parameters dynamic by essence.

Indicators and health objectives

Indicators are markers for health status, system performance or available resources. They are usually established to ensure follow-up and evaluation of progression towards health targets formulated by strategic programmes. They should not be confused with public health objectives expressed in terms of disease reduction or public health improvements. These are quantitative measurable achievements reached within a specific time-frame.
A practical and interesting example is given by the work of the US Public Health Services, Department of disease prevention and health promotion. The document produced "Health 2010" can be consulted on their web-site.

For oral health, twelve priority objectives for 2010 have been formulated. Oral public health is a very broad concept. Objectives relating to the reduction or the prevention of the most common oral diseases: caries and periodontal diseases, are found among health promotion objectives such as "Increase the number of health practitioners and dentists counselling their patients on tobacco consumption, physical activity and cancer screening", "increase the proportion and the number of local health services which have established preventive and health promotion programmes.", are found together with "reduce the proportion of children and adolescents with untreated caries" or "reduce periodontal diseases". Some objectives are formulated in terms of social equity "increase the number of children and adolescents having had at least one access to preventive oral health care in the last year", objective for "the integration of the oral health system within the first level of reference of the health system" , "increase the proportion of oral care services within the school health system", an objective relates to the reduction of facial trauma by furnishing protective equipment during physical activities at school".
Each of the 12 priority objectives embodies subsets of goals with corresponding measurable indicators and a calendar for desired achievements.

It should be noted that oral health is broadly integrated within the health sector in the formulation of general targets as well as reflected in the list of proposed indicators. Oral health is considered as a full participative health sector, contributing not only to the promotion of oral health but also as a key actor to the promotion of general health.

Conclusions

In summary, we should keep in mind that beside their scientific qualities, the selected indicators should: respond to the priority needs of the community health strategies, national, local or regional, strategies for disease reduction and health promotion, be practically useful and easy to collect, be part of a highly adaptable information system, adaptable to the variety of needs and resources ant to the evolution of scientific and economic contexts.
The development of national and international health surveillance systems has resulted in a deluge of indicators overwhelming health services personnel in charge of epidemiological surveillance and evaluation of care programmes. The oral health sector is no exception. Within a context of a profusion of health indicators, operating a selection is not an easy task. The need for the necessary integration of the oral health sector within the national and European health information systems is an added challenge, considering that this should be done at all levels of the reference system. A challenge that this European research project will contribute to meet with practical and decisive recommendations.

References

Bourgeois DM, Carlos Llodra J (2004): *Health Surveillance in Europe. European Global Oral Health Indicators Development Project. 2003 Report Proceedings.* Quintessence Publishing Co, Inc. Paris.

Chapter 2
Methodological considerations

Validity criteria for health indicators in relation to priorities and health systems strategies

Professor Gerard Duru, University Lyon, France

Professor Duru presented an opening communication titled "Towards integrated surveillance". Before beginning work on setting priorities and to develop a common understanding of terms, Professor Duru described in details the terms "Vision, goals, objectives, baselines, and targets" often are used differently by participants in planning processes. Then he described the criteria for objectives development. It underlined that the result to be achieved should be important and understandable to a broad audience and relates to the goals and focus areas. In his view,

1- objectives should be prevention oriented and should address health improvements that can be achieved through population-based and health-service interventions;
2- objectives should drive action and suggest a set of interim steps that will achieve the proposed targets within the specified timeframe;
3- objectives should be useful and relevant. States, localities, and the private sector should be able to use them to target efforts in schools, communities, work sites, health practices, and other settings;
4- objectives should be measurable and include a range of measures–health outcomes, behavioural and health service interventions, and community capacity–directed toward improving health outcomes and quality of life. They should count assets and achievements and look to the positive;
5- continuity and comparability are important. Whenever possible, objectives should build upon Healthy People 2010 and those goals and performance measures already adopted;
6- at least, there must be sound scientific evidence to support the objectives.

Professor Duru explained the criteria guiding selection of leading health indicators. Criteria Guiding Selection of Leading Health Indicators e.g.

1- Worth measuring;
2- Can be measured for diverse populations;
3- Understood by people who need to act;
4- Information will galvanize action;
5- Actions that can lead to improvement are known and feasible;
6- Measurement over time will reflect results of action.

He presented locally appropriate interventions developed by the task forces using an evaluation framework known as PEARL (Vilnius and Dandoy): a socio-economic, legality, and political viability tool.

To conclude, Professor Duru indicated the criteria to prioritise each intervention against the criteria:

1- Effectiveness
2- Strength of evidence that the indicator produces the outcome
3- Quality including precision, validity, repeatability, timeless, sensitivity, responsiveness to change and consistency over time
4- Potential to change clinical practice to best practice
5- Feasibility of measuring the indicator (periodic compared to continuous monitoring)
6- Cost of collecting data.

Knowledge Discovery and Data mining: Methodology for aggregation of preferences

Dr Nicolas Nicoloyannis, EGOHIP Consultant

The transition from the individual to the collective is a real issue in social science. Indeed, to "govern", a choice has to be made between different alternatives, but if it is the "population" which is governing, these choices must be made collectively. Individual choices or even individual preferences therefore must be aggregated into a collective choice.

The aggregation of individual preferences can be classed as "democratic" if it complies with a minimum of principles as follows:

Universality: This principle states that once the group of individuals whose preferences are to be established in a collective choice has been selected, we cannot eliminate the preferences of certain individuals.

Unanimity: If all of the individuals opt for A over B, then the collective choice must also opt for A over B.

Non-dictatorship: The preference of a single individual cannot be chosen as a collective preference if all of the others disagree.

Independence of irrelevant alternatives: The collective choice between A and B must solely depend on individual choices between A and B and not on an "irrelevant alternative" X which is entirely independent of A and B, or the aggregation procedure can be manipulated.

Transitivity: If A is chosen over B and B is chosen over C, then A must be chosen over C.

On the basis of these five principles which no democratic aggregation procedure can violate if it is considered as such, we can now state the Arrow Theorem, developed by the eponymous Kenneth J. Arrow, awarded the Nobel Prize in Economics in 1972.

The Arrow Theorem (1951): *There is no procedure to aggregate individual choices into collective choices which complies with the 5 aforementioned principles.*

It should also be noted that Arrow was not the only one to have developed the logical impossibility of democratic contentions. He merely expanded the theory of public choices, already approached in the eighteenth century by Borda and Condorcet, who highlighted certain inconsistencies inherent in voting procedures.

The formation of a preference aggregation method implies the elimination of one of the five proposed principles.

The principle which tends to be eliminated is the most anti-democratic one, that of non-dictatorship.

The method that we propose for preference aggregation complies with the four principles set out above and is based on the principle of comparison by pairs, or indeed the Condorcet approach.

It should also be noted that the classification implied by this methodology can give rise to an idea and a discussion between experts for a compromise to be reached which is acceptable for the project participants.

Chapter 3

Short list of indicators in oral health: Point of views: health policy requirements and decision makers expectations

The next section of the presentation was to consider responses to a central question relating to oral health indicators asked of a number of policies and decision makers: *How does monitoring currently occur?* and then seeks to illuminate issues where change is needed. Two additional questions were requested: *What are the positive and negatives of current systems?* and *How can we combine the priority information which is needed into a rational template which will allow choice of the appropriate tool(s)?*

3.1. Decision in Principle by the Council of State on securing the future of health care in Finland

Dr. Anne Nordblad, Ministry of Social Affairs and Health, Finland

In recent years, there have been growing problems in the operational framework for and availability of services and this is something which must be addressed. The service system is being developed in cooperation between municipalities and the state, taking into consideration the operations of the private and the third sector. According to legislation, the responsibility for arranging services lies mainly with the municipalities.

The Council of State issued a decision in principle to secure the future of health care in April 2002 (www.stm.fi[1] Brochures 2002:6eng). The aim of the decision in principle is to develop health services as cooperation between the municipalities and the state so that the activities of NGOs and the private sector are also taken into consideration. In this way it is possible to ensure that the population receives the high-quality care that it needs in different parts of country in such a way that the provision of treatment is not dependent on the recipient's ability to pay. This includes oral health care services. In order to ensure the practicality of the service systems, the Council of State has decided upon the following measures:

Viable primary health care and preventive work
Sufficiently resourced and viable primary care is the foundation of the entire health care system. Preventive work is one of the paramount duties of primary health care, which together with the responsibility of the public for their own health and health habits, inhibits the rise in demand for services and redirects the need for services towards less demanding, more outpatient-orientated forms of treatment. The government has previously issued a statement concerning measures to promote health in the Health 2015 Programme.

Ensuring access to treatment
In order to decrease differences in the criteria for access to treatment, nationwide guidelines for non-urgent treatment and queue management will be implemented. The principle of access to treatment within a reasonable period including oral health care has been embodied in legislation which will be in force in March 2005.

Ensuring the availability and expertise of personnel
The Ministry of Education revised in 2003 the decrees concerning the further education in primary health care and specialised education of physicians as well as similar degrees applying to dentists, so that education following each primary physician's and dentist's first degree should include a period of at least nine months' practical work at a health centre (for dentists practical work should include at least six months at health centre). At least half of the specialised education should be carried out somewhere else than in a university hospital.
In-service training for personnel will be arranged which, depending on the length of the basic education, on how demanding the work is and on the changes to the job description, should be in average 3-10 days a year. The employer will be responsible for the costs of in-service training.

The reform of functions and structures
Primary health care is organised as regional, operational entities, big enough to function. Operational cooperation and the division of work will be carried out. Emergency services are being rationalised. In laboratory and imaging operations, there will be a changeover to units formed out of one or more hospital districts, and municipal enterprises and state-of-the-art technology will be utilised. The preparation of national treatment recommendations and regional treatment programmes will continue and their application in practise will be enhanced, so that the increase in efficiency will achieve rationalisation-related benefits. Nationwide electronic patient records will be introduced.

Augmenting the finances of health care
As of 2003, state subsidies for social welfare and health care allocated to the municipalities will be increased by EUR 104 million a year in accordance with decisions made in government framework negotiations. The service system is being developed as programme work advancing in stages, for which from 2004 to 2007 a project allocation is of EUR 30 million annually for health care.

As conclusion the key spheres of development are concerned with health promotion and preventive work, ensuring access to treatment, staff availability and the improvement of skills, reforming health care functions and structures and reinforcing financing. This is a national reform, which concerns all parties. There is an urgent need to establish a good follow-up with clear indicators also in oral health care.

3.2. Point of views: health policy requirements and decision makers expectations

Professor Nigel Pitts, University of Dundee, Scotland, UK

Professor Pitts acknowledged the organisers for the invitation to contribute the perspectives of a range of interests on efforts to harmonise oral health indicators. This challenging task should be taken forward in an open way which acknowledges what has been achieved to date, together with the new evidence which is emerging on an international level both from within Europe and more globally.

The perspective presented by Professor Pitts is drawn from a range of views derived from a number of positions he hold and activities he participate in. These include:

- The European Association of Dental Public Health (EADPH), in which he is currently President and Chair of the Epidemiology Special Interest Group

[1] www.stm.fi: Decision in Principle by the Council of State on securing the future of health care. Brochures 2002:6eng

- The British Association for the Study of Community Dentistry (BASCD), where he is am Scientific Coordinator of the BASCD / NHS Dental Information Programme
- From Scotland, experiences from the new National Dental Inspection Programme (NDIP)
- From a UK National Survey Consortium comprising: the Office of National Statistics and the Universities of Birmingham, Cardiff, Dundee and Newcastle
- From the International Caries Detection and Assessment System (ICDAS), where Professor Pitts is co-Chair the foundation ICDAS committee.

How Does Monitoring Currently Occur?

In the UK the Policy role, which defines the monitoring required by the four UK Health Departments of England, Wales, Scotland and Northern Ireland, is led by the four Chief Dental Officers. The detailed policies, targets and information systems are increasingly diverging to meet specific local and regional needs of the four constituent parts of the UK.
In terms of practical examples of monitoring oral health, let me summarise six areas of activity:

BASCD (British Association for the Study of Community Dentistry) / NHS Dental Epidemiology Programme
Historically this co-ordinated national programme working in partnership with the UK National Health Service ran between 1984-2004 using a 4-year cycle of annual epidemiological examinations of children in School aged: 5 / 12 / 5 / and 14 years old respectively.
The current programme in Scotland (NDIP) and Northern Ireland now uses a 4-year cycle of annual dental inspections of children in School aged: 5 / 11+ / 5 / and 11+ years old respectively.
In England and Wales the new timetable is likely to be annual dental inspections of children in School aged 10+ / 5 / followed by two years of collecting other locally relevant oral health information (other / other) and then returning to children in School aged 10+ / 5 years.
Current Developments in what is now becoming the BASCD / NHS Dental Information Programme are for developing more local user involvement, building on the core epidemiological data and supplementing it with data on the impact of oral disease, experience of pain, or days off school/work, enhanced estimates of preventive care need including estimating caries into enamel, and surveys of self reported oral health in adults where adequate response rates can be achieved. *[see Pitts N B, Boyles J, Nugent Z J, Thomas N, Pine C M. Community Dental Health 2004 21:45-58. Annex 1 = Report of a Workshop held in London May 2003]*

National Dental Inspection Programme (NDIP) in Scotland
Great care has been taken with the terminology used in this new Programme to ensure that it reflects the current best evidence from cariology and can also inform non-dental users of the information. Figure 1 shows a graphical representation of what information is and is not recorded in the detailed NDIP Inspections as "obvious decay into dentine".

Terminology used in the NDIP Report to reflect the current evidence from cariology and to inform non-dental users of the information

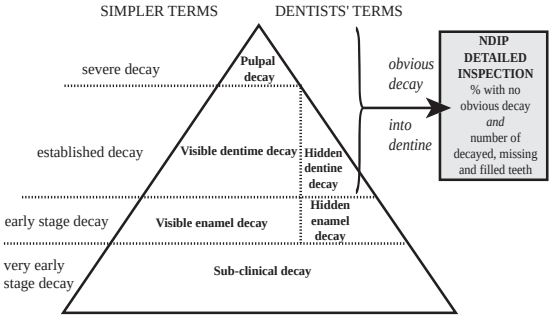


Figure 1

This should prevent abuse of the term "caries free" which to non-dental users and policy makers wrongly suggests that groups or individuals are entirely free of any stage of the disease, which is untrue. The Figure also shows the simpler lay terms which correspond to the terms that dentists use and indicates that the conventional visual only examinations in school without the benefit of any diagnostic aids will inevitably under record even the level of dentine caries present.

The results for the first year of NDIP (2003) are now available. The report of the Programme (available at http://www.dundee.ac.uk/dhsru/) has been structured as a series of answers to policy relevant questions. These include such information as

- *How many children had a detailed inspection?*
- *What proportion of Primary I children have no obvious decay experience in 2003?*
- *What levels of decay are seen in Primary I children in 2003?*
- *Are we on track to meet the 2010 target?*
- *How has the dental health of Scottish five year olds fared over time?*
- *How does the dental health of Scottish Primary I children compare with that in most other parts of Europe?*
- *Is there a link between social deprivation and poor dental health among Scottish five year olds?*

A key final question is: *How can the NDIP Programme be applied to local services?* The NDIP *Basic Inspection* classifies all children in the first year of primary education (and in alternate years the last year of primary education) into three simple *Risk Groups:* **A: high caries risk** – need to see a dentist immediately, **B moderate caries risk** – need to see a dentist soon and **C low caries risk** – need to see a dentist as part of normal oral health care. These assessments can be made quickly and efficiently and this level of information can be made available at school and local levels reflecting service planning.

The Modernised National Health Service in England and Wales
NHS Oral Health Care Services are being "modernised" in England and Wales according to the Options for Change Agenda set out in 2002. *[Pitts N B. NHS Dentistry: Options for change in context: a personal overview of landmark document and what it could mean for the future of dental services. British Dental Journal 2003 195: 631-635].* This change in

service philosophy and structure reflects the changes in objectives for the provision of care that has now taken place in many countries. The answer to the core question: What should dentists now be doing for their patients? has now shifted away from merely filling and re-filling carious teeth towards the more preventive, evidence based, mission set out on a dental appointment card in Figure 2.

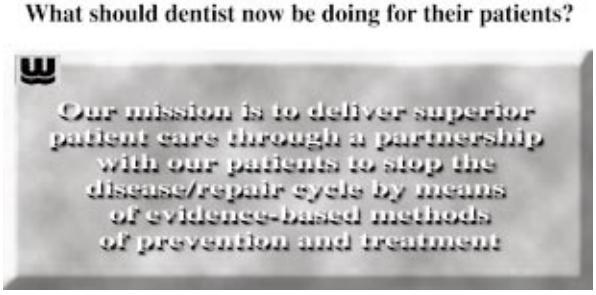
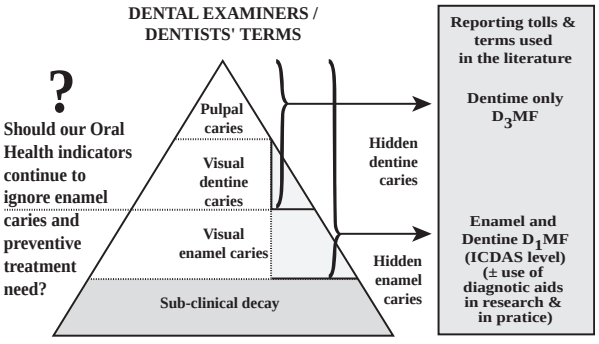


Figure 2

In terms of clinical decision making and advice based on best evidence, it is now clear that, in most cases, dentists should be moving from operative to more non-operative / preventive treatment for dental caries management [Pitts N B. Are we ready to move from operative to non-operative/preventive treatment of dental caries in clinical practice? *Caries Research 2004; 38:294-304.].*

Obviously the indicators used to monitor oral health services providing this type of care will be different to the just collecting the "routine" dentine only level d3mft/D3MFT data used previously. It is then reasonable to ask whether our Oral Health Indicators should in the future continue to ignore enamel caries and the issue of preventive treatment need? (Figure 3) and international efforts are underway to provide robust tolls to collect this type of health information (see ICDAS below) and to incorporate such data intro routine health data systems.



Diagnostic levels of visible tooth decay - terminology & tools

Figure 3

UK National Survey Consortium (Office of National Statistics with the Universities of Birmingham, Cardiff, Dundee and Newcastle)
The results of UK National Surveys Consortium's report for the UK Health Departments on the Adult Dental Health Survey carried out in 1998 graphically illustrates the effect of including or excluding *visual dentine caries* along with the more conventional traditional estimate of dentine decay, cavitated dentine caries. Traditionally only cavitated dentine was scored as caries, but with the changes in lesion morphology seen in recent decades, discoloured surfaces overlying obvious dentine lesions are now also registered as dentine caries, even if the dental probe does not fit into a physical cavity of specific dimensions. The impact of this inclusion/exclusion upon the proportion of dentate adults recorded with primary decay can be seen to vary dramatically with age. In the younger age groups (16-24, 25-34) the visual dentine decay dominates, whilst in the older age groups (45 years >) the cavitated dentine lesions are more common.

The UK National Surveys Consortium will publish the results of a National Child Dental Health Survey carried out in 2003 in October of 2004 and it is anticipated that due to the age effect seen wit the adults in 1998 the results will illustrate the same effect in permanent teeth. It should be appreciated that both these surveys specifically exclude enamel lesions and therefore systematically under record the levels of clinical caries which dental clinicians would register when the same individual attend for modern dental examinations.

International Caries Detection and Assessment System (ICDAS)

ICDAS: The Committee - this work has been carried out under the supervision and control of an informal committee who were assembled following the NIH Consensus Development Conference on Dental Caries in 2001 and the International Consensus Workshop on Caries Clinical Trials meeting in 2002 to try to advance some of the key recommendations of these meetings. The early committee comprised: from the Dental Health Services Research Unit, University of Dundee (DHSRU): N Pitts, C Longbottom, G Topping, D Ricketts, A Forgie and C Deery (now Edinburgh); from the University of Michigan: A Ismail and W Sohn; from Indiana University: D Zero (joined more recently by other staff); from Copenhagen University: K Ekstrand; from the International Dental Federation (FDI) E Reich and from NIH / NIDCR: R Selwitz.

ICDAS: Background - the philosophy on which this collaborative initiative is based is one where the methodology from caries epidemiology meets that from caries clinical trials and practise and the whole is conducted according to the values of evidence based dentistry (EBD). There have been many systems devised over the years for grading dental caries which have been visually based and included non-cavitated lesions in enamel. In 1979 the World Health Organization (WHO) guidance publication offered methodologies for both Basic and more *Advanced* caries surveys, the *Advanced* criteria including the ability to score enamel caries. Over more recent years only the booklet describing WHO *Basic Methods* survived. Over the years a series of research reports exploring the importance of coding non-cavitated carious lesions in both enamel and dentine have been published [see Pitts N B. Review of the ICW-CCT Meeting, The Importance of Early Detection and the Philosophy / Approach of ICDAS. In: Stookey G (Ed), Early Detection of Caries III, Indiana University, Indiana 2004, *in press]*.

ICDAS: Development Meetings - have been held in Dundee, Scotland in Spring 2002, in Ann Arbor, Michigan in August 2002, in Indianapolis, Indiana in May 2003 and in Bornholm, Denmark in April 2004.

ICDAS: Concept is that use of a standardized system should lead to better quality information to inform decisions about appropriate diagnosis, prognosis and clinical management of dental caries at both the individual and public health levels.

ICDAS at 2004 - Figure 4 summarises the key aspects of ICDAS at 2004. The caries detection criteria are ready for use and will be disseminated in 2005. The caries activity criteria and tools are still part of a research agenda.

EADPH and the Epidemiology Special Interest Group (S.I.G.)

Following a successful symposium at the Marburg EADPH meeting there have been a series of discussions starting to look at providing common, modern, epidemiological tools for use in Dental Public Health in Europe.

At the 2003 EADPH meeting in Finland the work of the ICDAS group was outlined and a Special Interest Group formed. This Group will meet in Portugal in September 2004 at the Opporto EADPH Conference and will develop the agenda further.

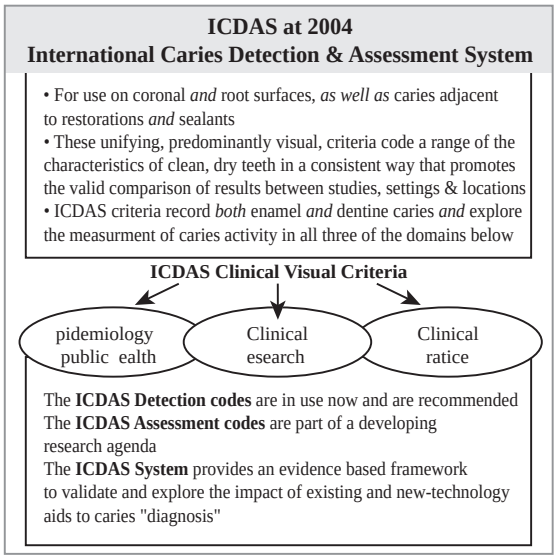


Figure 4

What are the Positive and Negatives of Current Systems of using Oral Health Indicators?

The Positives

- There has been a lot of good and useful work in this area, much of which has continuing value and should be retained and built on.
- Some of the work developed to date has been well used, more should be done to ensure that data collected is used effectively and is made available locally.

The Negatives

- There remains considerable confusion in the use of terminology and in the consistent application of standards.
- Because of this there is an unfortunate and unnecessary lack of comparability between datasets within and between European Countries.
- There is also a lack of "joining up" the different needs of policy, modern research evidence and clinical practice. This has resulted in a focus on restorative treatment indicators in an era when preventive care is being advocated, funded and practised.

How to combine the priority information which is needed into a rational template which will allow choice of the appropriate tool(s)?

The WHO STEPS approach was outlined at the Lyon workshop of this Oral Health Indicators Project Group. DHSRU has made an adaptation of this "Stepwise" approach, used by WHO in the Surveillance of NCDs, to allow its use with Oral Health Indicators, this is set out in Figure 5.

The STEPS approach allows organisation of the different and often disparate indicators used into a series of core indicators which can be used at STEP 1, 2 or 3. Importantly, it also documents how each STEP can be supplemented into an expanded form when needed and also identifies a series of standardised optional indicators that could be added as and when they are needed or can be afforded. While the detail content may be in need of refinement, the overall framework seems to have much to commend it and the adaptation was well received at a meeting of BASCD at the end of 2003.

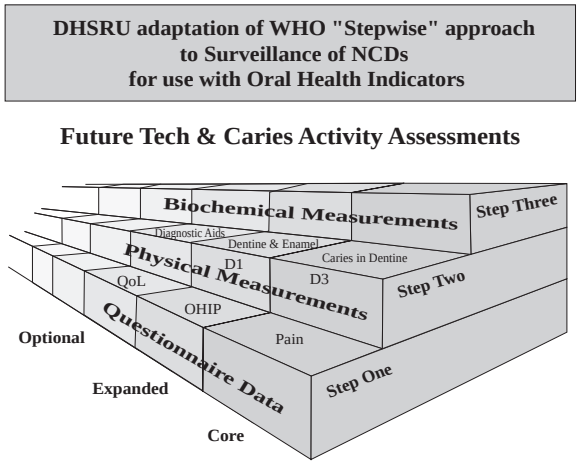


Figure 5

The final indicators emerging from this process should in the opinion of the author be able to be fitted into such a model. In addition they should:

- Be robust, appropriate and built around delivering effective preventive and restorative oral health care in the real world in Europe
- Should allow for IT based collection of data from dental practices in the future
- Be supplemented by badly needed more accurate and updated information on the dental workforce for the expanded EU

Acknowledgements and Disclaimer

The Author gratefully acknowledges support from the Scottish Executive Health Department and from the National Health Service. The views presented are those of the author and are not necessarily those of the UK Health Departments.

3.3. Point of views: health policy requirements and decision makers expectations

Dr. Alfonso Villa Vigil, President of Dental Council, Spain

Dr. Alfonso Villa Vigil explained that Spain is comprised of 17 regions, each of them with a large political and health legislation autonomy. This political decentralisation has led to a situation reflecting important differences from region to region in the organisation of oral health : 1) public health program focused on age groups seven to fifteen years old. 2) exclusive delivery of emergency care (teeth extractions, maxillo-facial surgery, etc.) Therefore today, there is no national oral health surveillance system in Spain. Because of the political decentralisation, it is unlikely that such a system will be established in the near future. Given the fact that the regions which have developed an oral care system based on public financing are actually focusing on children population and the tendency of the other regions to follow this model, it seems logical that the priority indicators in Spain be health promotion indicators in order to evaluate progress made in oral health in the future. In addition, there is a dramatic increase of the number of dentists in Spain – there are four times more dentists today than 20 years ago. Because of this situation, it is necessary to give priority to oral health system indicators in order to rationalise the number and the competence of oral health professionals.

3.4. Point of views: health policy requirements and decision makers expectations

Dr. Agneta Ekman, the National Board of Health and Welfare, Stockholm, Sweden

The interest among healthcare researchers and policymakers in measuring and reporting quality of care is growing, fuelled by two different secular trends in public policy in general and health policy in particular. The first is a declining willingness of consumers to remain deferent recipients of public services. There is an increasing desire to hold service providers, managers and politicians accountable for the quality of the services they deliver or procure. The second is a more widespread utilisation of market or quasimarket mechanisms to improve the effectiveness and the efficiency of the health care sector including oral health care. A precondition for markets to work properly is the availability of information about the quality of the different outputs.

As a consequence, substantial efforts have been made in recent years to develop and implement so-called quality indicators for oral health care. Quality indicators (QI) here means measures of oral health outcome or oral health improvement attributable to dental care. QIs are frequently classified into three categories structure, process and outcome. I will not focus on definitions as they are completely clear to all of you. However, QIs can be used to benchmark performance along the dimension of quality, i.e. to compare for one provider or one dental care system to a reference group.
In the real world, formidable technical obstacles and resource constraints often force us to compromise. Consensus formation in an international forum, as for example in the OECD – Organisation for Economic Co-operation and Development, is a difficult and time consuming process, in particular if it is starting from scratch. The universe of potential quality indicators is very large, making a full review infeasible. Supporting evidence might be absent or inadequately documented. Existing data sources might not permit the construction of the desirable indicators, because the required variables are not at all recorded or differently recorded. Dedicated data collection that would yield comparable information on a national level might be prohibively expensive. Thus, to tackle the problem in a way that respects time and resource constraints, an opportunistic rather than idealistic approach seems warranted.

The main disadvantage of relying on existing data sources is that the data systems have usually been designed for purposes other than quality measurement and may therefore not always provide exactly the desired information. The following limitations are commonly observed:

- Limited geographic coverage – in several countries, data are only available for selected regions.
- Limited coverage of populations –collection of administrative data is sometimes linked to individual characteristics, such as insurance status.
- Data access limitations – data collected by institutions other than national government or national institutes may sometimes not be readily accessible due to confidentiality issues or property rights issues, which prevent any release.

The main challenge is that although quality of care is a priority and being measured in many countries, the countries participating in the project probably are at different stages in measurement development and use different methodologies. Without coordination of our efforts international comparability is unlikely to emerge, depriving policy-makers of the possibility of benchmarking health systems.

Comments regarding the criteria to select indicators:
Of utmost importance that these matters will be discussed and agreed upon.

1. Importance of what is being measured

- Impact on health – what is the impact on health associated with this problem?
- Policy importance – are policy makers and consumers concerned about this area?
- Susceptibility to being influenced by the oral health care system – can the oral health system meaningfully address this aspect of problem?

2. Scientific soundness of the measure

- Validity – does the measure actually measure what it is intended to measure?
- Reliability – does the measure provide stable results across various populations and circumstances?
- Explicitness of the evidence base – is there scientific evidence avaliable to support the measure?

3. Feasibility of using the measure

- Existence of prototypes – is the measure already in use? A further question is if the measure is in use at the national level, or for sub-national population groups.
- Availability of required data across the system – can information needed for the measure be collected in the scale and time frame required?
- Cost or burden of measurement – how much will it cost to collect the data needed for the measure?

From the Swedish point of view it seems given resource constraints, this work could be limited to reviewing existing indicators rather than developing new indicators, e.g. take advantage of what has been achieved by other groups. The work should continue identifying the most promising indicators in the respective area, discuss their policy relevance and scientific soundness. We should focus on the short list, a set of data for which there is agreement on validity, importance and for which comparable data are available in most EU-countries.

For the larger or the long list of indicators proposed, which definitely should contain much fewer indicators than today, it is also of utmost importance that there is agreement on validity and importance, but not necessarily including specific information on data availability.

It seems that two types of decisions now need to be made for the future path of the project. First, consensus on some conceptual issues has to be found, and second, participating countries have to agree on operational strategy and resources to realize the envisioned product. Finally, the question arises whether or not the boundaries of the project should remain as narrowly defined as they currently are. From our point of view we are interested in adding other dimensions of performance of dental care systems, like responsiveness and equity. However, this is not mandatory.

The prerequisites for monitoring the quality of care in general and the outcomes of care in specific are exceptionally good in Sweden. Data from National Health Data Registers can be used to monitor health care utilisation, morbidity and mortality on a population level. The establishment of approximately 60 National Quality Registers has created good opportunities for analyses of the medical quality and outcomes in part of the healthcare system and registers within dentistry are now established.

However, conditions in health care and medical services are changing constantly. New methods of investigation and treatment affect the structure, contents, quality and results of the care provided. In December 2001 the Swedish Government commissioned the National Board of Health and Welfare to compile an annual report on the performance of the health and dental care systems of the nation. According to the mission statement, the report should focus on the quality and accessibility of services, with special emphasis on policy-relevant trends and changes. The framework of the report includes four main dimensions of healthcare and dental care quality; responsiveness, accessibility, medical effectiveness and safety. The choice of quality measures was based on national and international work on health and dental care quality indicators. The indicators are reported using two main approaches, e.g. regional comparisons between the 21 counties/regions in Sweden, responsible for the delivery of dental and health services, and age- and gender-specific longitudinal trends in national data.

Although the prerequisites for monitoring the quality of care in Sweden are good, further development of models and methods for performance assessment is needed in order to be able to deliver policy-relevant information to the nation's health policy makers. Within the European Global Oral Health Indicators Development Project we could create valuable indicators based on agreed and uniform definitions. Since indicators are an essential requirement for comparisons to be made over time not only between regions and care units but also at national level, these comparisons can be used as a basis in development and quality work at all levels of dental care and dental services.

3.5. Oral Health Monitoring from the Perspective of the Chief Dental Officer for Austria and as a Member of the Council of European Chief Dental Officers (CECDO) Executive

Dr Gabriele Sax, Chief Dental Officer, Austria

Health Care System in Austria – in brief

Austria's health care system is based on social security. Therefore, as far as medical care is concerned, nearly 100 % of the population and most treatments are covered by the Sick Funds. However, as far as dental care is concerned, the catalogue of treatments (which are paid fully by the Sick Funds) is nearly 30 years old and therefore a lot of treatments have to be paid for solely by the patients (with some co-payments by the Sick Funds; e.g. prophylaxis, implants, orthodontics).

Health and Oral Health Monitoring in Austria

There is a comprehensive health information system directed by the Austrian Health Institute, which monitors health and oral health. Data on structural, environmental and health related issues are collected (Fig. 6). It is used for regional analysis and health care planning.

For oral health care information there are three sources:

Administrative Statistics:

- Number of dentists (with/without contract with the Sick Funds)
- Money spent for dental care by sick funds (but without any deeper explanation, e.g. how many patients consumed these treatments)
- Number of patients with a dental diagnosis treated in hospitals

Micro Census

- Self perceived health status and consumption of health services (since 1973, every 7-9 years)

Basic Oral Health Surveys (since 1996)

- Following the WHO guidelines
- Each age group is examined in consecutive years (6-year-olds in 1996 and 2001, 12-year-olds in 1997 and 2002 and so on)

Monitoring carried out by the CECDO

Since 1994, every two years a questionnaire is sent to the members of CECDO. The CECDO has collected national data from all EU and EEA-member states[2]. The database comprises:

- General Population
- Dental Workforce: Number of dental professionals (e.g. general dentists and various dental specialists, dental hygienists, dental technicians, etc)
- Education system: number of dental schools (public and private); students and graduates per year; vocational training
- Financial data: % GNP total health care; % GNP dental care
- Epidemiological data: % 12 yr caries-free, DMFT 12yr olds, % 65 yr olds edentulous

These data are available at www.cecdo.org

[2] Austria, Belgium, Cyprus, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, (Liechtenstein; only data for 1996), Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, UK. Plus Israel and Zurich.

The CECDO-database is a rather comprehensive data collection. But there are still empty cells (because some data are not available in all countries).
Due to the fact that all "data providers/deliverers" are known personally the relative reliability and comparability of the data is known very well.

Background Information – why?
In Austria it is stated that there is a necessity of "Daten für Taten" (that means: "data for action"). "Good dental health should be the right of every citizen and all Europeans should have access to quality dental care based on their needs"(CECDO Annual Report 2002, Foreword by the President E. Widström). Chief Dental Officers are the senior professional advisers on dental questions to their National Governments. They therefore need the data for health care planning purposes.

Necessary information– what data should be collected?
Need of services
- Population in general and for "special needs groups"

Utilization of services
- Which services
- By whom
- At what cost
- Over-treatment – under-treatment

Barriers to use the oral health care system
- Which barriers
- For whom

Quality
- Of care (especially longevity of treatment)
- Of education
  - Dental team approach
  - Further education

Outcome of treatment, care and other services

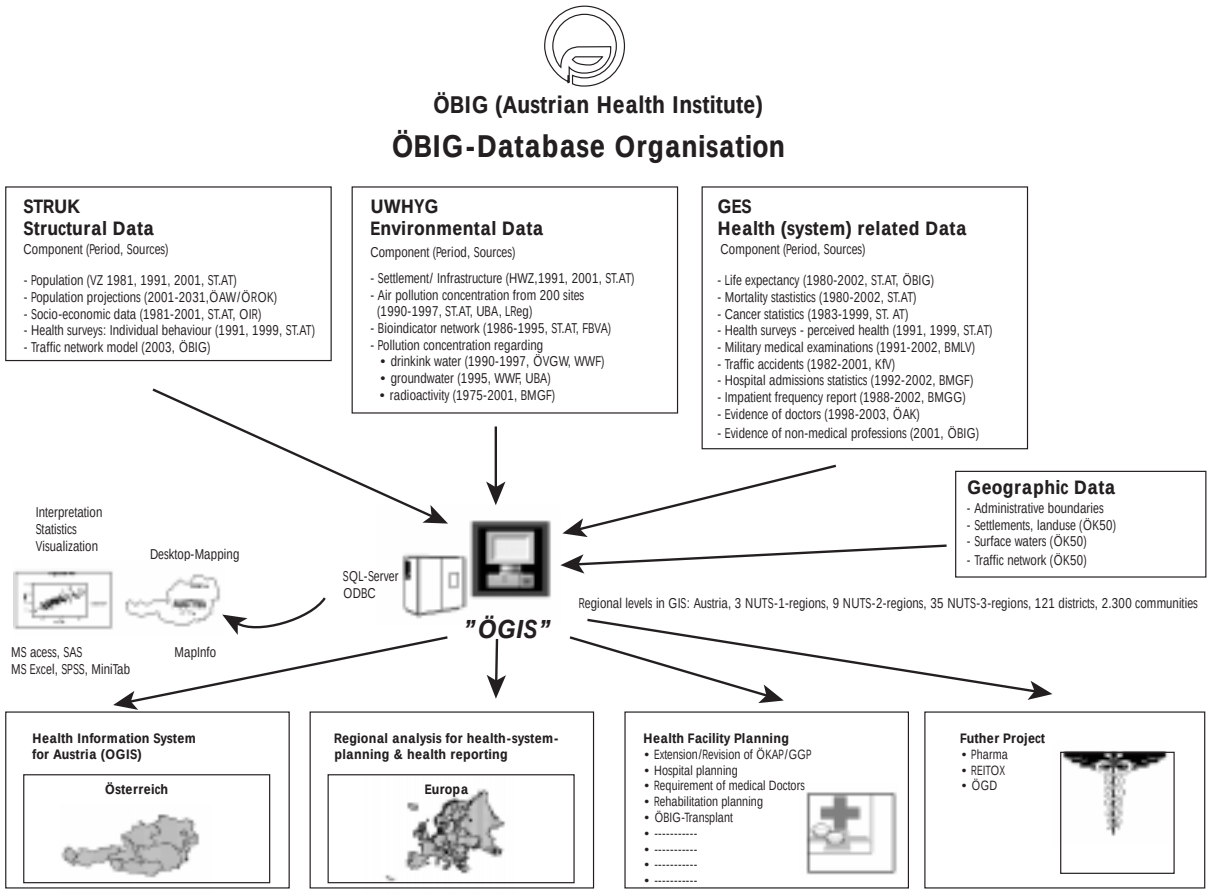


Figure 6

3.6. Point of views: health policy requirements and decision makers expectations Contribute for the Workshops for Selecting Oral Health Indicators in Italy

Professor Laura Stromengher, University of Milan, Italy

The intervention of Professor Stromengher was influenced by the country she come from and its peculiar situation. The oral indicators suggested to choose must be valid and specifically relevant for oral health conditions and strictly correlated to general health indicators. Otherwise, because of the lack of oral epidemiological data in Italy, our country would not be able to collaborate in data collection with the other EU countries. Furthermore it should be stressed how important it is to contribute to choose essential indicators of oral health actually measurable and available in all the countries represented in this workshop.
To explain better what above mentioned, Professor Stromengher would like to illustrate a few Italian peculiarities. "In Italy she we never had, and still does not have today, a national health system comprising dentistry. It is known that 97% of dental care produced in Italy is carried out privately, that is not in public structures and without any insurance con-

tribution. The remaining 3% of dental care is unfortunately not organized and managed nationally or locally, so that any quantification of dental care is not possible."
Therefore decision's makers can't know with precision what happens in Italia concerning dental care. The only available data we have come from surveys, often questionnaires, carried out by marketing companies and regarding patients' satisfaction and use of some oral health products.

This situation is going to change rapidly in the next years, due to the fact that a new system implying the introduction of insurance institutes will be introduced nation-wide. This change is supported by strong political motivations at a government level. The first application of such new system will take place in dentistry, since dentistry is the only field in medicine that is totally private. Therefore, it is very easy to apply modifications to the dental system. Of course, for obvious reasons, the main obstacles to the realization of this program come from private dental associations.
This "local" forward was necessary to underline that we participate to this meeting with a contribution of uncompleted epidemiological national data. Our data have been collected locally from centers spread on the Italian territory in the last 20 years and more and more intensely in the last 5 years. Furthermore, we have data from 2 national surveys and a third one is going on. In any case, almost all our data concern only children.
In conclusion, Professor Stromengher underlined that the contribution to the second workshop to the selection of essential oral indicators must take into consideration the problems and the peculiarities mentioned so far.

The following indicators are useful, even if with some critical observations, are as follows:

• **Caries experience** through DMFT/dmft index appears to be the most useful and repeatable index. It could be associated to certain specific age groups and it could be completed with the % of healthy subjects at 4 or 6 years of age. Furthermore, it is suggested that oral health indicators such as caries experience at 12 and 35-44 years of age and the % of affected subjects be introduced, so that all participating countries could gather homogeneous and generalized data on oral health in the young and adult population.

• **Periodontal conditions** through the CPITN index. Periodontal conditions could be evaluated in a similar way. In our opinion, though, rather than CPITN in general, bleeding on probing represents the most relevant index. In presence of bleeding on probing and absence of periodontal pockets, education and information can lead to healthy periodontal conditions. Simply knowing the percentage of periodontally healthy subjects at 12 and 35-44 years of age could be very relevant in the context we work in.

• **Percentage of edentulous** in adults and elderly people. Professor Stromengher considers this an important indicator mainly in the older population, because of its implications and way of conditioning life quality at certain ages.

• **Sugar consumption.** Recent studies confirm that there is a strict correlation between sugar consumption and oral disease, in terms of frequency of consumption and not of quantity per year. Therefore, we could consider sugar consumption a relevant index if it were expressed as a frequency index and not as consumption per subject per year. Nevertheless, expressing sugar consumption in terms of frequency on a large scale appears difficult from a practical point of view. Therefore, such index, already present in some extent among general health indicators, is nowadays less relevant for oral health status.

• **Use of toothbrush and fluoride toothpaste.** On the contrary, we consider those indicators very useful, easy to determine and indicative of the diffusion of instruments for oral health prevention and self-care. They are also indicative of behaviours whose measure and change over time could lead to epidemiological modifications in oral health conditions. Detecting differences in those indicators among countries, for example in Europe, could help evaluating also the different sanitary models and habits and their results in terms of prevention, both in the past and in the future.

• **Tobacco use and alcohol consumption.** Those indicators, probably already present among general health indicators, are very relevant also in oral health conditions and therefore it is important to pay careful attention in detecting them.

3.7. Point of views: health policy requirements and decision makers expectations in Germany

Professor Annerose Borutta, University of Jena, Erfurt, Germany

Professor Annerose Borutta described "How does the monitoring currently occur". Since 1989 in Germany regularly epidemiological studies have been performed on a population level. Children, adolescents and adults as well elderly have been involved. The studies are under the responsibility of the Institute of German Dentists which was established by the German Dental Association and the National Association of statutory Health Insurance. The last study (third study) was performed in 1997. The results based on questionnaires and clinical examinations.were presented. The existing preventive care included in the statutory health insurance system is manifestly appropriate for achieving substantially comparable dental health notwithstanding the influence of socio-economic parameters.
In adults in comparison with previous studies the results show that caries experience remained constant. Some 20% of the adults have removable dentures, more often in Eastern than in Western Germany. Symptoms of craniomandibular dysfunction are common. 50% showed any sign of pathology by clinical detection. Professor Borutta advanced that whereas children and adults showed satisfactory results of oral health, large deficits were obtained in the oral health status of elderly.
The results of the 1994, 1997 and 2000 studies showed a remarkable caries reduction over the time combined with an increase in caries free children of all age groups. All these data can be used by political decision makers to develop health strategies for improving the oral heath in the population.

The **positive and negative points of the German system** were described by Professor Borutta.
Among the *positive factors of the system* the general access to the dental health care system for all people should be mentioned first of all. All people are covered by the national insurance system and have the right of an appropriate den-

tal care fixed by laws and other regulations. From research or strategic point of view changes are going on from a mostly curative oriented strategy in the past to a more and more preventive strategy in all field of dentistry. During the last years preventive dental care has gained significantly in importance in the German health care system.

Negative points of the system:
The cornerstone of the corporatization strategy in German healthcare policy is the system of joint self-government by doctors/dentists and health insurance funds. This corporatization as a healthcare strategy currently appears to be approaching the limits of its feasibility. In the present-day debate on healthcare policy the efficiency of the corporate structural model, and specifically its tradition of collective contracts, has been called into question. A new organizational paradigm is now assuming prominence – namely - , that of competition and the use of market elements within and between the corporate players as the corporate bodies of physicians and dentists and the health insurance funds. To make a clear forecasting what will happen in the future is not yet clear

In conclusion, Professor Borutta underlined there is an urgent need to define high risk patients and to analyse the risk factors of caries, especially of early childhood caries, as well as for progressive periodontal diseases. A further problem is the dental care for elderly, mostly for those who have multiple disabilities.

3.8. Current situation and future expectations concerning oral health monitoring systems in Hungary

Professor Judit Szöke, Semmelweis University of Budapest, Hungary

In this talk, Professor J. Szöke presented a brief introduction to Hungary and its parameters (including population, economy, health care system, dental care, insurance system, etc;); described current monitoring systems with a focus on oral health, discussing both positive and negative features; provided an overview of plans in the field and identified what priority information we want to obtain for which priorities on health objectives.

General Information - Country description
Hungary is a new member state of the European Union with an administrative structure - political and geographical - based on 7 regions, formed by 21 countries and the capital. Average life expectancy at birth of the 10.17 million inhabitants is respectively 68.1 years for the male and 76.5 for the female. GDP per capita as a ratio of EU average: 27. Hungary's health care system is still dominated by the state, so the government is the dominant regulator of health services. Health services are funded chiefly from the compulsory National Health Insurance Fund for recurrent costs. The Fund is based on compulsory payroll contributions from both employers and employees. Health services are delivered predominantly by public providers in facilities owned mainly by local governments. Additionally, private service is available. Some primary care and specialist private clinics have been established where people pay for services.

For more than a decade, the health care systems in Hungary have been in transition, and new changes are now on the horizon with a view to privatization, outsourcing certain health care services to the business sector. Dental care, besides prosthetic work, is provided free of charge by the Public Dental Health Service. Children up to 18 years of age receive free dental care in the context of school dentistry.

Health monitoring in Hungary today
In Hungary, as in other countries, pollsters regularly collect and survey data on the population's health and major influences, such as environmental and individual factors. Health monitoring is up and running, with regular collection, evaluation and publication of health data to identify health goals, determine the success rate of public health programs, and to support well-founded decisions.
The central health records consist of data of individual citizens and of the general population. On individual citizens, namely patients data are mostly collected by primary data collectors, that are the health care providers including dentists, who then supply the data to secondary data collectors; on the general population (samples), by secondary entities. These are typically national organizations, institutions and agencies, which collect, process and supply data concerning health/oral health:

Hungarian Central Statistical Office collects data annually under the National Statistical Data Acquisition Program, which is regulated and mandated for every provider by an annual Government Decree, and covers health and dental care as well.
The Minister of Health issues an annual report on survey methods and formulae by indicators:

- number of visits to a dentist during the past year
- number of dentist interventions during the past year

As a downside, this survey contains no indicators whatsoever with respect to patient instruction and to preventive treatment (cleaning, fluoride treatments, sealing).

National Institute for Strategic Health Research provides data collection from primary data collectors and other entities for domestic purposes and international databases, according to specific indicators such as:

- European Health for All Database
- Organization for Economic Co-operation and Development (OECD)

National Center for Epidemiology obtains, processes and professionally analyzes data from primary sources, and as primary data collector is in charge of Hungarian Health Interview Surveys. These polls, conducted on 447 communities since 2000, interrogate a representative sample (5,000-7,000) of the population over 18. "Use of dental services over the past 12 months" as oral health indicator was present. Only 38 % of adults visited a dentist, private or otherwise, during the past year. This is far below the EU average of 60%. Women had a higher visit rate (43 %) then men (34 %).

National Insurance Fund collects data based on an itemized list of dental services determined in a Government Decree. These data on the number of services extended to patients are then used to allocate financing to various practices.

National Oral Health Surveys. In addition let us take a brief look at this very important oral health monitoring program, which is run by a dedicated team of dentists organized for this purpose, and which I feel we have every right to be proud of. In Hungary the first national baseline examination (the so-called *pathfinder survey*) was carried out in 1985, followed by data collections several times in different index ages and age groups. The data are available from the WHO Global Oral Data Bank. The last time around, an oral health questionnaire administered to 12-year-olds and adults on dental knowledge and health care habits included questions about smoking.

Professor Szöke showed a few data on the prevalence, trend and treatment needs of dental diseases in various age target groups.(1) The DMFT mean value of 12 year olds was 3.3; (2) the caries trend of 12-year-olds has shown a decreasing tendency; (3) only 66 % of the adolescents aged 18 had full dentition compared to the WHO goal of 85 %); (4) the levels of oral diseases have been high and stable at the 35-44-year age group over the past fifteen years; (5) of the 65-74 age group 26 % was edentulous.

Going back to our larger context, in summary we can say that data collection in Hungary still has its limitations nevertheless some good and useful features as well. The positives of current systems are (i) some data collection is very informative and useful and (ii) a lot of data collected are comparable. The negatives aspects are that there is no standardized list of core indicators. Otherwise, the existing monitoring mechanisms suffer from flaws, shortcomings, overlaps, and limited availability. Sometimes it seems there are too many data collectors and too many data; other times we realize that some basic data are missing or there is a lack of appropriate reference data for comparison. At least, the current data collection practices within the Hungarian health monitoring system fail to provide sufficient information on a considerable proportion of indicators. It is therefore a prerequisite for us to update and further develop the Hungarian system of health monitoring.

Plans and tasks for the future of Hungarian health monitoring

On the initiative of the Ministry of Health, in 2003 Hungary began to develop a population health reporting system, building on the collaboration of the major institutions of the sector.

As a result of the cooperation, specific objectives and tasks have been identified.

Long term and short term tasks and developments:

- Organizational and capacity development, training
- National integrated health databases that provide feedback of comparative information in countries
- Identification of core indicators
- Regular updates of the health data bank
- Monitor non-communicable diseases of special significance for national health, also with regard to their determinant factors

Fortunately, we have hopeful perspectives due to our new Public Health Program. This program, called National Program for the Decade of Health, meshes with the World Health Organization's Health21 policy and includes action plans that are essential to European Union accession.

The Program intends to move forward in four areas:

- Creating a health-promoting social environment
- Promotion of healthy lifestyles, reducing risk factors to human health
- Preventing avoidable mortality, morbidity and disability
- Strengthening the institutional system of health care and public health

This latter field has a high-priority popular health project centered on the topic of Information Technology for Monitoring The program includes several subprograms. There is no separate sub-program for oral health. Oral health goals were set up and actions were defined, so the dental tasks are integrated into the different subprograms, but I still feel that the field is underestimated and underrepresented in this program.

In summary, Hungary's own health policy needs and the expectations of professional and political decision makers dictate the establishment of a health database to European standards and in synergy with international databases, as well as the implementation of the appropriate health monitoring system. Competent experts in Hungary look forward to reviewing the material compiled as a result of our joint efforts here, and are prepared to accept the list of oral health indicators.

3.9. Oral Health Indicators: health policy requirements and decision makers' expectations in Greece

Dr Elpida Pavi, Chief Dental Officer, Greece; President of the Council of European Chief Dental Officers

Oral health surveillance is the essential tool for the monitoring the oral health status and its determinants. It offers the information required for the formulation and evaluation of oral health policies and strategies. However, it relies on the infrastructure of the health and oral health system of each country, and thus differs among the E.U. member states.

The health and oral health system in Greece

The Greek health care system is a system of compulsory public health insurance with strong elements of a national health system and extensive involvement of the private sector. In the public sector, health care is provided by the National Health System called ESY which offers primary, secondary and tertiary care through a network of hospitals in urban areas, Health Centres in semi-urban and rural areas, and rural medical surgeries covering the whole of the country. Still in the public sector, health care is also provided by a number of the Social Insurance Funds which operate primary care polyclinics in urban areas. The private sector offers both primary and hospital care all over the country, mainly concentrated in the big urban centres, due to the prevailing free-market forces.

As far as dental care is concerned, dental departments operate within the Health Centres and the Hospitals of the National Health System (ESY). Dental departments also exist in certain of the polyclinics of the Social Insurance Funds, and finally, the main dental care provider by far, is the private sector.

The dental departments of the Health Centres offer Primary *Dental Care which comprises:*

1- Full dental care to children from birth to 18-years of age
2- Dental health education to the whole population of their catchment areas.
3- Emergency dental care to adults.

Hospital Dental care comprises of:

1- Dental treatment to patients suffering from systemic diseases or general medical problems which require hospital support and support from other medical specialties.
2- Emergency dental care to everybody as well as to in-patients.

Still within the public sector, dental care is provided by some of the Social Insurance Funds which operate polyclinics with dental departments. The major social insurance fund in Greece is IKA (Institute of Social Insurance) which covers the employees and labourers of the private sector. IKA is like a second health system on its own, as it operates dental departments in polyclinics based in urban areas, and thus IKA is actually a major provider of primary dental care of the public sector in the urban areas of the country. Dental treatment is provided free of charge at the point of delivery.

Another 10 Insurance Funds operate a small number of dental departments of polyclinics based in urban areas as well, offering dental care. Some treatments are free of charge at the point of delivery, for some others co-payments are charged.

Apart from IKA, all other Social Insurance Funds offer some coverage of dental treatment, but the level of coverage differs. They operate as purchasers of dental care from the private sector on behalf of their insured members. However, only a small number of them contract with private dental practitioners, as the fees-per-item they pay are considered low and dentists are not willing to contract. So the vast majority of dental patients pay their private dentist themselves and claim back a small percentage of the fees.

Last, but not least at all, comes the private sector, where the majority of Greek dentists work, in their own single or group dental practices. Approximately 88% of the Greek dentists work in the private sector. A most interesting figure concerns dental expenditure. 95% of the dental expenditure in Greece is private expenditure. This means that the dental care offered by ESY and the care covered by the Social Insurance Funds account only for 5% of the dental expenditure. So dental care is almost uninsured and left to the private sector.

Oral health information sources in Greece

The fact that oral health care is almost uninsured and covered by the private sector has a significant impact on the extent and form of data that can be collected for the monitoring of the system.
Private practitioners have no obligation to report the turnover of their work: the number of patients, number of appointments, courses of treatment, case mix, waiting time, fees, income, etc. There is an indication of their total income from their annual income tax reports, but this is an underestimate because there is some tax evasion in Greece.
The lack of routinely collected information on the use of the private dental services means that the greatest part of oral health care information cannot be substantiated given that as mentioned earlier 95% of dental care is provided privately. Thus, Greece relies on ad hoc surveys mainly.

On the other hand, the fees per item reimbursed by most of the Social Insurance Funds are so low, that not all patients claim back dental fees. This way, Insurance Funds keep their dental expenditure low, a situation which is welcome and adhered to. From the claims, it would be possible to know the case mix, courses of treatment, and so on, but most of the Insurance Funds do not publish their data routinely. Thus, Greece relies on ad hoc surveys based on the Insurance Funds claims archives which represent an underestimate. There is however, the Annual Social Budget, the official report of the Ministry of Labour and Social Insurance, where the lump sum of money budgeted for dental treatment for the coming year for each Insurance Fund is mentioned.

Oral health information collection is better organised in the National Health System (ESY).

Dental departments of the hospitals and health centres of the National Health System (ESY), send to the Ministry of Health their annual reports with monthly breakdowns of their activities, that is, numbers of items of treatment provided and numbers of school visits (this is for the Dental Departments of the Health Centres only, not of the hospitals, because it is the Health Centres' responsibility to cover the schoolchildren). They also keep in their archives the dental records of the children of their catchment area; however, they are not obliged to send oral health status reports to the Ministry.
So, for the level of oral health, ad hoc surveys are undertaken. In 2002-03, the second national pathfinder survey of the oral health status of children was carried out. However, we do not have a system of periodic national surveys like other European countries do.
The Dental Department of the Ministry of Health collaborates with the Hellenic Dental Federation and the District Dental Associations for issues of dental manpower, as well as oral health promotion programmes they undertake. Collaboration also exists with the Social Insurance Funds of Health Professions, in order to cross-check the active dentists (active dentists are obliged to pay their insurance premiums).

In conclusion, routinely collected oral health data in Greece are limited. Oral health surveillance in Greece relies on ad hoc surveys or reports which analyse the various fragmented sources of oral health information.

Weak links in oral health information collection in Greece

An inherent problem of the oral health information collection in Greece is that the private sector, the major oral care provider, cannot be obliged to provide the Dental Department of the Ministry of Health with routine data. An estimate only would be possible to be drawn indirectly, if oral health coverage either by the social insurance funds or private insurance companies was increased. This would act as a strong incentive to patients to claim back their dental care expenses and thus retrieve data from the claims. However, there is no indication that something like that is going to happen in the near future.
Another problem is that information technology and computerisation has not been adapted to the extent that would allow quick transfer and analysis of comparable data. So, there is a wealth of data at hospitals and Health Centres of the National Health System which cannot be readily transferred to the Ministry of Health.

From the above information it is evident that oral health and oral health care surveillance in Greece relies on ad hoc surveys.

This is the reason why Greece would not be in a position to provide full information (national figures in all fields) in the near future, if an ambitious database was instituted at European level.

Greek priorities in oral health information collection
Greece adopts the views of the Network of Competent Authorities of the Health Information Strand of DG Sanco of the European Commission to start with a core set of health indicators, from existing and valid data in order to have a fully completed core database. This will concern data which will continue year after year to be collected. As any database is a dynamic and not a static tool, more indicators will be developed in the future and will be built-in as new valid, reliable, sensitive and specific indicators.
Furthermore, data should concern topics of significant public health importance and for which there is space for improvement.

Great political importance at E.U. level is attributed to the mobility issue, a topic which is included in the mandate of the Health Systems Working Party of the Health Information and Knowledge Strand as implemented by DG Sanco. The mobility issue covers both aspects of oral health professionals' mobility and dental patients' mobility. Dental patients' mobility can have a significant impact on dental expenditure and the dental market in general, as it entails costs for the insurance system which are incurred in another member state. This is an issue which is currently being discussed at the Council of European Chief Dental Officers.

Thus, it is proposed that this project includes an indicator for professionals' mobility, perhaps % of foreign dentists practising in a country, and another indicator for patients' mobility. Patients' mobility is more difficult to trace and document, as patients can seek dental care in any E.U. member state. Indirectly this could be done through the Social Insurance Funds which keep data of the dental costs they cover for treatments abroad. However, this would only be a proxy measure as far as Greece is concerned, because as mentioned earlier, dental care is almost uninsured. Thus, more thought has to be given on this issue.

In conclusion, oral health care administrators of the Hellenic Ministry of Health look forward to:

- A realistic data set: data that can be found and a database possible to be filled in and not to remain with empty boxes and fields.
- To concentrate on oral health issues of public health importance, not on research oriented data. What is needed is monitoring. If a finding emerges which requires further research this can be undertaken by either the Dental Department of the Ministry of Health directly, or it can be commissioned to the Dental Schools or other research institutes, but it should be problematic if it is included in the core indicators list. Perhaps later on when a valid and reliable indicator is established, then it can be added in the database.
- Indicators to have been tested: valid, reliable, sensitive and specific. Indicators that are now being developed by the dental academia should not be included in the core set now. They can be added later on when proved valid and reliable.

- Socio-demographic information: collaborate and co-ordinate the oral health database with other European projects, in order to have the same indicators, so each country collects and reports one figure for the same issue.
- Finally, some of the indicators under discussion relate to country oral health systems profile. However, other projects already have done relevant work, so again collaborate and co-ordinate with them (EUCOMP, CECDO etc.)

As administrators, we want to know what is:
- the supply of dental services,
- the oral health status and oral health needs of the population and the vulnerable population groups,
- the utilisation of dental services,
- at which costs care is provided,
- the quality of oral health care services including accessibility and responsiveness of dental services,
- also, indicators selected to give us the opportunity to monitor the achievement of the HEALTH21 Goals,
- the mobility of oral health professionals and patients.

3.10. Point of views: health policy requirements and decision makers expectations
"Caries Risk Assessment"

Dr. Jaap.SJ. Veerkamp, ACTA University, Netherlands

The European 12-yr old children are among the dentally healthiest in the world. Some specific groups of children however, are not. As a European community it is our duty to identify those groups and assist them in preventing or solving their dental problems. In this lecture we will clarify that mainly economical reasons play a role in the decision to prevent and treat dental caries in risk groups.
The groups at risk are mainly the very young patients, the mentally disabled and the elderly people. Group strategies on preventive issues are mainly paid according to the 80%-20% principle: with 20% of the costs 80% of the effect must be achieved. In this case a preventive campaign should have an 80% effect for very limited costs. To reach the last 20% of the people, the vulnerable people, the costs would be a lot higher and probably an inversed situation might occur; we would need 80% of the costs for a 20% effect.
Taking the consequences of these facts, national campaigns on caries are out. We need to find other ways to inform the last 20%, the people at risk, the vulnerable people. The finances on such a project have to be limited; otherwise such a project would not leave the drawing table. In developing new indicators, in assessing their efficacy, economical factors are very important.

In the Netherlands the dmf-s in 5yrs old children is approximatively. 4.0 (no X-rays taken, therefore probably an underestimated figure). The restorative degree is app. 12.5%, though 85% of the dentists claim that treatment of toddlers should be their first priority.

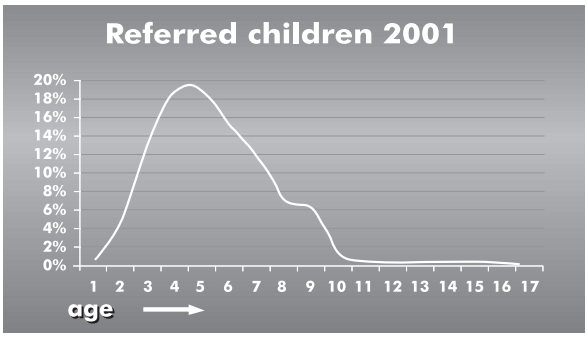


Figure 7

A representative graph of children referred to Dutch paediatric dentists for dental treatment shows that 75% of the children are in the 3-7 yrs group. This apparently being the most difficult part of paediatric dentistry focuses on the preventive need of the referred group of paediatric risk patients; solely restoration will not solve the problem. Next year probably a new wave of referrals will appear.

In a survey we found four factors related to dental health: Age-caries-cooperation and preventive attitude. A short outline of the relevant studies is given.

1. **Age.** In the Dutch study, as well as in many others, age is the strongest factor associated with dental caries. Nursing bottle caries and developmental disturbances en adolescent behaviour is the most striking examples.
2. **Caries.** The occurrence of caries in the deciduous dentition is a strong predictor for further caries in the deciduous en -with limited figures- the permanent dentition.
3. **Dental anxiety** is strongly and positively related to dental decay, mostly in cases where the mother is not able to take care for adequate dental treatment of the child due to her own dental anxiety.
4. **Prevention.** The most effective attitude to prevent dental caries is brushing with fluoridated toothpaste. The evidence is overwhelming.

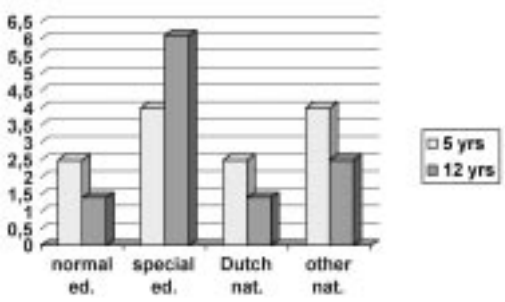


Fig.8 Children arranged according to their school level (normal/special education) and to their ethnicity (Caucasian/other).

In a large Dutch study with the dmf-t as dependent variable, the influence of developmental level and ethnicity was studied. Though only cross sectional, the study indicated that a developmental disability is a stronger predictor for oral health than ethnicity. In general we have to guide a patient from the level of being taken care for to a level of self-care. If self care is not possible the community has to fill in the blanks.
Focusing on the patient at risk for oral health we will be able to develop general criteria that can be implemented in every country to the level that country needs. Every country can assess its individual level of vulnerability.

Summarising we have to focus on three things: (1) Can we afford it? (2) Professional- or Self-care? (3) Political implications.

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Chapter 4
Long List as the starting point for selecting Core Indicators

Working Groups by theme: Long list vs. short list: Harmonization of knowledge, validation and critical analysis

The **goals** of the working groups were to identify broad issues which, if applied, would provide the greatest oral health gain and prioritise each intervention against criteria below.

Process: As an initial step after reviewing needs assessment data, ask members of the planning group to describe the three most important health areas of concern for the state in the next decade. For each issue, list the primary goal and the primary strategy that has been or could be used to approach it. After consensus on the priorities has been achieved, consider this input in ranking potential goals and issues to address.

The following questions were adressed to the groups:
Indicators and health policies

- Which are the big problems in term of general public health policy maker and the big chances for improvement?
- Which "indicators" represent overall (negative or positive) health measures, or the largest health problems (largest 'disease burden') in terms of diseases or functional health at the population level?
- Where the most important oral health inequalities appear (possibly to be implemented by SES stratification of many indicators)?
- Which focus on determinants of oral health can be influenced by oral health and other policies and on associated interventions in health promotion, health protection, prevention and/or health care?

Indicators and long list structure

- Is the format of the long list proposed OK?
- Which indicators - selects between 3 and 6 indicators - in each of the 4 chapters are the most crucial ones from a general public health point of view? Include arguments why the indicators are selected.
- Will we keep QoI as a separate category or should it be included as part of the section Oral Health Status (Class 4)?
- Are the categories included OK?

4.1. Oral Health Determinants Report from Working Groups

Chairperson: Dr Jaap Veerkamp; Rapporteur: Dr Elpida Pavi

The issue of indicators concerning the oral health determinants was discussed in three rotating working groups, thus the report encompasses the views of all participants of the Granada Meeting. The view was accepted that oral health determinants are considered important because they allow us to actually identify the at-risk groups. So, this was established as the focus of the discussions.

The method of the work was decided to be the examination of the indicators included in the long list with the objective to select the core set from the point of view of the identification of at-risk groups.

Long List Class 1: Socio economic and demographic indicators

The first issue raised and agreed upon was that we should not concentrate only on dental caries, but to keep in our view the oral health as a whole.

Main indicators

Various socio-demographic characteristics were discussed as being important in identifying or characterising at-risk groups, like age (children-elderly), low SES, people with special needs, ethnic minorities, lack of insurance etc. After extensive discussion it was concluded that the main indicator is **Education,** and then follow the other indicators: **Economic status, Social class** and **Vulnerable groups.** Those indicators must be seen in relation to a country resources and possibilities. All other indicators from the long list (family situation, GNP, immigrant or refugees) are more ore less related to the basic items.
It is acknowledged that social class may be determined differently in each country and this may be a problem. It is also suggested that 'vulnerable groups' is an open indicator. This will allow each country to report on its own vulnerable groups, which may differ from the vulnerable groups of another country.

Considerations

During the discussions considerations raised related to the ethnic minorities, migrants (legal and illegal), language, family composition (one-parent families), as well as ethical and democratic considerations on categorising or labelling people. While these have to be kept in mind, the indicators suggested for inclusion in the core set are those mentioned above.

Long List Class 2: Oral health Systems

There was unanimous agreement that the Oral Health System has to have the ability to identify the at-risk groups of the population.

Main indicators

Discussion started with the school-based programmes (implying that school children are a major at-risk group) and their components. Then, other population groups emerged like the medically compromised elderly.
Eventually, it was concluded that the main factor/indicator which we should formulate in a way (not known yet) is the **Outreach philosophy and practice of the system.** It is stressed that the oral health system must be active and reaching out to at-risk groups and not just operate passively and wait for these groups to initiate themselves contact with the service.
Another conclusion was that another important indicator to be included in the core set is that the system must adopt the

Common risk factor / Multidisciplinary approach. There is good and ever increasing evidence from countries like the UK, Denmark and Italy that oral health awareness is successfully raised by community nurses visiting nursing mothers, or by paediatricians advising mothers and communicating with children. Oral health education to pregnant women was also discussed as an example of good practice.

Considerations

During the discussions considerations raised related to the age factor as being important (see introduction), because risk criteria may differ for different age groups. However, we have to be cautious because there are different epidemiologic profiles in different member states.

Long List Class 3: Use of Services

Frequency of utilisation of oral health services was the first issue discussed, and there were arguments on how to define regular attendance. Also, whether frequency of dental visiting is more important than reasons for dental visiting or not.

Main indicators

The drawbacks of reported measures of dental services utilisation were noted. Furthermore, regularity of dental attendance may be determined differently in different member states and it strongly correlates with needs. Differences in the optimal regularity (frequency) of dental attendance were also discussed.

Eventually, it was concluded that the most important determinant of utilisation of dental services from the point of view of the at-risk groups is the **Economic status.**

Other indicators discussed and agreed upon were **Availability** and **Accessibility** of dental services. Also, **percentage (%) of population with individualised recall system.** The proposal of this indicator expresses the unanimous view that optimal dental attendance differs according to needs.

Considerations

During the discussions considerations raised related to distance and time as important factors influencing use of dental services, the economics of dental care (cost), and the avoidance behaviours (dental phobia - can be decreased/alleviated through an individualised recall system which offers desensitisation). This means that finances, distance to and number of health care professionals should be no barrier. Through policies, these indicators will have to show their improvement.

Long List Class 4: Risk Behaviours

The role of toothbrushing behaviour, eating and drinking patterns, smoking, alcohol consumption and medications for chronic conditions were raised during the discussions.

Main indicators

There was unanimous agreement that the most valid indicator for **toothbrushing behaviour is Toothbrushing twice per day with fluoride toothpaste.** The importance of fluoride toothpaste is stressed.

Frequency of intake of fermentable carbohydrates was examined as an indicator. After extensive discussion it was agreed that the most appropriate indicators are **Frequency of eating** and **Frequency of drinking** in general (not just carbohydrates) as two separate indicators. Still, it was mentioned that **Past Caries experience** (last year's) is the strongest predictor of future at-risk status. **Smoking, Alcohol** and **Medication** taking were also accepted as important behaviour indicators for identifying at-risk groups.

Considerations

Considerations related to the age factor. Risk behaviours differ in the various age groups. Caution is needed when compiling and interpreting data of self-reported measures of behaviours.

The database will have to be constructed in such a way so that it will allow combinations – crosstabulations of age and the various behaviours, as well as the examination of the interrelationships of the behaviours.

A final point considered concerned the fact that nowadays there is a shift from the study of the constituents of an unhealthy behaviour towards the characteristics of a healthy behaviour (i.e. research on the profile of the non-smoker or the non-drinker, rather than on the profile of the smoker or the drinker).

4.2. Oral health status and oral health related quality of life (OHQOL) Report from Working Groups

Chairperson: Professor Denis Bourgeois; Rapporteur: Dr Anna Mari Nihtila

The working groups were asked to identify the main problems in term of public health policy maker and also to identify which indicators represent the largest health problems in terms of diseases or functional health at the population level. The working groups were also asked to comment on the format of the long list and to select between 3 to 6 indicators that are the most crucial ones for a general public health point of view.

Indicators and health policies

All the working groups identified the **inequality** in oral health as the main problem. This concerns especially children, adolescents and frail elderly. The major issue is to identify the **risk groups.**

Specific diseases and proposed indicators

Dental caries:

The groups discussed of recording oral health or oral disease status and agreed that oral disease status should be assessed. The proposed indicator was the percentage of population affected and the mean DMFT of those affected. The DMFT index with its limitations was still valued, as it is useful for benchmarking between countries and for detecting trends and for planning oral health services. Especially the D component was considered important.

Working group one recommended a new and robust indicator, **caries of the first permanent molars** to be added to the long list.

Periodontal diseases:
The CPITN indicator was discussed and agreed that it is difficult to get reliable data by using this indicator only. The following indicators were proposed for assessing periodontal diseases: CPI **and** the loss of attachment, presence of pockets, bleeding on probing.

Missing teeth:
Edentulousness was considered useful indicator at the moment, but in the future as edentulousness is decreasing rapidly in the European countries this might not be a practical indicator.A widely used indicator, 20 or more teeth present was proposed to be added to the long list of indicators.

Oral health related quality of life (OHQOL)
All the working groups agreed that there is need for measurement of the oral health related quality of life and it should be included as part of the oral health status section. The OHQOL indicators should be simple and robust. Pain and functional limitations were considered the key concepts.

Oral Health Impact Profile (OHIP) instrument was regarded useful. When monitoring the health of populations it is necessary to measure not only the clinical signs of diseases but also the impact of diseases on the physical, psychological and social wellbeing of people, i.e. subjective health. Measures of subjective oral health or health related quality of life should have sound theoretical basis and should be an integral part of population-based health surveillance.

In oral health, a conceptual model based on World Health Organization's first classification of impairment, disability and handicap has been proposed by David Locker to explain the biological, behavioural and psychosocial consequences of oral disease. Since the publication of Locker's model, a variety of subjective oral health status measures have been developed The 14-item version of the Oral Health Impact Profile is one such measure: It has been tested for reliability and validity and has been widely used all over the world. It has been used as part of national surveys in Australia, Finland and the United Kingdom. The longer version has been used in a national survey in Germany and the NHANES-04 includes six quality of life questions that are based on the OHIP14 questionnaire, with some changes to wording.

The seven dimensions and the subjects of the questions included in OHIP14 are:

- **Functional Limitation:** trouble pronouncing words, worsened taste.
- **Physical Pain:** aching in mouth, discomfort eating food.
- **Psychological Discomfort:** feeling self-conscious or feeling tense.
- **Physical Disability:** interrupted meals or poor diet.
- **Psychological Disability:** difficulty relaxing, embarrassment.
- **Social Disability:** irritability, difficulty in doing usual jobs.
- **Handicap:** life less satisfying, inability to function.The frequency of each impact during the preceding year are reported on a five-point scale ranging from "never" through "hardly ever", "occasionally", "fairly often" to "very often".

The wide use of OHIP14 is based on its feasibility. It takes only few minutes to administer and it can be used in postal, computerised or interview form.

Other discussion outcomes
Oral cancer
Collecting data on oral cancer (incidence and mortality rates) is a national responsibility and this information is available in the cancer registries.
Fissure sealants
Indicators collecting information of sealants should not be in the oral health status section and it was proposed that these indicators would be moved to the prevention section.
Orthodontic care
An indicator connecting malocclusion and the quality of life was regarded important in the European context.
At least, the structure of the list was discussed in the working groups and the following change to the structure was proposed:
1- To merge the thematic "Oral health and Quality of life",
2- To produce literature on Evidence and Feasibility

4.3. Oral Health Systems Report from Working Groups

Chairperson: Dr Kenneth A. Eaton; Rapporteur: Professor Joana C. Carvalho

Introduction
Three different small groups of delegates took part in sequential discussions during three sessions which took place in Granada, on 7/8 May 2004. At the beginning of each session, each group was given a concise description of the existing oral health system in the countries of the expanded European Union (EU) and European Economic Area (EEA) to provide a background for the work in hand. In subsequent discussions the following points were then considered to aid the small groups in their choice of appropriate oral health indicators, relevant to current and future conditions:

- *What is the importance of oral health system indicators for the quality of oral health care on a population basis?*
- *Does it help to measure the effectiveness of the system responsible for delivering care?*
- *Do the indicators bring any benefit to the system?*
- *What does the health system lose by not having this indicator?*

A start was made on exploring the feasibility of recording such indicators in the EU/EEA; taking into account the time required and costs *(recording may at present be realistic in some countries while in others it may need to be encouraged in the future).* It was agreed that it would be essential to assess the strengths and weaknesses of the indicators against

evidence from scientific investigations rather than opinions. Finally, a set of core indicators for the next 10 years was suggested.

Existing Oral Health Systems in European Countries

According to Andersen et al. (1995), an oral health care system is composed of policy, organisation and resources. These three components can be considered when comparing oral health systems in European countries. In principle, the policy of a system should guarantee to a large extent the prevention of oral problems and, and in cases of their occurrence, the system should, in order of descending priority, offer relief of pain, restoration of function and aesthetics (Tickle et al. 1997). The organisation of oral health care systems may follow a uni-disciplinary approach (oral health care professional working in private or public clinics) or a multi-disciplinary approach (oral health care professional working in a team to promote general good health). The organisation and the co-ordination of the oral health systems may be established at national, regional or municipal levels and their performance is dependent of the available financial and human resources (Eaton, 2002). Few studies have described and compared systems for the delivery of oral health care at national level in European countries (Eaton, 2002). The following broad classification of oral health care systems in the EU/EEA was suggested by Widström and Eaton (1999) and modified to include the ten countries that joined the EU in May 2004 (Widström and Eaton, 2004):

Nordic System – (Denmark, Finland, Norway, Sweden, and (in some aspects) Iceland.

There is a significant government involvement in organising, delivering and financing oral health care in these countries. The system is characterized by the universal access to a free public oral health care for children and facilitated access for adults. Oral health care data is collected by the governments; consequently the system is regularly monitored for effectiveness and costs. There is widespread and growing use of a range of oral health care clinical personnel including dental hygienists, dental nurses and (in Denmark and Finland) clinical dental technicians, to support dentists.

Bismarckian System – (Austria, Belgium, France, Germany, Luxemburg)

There is little government involvement in the system, which is based on the principle of obligatory social insurance, funded by employers and employees. Payments for oral health care are made by sickness funds. Apart from recent national oral health surveys (in Austria and Germany, data collection has been largely related to the payments made by sickness funds. Dental hygienists (with the exception of Germany) and clinical dental technicians are not employed. In Belgium and France the majority of dentists do not employ dental nurses.

Beveridgian System – (United Kingdom)

Until recently, the vast majority of oral health care has been provided through the Beveridge, inspired National Health Service, in which private dental practitioners have contracted with the government to provide oral health care. The system is financed by the government and a wide range of data, on both oral health status and costs are collected for the government. There is widespread and growing use of oral health care clinical personnel other that dentists to provide oral health care under the supervision of dentists,

Southern European System – (Cyprus, Greece, Italy, Portugal, Spain)

The system is essentially private with virtually no government involvement. Data collection is fragmented and associated with regions or municipalities. At present, there is generally little oral health care data collection at a national level. There is growing use of other clinical personnel, such as dental hygienists and dental nurses, to support dentists in Italy, Portugal and Spain.

Hybrid – (Ireland, Malta, Netherlands)

This system is a mixture of the Bismarkian and or Beveridgian systems with a private system Children benefit from publicly funded oral health care. Oral health status data are collected at a national level in Ireland and Malta. There is widespread and growing use of other clinical personnel in Ireland and the Netherlands, where equal numbers of dentists and oral health care therapists are now in training.

Transitional – East European countries (Czech Rep, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia)

Since 1990, these countries have experienced changes in their oral health system. With a move away from highly centralised co-ordination and largely publicly funded clinics employing many dentists to small privately funded practices. Some national data on oral health care status are collected but data on costs are generally unavailable. Other clinical personnel are employed to support dentists.

Choice of appropriate oral health indicators relating to oral health systems

In discussion it was agreed that in the past ten years there had probably been a gradually increasing demand for representative and reliable data for planning and monitoring of oral health in most EU/EEA countries. Some of the data required are connected with the organisation and resources of the individual systems. For example, there is a lack of data to assess aspects of **workforce** and of patients' mobility in the EU/EEA.

Data related to the workforce should provide information about training of professionals to deliver provision of appropriate oral health care, number of dentists entitled to work in Europe - not only those registered, but also those who are actively providing clinical oral health care (university-trained dentists, stomatologists, some doctors and a few no-university-trained dentists) – and the number of other clinically active professionals working in dentistry (hygienists, therapists, dental nurses, dental technicians, denturists and general nurses). Data relating to the migration of oral health care workers from country to country was thought to be important. The

mobility of patients was also thought to be an important issue, as it appears that growing numbers of patients are travelling across international borders to obtain oral health care (usually at a lower cost) in countries other their own. It may be difficult to quantify such migration of patients. However, it should be established as a future goal.

The evaluation of effectiveness of oral health polices is partly founded on the **accessibility of the services** for the general population. It has agreed that an attempt should be made to collect data at a national level on this topic and on selected groups of young and old people considered at risk, in the future. Such data might be collected by assessing the number of people who potentially have access to oral care and then determining the percentage of people reporting difficulties in accessing oral health care.

Group members who worked for governments or advised insurance systems felt that it was essential to improve the quality of data on **oral health care costs** and to devise mechanisms to ensure that such data were collected in all EU/EEA countries.

Finally, it was agreed that **uptake/ utilisation of oral health care services** by the population was important and would give a measure of the extent to which a system was effective in educating/informing the general population about the benefit of using the available services, their awareness of these benefits and of the effectiveness of delivering these services. It would also help to assess demand when workforce planning.

Strengths, weaknesses and feasibility of recording the suggested indicators taking into account time and costs.

It was agreed that the existing systems for collecting data on the key topics identified in discussion were often neither robust nor reliable in the countries where they existed and that they did not exist at all in some EU/EEA countries. However, it was felt that methodologies should be developed and piloted in the near future. One suggestion was that in countries with little or no previous experience of collecting national oral health data, questions could be added to national household (consumer) surveys or possibly carried out in collaboration with national dental associations. Time did not permit any deep consideration of the issues involved, if it were decided to collect national data on the five topics identified by the group in all EU/EEA countries. However, they clearly need to be addressed in the future.

Conclusions – Suggested Key Oral Health Indicators for Oral Health System

From the discussions which took place it is suggested that the following five areas/topics are of key importance when collecting data on oral health care systems and that further work is necessary to develop methodologies and mechanisms which overcome current problems in implementing their national data collection in all the countries of the EU/EEA:

- Workforce (number, need/demand, migration)
- Migration of oral health care workers and patients
- Access to oral health care
- Uptake/Utilisation of oral health care services
- Costs of oral health care

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Chapter 5:
Final long list of oral health indicators

The specific objectives of the workshop were reached on the initial points proposed at the beginning of the meeting.
The next step of the project is to produce in September 2004 a compendium issuing of the meeting under the auspices of the SANCO Monitoring Programme including all the presentations, discussions, contributions of the Group.
The Oral Health Indicators questionnaire must be, in accordance with the recommendation of the working groups, slightly revisited in order to increase the precision especially in the field of the quality criteria. The finalisation of the long list of the indicators will introduce the processes of the consultation through the European network in order to present a short list in the next meeting, Nice, France, 5.6 November 2004.

CLASS 1, SOCIO ECONOMIC, CULTURAL AND DEMOGRAPHIC FACTORS

1. Population (in millions)
2. GNP per capita
3. Health Care GNP (%)
4. Population income per capita
5. Population under 15, 16-64, 65+ (%)
6. Percentage of school population
7. Median age of population
8. Percent urban population
9. Percent of ethnic minorities
10. Percent of migrants
11. Percent of people with disabilities and handicaps
12. Unemployment rate 15-64 / Employment
13. Population with income below 60% national median (Eurostat def.)
14. Population by occupational class
15. Location
16. Income per capita
17. Education
18. Finish education level
19. Current employment status
20. Unemployment rate

CLASS 2, ORAL HEALH SYSTEMS

PREVENTION, PROTECTION, ORAL HEALTH PROMOTION

1. Regulations, Programs and Models

2. Regulations on Fluoride
3. Regulations on Public Smoking
4. Regulations on Alcohol Consumption
5. Regulations on Drugs Consumption
6. Regulations on responsibility of preventive care
7. Children screening coverage (%)
8. Children covered by school dental services (%)
9. Children's health monitoring (%)
10. Oral health promotion campaign
11. Community Water Fluoridation Programs
12. Community Salt fluoridation Programs

School that promote based Programs centred on: (%)

13. Daily toothbrushing with fluoride toothpaste
14. Bi-diary tooth-brushing at home or in the school.
15. Dietary fluoridation supplements
16. Fluoride mouth rinses
17. Fissure sealant
18. Fluoride varnishes, F-gel
19. Milk fluoridation
20. Diet recommendations
21. Toothbrushing exercises
22. Preventive oral health programmes in kindergartens (%)
23. Special programmes for handicapped children
24. Schools that require use of appropriate head, face, eye, and mouth protection for students participating in school-sponsored physical activitie
25. Community Programs on the Prevention and Control of Oral and Pharyngeal Cancer
26. Dentists who counsel their at-risk patients about tobacco use cessation and cancer screening.(%)
27. Population covered by Prevention and Control of Intentional and Unintentional Injury

28. Population covered by Primary Oral Health Care Service (%) Children Adolescents Adults, Elderly

29. Emergency care
30. Service on demand
31. Systematic care
32. Population with free oral health care, payed by government/ public insurance (%)
33. Actual Estimated levels of Demand for Oral Care (%) 0-14 yrs, 15-29 yrs, 30-64 yrs, 65+
34. Training facilities for oral care personal
35. Fluoridation status (% population receiving)
36. F toothpaste daily (% population that claims to use)
37. Daily toothbrush with F toothpaste (% population that claims to)

Public fluoride programmes

38. Fluoride drinking water
39. Fluoride salt
40. Fluoride topical application
41. Fluoride toothpaste

School Oral Health Programmes (%) 6-7 yrs, 12 yrs, 15 yrs

42. Regular oral examinations
43. Topical fluoride application
44. Fluoride mouthrinsing programmes
45. Pit and fissure sealing
46. Oral health education
47. Non operative treatment of erupting teeth
48. Curative care
49. Kindergarten oral health programmes: % of 2-6 year-olds covered
50. School-based health centers with an oral health component

High Risk Strategies (% categories at risk covered by) Children, Adolescents, Adults, Elderly

51. Bi-diary F. tooth-brushing at home or in the school.
52. Dietary fluoridation supplements
53. Fluoride mouth rinses
54. Fissure sealant
55. Fluoride varnishes, F-gel
56. Milk fluoridation
57. Diet recommendations

Sugar Consumption

58. Total of sugar consumption (kg/person/year)
59. Percentage of sugar consumption via snacks/ candy/chocolate (kg/person/year)
60. Use of Xylitol

Oral Hygiene and Materials Consumption

61. Toothbrushes (Nb/person/year)
62. F-Toothpaste (kg/person/year)
63. Amount of toothpaste on brush used by children under age 7: smear, peasized, halfhead, fullhead, overflowing
64. Average Toothpaste Price
65. Sales of fluoride toothpaste by ppm fluoride as a % of total toothpaste sales
66. Age at which toothbrushing with fluoride toothpaste begins
67. Average Toothbrush Price
68. Electric toothbrushes Price
69. Flossing interdental brushes
70. Frequency of replacement of toothbrush
71. Use of toothpaste with more than one thousand ppm of F

ADMINISTRATION AND FINANCING

Costs

72. Total Public Private expenditure on oral health
73. Oral Health Care GNP (%)

Oral Health Care Fees, Children, Adolescents Adults, Elderly

74. Government
75. Private Insurance
76. Patient
77. Remuneration system, Salaried, fee per item, capitation

Provision of care

78. Access to care: proportion of population within e.g. 5km of a dentist ?
79. Oral Health Care Providers (Number and Density per 100,000)
80. Dentists

81. Chairside assistants
82. Hygienist
83. Laboratory technicians
84. Dental therapists
85. Clinical Dental technicians (denturists)
86. Other types
87. Practising dentists density
88. Practising dentists per 100,000
89. General dentists per 100,000
90. Specialists dentists per 100,000
91. Practising dentists rate (%)
92. Public Services
93. Private Services
94. Universities/Dental Schools
95. Others
96. Practising dentists by sex (%)

Activities: Per dentist per year

97. Number of patients in private practice
98. Total dentist income
99. Number of working hours
100. Total number of patients
101. Total number and percentage of new patients
102. Number and percentage of patients in regular care
103. Number of yearly vacation week
104. Number of working day per week
105. Number of daily working hours
106. Number of patients attended per day
107. Age of the primary dental unit (years)
108. Number of dental chairs normally operate concurrently
109. Number of years practising as a dentist

Care regulations

110. Who is responsible for licensing/relicensing dentists?
111. Who is responsible for licensing/relicensing dental hygienists?
112. Who is keeping registry of oral health personnel
113. Who is responsible for the supervision of professional practice?
114. Regulations on X-Rays?
115. Are there guidelines on treatment procedures and who is responsible for updating guidelines?

Interventions

Percentage of persons having received per year

116. Fissure sealing
117. Fillings
118. Non-operative occlusal caries treatment
119. Crown restorations
120. Veneers
121. Bridges
122. Implants
123. Scaling for periodontal treatment
124. Fixed orthodontic appliance
125. Number of teeth with replacement of restorations
126. Average time by endodontic treatment

Estimation of time spent on patients in the various categories of treatment

127. Check up
128. Preventive
129. Non surgical Periodontal
130. Periodontal Surgery
131. Non-operative dental caries treatment
132. Simple restorative
133. Advanced Restorative
134. Endodontics
135. Extractions
136. Orthodontics
137. Others

Average Time Estimation for Treatment

138. Full Orthodontic treatment course
139. Periodontal scaling per sextant
140. Periodontal complex therapy per sextant
141. Fixed and removable Prosthetic Care
142. Endodontic treatment
143. Restorative care
144. Non Interventive care
145. Extraction

Knowledge, Attitude, Questions on Sealants by Dentists (i.e. Agree, Undecided, Disagree)

146. Newly erupted permanent molars are the most important candidates for sealant
147. Sealants are of great value in preventing caries
148. Sealants are difficult to apply
149. Sealants are easy to promote patients
150. Sealants are not practical in the private office setting

Level of satisfaction with the remuneration provided for:

151. Preventive services
152. Restorative services
153. Prosthetic services
154. Orthodontic services

Level of satisfaction with the quality of care given to the patients

155. Full Orthodontic treatment course
156. Periodontal scaling per sextant
157. Periodontal complex therapy per sextant
158. Fixed and removable Prosthetic Care
159. Endodontic treatment
160. Restorative care
161. Non Interventive care
162. Extraction

CLASS 3, USE OF SERVICES AND RISK BEHAVIOUR

USE OF SERVICES

Dental visits

1. Number of visit to the dentist (including orthodontics) during the last 12 months (No visit, Once, Twice, More than twice, Don't know)
2. Percentage of people who visited the dentist within the past year
3. Proportion of long-term care residents who use the oral health care system each year
4. Proportion of low-income children and adolescents who received any preventive dental service during the past year
5. Visit to the dentist for a check up in the last 2 years
6. How long since the last visit to dental practice Less than 6 months (6-12 months,1-2 years, More than 2 years, Never)
7. Individual based control interval
8. Occlusal caries control during tooth eruption.
9. Percentage of people who had a teeth cleaning within the past year

Reason for the last visit to the dentist

10. Parents had made an appointment
11. Appointment initiated by the dentist
12. Follow up treatment
13. Emergency appointment
14. Others

Act(s) carried out by the dentist during the last visit

15. Provided fillings
16. Removed calculus
17. Extracted tooth
18. Examined the teeth
19. X ray
20. Provided fluoride treatment
21. Explain how to take care of the teeth
22. Checked the need for orthodontic treatment
23. Other treatment

Main reason for not visiting the dentist in the last 2 years

24. Couldn't afford it
25. Don't want to waste money on dental care
26. Afraid I might not like him
27. Too busy
28. No need
29. No serious dental problems
30. Dental problems will go away
31. Dentist's office too far away
32. Others
33. Don't know
34. I am too afraid of the dentist

Reason for the most recent visit to a dentist

35. Something was wrong
36. Time for a check up
37. Recall by a dentist
38. To have the teeth clean
39. Part of a treatment
40. To remain within the payment system
41. Never received dental care
42. Acute pain

Treatment received at the most recent visit

43. Examination
44. X Ray
45. Cleaning

46. Emergency
47. Instruction in taking care of teeth and gums
48. Fluoride treatment
49. Fillings
50. Crowns
51. Root canal work
52. Inlay work
53. Bridge work
54. Extraction
55. Denture work
56. Periodontal/gum work
57. Orthodontic work
58. Any other treatment

Payment directly (out of pocket costs) for the last visit (%)

Sources of dental costs

59. Private dental insurance from the employer
60. Private dental insurance pay for yourself
61. Government
62. Dental clinic
63. Other

Satisfaction with the last visit (Very satisfied to very dissatisfied)

64. Appointment at a suitable time
65. Proximity
66. Location (security, environment)
67. Reception
68. Staff comportment
69. Dentist's attitude
70. Information concerning the oral health state
71. Information about treatment to be pursued
72. Quality of treatment
73. Standard of dental equipment
74. Time spent waiting
75. Cleanliness and furnishing of premises
76. Cost of last visit
77. Pain control
78. Information concerning treatment options and procedures

Feeling about dentists and dental care (Fully agree to fully disagree)

79. Dentists explain all the dental problems that a patient has
80. Dentists devote enough time to their patients
81. Dentists examine patients very carefully
82. Dentists prefer to fix up teeth rather than explain how to avoid problems
83. Dental anxiety and beliefs on the dentist (use psychometric instruments already existing)

Perception of what the dentist might say in case of consultation

84. You have to brush your teeth better
85. Calculus has to be removed
86. You needs fillings
87. You need to have a tool pulled out
88. You must have your teeth straightened
89. Your teeth are fine

Consultation of other person than a dentist for advice or treatment during the last 12 months

90. Doctor (not a dentist)
91. Dental technician
92. Acupuncturist
93. Pharmacist (paramedical)
94. Naturopath, homeopath
95. Other

Provider of the last oral health treatment

96. Dentist Hygienist Dental Technicien
97. Dental Specialist Other

Use of Dental Services by Children

98. Assessment of Disease Status (percentage of all child enrolles who have had their periodontal and caries status assessed within the past years
99. New Caries Among Caries-active Children (proportion of all caries active child enrolles who receive tretament for caries-related reasons within the reporting year)
100. New Caries Among Caries-inactive Children (proportion of all previously caries inactive child enrolles who receive treatment for caries-related reasons within the reporting year)
101. Preventive Treatment for Caries-active Children (percentage of all caries active child enrolles who receive a dental sealant or a fluoride treatment within the reporting year)
102. Dental caries experience in their primary or permanent teeth
103. Children who have received dental sealants on their molar teeth

ORAL HYGIENE AND HEALTH STATUS

104. Frequency of brushing the teeth
105. Use of manual or electric toothbrush
106. Use of fluoride toothpaste

Use of additional measure to clean teeth or gums

107. Wooden toothpicks Plastic toothpicks
108. Dental floss
109. Charcoal, Chewstick /meswak, Other
110. Xylitol containing chewing gum

Mothers opinions and attitudes (Fully agree to totally disagree)

111. It is important t for children to have dental checkups at least once a year
112. Topical fluoride is important in preventing tooth decay for children"
113. Children's baby teeth should be filled only when they hurt

Compliance (Fully agree to totally disagree)

114. Brushing one's teeth prevent tooth decay
115. Brushing one's teeth makes for health gums
116. Using floss to clean th espace between one's
117. Teeth is no guarantee of healthy gums
118. Tobacco is bad for teeth and mouth
119. Sweet products are bad for the teeth
120. Fluoridated drinking water protects your teeth
121. Using fluoride is a harmless way of preventing tooth decay
122. Going to the dentist will solve my problems I have with my teeth, gums, dentures

Perception or feel about health (Fully agree to totally disagree)

123. Poor teeth are detrimental to one's appearance
124. The state of the teeth is of great importance for me
125. Conserving one's teeth is not important
126. Dental problems can affect the organism as a whole

Beliefs on dental health (Schoolchildren) (Agree/disagree)

127. Tooth decay can make me look bad
128. Keeping natural teeth is not that important
129. False teeth will be less of a bother than natural teeth
130. I'm afraid of going to the dentist because of possible pain
131. Regular visits to the dentist keep away dental problems
132. Brushing my teeth can prevent tooth decay

Which advise to take care of the teeth (Schoolchildren)

133. Friends, Parents, Relatives, Teachers
134. TV, Radio, Cinema, Newspapers, Dentist
135. Medical Doctor, Medical nurse, Nobody Others

TOBACCO, DIET, ALCOHOL AND OTHERS RISK FACTORS

Tobacco

136. Current cigarettes smokers
137. Former cigarettes smokers
138. Never cigarettes smokers
139. Current cigarettes smoker: <\9 per day, 10-19 per day, 20 per day, 21-30 per day, >30 per day
140. Former cigarettes smokers: 0-2 years, 3-5 years, 6-10 years, >10 years

Frequency of use of types of tobacco

141. Cigarettes, Pipes
142. Cigars
143. Chewing tobacco
144. Snuff
145. Others

Diet

146. Body Mass Index (by categories)
147. Intake frequency (diary) meals and snacks
148. Snack category (no snack to six or more snacks)
149. Frequency of use eat or drink even in small quantities (Schoolchildren)
150. Fresh fruit, Biscuit, cakes, buns, etc
151. Lemonade, coca-cola, etc, Jam/honey
152. Chewing gum, containing sugar
153. Sweets, Milk with sugar, Tea with sugar

Alcohol

154. Current, Former, Never
155. What kind of alcoholic drink do you prefer ?

Salivary function

156. Feel dry when eating a meal
157. Difficulty swallowing dry foods
158. Sip liquids to aid in swallowing dry foods
159. Amount of saliva in your mouth seem to be too little, too much or you don't notice it
160. Mouth usually feel dry

Pregnancy Oral Health related Risk Assessment

161. I was sent to a dentist by a maternity clinic for counselling
162. Is there any referral system for pregnant women

Care of teeth during the most recent pregnancy

163. I needed to see a dentist for a problem
164. I went to a dentist or dental clinic
165. A dental or other health care worker talked with me about how to care for my teeth and gums
166. I went to a dentist or dental clinic for routine care such as teeth cleaning or regular check-up
167. I had been told that I have problems with my teeth or gums such as cavities, gingivitis, root canal, etc.
168. I had problems with my teeth or gums, but I did not see a dentist
169. I went to a dentist or dental clinic for a problem with my teeth or gums.
170. I received treatment for a problem with my teeth or gums
171. How long has it been since you had your teeth cleaned by a dentist or a dental hygienist? Within the past year, 1 to less than 2 years, 2 to less than 5 years, 5 or more years, never

CLASS 4, QUALITY OF LIFE AND ORAL HEALTH STATUS

QUALITY OF LIFE

1. Description of the teeth and gums (Excellent to Poor)
2. Avoid smiling and laughing on account of unattractive teeth, gums or bad breath (Very often to Never)
3. Avoid conversation on account of unattractive teeth, gums or bad breath (Very often to Never)
4. Capacity of chew hard things, such as hard bread or apples (%)
5. Toothache or feel discomfort on account of the teeth during the last 12 months (Often to Never)

Following problems during the last 12 months

6. Gums often bleed when brushing the teeth
7. Teeth hurt when hot or cold consummation
8. Cannot chew hard things
9. Teeth hurt when having sweets or sweetened drinks
10. Satisfaction with the appearance of the teeth (Very quite to Not at all)
11. Do other schoolchildren make fun of your teeth
12. Missing classes occasionally or for whole days caused by to toothache or discomfort during the last 12 months (Schoolchildren)
13. Any natural teeth at all (%)
14. Number of natural teeth do you have

Removable dentures (Adults)

15. Partial denture (%), Full upper denture (%), Full lower denture (%)
16. Can you pronounce clearly
17. Difficulty to eat
18. Dentures well fixed
19. Dentures hurt
20. Dentures nice to look at

Oral disadvantage due to disease/tissue damage

21. Avoid laughing or smiling because of unattractive teeth or gums
22. Avoid talking to someone because of unattractive teeth or gums or bad breath
23. Embarrass by the appearance or bad health of teeth or gums

Oral disadvantage due to functional limitation

24. Avoid chewing hard things because of teeth or dentures
25. Prevented from eating foods because of teeth or dentures
26. Avoided eating with others because of a problem with chewing

Oral disadvantage due to pain

27. Pain or discomfort from teeth or dentures prevented normal daily activities
28. Trouble sleeping because of pain or discomfort from teeth or dentures

Orofacial pain prevalence and behaviour from pain

29. Pain in the jaw joint or in front of the ear
30. Dull aching pain across face or cheek
31. Painful sores or irritations around the lips or mouth
32. Teeth sensitive to hot or cold fluids
33. Tooth pain while chewing
34. Burning sensation in the tongue or any other part of the mouth
35. Oral Health Impact Profile (OHIP)

DENTAL CARIES

36. Caries-free (%)
37. Proportion of subjects with no “obvious decay into dentine”
38. Primary dentition: prevalence and extent of caries
39. Primary dentition: incidence and extent of caries
40. Early childhood caries
41. Severe early childhood caries
42. DMFT / dft
43. DMFT 1st permanent molars
44. Number of initial lesions (occlusal surfaces)
45. SiC Index
46. Prevalence of individuals with 5 or more DMFT/dmft
47. Caries experience: percentage of the population with one or more decayed, missing or filled teeth (primary ,permanent and mixed dentition)
48. Number of sound unrestored teeth
49. Number of initial lesions (smooth surfaces)
50. Number of initial lesions (occlusal surfaces)
51. Number of restored teeth
52. Number of teeth with decay
53. Caries of the first permanent molars
54. Occlusal caries in first permanent molars
55. Untreated caries: percentage of the population with one or more untreated decayed teeth
56. Percentage with 20 teeth in functional occlusion,
57. Sealants (any sealant, complete or incomplete)
58. Percentage of children with 4 sealant, more than 4 sealants, 8 sealants
59. Quality of sealants
60. Percentage of the population with any sealant
61. Presence and number of crowns, bridges, denture
62. Caries projection (future trends)

PERIODONTAL DISEASES

63. Loss of attachment
64. Community Periodontal Index (CPI)
65. Periodontal disease
66. Presence of >/1 site with clinical attachment level>/4mm and probing depth >/4mm
67. Periodontal disease
68. Prevalence of sites with PD>/5 mm (%) and sites with AL>/4 mm (%)
69. Bleeding sites (%)
70. Presence of pocket more than 6 mm

MISSING TEETH

71. Edentulous
72. Prevalence of missing teeth
73. Type of extracted teeth
74. Number of tooth loss
75. Complete tooth loss
76. Number of natural teeth

DENTAL FLUOROSIS

77. Percentage with any opacity on their teeth
78. Percentage with normal, questionable, very mild, mild, moderate, severe fluorosis according to Dean’s index for 8-year-olds and for 15 year-olds

ORAL CANCER

79. Cancer of the oral cavity (Incidence and mortality rates)
80. Cancer of the pharynx (Incidence and mortality rates)

HIV/AIDS related lesions

81. Oral lesions
82. Candidiasis
83. Erythematous gingival bleeding
84. Necrotizing gingivitis
85. Ulcerations
86. Recurrent herpes labialis, recurrent aphtous ulceration, atypical oral ulcerations
87. Hairy leukoplakia
88. Oral Kaposi’s sarcoma
89. Other

OTHERS

Dental injuries from trauma

90. Annual incidence of dental injuries from trauma in children under 12 years of age
91. Percentage with any treated or untreated trauma
92. Percentage with traumatised incisors needing treatment

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