Health Surveillance in Europe • 2008

European Global Oral Health Indicators Development Project
Oral Health Interviews and Clinical Surveys: Overviews

Edited by
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Health Surveillance in Europe

*European Global Oral Health Indicators Development Project*

**Oral Health Interviews and Clinical Surveys: Overviews**
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 European Commission Health Monitoring Programme has as its main objectives to monitor the trends in the European Community, to evaluate Community programmes and actions and to provide Member States with appropriate health information to make international comparisons and to support their national health policies.

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 public health project will contribute to meet with practical and decisive recommendations.

As part of the Health Information and Knowledge System, the oral health project objective is to provide quality, relevant and timely data, information and knowledge in order to support public health decision-making at European, national, sub-national and local level. Choosing the most relevant set of data indicators, an up-to-date information technology, methods and relevant statistical analysis, represent some of the essential steps to assure a functional Health Information System. The argument in favour of developing a second plan linked to oral health indicators within the European Community's SANCO Monitoring Programme is based on an analysis of the current situation and the need to organize and achieve oral health system monitoring.

The European project titled "European Global Oral Health Indicators Development" (SPC 2002472) has been developed under the auspices of this Programme. The purpose was to establish priorities for a specifically European context in coordination with the existing programme and to make recommendations for improving health system information performance by the establishment of the major indicators of reference. The scopes and purpose of the EGOHID Phase I project for 2003-2005 were to support the exchange of expectations and experiences among experts of oral health statistics and their audience, policy makers in particular. It was also to recommend a list of essential indicators through the conduct a systematic review and to outline a process for identifying a set of core indicators for oral health that will help professionals and decision-makers to promote and improve the global oral health promotion, quality of care and surveillance of people in Europe.

Overall objective were listed i.e. (i) to support European Member States in their efforts to reduce the toll of morbidity, disability related to oral health diseases and especially to strengthen the ability at the local, national, regional levels to measure, compare and determine the effects of oral health services and use of resources on oral health; (ii) to identify indicators of oral health – problems, determinants and risk factors related to lifestyle – of critical oral health care, its quality of care and of essential health resources and to (iii) identify the types of data generation and management problems within the health information system.

40 indicators for monitoring the oral health of children and adolescents, the oral health of general population, the oral health systems and for monitoring the oral health related quality of life were selected, recommended and described in the Catalogue entitled "A Selection of Essential Oral Health Indicators recommended by European Global Oral Health Indicators Development Project."

The purpose of the catalogue was to promote systematic and brief identification and technical specifications of oral health indicators of reference through the use of an oral health outcome framework including information on the level of development of existing indicators and issues where indicators are lacking and require research. This catalogue was edited to facilitate comparisons of indicator data by promoting the harmonisation of the information systems and to improve the capacity of area health services to monitor their oral health improvement activities in a standardized manner. It was therefore indicated to facilitate, in the medium term, service specifications across area health services with a view to maintaining and improving performance and to enhance the capacity to analyse the social, economic, behavioural and political determinants with particular reference to disadvantaged populations.
The EGOHID Project Phase II: Scope and Purposes

The general objective of the European Global Oral Health Indicators Development Project is to support European Member States in their efforts to reduce the public health impact of morbidity and disability related to oral diseases. As part of the Health Information and Knowledge System, the objective of the oral health project is to provide quality, relevant and timely data, information and knowledge in order to support public health decision-making at the European, national, sub-national and local level. To ensure a functional Health Information System it is essential that the most relevant set of data indicators, methods, statistical analysis and up-to-date information technology are chosen.

The scope and purpose of the EGOHID Phase I project for 2003-2004 were to support the exchange of expectations and experiences among experts in the field of oral health statistics and their audience, in particular policy makers, resulting in recommendations for a list of essential oral health indicators. However, a critical analysis of the methodological criteria used in international scientific literature has underlined that new and complementary trends should be recommended to improve the production of higher quality information in oral health epidemiology. Standardized procedures including health interview and health clinical surveys in relation with core indicators should be developed and used. Similarly, thought should be given to the design and implementation of an Oral Health Surveillance System, based on oral health primary care providers which would support national health surveillance systems such as Health National Interview Survey and Health National Clinical Survey. The analysis of the scientific literature showed weaknesses in the evaluation of oral health trends in terms of methodology, quality control, and presentation of results. The ability to interpret and make conclusions in public oral health are therefore limited. New or complementary measures should be put in place in order to improve the quality of medical information in oral health epidemiology.

EGOHIDP Phase II is part of the overall process to provide decision-makers with efficient methodological tools, based on proven evidence, to initiate and develop an operational community health surveillance system in close relation to the other surveillance programmes supported by SANCO (ECHI, ISARE, EIKS, EUROHIS). It is also a continuation of EGOHIDP Phase I. The indicators system will facilitate further promotion of oral health and non communicable disease surveillance in Europe in order to collect information with standardized methodologies, monitor changes, assess the effectiveness of services and plan oral health services within the framework of an inter-sectorial preventive policy based on health determinants.

The objectives of the programme are in line with those of the public health Community action programme (2003-2008):
- to strengthen the health system performance through better system organization;
- to improve the quality of health information while facilitating Member States cooperation;
- to encourage the development of relevant and action-oriented community health policies with priority focus at reducing health inequalities.

EGOHIDP Phase II, according to existing morbidity projects DG SANCO (ECHI, EUROHIS, ISARE, …), will establish methodological criteria for the collection of data to implement and promote oral health indicators in an operational way in order to be able to support and achieve the overall objectives.

The principal objective of EGOHIDP Phase II, 2006-2007, is to develop and promote the use of common oral health instruments in Europe in order to:
- promote systematic identification and technical specifications of oral health indicators;
- facilitate comparisons of indicator data by promoting standardization of methods;
- improve the capacity of area health services to monitor their oral health improvement activities in a standardized manner in the longer term;
- facilitate, in the longer term, service specifications across area health services with a view to maintaining and improving performance;
- enhance the capacity to analyse the social, economic, behavioural and political determinants with particular reference to poor and disadvantaged populations.

The four sub-objectives of EGOHIDP II are to:
- (i) develop recommended common instruments for national health interview surveys (NHIS).
- (ii) develop recommended common instruments for national health clinical surveys (NHCS).
- (iii) develop a methodology for improved NHIS and NHCS data, routinely collected in 25 European
countries at the primary oral health care level.

• (iv) develop methods to adjust national data to allow cross national comparisons.

The next step is to promote the actual implementation of these instruments in the national health interview surveys, the national health clinical surveys and to evaluate their performance.

The main attempted output of the project is promotion of systematic identification and technical specifications of oral health indicators through the use of an oral health outcome framework. This includes information on the level of development of existing indicators and issues where indicators are lacking and require research. In the longer term, EGOHIDP Phase I and II will facilitate service specifications across area health services with a view to maintaining and improving performance and with the enhancement of the capacity to analyze the social, economic, behavioural and political determinants with particular reference to poor and disadvantaged populations.

Within the European Global Oral Health Indicators Development Project Phase I valuable core indicators based on agreed and uniform definitions were created. These indicators are essential for comparisons to be made over time not only between regions and care units but also at national level. These comparisons can then be used as a basis in development and quality work at all levels of dental care and dental services. The prerequisites for monitoring the quality of care in Europe are good, despite major disparities between Members States. However, further development and promotion of models and methods for performance assessment is needed in order to be able to deliver policy-relevant information to each nation’s health policy makers.

The range of potential quality methods is vast, making a full review impracticable. Supporting evidence might be absent or inadequately documented. Existing data sources might not permit the construction of the desired indicators, because the required variables are missing or recorded differently. Dedicated data collection that would yield comparable information on a national level might be prohibitively 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.

Phase II identifies the most promising methods in the respective area; discusses their policy relevance and scientific soundness. It focuses on a set of recommendations for development of the use of common methods for which there is agreement on validity, importance and for which comparable data are available in most EU-countries.

• Promotion of systematic identification and technical specifications of oral health indicators through the use of an oral health outcome framework including information on the level of development of existing indicators and issues where indicators are lacking and require research.
• Facilitation of comparisons of indicator data by promoting standardization method component of indicators.
• Improvement of the capacity of health services to monitor their oral health improvement activities in a standardized manner in the longer term.
• Facilitation of service specifications across health services with a view to maintaining and improving performance in the longer term.
• Enhancement of the capacity to analyze social, economic, behavioural and political determinants with particular reference to poor and disadvantaged populations.
Nine series of tasks were defined corresponding to nine Work Packages (WPs). Each Work Package was developed by a country team including Associate Partners. Co-ordination, dissemination and evaluation were covered by WP1 (France), WP2 (France) and WP3 (World Health Organisation). Harmonization of knowledge was the theme of WP4 (Latvia). Overview of existing instruments was the task of WP5 (Italy); the development of instruments for interviews, clinical information and provider survey addressed by WP7 (Denmark), WP7 (UK) and WP8 (Spain). Finally, the pre-test of common instruments is being carried out by WP9 (France).

Under the coordination of the main partner and with the identification of a principal investigator and the establishment of a research group, the project was divided into six stages reflecting the task under each of the four sub-objectives with respect to the three categories of core indicators recommended and described in EGOHIP Phase I.

Accordingly, the development of recommended common instruments comprises:

Step 1: Harmonization of knowledge from EGOHIP Phase I for the new European Union Member States in order to help decision-makers promote and improve the global oral health promotion, quality of care and surveillance of people in Europe, and be operational in EGOHIP Phase II (Work Package 4).

Step 2: Review and analysis of the existing instrument resources for the monitoring and control of oral health in Europe including 2 arms of research and development (Work Package 5).

Goal 1. Review and analysis of the global (Health and Oral Health) existing instrument resources (Health Interviews, Clinical Interviews) in the literature for monitoring and control of health (Work Package 5).

Goal 2. Review and analysis of the existing Oral Health instrument resources (Health Interviews, Clinical Interviews) used in national surveys for the monitoring and control of oral health in Europe (Work Package 5).

Step 3 and 5: Development of a catalogue of common draft instruments including clinical survey forms, questionnaires, translation processes and fundamental methods guidelines for National Oral Health Interview Surveys, for National Oral Health Clinical Surveys including “sentinel network” and for National Oral Health Provider Surveys (Work Packages 6, 7, 8).

Step 4: Development of a Pre-test Collaborative Study of common instruments at a sub-national level (Work Package 9).

Goal 1. EGOHIP Pre-Test 2007 of a common instrument for Oral Health Interviews Surveys (Work Package 9).

Goal 2. EGOHIP Pre-Test 2007 of a common instrument for Clinical Oral Health Surveys (Work Package 9).

Goal 3. EGOHIP Pre-Test 2007 of a common instrument for Oral Health Interviews Providers’ Surveys (Work Package 9).

Step 6: Communication, dissemination of the information and promotion of the EGOHIP Phase II outcomes (Work Package 2).

Results will be disseminated by:

1. Distribution of the Catalogues to the World Health Organisation, DG SANCO, Ministry of Health of Members States.
2. Dissemination to other Project Leaders of past and present DG SANCO project.
3. Publication of guidelines for distribution to international and national societies members (Public Health Societies, Oral Public Health Associations, Dental Associations), individual oral health care providers, and oral health administrative managers in EU members states.
4. Dissemination of the methodology, using the European oral health decision-makers database, to the public health sector, European and national dental associations, health service and national insurance providers.
5. Internet availability for local, national, regional health authorities, the scientific community and universities to support and promote surveillance systems in oral health in relation to EGOHIP Phase I and II.
6. Communication of the goals, methods and guidelines through publication in international journals.
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Work Package 5: Oral Health Interviews and Clinical Surveys: Overview

As stated above, the EGOHID II project is divided into six stages which reflect the tasks identified under the objectives agreed in the project proposal.

Step 1: Harmonization of knowledge from the EGOHIP phase I for the new European Union Member States now involved in Phase II.

Step 2: Overview of existing instruments.

Step 3 and 5: Development of common instruments, methods and guidelines to be used in national surveys.

Step 4: Pre-testing of collaborative studies of instruments for interviews, clinical surveys and provider surveys.

Step 6: Communication, dissemination and promotion of project outcomes.

The objectives of the WP5 Programme correspond to Step 2 “Overview of Existing Instruments”, in order to present a review of the existing methodologies used in oral health interviews and clinical surveys, facilitate discussion with WP 6, 7 and 8 (development of instruments for interviews, clinical information and provider surveys) on the availability of instruments in Europe, stimulate critical thought on the part of WP6, WP7 and WP8 associate partners on the future role of instruments.

Participants

WP5 has been allocated to the Sapienza University of Rome, Italy.

WP 5 includes the following partners:

• University of Lyon (France)
• Universität Jena (Germany)
• Riga Stradins University - (Latvia)
• University of Dundee (United Kingdom)
• Heim Pal Children Hospital (Hungary)
• University of Nice (France)

The objectives of the WP5 consultation were to facilitate the implementation and development of the WP6, WP7 and WP8 by:

• Presenting a review of the current situation regarding the oral health indicators recommended in EGOHIP phase I relating to problems with health instruments, risk factors and determinants as well as an initial evaluation of action undertaken;
• Facilitating discussion between the various parties involved in the project in the EU region, on the available instruments (at regional and national levels);
• Stimulating critical thought on the part of associate partners in WP6, WP7 and WP8 on the future role of instruments (Health Interviews Surveys and Health Clinical Surveys) in relation to oral health policy.

The investigation comprised two phases:

1. Review and analysis of existing instruments resources in the literature for the monitoring and control of health and oral health and suggestions for use in Europe by:
   1.1 Bibliographic research to identify current thinking on methods of administering instruments Health Information Systems (HIS), Health Clinical Systems (HCS) and to identify emerging trends;
   1.2 Methodological research to enhance and optimize the efficiency of consensus research fields applied to the topics previously identified;
   1.3 Critical analysis of HIS and HCS as oral health instruments within international experience.
2. Review and analysis of existing oral health instruments resources within the differing national experiences in Europe for the monitoring and control of oral health. This comprised two steps:
   2.1 A preliminary phase to decide on the working design and technical procedures;
   2.2 A general development phase including:
      2.2.1 Information collation provided by secondary sources (references, statistical sources) and provided by collection of qualitative information (interviews, symposia, etc.);
      2.2.2 Listing of factors determining HIS and HCS methods instruments of oral disease surveillance.
Methodological foreword

This volume contains two chapters. Chapter 1 provides a global review of the existing scientific literature and methodological references in health assessment. The methods used in collecting health information are presented for each dimension of health related information and each reference is referred to one or more sections: Health Sociological Studies (HSS), Health Clinical Studies (HCS) and Health Provider Studies (HPS).

The studies referred to are described under a standardized format (Format A) with the aim of:

- providing a quick overview of a study with easy access to the key information;
- providing all the essential elements of information to support a rigorous analysis of the described method.

Chapter 2 collects existing methods and material of oral health indicators, interviews and clinical surveys.

Forty essential oral health indicators - selected by EGOHID I - have been taken into consideration for the purpose of this study and are described under a standardized format (Format B: oral health indicators methods and material). This chapter is divided into four sections: Oral Health of Children and Adolescents (A1-12), Oral Health of General Population (B1-18), Oral Health Systems (C1-5), Oral Health Related Quality of Life (D1-5).

Results

The bibliographic research has focused on the methodologies described in the current scientific literature on oral health. References were collected through different sources such as biomedical databases (PubMed), National Health Systems websites (European NHS, CDC, NIH, Canadian HS, etc.), European and international organizations’ websites (EU, WHO, etc.).

The procedure’s results have been collected in structured forms - one form for each main reference - specifically designed to highlight the most important features considered useful to fulfil the objectives of Work Package 5 (WP5): Oral Health Interviews and Clinical Surveys: Overviews.

For this purpose the two different formats (A and B) have been designed in order to better describe each dimension of health related information:

- Health Sociological Studies, Health Clinical Studies, Health Provider Studies (Chapter 1);
- Methodological aspects regarding data collection of each of the 40 Oral Health indicators (Chapter 2).

The overall number of selected methodological references is 137, organized by health domain (17) and oral health indicator (120). In particular, the chosen references are representative of international and European experiences, with special regard to various territorial European representativeness. This document does not pretend to be complete and from a practical point of view is limited in size.

The reference style and format are inspired by the standard of the International Committee of Medical Journal Editors: Uniform Requirements for manuscripts submitted to biomedical journals with proper adjustments. In the main references’ citation (formats A and B) the title has been printed first in order to assist easy identification of the contents.

Guide to use

The following is the structure of the forms contained in each chapters: Format A (Chapter 1) and Format B (Chapter 2).

Chapter 1. Format A. Scientific Literature and Methodological References in Health Assessment. Global Review.

The format A includes nine fields as follows:

Section
The type of health information studies: Health Sociological Studies, Health Clinical Studies, Health Provider Studies.

Health domain
The domain of the study (Diabetes, Pulmonary diseases, Cancer, etc.).

Study objectives
The objectives of the study which are usually clearly stated in the publication abstract.

Method of reference
The name of method as stated by the author(s) (WHO, NIH, Eurobarometer, etc.); the method itself is not described here.

Population studied
A faithful description of inclusion/exclusion criteria and date/place data, besides a brief description of
the studied population (number, group age, etc.) and of the sampling method (random, quota, stratified, etc.) as provided by the author.

**Information collection method**
A detailed description of the method used in the study (telephone, interview, clinical examination, extracted from registers, etc.).

**Comments**
Observations related to one or more of the following issues:
- Practical aspects of the conduct of the study (feasibility, difficulties in implementation, etc.).
- Personal considerations on the methodology with attention to: the possible weakness or debatable aspects of the protocol; the practical implementation.
- Level of implementation of the method (widely used, tested, validated).
- Ethical issues (if necessary).

**Critical scientific references and relevant bibliography**
A limited number of references strictly restricted to those relevant to the critical analysis of the methodology used in the study.

**Major Issues**
A final statement summarizes the main conclusions of the study and the usefulness of the method for EGOHID II.

Chapter 2. Format B. Oral Health Indicators – Existing Methods and Material.
Format B includes nine fields as follows:

- **Title**
  The name of the oral health indicator as stated in *A selection of essential oral health indicators recommended by EGOHID Project: 2005 Catalogue*

- **Main reference**
  The name given by the author(s) of the study and the main full standard bibliographic reference.

- **Study objectives**
  The objectives of the study which are usually clearly stated in the publication abstract.

- **Method of reference**
  The name of method as stated by the author(s) (WHO, NIH, Eurobarometre, etc.); the method itself is not described here.

- **Population studied**
  A faithful description of inclusion/exclusion criteria and date/place data, besides a brief description of the studied population (number, group age, etc.) and of the sampling method (random, quota, stratified, etc.) as provided by the author.

- **Information collection method**
  A detailed description of the method used in the study (telephone, interview, clinical examination, extracted from registers, etc.).

- **Comments**
  Observations related to one or more of the following issues:
  - Practical aspects of the conduct of the study (feasibility, difficulties in implementation, etc.).
  - Personal considerations on the methodology with attention to: the possible weakness or debatable aspects of the protocol; the practical implementation.
  - Level of implementation of the method (widely used, tested, validated).
  - Ethical issues (if necessary).

- **Critical scientific references and relevant bibliography**
  A limited number of references strictly restricted to those relevant to the critical analysis of the methodology used in the study.

- **Major Issues**
  A final statement summarizes the main conclusions of the study and the usefulness of the method for EGOHID II.

This catalogue is available online on the EGOHID website http://www.egohid.eu.
Oral Health Interviews and Clinical Surveys: Overviews

Methods for Health Information Collection

Chapter 1

Format A. Scientific Literature and Methodological References in Health Assessment. Global Review
Chapter 1: Format A. Scientific Literature and Methodological References in Health Assessment. Global Review

Methods for Health Information Collection:

- HSS - Health Sociological Studies
- HCS - Health Clinical Studies
- HPS - Health Provider Studies

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<td>Computerised network of voluntary Sentinel General Practitioners (SGPs) in France (Sentinelle system)</td>
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<td>European Health Survey System (EHSS)</td>
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<td>WHO – Oral Health Survey: Basic methods</td>
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<tr>
<td>UK General Dental Practitioners</td>
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The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian non-institutionalized population of the United States and is one of the major data collection programs of the National Center for Health Statistics (NCHS). The National Health Survey Act of 1956 provided for a continuing survey and special studies to secure accurate and current statistical information on the amount, distribution, and effects of illness and disability in the United States and the services rendered for or because of such conditions. The survey referred to in the Act, now called the National Health Interview Survey, was initiated in July 1957. Since 1960, the survey has been conducted by NCHS, which was formed when the National Health Survey and the National Vital Statistics Division were combined. The main objective of the NHIS is to monitor the health of the United States population through the collection and analysis of data on a broad range of health topics. A major strength of this survey lies in the ability to display these health characteristics by many demographic and socioeconomic characteristics.

The National Health Interview Survey is a cross-sectional household interview survey. While the NHIS has been conducted continuously since 1957, the content of the survey has been updated approximately every 10-15 years. In 1996, a substantially revised NHIS content began field testing. This new questionnaire began in 1997 and improves the ability of the NHIS to provide important health information.

The NHIS covers the civilian non-institutionalized population of the United States living at the time of the interview. Because of technical and logistical problems, several segments of the population are not included in the sample or in the estimates from the survey. Sampling and interviewing are continuous throughout each year. The sampling plan follows a multi-stage area probability design that permits the representative sampling of households. The households selected for interview each week in the NHIS are a probability sample representative of the target population. With four sample panels, NHIS data are collected annually from approximately 43,000 households including about 106,000 people. Survey participation is voluntary and the confidentiality of responses is assured. The annual response rate of NHIS is greater than 90 percent of the eligible households in the sample.

Data are collected through a personal household interview. For the Family Core component of the Basic module, all adult members of the household 17 years of age and over who are at home at the time of the interview are invited to participate and to respond for themselves. For children and for adults not at home during the interview, information is provided by a responsible adult family member (18 years of age and over) residing in the household. For the Sample Adult questionnaire, one adult per family will be randomly selected; this individual must respond for themselves to the questions in this section. Information for the Sample Child questionnaire will be obtained from a knowledgeable adult in the household. The sections of the 1997 questionnaire are:

- **Injuries**: Questions in this section are designed to improve injury surveillance by asking about the external causes and circumstances of injury.
- **Health Insurance**: The purpose of this section is to classify all household members by type of health care coverage.
- **Access to health care**: Questions on access in the Adult and Child Cores are designed to identify persons who have a usual source of care and to determine the nature of that source.
- **Health Care Utilization**: The Family Core contains questions on hospitalizations that are used to monitor trends and differentials in inpatient stays and length of stay by socio-demographic, health status, and health insurance variables. Items in the Adult and Child core include questions on the length of time since last contact with 1) a dentist or 2) a doctor or other health care professional.
**Conditions:** The section on health conditions was designed with the goals of substantially reducing the length of the NHIS survey and eliminating the analytic complexity of the data while preserving the ability to produce national estimates of disease prevalence. The domains for adults are organized by organ system or health topic and include the following: cardiovascular disease, respiratory conditions, cancer, diabetes, gastrointestinal conditions, renal conditions, joint symptoms, oral health, sensory impairments, pain, and mental health.

**Behaviors:** Questions on health behaviors include tobacco use, physical activity, and alcohol use.

**Tobacco:** The NHIS has long been an important part of national tobacco use surveillance. Questions have been designed to monitor self-reported cigarette smoking behavior.

**Immunizations:** Both the Adult and Child Core questionnaires contain questions on immunizations. AIDS.

**References** Details of the methods, data collection, survey instruments and references are available from: http://www.cdc.gov/nchs/

**Major Issues** A generic, scientifically based model of reference for the collection of information by interview. NHIS has the advantage of providing a regular, integrated and multidisciplinary method which includes oral health. Methodologies are described in details and are available on Internet.
The Behavioral Risk Factor Surveillance System (BRFSS) is the world’s largest, on-going telephone health survey system, tracking health conditions and risk behaviors in the United States yearly since 1984. Conducted by the 50 state health departments as well as those in the District of Columbia, Puerto Rico, Guam, and the U.S. Virgin Islands, with support from the Center for Disease Control (CDC), BRFSS provides state-specific information about issues such as asthma, diabetes, health care access, alcohol use, hypertension, obesity, cancer screening, nutrition and physical activity, tobacco use, and more. Federal, state, and local health officials and researchers use this information to track health risks, identify emerging problems, prevent disease, and improve treatment.

By the early 1980s, scientific research showed clearly that personal health behaviors played a major role in premature morbidity and mortality. Although national estimates of health risk behaviors among U.S. adult populations had been periodically obtained through surveys conducted by the National Center for Health Statistics (NCHS), these data were not available on a state-specific basis. This deficiency was viewed as critical for state health agencies that have the primary role of targeting resources to reduce behavioral risks and their consequent illnesses. National data may not be appropriate for any given state; however, state and local agency participation was critical to achieve national health goals. States use BRFSS data to identify emerging health problems, to establish health objectives and track their progress toward meeting them, and to develop and evaluate public health polices and programs to address identified problems. The BRFSS is the primary source of data for states and the nation on the health-related behaviors of adults.

States collect data through monthly telephone interviews with adults aged 18 or older. BRFSS interviewers ask questions related to behaviors that are associated with preventable chronic diseases, injuries, and infectious diseases. Currently, each state completes between 125 and 625 interviews a month totaling more than 150,000 completed interviews each year.
Information Collection Method

The BRFSS is a cross-sectional telephone survey conducted by state health departments with technical and methodologic assistance provided by CDC. States conduct monthly telephone surveillance using a standardized questionnaire to determine the distribution of risk behaviors and health practices among adults. Responses are forwarded to CDC, where the monthly data are aggregated for each state, returned with standard tabulations, and published at the year’s end by each state. Data derived from the questionnaire provide health departments, public health officials, and policymakers with necessary behavioral information. When combined with mortality and morbidity statistics, these data enable public health officials to establish policies and priorities and to initiate and assess health promotion strategies.

In the state each year, BRFSS relies on a sample of the population. The used sampling method assures comparability of data across states and over time. Most states use the Disproportionate Stratified Sample (DSS) method. Phone numbers are randomly selected throughout the state and individuals age 18 years and older are randomly selected from each household called. Most interviewers use Computer Assisted Telephone Interview (CATI) software to manage telephone dialing and data collection. States make calls 7 days a week. The BRFSS questionnaire is comprised of core questions and optional modules. There are three types of core questions. Fixed core questions are asked every year. Rotating core questions are asked every other year. Emerging core questions typically focus on “late-breaking” health issues. These questions are evaluated at the end of a survey year to determine if they are valuable. If the coordinators decide to keep the questions, they are added to the fixed core, rotating core, or optional modules, whichever is most appropriate. All states must ask all core questions.

The optional modules are standardized questions that are supported by the CDC that cover additional health topics or are more detailed questions on a health topic included in the core. Each year, states must choose which optional modules they will use based on the data needs of their state. The BRFSS questionnaire is designed by a working group of state coordinators and CDC staff. Currently, the questionnaire has three parts: 1) the core component, consisting of the fixed core, rotating core, and emerging core, 2) optional modules, and 3) state-added questions. All health departments must ask the core component questions without modification in wording; however, the modules are optional. The fixed core is a standard set of questions asked by all states. It includes queries about current behaviors that affect health (e.g., tobacco use, women’s health) and questions on demographic characteristics. The rotating core is made up of two distinct sets of questions, each asked in alternating years by all states, addressing different topics. In the years that rotating topics are not used in the core, they are supported as optional modules. The emerging core is a set of up to five questions that are added to the fixed and rotating cores. Emerging core questions typically focus on issues of a “late breaking” nature and do not necessarily receive the same scrutiny that other questions receive before being added to the instrument. These questions are part of the core for one year and are evaluated during or soon after the year concludes to determine their potential value in future surveys. Optional CDC modules are sets of questions on specific topics (e.g., smokeless tobacco) that states elect to use on their questionnaires. Although the modules are optional, CDC standards require that, if they are used, they must be used without modification.

Module topics have included survey items on smokeless tobacco, oral health*, cardiovascular disease, and firearms.

* How long has it been since you last visited a dentist or a dental clinic for any reason? Include visits to dental specialists, such as orthodontists.
* How many permanent teeth have been removed because of tooth decay or gum disease?
* How long has it been since you had your teeth cleaned by a dentist or a dental hygienist?

Manuals listed below were developed for interviewer and examiner training. The User’s Guide is a manual covering all aspects of BRFSS survey operations. This fully navigable, fully printable PDF version includes information on many aspects of the BRFSS survey, including the following: Processes of the BRFSS, survey protocol, staffing, questionnaire development, survey methodology, data collection and management, quality assurance, funding, data use and promotion, reference material, tips and pointers from the states. The BRFSS Interviewer Training familiarizes BRFSS telephone interviewers with the software and success strategies for completing quality interviews.
Annual questionnaires dating back to 1991 are available in portable document format (PDF) on the BRFSS Web site under Questionnaires.
As an effort to promote healthy personal behaviors, thereby preventing disability and premature death, the BRFSS provides data that are used for: assessing risk for chronic diseases, identifying demographic differences, measuring trends in health related behaviors, designing and monitoring health intervention and services, addressing emergent and critical health issues, formulating policy and proposing legislation for health initiatives, measuring progress toward achieving state and national health objectives.

References
Details are available from: http://www.cdc.gov/brfss

Major Issues
Beyond US specificities, three methodological aspects should be taken into consideration:
1. The validation of telephone surveys as a cost-effective alternative to face-to-face interviews.
2. The three levels of questionnaires: core, rotating, optional which allows for flexibility and adaptation to local specificities while keeping across-sites comparability.
3. The integration of Oral Health into the fields of Health Promotion and Prevention of Chronic Diseases.
**National Health and Nutrition Examination Survey (NHANES)**

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<th>Health Domain</th>
<th>US Health, Attitudes, Beliefs and Behaviour patterns</th>
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<td><strong>Objectives</strong></td>
<td>The National Health and Nutrition Examination Survey (NHANES) is a program of studies designed to assess the health and nutritional status of adults and children in the United States. The survey is unique in that it combines interviews and physical examinations. NHANES is a major program of the National Center for Health Statistics (NCHS). NCHS is part of the Centers for Disease Control and Prevention (CDC), U.S. Public Health Service, and has the responsibility for producing vital and health statistics for the Nation. Findings from this survey will be used to determine the prevalence of major diseases and risk factors for diseases. Information will be used to assess nutritional status and its association with health promotion and disease prevention. NHANES findings are also the basis for national standards for such measurements as height, weight, and blood pressure. Data from this survey will be used in epidemiological studies and health sciences research, which help develop sound public health policy, direct and design health programs and services, and expand health knowledge for the United States.</td>
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<td><strong>Method of Reference</strong></td>
<td>The NHANES program began in the early 1960's and has been conducted as a series of surveys focusing on different population groups or health topics. In 1999, the survey became a continuous program that will have a changing focus on a variety of health and nutrition measurements to meet emerging needs. Because NHANES is now an ongoing program, the information collected will contribute to annual estimates in some topic areas included in the survey. For small population groups and less prevalent conditions and diseases, data must be accumulated over several years to provide adequate estimates. The new continuous design also allows increased flexibility in survey content.</td>
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<td><strong>Population Studied</strong></td>
<td>The sample for the survey is selected to represent the U.S. population of all ages. The survey examines a nationally representative sample of about 5,000 persons each year. These persons are located in counties across the country, 15 of which are visited each year. Special emphasis in the current NHANES will be on adolescent health and the health of older Americans. To produce reliable statistics for these groups, adolescents 15–19 and persons 60 and older are over-sampled for the survey. African Americans and Mexican Americans are also over-sampled to enable accurate estimates for these groups. Several important areas in adolescent health, including nutrition and fitness and other aspects of growth and development, will be addressed.</td>
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<td><strong>Information Collection Method</strong></td>
<td>The NHANES detailed interview (CAPI) includes demographic, socioeconomic, dietary, and health-related questions. Health interviews are conducted in CAPI respondents' homes. Questionnaires are administered to NHANES participants both at home and in the trailers. Available on the website, they include:</td>
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<td>1. Screener Modules 1 and 2. Screener 1 is administered on the doorstep. This set of questions determines if anyone in the household is eligible to be in the sample. Screener 2 establishes the relationship of people in the household to others living in the household.</td>
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<td>2. Family Questionnaire: Household and family level information is collected here. The sections are labeled to reflect content; demographic background/occupation, food security, housing characteristics, income, smoking.</td>
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<td></td>
<td>3. Sample Person Questionnaire: Individual level information on participants is collected here. The sections are labeled to reflect content. The Medical Conditions section covers many subject areas i.e: blood pressure, cardiovascular disease, cardiovascular fitness, demographic information, dietary supplements and prescriptions, oral health.</td>
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<td>4. Post-Examination Questionnaires: Food Propensity - mailed to respondent; Hepatitis Follow-up - telephone interview; Prostate Follow-up - telephone interview.</td>
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Mobile Examination Centers (MEC) - ACASI and CAPI Questionnaires

Audio computer assisted personal self interview (ACASI) and computer assisted personal interview (CAPI) questionnaires are administered in the MEC. During the visit to the examination center additional questions are administered that cover more sensitive areas such as reproductive health and illegal drug use.

Computer Assisted Personal Interview (CAPI) Questionnaire included alcohol (20+), current health status, kidneys, physical activity, reproductive health, respondent information, tobacco (20+).

Examinations were performed in specially designed and equipped mobile examination centers, which travel to survey locations throughout the country. The survey team consists of a physician, medical and health technicians, dietary and health interviewers. A large staff of trained bilingual interviewers conducts the household interviews.

The examination component consists of medical and dental examinations, physiological measurements, and laboratory tests administered by highly trained medical personnel.

The diseases, medical conditions, and health indicators to be studied include: anemia, cardiovascular disease, diabetes, environmental exposures, hearing loss, infectious diseases, kidney disease, mental health and cognitive functioning, nutrition, obesity, oral health, osteoporosis, physical fitness and physical functioning, reproductive history and sexual behavior, respiratory disease (asthma, chronic bronchitis, emphysema), sexually transmitted diseases, vision. The purpose of the NHANES oral health component is to assess the prevalence of oral diseases and conditions, such as dental caries, periodontal disease, edentulism, denture use, sealants, fluorosis and traumatic injury in a national sample. The periodic assessment includes evaluation of tooth wear, functional occlusal contacts and perceived overall quality of oral health.

References

Manuals listed below were developed for interviewer and examiner training. These are important references for NHANES as all correct procedures, policies, and standards are comprehensively detailed. Manuals including Interviewer Procedure Manuals, Survey Operations Manuals, Consent Documents, Brochures, Survey Questionnaires, Examination Components were first produced in January 1999 and described in detail on the Website of NHANES. Information from NHANES is made available through an extensive series of publications and articles in scientific and technical journals. For data users and researchers throughout the world, survey data are available on easy-to-use CDROMS and personal computer diskettes. In the future, data will be widely distributed on the World Wide Web. Research organizations, universities, health care providers, and educators will benefit from survey information. Primary data users are the U.S. Public Health Service agencies that collaborated in the design and development of the survey. Details on National Health and Nutrition Examination Survey are available from: http://www.cdc.gov/nhanes.

Major Issues

Results of NHANES will benefit people in the United States in important ways. Facts about the distribution of health problems and risk factors in the population give researchers important clues to the causes of disease. Information collected from the current survey will be compared with information collected in previous surveys. This will allow health planners to detect how the extent of various health problems and risk factors have changed in the U.S. population over time. By identifying the health care needs of the population, government agencies and private sector organizations can establish policies and plans for research, education, and health promotion programs that will help improve present health status and prevent future health problems.

The most interesting aspects for the EGOHIP work lie in the information collection method; the systematic use of computer technology. It is one of the rare studies that combines personal interviews and physical examination of the same person. It is also a major illustration of the integration of oral health into general health which is still a long term objective in most countries in Europe. European Commission projects are key to reaching this goal.
## Health Domain

**EU Attitudes, Beliefs and Behaviour patterns**

The European Social Survey (the ESS) is an academically-driven social survey designed to chart and explain the interaction between Europe’s changing institutions and the attitudes, beliefs and behaviour patterns of its diverse populations. Now in its third round, the survey covers over 20 nations and employs the most rigorous methodologies. It is funded via the European Commission’s 5th and 6th Framework Programmes, the European Science Foundation and national funding bodies in each country. The principal long term aim of the project is to chart and explain the interaction between Europe’s changing institutions, its political and economic structures, and the attitudes, beliefs and behaviour patterns of its diverse populations. But an equally important shorter term aim is to develop and demonstrate an approach to the conduct of rigorous qualitative multinational social surveys in Europe matching that of the best national surveys in Europe and the USA. The ESS is being designed as a time series. Thus, if and when survey builds upon survey, it will provide a unique long-term account of change and development in the social fabric of modern Europe. In addition, it will help to activate research networks across Europe and the participation of young researchers in the substance and methodology of rigorous comparative research.

The wide-ranging questionnaire covers people’s value orientations, their cultural perspectives and the underlying social structure of their societies. A separate data collection exercise monitors major events during fieldwork as a backdrop to an understanding of attitude change. Always intended as a time series, the ESS has quickly established a remarkable momentum, a Europe-wide infrastructure and a world-wide reputation for both its content and its rigour. Data collection takes place every two years, by means of face to face interviews of approximately one hour in duration, followed by a short supplement. The questionnaire consists of a ‘core’ module lasting about half an hour - which remains relatively constant from round to round - plus two ‘rotating’ modules, to be repeated at intervals, each devoted to a substantive topic or theme. The purpose of the rotating modules is to provide an in-depth focus on a series of particular academic or policy concerns, while the core module aims instead to monitor change and continuity in a wide range of socio-economic, socio-political, socio-psychological and socio-demographic variables.

The survey is representative of all persons aged 15 and over (no upper age limit) resident within private households in each country, regardless of their nationality, citizenship, language or legal status. Questionnaires are available in all languages spoken as a first language by 5 per cent or more of the population and interviewers must be available to administer them. For speakers of certain minority languages, however, the questionnaires from another participating country may be adapted. Potential under-coverage of certain groups, because of language problems or sampling frame deficiencies, or for any other reason, are discussed with the CCT and their expert panel prior to deciding on the final sampling method, so that the problem can be remedied if possible.

The sample is selected by strict random probability methods at every stage and respondents are interviewed face-to-face. Procedures for selecting a household from a multi-household address, and an individual within a household are specified and agreed in advance. In any event, the relative selection probabilities of every sample member is known and recorded, as is any remaining systematic non-coverage problems. Quota sampling is not permitted at any stage, nor is substitution of non-responding households or individuals (whether refusals or non-contacts). The minimum number of actual interviews to be achieved is 2,000 (except in countries whose total population is less than 2 million, when the minimum number is 1,000). Irrespective of the actual number of interviews, however, the minimum ‘effective achieved sample size’ is 1,500, after discounting for design effects, or 800 in countries with...
populations of under 2 million. Thus each country determines the appropriate size of its initial issued sample by taking into account the realistic estimated impact of clustering, eligibility rates (where appropriate) and response rate on the effective sample size. Outcomes of all approaches to addresses, households and individuals in the sample are defined and recorded according to a pre-specified set of categories that distinguish non-eligibility, non-contacts and refusals. The proportion of non-contacts does not exceed 3 per cent of all sampled units, and the minimum target response rate - after discounting ineligibles (and other ‘deadwood,’ as defined by the CCT) - is 70%. This figure is likely to be exceeded in certain countries and the ESS as a whole would be damaged if major national variations in response rates were to occur. Survey organisations are encouraged to cost their surveys with this response rate in mind and consider what steps may be required to achieve it.

An academically-driven, uniquely rigorous survey, the ESS is documenting and helping to interpret hitherto inadequately charted aspects of European life. A forerunner of the European Research Area at work, the ESS has become a major scientific endeavor that requires continued core support for both its substantive and methodological contributions to European governance.

References

Details are available from: http://www.europeansocialsurvey.org/

Major Issues

ESS offers a well developed, rigorous, comparative methodology for social surveys in Europe. One important potential contribution of ESS to the issue of survey methods development is the ESS research into mode effects. It has begun to explore the issues involved in introducing alternative data collection modes. It aims to assess the impact of mixed-mode data collection on data quality. A series of experimental studies will examine two mixed mode data collection scenarios. The first is where a survey is carried out by different modes in different countries (with just a single mode within each country). The second is where, within a country, respondents may be given a choice of response mode, or modes may be used in combination. The modes to be considered are face-to-face interviewing, telephone interviewing, paper self-completion questionnaires and web questionnaires. Primary data collection will involve a series of large-scale field experiments under controlled conditions in different countries.
The objectives of GPASS are to create a national data resource for studying morbidity in Scottish general practice, complementary to existing information systems and available for management and research purposes at national and local levels. The Department of General Practice, University of Aberdeen has worked since 1988 to collect and analyse computerized information at practice, regional, and national levels by distribution of a floppy disk-based software program, which extracts a predetermined dataset from each general practice computer system.

Collection of major morbidity and prescribing data from up to 2.4 million patients, approximately half the population of Scotland, takes place biannually. A subset of practices (population 282,700 patients; 52 practices) are continuously collecting doctor/patient contact information (symptoms or diagnoses). The sample population studied is representative by age, sex, deprivation, and sparsity (using the postcode) of the national population. Large sub-populations of patients satisfying a selected criteria can be extracted for further study of needs assessment or of epidemiological research.

The collected data provide information at the level of the individual patient. Morbidity, prescribing, screening, and administrative data can be linked by patient, date or postcode. Almost 100% of patients in Scotland are registered with a general practitioner. Scotland has a national computer system, the General Practice Administration System for Scotland (GPASS), used by over 75% of all Scottish practices. Escalating costs of health care and demographic changes in the national population emphasise the monetary value of the gatekeeper role of general medical practice. General practitioners’ increasing involvement in the provision and purchasing of care has raised the importance of the management of populations as well as the care of individual patients. An “electronic questionnaire” in the form of an interrogation questionnaire was used to extract a subset of data from practice computers running a standard GPASS software package. The data were retained by each practice and also collected and analysed centrally to produce regional and national data. All 257 general practices in Scotland using GPASS software were sent the electronic questionnaire; data from 154 practices, including 759 general practitioners and covering 1,010,452 patients, were collected. Ninety three practices had all their patient records on computer; others had selectively entered data on, for example, only those patients receiving repeat prescriptions. The number of computerised patient records per practitioner ranged from 46 to 2373. Altogether 194,261 patients had repeat prescribing data and 204,005 morbidity or clinical data. Most practices (94.5%) use their computer for data collection, 63.6% of practices use a manual data capture form and 28.8% use computer data capture methods. Methods of collecting patient data and selection of Read codes for computer data entry are variable. Most practices use one method of data collection; a significant minority use multiple methods or more than one Read code to record the same item. The recording of health promotion on computer has increased greatly since the introduction of the new regulations: the current levels of recording are alcohol history (26.3%), blood pressure reading (57.6%), smoking (35.4%), exercise (7.1%), weight (21.4%) and height (16.4%). Most practices (94.3%) intend using GPASS for data analysis.

The gatekeeping role of Scottish general practice and the predominance of GPASS favours standardisation of methods of data capture and the construction of large regional, national, and Continuous Morbidity databases. Analysis by geographical, demographic, and temporal distributions allows the changing patterns of illness and provision of health care to be studied in substantial detail to the benefit of patients, doctors, and the National Health Service in Scotland. An electronic questionnaire is a simple and effective way of investigating the information held on practice computers, allowing analysis and feedback of
information to practitioners. Development of this system will provide a cumulative information system for Scottish general practitioners. Methods of collecting and recording health promotion data differ greatly between practices, with variable standardisation of health promotion codes and differing use of appropriate elements of the GPASS software.


Major Issues  This model, developed and implemented to collect information available at the level of the individual medical practitioner, is a potential reference for the development of a similar system reaching oral health practitioners. It could be adapted to various care systems existing throughout Europe. The concept of integration of the oral health sector into general health should nevertheless not be forgotten, and for this purpose a reduced set of oral health variables might be integrated into existing questionnaires initially designed for other health information collection.
The ISARE (Indicateurs de Santé des Régions Européennes) project was carried out on the initiative of the Fédération Nationale des Observatoires Régionaux de Santé (FNORS) within the framework of the Health Monitoring Programme of the European Commission. The first phase, ISARE I (1999-2001), made it possible to identify for each country, the most appropriate sub-national level (“health region”) for the exchange of health indicators within the European Union and to assess the extent of data availability at those levels. The second phase, ISARE II (2002-2004), made it possible to test the feasibility of collecting regional data in each European country. The general objective of the project is to check the feasibility of the data collection process at the identified intra national levels in the European Union countries. In order to reach this objective, a survey involving 14 countries has been undertaken. Several steps were necessary to: determine the two lists of data to be collected at the regional levels, develop clear definitions for these data, select the year for data collection, develop questionnaires including a form updating the information provided in the first phase of ISARE to collect the data; a form to provide data sources and global judgments about the data use and its quality.

In the whole report, there is a distinction between raw data (for instance the number of physicians or the general population) and the indicators which are derived from the raw data (for instance the number of physicians per 1,000 inhabitants). In the ISARE report, a list of 130 data has been used (ECHI list). These data have been selected in order to allow the calculation of indicators covering a number of health aspects. These data were grouped into 10 groups: health professionals, health care resources, health care consumption, demographic and socio economic data, mortality data, morbidity data, health status data, biological factors and lifestyle items, living and working conditions, data on prevention. From this list and the results of ISARE I, an initial selection of 80 data has been developed with an essential availability criterion: the variables have to be available in all the regions of at least 7 countries (out of the 13 countries for which this information was declared available in ISARE I).

There are three stages to the information collection methods adopted for the ISARE project:

- the creation of a partnership with the representatives of the different countries of the European Union;
- the development of a survey instrument to collect the selected data;
- the building of a demonstrator database and analysis of the processes, resulting in recommendations aimed at the integration of health indicators at a regional level in the European database.

Prior to the distribution of the questionnaire, each country representative was contacted by telephone by a member of the project team to provide information about technical points and to discuss possible difficulties with the data collection. The survey required a number of contacts between representatives and project group members. The country correspondents also had contact with other experts in their own country and with professionals from the selected data collection region. Information and contacts between members of the different groups took place during organised project meetings.

The questionnaires were sent by email to the country representatives. Contact was made with each country in mid January 2003 to assess the status of data collection. On receipt of the files, complementary information was sought from the representatives as necessary.

A number of criteria were established to analyze the availability, conformity to the proposed definition and the quality of each of the data items. Firstly a score was attributed to each of the data items to judge its availability. The availability score was calculated as follows: Availability score = Number of countries for which data are fully available (all regions, 1999) + 0.5 x number of countries from which the data is fully available, but only for certain regions and/or for a year other than 1999.
A database demonstrator, built to illustrate this work, is available on the website. Access to the health database is according to two modes of interrogation:

- indicators interrogation: in this mode one of the 38 indicators of the base can be selected showing a table presenting its value in one, several or even the whole European “health regions”;
- regional figures interrogation: a region then a category of indicators can be selected. A summary table presents the values of the various indicators of the category but also the highest and lowest values of the indicators within the regions of the selected country and the whole regions of the EU.

The ISARE II project has shown that the construction of a health database at the level of European regions with information from the regions, is possible. The mobilisation of a network of correspondents working on health observations in the regions brings considerable added value: knowledge of the terrain and their close links with local decision makers are a useful complement to the knowledge of the administrators of national databases. Taking account of their availability, their quality and their conformity to the definition, a high number of the data (27 out of 38) may be used to build indicators to integrate into a regional health database. Great interest was shown by the participants in the ISARE project, as much at country level as with international organisations. This interest underlines the contribution of the regional picture in studies and analyses carried out at European level.

The ISARE II project also highlights the difficulties still to be overcome before the integration of regional health data into European databases becomes routine:

- Some of the work of identification of data sources and appropriate contact persons, remains to be done. This will involve a major investment in the early stages of gathering of regional data, but later will only involve updating this information.
- Continuing work is needed on specifying the geographical reference levels, seeking the best possible benefit in terms of help with decision making whilst taking into account the European regulations that are now in place.
- Work remains to be done to make clear definitions available that can be widely used in Europe. Finally, although it was shown that the comparability of data between regions of the some country did not in most cases pose major problems, there remain questions on the comparability between regions of different countries.

Details are available from: http://www.isare.org/

The ISARE experience shows that the implementation of a European health indicators data-base requires access to regional networks within a given country as well as to national statistical bodies. It is also necessary and indispensable to have a network of local consultants to collect information which may be available at local level and not at upper levels of the health information system because they are not routinely collected at national level. In addition, because of their professional function at regional levels and because they are direct users of the data collected at their level of reference, these local consultants have a precious specific expertise on the reliability of the information collected, and are in the best position to evaluate the limit of the interpretation that can be made on their data sets. These are key issues to be taken into consideration by EGOHIP II working groups.
The National Oral Health Surveillance System (NOHSS) is a collaborative effort between the United States’ Center for Disease Control’s (CDC) Division of Oral Health and the Association of State and Territorial Dental Directors (ASTDD). NOHSS is designed to monitor the burden of oral disease, use of the oral health care delivery system, and the status of community water fluoridation on both national and state level. The Council of State and Territorial Epidemiologists (CSTE) and the National Association of Chronic Disease Directors (NACDD) were instrumental in developing the framework for chronic disease surveillance indicators, and these oral health indicators. Three of the oral health indicators—dental visit, dental cleaning, and complete tooth loss—are among the chronic disease indicators.

Oral health indicators included in NHOSS are:

**Dental Visit:** adults aged 18+ who have visited a dentist or dental clinic in the past year. Routine dental visits aid in the prevention, early detection, and treatment of tooth decay, oral soft tissue disease, and periodontal diseases.

**Teeth Cleaning:** adults aged 18+ who have had their teeth cleaned in the past year (among adults with natural teeth who have ever visited a dentist or dental clinic). Having one’s teeth cleaned by a dentist or dental hygienist is an indicator of preventive behavior.

**Complete Tooth Loss:** adults aged 65+ who have lost all of their natural teeth due to tooth decay or gum disease. Loss of all natural permanent teeth (complete tooth loss) may substantially impair a person’s quality of life, self-image, and daily functioning.

**Lost 6 or More Teeth:** adults aged 65+ who have lost six or more teeth due to tooth decay or gum disease. Tooth loss can have an impact on food choices, quality of life, and self image.

**Fluoridation Status:** percentage of people served by public water systems who receive fluoridated water. Water fluoridation plays an important role in reducing tooth decay and tooth loss.

**Dental Sealants:** percentage of 3rd grade students with dental sealants on at least one permanent molar tooth. Plastic coatings applied to decay-susceptible tooth surfaces (the pits and fissures) can reduce tooth decay – the Task Force on Community Preventive Services strongly recommended school-based or school-linked dental sealant programs in their 2001 report. These materials have been approved for use for many years, and are recommended by professional health associations and public health agencies, particularly for children at high risk for tooth decay.

**Caries Experience:** percentage of 3rd grade students with caries experience, including treated and untreated tooth decay. Dental caries (tooth decay) is the single most common chronic childhood disease.

**Untreated Tooth Decay:** percentage of 3rd grade students with untreated tooth decay. To avoid pain and discomfort, decayed teeth need to be restored (filled). To keep as much of the natural tooth as possible, tooth decay should be discovered early and treated promptly so that fillings may be kept small.

**Cancer of the Oral Cavity and Pharynx:** oral and pharyngeal cancer comprises a diverse group of malignant tumors that affect the oral cavity and pharynx (mouth and throat). Each year, some 28,000 new cases of oral and pharyngeal cancer are diagnosed and 7,200 people die from the disease. The most recent statistics for oral and pharyngeal cancer are available at the U.S. Cancer Statistics Web site http://www.cdc.gov/cancer/npcr/uscs/index.htm. For more information on oral cancer, see Oral Health Resources: Oral Cancer and Cancer Prevention and Control: National Cancer Data.

Estimates for certain population subgroups may be based on small numbers and be subject to relatively large sampling error. When the number of events is small and the probability of such an event is small, considerable caution must be observed in interpreting the conditions (cell size < 50). Data from multiple years may be pooled to obtain adequate sample size. Data are included from:
• Behavioral Risk Factor Surveillance System (BRFSS).
• Basic Screening Survey (BSS).
• CDC Fluoridation Census 1992.
• CDC Water Fluoridation Reporting System (WFRS).
• National Health and Nutrition Examination Survey (NHANES).
• National Health Interview Survey (NHIS).
• Pregnancy Risk Assessment Monitoring System (PRAMS).
• State Oral Health Surveys.
• Synopses of State and Territorial Dental Public Health Programs.
• Youth Risk Behavior Surveillance System (YRBSS).

Oral health data systems monitor the prevalence of oral diseases and the factors influencing oral health, such as risky or protective behaviors, the availability of preventive interventions and utilization of preventive services. The systems bring together existing data from multiple national and state sources and present the data in useful and accessible formats for the broad community interested in promoting oral health.

The Behavioral Risk Factor Surveillance System (BRFSS) is a state-based, ongoing data collection program designed to measure behavioral risk factors in the adult, non-institutionalized population 18 years of age or older. Every month, states select a random sample of adults for a telephone interview. This selection process results in a representative sample for each state so that statistical inferences can be made from the information collected.

The Basic Screening Survey (BSS) is a standardized set of surveys designed to collect information on the observed oral health of participants, self-report or observed information on age, gender, race and Hispanic ethnicity, and self-report information on access to care for preschool, school-age, and adult populations. The surveys are cross-sectional and descriptive. In the observed oral health survey, gross dental or oral lesions are recorded by dentists, dental hygienists, or other appropriate health care workers in accordance with state law.

The 1992 Fluoridation Census provides information regarding the fluoridation status for each state. States reported each fluoridated public water system and the communities each system served; the type of fluoridation-adjusted or natural (including fluoridated water purchased by non-fluoridating systems); the number of people receiving fluoridated water; the date on which fluoridation started; and the chemical used for fluoridation, if adjusted.

The Water Fluoridation Reporting System (WFRS) provides state oral health program staff a tool for monitoring the quality of the water fluoridation program in their state. Data provided by water systems is used by state oral health program staff to recognize excellent work in water fluoridation and identify opportunities for continuous improvement in the water fluoridation program.

The National Health & Nutrition Examination Survey NHANES III, conducted between 1988 and 1994, included about 40,000 people selected from households in 81 counties across the United States. To obtain reliable estimates, infants and young children (aged 1 to 5 years), older persons (aged 60 years and older), African Americans and Mexican Americans were sampled at a higher rate. NHANES III also placed an additional emphasis on the effects of the environment upon health. NHANES 1999–2004 began in April 1999 and is a continuous survey visiting 15 U.S. locations per year. Approximately 5,000 people are surveyed annually. Oral health data from the current NHANES will be added to NOHSS when data from each phase of the survey become publicly available.

The National Health Interview Survey (NHIS) is a cross-sectional household interview survey on the health of the civilian non-institutionalized population of the United States. The sampling plan follows a multistage area probability design that permits the representative sampling of households. NHIS data are collected annually from approximately 43,000 households including about 106,000 persons.

The Pregnancy Risk Assessment Monitoring System (PRAMS) collects state-specific, population-based data on maternal attitudes and experiences prior to, during, and immediately following pregnancy. The PRAMS sample of women who have had a recent live birth is drawn from the state’s birth certificate records. Each participating state samples between 1,300 and 3,400 women per year. Women from some groups are sampled at a higher rate to ensure adequate data are available in smaller but higher risk populations.
Information is gathered by mail and telephone. Data collection procedures and instruments are standardized to allow comparisons between states. PRAMS allows CDC and state health officials to monitor changes in maternal and child health indicators (e.g., unintended pregnancy, prenatal care, breastfeeding, smoking, alcohol use, infant health).

Many states conduct periodic oral health surveys. Some states now use the BSS (Basic Screening Survey) protocol or similar protocols for their surveys. States can submit results from these surveys for inclusion in NOHSS.

The Synopses of State and Territorial Dental Public Health Programs collects oral health program information provided to the Association of State and Territorial Dental Directors (ASTDD) annually by each state’s dental director or oral health program manager. ASTDD, in conjunction with CDC’s Division of Oral Health, presents that information with data from standard sources (US Census, Department of Education, Bureau of Labor Statistics, etc.) on the State Synopses website. Each state has its own synopsis which contains state-specific information on demographics, oral health infrastructure, oral health program administration, and oral health program activities.

The Youth Risk Behavior Surveillance System (YRBSS) is a CDC school-based survey conducted biennially to assess the prevalence of health risk behaviors among high school students. YRBSS includes national, state, territorial, and local school-based surveys of high school students. The school-based surveys employ a cluster sample design to produce a representative sample of students in grades 9–12. Survey procedures are designed to protect the students’ privacy by allowing for anonymous and voluntary.

The graphic below illustrates the relationships between and among the different Oral Health data systems.

WFRS also provides annual data to NOHSS and the Synopses. The Synopses provide data to NOHSS through a real-time link. WFRS also provides data in real-time to two new systems—My Water’s Fluoride (MWF) and the Oral Health Maps.

* Although most of the data in the Synopses is updated annually, the real-time link allows instant updating of the contact information for state and territorial dental directors.

References: Details are available from: http://www.cdc.gov/OralHealth

Major Issues: NHOSS is an example of the rigorous, sophisticated, complex and integrated approach implemented in the US for collecting oral health information. Tailored to the US health system structure and institutions as well as to the magnitude of available resources, it nevertheless provides an interesting approach to the systematic integration of oral health and other health information especially the use made of other national surveys to capture oral health information from other sources.
Canadian Paediatric Surveillance Program (CPSP)

<table>
<thead>
<tr>
<th>Health Domain</th>
<th>Child Health Surveillance, Canada</th>
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<tbody>
<tr>
<td><strong>Objectives</strong></td>
<td>The mission of the Canadian Paediatric Surveillance Program (CPSP) is to contribute to the improvement of the health of children and youth in Canada by national surveillance and research into childhood disorders that are high in disability, morbidity and economic costs to society, despite their low frequency. The CPSP was developed with a dual purpose: to serve the health needs of Canadian children and youth, and facilitate the research needs of professionals whose prime concern is the health and care of children and youth. Program goals are to: identify populations that are at risk, and to obtain important ecological and epidemiological data on their circumstances, evaluate the success of public health interventions by tracking their effectiveness, provide supporting scientific evidence for the stance taken by physicians and other health-care professionals in establishing and promoting public health programs/interventions, take the pulse at the national level on injury prevention issues, serve as an important beacon in the event of significant threats to the health of the public. The objectives of the program are to: initiate projects of national scientific importance, acquire sound funding, develop a strong infrastructure, including a steering committee, that represents the needs and views of both the paediatric and public health communities, develop, establish and maintain a surveillance system to monitor health in Canadian children and youth, facilitate research into uncommon, childhood disorders for the advancement of knowledge and the improvement of treatment, prevention and health-care planning, encourage awareness and education within the medical profession of less common disorders, respond quickly to public health emergencies where these relate to Canadian children and youth, by adapting surveillance activities, collaborate with other national paediatric surveillance units, via the International Network of Paediatric Surveillance Units (INoPSU), to promote 'global village' surveillance which can result in an acceleration of the acquisition of timely information for public health decisions.</td>
</tr>
<tr>
<td><strong>Population Studied</strong></td>
<td>The CPSP studies relevant conditions of public health importance that are of such low incidence or prevalence that national ascertainment of cases is needed. To ensure national representation and that sufficient numbers of cases will be generated for meaningful results, more than 2,400 paediatricians, providing health care to over seven million Canadian children and youth, have been enrolled as CPSP participants. Paediatric subspecialists, such as neurologists, allergists, medical geneticists and intensivists, are enrolled in the program when research studies indicate their participation. The program has steadily grown from three studies in the pilot year, to 32 conditions under study since its inception in 1996. With the assistance of a Program Coordinator based at the CPS office to manage the daily activities of the program, the Steering Committee guides the development of the program, addresses key challenges for the future, and determines the overall direction of the CPSP. The Committee meets annually in the spring and the fall to review the progress of existing studies, to consider protocols submitted for future inclusion in the CPSP, and to oversee the development of the program. The CPSP is designed to study uncommon disorders with high morbidity and mortality in childhood or rare complications of more common diseases of such low frequency that data collection nationally is required to generate a sufficient number of cases to derive meaningful results. A list of current studies is available at: <a href="http://www.cps.ca/english/CPSP">www.cps.ca/english/CPSP</a>.</td>
</tr>
<tr>
<td><strong>Information Collection Method</strong></td>
<td>Participants are encouraged to report all cases meeting the case definitions that come to their attention. If in doubt about whether or not to report, they are encouraged to do so. This sometimes leads to duplicate reports but avoids missed cases. Duplicates are identified during case follow-up. The CPSP needs to hear back from all participants, whether they have seen a new case or not. Even a 'nothing to report' response is vital in assuring completeness of case ascertainment by helping the CPSP reach its goal.</td>
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</table>
of 90% response. The CPSP uses a two-tiered reporting process to ascertain and investigate cases: an initial 'check-off' form and a detailed reporting form. To keep participants informed of progress, monthly compliance rates and the number of cases reported are mailed quarterly to all participants. Quarterly reminders are mailed to respondents who have not replied for all months of the year. These reminders have greatly improved response rates and the ascertainment of cases.

The CPSP is committed to sharing information to showcase the value of active surveillance and to keep participants interested and engaged in the program: during and upon completion of individual studies, investigators analyze data and submit papers for publication. On a quarterly basis, a map showing the provincial and total response rates is mailed to all participants. Annual Results are printed and distributed to participants and interested individuals and organizations.

In 1998, the International Network of Paediatric Surveillance Units (INoPSU) was established to enhance collaboration between units from four continents, providing a unique opportunity for simultaneous cross-sectional studies of rare diseases in populations with diverse geographic and ethnic characteristics.

The founding units were: Australia, United Kingdom, Canada, Germany, Latvia, Malaysia, the Netherlands, New Zealand, Papua New Guinea, and Switzerland. Fifteen countries are full members. Through a series of publications and presentations, the CPSP demonstrated its commitment to sharing information that would showcase the value of active surveillance and keep participants engaged in the program.

Examples are:
- monthly highlights published in *Paediatrics & Child Health*;
- monthly articles published in *CPS News*;
- May/June issue of *Paediatrics & Child Health* dedicated to surveillance;
- the INoPSU First Progress Report 1999-2002 outlines the development of the international network from its inception, core surveillance activities, as well as the activities of its member units.

Details are available from: http://www.cps.ca/english/index.htm

**References**

**Major Issues**

The UK, Germany and Latvia are three European countries already involved in this health surveillance program. It may be extremely useful for the work of EGOHIP to make links with these national structures and analyze how they could be used to contribute to the EGOHIP Programme.
Health Domain

Objectives

The WHO STEPwise approach to Surveillance (STEPS) is a simple, standardized method for collecting, analysing and disseminating data in WHO member countries. By using the same standardized questions and protocols, all countries can use STEPS information not only for monitoring within-country trends, but also for making comparisons across countries. The approach encourages the collection of small amounts of useful information on a regular and continuing basis. There are currently two primary STEPS surveillance systems, the STEPwise approach to risk factor surveillance and the STEPwise approach to stroke surveillance. STEPS will determine the extent of several of the major risk factors for major chronic non-communicable diseases (e.g. diseases not caused by infections). These diseases and their risk factors include: Tobacco use, alcohol consumption, low intake of fruit and vegetable, physical inactivity, raised blood pressure, raised fasting blood glucose, obesity, high levels of fat in the blood.

Violence and Injury, Mental Health, and Oral Health modules are being developed and are in various stages of being pilot tested. Instruments will be available after the pilot test.

Population Studied

A minimum target sample size of 2,000 adults aged between 25 and 64 and stratified by sex and 10 year age groups is required for STEPS surveillance. This basic recommendation assumes that the population is homogenous and does not allow analysis by subpopulations other than age and sex. Most risk factors for chronic diseases increase with age, but because numbers in older age groups are generally fewer than in younger groups, they can be less well represented in samples, with consequent loss of precision in estimates.

To ensure adequate representation of each stratum, regardless of their sampling methods, all STEPS surveys should be stratified by sex and 10-year age group, effectively making a separate population survey for each stratum. Increasing numbers by approximately 10% is one means of compensating for anticipated non-response. This will ensure that the total number of people actually participating in the survey will be at least the minimum required. The table below shows how the sample should be selected for each stratum:

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Recruitment target</th>
<th>Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men: 25 – 34 years</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>35 – 44</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>45 – 54</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>55 – 64</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>Women: 25 – 34 years</td>
<td>250</td>
<td>275</td>
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<tr>
<td>35 – 44</td>
<td>250</td>
<td>275</td>
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<td>45 – 54</td>
<td>250</td>
<td>275</td>
</tr>
<tr>
<td>55 – 64</td>
<td>250</td>
<td>275</td>
</tr>
</tbody>
</table>

Information Collection Method

The tool used to collect data and measure chronic disease risk factors is called the STEPS Instrument. The STEPS Instrument covers three different levels or ‘steps’ of risk factor assessment: Step 1, Step 2 and Step 3. The generic STEPS Instrument template, which countries use to develop their own Instrument, contains:

- Core items, expanded items, response options for Step 1, Step 2 and Step 3.
- Coding columns are used later to facilitate data management. The levels of “steps” are: questionnaire, physical measurements and biochemical measurements. The STEPS Manual provides a complete overview and guidance to sites wishing to implement the WHO STEPwise approach to chronic disease risk factor...
surveillance. It includes both general information and specific instructional material that can be used for planning and setting up STEPS, training, data collection, data entry, data analysis and reporting. Information is gathered through steps of data collection: Step 1 - Interview questions - Step 2 - Measurements of height, weight, waist & blood pressure - Step 3 - Blood tests for sugar and fats.

The STEPS Manual is written in modular parts and follows the sequence of events required to implement a STEPS survey. It is divided into seven parts. Each part of the manual is divided into sections. Each part and section is introduced with a table of contents to help readers find specific topics.

The STEPS Manual provides guidelines and supporting material for sites wishing to undertake chronic disease risk factor surveillance, using the WHO STEPwise approach to surveillance. Sections of the manual give guidance on the process of: planning and preparing the survey scope and environment; training staff for data collection, data entry, and data analysis; conducting a STEPS survey; capturing and analysing the data that is collected; and finally reporting and disseminating the survey results. The question by question instruction guide provides background information to the interviewers and supervisors as to what is intended by each of the questions or measures on the generic STEPS Instrument.

Comments

The STEPS approach focuses on obtaining core data on the established risk factors that determine the major disease burden. It is sufficiently flexible to allow each country to expand on the core variables and risk factors, and to incorporate optional modules related to local or regional interests. Derived from STEPS, the Global school-based student health survey (GSHS) is a collaborative surveillance project designed to help countries measure and assess the behavioural risk factors and protective factors in 10 key areas among young people aged 13 to 15. The GSHS is a relatively low-cost school-based survey which uses a self-administered questionnaire to obtain data on young people’s health behaviour and protective factors related to the leading causes of morbidity and mortality among children and adults worldwide.

References

Details are available from: http://www.who.int/chp/steps/en/

Major Issues

An excellent approach to the integrated surveillance of non communicable diseases based on risk factors and a dynamic system. EGOHID II certainly has to take into consideration this concept including HSS as a priority and then HCS, concept which is validated and promoted at international level. Free access is available to methodologies and documents.
The WHO-sponsored International Collaborative Study of Oral Health Outcomes (ICSII) established three major research goals. The first was to describe each of the seven study sites according to 1) oral health outcomes, including oral health behaviour, oral health status and oral quality of life, 2) social groups' differences in oral health outcomes and 3) differences between individuals in each of the oral health outcomes. For all three dimensions, the sites were compared to gain a better understanding of the status of each site. The second goal was to investigate how the socio-environmental and oral health care system characteristics of the various sites were related to differences in the status of their oral health outcomes, differences in the magnitude of gaps between social groups in these outcomes and differences in the explanatory factors for these outcomes. The final goal was to test whether certain explanations for the three sets of oral health outcomes derived from previous single-country studies could be generalized to all sites in the study. In practical terms ICSII was aimed at describing the oral care system and the oral health outcomes in each country, analyzing the adequacy of the care system to respond to the needs and demands of the population and providing cross-country comparisons so that public health decision makers and politicians could benefit from other countries' experiences.

Developed jointly by WHO and the Center for Health Administration Studies at the University of Chicago. A theoretical model was developed to guide the study design, the development of instruments and the analysis of the information collected. The ICSII model was derived from an integration of existing oral health behaviour and oral health status models and the general health models of Andersen and Blum. The model presents the factors influencing oral health outcomes of a person both at individual and system levels. Factors at system level are related to the oral health care system as well as socio-environmental characteristics. Individual level variables are personal characteristics (predisposing and enabling) oral health behaviour, oral health status, oral quality of life (symptoms, well-being, functioning). The impact of the system and individual level factors on an individual's oral health behaviour, oral health status and quality of life was tested in all sites as part of the study hypotheses.

Since it was recognized that few countries would have resources required to conduct a survey of the entire country, recommended guidelines were established for the selection of study areas, target sample sizes and sampling methodology. First, the selected study sites should be served by an oral health care system that was at least 15 years old and was typical of the country. Secondly, the study site should contain a non-institutionalized population of at least 300,000, with more than one-third residing in urban areas. Thirdly, the site should have an oral health care provider-population ratio of at least 1:3000. Fourthly, a target sample size of 1,000 was established for each age-group. Finally, the sample should be drawn as probability samples from samples frames known to include at least 90% of the population.

Seven study sites in five countries were included: Erfurt in Germany, Yamanashi in Japan, New-Zealand (the whole country), Lodz in Poland, Baltimore, two Navajo reservations and two Lakota reservations in the USA. Latvia, France and San-Antonio, USA participated at a later stage and their results are not included in the referenced publication. In each site three age-groups: children aged 12-13 years, adults 35-44 years, and 65-74 years were studied.

All non-institutionalized individuals residing in the study site and of the appropriate ages were eligible for the study. Interviews and clinical examinations were conducted from 1988 to 1994, depending on each site schedule, resulting in a total of 14,252 completed questionnaires and 11,717 clinical examinations. (The sample size of 1,000 per age-group was in some sites difficult to reach and one site did not include the elderly group). Interviewers were trained to collect the information. For children, the questionnaires were
distributed in the schools and self-administered. Clinical examinations were carried out by a local team, trained and calibrated by a roving epidemiologist from the WHO using the WHO calibrating methodology. (ref/ OHS basic methods). Aggregate secondary data concerning the socioenvironmental characteristics and oral health care system at each site were also collected.

ICSII provides a set of data collection instruments especially on social surveys including health beliefs, behaviour, and quality of life in relation to oral health. Questionnaires have been tested for cross-cultural validity and reliability. They have been used successfully in various settings, practical conditions and cultural and political contexts. In addition, methods for adjustment of instruments to local constraints, translation while keeping the conceptual content in different cultures thus ensuring cross-country comparability and describing its limits are part of the ICSII valuable contribution to oral health international research.

In an effort to better capture oral health determinants, the social interviews and the clinical examinations were conducted on the same persons in each of the age-groups of the samples. This is a specific feature of this study, tailored to its specific objectives. This would not be necessary for the sake of describing and following trends from a public health policy point of view. Beyond its specific aspects and purposes, this study provides a unique methodological compendium of tools and experience. It is worth looking into this material while developing methods and instruments for the collection of sociological oral health related information in European countries.


ICSII should serve as one of the major references for EGOHIP, especially in respect of the development of social survey instruments and methods for ensuring cross-country consistency in collecting oral health information throughout Europe. It offers a series of tools proven to be scientifically and practically valid. ICSII instruments were designed for international research purposes in an attempt to fill in mainly theoretical gaps and to provide further research directions. In this respect, the instruments have demonstrated their adequacy and their limitations. Whereas ICS was carried out as a considerable human, practical and financial investment, a similar challenge can be taken up at European level at a much lower cost in time, energy and in financial terms. The selection of a limited number of strong and universal social survey indicators was the first step in this direction and has been achieved by EGOHIP Phase I. As a second step, and with reference to ICSII, the social survey questionnaires for adults and children should be dramatically reduced while keeping some key methodological concepts such as the development of “core” instruments with allowance for country or local specific characteristics to be included and analyzed.
Health Domain: Health Care

Objectives: Health Care (HC) statistics describe the process of providing health care services in countries by referring to the participating institutions and to the services provided. Institution-related data mostly refer to available resources and so focus primarily on a capacity dimension, whereas service-related data aim at quantifying directly elements of the health care delivery process.

The respective data are, due to their heterogeneity, collected, stored and disseminated via different concept-specific tables. They are based on different sources. This may lead to the time and geographical coverage being different, to variation in data validity, reliability and comparability. Furthermore, it may not always be possible to have the health care system implicitly underpinning the data collection, being consistently defined across data sources.

Health Care data are classified in different categories e.g. Ambulatory Care: this refers to results from population surveys on (1) the number of patient contacts with (a) general practitioners, (b) medical specialists, (c) dentists, and (2) the time needed for seeing the nearest (a) general practitioners, (b) hospital, all variables by age and gender, educational attainment and employment status. Survey results refer to the number of patient contacts with General Practitioners (GPs), medical specialists and dentists within a calendar year.

Methodologies and data collections:

Data from LFS surveys: For data collected via the Labor Force Survey (LFS), health information is available for the 15 previous EU-Member States (EU15).

Data from ECHP surveys: For data collected via the European Community Household Panel (ECHP), health information is available for the 15 previous EU-Member States (EU15).

Data from the Eurobarometer surveys: Data are available for all previous EU15-Member States.

Population Studied:

Data are available for EU-25, Iceland, Norway, Switzerland, Liechtenstein, Bulgaria, Romania, Turkey, Albania, Bosnia & Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Serbia & Montenegro. Data for Canada, United States and Japan are included for comparison purposes. Some countries are not in a position to provide all data and for some countries the comparability of the data is limited.

Statistical Unit:

Data from administrative records: Administrative data sources refer to registered health professionals, health care facility categories, patients treated or procedures applied. The underlying totality of institutions, for which data collections are available, may differ. In some countries, data may not be available for a subgroup of institutions (e.g. private hospitals).

Data from LFS/ECHP/Eurobarometer surveys: Individuals responding to the LFS, ECHP or Eurobarometer surveys.

Population:

Data from administrative records: the statistical population is the resident population of a given country.

Data from LFS/ECHP/Eurobarometer surveys: in principle, the target population covered for LFS, ECHP and Eurobarometer samples includes all private households throughout the national territory of each country. For more information see the respective methodological elements in the LFS publication on the web site, the ECHP CIRCA site and the European Commission – Public opinion analysis site (Eurobarometer).

Concerning the Eurobarometer surveys, it should be noted that in each country the sample is only around 1,000 people except Luxembourg (around 600). The small sample size results in large confidence intervals (CI), in particular for breakdowns for age and sex.
Data are broken down by type of health care resource or output variable. Annual national and regional data are provided in absolute numbers and in population-standardised rates (per 100,000 inhabitants). Most health care data are based on administrative data sources in the countries. The following data are based on European-wide harmonised health or general-purpose surveys or on Eurobarometer data:

- health staff: employment in health and social care – Labour force Survey (LFS),
- inpatient care: nights spent in hospitals – European Community Household Panel (ECHP),
- medical treatment: preventive examinations – Eurobarometer (specific surveys in 1996 and 2002),
- ambulatory care: patient contacts with providers of ambulatory care – European Community Household Panel (ECHP),
- Accessibility of services – Eurobarometer 1999.

Data on Health Care form a major element of public health information as they describe the capacities available for types of health care media as well as potential bottlenecks observed. The quantity and quality of health care services provided and the work sharing established between the different institutions are a subject of ongoing debate in all countries. Sustainability – continuously providing the necessary monetary and personal resources needed – and meeting the challenges of ageing societies are the primary perspectives used when analyzing and using the data.

Health care data, based on national administrative sources, reflect the country-specific way of organizing health care, and may not always be completely comparable. Health care data, based on national administrative sources, reflect the country-specific way of organizing health care, and may not always be completely comparable.

References: Details are available from: http://forum.europa.eu.int/Public/irc/dsis/health/library. Regional data are available for selective variables for most of the countries.

This database constitutes a major source of health care related information in Europe. It should be manipulated cautiously in terms of comparisons. As is usually the case for multiple countries data bases, each information set is given some characteristics which are mostly specific to the particular country health care system. It could also be referred to by EGOHIPII working groups in the development of methods for gathering information on oral health care personnel in Europe.
**Health Domain**

EU Attitudes Population

**Objectives**

Twice a year the European Commission conducts the Eurobarometer survey in order to gather information on the attitudes of the population towards the EU and its policies. Each year, additional questions about specific subjects are appended to the questionnaire. Starting with Eurobarometer 34 (1990), separate supplementary surveys on special topics have been conducted under almost each Eurobarometer number. The Eurobarometer series is designed to provide regular monitoring of the public's social and political attitudes in the European Union through specific trend questions. The Eurobarometer public opinion surveys are conducted on behalf of the European Commission which regularly publishes the corresponding survey reports.

**Method of Reference**

Since the early seventies, representative national samples in all European Union (formerly European Community) member states are simultaneously interviewed in the spring and autumn. A two-stage sampling method is used. In the first stage a random selection of sampling points within each region is made such a way that urban and rural areas are represented proportionally. In the second stage, interviews are distributed in these sampling points, i.e. in each of the selected sampling points a starting address is drawn at random and further addresses are selected at every nth address from the initial address by standard random route procedures. In each household, the respondent is drawn at random. All interviews are face-to-face in people's homes and in the appropriate national language. The Standard Eurobarometer fieldwork was – from autumn 1989 to spring 2004 – carried out by national institutes associated with INRA (International Research Associates) EUROPE - European Coordination Office in Brussels (Eurobarometer 32). INRA EUROPE is also responsible for the coordination and the production of the integrated data sets, starting with Eurobarometer 54 in cooperation with GfK in the new European Opinion Research Group, EEIG. All participating institutes are members of the "European Society for Opinion and Marketing Research" ESOMAR and comply with its standards. Formerly, until Eurobarometer 31A, the fieldwork was carried out by national organizations belonging to the European Omnibus Survey (EOS-GALLUP Europe). The surveys were then coordinated and integrated by 'Faits et Opinions' in Paris. From autumn 2004 (Eurobarometer 62) the standard Eurobarometer has been run by "TNS Opinion & Social", a consortium formed by Taylor Nelson Sofres (TNS) and EOS Gallup Europe, and managed by the EOS Gallup office in Brussels. Since Autumn 1989 (Eurobarometer 32) the basic sampling design in all member states has been a multi-stage, random (probability) design. The sampling is based on a random selection of sampling points after stratification by the distribution of the national, resident population in terms of metropolitan, urban and rural areas, i.e. proportional to the population size (for a total coverage of the country) and to the population density. These primary sampling units (PSU) are selected from each of the administrative regions in every country. Starting with Eurobarometer 32 NUTS (EUROSTAT Nomenclature of Territorial Units for Statistics with multiple level of codes [hierarchical list of NUTS regions] [maps of NUTS regions]) level 2 regions are applied for all member countries. New independent samples are drawn for each Eurobarometer, which is also true for additional surveys with identical basic survey id. In the second stage, a cluster of addresses is selected from each sampled PSU. Addresses are chosen systematically using standard random route procedures, beginning with an initial address selected at random. In some countries respondents are randomly selected from electoral registers, such as Great Britain (until Eurobarometer 35), Republic of Ireland and Luxembourg (until Eurobarometer 32). Sweden uses a random sample bought at the government census bureau. In each household, a respondent is selected by a random procedure, such as the first birthday method. Up to two recalls are made to obtain an interview with the selected respondent. No more than one interview is conducted in each household. In the case
of special target groups (e.g. respondents aged 15 to 24) the sampling procedure can differ (e.g. quota sampling in Eurobarometer 34.2).

In previous Eurobarometer surveys, different sample methods were used which varied between countries. Until Eurobarometer 31A in Denmark, Luxembourg, and the Netherlands a random selection from the population or electoral lists (of individuals or households) was used; in Belgium, France, Italy, United Kingdom, and Ireland quota sampling established by sex, age and occupation on the basis of census data; in Greece, Spain and Portugal a random route procedure (combining the two preceding ones). Germany used quota sampling established by sex, age and occupation on the basis of census data until Eurobarometer 23 and random route starting with Eurobarometer 24.

Confidence Limits: the Eurobarometer user is reminded that survey results are estimations, the accuracy of which, everything being equal, rests upon the sample size and upon the observed percentage. With samples of about 1,000 interviews, the real percentages vary within the following confidence limits:

<table>
<thead>
<tr>
<th>Observed percentages</th>
<th>± 1.9%</th>
<th>± 2.5%</th>
<th>± 2.7%</th>
<th>± 3.0%</th>
<th>± 3.1%</th>
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</thead>
<tbody>
<tr>
<td>10% or 90%</td>
<td></td>
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<tr>
<td>20% or 80%</td>
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<td>30% or 70%</td>
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<td>40% or 60%</td>
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<tr>
<td>50%</td>
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</table>

Source: Eurobarometer Reports (Technical Specifications)

Intermittently, Standard Eurobarometer have investigated special topics, such as agriculture, biotechnology, energy, environment, gender roles, health related issues, immigration, poverty, regional identity, science and technology, working conditions, urban traffic etc. In the case of some supplementary studies, special youth and elderly samples have been drawn. Starting with Eurobarometer 34.1 additional supplementary surveys on special issues have been conducted, some including a reduced set of standard trend questions or demographics.

The Eurobarometer covers the resident population of the respective nationalities of the European Union Member States, aged 15 years and over. In each country the sample is around 1,000 persons except Luxembourg (around 600). The small sample size results in large confidence intervals (CI).

For more information see the respective methodological elements in the European Commission – Public opinion analysis site (Eurobarometer).

The use of telephone surveys rather than face-to-face interviews has been increasing in European empirical social research. The Eurobarometer representative surveys, conducted biannually in the EU member states for the European Commission in Brussels, provided an opportunity in the Spring of 1994 (EB 41.0), to directly compare the two methods. At nearly the same time as that face-to-face (Eurobarometer) survey was conducted, a nearly identical survey questionnaire was also administered as a telephone survey in the (then) twelve EU member states. This permitted a systematic investigation of the differing sample designs and survey methods to be conducted. In three of the twelve EU member states, in addition, the comparative base was enhanced by a telephone panel component. The contributions in the current volume investigate the survey methodology questions raised by this comparison. The research is of importance for internationally comparative empirical social research, as well as for market surveys and public opinion research in Europe.

Survey results are regularly published in official reports by the Eurobarometer unit of the European Commission. All Eurobarometer data files are stored at the Zentral-Archiv (Universität Köln, Bachemer Strasse, 40, D-50869 Köln-Lindenthal), available through the CESSDA Database http://www.nsd.uib.no/cessda/europe.html. They are at the disposal of all the institutes that are members of the European Consortium for Political Research (Essex), of the Inter-University Consortium for Political and Social Research (Michigan) and of all those interested in social science research.
Monitoring public opinion in the European Union is the mission of the Standard Eurobarometer surveys conducted on behalf of the European Commission at least twice annually in all member states of the European Union. Since the early seventies they have provided regular information on social and political attitudes of the European public. In the nineties the Eurobarometer program has been complemented by the small scale Flash Eurobarometer on specific affairs and by the Central and Eastern Eurobarometer series, at a later date replaced by the Candidate Countries Eurobarometer.

Details are available from: http://ec.europa.eu/public_opinion/index_en.htm

The standard Eurobarometer survey series is a unique program of cross-national and cross-temporal comparative social research. In this outline, Eurobarometer is presented in its broad methodological aspects. However, some specific health surveys have been conducted and it is recommended that the EGOHIP II working groups look into these specific topics for more detailed and specific health information. Eurobarometer started classically using face-to-face interviews, a method which has tended to be replaced by telephone interviews. These two methods and their respective values, from the scientific, costs and feasibility points of view should be considered by EGOHIP II working groups while developing their methodological recommendations.
The European Community Household Panel (ECHP) is a survey based on a standardized questionnaire that involves annual interviewing of a representative panel of households and individuals in each country, covering a wide range of topics: e.g. income, health, education, housing, demographics and employment characteristics. Three characteristics make the ECHP a unique source of information. These are (i) its multi-dimensional coverage of a range of topics simultaneously; (ii) a standardized methodology and procedures yielding comparable information across countries; and (iii) a longitudinal or panel design in which information on the same set of households and persons is gathered to study changes over time at the micro level.

A. Multi-dimensional coverage: Two major areas covered in considerable detail in the ECHP concern the economic activity and personal income of the individuals concerned. In addition, a wide range of other topics are covered, such as the individual’s social relations and responsibilities, health, pensions and insurance, degree of satisfaction with various aspects of work and life, education and training, and biographic information. Hence compared to other social surveys in the EU, the ECHP has a much broader and integrative character: it aims to provide comparable and inter-related information on, for instance, earnings and social protection benefits and employment and working conditions and housing and family structures and social relations and attitudes.

B. Cross-national comparability: Furthermore, these inter-relationships can be studied and compared across countries. Comparability is achieved through a standardised design and common technical and implementation procedures, with centralised support and co-ordination of the national surveys by Eurostat. The ECHP design has a number of features introduced to enhance cross-national comparability.

C. Longitudinal or panel design: Within each country, the original sample of households and persons is followed over time at annual intervals. In addition to providing longitudinal data, ECHP is also designed to provide representative cross-sectional pictures over time by constant renewal of the sample through appropriate follow-up rules. People who move or otherwise form or join new households are followed up at their new location. Children in the original sample become eligible for the detailed personal interview as they achieve the age of 16, and children born to sample women are automatically included as a part of the survey population. In this manner, the sample reflects demographic changes in the population and continues to represent representative of the population over time, except for losses due to sample attrition and households formed purely of new immigrants into the population. Furthermore, at any time the detailed survey covers all persons cohabiting with any of the original sample person in the same household. This is so that the sample persons can be studied in the context of their total household. More information is available in the CIRCA library "ECHP/ ECHP documents".

The total duration of the ECHP was 8 years, running from 1994 to 2001. In the first wave, in 1994, a sample of some 60,500 nationally represented households – i.e. approximately 130,000 adults aged 16 years and over - were interviewed in the then 12 Member States. Austria (1995) and Finland (1996) have since joined the project. Data for Sweden is available as of 1997, and has been derived from the Swedish Living Conditions Survey and transformed into ECHP format.

Please note that the data sources used may not have been initially implemented for statistical purposes, and that the initial purpose of a data source may differ across countries. Both facts may influence the validity and comparability of results.
European Community Household Panel (ECHP)

Comments  Because of its multi-dimensional coverage, information on some of the topics may be less detailed or less precise than that in single-topic sources, but in ECHP it forms a part of a single micro-data source on the basis of which inter-relationships between different fields and the relevance of specific factors for the individuals’ living conditions can be analyzed. The issue of inter-country comparability is addressed by four key features:
- a common survey structure and procedures, in this case annual interviewing of a representative panel using specified follow-up rules etc;
- common standards, and where possible common arrangements as well, for data processing and statistical analysis, including editing, variable construction, weighting, data adjustment, variance computation etc;
- common sampling requirements and standards (concerning sample size, probability selection procedures, respondent and call-back rules etc.), coupled with flexibility in the actual designs to suit national conditions;
- a central feature of the project is the use of a common 'blue-print' questionnaire which is to serve as the point of departure for all national surveys.
The truly unique contribution of ECHP is its panel design which allows for longitudinal follow-up and analysis.

References  Details are available from: http://circa.europa.eu/irc/dsis/echpanel/info/data/information.html

Major Issues  Whereas the study captures information far beyond the oral health field or indeed any sole health domain, its design and methodological developments provide a rich and valuable contribution to the work of EGOHIP II. The comparability issue has been addressed in drawing methods similar to the ICSII study where the focus was on oral health. In both studies, similar methods have been used: “core” or “blueprint” questionnaires, common sampling requirements and standardization of analytical procedures. Apart from its potential use as a model for the design of specific social oral health European surveys, ECHP is an important source of sociological and health related information in 15 of the European Community countries.
Health Domain

Objectives

The Reseau National Tele-informatique de surveillance et d'information sur les Maladies Transmissibles (RNTMT) (French communicable diseases computerised surveillance network) comprises a network of sentinel general practitioners (SGP). Since November 1984, the French Communicable Disease Network (FCDN), a national surveillance system, has allowed the collection, the analysis and the real-time redistribution of epidemiological data coming from general practitioners’ activity. These benevolent volunteers are responsible for weekly epidemiological surveillance. The sentinel system has five main objectives: description of attitudes, epidemiological description of communicable diseases without any vaccination programme, evaluation of immunization programmes (mumps, measles), outbreak detection (influenza syndrome, acute diarrhoea), and description of annual trends for sexually transmitted diseases (viral hepatitis, male urethritis). The FCDN SGPs are also occasionally used as a panel to study other epidemiological problems of interest in general practice i.e asthma, suicide attempts (1999), shingles (2004) and hospitalizations (1997).

Population Studied

Since 1984, SGPs have updated a database with information on eight communicable diseases via videotext terminals. For example, each case of an influenza-like illness (ILI) is defined by the association of a sudden fever of 39°C or above, respiratory symptoms, and myalgias. An ILI epidemic is detected when the national weekly incidence rate exceeds a seasonal threshold for two successive weeks. An ILI epidemic was reported from November 1995 to January 1996. In total, 13,951 individual cases were reported by 500 SGPs during the epidemic period. The size of the epidemic (number of patients consulting a GP) was estimated to be 2,370,000 subjects. The FCDN redistributes this information in the form of standardised weekly incidence estimates. Between 1991 and 1995, 15,817 cases of chickenpox were reported and provided the basis for the analysis. Chickenpox was defined as a sudden onset of typical skin eruption with pruritus, leaving scabs and associated with moderate fever. For each reported case, the SGP gave information on the age of the patient, sex, prevailing childcare for the children, contacts and complications (skin superinfections, lower and upper respiratory infections, conjunctivitis and corneal infections, nervous system injuries, stomatitis and others).

Information Collection Method

The data were collected by the computerised Sentinelle system. The Sentinelle system uses a videotext server that allows information exchange, data entry, and synthetic return of information. Over the last 11 years, more than 1800 GPs have been recruited through "Sentinelles" and through the three French medical daily newspapers, in order to maintain a sample of approximately 500 data providers (i.e. 1% of all GPs in France). It represents a total of more than 120,000 connections to the RNTMT telematic service center. The principal motivation of these benevolent SGPs was to 'actively participate in public health', although only a minority of them (17.6%) had any training in this field. Such a system, based on the benevolent and voluntary activity of SGPs, requires a good understanding of SGPs’ attitudes towards epidemiological surveillance in general and the tool used, in order to quantitatively and qualitatively follow their participation and to provide regular and useful feedback to the surveillance participants.

These weekly estimates now appear on the Internet and are the basis for issuing alerts of influenza epidemics. We postulate that day to day estimations would be highly desirable to achieve timely detection of the actual onset of the epidemic, a need dramatically underscored by the emergence of bio-terrorism.

The Sentinelle system demonstrated adequate sensitivity and timeliness regarding specific epidemics. Moreover, results of the monitoring were made available on the internet to increase the dissemination of information.
References

Major Issues
Further investigation should be made to find out if similar systems have been implemented in other European countries. In view of the full integration of oral health into the health sector, possible links to the existing system could be envisaged as well as an adaptation of the French system at European level. Selected key oral health surveillance variables should be identified to become part of the existing Sentinelle networks.
### Health Domain

**Health Surveillance System in Europe**

### Objectives

**Eurostat and the Health and Consumer Protection Directorate General (DG Consumer Protection)** are developing the European Health Survey System (EHSS) for the purpose of implementing and enhancing the modules for health surveys. For DG Health and Consumer Protection this an important aspect of the collection of data forming the basis for the European Community Health Indicators (ECHI) defined in the Community Public Health Programme.

The goals of the European Health Survey System can be summarized as follows: identification of health problems, description of the health status and health needs of the population, estimation of the prevalence and distribution of health indicators, analysis of social (in)equality in health and access to health services, study of healthcare consumption and its determinants, as well as preventive care, study of possible trends in health status, life style and healthcare services consumption among the population.

### Population Studied

**The European Health Survey System** is defined as a combination of existing international or national survey instruments with appropriately designed common questions modules. It comprises a Core Health Interview Survey, managed by the Community Statistical Programme and a set of Special Health Interview Survey modules, managed by the Public Health Programme. A feasibility study for a European Health Examination Survey is also a part of the system.

### Information Collection Method

**The European Health Survey System (EHSS)** consists of the European Health Interview Survey (EU-HIS) or the 18 HIS-item Eurostat Project, the European Community Household Panel Survey (ECHP), the Survey of Income and Living Conditions (EU-SILC), the DG Health and Consumer Protection’s health Eurobarometers, DAFNE - European food availability databank based on household budget surveys (food, socio-economic and demographic data collected in the household budget surveys, HBS) and EMCDDA – general population surveys of drug use. General population surveys of drug use are carried out by the EMCDDA (European Monitoring Centre for Drugs and Drug Addictions; representative sample surveys of the whole population concerning drug use and related factors).

Health interview surveys (HIS), health examination surveys (HES) and combinations of HIS/HES and other population surveys were used in EU Member States to collect information about the self-assessed health of the population, on health-related behaviours and on the use of medical services. This information was collected and stored in an electronic format (the HIS/HES database) by Eurostat.

**The European Core Health Interview Survey (ECHIS)** is the basic survey of the European Health Survey System (EHSS). The first round of the ECHIS could take place in 2007 in all the EU Members States. The survey system might take various forms in the different countries, but in all Member States the common elements could be: the annual Mini European Health Module (MEHM), this would be the annual component of the ECHIS, providing the data needed annually for the European Structural Indicators in the field of health, such as the Healthy Life Years (HLY) as well as other modules such as a European Module on Health Status (EMHS), a European Survey Module on Determinants of Health (ESMD) and a European Survey Module on Care (ESMC).

The ECHIS, together with DG Health and Consumer Protection’s European Special Health Interview Survey (ESHIS) will constitute the European Health Interview Survey (EHIS). From DG Health and Consumer Protection’s point of view, the EHIS thus consists of five components:

1. The European Core Health Interview Survey (ECHIS): the annual Mini European Health Module (MEHM), the European module on health status (ECMHS), the European Health Determinants Module (EHDM), the European Health Care Module (EHCM), the European Background Module (EBM). This component will be handled by the European Statistical System (ESS).

2. A complementary set of European Special Health Interview Surveys (ESHIS). These complementary surveys may look at different subjects or thematic areas, such as nutrition, adolescents, mental health,
musculoskeletal diseases, respiratory diseases, drug addiction, mental health, chronic diseases, use of health services, self-medication, limitation of functions, reproductive health, etc. However, for reasons of comparability and in order to improve overall coordination, these surveys should at least include the MEHM and preferably one or more of the ECHIS modules. Technical co-ordination in this area should be improved. This component will come under the Community Public Health Programme 2003-2008.

3. In the context of the complementary set of European Special Health Interview Surveys (ESHIS), specific attention will be focused on the development of survey instruments covering three important topics:
   - coverage of functional topics in Europe as set out in the ICF (International Classification of Functions);
   - modules on mental health and on QOL (quality of life) indicators which define, for both these fields, appropriate instruments within the DG Health and Consumer Protection Working Party on Mental Health;
   - the key indicator 'Extent and patterns of drug use among the general population' following the European Model Questionnaire (EMQ) developed by the European Monitoring Centre for Drug and Drug Addiction.

4. A European Health Examination Survey (EHES) carried out on a sub-sample of individuals selected for an HIS in order to meet certain design and procedural requirements if the ongoing feasibility study gives a favourable opinion.

5. Some auxiliary modules focusing on opinion of citizens on health related problems or serving as an auxiliary tool in certain circumstances (gaps in the HLY indicator) could, where appropriate, be implemented using the European Commission Eurobarometer survey or, in certain cases and where possible, other European surveys such as the Labour Force Survey etc. Synergies and frameworks shared with other international surveys need to be defined (e.g. EPIC, World Health Survey etc.).

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**European Health Survey System (EHSS)**

**ECHIS (EUROSTAT – ESS)**
European Core Health Interview Survey

Annual component from 2004 onwards
- > 1 module with 7 variables:
  - First 3 variables: MEHM (Minimum European Health Module) in EU-SILC survey (Statistics on Income and Living Conditions) -> perceived health, chronic illness and limitation -> HLY indicator (SI, SDI indicators).
  - Other 4 variables -> unmet need for medical / dental examination or treatment.

**ESHIS (SANCO)**
European Special Health Interview Survey

These surveys address specific policy demands in-depth analysis on some health issues (e.g., nutrition, injuries, mental health, etc.). From 2004 onwards, they can be carried out only once or repeated some time to time.

**HIS / HES Database**
Health Interview Survey / Health Examination Survey

This is a database of certificated standard and recommended reference instruments. Current database developed by NIPH-Belgium and KTL-Finland with the support of DG SANCO and Eurostat.

**Every 5 years component from 2006/07 onwards - 4 modules:**
- EHSM (European Health Status Module) (*);
- EHCM (European Health Care Module);
- EHDM (European Health Determinants Module);
- EBM (European Background Module).

Could also be complemented in future by a European HES.

* Already developed, includes MEHM questions and also covers detailed chronic conditions, physical and functional limitations, personal care activities, household care activities, other daily activities and mental health.
The European Health Survey System (EHSS) and other European Surveys and Databases should be taken into consideration to establish a competent network of health surveillance. Many surveys and databases in Europe exist such as:

The European Statistical System (ESS) and Eurostat. Work is underway at EU level on establishing the framework for all statistics in different areas, for instance public health, carried out by the European Statistical System (ESS). ESS was built up gradually with the objective of providing comparable statistics at EU level. The background for this work was the increasing number of requests for health statistics at Community level as well as requirements for high-standard statistics for monitoring policies in different areas. The ESS comprises Eurostat and the statistical offices, ministries, agencies and central banks that compile official statistics mainly in the EU Member States. Eurostat is the Statistical Office of the European Communities and its role is to provide the European Union with high-quality statistical information services.

The ESS functions as a network in which Eurostat's role is to lead the way in the harmonization of statistics in close cooperation with the national statistical authorities. ESS work concentrates mainly on EU policy areas, but with the extension of EU policies, harmonization has been extended to nearly all statistical fields. There is also coordination between ESS and international organisations such as the Organisation for Economic Co-operation and Development (OECD), the UN, the International Monetary Fund and the World Bank. The Statistical Programme Committee (SPC) has an important role in the work of the ESS. SPC is chaired by Eurostat and brings together the directors of the Member States' national statistical offices. SPC discusses the most important joint actions and programmes to be carried out to meet EU information requirements.

The European Health Survey System (EHSS) consists of the European Health Interview Survey (EU-HIS) or the 18 HIS-item Eurostat Project, the European Community Household Panel Survey (ECHP), the Survey of Income and Living Conditions (EU-SILC), the DG Health and Consumer Protection's health Eurobarometers, DAFNE - European food availability databank based on household budget surveys (food, socio-economic and demographic data collected in the household budget surveys, HBS) and EMCDDA - general population surveys of drug use. General population surveys of drug use are carried out by the EMCDDA (European Monitoring Centre for Drugs and Drug Addictions; representative sample surveys of the whole population concerning drug use and related factors).

Health interview surveys (HIS), health examination surveys (HES) and combinations of HIS/HES and other population surveys were used in EU Member States to collect information about the self-assessed health of the population, on health-related behaviours and on the use of medical services. This information was collected and stored in an electronic format (the HIS/HES database) by Eurostat.

Under the ongoing 18 HIS-item Project, significant improvements have been made in arriving at better internationally comparable data. The 2002 data compiled indicated that there were already a number of topics for which existing national surveys could deliver sufficiently comparable data: self-perceived health, chronic conditions, smoking, Body Mass Index, doctor/dentist consultations and use of medicines. For some other items, national approaches still differ significantly, although harmonisation in the future seems possible.

The European Community Household Panel (ECHP) is a longitudinal, multi-subject survey covering many aspects of daily life, particularly employment and income, but also demographic aspects, environment, education and health. The health section of the ECHP contains questions on perceived health, chronic conditions hampering daily activities, temporary reduction of activity because of health problems and hospitalisation, medical consultations, smoking and Body Mass Index. The detailed interview results are stored at Eurostat and many statistics derived from the ECHP are available in Eurostat's database, New Cronos.

The European Community Household Panel (ECHP) project was replaced in 2005 by a new instrument, EU-SILC (Statistics on Income and Living Conditions). EU-SILC is a continuous survey that covers statistics on income and living conditions for different types of households in European countries. The reason for the change was mainly adapting the instrument to new political needs, above all priorities for the eradication of poverty and a better understanding of social exclusion, based on commonly agreed indicators. The main output of the project is that, for the first time, comparable data on income distribution...
European Health Survey System (EHSS)

and on poverty/social exclusion have been produced for the EU. At the same time, work is underway to
develop different modules for a European Health Interview Survey (EHIS) containing several instruments
in a specific domain (health status, health determinants, use of medical services), collected on a national
level and co-ordinated by Eurostat.
The Directorate General for Health and Consumer Affairs (DG SANCO) also has a Health Eurobarometer.
First, there are Standard Eurobarometers (EBs) designated to gauge European public opinion on
aspects of European integration and the activities of European institutions. These EBs are designed
as surveys on social or living conditions. Secondly, there are special EB modules that can be
implemented based on in-depth thematic studies carried out for various departments of the
European Commission or other EU institutions, and then integrated into the standard
Eurobarometer’s polling waves. DG SANCO has for this reason launched some special EBs on
health. In 2005, DG SANCO launched a project to inventory 30 years of Eurobarometers on health
in order to produce a publicly available tool for analysis and consultation.

Other European Surveys and Databases

The European Social Survey (ESS) is a survey covering 20 nations jointly funded by the European
Commission, the European Science Foundation and academic funding bodies in each participating
country. The core module monitors change and continuity in a wide range of cultural, social and economic
variables, and the rotating modules are composed of questions which selected research groups have
formulated for specific research purposes. The system of rotating modules allows for flexibility and country-
specific contextual data, for instance the employment rate, tax level, social expenditure etc. There is
currently no rotating module on ageing.

The European Quality of Life Survey (EQLS) was carried out by the Foundation in 28 countries in 2003 and
examined issues such as education, household and family structures, housing, health care and
employment. In 2004, the Foundation published an analysis of quality of life issues using data from the
European Commission’s Eurobarometer surveys in the EU and from the acceding and candidate countries.
The data of the survey is, among other components, based on different age groups, which makes it possible
to present data on issues regarding ageing. Eurofound's work on living conditions and quality of life in
Europe also includes data from an interactive database of statistical quality of life indicators, EurLIFE.
EurLIFE offers data drawn from the Foundation’s own surveys and from other published sources.
The EQUAL project (Successful practices in age management) is an initiative for new ideas to the
European Employment Strategy and the social inclusion process and is funded through the
European Social Fund.

Its mission is to promote more inclusive working life through fighting discrimination and exclusion based
on sex, racial or ethnic origin, religion or beliefs, disability, age or sexual orientation. EQUAL also has a
database, the EQUAL Common Database (ECD8), which contains information on all of the projects
financed within the European Union. The data is destined for those involved with EQUAL, for networking
and for trans-national activities, for specific observers (political, researchers, etc) and for the public who
take an interest in employment issues, social integration, combating discrimination and inequality,
innovation, etc.

The aim of the HALE Project (Healthy Ageing: a Longitudinal Study in Europe) is to study changes in and
determinants of normal and healthy ageing in 13 European countries in terms of mortality and morbidity
outcomes as well as in terms of physical, psychological, cognitive and social functioning.
The main task of the SHARE project (Survey of Health, Ageing and Retirement in Europe) is to try to
understand ageing and how it affects individuals in the diverse cultural settings of Europe; that is, to study
how differences in cultures, living conditions and policy approaches shape the lives of Europeans just before
and after retirement, for example data on physical and mental health, health care services, well-being, labour
force participation, family and social networks, income and wealth.

European Research Area in Ageing (ERA-AGE) is a project under the European Union Sixth Framework
Research Programme, aiming at facilitating the coordination of existing European ageing research
programmes and knowledge exploitation, promoting joint disciplinary research activities between
countries and sharing good practice in the coordination and management of national ageing research.
programmes. Another objective is to help break down barriers between ageing research programmes, policy and practice so that the societal benefits of such research are realised as rapidly as possible. It is also important for the project to support the production of European priorities for ageing research programmes and ensure that these are fed systematically into national/regional funding mechanisms.

**References**

Details are available from: [http://ec.europa.eu/health/ph_information/dissemination/reporting/ehss_en.htm](http://ec.europa.eu/health/ph_information/dissemination/reporting/ehss_en.htm)

**Major Issues**

The goals of EGOHID II are similar to the main goals of European Health Survey System. This system, developed by Eurostat and DG SANCO indicates the future organization of the surveillance and data base knowledge network in Europe.
Basic Methods for Oral Health Surveys provides a sound basis for estimation of the present oral health status of a population and its future needs for oral health care. Since the first edition which was published in 1971, more than 130 health organisations and innumerable investigators in various parts of the world have conducted oral health surveys in accordance with the recommended basic methods. One of the main advantages of planning an epidemiological study, as recommended in this book, is the reliability and comparability of the data with similar studies conducted within the country as well as across the world. This book is essential reading for every researcher dealing with oral health surveys and epidemiology in the field of oral health. The current book is the 4th edition which, like previous editions, has been updated to address the needs of changing situations including new diseases.

The standard number of subjects in each index age group (5-7, 12, 15, 35-44 and 65-74 years) to be examined ranges from 25 to 50 for each cluster or sampling point, depending on the expected prevalence and severity of oral disease. The minimum number of subjects acceptable for analysis as one cluster is 20, but allowance must be made for the possibility that a subject’s form may be eliminated during data processing because of operator, recorder, or examiner error. Therefore the recommendation is that a minimum cluster size of 25 subjects per age group be examined to allow a margin for error.

Detailed assessment of dental caries of the primary dentition at the age of 5 and 6 years is not recommended for routine inclusion in a basic oral health survey. However, in order to monitor the achievements of preventive programmes and, in particular, disease trends, the recommendations are that a count of caries-free 5- and 6-year-old children be made in one class at each school in which 12-year-olds are examined. It is also possible to record the number of primary teeth that are decayed, missing or filled; relevant codes have been included as an option on the standard WHO forms. The 4th edition includes sections on the evaluation of extra-oral conditions, the oral mucosa, enamel opacities/hypoplasia, loss of periodontal attachment, and dentofacial anomalies.

Pathfinder surveys can be classified as either pilot or national, depending on the number of sampling sites and the age groups or index ages included. A national pathfinder survey incorporates sufficient examination sites to cover all important subgroups of the population that may have differing disease levels or treatment needs, and at least three of the index ages or age groups (see below). A pilot survey is one that includes only the most important subgroups in the population and only one or two index ages, usually 12 and 15 years. Such a survey provides the minimum amount of data needed for commencing planning in many situations. Additional data should then be collected in order to provide a reliable baseline for the implementation and monitoring of services.

The book is divided into seven chapters. Information on obtaining practical assistance for planning and implementing surveys, summarising data and analysing the results is also given. The first chapter describes the general principles for designing basic oral health surveys on which both monitoring of oral disease trends and estimation of oral care needs for populations can be based. This chapter concentrates on the methodology of pathfinder surveys which is a practical and economic survey sampling method which can give an insight into the oral disease status without involving elaborate design sampling methods and extremely exhaustive and expensive epidemiological investigations. The organisation and conduct of a proper survey are discussed in Chapter 2. The ways of ensuring that the data collected are as consistent and reliable as possible are described in the third chapter. It is recommended that the reliability and the validity of the data are achieved by training and calibrating the examiners, stress being laid on the need to constantly monitor inter- and intra-examiner variability by duplicating examinations of 5-10 per cent.
of the sample each day. It is also advised that when the survey is to be conducted by a group of examiners an experienced epidemiologist is appointed to act as a validator for the survey team. The information on how to calculate reproducibility of survey research is also annexed.

Practical guidance for implementing surveys by establishing contacts with persons in authority, keeping a logbook for recording details of each day’s examination are provided. The survey implementation starts with a preliminary sampling exercise; an estimation of fluoride in local sources of drinking water and the level of usage of topical fluoride especially tooth paste or any other product which may be in use and is likely to have an impact on oral diseases. Details are given regarding the personnel and organisation required for implementing a survey.

The instructions for completing the standard oral health assessment forms are described. A suitable format for recording results of oral health assessment is given in this chapter. The standard codes for recording oral diseases and their explanations are presented. Details of the oral health assessment forms are described which can be easily understood by an investigator. Details are also given regarding the various sections of the form and the computerised coding with criteria. This is the main chapter of the book with various diagrammatic presentations and coloured plates describing various soft tissue and hard tissue diseases at various stages and the various examination methods.

Chapter 6 describes how assistance can be provided by WHO and how to obtain it. The assistance can be provided at various levels e.g., pre-survey and post-survey assistance. Investigators can be provided with expert assistance to help in proper designing of the survey depending upon the standard information to be provided.

Post-survey, assistance can be provided to analyse the data using a standard WHO computer programme. The summary data is also systematically included in the WHO Global Oral Data Bank. For those investigators who do not have an access to computer facilities, the WHO arranges assistance for the data analysis provided the request is made before the survey is undertaken. The last chapter deals with the post-survey preparation of reports including a brief summary.

**Comments**

Practical guidelines in economic sample design suitable for assessing oral diseases and treatment needs for planning and monitoring oral health services, are provided. The diagnostic criteria of the various oral diseases given in this book are descriptive and definitive in nature which can be readily understood and applied by investigators in different countries. Information on how to obtain practical assistance for planning and implementing surveys, summarising data and analysing the results are also given. This book also has appended various formats of tables which can be generated and are required for reporting and publishing of the recorded data. In short, this book is invaluable for health planners and investigators dealing with the planning of oral health services, assessing disease status and the need for care.

**References**


**Major Issues**

The model of reference in oral health even if the methods proposed are largely derived from traditional epidemiological studies.
UK General Dental Practitioners

Health Domain  UK General Dental Practitioners

Objectives  The objectives of the study were to assess the feasibility of gathering dental epidemiological information by General Dental Practitioners (GDPs) during routine dental examinations. Traditional surveys of adult dental health have used calibrated examiners to collect clinical data.

Method of Reference  This study examines an alternative approach using data collected by GDPs about their adult patients.

Population Studied  Twenty-four dentists in Greater Manchester recorded both personal and intra-oral information on 3,832 of their regularly attending dentate patients over 24 years of age. Ten GDPs and five Community Dental Officers (previously trained as dental examiners for epidemiological purposes) performed dental examinations of the same 10 volunteer adult patients in order to record decayed, missing and filled teeth.

Information Collection

Method  The mean numbers of filled teeth, sound teeth and the proportion of patients with 21 or more teeth were all similar to those found in the 1988 United Kingdom national survey of adult dental health. For example, the mean number of filled teeth in the 25-34 year age group was 11.7 compared with 11.9 for subjects who claimed to attend regularly in the 1988 national survey, and these figures reduced to 11.2 and 10.0 in the 55-64 year age group. The proportion of adults with 21 or more teeth was found to be 99 per cent compared with 98 per cent in the 1988 survey for the 25-34 year age group, falling to 55 per cent compared with 56 per cent in the 55-64 year age group. The collection of epidemiological data by general dental practitioners is feasible, and has construct and internal validity. It is a possible alternative to conventional surveys of adult dental health.

Comments  Agreement assessed by the kappa statistic showed that both the previously trained dental examiners and the GDPs assessed tooth conditions other than tooth decay consistently. Furthermore, all of the GDPs were within the range of findings of the previously trained dental examiners for missing teeth and total DMFT score. Eight of the 10 GDPs were within the range of findings for the previously trained dental examiners' assessments of which teeth were filled and seven were within the range for decayed teeth. However, the previously trained dental examiners were more consistent in classifying teeth as decayed than the GDPs.


Major Issues  This study is a model for obtaining adult oral health data during elective dental consultations in General Dental Practice. It demonstrates that this could be a practical method of gathering dental epidemiological information on adults.
Oral Health Interviews and Clinical Surveys: Overviews

Selection of Oral Health Indicators
Existing Methods Report

Chapter 2

Format B. Oral Health Indicators. Existing Methods and Material
Chapter 2 - Format B. Oral Health Indicators. Existing Methods and Material

2.1 Oral health of Children and Adolescents
A1 - Daily Brushing with Fluoride Toothpaste
A2 - Preventive Care-Seeking for Pregnant Women
A3 - Mother’s Knowledge of Fluoride Toothpaste for Child Caries Prevention
A4 - Fluoridation Exposure Rates
A5 - Preventive Oral Health Programmes in Kindergartens
A6 - Schools with Based Programs Centred on Daily Brushing with Fluoride Toothpaste
A7 - Screening Oral Health Programme Coverage
A8 - Protective Sealants Prevalence
A9 - Orthodontic Treatment Coverage
A10 - Early Childhood Caries
A11 - Decay Experience in 1st Permanent Molars in Children
A12 - Dental Fluorosis

2.2 Oral Health of General Population
B1 - Daily Intake of Food and Drink
B2 - Tobacco Usage Prevalence
B3 - Geographical Access to Oral Health Care
B4 - Access to Primary Oral Care Services
B5 - Dental Contact within the Previous Twelve Months
B6 - Reason for the Last Visit to the Dentist
B7 - Reason for not Visiting the Dentist in the Last Two Years
B8 - Tobacco Use Cessation
B9 - Untreated Caries Prevalence
B10 - Periodontal Health Assessment
B11 - Removable Denture Prevalence
B12 - No Obvious Decay Experience
B13 - Dental Caries Severity
B14 - Periodontal Disease Severity
B15 - Cancer of the Oral Cavity
B16 - Functional Occlusion Prevalence
B17 - Number of Natural Teeth Present
B18 - Edentulous Prevalence

2.3 Oral Health Systems
C1 - Cost of Oral Health Services
C2 - Gross National Product Spent on Oral Health Care Services
C3 - Dentists and Other Oral Care Clinical Providers
C4 - Satisfaction with the Quality of Care Given
C5 - Satisfaction with the Remuneration Provided

2.4 Oral Health-Related Quality of Life
D1 - Oral Disadvantage due to Functional Limitation
D2 - Physical Pain due to Oral Health Status
D3 - Psychological Discomfort due to Oral Health Status
D4 - Psychological Disability due to Appearance of Teeth and Dentures
D5 - Social Disability due to Oral Health Status
Main Reference

- To analyse the establishment of toothbrushing frequency as a healthy habit by Finnish adolescents between 12 and 18 years of age.
- To describe the oral hygiene habits (toothbrushing and flossing) of 11-year-old schoolchildren in 22 European countries (Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greenland, Hungary, Israel, Latvia, Lithuania, Northern Ireland, Norway, Poland, Russia, Scotland, the Slovak Republic, Spain, Sweden, and Wales) and Canada.
- To determine the benefit of twice daily toothbrushing on newly erupted first permanent molars.
- To investigate, through the Health Belief Model, how parents' beliefs influence the likelihood of their children brushing twice a day. To identify aspects of a toothbrushing intervention programme that can be used in general dental practice.
- To determine whether teacher-supervised toothbrushing, once a day, at school, during term time, with commercial toothpaste containing 1,450 ppm fluoride, could reduce dental caries in primary school children when compared with children from the same community who did not receive this intervention.
- To determine the reduction in 2-year caries increment that can be achieved by daily supervised toothbrushing on school-days with a toothpaste containing 1,000 ppm fluoride (as sodium monofluorophosphate) and 0.13% calcium glycerophosphate, combined with recommended daily home use, compared to a control group involving no intervention other than 6-monthly clinical examinations.

Study Objectives

- The Adolescent Health and Lifestyle Survey is a postal cross-sectional household interview survey.
- This study is part of the WHO International Collaborative Study of Oral Health Outcomes (ICSII) Cross-National Survey on Health Behaviour in School-aged Children—a WHO Collaborative Study, which started in 1982.
- The Health Belief Model.
- British Association for Community Dentistry (BASCD) criteria.
- Fibre optic transillumination (FOTI), dmft.

Method of Reference

- The data were collected as part of a nation wide research programme.
- Population: At least 1300 school children, representing the whole country, participated in the study in each country.
- Participants: 461, 5-year-old school children in deprived communities in Scotland, UK.
A total of 517 children (mean age 5.63 years) were recruited for the study. Class teachers were trained individually by the same dental hygienist in an appropriate toothbrushing technique for young children. Children in the intervention group brushed once a day at school.

Five hundred and thirty-four children, mean age 5.3, in schools in deprived areas of Tayside were recruited. Each school had two parallel classes, one randomly selected to be the brushing class and the other, the control. Local mothers were trained as toothbrushing supervisors. Children brushed on school-days and received home supplies.

The data were collected as part of the nation-wide research programme, the Adolescent Health and Lifestyle Survey. All Finns born in 1968 with birthdays on 20-25 July formed the sample (N=1106). Questionnaires were mailed to the whole sample in February 1981 (12 years of age), 1983 (14 years), 1985 (16 years) and 1987 (18 years). The rate of return for all four questionnaires was 62% (six-year follow-up) and for two two-year follow-up questionnaires 79% (12 and 14 years), 72% (14 and 16 years) and 68% (16 and 18 years).

The data were collected from standardized anonymous questionnaires in school classrooms during the 1993-1994 school year. Oral hygiene habits were analyzed according to gender, age, country, school performance, and family income.

A single examiner undertook 6-monthly examinations recording plaque, caries (D(1) level), and used FOTI to supplement the visual caries examination.

This survey is a well designed longitudinal nation wide research programme. The feasibility of implementation in other countries may depend on individual health delivery systems and the attitudes of particular populations.

Practical aspects: WHO collaborative multi-center studies are internationally accepted and recognized. They are useful for assessing different health indicators and their different occurrences. Standardized methods, proportion of daily toothbrushing data are obtainable from national health systems and from self-report surveys. However, school attendance is not always compulsory in pre-school children, so 3-6 years-olds’ data could be difficult to collect.


Major Issues

- Those adolescents, who brushed their teeth more than once a day at age 12, were more stable in their behaviour during the following six years than those who brushed their teeth less often. It may be concluded that although toothbrushing frequency will be gradually adopted as a health habit when the adolescents mature between 12 and 18 years, health education should still improve performance in those groups which have not established the recommended toothbrushing frequency.

- Toothbrushing frequency differed significantly according to school performance in Canada, the Czech Republic, Scotland, Poland, Northern Ireland, and Wales and between different socio-economic groups in Northern Ireland, Wales, the Czech Republic, Scotland, Poland, and Russia. In conclusion, there are considerable differences in toothbrushing frequency among children in European countries and Canada.

- Results from the questionnaires showed that parents' beliefs influence the likelihood of their children brushing twice a day. Key parts of the intervention programme can be used when children attend general dental practice and would be welcomed by parents.

- For children in the intervention group, the overall caries increment (2.60) was significantly less (10.9%; p < 0.001) than for children in the non-intervention group (2.92). Among different tooth surfaces, the difference in caries increment between the intervention group (0.78) and the non-intervention group (1.03) was greatest for the proximal surfaces (21.4%; p < 0.01). In conclusion, this study suggests that a programme of daily teacher-supervised toothbrushing with fluoride toothpaste can be effectively targeted into socially deprived communities and a significant reduction in dental caries can thereby be achieved especially among caries-susceptible children.

- For children in the brushing classes, the 2-year mean caries increment on first permanent molars was 0.81 at D(1) and 0.21 at D(3) compared to 1.19 and 0.48 for children in the control classes (significant reductions of 32% at D(1) and 56% at D(3)). In conclusion, high-caries-risk children have been shown to have significantly less caries after participating in a supervised toothbrushing programme with fluoridated toothpaste.
### Main Reference

### Study Objectives
- To determine national and state-specific estimates of dental care use among adult pregnant women in the United States using data from two 12-month periods. The study also determined person-level characteristics that may predict a lack of dental care use within this subgroup.
- The aim of the study was to evaluate the effectiveness of this pre-natal and post-natal prevention program after the first four years.
- To investigate factors related to utilization of dental services during pregnancy and to assess the extent of mothers’ knowledge regarding oral health during pregnancy and its effect on pregnancy outcomes.

### Method of Reference
- US Centers for Disease Control (CDC) Behavioural Risk Factor Surveillance System (BRFSS).
- WHO visual criteria.
- Cross-sectional study using a structured questionnaire.

### Population Studied
- Pregnant women aged 18 to 44 years who participated in the 1999 and 2002 state-based BRFSS.
- The medical centre at Almirante Nef Naval Hospital, Vina del Mar, Chile, operates a mother and child preventive dental program (PDP) which includes women from their fourth month of pregnancy and mothers with their offspring. Prevalence of Early Childhood Caries (ECC) of 180 1 to 3-5 years old children enrolled in the PDP was compared with 180 non-participating children. The control group was randomly selected from the rolls of the healthy child system of the Valparaiso-san Antonio Health Service and was comparable by age, socio-economic status and level. The screening period was 1991-1995.
- The target population was mothers who gave birth from August 2001 to March 2002 in Johnson County, Iowa, USA.

### Information Collection Method
- The BRFSS is a random, state-based telephone survey of major health risk behaviours, clinical preventive health practices, and health care access that relies on a representative sample of non-institutionalized adults (aged > 18).

Responses were analyzed from 4619 pregnant women. Estimates of dental care use by pregnant women were stratified by age, level of education, diabetes status, health insurance status, income, marital status, smoking status, and race/ethnicity. Dental care use was defined as having either had a dental visit or dental cleaning within the preceding 12 months. BRFSS data for 1999 and 2002 were pooled to increase the samples of pregnant women at the state levels. Analysis was restricted to the dentate, and missing data or persons not responding to the questions were removed from the denominator (< 1%). The average non-response rate combined across the various characteristics examined in this analysis was 0.80%.

Dental care use was defined as having a dental visit or a dental cleaning in the 12 months preceding the interview. All female participants (aged ≤ 44 years) in the BRFSS survey were asked about their pregnancy status with the question, “To your knowledge, are you now pregnant?” Three oral health questions were included in the core module, asked of all participants:

1. *How long has it been since you last visited a dentist or a dental clinic for any reason?*
2. *How many of your permanent teeth have been removed because of tooth decay or gum disease?*
3. *How long has it been since you had your teeth cleaned by a dentist or dental hygienist?*
Clinical caries examinations (following DMFT/dft criteria) were conducted by two calibrated examiners in a dental clinic using WHO visual criteria with the aid of a mirror. No radiographs were taken. Examination procedures were standardized according to a simple blind design.

Names and addresses were collected from state birth certificates in Johnson County, Iowa. Questionnaires were sent to mothers to gather information on knowledge, behaviours, and attitudes toward dental care during pregnancy, and personal, demographic, and pregnancy-related factors. Between January and June, self-administered questionnaires were mailed to 889 mothers. Return of the questionnaire was considered consent. Questionnaires were coded to allow a second mailing. After 3 weeks, non-respondents were sent a reminder notice and another survey. The subject matter of the questionnaire was designed to assess: (1) mothers’ personal characteristics, including financial, psychological, and pregnancy-related factors; (2) frequency of utilization of dental services during pregnancy; and (3) mothers’ knowledge of the potential associations between oral health and pregnancy outcomes. The main dependent variable was utilization of dental services during pregnancy, dichotomized as whether or not the women had a dental visit during pregnancy. To study the factors related to the likelihood of a woman visiting a dental office during her pregnancy, a model describing six broad domains (demographics, dental health care behaviours, lifestyle, financial variables, pregnancy-related variables, and knowledge of the possible association between oral health and pregnancy) was developed.

The methodology at a European level would be feasible and produce valuable results. CDC archives and methods are widely and constantly used, tested and validated and have a high level of scientific international recognition.

Only by inserting oral health within the general health care systems can targeting of women for oral health prevention early in their pregnancy be achieved. Continuing this after the birth of their children is highly effective in preventing and delaying development of dental caries in children regardless of socio-economic status.

Of the 625 respondents, half (49%) reported a visit to the dentist during their most recent pregnancy, whereas prior to pregnancy almost three-quarters (71%) reportedly visited the dentist every 6–12 months. Among mothers who reported having a dental visit during pregnancy, the main types of treatment received were examination and routine cleaning (96% and 95%, respectively).

A potential limitation of this investigation was reliance on self-reported data by the study participants where inaccuracies can be introduced. Although informal pilot testing was carried out to make sure that women understood the questions, one cannot rule out the possibility that some women misunderstood the questions. Moreover, no data were collected from non-respondents to allow for comparison of characteristics of respondents and non-respondents.

For those who did not report a dental visit during pregnancy, the most common reasons for not going to the dentist were, “I was not having a problem” (89%), and “I chose to delay until after pregnancy” (68%). Of the 34% who cited “other” as the reason for not having a visit, nearly two-thirds indicated that they did not think they should go to the dentist while pregnant, or had not been informed that they should visit the dentist. Approximately one-third (39%) indicated that they did not consider a dental visit a priority.

Other EGOHID indicator concerned: B7

References


**Major Issues**

- Data from CDC surveys are used in epidemiological studies and health sciences research, which help develop public health policy, direct and design health programs and services, and expand the health knowledge in the USA.
- This preventive dental program begun with pregnant women and continued following the birth of their children was highly effective in producing a long-term reduction of dental caries.
- Significant explanatory variables for having a dental visit during pregnancy included being married, use of inter-proximal cleaning aids, visiting the dentist every 6–12 months when not pregnant, having dental insurance and being aware of the possible connection between oral health and pregnancy outcomes.
2.1 **A3 – Mother’s Knowledge of Fluoride Toothpaste for Child Caries Prevention**

**Main Reference**

**Study Objectives**
- To discover the knowledge of and attitudes towards dental health of a group of regularly attending mothers of young children at high-risk of caries, and to evaluate their toothbrushing techniques.
- To undertake formative studies investigating how the experience of dental caries in young children living in diverse settings relates to familial and cultural perceptions and beliefs, oral health-related behaviour and oral micro flora.

**Method of Reference**
- Questionnaire survey.
- Multi-centre interview survey.

**Population Studied**
- 268 mothers of 334 children at high-risk of caries.
- 2,822 children and families were recruited.

**Information Collection Method**
- As part of the baseline examination of a randomized controlled trial to test the influence of dental health counseling on the caries increment of at-risk pre-school children, mothers of children completed a questionnaire enquiring about their own dental health knowledge and attitudes, and were also observed brushing their children’s teeth.

- The scientific consortium came from 27 sites in 17 countries; each site followed a common protocol. Each aimed to recruit 100 families with children aged 3 or 4 years, half from deprived backgrounds, and within deprived and non-deprived groups, half to be “caries-free” and half to have at least 3 decayed teeth. Parents completed a questionnaire, developed using psychological models, on their beliefs, attitudes and behaviors related to their child’s oral health.

**Comments**
- Although most mothers knew that they should brush their children’s teeth twice a day using a small toothbrush (94%), only 52% knew that they should use only a small pea-sized amount of paste, and only 3% knew the recommended level of fluoride in toothpaste for these at-risk children. 40% of the children insisted on brushing their own teeth and 40% of the mothers brushed their children’s teeth inadequately.

- This multi-centre study was well designed and employed internationally accepted methods. In multivariate analyses, reported tooth brushing behaviors that doubled the odds of being caries-free were a combination of brushing before age 1, brushing twice a day and adult involvement in brushing. Analyses combining beliefs, attitudes and behaviors found that parents’ perceived ability to implement regular toothbrushing into their child’s daily routine was the most important predictor of whether children had caries and this factor persisted in children from disadvantaged communities.

**References**

**Major Issues**

- Knowledge, attitudes and behavior about dental health among these regularly attending mothers of at-risk, pre-school children were superficial. Their attitudes to dental health of primary teeth were equivocal and their demonstrated brushing behavior on their children was inadequate.
- Parental beliefs and attitudes play a key role in moderating oral health related behaviour in young children and in determining whether they develop caries. Further research is indicated to determine whether supporting the development of parenting skills would reduce dental caries in children from disadvantaged communities independent of ethnic origin.
2.1 A4 – Fluoridan Exposure Rates

Main Reference

Study Objectives
- This article reviews pertinent literature concerning dental fluorosis (definition, appearance, prevalence), pre- and post-eruptive use of fluoride, aesthetic perceptions of dental fluorosis, fluoride levels of beverages and foods, the Iowa Fluoride Study, and the U.S. Centers for Disease Control and Prevention’s “Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States”. In particular, the Iowa Fluoride Study was begun in Iowa in 1992 with the goal of assessing longitudinal patterns of fluoride intake and dental fluorosis and caries.
- To obtain information on the level of total fluoride intake from food, beverages and toothpaste by children at the age of 22–25 months of low and high socioeconomic status in major Colombian cities.
- To estimate average daily intake of fluoride via all applicable exposure pathways contributing to fluorosis risk for infants and children living in hypothetical fluoridated and non fluoridated communities. Hazard quotients were also estimated for each exposure pathway and hazard indices for exposure conditions representative of central tendency exposure (CTE) and reasonable maximum exposure (RME) conditions.
- Annual statistic documentation of the Federal Association of Statutory Health insurance dentists (KZBV).

Method of Reference
- Centers for Disease Control (CDC)/National Institute for Dental and Craniofacial Research (NIDCR), Iowa Fluoride Study.
- Daily fluoride intake was assessed by the duplicate plate method and by recovered toothpaste solution during a 3-day period and afterwards analysed by the micro diffusion method.
- A risk assessment paradigm developed by the National Academy of Sciences (1983), which is commonly used by federal environmental agencies in the United States to inform decisions regarding risk priorities, risk ranking, and health-based environmental standard development [U.S. Environmental Protection Agency (EPA) 1989, 1995].
- Country wide Federal Registers.

Population Studied
- The Iowa Fluoride Study is a prospective cohort study that enrolled approximately 1,400 mothers with newborns from 8 Iowa hospitals, with approximately 750 of these women still participating in 2003. The screening period was from 1992 to 1995.
- The study population consisted of 118, 22–35-month-old healthy boys and girls with similar, low fluoride (F) drinking water supplies in major Colombian cities. The sample was drawn from children of low socio-economic status (LSES), attending the Colombian Family Well-being Day-care Centres (DCCs), and high socio-economic status (HSES) attending private DCCs. For the LSES, the sample was probabilistic, clustered and stratified. A randomized final selection was made based on a listing of the centres in each city. For HSES, the type of sample was non-probabilistic (convenience), given that data collection required high cooperation from parents, which is not usual in the HSES of this country. In order to improve the representativeness, HSES centres were selected based on criteria such as tuition costs, family income and geographical location.
The authors performed a comparative analysis of fluoride intake in fluoridated and non-fluoridated communities by characterizing the exposures via all significant exposure pathways applicable for infants and children in two age groups: infants less than 1 year of age and children 3–5 years of age. The analysis was limited to formula-fed infants only.

Register from patients insured by national health insurance system and by private health insurance companies (<10%) from 6 to 18 years of age. Register from children involved in group prevention programmes in kindergarten and schools. To estimate the amount of fluoride ingested from various sources, parents of children in the Iowa Fluoride Study were asked to complete questionnaires about water sources, use of fluoride supplements and dentifrice, and intake of beverages and selected foods.

In order to determine the fluoride intake from foods and beverages through the duplicate plate technique, a duplicated sample from all the ingested foods and beverages at DCC, homes, restaurants or homes of relatives, was collected over 3 days (two weekdays and one weekend day). The collection was done for each participating child by auxiliary personnel in the DCC and by their parents or the person in charge in the child’s house; both with previous training which consisted of a demonstration of the procedure followed by supervision of the first duplication done at home. In order to determine the fluoride intake from toothpaste the following steps were followed: (i) the amount of toothpaste used was assessed weighing the toothbrush and then the toothbrush with toothpaste; (ii) the amount of fluoride in the toothpaste used was determined by micro diffusion analysis from a toothpaste sample used by each child; (iii) the amount of no ingested fluoride was calculated from the recovered rinsing solution which included toothpaste remnants from the face and clothes which was recovered with a facial tissue. This facial tissue was added to the rinse solution; (iv) the amount of recovered fluoride was subtracted from the amount of fluoride used; the result was assumed to be the ingested amount; (v) the amount ingested was multiplied by the number of tooth brushings per day in order to estimate the daily F intake from this source. Foods, beverages and recovered toothpaste solutions collected each day were separately stored in plastic containers at -15°C. The fluoride intake for each child is expressed as the total amount (mg F/day) and the ingested amount (mg F/kg bw/day). A questionnaire was applied to children's parents or person in charge. It included questions on social–demographical data, oral hygiene habits, fluoride-use habits and the instructions adults have received for the children's oral care.

This risk assessment model, in general, consists of the following four steps: hazard identification, dose–response assessment, exposure assessment, and risk characterization. We applied this four-step risk assessment paradigm to quantitatively estimate exposure-pathway-specific and cumulative daily average intake of fluoride by infants and children. The exposure pathways considered were: uptake of fluoride via fluoridated drinking water, beverages, cow's milk, foods, and fluoride supplements for both age groups. Additionally, consumption of infant formula for infants and inadvertent swallowing of toothpaste while brushing and incidental ingestion of soil for children were also considered.

Registered from billing data of the dental practioner. Registered from the annual documentation form from public health offices.

Assessing fluoride intake involves public health, marketing information and nutritional data of the population. It could be feasible to focus on the data regarding main fluoride sources.

This paper presents the findings from the first study to assess the mean total daily fluoride intake in very young Colombian children using the duplicate plate method. It is difficult to compare these values with those from previous reports because of differences in the age of children in various studies and in the methods used for assessing dietary fluoride intake. A number of earlier studies were based on the estimation of fluoride ingestion from foods and beverages through food consumption tables, dietary surveys and/or dietary recall. Most of these latter studies reported average daily F intakes lower than the values found in this work. The magnitude of the experimental effort currently involved and some economic and technical restrictions did not allow to include more frequent sampling of foods, beverages and more accurate data on the proportion of swallowed dentifrice. As it was reported in recent
publications, the amount of fluoride consumed by participating children in this study on a day-to-day basis varied greatly from one day to another (results not shown) in the same child. The duplicate plate method appears to be of difficult application in wider scale studies.

As a theoretical estimate study it could be applicable in several conditions. Further research with carefully designed epidemiologic studies with enough statistical power and strong exposure assessment component is essential and warranted to answer critical questions about the necessity of fluoridation in the presence of changes in dietary behavior of children and multiple sources of fluoride currently contributing total intake. Cost–benefit analysis for fluoride should be a component of such studies.

Fluoride exposure rates data derived from national health insurance registers of German population.

**References**


**Major Issues**

Water and toothpaste are the mainstays of fluoride delivery for all.

Although the contribution of alimentary F to the mean TDFI provides additional support to the appropriateness of salt fluoridation, when young children are exposed to different major sources of systemic ingested fluoride, e.g. fluoridated salt and dentifrices, it seems appropriate to recommend the use of very small amounts (‘pea-size’) of dentifrice for each brushing, to encourage and teach young children to expectorate as much as possible of the toothpaste used, and to market dentifrices containing F concentrations 500 ppm, for use in children younger than 6 years.

The present study’s theoretical estimates are in good agreement with measurement-based estimates reported in the literature. Although CTE estimates were within the optimum range for dental caries prevention, the RME estimates were above the upper tolerable intake limit. This suggests that some children may be at risk of fluorosis. In addition, future studies should lead to collection of detailed exposure data for each exposure pathway so that more robust probabilistic risk assessment techniques, as opposed to the point estimates of intake/risk presented here, can be applied to obtain distribution of fluoride intake/risk among children with quantitative measures of uncertainty.

Annual data has been derived from documentation and registers from dental surgeries as well as from public programmes. Greater caries prevention efficacy with the 1100 ppm fluoride treatment.
Main Reference


Study Objectives

- To systematically review and evaluate the existing literature on various caries preventive methods and to report findings concerning the caries preventive effect of fluoride toothpastes in various age groups, with special emphasis on fluoride concentration and supervised versus non-supervised brushing.
- To investigate cross-sectionally a probable dental caries decline in Belgian 12-yr-olds and to analyse some factors that may be associated with dental caries during the study period.
- A register of measurements from prevention programmes in the Federal States for which information is available.

Method of Reference

- Swedish Council on Technology Assessment in Health Care protocol.
- WHO criteria.
- Assessment form /Documentation Form.

Population Studied

- Electronic databases for articles published between 1966 and April 2003 (905 articles).
- Inclusion criteria of a randomized or controlled clinical trial, at least 2 years follow-up and caries increment in the permanent (DMFS/T) or primary (dmfs/t) dentition at endpoint. (54 articles met the inclusion criteria).
- 10 000 12-yr-old children attending 120 secondary schools in the Brussels area.
- All schoolchildren (2.6 million) in Germany from 2-to 6-years of age.

Information Collection Method

- Relevant literature searching on library databases using search terms such as: “dental caries”, fluoride dentifrice”, “fluoride toothpaste”. Various selection steps and phases are described. Only papers published after 1977 are included.
- In the Brussels area, children in the 7th grade at the same schools were sampled in 1983 (n=533) and 1998 (n= 496). DMFT, DMFS and dental fluorosis were clinically recorded. The samples represented 5% of the age-specific population. Data on children’s home-based and professional dental health care habits were registered. Multiple linear regression analyses revealed that tooth brushing with fluoridated toothpaste, dental appointments and dental fluorosis were significantly related to dental caries reduction.

Clinical Examination and Interview (A5 Indicator related):

In order to approach analytically some factors that might be associated with dental caries during the study period, the examiner interviewed each child with regard to his/her dental health care habits. In relation to children’s professional dental health care the subsequent information was required: reason for making dental appointment (never, discomfort or pain, control visit at least once per year); toothbrush training (never had, from parents, from private dentist, at school); and treatment with topical fluoride (never, some times, regularly). In order to determine the accuracy of the interview data, answers from 25 children were compared with the answers from their parents. The children and their parents were interviewed separately to prevent any influence on their individual answers.

Registration.
Comments

- Practical aspects: description of scientific literature with different methods of fluoride programs assessment. No evidence has been found for caries prevention by fluoride toothpaste in the primary dentition. In addition, strong evidence has been found for supervised versus non-supervised tooth brushing programs.
- Only 3% of interviewed children/parents had tooth brushing training in school.
- In Germany 67% of children are included in the programme. In some EU countries it is possible to collect information on the whole targeted population.

References


Major Issues

- Incomplete evidence was found regarding the effect of fluoride toothpaste in the primary dentition. The review reinforced the importance of daily tooth brushing with fluoridated toothpastes for preventing dental caries, although long-term studies in age groups other than children and adolescents are lacking.
- A remarkable decline in dental caries was observed during the 15 year period. Factors related to the children’s home-based and professional dental health care were associated with the observed decline.
- There is variation in the availability of the indicator’s data throughout the EU.
Oral Health of Children and Adolescents

A6 – Schools with Daily Fluoride Toothpaste Brushing Programmes

2.1 A6 – Schools with Daily Fluoride Toothpaste Brushing Programmes

Main Reference

Study Objectives
- The aim of the study is to evaluate the effects of a 2-year oral health education and caries prevention program implemented in kindergartens in China.
- To estimate the mean length of dental examination intervals and the mean number of preventive procedures in two Finnish towns during the periods of 1990-1992 and 1993-1995. Secondly, to ascertain whether the length of the check-up interval and the intensity of prevention varied according to the caries experience at the beginning of a treatment period.
- To describe the current organization of health promoting and preventive activities within the Danish Municipal Dental Health Service and to assess how the service has chosen to comply with the directives as formulated by the National Board of Health. The study aim was to obtain information on: recall-intervals for children and adolescents; passive prevention (use of different forms of fluorides, fissure sealing practices and professional plaque control); active prevention (e.g. instruction in oral hygiene); programmes to identify children at risk; health education activities aimed at different target groups of children (preschool children, school-children, 16–17-year-olds); content, structure and duration of health education; division of tasks between health care personnel and the incorporation of key persons; local health activities and interdisciplinary work.

Method of Reference
- A random sample of all 12- and 15-year-old children was drawn in 1992 and 1995 in the towns of Jyvaskyla and Kuopio, Finland.
- A cross-sectional survey of the municipal dental health services was carried out on a national scale.

Population Studied
- 731 3-year-old children in 10 kindergartens in Miyun County, Beijing, China (1998).
- The data were available for 267 and 590 subjects in 1992 and 1995, respectively.
- The target population for the present study comprised all Danish public dental health services.

Information Collection Method
- A randomized, examiner-blinded clinical trial study. The kindergartens were randomly divided into 2 groups. A clinical examination of the study children and a self-administered questionnaire survey of their parents were conducted at baseline and after a 2-year program.
- Oral health records obtained from public dental clinics were used for gathering the data on dental check-ups, DMFT and all preventive and treatment measures during the previous three years.
- According to the 1986 act, the municipal administration establishes and maintains the public dental services for children and adolescents. In 201 of the 275 municipalities public dental clinics were established, whereas in 74 municipalities private dental practitioners provide care on a contract basis. A total of 141 (70%) services responded. Questionnaires were sent by mail to the official addresses of the dental health services, who were asked to report on their actual activities. The questionnaire was structured, but also contained qualitative questions to obtain information about the organization of clinical work and the work carried out in the local community. Before launching the study, the questionnaire was tested in four pilot municipal dental health services. Postal questionnaires were used to collect information on active and passive preventive care activities and community-orientated health promotion.
Oral health education (OHE) was provided to teachers in the test kindergartens every 3 months. The OHE sessions were conducted for the test children monthly and for their parents every 6 months. Children in the test kindergartens brushed their teeth twice daily with fluoridated toothpaste (1100 ppm F) in their kindergartens under the supervision of teachers during weekdays. No OHE session and no supervised tooth brushing activities were carried out in the control kindergartens.

For 12-year-old children in 1990-1992, the mean length of check-up interval was 13.0 months in Kuopio and 12.4 months in Jyvaskyla, while in 1993-1995 it was 18.1 months and 16.1 months, respectively. Among 15-year-old children in 1990-1992, the mean was 12.3 in Kuopio and 14.7 in Jyvaskyla. During the latter period the interval was 1.2 months longer in Kuopio, but there was no lengthening in Jyvaskyla. Fluoride varnish applications, sealants, and instruction in oral hygiene were the most commonly used preventive measures. Practically no other fluoride methods than varnish applications were performed in dental clinics. Prevention seemed to be based mainly on procedures performed by the staff at the dental clinics and less attention was paid to the promotion of self-care. There was very little difference in the mean length of check-up interval and prevention between children who were caries free at the beginning of the treatment period and those with present or past caries experience.

Modern municipal dental health services in Denmark comprise a diversity of ‘hard’ and ‘soft’ health activities. The study has indicated that resources – economic and personnel – as well as political support at the local level improve the conditions for developing community health work. However, good internal dental health service conditions are also of great importance; factors such as positive working conditions, a good ambience in the dental health service, sources of inspiration, the dental health care personnel’s motivation and involvement as well as a visible management have a constructive impact on the organization of health work.

The tables included the following indicators:

- Percentage of municipal dental health services who stated that they recall children at certain intervals (related to age/grade), and the percentage of dental health services calling children according to individual needs.
- Percentage of municipal dental health services who stated that they use different fluoride methods and fissure sealing in children with regard to age/grade.
- Percentage of municipal dental health services who offer systematic oral hygiene instruction to children related to age/grade.
- Percentage of municipal dental health services who stated that they use different criteria to identify children at high risk.
- Percentage of municipal dental health services who stated that they collaborated with various key persons with respect to health education of children.
- Percentage of municipal dental health services who stated that they collaborated with various key persons with respect to health education of children.
- Typical oral health education program activities in relation to target group.

References

Oral Health of Children and Adolescents
A6 – Schools with Daily Fluoride Toothpaste Brushing Programmes


**Major Issues**

- The Oral Health Education programme is effective in establishing good oral health habits among preschool children and in increasing the oral health knowledge of their parents.
- Prevention appeared to be stereotyped and often had little relevance to the actual needs of the individual patient.
- It must be expected that the Municipal Dental Health Service in Denmark will go through a process of reorganization to adapt to the changes in oral disease patterns and higher standards of health. A redistribution of tasks resulting in greater involvement of ancillary personnel would be of value. The effect of the redistribution of tasks could be analyzed more precisely through experiments or alternative delivery models. Moreover, health systems research aimed at the evaluation of community-based preventive care programmes is badly needed.
2.1 A7 – Oral Health Screening Programme Coverage

Main Reference

Study Objectives
- To estimate the precision with which Danish schoolchildren at high risk for developing dental caries within 1 year can be identified based on information from routine registers.
- To investigate characteristics of medical providers that influence their referral of children who are at risk for dental disease to a dentist.
- To assess paediatricians' knowledge, attitudes, and professional experience regarding oral health, and to determine willingness to incorporate fluoride varnish into their practices.

According to a report by the Office of the Inspector General of the Department of Health and Human Services, only 20% of children under 21 years of age, who were enrolled in Medicaid and eligible for Medicaid's Early Periodic Screening Diagnosis and Treatment (EPSDT), actually received preventive dental services. Medicaid’s (EPSDT) program is intended to provide regular dental screenings and appropriate treatment but has apparently played a limited role in improving access to dental care for poor children.

Method of Reference
- Danish National Board of Health's Recording System.
- Maternal and Child Health Bureau and Health Resources and Services Administration Bright Futures in Practice: Oral Health, American Academy of Paediatrics (AAP) Recommendations for Preventive Paediatric Health Care.
- American Academy of Paediatric Dentistry (AAPD) and the American Dental Association (ADA) recommendations.
- National interview by postal questionnaire.

Population Studied
- A cross-sectional survey was undertaken of primary care clinicians in 69 paediatric practices and 49 family medicine practices who were enrolled in a study to evaluate a paediatric preventive dentistry program targeted toward Medicaid-eligible children in North Carolina.
- A national sample of 1600 paediatricians randomly was selected from the American Medical Association Master File to assess their knowledge, current practice, and opinion on their role in the promotion of oral health; experience with dental decay among patients and in referring patients for professional dental care; and willingness to apply fluoride varnish. Of 1,386 eligible survey recipients, 862 returned surveys with a response rate of 62%.

Information Collection Method
- Data were derived from the Danish National Board of Health's Recording System for the Danish Child Dental Services and from the Central Office of Civil Registration. Dental health information as of 1994 and changes 1994–1995 were applied in multiple logistic regressions together with social data from 1995 to estimate the individual 1-year (1995–1996) risk of developing caries.
- A 100-item, self-administered questionnaire with 23 items on some aspect of dental referral elicited providers' knowledge and opinions toward oral health, their provision of dental services, and their confidence in providing these services. Patient characteristics (tooth decay status, insurance status, immigrant status, English speaking); practice characteristics (setting, number of providers, patient volume, business); practice environment (perceived and actual availability of dentists) and other provider characteristics (gender, type, practice experience, board certification, training in oral health during or after professional education, hours worked, teaching of residents, preventive behaviors) were assessed.
- National data were collected by self-administered questionnaire.
Dental screening programmes for Danish children generally target all children, irrespective of their individual caries risk. The standard screening interval is approximately 12 months with data derived from the national health information system. A valid systematic screening tool based on routine information sources is however indispensable to help develop more selective screening strategies to target the children at highest risk.

This study has identified several factors that need consideration in the further exploration and development of primary care physicians' role in providing for the oral health of their young patients. This study assesses paediatricians' knowledge about preventive oral health and the extent to which they may already be participating in prevention and assessment. It has also increased knowledge about the incidence of dental problems in pediatric practice, and whether paediatricians perceive barriers to their patients' receiving professional dental care.


Based on information from Danish routine registers, children at low caries risk may be identified relatively precisely. This may form the basis for the continuous development and targeting of strategies where children at high risk of developing caries are targeted and screening for caries among children of estimated low risk is postponed for at least one year.

Paediatric primary health care providers can provide oral health promotion and disease prevention activities, thereby eliminating or delaying dental disease and the need for treatment at a very young age. However, effective and appropriate involvement of pediatric primary care clinicians can be expected only after they receive the appropriate training and encouragement and problems with the dental referral environment are addressed.

Dental screenings can easily be incorporated into a busy paediatrics practice and paediatric primary care providers can significantly contribute to the overall oral health of young children by the identification of those children who need to be seen by a dentist.

By increasing their involvement in oral health prevention during routine child visits, paediatricians may be able to play an important role in improving the dental health of their patients who have difficulty obtaining access to professional dental care. It is important to know how paediatricians value the promotion of oral health and whether they would be willing to take on additional activities aimed at its improvement.
2.1 Protection Sealant Prevalence

Main Reference

Study Objectives
- This retrospective cohort analysis of children enrolled in the North Carolina Medicaid program compared the likelihood of restorative treatments and associated cumulative Medicaid expenditures for teeth with or without dental sealants.
- Primary objectives: The first primary objective of this review was to evaluate the caries prevention effectiveness of resin based pit and fissure sealants and glass ionomer cement sealants in children and adolescents. This was carried out for different background levels of caries in the population. The second primary objective was to assess the effectiveness of resin based sealants against that of glass ionomer cement sealants in preventing dental caries in children and adolescents.
- Secondary objectives: To document and report on data concerning retention of sealants; to document and report on any data concerning the safety of sealants and possible harmful effects; retention of sealants was not evaluated as a secondary objective.
- This is the first Centers for Disease Control Surveillance Summary that addressed conditions and practices for dental caries, dental sealants and enamel fluorosis.
- The Survey of the Oral Health Status of Maryland Schoolchildren, 2000-2001 was used to describe dental sealant prevalence among third-grade public schoolchildren in Maryland.

Method of Reference
- Centers for Disease Control (CDC)/Medicaid.
- Cochrane Oral Health Group.
- Centers for Disease Control and Prevention (CDC), Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, CDC, USA.
- Household survey.

Population Studied
- Population: 15,438 children.
- Type of study: longitudinal retrospective cohort analysis.
- Inclusion criteria: To be selected for the cohort, children had to (1) have been enrolled in Medicaid at between 5 and 7 years of age, (2) have been aged 4 to 6 years in July 1985, when the sealant benefit began, and (3) have had at least 1 Medicaid dental claim submitted on their behalf between July 1985 and December 1992. The intent was to select children who were enrolled in Medicaid around the time of the eruption of their first permanent molars, thereby minimizing potential restorative treatment to those teeth before sealants could be placed.
- Randomized or quasi-randomized controlled trials of at least 12 months in duration in which sealants were used for preventing caries in children and adolescents from the general population under 20 years of age were included. The primary outcome was the increment in the numbers of carious occlusal surfaces of premolars and molars. Studies that tested any other caries preventive treatments (such as fluoride varnishes) concurrently with the sealants were not included in this review. Studies where fissure sealants were used concurrently both in test and control groups with fluoride toothpaste or with fluoridated water were included.
Information Collection
Method

The National Health and Nutrition Examination Survey (NHANES) is an ongoing survey of representative samples of the civilian, non-institutionalized U.S. population aged ≥2 months in NHANES 1988-1994 and all ages during 1999-2002. The dental component gathered information on persons aged ≥2 years. The sample for the survey is selected to represent the U.S. population of all ages. Special emphasis in the current NHANES will be on adolescent health and the health of older Americans. To produce reliable statistics for these groups, adolescents 15–19 and persons 60 and older are oversampled for the survey. African Americans and Mexican Americans are also over-sampled to enable accurate estimates for these groups.


The authors assessed the dental experience of the cohort of 15,438 children from 1985 to 1992 on the basis of enrolment and claims files. These files provided demographic information about the children (e.g., age, sex, race/ethnicity, whether or not in foster care), enrolment (e.g., months eligible, proportion of time eligible), dental treatment (e.g., number of visits, number of prophylactic services, topical fluoride treatments, and restorative treatment on primary and permanent teeth), and dentists (e.g., number of Medicaid patients seen per year). Information about the child's dental provider was obtained from annual North Carolina dentist licensure surveys. They conducted regression analyses for outcomes (caries-related services involving the occlusal surface of permanent first molars) and cumulative expenditures, controlling for characteristics of the child, the treating dentist, and the child's county of residence.

Incidence of caries expressed in terms of caries or no caries on occlusal surfaces of permanent molar teeth. Caries was defined as caries into dentine. Enamel lesions were regarded as sound surfaces.

The NHANES detailed interview includes demographic, socio-economic, dietary, and health-related questions. The examination component consists of medical and dental examinations, physiological measurements, and laboratory tests administered by highly trained medical personnel.

The presence/absence of dental sealants on permanent molars was scored according to visual criteria. Descriptor variables included gender, race/ethnicity, parent/guardian level of education, and dental insurance status. They obtained data from a questionnaire filled out by parents or guardians participating in the Survey of the Oral Health Status of Maryland School Children, 2000-2001 (N = 2,642). Outcome variables included having a dental visit in the last year, prophylaxis in the last year, usual source of medical care and usual source of dental care. Descriptor variables included region, grade, race/ethnicity, and eligibility for free or reduced-fee meals, parents’ or guardians’ education and dental insurance status.

In the standardized oral health surveys, clinical evidence of dental sealant is a widely and internationally recognized, accepted and collected data.

This study was a review of sealant effectiveness study methodology. According to the results of this systematic review, sealing is a recommended procedure to prevent caries of the occlusal surfaces of permanent molars. The effectiveness of resin sealants in reducing caries is clear but data on glass ionomers are less convincing.

Practical aspects: a widely and constantly used, tested and validated method with a high level of scientific international recognition. Strengths: it is consistent with the general purpose of inserting oral health indicators within the general health assessment systems. The periodical featuring of the survey also supports constant data updating. Weakness: it is difficult to calibrate and to consider all the local variables (population, national health systems, insurance policies, etc). Ethical issues: since participants receive compensation to facilitate and encourage participation, this should be evaluated at national level in the EC.

Other Egohid indicators concerned: A11, A12, B13.

Oral health surveys of schoolchildren are a valuable source of Protective Sealant Prevalence by means of visual criteria. Widely used and internationally accepted method.
References


Major Issues

- Overall, 23% of children received at least 1 sealant and 33% at least 1 caries-related service involving the occlusal surface (CRSO). Sealants were effective in preventing CRSOs, although the degree of effectiveness was highest for children with the greater levels of CRSOs before sealant placement. Estimated cumulative Medicaid expenditures indicated expenditure savings from sealants within 2 years of application for children with 2 or more prior CRSOs. As sealant placement was associated with expenditure savings to Medicaid for certain high-risk children, Medicaid and, more broadly, society will benefit by providing sealants for these children.
- Overall, less than 25% of third-grade Maryland schoolchildren had dental sealants, including 16% of non-Hispanic black children, 11% of children from families with less than 12 years of education, and 17% of those without dental insurance.
2.1 A9 – Orthodontic Treatment Coverage

Main Reference

Study Objectives
- The 2003 Children’s Dental Health Survey is the fourth in a series of decennial national children’s dental health surveys in the United Kingdom. This paper reports on the orthodontic condition of children aged 12 and 15 years.
- To evaluate: (i) the effect of ethnicity, social deprivation, and normative orthodontic treatment need on orthodontic aesthetic self-perception, self-perceived need for orthodontic treatment, and oral aesthetic impact of malocclusion; (ii) the effect of ethnicity, social deprivation, and gender on perceived orthodontic treatment need and use of orthodontic services; (iii) the influence of perceived oral aesthetic impact of malocclusion on perceived need and wish for orthodontic treatment; and (iv) whether orthodontic treatment experience influences perceived the oral aesthetic impact of malocclusion.
- To describe a method of determining the amount of orthodontic treatment in a population and to investigate whether socio-economic background influenced the orthodontic situation in a large group of children, where orthodontic service was performed mainly according to objective indication for treatment.
- To describe the occurrence of malocclusion and the uptake of orthodontic treatment among 12-13-year-olds in the province of Taranaki, New Zealand.

Method of Reference
- Clinical and Interview surveys.
- Oral Aesthetic Subjective Impact Scale (OASIS) and Index of Orthodontic Treatment Need (IOTN), Townsend’s Index of Social Deprivation (1997).
- Danish Child Dental Health Services, National Dental Association.
- Clinical and Interview surveys.

Population Studied
- In the UK in 2003, 2,595 12-year-olds and 2,142 15-year-olds were examined.
- All 14-15-year-old Asian and Caucasian children from schools in Manchester.
- The sample consisted of 2,042 children (997 boys and 1,045 girls) of 11-15 years of age attending the 4th, 5th, 6th, 7th and 8th school grades in a region of Aarhus, the second largest city in Denmark (approximately 98% of the children in these school grades).

Information Collection Method
- A representative sample of children across the UK were invited to participate in a clinical dental examination in school. Current and past orthodontic treatment and type of appliance worn were recorded. Orthodontic treatment need was assessed by the Modified Index of Orthodontic Treatment Need (IOTN) in those not undergoing treatment. A postal questionnaire sought parents’ views on the orthodontic condition of their children and perceived need for treatment.
- A stratified, random sample of 434 14-15-year-old children from schools in Manchester, UK, was obtained. Information was collected on orthodontic aesthetic self-perception and orthodontic treatment experience using a questionnaire. Response rate 77%. The former data were combined to form an Oral Aesthetic Subjective Impact Scale (OASIS). Normative orthodontic treatment need was measured by a trained and calibrated examiner with the Index of Orthodontic Treatment Need (IOTN). Each child was asked whether they had received orthodontic treatment and whether they
thought they needed orthodontic treatment (response coded as “agree, disagree, don’t know”). A comparison between child and examiner IOTN was performed.

The children were, as a part of their orthodontic care, examined in the 3rd school grade by the author. Each child was placed in one of five orthodontic categories (percentage refers to observed frequencies): 1. No anomaly (25%); 2. Malocclusion - under observation only (4%); 3. Undergoing orthodontic treatment (20%); 4. Orthodontic treatment completed (12%) and 5. Orthodontic treatment discontinued (3%). The SES of the child’s family was determined by the parental occupation (Low; Lower middle; Middle; Upper middle and Upper SE group).

Parents or caregivers completed a postal questionnaire. Children completed a questionnaire and were dentally examined. Malocclusion, using the Dental Aesthetic Index (DAI), recorded by a single calibrated examiner, and the use of orthodontic services as reported by parents or caregivers. Socio-economic status (SES) was also assessed.

**Comments**

- Perceived need and actual treatment comparison.
- Practical aspects: easily understandable questions. Good feasibility at all EU levels.
- Practical aspects: feasibility of this method is highly dependent on individual National Health Services’ capabilities. Thus there may be possible disparities in the indicator’s availability in EU Countries.
- Ethical issues: While over one-third of the children had been advised to seek an orthodontic consultation, a proportion (23.4%) did not proceed with care because of financial considerations. Children of low SES were disproportionately represented in these groups. Children with “severe” or “handicapping” malocclusions who did not proceed with treatment came predominantly from low-SES households and high-deprivation areas. SES at-risk groups should be considered for this indicator.

**References**


**Major Issues**

- In this representative sample of UK children, one in five were still judged as having an orthodontic treatment need at age 15 years, as determined by the modified Index of Orthodontic Treatment Need. However, considerable variation was observed between professional and lay perceptions of need.
- No ethnicity-related disparity in use of orthodontic services was found. However, more deprived children were less likely to have received orthodontic treatment. Despite this, OASIS scores were similar between treated and untreated children. Untreated children who wished for orthodontic treatment had higher IOTN and OASIS scores.
- The distribution of the orthodontic categories within the socioeconomic groups were found to be almost equal, but three trends could be noted: a slightly higher frequency of malocclusion in the low socio-economic group; children from the middle socio-economic group represented a relatively large part of the orthodontic treatment group and children in the two lowest socio-economic groups showed a greater frequency of discontinued orthodontic treatment than the rest of the children.
- Cost was a barrier to orthodontic treatment for low-SES, high-deprivation children and Maori. Social
and ethnic inequalities exist in orthodontic treatment need in Taranaki. The utilisation and provision of orthodontic treatment appeared to be largely neither equitable nor rational.

**Main Reference**

**Study Objectives**
- To assess the prevalence of dental decay in young children, to assess risk factors for Early Childhood Caries (ECC) and to determine the influence of vitamin D supplementation, both prenatal and at 6 weeks of age, on the oral health of children in the community of Garden Hill First Nation, Manitoba, Canada.
- To assess the prevalence of Early Childhood Caries (ECC) among preschool children attending nursery schools and to compare the results with those of a previous survey where the investigators used the term and diagnosis for Baby Bottle Tooth Decay (BBTD) syndrome.
- To investigate the possible association between dental erosion and caries, and variables including socio-economic status, reported dietary practices and oral hygiene behaviour, in a sample of children in Jeddah, Saudi Arabia.

**Method of Reference**
- American Academy of Pediatric Dentistry. World Health Organization.
- Diagnostic criteria of ECC as adopted by the American Academy of Pediatric Dentistry, WHO.
- BASCD diagnostic criteria for caries.

**Population Studied**
- A total of 98 children participated: their mean age was 46.4 ± 6.3 months (approximately 3.8 years) 57 (58.2%) of the children were male. Of the 179 eligible children, 98 (54.8%) participated in this study; others left the community and some parents did not consent to their child's participation. Beginning in 1999, the pediatric dental survey was conducted in Garden Hill First Nation, Manitoba.
- 1,006 preschool children (519 males, 487 females) attending both private and public nursery schools in the area of Ulss n. 15 "Alta Padovana", in Veneto region (Italy). This population comprised 29 children aged <36 months, 271 aged 3 years, 364 aged 4 years and 290 aged 5 years and was examined between October 2002 and May 2003. For the comparison survey population a sample of 401 4 year old children was examined using the BBTD criteria, where at least 2 maxillary incisors were affected by cavitation.
- A sample of 987 children (2–5-year-olds) was drawn from 17 kindergartens.

**Information Collection Method**
- A cross-sectional and retrospective cohort study design was employed to investigate the oral health of young children. The study involved a cross-sectional dental examination of children, an interview with mothers and a maternal chart review. The dental examiner was blind to the interview and chart review data. The dental examination was limited to the primary dentition and information was collected relating to dental caries, missing or extracted teeth, enamel hypoplasia and previous restorative treatment following WHO criteria. The half-hour interview consisted of 36 questions focusing on oral hygiene practices and previous dental care of the child, early childhood eating habits, maternal health and nutrition and mother and infant exposure to vitamin D. Some questions were structured to assist with recall. Chart reviews were performed to confirm whether women received the modified Stosstherapy during pregnancy and whether young infants received a high dose of ergocalciferol at 6 weeks of age. The interview and dental examination results were coded for anonymity, and mother and child components were combined.
Dental examinations. Children were visited and an oral examination was conducted, at school, by one clinical dental examiner using plain mouth mirrors and dental probes. A sub-sample of children was examined a second time at a later date to assess the intraexaminer’s reproducibility. Only primary teeth were included in the caries scoring using WHO [1997] recommendations for oral health surveys. Therefore, lesions were recorded as present when a carious cavity was apparent on visual inspection. At the time of the examinations 52 children aged more than 71 months were excluded according to ECC definition and diagnostic criteria.

In 1994 in the same geographic area a survey was carried out to evaluate the prevalence of caries among a paediatric population of 1,626 children aged 4 to 12 years old. A sub-sample of 4 year old children was examined using the BBTD criteria, where at least 2 maxillary incisors were affected by cavitation. With the aim of comparing the results of this previous survey, 401 4 year old children living in the same area were examined utilizing the same diagnostic criteria as in 1994.

Data from the 2002-2003 study were stratified on the basis of whether each child was a native born Italian or were born in another country. The latter were defined as ‘immigrant’ children. We considered as ‘immigrants’ children belonging to families from Africa, East Europe, South America and Asia who had come to Italy in the previous 10 years. The status of immigrant or native born was determined by questioning the mother of each child. A comparison of ECC prevalence was then made between immigrant and native born children.

Diagnostic criteria of ECC as adopted by the American Academy of Paediatric Dentistry:
- ECC is the presence of one or more decayed (noncavitated or cavitated lesions), missing (due to caries) or filled tooth surfaces in any primary tooth in a child of 71 months of age or younger;
- in children younger than 3 years of age, any sign of smooth-surface caries is indicative of Severe Early Childhood Caries (S-ECC);
- from 3 to 5 years of age, one or more cavitated, missing (due to caries), or filled smooth surfaces in primary maxillary anterior teeth, or a decayed, missing or filled score of ≥4 (age 3), ≥5 (age 4) or ≥6 (age 5) surfaces constitutes S-ECC.

A cross-sectional study including dental examination and questionnaire survey was carried out at a number of kindergartens. A sample of children was drawn from 2–5-year-old attending kindergarten schools in the city of Jeddah. A pilot study involving 30 children from two schools was carried out prior to the start of the main survey. To derive the sample, kindergarten schools in Jeddah were stratified by funding source (private or public) and by the area of the city. Of the 152 schools, 20 were public schools (attended by 2621 children) and 132 were private schools (11,317 children). A random sample was selected from public and private schools in each of the four geographical areas of the city. This allowed for less than 100% consent and the achievement of a sample of approximately 400 children from public schools (100 from each area of the city) and 600 children from private schools (150 from each area).

Information regarding diet and socio-economic factors was drawn from questionnaires distributed to the parents through the schools.

Comments
- The participation rate was low due to the children’s age and parental refusal. Low rate of school attendance at this age can interfere with data collection.
- The choice of case definition and diagnostic criteria to be used in carrying out the 2002 – 2003 study was highlighted by a topic much debated in international dental paediatric literature. In 1994 the ‘umbrella term’ of ECC (caries in primary teeth) was proposed by CDC of Atlanta and substituted the previous and different terminology (e.g. Baby Bottle Tooth Decay, Rampant Early Childhood Dental Decay which adopted the diagnostic criteria of at least two carious cavities on maxillary incisors involved).
- The study used a well designed questionnaire to assess dental erosion and dental caries in pre-school children, and the relationship between their dietary items, social factors and erosion and/or caries.

References
- Drury TF, Horowitz AM, Ismail AI, Maertens MP et al. Diagnosing and reporting early childhood caries for research purposes. A report of a workshop sponsored by the National Institute of Dental and
The high caries burden among children from this community reveals the need for effective prevention methods. It is important for paediatricians, family physicians and other health service providers encountering very young children and expectant mothers to be cognizant of ECC and its ramifications, as their education efforts represent the first line of defence.

Although it appears that the prevalence of ECC/BBTD has decreased, which is beneficial, Early Childhood Caries remains a significant problem for pre-school children in the Veneto region, Italy. Concern remains about the high levels of the condition in immigrant groups, which poses a problem in trying to implement a preventive program because of cultural and language difficulties.

There was no clear relationship between erosion and social class, or between erosion and oral hygiene practices whereas the reverse was true for caries. However, dietary factors relating to both erosion and caries and/or rampant caries were found in this sample of children.
2.1 A11 – Decay Experience in 1st Permanent Molars in Children

Main Reference

Study Objectives
- The decline in caries has slowed and this may be indicative of variation in the susceptibility of differing teeth to caries. This study tested the hypothesis that in children, there are groups of tooth sites that exhibit differences in caries susceptibility.
- To monitor the dental health of children and contribute to the national monitoring of service provision and targets, while providing data locally to aid in service planning and evaluation of oral health strategies.
- To investigate the caries status of, and the delivery of care to, a group of regularly attending adolescent dental patients. To conduct research in primary dental care. A subsidiary aim was to compare the caries status of this sample to population samples.

Method of Reference
- US National Preventive Dentistry Demonstration Programme (NPDDP) using standardised DMF criteria.
- The agreed British Association for the Study of Community Dentistry (BASCD) criteria and conventions (as set out in the BASCD trainer’s pack) were employed.
- Strategies for Caries Control Study (SCCS), undertaken by the Dental Health Services Research Unit, University of Dundee using clinical criteria.

Population Studied
- The NPDDP included 20,052 children aged from 5 to 16 years of age from 10 locations in the USA: five fluoridated and 5 non fluoridated communities.
- A total of 135,075 ten and eleven-year-old children from across Great Britain, the Isle of Man, and Jersey were examined, some 27% more than in the 2000/2001 survey which omitted Scotland. On average, this represents 21% of the total population of this age group, although in the different areas there was a wide range in the size of samples chosen according to local needs and practices.
- Six hundred and sixteen patients volunteered to participate in the project. This is the number of patients the project aimed to recruit (15 patients per practitioner). The mean age of the sample at baseline was 12.1 years. Approximately half the sample were male and half female. Three hundred and twenty nine (53.2% of those consenting) subjects attended for all visits and 403 (65.4%) subjects were seen at both the baseline and final examination. Only 34 (5.5%) subjects were not seen at any examination.

Information Collection Method
- This study used the data from the National Preventive Dentistry Demonstration Programme (NPDDP) in the United States. The NPDDP data set was used as it contains the most extensive and comprehensive longitudinal data available on caries preventive regimes using standardised DMF criteria that have been shown to be reliable through extensive critical analyses of the project. Perhaps most importantly for this project, the caries data range was very wide: both within the individual ethnic groups and according to water fluoridation status. The caries surface data were selected for each child at the beginning of the study.
- Representative samples were drawn from participating strategic health authorities, primary care trusts, health boards and local health boards. Dental caries were detected using clinical visual diagnostic criteria at the D3 (caries into dentine) threshold.
A 3-year cohort study with 41 volunteer general dental practitioners and 616 adolescent patients (mean age = 12.1 years at baseline) defined by the practitioners as ‘regular’ attenders. All the General Dental Practitioners (GDPs) who participated in the interview component of the study (SCCS Phase 1) were invited to participate in Phase 2. Initial interest in participation was first determined by letter and was followed by an explanatory booklet describing the planned project. The GDPs who continued to indicate a willingness to participate were then visited by two researchers to explain the study protocol, including the implications for the GDPs themselves and their practices. The dentists provided the patient sample by each supplying the names of 30 adolescent patients; the only criteria for patient selection was that the patient should be between 11-13 years old and, in the opinion of their general dental practitioner, a regular attender. A regular attender was defined as ‘someone whom they believed would keep appointments’, as the practitioner’s opinion was considered to be a predictor of attendance behaviour. They were specifically asked not to select on other criteria, such as caries status. Each list was randomized and fifteen patients per list were invited to participate. If a patient refused, the next person on each list was invited to take part until each dentist’s quota was completed.

Preventive interventions were introduced which allowed an analysis of the changes in caries patterns with the decline in caries to be examined. DMFT/S has been shown to be reliable through extensive critical analyses. It has been widely used and scientifically recognized at international level. Results indicate total populations and samples, results for DMFT and its components, sealed teeth, the percentage of and mean disease experience for children with DMFT > 0 and DT > 0, and values for care index percentage (FT/DMFT x 100%) for every participating health authority, local health board, or health board, and for the current ‘regions’ (of the National Health Service in England and Wales). The results demonstrated a wide variation in prevalence across the regions, with mean values for DMFT for regions and countries.

Other EGOHID indicators concerned: A8, B9, B10, B12, B13.

The majority of the disease was to be found in the molar teeth, particularly the first permanent molars. Disease levels were related to socio-economic status. The clinical examination for the diagnosis of caries and assessment of restoration quality was entirely visual. The criteria for coding dentinal caries divided lesion severity into cavities greater or less than 0.5 mm in diameter. A CPITN probe was available to assist with this judgment but teeth were not probed to establish caries status.

Other EGOHID indicators concerned: A8, B9, B10, B12, B13.


and can be grouped; the sizes of the groups vary. The most susceptible group consists of six tooth surfaces: the buccal pits and occlusal fissured surfaces of the first molar teeth. An effect that reduces the cariogenic challenge of one of the sites within a group is likely to affect all the other sites within the particular group.

Dental health of 11-year-old children was surveyed in Great Britain, Jersey, and the Isle of Man in 2004/2005: the cohort was of a slightly younger mean age than in previous BASCD surveys. Geographic variation in oral health was marked at both the local and national levels. Overall, the provision of operative care for those with dentinal decay was around 42%. While many children enjoyed good oral health, sizable groups remained within the population of 11-year-old children who had a clinically significant burden of preventable dental disease.

The ‘regularly attending’ subjects had a better normative level of dental health than their peers in the Scottish population. However, wide variation was found. The project also demonstrated the feasibility of undertaking research in partnership with general dental practitioners.
2.1 Dental Fluorosis

Main Reference

Study Objectives
- To determine changes in the prevalence of dental fluorosis, and in perceptions of aesthetic concerns due to dental fluorosis after water fluoridation ceased in 1992.
- To compare the DEAN, T-F and TSIF dental fluorosis indexes in relation to prevalence of surfaces, teeth and locality, and to verify the statistical correlation among them.
- To compare levels of dental caries and enamel fluorosis among children and adolescents in the fluoridated Republic of Ireland (RoI) with those in the non fluoridated North of Ireland (NI).
- To determine the relationship between the concentration of fluoride in drinking water and the prevalence of dental caries and fluorosis in seven Japanese communities with different concentrations of fluoride occurring naturally in the drinking water.

Method of Reference
- Interview and Clinical Surveys. Recommendations of the Canadian Dental Association.
- Clinical Survey.
- World Health Organization.
- World Health Organization.

Population Studied
- Children under the age of 9 were examined at the Comox/Courtenay and Campbell River communities in British Columbia (BC), Canada during 1993–94, 1996–97 and 2002–03. The age of participants at the time of examination ranged from 6.2 to 9 years of age.
- At a follow-up epidemiological survey, residence and dental histories were confirmed on all children to determine the extent of exposure to all types of fluorides. Comparisons between the three surveys were used to establish the influence of fluoridated water and other fluoride sources on the occurrence and severity of dental fluorosis. Aesthetic ratings from parents were used to assess the aesthetic conditions of maxillary anterior teeth across the three surveys.
- The sample for this study consisted of 461 schoolchildren, 276 males and 183 females (12-14 years of age), registered at public schools. The age range of 12-14 years was recommended by Dean and Arnold (1943), because all the permanent teeth have erupted. The schoolchildren in the sample had been born and reared in the city from 2 years of age. Sample selection was by means of a random stratified proportion from the list of schoolchildren provided by the directors of public schools, who had previously been fully informed about the study. Erupted teeth with less than 2/3 of the crown or filled teeth (Horowitz et al., 1984) were excluded from the sample.
- An all Ireland/North-South survey of Oral Health was carried out in 2001/2002.
- A total of 1,060 10- to 12-year-old lifetime residents were examined to determine the prevalence of dental caries and fluorosis in communities with trace amounts to 1.4 ppm fluoride in the drinking water in 1987.

Information Collection Method
- All children in the study communities were sent home with consents and oral health questionnaires requesting parental permission for participation and information concerning residency status and use of home care products. Only 62% of children in grades 2 and 3 responded to three rounds of sending consents and questionnaires home. 55% of the total population had negative systemic fluoride
histories. The TFI (1) and an instrument for assessing dental aesthetics (2) were used in the 2002–03 survey. Parents were asked to evaluate the perceived aesthetics of their child’s teeth by indicating an opinion about the reference statement, ‘The colour of my child’s teeth is pleasing and looks nice’, using a Likert-like scale. In the first two surveys the same examiners were used. Certain items from the questionnaire were tested for reliability by telephoning parents and guardians after return of the questionnaire and asking them to respond to certain repeat items.

Dean (1934) developed a fluorosis index which classified individuals into 5 categories, depending on the degree of enamel alteration, and which was based on the identification of the 2 most severely affected teeth, giving ordinal numbers as the severity of the enamel alteration increased. This index was later modified by Moller (1982) and it is actually in the WHO Basic Methods. Thylstrup and Fejerskov (1978) developed an index (T-F) based on the biological aspects of dental fluorosis, classifying individuals into 10 categories characterizing the macroscopic degree of fluorosis in relation to histological aspects. In the original classification, buccal, occlusal and lingual surfaces were examined.

Thylstrup and Fejerskov (1978) developed an index (T-F) based on the biological aspects of dental fluorosis, classifying individuals into 10 categories characterizing the macroscopic degree of fluorosis in relation to histological aspects. In the original classification, buccal, occlusal and lingual surfaces were examined.

Horowitz et al. (1984) developed a fluorosis index based on aesthetic aspects of tooth surface (TSIF) classifying individuals into 8 categories. In this index a value is given for each anterior tooth surface not restored (buccal and lingual) and three values for posterior tooth surfaces (buccal, lingual and occlusal). These dental fluorosis indexes have been compared in several scientific articles. All the children were instructed on tooth brushing before the examination by a trained dental hygienist. The dental fluorosis examinations were carried out in a portable dental chair, with artificial light, a plane dental mirror and the teeth were dried with an air syringe for one minute prior to the examination.

The survey team was composed of an examiner, a recorder and an assistant. The buccal, lingual and occlusal surfaces of the posterior teeth, and the buccal and lingual surfaces of the anterior teeth were examined. The examination sequence was as follows: 1st phase: examination using the DEAN index with a one week interval; 2nd phase: examination using the T-F index with a one week interval; 3rd phase: examination using the TSIF index. The 1-week interval between examinations was made to minimize the “habits” (possible memorization) of clinical examinations.

WHO examination criteria with the addition of visible, non cavitated dentine caries were used for recording caries. Fluorosis was measured using Dean’s Index.

The prevalence of dental caries was inversely related and the prevalence of fluorosis was directly related to the concentration of fluoride in the drinking water. The mean DMFS in the communities with 0.8 to 1.4 ppm fluoride was 53.9% to 62.4% lower than that in communities with negligible amounts of fluoride. Multivariate analysis showed that water fluoride level was the strongest factor influencing DMFS scores. The prevalence of fluorosis ranged from 1.7% to 15.4%, and the increase in fluorosis with increasing fluoride exposure was limited entirely to the milder forms.

Comments
- The study used a valuable, widely and constantly used, tested and validated method with a high level of scientific international recognition which would be applicable in the European context.
- This study compares different dental fluorosis indices, all of them widely used and internationally accepted.
- WHO examination criteria with the addition of visible, non cavitated dentine caries were used for recording caries. Fluorosis was measured using Dean’s Index.
- In 2002 apart from 8-year-olds, caries levels were lower amongst children resident in fluoridated communities in RoI than amongst corresponding age groups in non-fluoridated NI. Caries has declined in fluoridated and non fluoridated groups in both jurisdictions since the early 1960s. In RoI fluorosis levels were higher amongst lifetime residents of fluoridated communities and have increased since 1984.
- Systemic fluorides (drops or tablets) have never been available in Japan and the market share of fluoride-containing toothpaste was 12 percent at the time of the study.

References


Following fluoridation cessation of the public water supply, the prevalence and severity of dental fluorosis decreased significantly.

The percentages of affected surfaces by dental fluorosis determined by each index were similar for each of the considered cities. The three indexes used showed a high Spearman correlation coefficient, mainly when the DEAN and TSIF indexes were compared. The three fluorosis indexes had similar prevalences using the same measuring methods for clinical examination.

It is necessary to make a risk-assessment between the degree of dental fluorosis considered acceptable to people and the caries reductions attributable to the ingestion of fluoride. The risk factors for dental fluorosis must be carefully scrutinised and the recommendations for the use of these fluoride modalities strictly adhered to.

The findings of this study conducted in 1987 in Japan parallel those reported by Dean et al. in the early 1940s.
Main Reference


Study Objectives

- Evaluation of the associations between tooth loss and the self-reported consumption of fruits and vegetables and selected CVD-related nutrients.
- To assess the opinions and beliefs of parents and teachers of middle school students regarding the school food environment.
- To investigate the possible association between dental erosion and caries, and variables including socio-economic status, reported dietary practices and oral hygiene behaviour, in a sample of children in Jeddah, Saudi Arabia.

Method of Reference

- American Dietetic Association, longitudinal study, cross sectional study, self-reported food frequency questionnaire.
- British Association for the Study of Community Dentistry (BASCD).

Population Studied

- 121,700 female registered nurses between the ages of 30 and 55 residing in 11 US states.
- A convenience sample of parents (n=350; response rate: 66%) and teachers (n=490; response rate: 70%) of middle school students from 16 schools in the St Paul-Minneapolis metropolitan area who participated in the Teens Eating for Energy and Nutrition at School study.
- A sample of children was drawn from 2–5-year-olds attending kindergarten schools in the city of Jeddah, 987 children both from public and private schools.

Information Collection Method

- The population studied completed a mailed questionnaire, which inquired about lifestyle practices, potential risk factors for cardiovascular diseases and cancers, and medical history. Follow-up questionnaires were completed every 2 years to update the information. In 1980, a 61-item food frequency questionnaire (FFQ) was included to assess dietary intake, and the questionnaire was expanded to include 116 items in 1984. Similar dietary questionnaires were used in 1986, 1990 and 1994 to update the dietary information. Questions regarding the number of remaining teeth and teeth lost in the past 2 years were added in 1992. On average, the response rates for each biennial questionnaire were over 90% and around 80% for dietary questionnaires. The return of the questionnaire(s) constituted informed consent. Data collection in 1992; the participants reported the number of natural teeth present in one of five categories (none, 1–10, 11–16, 17–24 and 25–32) and the number of teeth lost in the previous 2 years in the following categories: 0, 1, 2, 3, 4, 5–9, 10. Data on dietary intake in 1990 and 1994 was collected by semi-quantitative FFQ. Participants reported the frequencies of consuming specific foods in nine different categories over the past year. Frequency of consumption ranged from less than once a month to six or more times per day in a commonly used unit or portion for all items of food (such as 1 tomato, 1 glass or 1/2 cup). Nutrient intake was computed by multiplying the consumption frequency of each food by the nutrient content of the specified portion without supplements, as supplement use is unlikely to be directly associated with remaining teeth number, and adjusted for total calorie intake by the residual method. The daily intakes of all fruits (with and without juice) and of all vegetables for each respondent were calculated. The proportions of women consuming banana, cantaloupe, fresh apple or pear and cooked or raw...
carrots (fruits assessed in our FFQ which represent different hardness), at least one time per week, were evaluated across number of natural teeth to evaluate the impact of tooth loss on foods of different hardness. The questionnaire assessed intake of fresh apples or pears which presumably consist of raw apples or pears, as additional items had included apple sauce and apple juice.

**Inclusion criteria:** only participants who answered the dental questions in 1992 and completed at least one of the dietary questionnaires in 1990 or 1994 were included.

**Exclusion criteria:** Participants who left 70 or more items blank in dietary questionnaires or who reported extreme total energy intake (<2761 kJ/day or >14,644 kJ/day) were excluded.

Surveys mailed to parents and placed in teachers’ school mailboxes included questions about adolescents’ eating practices, food choice at school, and school-related food policies and practices. Descriptive statistics examined the prevalence of parents’ and teachers’ opinions and beliefs about adolescents’ eating practices, food choice at school, and school-related food policies and practices.

Forms were sent to the parents of 1554 children and 1063 (68%) forms were returned. The results relate to 987 children for whom a questionnaire had been completed and who had been dentally examined. **Clinical examinations** were carried out for erosion of maxillary incisor teeth and for caries and rampant caries. All teeth and surfaces were examined for caries using BASCD criteria and scoring systems. The questionnaire was designed to collect general information on each child’s age and gender, any chronic illness and medication taken by the child, as well as socio-economic background questions including parental occupation and education. **Dietary information** sought included: infant feeding practices; past and current intake of drinks including fruit juices, diluted fruit syrups, herbal drinks and carbonated drinks; current frequency of intake of selected foods, particularly fruit; and past and current use of sweetened comforters. Questions relating to the age at which the child’s teeth were first brushed; frequency of brushing; whether brushing was carried out with or without assistance were also included.

**Comments**

- The indicator “Daily Intake of Food and Drink” is defined by the frequency of daily intake of food and drink of people aged 5 to 60 and older; that is the number of separate occasions within 24 hours that the individual consumes food or drink. The food frequency questionnaires are designed for the assessment of intake of different nutrients (saturated fat, trans fat, cholesterol and vitamin B12, polyunsaturated fat, fiber, carotene, vitamin C, vitamin E, vitamin B6, folate, potassium, vegetables, fruits) and not for the evaluation of the number of occasions of food consumption.

- Most parents and teachers agreed that the nutritional health of students should be a school priority. However, only 18% of parents and 31% of teachers believed schools give adequate attention to student nutrition. Among both parents and teachers, 90% agreed that more healthy snacks and beverages should be available in school vending machines and on school a la carte lines.

- The target age of the indicator is over 5 years old. In this study the population investigated was under 5.

**References**

- Temple NJ, Steyn NP, Myburgh NG, Nel JH. Food items consumed by students attending schools in different socioeconomic areas in Cape Town, South Africa. *Nutrition.* 2006 Mar;22(3):252-8.


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**Major Issues**

Because oral health and diet are both associated with health consciousness, the impact of several potential confounders was assessed, including smoking status, body mass index, physical activity, diabetes, hypertension, hypercholesterolemia, alcohol drinking, and vitamin use. Some confounders did not affect the association between the number of teeth and dietary intake appreciably. Hence only age (5-year categories), physical activity (overall weekly activities summed and categorized in quintiles), and smoking status (never, past and current smoker) were included in the final model.

Findings suggest that parents and teachers are concerned about the nutritional health of students and the "state of health" of the school food environment. Dietetic and other health professionals who work in school settings should actively engage parents and teachers in the process of affecting and monitoring policies and practices that foster a healthy school food environment.

This study provides evidence of associations that may be important in the aetiology of both erosion and caries. There was no clear relationship between erosion and social class but the reverse was true for caries. The dietary factors identified as being related to erosion may also have contributed to caries and/or rampant caries in this group of children.
Main Reference


Study Objectives

- To examine the association of active and passive smoking with tooth loss among pregnant Japanese women using baseline data from the Osaka Maternal and Child Health Study.
- To identify the pathways through which US state-funded counter-industry media campaigns influence beliefs and attitudes regarding tobacco industry practices and smoking status. This study tested these relationships, controlling for the impact of cigarette prices and other state tobacco control policies, among a national sample of teens (12 to 17) and young adults (18 to 24) prior to the launch of a national truth campaign.
- *The Health, United States*, series provides an annual picture of health for the entire Nation. Trends are presented on health status and health care utilization, resources, and expenditures. The actual *Chartbook on Trends in the Health of Americans* updates and expands information from previous chartbooks and introduces this year’s special feature on access to health care.

Method of Reference

- Osaka Maternal and Child Health Study (OMCHS): Prospective cohort study of risk factors.
- Random-digit-dial telephone survey.
- National Centre for Health Statistics, Centres for Disease Control and Prevention.

Population Studied

- The OMCHS is an ongoing prospective cohort study of risk factors for maternal and child health such as dental health, allergic disorders, and postpartum depression. The OMCHS requested that pregnant women complete a baseline survey, which was followed by several post-natal surveys. Eligible subjects were those women who became pregnant in Neyagawa City, which is one of 44 municipalities in Osaka Prefecture, a metropolis in Japan with a total population of approximately 8.8 million. Of 3639 eligible subjects, a total of 1002 pregnant women gave their fully informed consent in writing and completed the baseline survey.
- Population. A US wide random-digit-dial telephone survey of 6875 youths 12 to 24 years old. The analysis sample consisted of 3198 teens (50.3%) and 3154 young adults. The sample was split almost evenly by gender (47.4% male, n = 3011) and consisted of half whites (51.1%, n = 3246), with the remainder classified as African-Americans (16.0%, n = 1016), Hispanics (17.3%, n = 1099), or other (15.5%, n = 984). Based on the criteria outlined above, the authors classified 2547 (40.1%) respondents as closed to smoking, 762 (12.0%) as open to smoking, 1626 (25.6%) as prior experimenters, 642 (10.1%) as early smokers, and 775 (12.2%) as established smokers.
- Exclusion criteria: Respondents with missing data (n = 523) for any analysis variables were removed from the sample.
- Determinants of health considered in the chartbook include demographic factors, poverty, health insurance coverage, and health behaviors and risk factors, including obesity, cigarette smoking, and physical activity. Among health risk factors it included blood cotinine levels in children.
Information Collection

The OMCHS was approved by the ethics committees of the Osaka City University School of Medicine and the Osaka Prefectural Institute of Public Health. In the baseline survey, the participants filled out a set of two self-administered questionnaires. The participants mailed the questionnaires to the data management center. Research technicians completed missing or illogical data by telephone interview. One of the self-administered questionnaires elicited information on age, gestation, parity, family income, education, and experience of extraction of permanent teeth excluding third molars, number of remaining teeth, smoking habits, and passive smoking exposure at home and at work. Tooth loss was defined as the extraction of one or more teeth. The other self-administered questionnaire was a validated self-administered diet history questionnaire that was used to assess dietary habits over a period of 1 month. Cigarette smoking was classified into four categories (never, former, and current smoker consuming 15 or 15 cigarettes per day); pack-years of smoking into four (none, 0.1–2.9, 3.0–7.9, and 8.0); passive smoking at home into four (never, former, and current passive smoker exposed to 10 or 10C cigarettes per day); pack-years of passive smoking at home into four (none, 0.1–2.9, 3.0–7.9, and 8.0); passive smoking at work into four (never, former, and current passive smoker exposed intermittently or constantly); years of passive smoking at work into four (none, 1–3, 4–6, and 7); age into three (29, 29–31, and 32 years); gestation into three (15, 15–20, and 21 weeks); parity into two (0 and 1); family income into three; and education into three (13, 13–14, and 15 years). BMI was used as a continuous variable.

The survey assessed tobacco use, exposure to counter-marketing messages, and beliefs and attitudes that might be associated with tobacco use. Telephone calls were spread across all days of the week and times of the day, including evenings and weekends, to maximize the likelihood that adolescents and their parents were home. For each case, up to 12 callbacks were made, including a minimum of 2 daytime attempts. Up to 2 refusal conversion attempts per case were made unless the respondent or parent was adamant about not participating in the survey. A small cash incentive was used to encourage those who initially refused to complete the survey. The telephone survey had an overall response rate of 52.5%.

To minimize the potential of interpreting chance relationships, the original sample was split into two random subgroups (a calibration sample and a validation sample) and conducted exploratory factor analysis using the calibration subsample. Upon satisfying tests of reliability, confirmatory factor analysis among the calibration sample was conducted and the resultant model in the validation sample was tested using fixed-structure cross-validation procedures.

Cigarette smoking and related tobacco use are measured in several different data systems. Birth File – Information on cigarette smoking by the mother during pregnancy is based on Yes/No responses to the birth certificate item "Other risk factors for this pregnancy: Tobacco use during pregnancy" and the average number of cigarettes per day with no specificity on timing during pregnancy. This information became available for the first time in 1989 with revision of the U.S. Standard Certificate of Live Birth. The areas reporting tobacco use comprised 87 percent of U.S. births in 1999-2002. In 2003, data on smoking during pregnancy was included for all States except California, Pennsylvania, and Washington, and comprised 81 percent of births. California did not report this information. Pennsylvania and Washington implemented the 2003 revision of the U.S. Standard Certificate of Live Birth, which asked for the number of cigarettes smoked at different intervals before and during pregnancy.

The aim of the study was not to determine how many subjects were using tobacco. Data on tobacco usage prevalence was collected in order to examine the association of active and passive smoking with tooth loss in the population studied.

Practical aspects the random digit telephone survey represent a good and feasible mean to reach a large number of respondents using a limited number of interviewers. Possible difficulties are the low answering attitude to telephone survey in some country.

Strength: The methodology was valid from the survey design to the statistical analysis and assessment. Level of implementation: widely and validated method of assessing population attitudes (health-related and non-health-related).
Many measures are shown separately for people of different ages because of the strong effect of tobacco usage on health. Selected figures also highlight differences in determinants and measures of health status and utilization of health care by such characteristics as sex, race, Hispanic origin, education, and poverty status.

**References**


**Major Issues**

- Only current light smoking was independently associated with an increased prevalence of tooth loss. Compared with never smoking, 8.0 or more pack-years of active smoking was significantly related to a 2.9-fold increased prevalence of tooth loss, showing a significant dose–response association with cumulative consumption of cigarettes.
- The study demonstrated a sound example of telephone interview methodology. There may be disparity in data availability, depending on local attitudes to this type of survey.
- For a nation to improve health and enable policymakers to chart future trends, target resources most effectively, and set program and policy priorities, it is essential to keep collecting and disseminating reliable and accurate information about all components of health, including current health status, the determinants of health, resources, and outcomes.
2.2  B3 – Geographical Access to Oral Health Care

Main Reference

Study Objectives
- To compare the travel times, distances, and physician specialty mix of all US Medicare patients living in Alaska, Idaho, North Carolina, South Carolina, and Washington. The authors’ primary interest was whether remote and isolated Medicare beneficiaries received a different mix of physician care than their urban counterparts. In addition, they were interested in comparing the time and distance patients travel to see health care providers depending on the patient’s rural versus urban location.
- To give a brief description of the Australian context for its dental care services and to discuss some of the nationally recognized issues in access to dental care with special reference to the situation in the most populous state, New South Wales. Australia is the size of continental USA but with only around 21 million people, 85% of whom reside within 50 km of the coastline. Thus, access to health care has also a strong urban– rural dimension.
- To describe the US system for dental care services; asserts that there is much to be learned by considering the experience of other countries; identifies a few lessons that may be learned from comparisons with England, Australia, and other nations; and encourages the monitoring of outcomes associated with innovations in financing and delivery of services elsewhere.

Method of Reference
- Retrospective cross-sectional study.
- National Health Service (NHS) collection.
- International Collaborative Studies, commonly referenced as ICS I and ICS II developed jointly by WHO and the Center for Health Administration Studies at the University of Chicago.

Population Studied
- In the cohort there were 2,220,841 Medicare patients living in Alaska, Idaho, North Carolina, South Carolina, and Washington and 39,780 providers, including 6,405 (16.1%) generalists, 24,772 (62.3%) specialists, and 8,603 (21.6%) nonphysician providers.

Information Collection Method
- The study used 1998 Medicare billing data. Travel time was determined by computing the road distance between 2 population centroids: the patient’s and the provider’s zone improvement plan codes. The ZIP code of the physician defined where a provider/patient encounter took place. This information was contained on each billing line and represented the ZIP code of the provider’s practice setting at the time he/she saw the patient. If the provider worked at more than 1 site, then the ZIP codes reflected this. Rural status was determined by linking the patient ZIP code to its rural-urban commuting area code (RUCA). The 30 RUCA designations were aggregated into 4 categories: urban, large rural city, small rural town, and isolated rural town. Non-city/town areas were aggregated with the city/town where they had a strong commuting relationship. Travel distance was calculated by determining the road distance along the fastest route between the population centroid of the physician’s ZIP code and the patient’s ZIP code.
- Access patterns in Australia are uneven across the population. Geographic inequalities in access to dental care among residents of rural and remote areas of Australia are shown by their greater problem-oriented dental visiting pattern. The paper deals with health policy and programming, not with an actual methodology. Data are collected by NHS, focusing on dental care access by socio-economic status (SES) and residency.
- All non-institutionalized individuals residing in the study site and of the appropriate ages were eligible for the study. Interviews and clinical examinations were conducted from 1988 to 1994.
depending on each site schedule resulting in a total of 14,252 completed questionnaires and 11,717 clinical examinations. Interviewers were trained to collect the information. For children the questionnaires were distributed in schools and self-administered. Clinical examinations were carried out by a local team, trained and calibrated by a roving epidemiologist from the WHO using the WHO calibrating methodology. Aggregate secondary data concerning the socioenvironmental characteristics and oral health care system at each site were also collected.

Comments

It is important to observe that access to care is determined by more than just geography. Availability of transportation and other patient characteristics (health status, socioeconomic status, preferences, etc.) play a large role in access and are unmeasured in this study. Despite these limitations, the study provides a detailed examination of patient travel time and specialty mix. The authors employed the latest methodologies to determine a patient’s rural status, as well as to determine patients’ travel times and distances to see their providers. The study design was appropriate for Medicare patients living in USA and needs to be adjusted for other populations in European countries. Geographical access to general health care was investigated while indicator B3 is referred specifically to geographical access to oral care services.

Access to health care in the most Australian populous state, New South Wales has a strong urban–rural dimension. The universal healthcare coverage excludes dental care, 80–90% of which is delivered through traditional fee-for-service private dental care.

A public dental care system exists with varying eligibility criteria from state to state, mostly directed at children, low-income individuals, pensioners, and defined disadvantaged groups. Thus, access to dental care also has a strong socio-economic dimension with disadvantaged people having serious access problems and extensive waiting times. Government and other reports have documented considerable polarization issues both in oral health and in access to dental care.

Among the key findings of ICS I were the following:

- School-based systems were effective in childhood but did not show a long-term impact when the children became adults.
- Oral health status was apparently not related to availability and accessibility of services.
- Except for those living in poverty, the primary barrier to receiving dental care appeared to be perceived lack of need and a belief that available services were not acceptable.

Findings regarding the role of the care delivery system were no more straightforward. ICS II found that:

- Systems for organization and delivery of dental care were related to utilization.
- In most settings, a usual source of care was critical to promoting regular use of oral health services.
- Despite this, having a usual source of care was not associated consistently with better health status in children or with better periodontal status of adults.

References


**Major Issues**

- Rural residents have fewer overall visits and see fewer medical specialists and more generalists for their care than their urban counterparts.
- A number of policy action steps have been suggested that would diminish the increasing disparities and help to improve oral health and access to dental care. These steps were proposed so as to stimulate a better balance between the prevention and the treatment of oral disease, and are relevant to all levels of government and jurisdictions.
- Conducting two international collaborative studies was an attempt to understand not only what could be learned by comparisons between countries but also how to measure important attributes of the environment, the system for delivering care, personal behavior, and health outcomes.


To review the evidence for effectiveness of five possible physician interventions – (1) screening and risk assessment, (2) referral, (3) provision of dietary supplemental fluoride, (4) application of fluoride varnish, and (5) counselling – for the prevention of dental caries for the U.S. Preventive Services Task Force.

To outline the approach being adopted in England to address difficulty of dental access to primary dental care services.

The purpose of this study was to compare the use of dental services for preschool aged children enrolled in North Carolina Medicaid, a traditional program based on a fee-for-service schedule, and North Carolina Health Choice, and State Children’s Health Insurance Program dental insurance program structured similarly to private insurance.

Articles from 1966 to 2001 addressing the effectiveness of primary care clinicians’ interventions to prevent or manage dental caries were identified in MEDLINE. The evidence for effectiveness of supplemental fluorides, fluoride varnish, and counselling for caries prevention performed by dental personnel was also examined through existing and new systematic reviews.

All children (165,858) 1–5 years of age enrolled in Medicaid and S-CHIP (NCHC) at some time during one study year (October 1, 1999–September 30, 2000).

The framework was intended to outline general types of interventions provided by primary care clinicians that are appropriate to children aged between birth and 5 years. Although prenatal counselling is recommended by some professional healthcare organizations and might be appropriate, it was not a focus of this review. Similarly, application of dental sealants (another effective preventive dental care service) was outside the scope of this review because it was unlikely to be feasible for primary care clinicians to provide this service.

The five key questions for physicians’ roles in preventing dental caries in preschool children, which were developed to direct this review, were as follows:

1. How accurate is screening by the primary care clinician in identifying children aged from birth to 5 years who:
   a. have dental caries requiring referral to a dentist?
   b. are at elevated risk for future dental caries?
2. How effective is referral by the primary care clinician of children aged from birth to 5 years to dentists in terms of the proportion of referred children making a dental visit?
3. How effective is the prescription of dietary supplemental fluoride by the primary care clinician in terms of:
   a. appropriateness of supplementation decision?
   b. parental adherence to the dosage regimen?
   c. prevention of dental caries?
4. How effective is application of fluoride by the primary care clinician in terms of:
   a. appropriateness of application decision?
   b. achieving parental agreement for the application?
   c. prevention of dental caries?

5. How effective is counselling by the primary care clinician for caries-preventive barriers, as measured by:
   a. adherence to the desired behaviour?
   b. prevention of dental caries?

Note: For this question (no. 5), the caries-preventive behaviours of interest relate to diet (reduction in frequency and amount of sucrose, appropriate use of the bottle), oral hygiene (brushing frequency and efficacy), dental attendance (regular dental examinations and first visits for assessment of risk of disease), appropriate use of fluoride (accepting professional recommendations, use of fluoride dentifrice at home), and implications of caregiver oral health (possible transmission of cariogenic bacteria).

This case study of the dental reforms currently being implemented in England highlights progress at a particular point in time (Summer 2005). It will take a number of years to find a new national dental payment system (the National Health Service) to replace the system which has changed little since 1948. However, the political pressure to address poor access to state-funded dental services calls for more immediate actions. The initial approach was to increase the dental workforce via international recruitment, and in the medium term to increase the number of dental students in training and to expand the numbers of other members of the dental team. An additional stratagem was to retain those already providing dental care under the National Health Service by the introduction of a new method of remuneration. England is trying to improve both access to care and the oral health of the population by creating a workforce more suitable to public demands and changing oral health needs.

Medicaid and NCHC enrolment and dental claims files were obtained for individual children. The study was observational with a retrospective cohort design. Use of dental services for each child was measured as having at least one dental claim during the outcome period (October 1, 1999–September 30, 2000). Multivariable logistic regression models were developed to compare the effect of two differently administered insurance programs on the use of dental services, controlling for demographic, enrolment, and county characteristics.

The North Carolina Medicaid enrolment and dental claims files in the state's Medicaid Management Information System (MMIS) were used to create a person-level file for the purposes of this study. The enrolment file is a census of children 1–5 years of age enrolled in Medicaid at any point during the outcome period. Enrolment spells were available for Medicaid and S-CHIP subjects from the initiation of the NC Health Choice program to the beginning of the outcome period and through the end of the outcome period. These enrolment files provide demographic information about the children (date of birth, sex, race, and county of residence) and enrolment status for every month of enrolment during the 24 months. The Medicaid and S-CHIP dental claims files contained all paid dental claims for an enrolled child during the outcome period. The child's Medicaid/S-CHIP identification number was used to link claims and enrolment files across enrolment years and the outcome period, creating a person-level analytical file with unduplicated observations for each child. The dataset was supplemented with county-level provider characteristics created from the Medicaid and S-CHIP files along with census type socio-economic indicators published in Community Health Status Indicator Reports (Health Resources Service Administration 2000). These characteristics were linked to each person-level record using the Medicaid county identification code for each child. The dependent variable used to measure dental utilization was any use of dental services defined as having at least one paid dental claim during the outcome period.

Comments
- The involvement of paediatricians in oral health monitoring is a topic of frequent debate.
- In September 2002, the publication of the report document National Health Service Dentistry: Options for Change (1) took the form of a landmark commentary on how government dental services are provided and explored opportunities for changing them. The report documented how, since 1948, the main delivery of dental services in the UK has been via a ‘fee for item’ approach, with dentists being paid according to an agreed-upon national tariff according to treatment provided.
While this system worked well for a population with a high level of dental disease, it incorporated over 400 separate fee items; in low caries populations it became inappropriate. The fee for each patient had to be calculated individually, with the dentist submitting details to a central payment system (the Dental Practice Board) who subsequently paid the dentist.

**Practical aspects:** feasibility at EU Countries level would be dependent on individual National Health Systems and national health data on oral health services availability.

### References


### Major Issues

- **Evidence for the effectiveness of traditionally recommended primary care clinician interventions (screening, referral, counselling) to prevent dental caries in preschool children is lacking.** There is fair evidence for the effectiveness of two fluoride-based interventions (fluoride supplementation and varnish) applicable in primary care practice. However, there is also fair evidence indicating that physicians’ consideration of fluoride exposure is incomplete, thus increasing the risk for fluorosis among those prescribed supplements.
- **Access to dental services remains a challenging issue for many countries.** Market forces are changing. In industrialized countries, in particular, there is a sharp rise in demand for cosmetic dentistry, an increased willingness on the part of patients to pay for treatment and services. At the same time, the workforce is currently insufficient to meet changing and growing demands. The problem is compounded by the fact that it is often hard to create the right configuration of skill mixes among members of the wider dental team. Furthermore, regulatory restrictions frequently obstruct the mobilization of dental care professionals to areas of high need/demand.
- **The State Children’s Health Insurance Program S-CHIP appears to provide children with increased access to dental care compared to children in the Medicaid program.** Based on these findings separate S-CHIP and other public insurance programs designed like private insurance have the potential to improve access to dental care compared with traditional Medicaid programs. The NCQA recommended performance measure of a ‘dental visit’ suggests that every child enrolled in EPSDT WHO is 1 year of age or older should have an annual dental visit. These guidelines underscore the importance of including young children (1–2 year olds) in any analysis of children’s dental utilization. These poor utilization rates among very young children underscore the importance of public insurance programs incorporating innovative strategies to increase demand for dental care for these children.
2.2

Main Reference


Study Objectives

- To compare by location of residence (urban, rural and remote), the proportion of Western Australians aged 60 years and over that had visited a dentist in the past 12 months and to determine the associated factors.
- To collect data on oral health behaviour and dental knowledge.
- To determine the level of dental health care coverage in people aged 18 years and over across the country, and to identify the factors associated with coverage.
- To collect data on health status and health determinants in all European Union countries. This set of questions from Eurobarometer 59.0 (Winter 2002/2003) addressed incidence of chronic illness, long-term treatment, dental health and, in more depth, health maintenance by discussing doctor’s visits and various screening tests. Women’s health – and medical tests relating specifically to women’s health – were also addressed in some depth. Safety and children’s safety were also examined in detail. While some aspects of health and safety are fairly uniform across Europe and across sociodemographic groups, others show notable differences and are described here.
- The National Health and Nutrition Examination Surveys (NHANES) have collected data on chronic disease prevalence and conditions and risk factors such as obesity and smoking, serum cholesterol levels, hypertension, diet and nutritional status, immunization status, infectious disease prevalence, health insurance, and measures of environmental exposures. Other topics addressed include hearing, vision, mental health, anemia, diabetes, cardiovascular disease, osteoporosis, oral health, mental health, pharmaceuticals used, and physical fitness.

Method of Reference

- Computer Assisted Telephone Interview Survey.
- World Health Organization, HIS. National Centre for Epidemiology, Budapest.
- World Health Organization for the World Health Survey.
- Eurobarometer.
- National Health and Nutrition Examination Survey.

Population Studied

- Sample population consisted of 800 urban, 800 rural and 500 remote Western Australians aged 60 years and over.
- 1600 people, 35-44 and 65-74-years-old, random with a response rate of 89 %.
- Two-stage stratified random sample from the National Election Register (no surrogate persons). 7000 respondents (non-institutionalised) aged 18 and over, living in 447 settlements. A nationwide model, representative by age, gender and settlement size. Out of 7000 questionnaires distributed, 5029 were successfully completed (72%).
- *Population: instruments and sampling strategies developed by WHO for the World Health Survey, a cross-sectional national survey was carried out at the household and individual (adult) levels. Dental data were collected in 20 of Mexico’s 32 states, from 38,746 households, with a mean of 1250 households for each state.

Screening period: between November 2002 and April 2003.
Information Collection Method

- Respective nationalities of the European Union Member States, aged 15 years and over, resident in each of the Member States.
- Coverage: With the exception of the Hispanic Health and Nutrition Examination Survey, the National Health Examination Survey and NHANES provide estimates of the health status of the civilian non-institutionalized population of the United States. The NHANES III target population was the civilian noninstitutionalized population 2 months of age and over. The sample design provided for oversampling among children 2-35 months of age, persons 70 years of age and over, black Americans, and Mexican Americans. Beginning in 1999 NHANES oversampled low-income persons, adolescents 12-19 years of age, persons 60 years of age and over, African Americans, and Mexican Americans.

Participants in this telephone survey were aged 60 years or over, had a telephone listing, were on the State Electoral Roll and lived in non-institutionalised accommodation. Interviews were conducted by trained interviewers using Computer Assisted Telephone Interview software.

1. Questionnaire – self administered (WHO form):
   Questions:
   - What was the reason for your most recent visit to a dentist?
   - Something was wrong/I thought it was time for a check-up/The dentist reminded me it was time for a check-up and cleaning/It was part of a treatment.

2. Face-to-face interview:
   Questions: During the past 12 months, how many times did you meet the following health professionals, including private health care, in connection with your own health?
   - Dentist/Number of occasions/Does not know/Not sure/Refused/When was the last time you visited a dentist?/Within the past 2 years/Within the past 5 years/More than 5 years ago/Never/Does not know/Not sure/Refused.

The National Performance Evaluation Survey 2002–2003 (ENED) was part of the technical collaboration between the Ministry of Health of Mexico (SSA) and the World Health Organization, which used the survey instrument and sampling strategies developed by WHO for the WHS. The sample design was probabilistic, multistage, stratified, through conglomerates, and was calculated to provide representative information at the state level, and across urban and rural areas. Three strata were considered: (a) cities or metropolitan areas; (b) urban settings and (c) rural areas. The complete WHS instrument was not used in every state, and in some cases the dental items were omitted. Data on dental conditions are only available for 20 of the 32 states of Mexico, leading to a total of 24,159 households included in this study. The national non-response rate was 3.1%.

WHO/WHS ORAL HEALTH CARE - Questions to be asked to all respondents
Q6750 During the last 12 months, did you have any problems with your mouth and/or teeth?
   1. Yes 5. No If No: Go to Q6757

Q6751 During the last 12 months, did you receive any medical care or treatment from a dentist or other oral health specialist for this problem with your mouth and/or teeth?
   1. Yes 5. No If No: Go to Q6757

What types of care or treatment did you receive for this problem with your mouth and / or teeth?
Problem for all types of care or treatment. Record in questions 6752-6756 all types mentioned.
Q6752 Medication 1. Yes 5. No
Q6753 Dental work / oral surgery 1. Yes 5. No
Q6754 Dentures or bridges 1. Yes 5. No
Q6755 Information or counseling on dental care / oral hygiene 1. Yes 5. No
Q6756 Other oral treatment 1. Yes : Specify _____ 5. No

Q6757 Have you lost all of your natural teeth? 1. Yes 5. No

Sample design: multi-stage, random, a number of sampling points in each country. Total number of interviews: 16,370 by gender, age, region.
Questions:
Q.20 In the last twelve months, have you been to…? (possible answers: yes no dk/refusal): a family doctor or a general practitioner/a dentist/a psychiatrist (N)/another specialist (M)/a hospital or clinic as a patient overnight or longer.

Q.22 How many of your own natural teeth are missing? (read - out– one answer only)
None; 1-5 teeth; More than 10 teeth; but not all; All teeth missing; dk/refusal

Q.23 Over the last twelve months, on the whole, how satisfied have you been with your teeth, the dentures or false teeth you may have or your mouth in general? Would you say you have been…? very satisfied; fairly satisfied; neither satisfied nor dissatisfied; fairly dissatisfied; very dissatisfied; dk/refusal

Q.24 I am going to read out a series of possible tests or health check-ups. For each of them, please tell me if you had one in the last twelve months, whether or not as part of any treatment. And if yes, whether it was on your own initiative, at a doctor's initiative or as part of a screening programme? (Possible answers: Yes own initiative, Yes doctor’s initiative, Yes screening programme, No, Dk/refusal): Dental check-up /2 X-ray, ultrasound or other scan (M)/Eye test by an optician or an eye doctor (M)/Cholesterol test/Heart check-up /Blood pressure test (N)/Test for cancer (M)/Test for diabetes.

Methodology: Starting in 1997, National Health Interview Survey respondents were asked “About how long has it been since you last saw or talked to a dentist? Include all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists as well as hygienists.” From 2001, the question was modified slightly to ask respondents how long it had been since they last saw a dentist. Questions about dental visits were not asked for children under 2 years of age for years 1997-99 and under 1 year of age for 2000 and beyond. Starting with data year 1997, estimates are presented for persons with a dental visit in the past year. Prior to 1997, dental visit estimates were based on a 2-week recall period.

Sample Size and Response Rates: NHANES III sampled 7,514 youths and reported a response rate of 90 percent. Over the 6-year survey period of NHANES III, 39,695 persons were selected, the household interview response rate was 86 percent, and the medical examination response rate was 78 percent. In the sample selection for NHANES 1999 2000, there were 22,839 dwelling units screened. Of these, 6,005 households had at least one eligible sample person identified for interviewing. A total of 12,160 eligible sample persons were identified. For NHANES 2001 02 there were 13,156 persons selected in the sample, of which 83.9 percent (11,039) were interviewed and 79.7 percent (10,480) of the 13,156 selected completed the health examination component of the survey.

Although there is potential bias with the use of telephone surveys in different regions and population subgroups, substantial literature supports the use of such surveys, including in older participants. Qualitative studies in selected areas of high and low utilization can explore the role of attitudes to dental care and oral health, affordability and accessibility of services and other factors, in order to ensure that new services are used appropriately.

The main tasks and present activities of the Centre are (i). Communicable disease epidemiology surveillance; (ii). Elaboration and implementation of the regional and national strategies in disease prevention and control, (iii). Elaboration of recommendations and guidelines for public health intervention and iv. Research activities.

Practical aspects: A widely and constantly used, tested and validated method at the European level with a high level of scientific international recognition.

This survey was requested by Directorate General Health and Consumer Protection and coordinated by Directorate General Press and Communication. It was carried out on behalf of the European Opinion Research Group (EORG: a consortium of market research and public opinion agencies). The report presents the main results of the survey. For each of the themes, results are analysed in terms of the European average and, if necessary, evaluated at national level. When necessary, several brief comments are added on the basis of the social-demographic variables of respondents.

Beginning in 1999, NHANES became a continuous, annual survey, which also allows increased flexibility in survey content. Since April 1999, NHANES has collected data every year from a representative sample of the civilian U.S. population, newborns and older, by in-home personal interviews and physical examinations in Mobile Examination Clinics. The sample is not designed to give a nationally representative sample for the total population of Hispanics residing in the United States.
Major Issues

Respondents with bleeding gums, natural teeth and/or non-smokers were more likely to have had a recent dental visit. Attending for a check-up was predictive of a recent visit, as was lack of difficulty in accessing a dentist. Among respondents with the same oral health status, there was still a significant negative relationship between degree of remoteness and having had a recent visit.

Using WHO methodology, provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems.

The National Performance Evaluation Survey (ENED), using WHO/WHS methodology, provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems.

The most common health check in the EU is a dental check, with nearly two-thirds of Europeans having had one in the previous year; southern Europeans have the least number of dental check-ups. Tests have increased slightly since 1996. Persons with the lowest income most often had medical investigations which were ordered by a doctor, whereas higher income persons most often undertook the tests on their own initiative.

The NHANES includes clinical examinations, selected medical and laboratory tests, and self-reported data. The NHANES program includes a series of cross-sectional nationally representative health examination surveys conducted in mobile examination units or clinics.
Main Reference

Study Objectives
- To determine the level of dental health care coverage in people aged 18 years and over across the country, and to identify the factors associated with coverage.
- The Primary Care Trust (PCT) is responsible for the health of all patients registered with a Camden GP, regardless of where they live, as well as anyone not registered with a General Practitioner (GP) who lives within the boundaries of Camden. There are currently 245,300 patients registered with Camden GPs. The PCT survey did not examine in detail the experience of people who used specific non GP and non Dental services. There was no coverage of any Allied Health Professional services such as Speech and Language Therapy, Physiotherapy, Occupational Therapy, etc and no coverage of any specialist services heavily used by particular groups, such as District Nursing, Wheelchair Services, Prosthetics Services, Orthotics, and Community Equipment etc. where there are known to be widespread national problems of quality and efficiency.
- To examine this intersection of oral health care needs and constraints by using the most current nationally representative data to describe the utilization patterns of adults aged 55 years or older, including the reasons reported for visiting or not visiting a dentist. The findings will be useful for anticipating visit patterns, as well as for developing and targeting interventions to improve visit patterns as one means of addressing the oral health care needs of older Americans.
- To investigate the temporal development of the utilization of dental care in relation to socio-economic factors and also considering perceived oral health, attitudes to dental care, dental anxiety, care organisation and changes in the way that dental care is paid for.

Method of Reference
- World Health Organization for the World Health Survey.
- UK National Patients Survey programme, HIS.
- Cross-sectional survey with mail questionnaire.

Population Studied
- Population: instruments and sampling strategies developed by WHO for the World Health Survey, a cross-sectional national survey was carried out at the household and individual (adult) levels. Dental data were collected in 20 of Mexico’s 32 states, from 38 746 households, with a mean of 1250 households for each state.
  
  **Screening period:** The National Performance Evaluation Survey was conducted between November 2002 and April 2003.
- The first survey, of acute inpatients in all relevant Trusts in England was undertaken in early 2002. Non-acute Trusts are also involved in the program. 1696 Primary Care Trust patients were surveyed in 2003 by gender, age, education, ethnic group. The latest estimate of the resident population suggested that 210,700 people live in the borough of Camden. The population is comparatively young: only 10% is aged over 65 while 22% is aged 20-29 years. This compares with national rates of 16% and 12% respectively. Camden is also home to an extremely mobile population, with a high proportion moving address each year.
Oral Health of General Population

B6 – Reason for the Last Visit to the Dentist

The source of the data for this investigation was the 1999 public-use version of the National Health Interview Survey, or NHIS. The 1999 NHIS used a complex, multistage probability sampling design to select survey participants. African-Americans and Hispanics were oversampled to increase analytical precision for these two racial/ethnic groups. The final sample was composed of 9,272 respondents, representing 52.8 million adults aged 55 years or older in the United States. The results were statistically weighted to represent these 52.8 million adults.

The original study group numbered 8888 people. In 1997, the same population was sent a new questionnaire. The questionnaire was completed by 5363 people in both 1992 and 1997.

Secondary analyses on health survey data from a nationally representative sample in Mexico were conducted and the methodology published. ENED 2002–2003 was part of the technical collaboration between the Ministry of Health of Mexico (SSA) and the World Health Organization, which used the survey instrument and sampling strategies developed by WHO for the World Health Survey.

The National Institute of Public Health (INS) and the General Direction of Performance Evaluation of the SSA implemented the ENED. ENED provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems. The sample design was probabilistic, multistage, stratified, through conglomerates, and was calculated to provide representative information at the state level, and across urban and rural areas. Three strata were considered: (a) cities or metropolitan areas (locales with >100,000 inhabitants); (b) urban settings (locales with 2500 to 99,999 inhabitants), and (c) rural areas (locales with <2500 inhabitants). The sample size considered: 9% as the smaller proportion to estimate; state estimations with a maximum relative error of 25%; a confidence level of 95%; nonresponse rate of 15%; and a design effect of 1.7. The complete WHS instrument was not used in every state, and in some cases the dental items were omitted. Data on dental conditions are only available for 20 of the 32 states of Mexico, leading to a total of 24,159 households included in this study. The national nonresponse rate was 3.1%.

A sample of 1696 patients registered with their GPs and held on the Exeter system (a software suite used by all local health organisations in England and Wales for the administration of cancer screening call/recall programmes and management of patient registration and contractor payments) by the NHS was used for the survey. The sample was generated at random on an agreed national protocol from all those registered on the Exeter system in Spring 2003. The PCT survey was not a survey of patients who are known to have attended GP surgeries, or have used specific services. Because sampling took place from registered patients rather than service users, it had much more of the characteristics of a population survey than a patient survey. As not all groups of registered patients are equally likely to visit a GP for advice, some groups of registered patients were less likely to respond than others.

Response rate: 497 completed surveys were returned from the initial sample of 850.

Questionnaire sent to patients: An approval letter covered the ethical issues/Freeform questions gave patients the opportunity to express views.

Response rate: 497 completed surveys were returned from the initial sample 850: The response rate was 31% (497 usable responses from a sample of 1621). A group of 75 patients were excluded from the sample.

Questions: Why did you go to the dentist? A routine check-up/I had a dental problem.

Other EGOHID indicators related: B1, B2, B7, B8
For this investigation, questionnaire items from the Health Care Access and Utilization portion of the Adult Core Questionnaire were used. The final interviewed sample consisted of 37,573 households, containing 97,059 family members from 38,171 families. The final response rate for the Adult Core Questionnaire was 69.6 percent. The descriptor variables included age (55 through 64 years, 65 through 74 years, 75 years or older), sex, race/ethnicity, poverty status (200 percent of the federal poverty level, or FPL, or higher; 100 to 199 percent of the FPL; less than 100 percent of the FPL; unknown poverty status), geographic region, private dental insurance status and dentition status (dentate, edentulous).

The investigation consisted of three outcome variables. The first was a general dental visit variable, the second involved the main reasons for the last dental visit, and the third variable involved the main reasons for not visiting a dentist in the previous year.

The "reason for the last dental visit" variable was derived from an item that asked, "What was the main reason that you last went to the dentist?" Response categories for this questionnaire item included patient-initiated check-up, examination or tooth cleaning; dentist-initiated check-up, examination or tooth cleaning; something wrong, bothering them or hurting; treatment or condition found during an earlier dental visit; and other undefined reasons. For simplicity of interpretation, the "patient-initiated" and "dentist-initiated checkup, examination or tooth cleaning" categories were combined into a single "checkup or cleaning" category. The "treatment or condition found during an earlier dental visit" and "other undefined reasons" categories were also combined into a single "treatment or other reason" category.

Other related EGOHID indicators: B7
In 1992, a mail questionnaire was sent to all 50-year-old persons in two counties in Sweden, Orebro and Ostergotland, as part of a cross-sectional study.

The questionnaire was designed with six different sections:
Socio-economic conditions: age, gender and occupation, etc…/General health: physician visits, tobacco habits, and drug consumption, etc…/Oral conditions: satisfaction with teeth, problems, oral hygiene habits, number of teeth, etc…/Attitude questions concerning function and appearance of teeth/Experiences and use of dental care/Questions about most recent visits to a dentist.

All questions analysed in this study were the same in 1992 and 1997. Without changing the design of the overall study a few questions were added at the later time. Indicators of dental care utilization were:
Time since most recent dental visit (less than 1 year, between 1 and 3 years, between 3 and 5 years, more than 5 years). Frequency of dental visits (twice or more per year, once a year, every second year, or more seldom).

Comments
Practical aspects: A widely and constantly used, tested and validated method at the European level with a high level of scientific international recognition.
Practical aspects: A widely and constantly used, tested and validated method at the European level with a high level of scientific international recognition. Half of those who had been to the dentist (50%) said they did so for a routine check up; and half (50%) said that they went because they had a dental problem.

All analyses were stratified according to dentition status, because presence or absence of teeth is a very strong predictor of whether an individual visits the dentist. Those respondents with an unknown dental visit history (n = 233), dentition status (n = 55) and private dental insurance status (n = 322) were excluded from the analysis because of the small sample sizes for these groups. Respondents with an unknown poverty status in the poverty status variable were included because this category
including about 11 percent of the total sample, and it was not desirable to eliminate that percentage of respondents from the analysis. The indicators were analysed separately but were also pooled into an index. People who stated that they visited a dentist less than one year ago and also said that they consulted a dental professional two or more times per year were combined into a group of ‘high consumers.’ Those with the most recent dental care visit more than one year ago and regular visits every second year or more seldom were combined into a group of ‘low consumers.’ All others were characterized as ‘average consumers.’ Changes in utilization of dental care were analyzed. An increase in personal expenditure for care was obvious, 42% paid more in 1997 compared with 1992. In the study, 7% had prolonged their time since most recent visit and 12% had less frequent visits. In regression models, education, occupation, place of residence, country of birth, marital status, gender, dental anxiety, having poor perceived oral health and poor general health were associated with utilization. Care organization factors showed there was a greater probability of having higher utilization and higher cost of care when private practitioners provided the care.

References


Major Issues

ENED, using WHO/WHS methodology, provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems.

Using WHO methodology, provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems.

Among dentate adults, the vast majority reported that their last dental visit was for a checkup, examination or cleaning. More than 20 percent reported that their last visit was because something was wrong, bothering them or hurting, whereas the remaining 6 percent said that their last dental visit was for treatment or for a condition found during a previous visit, or because of some other undefined reason. Among edentulous adults, we found a more equal distribution of reasons reported for the last dental visit than we found among dentate adults. Although checkup, examination or tooth
cleaning remained the most common reason, the proportion of edentulous adults who gave the two alternative reasons was substantially higher than the proportion among the dentate group.

Small changes in the utilization of dental care occurred during this study time. Inequality in utilization existed and socio-economic factors affected utilization as well as health perception and dental anxiety. Changes in the cost of care did not affect utilization appreciably, probably because of a selected population with high price elasticity. Having a private care provider compared with one in the public system affected the probability of having higher utilization and higher cost for care.
2.2 B7 – Reason for not Visiting the Dentist in the Last Two Years

Main Reference

Study Objectives
- To describe dental visits for those 60 years of age and older living in urban, rural and remote locations in Western Australia and to determine factors associated with such visits.
- This study sought to estimate and characterize the proportion of California adults who visited a dentist in the preceding year and to identify reasons for not going.

Method of Reference
- Cross-sectional telephone survey.

Population Studied
- 2100 participants in this telephone survey were aged 60 years or over, had a telephone listing, were on the State Electoral Roll and lived in non-institutionalized accommodation.
- 4,029 adults were interviewed by telephone. Items included recentness of a dental visit, dental insurance status, and number of teeth lost due to disease. Persons who had not seen a dentist within the preceding year were asked the main reason they had not gone.

Information Collection Method
- Interviews were conducted by trained interviewers using Computer Assisted Telephone Interview software with subjects contacted until the quota of 800 urban, 800 rural and 500 remote participants was reached. The response fraction was 62% (urban 59%, rural 59% and remote 73%).
- One of the most widely developed systems is the Behavioral Risk Factor Surveillance System (BRFSS), an ongoing state-based telephone survey of randomly selected noninstitutionalized adults. The BRFSS is sponsored by CDC and is conducted in all 50 states, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. Survey participants are at least 18 years of age, live in the United States, and speak English (some states include the BRFSS in Spanish).
- Sample design. The BRFSS protocol specifies that the design must be a state-based probability sample in which all households with telephones have a chance of inclusion.

Comments
- The length of time since the last dental visit was associated with where people lived. Urban residents reported the shortest interval since their last dental visit, followed by rural and then remote residents. Two-thirds of urban respondents reported a dental visit in the previous 12 months compared to just over a third of remote respondents. Over one-fifth of rural and remote residents had not been to a dentist in more than five years.
In 1995, 65.9% of adults reported visiting a dentist in the preceding twelve months. Use of dental services was greater among persons aged 35 years or older (70.4%) than among those aged 18-34 years (58.4%) and among those with dental insurance (74.9%) than those without (54.4%). Dental visits were less likely among adults living at or below 200 percent of the federal poverty level, those with less than a high school education, and the edentulous. Reasons most commonly cited for not seeing a dentist were no perceived reason to go (37.2%), cost (30.7%), and fear (9.2%). Substantial variation in use of dental services exists among California’s adults. Achieving equity in access and opportunity for disease prevention in this state may require expanded dental insurance coverage and serious efforts in oral health promotion.


An increase in the numbers and accessibility (including affordability) of dental services would assist in increasing utilisation rates. However, if lack of access was the only reason for the reduced dental visits by rural and remote residents, the variable measuring perceived difficulty would have explained all of the difference between areas. Clearly there are other factors, not captured in this survey, that underlie the different patterns of use of dental services by locality in Western Australia.

Like all data bases, the BRFSS has limitations which require thoughtful consideration on the part of analysts. However, as one of the largest on-going telephone surveys of health behaviors, and the only source of state-specific data on many health behaviors, the BRFSS has substantial research potential. The usefulness of the BRFSS survey is perhaps best seen in the increasing utilization of the data by states and by health researchers. Since the inception of the survey in 1984, over 200 articles and reports have been published using the data.
Oral Health of General Population
B8 – Tobacco Use Cessation


To examine oral cancer prevention and early detection practice patterns in a population-based random sample of practicing oral health care professionals in the state of New York, to assess the subjects' readiness to offer tobacco-use cessation and alcohol-abuse counseling and oral cancer examinations, and to examine whether there were any demographic or practice-level variables that were associated with lower adherence to recommended health behavior counseling so as to properly target future statewide professional educational initiatives to increase adoption of such practices.

Researchers, public health experts, and the medical community increasingly understand the importance of identifying smoking cessation strategies among this population. This update reviews current research concerning adolescent smoking cessation. Literature from June 1, 2003 to May 1, 2003.

To investigate family physicians and paediatricians' practice of and perceived barriers to smoking cessation counselling among patients 18 years and younger.


United States Public Health Service's smoking cessation guideline.

The Authors selected a population-based, self-weighting, stratified random sample of dentists (n = 1,025) and dental hygienists (n = 1,025) from the roster of licensed oral health care practitioners in New York. The stratification was based on the geographical location of their residence (New York City versus the remainder of New York State). Only professionals who were active in the practice of dentistry or dental hygiene were eligible to participate in the mail survey.

Current research concerning adolescent smoking cessation strategies: Adolescent attitudes toward smoking cessation/Behavioral interventions/5A brief intervention/Pharmacotherapy/Concurrent use of cigarettes and nicotine replacement therapy/Adjunct cessation strategies (Internet-based information, telephone quit lines, self-help pamphlets, videos, and so forth)/Health disparities in adolescent smoking cessation.

1997 American Medical Association Physician Masterfile of family physicians and paediatricians 65 years and younger, who practice in urban California, work at least 10% of the time in ambulatory care, and have at least 10% of the patients 18 years and younger


Five mailings using the Tailored Design Method. The subjects were sent initial contact letters in May 2002. Thereafter, the authors mailed all eligible providers a cover letter, a questionnaire, a stamped return envelope and a new U.S. golden dollar as an incentive. A reminder postcard was mailed two weeks later to the entire study sample. This was followed by a second mailing three weeks later to non respondents. Finally, a complete third mailing was sent to 411 non respondents by overnight delivery three weeks thereafter, with the principal investigator personally signing each cover letter. 499 dentists and 630 dental hygienists responded to the survey, yielding effective response rates of 55 and 66 percent, respectively.
DHHS guidelines include a list of activities and behaviors called "the five As": Ask the patient about his or her tobacco use/Advise the patient to quit/Assess the patient’s willingness to make a quit attempt/Assist in the quit attempt/Arrange follow-up contact, preferably within the first week after the quit date.

The participants were asked to estimate the percentage of their patients for whom they routinely provided each of these five tobacco-use cessation activities: less than 20%, 21 to 40%, 41 to 60%, 61 to 80% and greater than 80%. A percentage of greater than 80 indicated routine adoption of the recommended practice behavior. It was also assessed whether the providers asked in their medical history-taking about patients’ present and past use of tobacco, as well as the type and amount of tobacco used. As with tobacco use, the participants were asked to estimate the percentage of their patients for whom they routinely provided each of the five activities, using the same percentage groupings.

Reviewed surveys have been conducted both on physicians and youth population. Used collection methods: focus groups with high school students, telephone survey, multifaceted school-based pilot study, randomized control trial, self-reported regular smoking survey.

A stratified random sample of 1000 physicians was selected and sent a 31-question self-administered questionnaire based on current smoking cessation literature. The questionnaire was pre-tested with 10 practicing physicians to ensure readability, comprehension of the questions, and inclusion of all important subject matter. Survey packets mailed to physicians included a cover letter with telephone contact numbers, letter of support from professional organizations, the questionnaire, a stamped return envelope, and a $5 bill.

Questions on: Background Physician Information, knowledge of the smoking initiation process, smoking cessation counseling practice (5As, barriers to counselling youth who smoke). Response rate: 55.5%.

The results presented are limited by the self-report nature of this study. Although the rates of oral cancer examinations may be over reported by the respondents, the low rates of oral cancer prevention activities and readiness to offer these services do not indicate that this is the case in this study.

Information concerning adolescent smoking behaviors, effective interventions, and smoking cessation therapy continue to grow and provide data that improve our understanding of adolescent smoking cessation. Although the adult findings cannot be directly extrapolated to this population, adult cessation research continues to inform future adolescent cessation efforts. Moreover, tobacco control intervention in working youth concluded that it is challenging to undertake a smoking cessation intervention in the workplace because of high turnover rates of employed teens.

Practical aspects: This study addressed the paucity of research on physician’s performance of the recommended smoking cessation counselling guidelines among young patients. One limitation of this study is that results were based on physicians’ self-reported behaviors, which were not validated by patients, their guardians, or medical chart reviews. The reported rates are therefore likely to be overestimated.

References


**Major Issues**

- US national as well as local studies have demonstrated that oral health care providers have not widely adopted the published guidelines for tobacco-use cessation counseling. Oral cancer examinations seem to have been adopted as a standard of practice by most oral health care providers in New York state, but cancer prevention services, such as counselling regarding cessation of tobacco use and alcohol abuse, are lacking. Oral health care providers should be trained in oral cancer prevention services such as tobacco-use cessation and alcohol-abuse counseling and encouraged to include these services, along with continued provision of oral cancer examinations, as a standard aspect of care.

- Adolescent smoking rates continue to exceed public health goals. However, the area of adolescent smoking cessation research is still quite young. Child health and behavioral science researchers increasingly recognize the need for further data concerning effective smoking cessation strategies, as well as continued efforts to reduce nicotine exposure. Funders, researchers, and both public and clinical practice organizations can work collaboratively to expand the current research landscape and therefore improve the utility and availability of effective adolescent smoking cessation interventions in practice. Several current National Cancer Institute-funded trials have evaluated systematically the effect of tobacco cessation interventions in youth.

- This study found that physicians are not currently providing paediatric and adolescent patients with desired level of smoking cessation counseling. Consistent with previous studies on adults, the data showed that physicians are more likely to ask and advise young patients on smoking than to assist with or arrange cessation and follow-up activities. To address the main perceived barriers to counselling and increase its practice, physicians should be encouraged to assure their patients of the confidentiality of responses and should receive formal training in counselling skills.

Oral Health of General Population

B8 – Tobacco Use Cessation
Main Reference

Study Objectives
- To determine the caries status and to provide a general evaluation of the level of dental treatment need of Pennsylvania public school children in grades 1, 3, 9 and 11 on a statewide and regional basis.
- To investigate changes in caries prevalence in the primary dentition of children resident in Brussels, Belgium between 1983 and 1998 and to analyse associations between changes in caries and children's socioeconomic and ethnic status.
- To report on caries status and to explore possible reasons for changes in caries experience among 5 and 12-year old Norwegian children.
- To assess the prevalence and severity of dental caries, and trends in the disease in all nine geographic regions of Slovenia.

Method of Reference
- National Health and Nutrition Examination Survey III Protocols (Centers for Disease Control and National Institute of Dental and Craniofacial Research), American Dental Association, World Health Organization.
- Belgium National Institute of Statistics, regional cohort study.
- National cross-sectional and time trend study.
- Sampling and examinations were performed according to WHO standards.

Population Studied
- Population: representative sample of 6040 public school children, age range 6-21 years.
  Type of study: the sample design for this survey was a random multistage PPS (probability proportional to size) selection of school districts from the public school system of Pennsylvania. The selection stages included, in sequence: selection of 1) school districts, 2) schools within districts, 3) children within schools. In selected classrooms, all eligible children were sampled. School districts were selected in the first stage using a list generated from Pennsylvania Department of Education data. Implicit stratification was employed by sorting the list on Dental Health District and school district enrolment size, and proceeding with a systematic PPS selection of school districts with a random start. In the final stage of selection, one class equivalents (approximately 25 children) were chosen for each index grade in each selected school either by random selection of a class or a method of random selection of 25 children from a survey index grade level. The clinical assessment consisted of a clinical epidemiologic oral screening of each child, conducted in the schools. The study used five trained and calibrated examiners in three teams under the supervision of a licensed dentist in Pennsylvania.
  Population: In the Brussels region, children in the first grade at the same schools were sampled in cohort 1983 (n 396) and cohort 1998 (n 473). Caries experience of Belgian and non-Belgian nationals was summarized in dmft scores. The socio-economic status of the children was established based on their parents' education and profession. The children were categorized in eight subgroups in relation to their socio-economic status, ethnic origin and cohort (SESEC subgroups).
  Ethical issues: Bitewing radiographs were not taken, following a recommendation by the ethical committee from the University of Louvain.
The Dental Health Service Act of 1983 obliged Norwegian counties to provide incremental dental care free of charge to persons 0–18 years of age. The 19 counties are divided into 3–9 dental health districts (n = 107), the population of which are served by a varying number of clinics.

In 1987, 1993 and 1998, nationwide surveys on the prevalence of dental caries were carried out in Slovenia. The three surveys were performed in 10 towns which are the economic and cultural centres of the nine geographical regions that make up the territory of Slovenia. The population of each town is between 40,000 and 60,000, so that taken together they have about 500,000 residents, representing about 25% of the population of Slovenia (2.0 million). Fluoride levels in the drinking water are low, varying from 0.01 to 0.05 mg/L in eight of the towns, and 0.24 mg/L in two. Each town has from three to five primary schools and one secondary school.

The study methodology was composed of: Interview with parents of children examined; Questionnaires; Clinical examination: data were collected only at the tooth level. Each permanent tooth was classified as sound, filled, carious or missing. Each primary tooth was classified as sound, filled or carious. Sealants were detected visually by the examiner and recorded as present or absent. Malocclusions was assessed by a modification of the IOTN index ("minor" malocclusion category-"major" malocclusions category). Tooth trauma was indicated as present when the examiner detected a non-caries loss of tooth. Treatment needs were classified in urgent and non-urgent, with specified inclusion criteria. (symptoms, oral soft tissues lesions, requirement of additional diagnostic follow-ups). Each child's parent/guardian was notified on the treatment need status.

Cohort 1983 was examined by one examiner. Two calibrated examiners carried out the examination of cohort 1998. The children had their teeth cleaned and dried before the clinical examination. Dental caries in the primary dentition was visually diagnosed using a plane mouth mirror. A dental probe was employed to identify whether cavitated lesions were soft or hard. Dental caries was assessed according to Møller and Poulsen and summarized in dmft/dmfs index. Thus, a surface was classified as sound when it showed normal enamel translucency without any previous or present signs of caries. A surface was defined as carious when it showed: (i) a lesion with discontinuity in the enamel and loss of substance without dentine involvement, (ii) a lesion as a definite cavity with dentine involvement, (iii) a lesion with probable pulp complication. In the case of missing teeth/surfaces, only those due to caries were included. Dental caries treated by fillings was recorded as such when the presence of a permanent filling was identified on one or more surfaces without the presence of any caries. Additionally, in 1998, a surface showing an opaque area with a dull-whitish surface was recorded as a non-cavitated active lesion.

The minimum and maximum number of children and the proportion of children examined and treated according to age and national administrative level 1997–2000 at 5 years were 60,526–61,086 (82.4-89.1%) and at 12 years 52,747–60,708 (79.7-88.4%). The number of dental districts supplying information varied from 61 (dmft; 1997) to 107. Administrative and dental health data are reported from clinic to district and then to the County Chief Dental Officer. Data aggregated to county level are then reported to the Directorate of Health (national level).

The clinical dental examinations of 12-year-old children are routinely supplemented with one pair of bitewing radiographs. Radiographs for caries diagnostic purposes are not routinely taken at 5 years of age. The components of the dmft/DMFT index were defined as follows: D = tooth requiring restorative treatment because of caries, lost or fractured fillings; M = tooth missing because of caries, and F = filled or crowned tooth without need for treatment. In practice, the caries diagnostic criteria reflect the prevailing restorative treatment intervention level, i.e. cavitation or lesion into dentine. Information was not available at an individual level.

The surveys covered the age groups 6, 12, 15, 18, 35–44 and 65 years or older were studied. In each age group, 200 persons or more were examined on each occasion. The first survey included 1623 subjects, the second 1567 and the third 1301. Each group comprised approximately equal numbers of males and females.
In every town, one randomly selected primary school participated in the surveys; in classes containing children aged 6, 12 and 15 years, every third pupil from the alphabetical list was enrolled. Adolescents aged 18 years were selected by the same procedure in secondary schools. The 35–44 age group was recruited from one randomly selected local factory or institution in each town. Persons aged 65 or older were selected randomly from the membership lists of local retired persons' societies. Dental examinations were performed by three teams, each consisting of two examiners: a children's dentist who examined the children and adolescents, and another dentist who examined the adults. Caries experience was recorded in terms of the DMFT (or dmft) value and its components. In all three surveys, caries was diagnosed at the cavitation level. During the surveys, school dentists in all participating schools (in all nine regions) were asked to complete a questionnaire about preventive care provided to pupils in the past 12 years.

Comments

- Practical aspects: treatment need/untreated caries are easily collectable data within OH status survey. It has been widely used, with a high grade of international acceptance and recognition.
- Terminology: dental caries diagnostic criteria, treatment need (if untreated carious lesion or also urgency of treatment).
- Practical aspects: A widely and constantly used, tested and validated method at the European level which considers socio-demographic phenomena, common to all EU Countries (immigration, educational level, etc.) with a high level of scientific international recognition.
- Terminology: possible variable interpretation at European level of scoring criteria for dental caries.
- Aggregated data from the Public Dental Services (PDS) and from official statistics were used. Information was available on the total number of children, the proportion receiving treatment, sale of fluoride tablets, socio-economic background, caries prevalence and dmft/DMFT scores. As the data were aggregated for each administrative level, the findings for 5 and 12-year-olds are presented as percentage caries prevalence and mean dmft/DMFT scores with a range for counties. The proportion of the population 0–17 years of age classified as first or second generation immigrants was included (http://www.ssb.no, 2001). The change in the number of full-time dental officers according to county between 1993 and 1998 was included along with the percentage of eligible children who were examined and treated.
- It is obvious that a random sample would have been preferable for obtaining an unbiased estimate of caries experience. However, the necessary funds were not available, and so the "Pathfinder" approach was adopted. Great care was taken to use the same methodology in all three surveys. Since the demographic characteristics of Slovenia did not change from 1987 to 1998 (population 2.0 million), the selection procedures should have resulted in samples from which reliable conclusions can be drawn on the changes of caries prevalence. This means that the caries-reducing effect of the preventive programmes is likely to have been assessed with satisfactory precision. It should be pointed out that nine of the 10 towns covered in the surveys are centres of the nine geographic regions of Slovenia and are thus located all over the country. Moreover, the schoolchildren, adolescents and to some extent also the adults and the elderly examined in each town came from different parts of that region.

References

Oral Health of General Population

B9 – Untreated Caries Prevalence


Major Issues

- Dental caries remains the most prevalent disease affecting Pennsylvania's schoolchildren. Caries status varies by region of the state, thus the environmental, social, and demographic contextual factors may be important determinants of disease prevalence.

- Children resident in Brussels showed caries decline in their primary dentition over 15 years. Diversity in caries decline and status was associated with children's socio-economic status and ethnic origin (SESEC). It is important that SESEC subgroups are taken into account in studies of this nature. Considering that more than 1200 dentists and 300–400 caries each year, it is unlikely that diagnostic variability has biased the estimates at national and county level, as even at county level the number of examiners exceeded 30. Thus inter-examiner variability is an unlikely explanation of the significant increase in caries prevalence and experience at the age of 5 years. While the caries trend and the effect of predictors are probably unbiased, underestimation of caries prevalence and extent cannot be precluded when using crude criteria and data recorded by PDS dentists rather than by trained and calibrated examiners.

The study suggests that the caries decline in Slovenia is the result of systematic mass-scale preventive measures, among which supervised brushing with concentrated fluoride gel in primary schools has been the most widespread for the past 20 years. Analyses suggest that improved oral hygiene and extensive use of fissure sealants have also played a significant part. Other factors that contributed to the caries decline were a stable and reasonably prosperous society and a well-organized public oral health service that continued to function without serious problems even when major changes in the social and political system were taking place.
The purpose of this study was to utilize Periodontal Screening and Recording (PSR) to estimate the periodontal health needs of a representative military population and to compare the results with other studies of varying populations.

To assess the periodontal treatment need of the 6th-grade Jordanian pupils aged 12 years old and provide baseline data.

To investigate the oral health and nutritional status of elderly men and women, including those living in institutions, representative of Spanish adults aged 65 years old and over.

To examine the oral health status and treatment needs of California schoolchildren: 84 preschools, 2520 children; 32 elementary schools, 3225 children; 40 high schools and continuation high schools combined, 898 children; 156 schools total, 6643 children total; in October 1993-January 1994, 2005.

Five hundred active duty military personnel at Fort Bragg, North Carolina were randomly selected for evaluation of their periodontal health status using PSR in conjunction with their annual dental examination.

Of the 48 classes examined, an initial sample was 1433 pupils. A final sample of 1388 pupils were examined, of which 534 (38.5%) were males and 854 (61.5%) were females. Their mean age was 12.35 years with a range between 11 and 14 years.

PSR codes are based on the following system:

- **Code 0**: Coloured area of probe remains completely visible in the deepest crevice in the sextant. No calculus or defective margins are detected. Gingival tissues are healthy with no bleeding after gentle probing.
- **Code 1**: Coloured area of probe remains completely visible in the deepest probing depth in the sextant. No calculus or margins are detected. There is bleeding after gentle probing.
- **Code 2**: Coloured area of probe remains completely visible in the deepest probing depth in the sextant. Supra- or subgingival calculus and/or defective margins are detected.
- **Code 3**: Coloured area of probe remains partly visible in the deepest probing depth in the sextant.
Code 4 - Coloured area of probe completely disappears, indicating probing depth of greater than 5.5 mm.
Code * - Denotes clinical abnormalities including but not limited to furcation invasion, mobility, mucogingival problems, or recession extending to the coloured area of the probe (3.5 mm or greater).
Code X - Denotes edentulous sextant.

The sample frame consisted of 288 classes distributed throughout the education region. Four classes for boys and the same for girls were randomly selected from each education zone, producing a total number of 48 classes. The periodontal assessments were carried out according to the World Health Organization for CPITN.

A pilot sample involving 50 subjects were examined by both examiners during a period of 2 weeks prior to the investigation. Another 50 subjects were examined midway through examination. Intra-class correlation coefficient for overall CPITN scores was 0.95 prior to the examination, and 0.97 midway through the examination.

Randomly selected primary care clinics and institutions. The oral health survey included a questionnaire and an oral examination conducted by calibrated dentists. A structured interview on socio-economic status, oral health habits, a Mini-Nutritional Assessment, and a clinical evaluation of oral and dental health, were performed.

Subjects were clinically examined using standard methods recommended by the World Health Organization. The percentage of dentate subjects with healthy gingiva, bleeding on probing, calculus, shallow pockets, and deep pockets (according to the highest CPI score) was recorded. Information on their perceived oral health status and behavior was obtained from an interview.

The sampling frame for the preschool component was obtained from the 1991 California. Health and Welfare Agency computer data file listing all private and public schools in California. The sampling frame used for the elementary schools and high schools and continuation high schools was the 1991 California Department of Education Public Schools data file. Schools were selected such that each ethnic group would be equally represented. In schools where ethnic groups were under-represented, schools with a higher percentage of that ethnic group were over-sampled.

Oral Health Variables
Access to dental care, Caries, Clinical treatment needs, Dental care utilization, Dental insurance, DMFS, Early childhood caries, Extraction, Fluoride supplements, Fluorosis, Last dental visit, Oral health knowledge, Oral lesions, Orthodontic treatment needs, Orthodonture, Periodontal disease/examination (Community Periodontal Index of Treatment Needs: only gingival bleeding and calculus were evaluated), Permanent dentition, Preventive care/oral hygiene, Primary dentition, Restorations, Sealants, Traumatic injuries , Untreated dental decay.

A single calibrated examiner performed all PSR screenings over a two-month period. An assistant recorded the patient’s name, age, rank, gender, racial background, and PSR scores by sextant. PSR is an AAP-ADA validated and well standardized index for periodontal assessment; it’s a modification of CPITN. The teeth to be examined in each sextant (and age-related modifications) can be specified.

The standardization of CPITN at European level is valuable. It has recently been replaced by CPI/PSR indices, but its application is still in use.

The proportion of the population who were edentulous was 31%. The dentate subjects had an average of 15 teeth. Risk of malnutrition was present in 43% of the edentulous and 39% of the dentate, and in 53% of institutionalized and 40% of non-institutionalized subjects. Malnutrition was present in 5% of edentulous and 4% of dentate adults.

Consent forms and questionnaires were completed by parents/guardians of participants. All materials were made available in English, Spanish, Cambodian, Cantonese and Vietnamese. Each exam of the preschool and elementary children took about 3-5 minutes during one day of school. High school participants were examined for about 6 minutes each. No radiographs were used in the clinical examinations.
A total of 23 dentists performed the examinations. Dentists and recorders were standardized during two training sessions. Examiners and recorders followed a training manual developed for this project. Manuals developed by NIDR and WHO were also distributed. Field testing occurred during the training sessions. Reliability data were collected by pairing examination teams producing a 96.3% agreement.

References

Major Issues
- The PSR method is similar to CPI, both modified from CPITN. Both are recognized, standardized and validated methods for the epidemiological assessment of community periodontal health.
- CPITN and its more recent modifications PSR and CPI are recognized, standardized and validated methods for the epidemiological assessment of community periodontal health.
- Despite the low level of edentulousness, the oral health of Spanish adults aged 65 and older is poor. There is also a need to ensure that the overall balance of the diet is not impaired because of the state of the dentition.
- CPITN is one of the most widely used and recognized indices. A number of national dental associations encourage its use among their memberships, and the U.S. Indian Health Service previously used CPITN in its treatment plan before the American Dental Association’s promotion of a slightly modified version, the Periodontal Screening and Recording (PSR).
Main Reference

Study Objectives
- To investigate oral health behavior and attitudes in 1998 and to establish whether attitudes have changed, with a view to determining the implications for the future of dental care.

Method of Reference
- 1998 UK NHS Adults Dental Health Interview Survey.

Population Studied
- In total, 6,204 interviews and 3,817 dental examinations were carried out. An overall household response rate of 74% was obtained. Ninety two per cent of all adults living in responding households took part in the interview and 72% of eligible adults (adults with some natural teeth who had previously been interviewed) had a dental examination.

Information Collection Method
- There were two elements to the survey: a face-to-face interview to collect information on the respondent's oral health behavior, attitudes and opinions; and for respondents with some natural teeth, a home dental examination. The Survey included face to face interviews with participants to determine their dental attitudes and behaviors. A series of questions were asked in the interview to investigate oral health behavior and attitudes. The 1998 responses to these questions were related to previous decades to establish whether attitudes have changed, with a view to determining the implications for the future of dental care.

Comments
- Most adults still perceived that denture wearing was a possibility for them in the future. In 1998, 28% of adults were seen to still be reliant on complete or partial dentures. Since 1968, the perception of having to wear complete dentures as an inevitable feature of ageing has changed. It is now more likely for adults to consider the wearing of full dentures as stigmatic. In 1998, 61% of adults who had no experience of wearing dentures were very upset at the thought of wearing complete dentures. However, only 27% were very upset at the thought of wearing partial dentures.

References

Major Issues
- The data presented in the UK Adult Dental Health Surveys, over three decades of reporting, indicate a steadily improving approach toward more positive dental health attitudes. In particular there is a strong indication that adults increasingly wish to retain their natural teeth and are prepared to undertake certain procedures that have been recommended to them by the dental profession and others. The most important indicator must be the increase in people who would prefer their aching back tooth to be restored rather than extracted.
Main Reference


Study Objectives

- To report the 2002 results of the survey and to compare the caries findings with those from studies carried out in 1996 and 1998.
- This paper describes early findings of evaluations of the International Caries Detection and Assessment System (ICDAS) conducted by the Detroit Center for Research on Oral Health Disparities (DCR-OHD). The lack of consistency among the contemporary criteria systems limits the comparability of outcomes measured in epidemiological and clinical studies. The ICDAS criteria were developed by an international team of caries researchers to integrate several new criteria systems into one standard system for caries detection and assessment. It will also include, in the near future, clinical criteria to differentiate between active and inactive carious lesions. ICDAS definitions describe in some details the clinical characteristic of each stage of the caries process as well as noncarious lesions that should be excluded.
- To use these data to analyze trends in the development of caries among children and adolescents between 1973 and 1993.

Method of Reference

- From the schools (kindergartens and sixth grades at elementary schools) in The Hague, a random selection, after stratification with respect to three socio-economic status (SES) levels (low, medium and high) of schools, was undertaken. The SES classification per elementary school was determined by the average SES of the population in the respective area of the city in which the particular school was situated. Eleven schools were selected.
- ICDAS.
- Four cross-sectional studies were carried out in 1973, 1978, 1983, and 1993 to collect clinical and radiographic epidemiological data on the dental health status of the inhabitants of Jonkoping, Sweden.

Population Studied

- All school governors except one assented to the investigation of the children. This school was replaced by another school in the same area of the city. Additionally the parents of all second-grade children born between 1-8-1996 (d-m-y) and 1-2-1998 and all sixth-grade children born between 1-8-1990 and 1-2-1992 were asked by letter for written permission to participate (n = 1,067). Parental consent was not received for 11% of the children (n = 114). At the examination day, 12% of the children were not present, leading to a total sample size of 832 children.
- Population: A total of 292 and 338 paired assessments of subjects were conducted to estimate inter- and intra-examiner reliabilities in wave I and II, respectively. Collectively the examiners scored a total of 23,322 and 26,174 tooth surfaces to estimate their reliabilities in wave I and II, respectively.
- Screening period: The inter- and intra-examiner reliability was assessed throughout two waves of data collection in 2002–03 and 2004–05.
- A randomly selected sample of 500 individuals from four parishes in the city of Jonkoping, Sweden, in the age groups 3, 5, 10, 15, and 20 years was examined clinically and radiographically in 1973. In the same manner, new random samples of 500, 527, and 523 children and adolescents in the same age groups and the same four parishes were selected in 1978, 1983, and 1993, respectively. The samples originally consisted of 130 individuals in each of the age groups in each year of examination.
Caries diagnosis was carried out according to Marthaler's [1966] reduced count method with the aid of a dental mirror, intra-oral fibre-optic light and a compressed air source enabling teeth to be dried. The clinical diagnosis was in principle based on visual inspection. A tooth surface was considered carious if the examiner judged that a cavity had penetrated the dentine. No bite-wing radiographs were taken. The criteria for caries diagnosis in the surveys in The Hague did not change in the period 1996–2002. Scoring of the type of restorative material was added to the dental caries protocol in 2002. Presence of sealants was recorded separately.

Using ICDAS in the DCR-OHD cohort study, dental examiners first determined whether a clean and dry tooth surface was sound, sealed, restored, crowned, or missing. Afterwards, the examiners classified the carious status of each tooth surface using a seven-point ordinal scale ranging from sound to extensive cavitation. Histological examination of extracted teeth found increased likelihood of carious demineralization in dentine as the ICDAS codes increased in severity. The criteria were also found to have discriminatory validity in analyses of social, behavioral and dietary factors associated with dental caries. The reliability of six examiners to classify tooth surfaces by their ICDAS carious status ranged between good to excellent (kappa coefficients ranged between 0.59 and 0.82).

Four cross-sectional studies were carried out in 1973, 1978, 1983, and 1993. All participants were personally invited to take part in the study and informed about examination procedures. Not all of the selected individuals participated in the study. The reasons for not taking part were recorded. The numbers of non-respondents were similar in 1973, 1978, 1983, and 1993. In each of the age groups, a total of 12%–23% of those asked to participate did not do so for the following main reasons: could not be reached (0.7%), had moved (3%–12%), had recently visited their dentist (0%–7%), military service (3%), had no special reason, were not interested, pregnancy, or had many siblings/children (17%–36%).

Diagnostic criteria

Clinical caries: all tooth surfaces available for clinical evaluation were examined for caries according to the criteria described previously. Initial caries: loss of mineral in the enamel causing a chalky appearance but not clinically classified as a cavity. Manifest caries – carious lesions on previously unrestored surfaces that could be verified as cavities by probing and in which, on probing in fissures using light pressure, the probe stuck.

Radiographic caries: lesions seen on the proximal tooth surfaces not accessible for clinical examination as clearly defined reductions in mineral content. Initial caries – a) the lesion was not deeper than 2/3 of the enamel and b) the lesion was deeper than 2/3 of the enamel but did not involve the dentin. Manifest caries – the lesion extended into the dentin. Occlusal tooth surfaces with sealed fissures were reported as intact tooth surfaces.

Questionnaire: The questions were aimed at obtaining information on their oral hygiene habits, dental attendance pattern and professionally applied fluoride application. No questions about diet, e.g. consumption of food and drinks during the day and night, were included in the questionnaire. Children were supervised whilst filling in the questionnaire.

Table of presentation: Percentages (% caries-free and 95% CI) of 6 and 12-year-old caries-free children (dmfs, respectively DMFS = 0) and mean dmfs/DMFS score per child (BSD) in 1996, 1998 and 2002, according to SES and nationality.

One important goal in developing ICDAS is to provide flexibility for clinicians and researchers to choose the stage of caries process and other features that fit the needs of their research or practice. The radiographic examination of the 3 and 5-year-olds comprised two bite-wing radiographs. In the 10, 15, and 20-year-olds, a full mouth intraoral radiographic examination was performed in 1973. In 1983 and 1993 the radiographic examination of the 10, 15, and 20-year-olds comprised four posterior and two anterior bite-wing radiographs.

References


**Major Issues**

**Trends in the percentages of caries-free children and mean decayed, missing and filled (DMFT) counts reported in this paper could be biased due to the use of restorative materials used in the period 1996–2002. The use of adhesive materials increased substantially in The Netherlands during the last decade. It is not unlikely that the use of tooth colour matching adhesive materials has increased the chance of misdiagnosis and, consequently, of underestimating the F component of the dmfs/DMFS counts and hence overestimating the percentage of caries-free children.**

While further work is still needed to define caries activity, validate the criteria and their reliability in assessing dental caries on smooth surfaces, and develop a classification system for assessing preventive and restorative treatment needs, this early evaluation of the ICDAS platform has found that the system is practical, has content validity, correlational validity with histological examination of pits and fissures in extracted teeth, and discriminative validity.

The diagnostic criteria for caries were unchanged during the 20 years encompassed by these studies. The introduction of the systematic use of fissure sealant in the early 1980s resulted in a marked drop in the number of decayed occlusal surfaces. In fact, most of the improvement seen in decayed and filled surfaces (DFS) among 10, 15, and 20-year-olds can be explained by the reduction in occlusal caries.


The aim of this study was to evaluate factors associated with the DMFT change in the period 1993-2001 in Lithuania. Data from two national surveys about 12 and 15 year old cohorts were available for this purpose.

To determine the beneficial and harmful effects of different recall intervals (for example 6 months versus 12 months) for different types of dental check-up, to determine the relative beneficial and harmful effects between any of these different types of dental check-up at the same recall interval, to compare the beneficial and harmful effects of recall intervals based on clinicians’ assessment of patients’ disease risk with recall intervals, to compare the beneficial and harmful effects of no recall interval/patient driven attendance (which may be symptomatic) with recall intervals.

The secondary objective of this review was to determine the beneficial and harmful effects of different recall intervals for each of the different types of interventions mentioned above for specific age groups and according to initial levels of caries severity (DMFS, DMFT, or other measure).

This paper describes the occurrence of dental caries in children and adolescents in Greenland and the disease pattern is analyzed across districts and over time.

To collect the DMFT and CPITN values in a population of young Italian male subjects, namely call-up soldiers and cadets, and relate them to the socio-economic status of the subjects.

To assess the feasibility of gathering dental epidemiological information by General Dental Practitioners during routine dental examinations.

WHO Oral Health Surveys Basic Methods.

Cochrane Collaboration.

WHO Oral Health Surveys Basic Methods.

World Health Organization caries diagnostic criteria for decayed, missing, and filled teeth.

World Health Organization (WHO) caries diagnostic criteria for decayed, missing, and filled teeth.

Population and screening period: the sample was composed of 1250 children aged 12 and 15 in 1993 and 935 in 2001. The sample was based on stratified random selection of participants from nine regions throughout Lithuania. In each nine pre-selected areas, schools were chosen randomly. In order to include subgroups that might reflect variation in oral disease experience, the sample was stratified according to urban and rural background and according to the naturally occurring fluoride content in the drinking water.

The authors searched the Cochrane Oral Health Group Trials Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and EMBASE. Reference lists from relevant articles were scanned and the authors of some papers were contacted to identify further trials and obtain additional information.

Date of most recent searches: 9th April 2003.

Selection criteria: Trials were selected if they met the following criteria: design - random allocation of
Participants; participants - all children and adults receiving dental check-ups in primary care settings, irrespective of their level of risk for oral disease; interventions - recall intervals for the following different types of dental check-ups: a) clinical examination only; b) clinical examination plus scale and polish; c) clinical examination plus preventive advice; d) clinical examination plus scale and polish plus preventive advice; e) no recall interval/patient driven attendance (which may be symptomatic); f) clinician risk-based recall intervals; outcomes - clinical status outcomes for dental caries (including, but not limited to, mean dmft/DMFT, dmfs/DMFS scores, caries increment, filled teeth (including replacement restorations), early carious lesions arrested or reversed); periodontal disease (including, but not limited to, plaque, calculus, gingivitis, periodontitis, change in probing depth, attachment level); oral mucosa (presence or absence of mucosal lesions, potentially malignant lesions, cancerous lesions, size and stage of cancerous lesions at diagnosis). In addition, the following outcomes were considered where reported: patient-centred outcomes, economic cost outcomes, other outcomes such as improvements in oral health knowledge and attitudes, harms, changes in dietary habits and any other oral health-related behavioural change.

In 2003, the study population counted 645 6-year-olds; 587 12-year-olds, and 488 15-year-olds. The participation rate was approximately 100%.

 italian academies' call-up soldiers and cadets aged from 19 to 25.

10 volunteer adult patients in order to record decayed, missing and filled teeth.

Caries recordings were obtained following the World Health Organization (WHO) criteria for epidemiological studies. Oral hygiene levels were estimated using a simplified OHI-S Greene–Vermillion index. Natural daylight was used for all clinical examinations. In the 1993 study, one examiner did the clinical registrations, while in the 2001 study two examiners were involved in clinical registrations. The intra-examiner agreement was not estimated. The inter-examiner agreement of DMFT scores was measured applying the j index. A j value of 0.78 for the inter-examiner agreement was considered satisfactory. Dental health-related habits were assessed by means of structured questionnaires. Each questionnaire was checked for missing answers at the time of the clinical examination. Questionnaires included the following information: year of examination, gender, date of birth, area of residency, and information about a number of dental health-related habits. The reliability of self-reported measures was not estimated.

The following age groups were considered in the review:
Children aged 6 years of age and younger (deciduous dentition)/Children aged 7 to 13 years of age (mixed dentition)/Adolescents aged 14 to 17 years of age (permanent dentition)/Young adults aged 18 to 25/Adults aged 26 to 55/Older adults aged 56 years and older.

Information regarding methods, participants, interventions, outcome measures and results were independently extracted, in duplicate, by two authors. Authors were contacted, where deemed necessary and where possible, for further details regarding study design and for data clarification. A quality assessment of the included trial was carried out. The Cochrane Oral Health Group's statistical guidelines were followed. Only one randomized controlled trial satisfied the eligibility criteria for this review.

Dental caries outcomes are reported in terms of: Caries experience: mean dmft/DMFT, dmfs/DMFS scores/Caries increment as measured by changes in the mean dmf/DMFS and dmft/DMFT scores/Untreated decayed teeth/surfaces (by site, if given, i.e. occlusal, approximal etc.)/Missing teeth/Filled teeth (including replacement restorations)/Sound teeth/surfaces/Teeth/surfaces affected by caries into dentine/humbar, size and severity of white spot lesions/Early carious lesions arrested or reversed/Root caries (adults only, any index).

Cross-sectional population surveys of children aged 6, 12 and 15 years. Data were stored in the oral health information system established for the Greenland Public Dental Health Services, recording the dental health status of children served by the programme. Dental caries is clinically recorded according to the criteria used by the Danish Public Dental Health Services.

The sample was made up of two groups from different Italian academies: call-up soldiers: 1184 male call-up soldiers aged from 19 to 25; cadets: 2477 cadets aged from 19 to 25. The level of education...
was evaluated by means of a questionnaire which the soldiers had to fill in before being examined. Two trained dentists carried out the epidemiological survey following WHO guidelines.

Ten General Dental Practitioners (GDPs) and five Community Dental Officers (previously trained as dental examiners for epidemiological purposes) performed dental examinations. Agreement assessed by the kappa statistic showed that both the previously trained dental examiners and the GDPs assessed tooth conditions other than tooth decay consistently. Furthermore, all of the GDPs were within the range of findings of the previously trained dental examiners for missing teeth and total DMFT score.

Who methodology applied, DMFT diagnostic threshold not specified.

Practical aspects: Wide review on OH status assessment methodologies in scientific literature.

The study employed WHO methodology which is widely recognized and internationally applied.

Practical aspects: WHO methodology applied, widely recognized and internationally applied methodology.

Eight of the 10 GDPs were within the range of findings for the previously trained dental examiners’ assessments of which teeth were filled and seven were within the range for decayed teeth. However, the previously trained dental examiners were more consistent in classifying teeth as decayed than the GDPs.

References


The dental caries burden is high in children in Greenland compared to Denmark and other Nordic countries. It is unrealistic to achieve international goals for oral health and, thus, the strengthening of oral health promotion and disease prevention is urgently needed. Extensive variations by district in dental caries indices were observed for all age groups. The dental caries experience tends to increase with time in young children, while the dental caries level remained stable for adolescents.

The results showed that call-up soldiers have a higher decayed, missing and filled (DMFT) index and the decay (D) value is higher in less educated subjects. Bleeding on probing did not vary either between call-up soldiers and cadets or among socio-economic subgroups. Such results have underlined the need for a systematical information campaign on oral hygiene in Italian schools.

Obtaining adult oral health data during elective dental consultations in General Dental Practice as a means to gather dental epidemiological information for adults is feasible.
Main Reference


Study Objectives

- Few recent nationwide studies of the periodontal landscape in European countries have been developed from the point of view of attachment loss and pocket depth. Decision-makers are not always in a position to estimate the burden of periodontal disease. The purpose of this study was to investigate the prevalence and the oral distribution of periodontal status among dentate adults in the general population of France.
- To investigate the association between oral health indicators and coronary heart disease (CHD) deaths among Finnish adults aged 30-69 years during a 12-year follow-up.
- This paper was prepared by the Research, Science and Therapy Committee of the American Academy of Periodontology and was intended for the information of the dental profession.

Method of Reference

- Health surveys.
- American Academy of Periodontology.

Population Studied

- The population studied to meet the first National Periodontal and Systemic Examination Survey (NPASES I) objectives comprised adults aged between 35 and 64 years, living in all 22 administrative Regions of metropolitan France, who underwent a health check in one of the 116 national health insurance “Caisse Nationale d’Assurance Maladie des Travailleurs Salariés” (CNAMTS) Health Examination Centers (HECs) between September 2002 and June 2003. The target population from which the sample was drawn consisted of 20,323,726 individuals.
- The baseline data for this study were based on the Mini-Finland Health Survey, conducted during 1978-80. The study group in this comprehensive health survey was a two-stage cluster sample drawn from the population register and stratified to represent Finns aged 30 years and over. The first stage consisted of the selection of 40 representative areas. In the second stage, a systematic sample of inhabitants was drawn from each area. The sample size was 8000, of whom 7217 (90.2%) participated in the health examination. The subjects were first interviewed for socio-economic factors, health behaviour, and other health determinants at home. The participants then underwent a health examination, including physical and dental examinations. This study group was comprised of all 3091 men and 3436 women aged 30-69 years with complete examination data.
- Prevalence is the number of cases of a disease in a designated population at a given point. Best information on the prevalence of numerous conditions, including periodontal diseases, comes from the results of national surveys of representative samples conducted by the US National Centre for Health Statistics and the National Institute of Dental and Craniofacial Research, with additional data from smaller scale surveys of specific, non-representative groups.

Information Collection Method

- Recruitment was carried out in the framework of the normal activity of the 29 HECs taking part in the study. The number of HECs randomly selected by region depended on the weight of the regional population. On the basis of an estimated prevalence of 3.9% for mild to severe periodontal disease in adults derived from the ICSII study developed in France in 1993, the sample size was calculated to be 2,144 to obtain a precision rate of 95% (IC:95%). The sampling technique adopted in the light of the study objectives was that of site quotas, a non-probabilistic method based on a Bayesian model. The quotas method consists of building up a
The sample that reproduces faithfully the studied population. The sampling method was similar to that used in the WHO’s 1995 International Collaborative Study II France program. It involved a 4-fold stratification, by age, gender, socio-professional category and Region. Participation in the study was strictly voluntary, and all invited persons were informed by an invitation letter and during the examination regarding the use of the data. For periodontal recordings, the mouth was divided into four quadrants which were used as the basic units for registration. Gingival inflammation was registered according to the method of Löe and Silness (1963). Each jaw quadrant was examined and classified into one of four categories: (1) no inflammation, (2) gingival inflammation, (3) periodontal pocket(s) from 4 to 6 mm deep, and (4) pocket depth(s) exceeding 6 mm. For periodontal status, subjects were categorized according to the worst periodontal condition in the mouth. Dental plaque status was measured separately for each jaw quadrant.

The basic clinical measures for periodontitis, apart from gingival bleeding and radiographic assessment of bone loss, are clinical attachment loss (CAL) and probing depth (PD). Composite indexes are now considered invalid and have thus been discarded. Although CAL, a measure of accumulated past disease at a site rather than current activity, remains a diagnostic “gold standard” for periodontitis, the absence of consensus on how best to incorporate CAL and PD into a case definition of periodontitis continues to hamper clinical and epidemiological research. Studies have measured CAL and PD on all teeth, all teeth in two quadrants, the worst teeth in each sextant, and selected index teeth. Measurements have been made on six, four, two, and one sites per tooth. As one illustration of the problems that follow this lack of uniformity, it has been suggested that the 1985-86 National Survey of Oral Health in U.S. Employed Adults and Seniors may have underestimated the national prevalence of periodontitis because it measured only two sites per tooth (mesiobuccal and mid-buccal) in one maxillary and one mandibular quadrant. Furcation and lingual areas, the places where disease is considered most likely to develop, were not included in the survey protocol.

Two indices – attachment loss and pocket depth – served as references for this transverse snapshot. The periodontal status of each subject was assessed on the basis of the amount of clinical attachment loss (CAL). Severity based on the most severe site in the mouth was characterized as follows: Slight = 1 or 2 mm CAL, Moderate = 3 to 4 mm CAL, and Severe = ≥5 mm CAL. Extent by severity (slight, moderate, severe) was characterized as “localized” (≤30% of site involved), or “generalized” (>30% of site involved).

Education level, obtained from the interview, was used as an indicator of socio-economic level. According to smoking history reported at the interview, participants were categorized as current smokers, quitters, or never-smokers. Diabetes was defined as a reported history of disease diagnosed by a physician. Participants were defined as having high blood pressure if they reported taking continuous medication for hypertension or if untreated systolic blood pressure exceeded 170 mm Hg or diastolic blood pressure 100 mm Hg. High serum cholesterol was defined as 7.8 mmol/L or above.

Determining the prevalence of periodontitis in the U.S. population, seemingly a straightforward issue, in fact is complicated by the various case definitions used. If periodontitis is defined as the identification of at least one site with CAL of ≥2 mm, around 80% of all adults are affected, and around 90% of those aged 55 to 64.8,4. When the case definition is at least one site with CAL of ≥4 mm, the prevalence in those aged 55 to 64 drops to around 50%. When it is CAL of ≥6 mm, prevalence is less than 20%.39 Using pockets of ≥4 mm as a case definition, 30% of adults had met that criterion on at least three to four teeth. When measured at population level and without adjustment for possible confounders, prevalence is greater in African-Americans and in Native Americans.

In periodontitis, “incidence” is often taken to mean new sites that meet a definition of periodontitis, even if these occur in people who already have other diseased sites. The term is also applied to an increase in CAL or bone loss in a site that has already been recorded as diseased. As with prevalence, measures of periodontitis incidence will vary according to the case definition of the disease. The more severe the extent of CAL or bone loss that is defined as incidence, the lower will be the incidence of periodontitis recorded.
Major Issues

The estimates based on a representative sample of the national population in France, can be useful for the study of periodontal status of the adult in Europe providing essential components of oral health information systems for the analysis of trends in oral disease and the evaluation of oral health programmes at the country, regional and global levels. These outcomes may be important to evaluate the level of periodontitis, and can be valuable for decision-makers to estimate the burden of periodontal diseases.

Of the several previously studied oral health indicators, periodontal infections have been suggested to have a unique position as a risk factor for CHD. Periodontal infections, measured as depth of periodontal pockets, were very common in our study population, with only a minority of the population having healthy periodontal tissues. The use of mouth quadrant as the basic unit of registration for periodontal pockets may have caused overestimation of the severity of periodontitis. Because the majority of subjects manifested periodontal pockets, it was difficult to demonstrate gradual worsening of periodontal status and subsequent gradual increase in CHD risk. At the time of the baseline study, the Periodontal Treatment Need System (PTNS) method was commonly used for epidemiologic studies. However, current opinion is that use of attachment loss would be a better proxy for the bacterial and inflammatory burden over the years.

This paper represents the position of the American Academy of Periodontology in regard to the state of knowledge in 2005 about the epidemiology of periodontal diseases. It supplies a recognized, standardized and validated method for the epidemiological assessment of periodontal health.


2.2 B15 – Cancer of the Oral Cavity

Main Reference


Study Objectives

- This website provides access to information on the world-wide occurrence of cancer held by the Descriptive Epidemiology Group (DEP) of the International Agency for Research on Cancer (IARC). The Group’s core function is to collect, collate, analyze and interpret data on cancer incidence, mortality and survival worldwide. These data provide the background for studies of cancer epidemiology and prevention. The Group supports and coordinates cancer registration throughout the world. Collaboration is most active with registries in developing countries, where the problems caused by cancer are poorly defined, and includes field studies to elucidate the causes of cancers that are important locally.
- To survey dentists in British Columbia and Nova Scotia on their practices and opinions related to oral and pharyngeal cancer.

Method of Reference

- WHO International Classification of Diseases.
- GLOBOCAN (a software program which provides access to information on the incidence and prevalence of, and mortality from 26 major cancers for all the countries in the world)
- Postal interview survey.

Population Studied

- For each application, the data are organized following five axes:
  1. the period or the year (except GLOBOCAN 2002), 2. the population 3. the cancer site 4. sex 5. age (except GLOBOCAN 2002) or the data type (GLOBOCAN 2002 only).
- In February 1998, a pre-tested, 41-item survey was mailed to a random sample of dentists in British Columbia (n = 817) and the population of dentists in Nova Scotia (N = 423). A reminder postcard and one additional mailing were sent to respondents who had failed to reply.

Information Collection Method

- Cancer incidence and survival data are provided by cancer registries, which document cases of cancers within a particular region, and mortality statistics are produced by national statistics systems.
  - The data on incidence and survival of children and adolescents in Europe (Automated Childhood Cancer Information System (ACGIS) project).
  - Mortality data extracted from the World Health Organization (WHO) databank.
  - The most recent estimates of the cancer incidence, mortality and prevalence, by sex and cancer site, for all the countries of the world (GLOBOCAN 2002).
- Of the 670 dentists supplying usable responses (response rate 55.2%), only 56.7% agreed that their knowledge of the subject was current. Of 8 health history items, dentists assessed 5 on average, with most (88%) asking about the patients’ current use of tobacco.

Comments

- Practical aspects: access, standardization and availability are of high standard, due to the national cancer registries and an internationally and validated data collection method.
- Terminology: no variable interpretation on relevant terms.
- A total of 72.7% of the responding dentists performed an oral cancer examination for all edentulous patients at every appointment, but 10.9% never did so. Similarly, 70.7% of the dentists always provided an oral cancer examination at the initial appointment for patients 40 years of age and older, but 9.8% never did so. Undergraduate training related to oral cancer examination was reported as good by only...
52.2% of the dentists. About three-quarters of all dentists (77.0%) were interested in taking continuing education courses on this subject. Differences between the 2 provinces were not statistically significant.

References


Major Issues

- This website provides access to information on the occurrence of cancer world-wide held by the Descriptive Epidemiology Group (DEP) of IARC. It is the international database on cancer epidemiological data and provides a high level of access, availability and scientific recognition. A regular procedure of validation is carried out by the Descriptive Epidemiology Group (DEP) of IARC to provide accurate data for the growing number of projects that it manages.
- Dentists in British Columbia and Nova Scotia could benefit from undergraduate and continuing education courses to increase their knowledge of health history assessment, examination for oral and pharyngeal cancers, and risk reduction strategies, such as counseling about tobacco cessation.
**2.2 B16 – Functional Occlusion Prevalence**

**Main Reference**

**Study Objectives**
- To analyze various clinical and radiographic data on oral health and compare the results to those of three cross-sectional studies carried out in 1973, 1983, and 1993.

**Method of Reference**
- National Health System.

**Population Studied**
- All subjects were inhabitants of the city of Jonkoping, Sweden.

**Information Collection Method**
- In 1973, 1983, 1993, and 2003 a random sample of 1,000; 1,104; 1,078; and 987 individuals, respectively, were studied. The individuals were evenly distributed in the age groups 3, 5, 10, 15, 20, 30, 40, 50, 60, 70, and 80 years. In 1973 80-year-olds were not included. The clinical and radiographic examination assessed edentulousness, removable dentures, implants, number of teeth, caries, restorations and overhangs, oral hygiene, calculus, periodontal status, endodontic treatment, and periapical status.

**Comments**
- Due to disparities in the availability of oral health indicators it would not be possible to reproduce this study in all EU countries.

**References**

**Major Issues**
- The comparison of the four studies shows that there has been a great overall improvement in oral health in Sweden over this 30-year period.

Study Objectives: To determine associations between method of payment for dental services and perceived oral health in the UK and to determine whether private service users were more likely to achieve the World Health Organisation's goal of 'retaining 20 teeth without having recourse to a denture' and perceive that their oral health had a greater positive influence on their quality of life compared to NHS service users, accounting for other factors.

Method of Reference: National Health Survey.

Population Studied: Population random probability sample of 2718 adult UK residents.

Information Collection Method: This study was conducted with the assistance of the Office for National Statistics employing their 'omnibus' surveys, a household survey of UK residents. From the Postcode Address File (the most complete list of addresses in Britain) 100 postal sectors were selected, from which 30 household addresses were randomly selected throughout the country, 2718 of which were eligible addresses, the others being unoccupied buildings. Trained interviewers sought to carry out a face-to-face interview with an adult respondent at each household address selected. Respondents were interviewed in their homes about their method of payment for dental services ("Was your dental treatment provided under NHS, privately or some other way?"), service use (time and reason for last dental visit), self-reported oral health status (information about their oral health status was based on self-reports of number of teeth possessed and denture status of participants) and the impact of their oral health on their quality of life (employing the 16-item OHQoL-UKq measure).

Comments: Practical aspects: the use of the indicator related to the World Health Organisation's goal of retaining 20 teeth without having recourse to a denture' seems to be well comprehended by the respondents. Terminology: the indicator title appears to be not completely consistent with the indicator rationale and definition (proportion of adults with 21 or more teeth).


Major Issues: The assessment of oral health status relied on participants self-reporting of number of teeth possessed and denture status. While this may be less than ideal, there is strong evidence to suggest that the public is very adept at providing such basic information. Tooth loss and denture status may appear to be a rather crude assessment of clinical oral health status, but it does remain a key WHO goal.


To determine the level of dental health care coverage in people aged 18 years across Mexico, and to identify the factors associated with coverage.

By searching databases, the objective of this study was a systemic literature review from 1986 to 2004 concerning the most prevalent oral problems experienced by elderly Brazilians, aimed at revealing the main obstacles for accessing health services.

The authors describe oral health indicators for the older adult population by place of residence in the United States.

### Method of Reference

- World Health Organization for the World Health Survey.
- World Health Organization.
- Centers for Disease Control (CDC), National Health and Nutrition Examination Survey (NHANES), National Health Interview Surveys (NHIS).

### Population Studied

Population: instruments and sampling strategies developed by the World Health Organization for the World Health Survey; a cross-sectional national survey was carried out at the household and individual (adult) levels. Dental data were collected in 20 of Mexico’s 32 states, from 38746 households, with a mean of 1250 households for each state.

Screening period: The National Performance Evaluation Survey (ENED) was conducted between November 2002 and April 2003.

Centro Latino-americano e do Caribe de Informação em Ciências da Saúde (BIREME), MEDLINE, LILACS e BBO, virtual library SciELO databases.

The authors analyzed data from the Third National Health and Nutrition Examination Survey and the 1995, 1997 and 1998 National Health Interview Surveys. Oral health indicators included perceived oral health (self-reported dental status and unmet dental needs) and dental status (untreated caries; decayed, missing and filled permanent teeth, or DMFT; and edentulism). Dental care utilization and access were measured by number of dental visits, frequency of dental visits and dental insurance status. For the study, people aged 65 years or older were included as over 65 is often the age associated with retirement and is the age for eligibility for Medicare coverage. The sample size of people 65 years of age or older in each survey included in this study was 6002 in NHANES III, 13306 in NHIS 1997 and 1998 and 11151 in NHIS 1995.

### Information Collection Method

Secondary analyses on health survey data from a nationally representative sample in Mexico were conducted and the methodology has been previously published. ENED was part of the technical collaboration between the Ministry of Health of Mexico (SSA) and the World Health Organization, which used the survey instrument and sampling strategies developed by WHo for the World Health Survey (WHO). The National Institute of Public Health (INSPI) and the General Direction of Performance Evaluation of the SSA implemented the ENED. ENED provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems. The sample design was probabilistic, multistage, stratified, through conglomerates, and was calculated to provide representative information at the state level, and across urban and rural areas. Three strata were
considered: (a) cities or metropolitan areas (locales with >100,000 inhabitants); (b) urban settings (locales with 2500 to 99,999 inhabitants), and (c) rural areas (locales with <2500 inhabitants). The sample size considered: 9% as the smaller proportion to estimate; state estimations with a maximum relative error of 25%; a confidence level of 95%; nonresponse rate of 15%; and a design effect of 1.7. The complete WHS instrument was not used in every state, and in some cases the dental items were omitted. Data on dental conditions are only available for 20 of the 32 states of Mexico, leading to a total of 24,159 households included in this study. The national nonresponse rate was 3.1%.

WHO/WHS ORAL HEALTH CARE - Questions to be asked to all respondents

“Now I would like to ask you some questions about the condition of your mouth and teeth.”

Q6750 During the last 12 months, did you have any problems with your mouth and/or teeth? Yes/No/If No: Go to Q6757

Q6751 During the last 12 months, did you receive any medical care or treatment from a dentist or other oral health specialist for this problem with your mouth and/or teeth? Yes/No/If No: Go to Q6757

“What types of care or treatment did you receive for this problem with your mouth and/or teeth?”

Q6752 Medication: Yes/No

Q6753 Dental work/oral surgery: Yes/No

Q6754 Dentures or bridges: Yes/No

Q6755 Information or counseling on dental care/oral hygiene: Yes/No

Q6756 Other oral treatment: Yes: Specify _______/No

Q6757 Have you lost all of your natural teeth? Yes/No

Systematic literature review.

NHANES III, 1988-1994, and the 1995, 1997 and 1998 National Health Interview Surveys, or NHIS. These surveys were multistage, complex, sample design surveys of the civilian noninstitutionalized population of the United States and were conducted by the National Centre for Health Statistics, or NCHS, component of the Centres for Disease Control and Prevention. NHANES III collected data through personal interviews, physical examinations that included detailed oral examinations and laboratory analyses.

Total tooth loss was ascertained with the question: “Have you lost all of your upper/lower natural (permanent) teeth?”

The authors preferred self-reported data from NHIS to examination data from NHANES III because the larger sample size in NHIS allowed for more stable estimates.

Comments

Practical aspects: A widely and constantly used, tested and validated method at the European level with a high level of scientific international recognition.

Several references (all local) on edentulousness and socio-economic status.

Simple and understandable questions comparable to those used by WHO.

References


Major Issues

ENED, using WHO/WHS methodology, provides policymakers with reliable and internationally comparable baseline information on a variety of health indicators, including measures of general population health and the effectiveness of health systems.

Most articles reported a high percentage of edentulism. The main barriers for access to dental services were poor education, low income, and scarcity of public oral health services.

Although loss of teeth results from oral diseases such as dental caries and periodontal diseases, it also reflects patients’ and dentists’ attitudes, availability and accessibility of dental care, and the prevailing standard of care. One approach to improving access to dental care for rural elderly people is to extend dental insurance/National Health System coverage.


To quantify development assistance for health to countries of central and eastern Europe and the Commonwealth of Independent States (CEE-CIS).

This article reports a survey of the systems for the provision of oral healthcare in the 28 member and accession states of the EU/EEA in 2003. Descriptions of the systems were collected from the principal dental advisers to governments in the individual states.

USA national descriptive data on children's experience with dental caries and dental visits were reviewed in order to provide participants with an overview of these disparities. The Authors used sociodemographic variables, including age, race, family income, sex, parental education, and geographic location, to characterize the dental status of US children and their access to dental services.


Chief Dental Officers (CDOs), WHO and World Bank websites. In states without a CDO, descriptions were gathered from CDO equivalents or senior academics.

Centers for Disease Control/National Institute of Dental and Craniofacial Research, National Health and Nutrition Examination Survey.

Health systems in many countries of central and eastern Europe and the Commonwealth of Independent States (CEE-CIS).

The extent and nature of government involvement in planning and coordinating oral healthcare services and the numbers and pay of the oral healthcare workforce varied between the different models. Six patterns for the administration and financing of oral healthcare in the expanding EU:

Beveridgian - healthcare provided from general taxation

Bismarkian - health insurances offering wide population coverage, comprehensive treatment and benefits connected with frequent dental visits.

The Eastern European (in transition) - there has been wide scale privatization of the previously public dental services. However, most of the EU accession (Eastern European) states seemed to be slowly developing insurance systems to cover oral health treatment costs.

Nordic - the public dental services still have strong political support and some expansion has occurred.

Southern European - public dental services seemed to have gained some acceptance for the treatment of children and special needs groups.

Hybrid - in the UK, which has a unique public dental service system, there are plans to make big changes in the delivery, commissioning and remuneration of dental services in the near future.

For this review, the authors selected data sources that represent the entire US population of children in the last decade. These sources include the 1986–94 Third National Health and Nutrition Examination Survey, the 1993 National Health Interview Survey, and the 1996 Medical Expenditure Panel Survey.

International development assistance can have a significant impact on the economic and social development of recipient countries. The importance of official development assistance (ODA) has been repeatedly emphasized during conferences of the United Nations. The UN Millennium Development Goal 8 specifically calls upon donor communities to increase its aid efforts. Despite this renewed political
commitment, the actual levels of ODA have shown a declining trend since 1992. Social and economic upheavals have affected health systems in many countries of central and eastern Europe and the Commonwealth of Independent States (CEE-CIS) in the past decade and the health status of the population has declined. In a number of countries of the former Soviet Union, life expectancy has still not recovered to the levels that existed a decade ago and has shown a deteriorating trend in recent years. However, most development assistance for health is still destined for the “traditional” developing countries, particularly in sub-Saharan Africa, with the CEE-CIS countries receiving little or no attention.

The authors analyse whether international development assistance for health to the CEE-CIS region is commensurate with the existing health needs of the region and its financial resources. The authors considered possible reasons for the current low allocation with respect to health indicators, such as child mortality and life expectancy, and whether higher levels of national health expenditures per capita result in lower external assistance for health.

Data sources: International Development Statistics database of the Organization for Economic Co-operation and Development and the database on development assistance for health compiled for the Commission on Macroeconomics and Health to quantify health development assistance to the region, compared to global and overall development assistance. The analysis was based on standard health indicators, including child mortality, life expectancy at birth and health expenditures.

A template (model description) was used to guide all respondents. Additional statistical information on oral healthcare costs and workforce was collected from the Council of European Chief Dental Officers, WHO and World Bank websites.

The NHANES detailed interview includes demographic, socio-economic, dietary, and health-related questions. The examination component consists of medical and dental examinations, physiological measurements, and laboratory tests administered by highly trained medical personnel. Tooth decay, or dental caries, were selected as the primary marker for children’s oral health and visits to the dentist as the marker for care. The authors selected these 2 markers because tooth decay remains the prominent oral disease of childhood and because there is reliable national data for dental office visits. This contribution summarizes national data available through 1999. No secondary analyses or multivariate studies of interactions between sociodemographic factors were conducted. Procedures for clinical examiners and interviewers are consultable at: http://www.cdc.gov/nchs/data/nhanes/nhanes_03_04/DentalExaminers-2004.pdf

Practical Aspects: the analysis of trends in development assistance for health over time was difficult due to lack of appropriate data. Furthermore, the way money is spent is likely to matter more for health outcomes than the sheer amount of public expenditure, although it is hard to imagine that the extremely low expenditures in some areas have no negative impact on health. To the best of available knowledge this analysis has been the first comprehensive look at the issue. In countries of the CEE-CIS, non-communicable diseases play a much greater role in the burden of mortality and disease than in traditional developing countries, which are often characterized by high rates of communicable diseases and high levels of infant and child mortality. The results lend weight to the hypothesis that non communicable diseases are being overlooked in development assistance worldwide.

Practical Aspects: Only a minority of member states appeared to collect data on uptake of services and care costs and there were great difficulties in assessing outcomes of care.

The data on costs appeared to show wide variations from member state to member state in per capita spending on oral healthcare. In the majority of states, however, costs, especially those in the private sector, could only be estimated.

Others related EGOHID Indicator: C2

Disparities in oral health status and access to dental care are evident when comparing race-ethnicity and parent educational attainment data. The fastest growing populations of children are those that currently have the highest disease rates and the lowest amount of dental care. These results are consistent with the migration situation in Europe.
Oral Health Systems
C1 – Cost of Oral Health Services

References


Major Issues

Although total development assistance per capita to the CEE-CIS was higher than that for most other regions of the world, development assistance for health was very low compared to other countries with similar levels of child mortality, life expectancy at birth and national expenditures on health. The allocation of development assistance for health on a global scale seems to be related far more to child mortality rather than adult mortality. Countries of CEE-CIS have a high burden of adult morbidity and mortality from non-communicable diseases, which does not appear to attract proportionate development assistance. Levels of development assistance for health should be determined with consideration given to the region’s particular burden of disease.

At a ‘macro’ level, the study indicated that, in 2000, the 28 member and accession states of the EU/EEA had a total population of 456 million and an oral health workforce of 900,000 (some 300,000 of whom were dentists) and that the cost of oral healthcare was about € 54,000,000,000.

The study showed wide variations in oral healthcare provision systems between EU/EEA member and accession states and no evidence of previous harmonization.

Data from this survey has been used in epidemiological studies and health sciences research, helping develop public health policy, direct and design health programs and services, and expand health knowledge in the USA.
Main Reference


Study Objectives

This paper provides an overview of the U.S. Surgeon General’s 1998 report on oral health, describes the burden of oral diseases and craniofacial disorders in the United States, and draws parallels with the state of dental health in Canada and in the province of Ontario. It concludes by focusing on the report’s recommendations for future action and briefly notes some of the lessons that Canadians can learn from these findings.

Method of Reference

U.S. Surgeon General’s report.

Population Studied

United States, Canada and Ontario population.

Information Collection Method

Official national U.S. and Canada data.

Comments

Estimates of national expenditures for dental health care and financing and reimbursement mechanisms demonstrate that Americans invest substantially in oral health care services. Expenditures for dental services alone made up 4.9% of U.S. health expenditures in 1998 — $53.8 billion out of $1.1 trillion. However, this figure does not take into consideration dental care expenditures for services provided by dentists (and by non dentists in hospital settings) for the management of severe early childhood caries, cleft lip or cleft palate, or facial injuries. Although they are somewhat outdated, 1989 expenditures on dental services in Canada made up 5.5% or $3.1 billion of total health care expenditures. Public funds accounted for only 14% of these expenditures in 1987. The proportion varied from 3% in Ontario to 75% in the Yukon and the Northwest Territories. Group dental insurance plans paid dentists $1.13 billion in total direct claims in 1997. For administrative-services-only plans, the total benefit payments in 1996 were $1.15 billion.

Other related EGOHID Indicator: C1

References


Oral Health Systems

C2 – Gross National Product Spent on Oral Health Care Services

2.3

C2 – Gross National Product Spent on Oral Health Care Services
Major Issues

The goal of this paper was to stimulate further discussion of the issues raised in the report, in an effort to encourage public-private partnerships dedicated to the creation and support of programs to make oral health a more integral component of general health.


2.3 C3 – Dentists and Other Oral Care Providers

Main Reference


Study Objectives

Since 1993, the CECDO have gathered key data relating to the oral health workforce, dental education, costs and oral health indicators. The Council aims to provide a forum for the exchange of views on dental matters which affect European Union and European Economic Area member countries. It exists to offer advice to National Governments, to the Commission and others on matters affecting European dentistry through the creation and maintenance of a contact organization for European Chief Dental Officers. The Council also maintains links with international organizations, research institutes and industry. Cooperation with European countries outside EU/EEA is also considered important.

Method of Reference

The Council of European Chief Dental Officers (CECDO).

Population Studied

All EU and EEA populations.

Information Collection Method

CECDO exchange knowledge and data between CDOs which can influence the current and future policy of national governments with respect to dental care. CECDO co-ordinate pan-European activities related to improvements in technology, dental care and dental education, take a proactive role in the development of programs designed to improve the quality of dental public health.

In addition the Council has developed a databank on European oral health, dental care, dental workforce and education. This databank will serve as a source of validated, quantitative and qualitative information against which programmes to improve oral care can be measured.

These data have been collected by the use of questionnaires sent to Chief Dental Officers or their equivalents at two yearly intervals between 1994 and 2000 and then again in 2003 (most of the data gathered in the 2003 survey were for 2002).

Other related EGOHID indicators:

CECDO DATABASE includes a brief report of other EGOHID OH indicators:

B12 - % 12 year olds DMFT = 0.
B13 - DMFT score for 12 year olds.
B18 - % 65 year olds edentulous.

C2 - % GNP spent Healthcare and % GNP spent in Dentistry.

Comments

Practical Aspects: The CECDO databank has a high level of access, standardization and availability at all EU Countries level. It has been widely used, been tested and validated and has a high level of scientific/international acceptance/recognition.

References


Major Issues

The CECDO databank will serve as a source of validated, quantitative and qualitative information against which programs to improve oral care can be measured.

The database is a valuable, maintained source of all educational and workforce in oral health in Europe.
Main Reference

Study Objectives
- To determine the self-perceived knowledge and attitudes of general dental practitioners (GDPs) concerning management of dental trauma in primary care. To identify potential barriers to the management of dental trauma in primary care.
- To identify issues, obstacles, and priorities related to implementing and using child health care quality measures from the perspectives of 4 groups: 1) funders of quality-measurement development and implementation; 2) developers of quality measures; 3) users of quality measures (including Medicaid and the State Children’s Health Insurance Program, employer coalitions, and consumer groups); and 4) health plans and providers (in their role as both subjects and users of quality measures).
- The aims of the study were to exchange experience of external quality improvement in the European Union by identifying existing organisations actively pursuing such systems, by cataloguing achievements, and by networking, to establish mechanisms for collection and dissemination of concepts, implementation and training. The study also aimed to support integration of external systems with internal quality improvement and to define a common framework and criteria for health service standards, surveyor training and programme operation.

Method of Reference
- Postal questionnaire survey.
- Consumer Assessment of Health Plans Survey and Health Plan Employer Data and Information Set, followed by the Child and Adolescent Health Measurement Initiative.
- EU Health Systems. Participants were representatives from EU countries supplemented by other experts, about 50 in all. In addition to the partnership organizations, contacts was also made with pan-European and international bodies (European Organization for Quality, European Societies for Quality in Health Care, European Accreditation, International Society for Quality in Health Care (ISQua)).

Population Studied
- All 417 general dental practitioners providing dental care in the areas of Newcastle, Northumberland, North Tyneside, South Tyneside, Gateshead and Sunderland were included in the survey to eliminate any possibility of subject selection bias and provide the maximum volume of data. The response rate was 74%.
- Effort was made to assure some representativeness among the groups as follows:
  - Funders: a balance of federal agencies and private foundations.
  - Developers: a mix of federal agencies, non profit organizations, and accrediting groups.
  - Users: a mix of users drawn from state Medicaid agencies and SCHIP programs, private employer purchasing coalitions, and child consumer advocacy groups. Within each of these subgroups, an attempt also was made to assure some geographic distribution.
  - Plans and providers: a balance of institutional and ambulatory care providers, health plan administrators, and school-based service providers.
- Given time and budget parameters for the project, the total number of interviews was limited to 40.
Managed by CASPE Research in the UK, ExPeRT’s partners and research team comprised key health care quality professionals from EU member nations, associated countries and specialists throughout the world.

A self-completion postal questionnaire survey of 417 GDPs in six local health authority districts in northeast England. Likert scale responses to 20 statements designed to test self-perceived knowledge and attitudes. Following descriptive statistical analysis. Factor analysis with principle components analysis was undertaken to identify areas of correlation in questionnaire responses.

The questionnaire was subjected to pre-pilot assessment by eight GDPs who worked part-time in Newcastle Dental Hospital, followed by a pilot survey of ten GDPs outside northeast England. Current lists of GDPs were obtained from the six local health authorities.

GDPs were asked about the numbers of patients attending their surgery with dental trauma during the previous 12 months, their ability to provide appropriate emergency and long-term treatment for dental trauma, barriers to management of dental trauma in primary care (NHS payments for treating trauma, postgraduate courses in the treatment of dental trauma competency in dental trauma treatment).

A series of semi structured interviews was conducted with 40 opinion leaders drawn from the 4 groups.

The interviews were conducted by telephone between September and December of 2001. Major topic areas covered in the interviews were similar across the groups. Topic areas included 1) strategic vision and/or objectives for funding, developing, or using quality measures for children’s health care; 2) a brief summary of the specific quality measures funded, developed, or used; 3) issues and challenges facing funders and developers of measures; 4) major successes achieved; 5) obstacles to implementation and use of measures; and 6) priority needs for future funding.

Four methods of developing and assessing organisational standards range from the medical specialty-driven “visitatie/visitatie” in the Netherlands, through traditional accreditation (developed in North America and Australia) and European Quality Awards (and national variants) to industrial certification, using ISO standards. Much of the project was devoted to analysing their differences and similarities in purpose, scope, methods and impact.

Language: adoption of common definitions between models, especially reconciliation with ISO terminology.

Standards: adoption of international conventions (e.g. ALPHA principles for standards) consistent with principles of ISO and EFQM; testing new programmes (e.g. JCIA) against these principles.

“Cross-walking”: mapping existing standards to international conventions in order to define gaps, overlaps and conflicts; identifying equivalent standards and criteria between models to enable comparison and conversion through relational databases.

Assessment: adoption of ALPHA standards for programme operation, particularly internal mechanisms, to minimise observer variation and promote reliability and consistency.

Quantification: making explicit the measurement and weightings of compliance with standards as a basis for the evaluation of reports and for tracking progress of health care providers over time and in relation to similar organisations.

Clinical performance: incorporating tests to demonstrate measurement and improvement against evidence-based clinical standards; defining and embedding standardised indicators of clinical process and outcome.

Assessment skills: adopting common core curriculum of knowledge, attitudes and skills required of assessors; developing reciprocal training programmes.

This study demonstrated a high self-perceived ability of GDPs to manage the simpler forms of dental trauma. Confidence was much lower in relation to more complex cases.

Ethical issues: following ethical approval from regional and local research ethics committees, a self-completion postal questionnaire was developed with advice from paediatric dentists, community dentists and a senior lecturer in dental public health. The questionnaire was confidential and consisted of a series of statements with a Likert scale graded from ‘strongly disagree’ to ‘strongly agree’.
Other related EGOHID indicators: C5.

Leaders from all four groups acknowledge the importance of developing a robust set of quality measures that can serve multiple objectives and multiple audiences. Standardization of measures was viewed as a critical feature related to all objectives. An assessment of specific quality measures funded, developed, or used by strategic objective showed a high correlation between the uses intended by funders and developers and the actual applications of the various users. The most commonly cited measures across all groups were the Consumer Assessment of Health Plans Survey and Health Plan Employer, Data and Information Set, followed by the Child and Adolescent Health Measurement, Initiative and special topic studies to support quality-improvement applications (e.g., asthma, diabetes, etc.).

This paper is a summary of the operation, findings and conclusions of a European Union project on external peer review techniques, termed ‘ExPeRT; to research the scope, mechanisms and use of external quality mechanisms in the improvement of health care. Many of the themes outlined are described in detail in other papers that have been prepared specifically for Volume 12 of The International Journal for Quality in Health Care. Although the emphasis of this project and of Volume 12 of the Journal is on Europe, the conclusions are more widely relevant.

References


Major Issues

Although GDPs believed that financial remuneration was inadequate, this did not prevent them treating trauma cases. They strongly agreed that they had responsibility for the management of dental trauma in primary care and that they believed trauma could be treated more effectively in practice if payment was greater. Time constraints were perceived as a barrier to long-term management of complex trauma cases in primary care. GDPs would welcome the use of management aids.

The five top needs for future funding identified across all four groups follow directly from the major obstacles that they reported: 1) develop the business case for children’s health care quality measurement and improvement based on rigorous cost-benefit analysis and documentation of quantifiable successes; 2) develop new measures to fill the gaps in critical areas (including adolescent health care, behavioral health, and chronic conditions) that can be applied at the hospital and ambulatory care provider levels; 3) invest in building needed research capacity, a trained pool of users of quality measures, and the capacity among providers to understand and use quality-improvement methods and tools; 4) invest in developing an information infrastructure that will support the efficient collection and use of measures for multiple purposes, including clinical practice, quality measurement, and quality improvement; and 5) develop increased public awareness and support for quality measurement based on improved strategies for communicating with consumers, purchasers, providers, and policy makers.

Until recently concerns for quality of care have focused on the content of the care provided. Attention has now turned to improving the quality of delivery and management of health care services, a change brought about by rising quality-consciousness, together with the introduction of user fees in government facilities and consumers’ growing expectations of receiving better health care. The ExPeRT project was established to identify systems used in Europe to improve the quality of service management and delivery.
2.3  

C5 – Satisfaction of Dentists with the Remuneration Provided

Main Reference

Study Objectives
- To examine job satisfaction among clinical dentists in Victoria, Australia; to examine differences in job satisfaction among private and public dentists and characteristics of dentists; and to measure job satisfaction among registered clinical dentists in order to identify issues which may influence recruitment and retention of dentists in active clinical practice.
- To measure job satisfaction of general dentists in Kentucky U.S.A.
- To identify sources of dissatisfaction which affect the retention of Community Health Centre (CHC) dentists and to determine CHC dentist salaries.

Method of Reference
- Interview survey with questionnaire.
- Interview survey.
- National Health System.

Population Studied
- Dentists selected from the 1999 Victorian Dental Register, Australia (80 private and 80 public sector).
- A questionnaire was administered to general dentists in Kentucky (N = 987).
- All known CHC dentists from the 10 Health Resources and Services Administration (HRSA) regional dental consultants or their counterparts. We then sent the survey to all dentists employed by CHCs that had dental components.

Information Collection Method
- A questionnaire measuring dimensions of job satisfaction was mailed to a stratified random sample of private and public dentist. An introduction letter and self-completed questionnaire were mailed to the randomly selected dentists with two rounds of follow-up mailings sent to non-respondents. The questionnaire collected information relating to dentist characteristics (age, gender, country of birth, year and school of graduation), area of dentistry (general practice or other), practice type (i.e., public or private) and job satisfaction.
- The questionnaire used for this research was based on a job satisfaction questionnaire developed by Williams et al. for use among US general medical practitioners.
- The Dentist Satisfaction Survey (DSS) is an instrument that measures both specific facets related and overall job satisfaction of dentists. The DSS contains 54 statements representing 11 facet scales and one overall satisfaction scale. The responses are measured on a 5 point Likert scale.
- Data sources: Health Resources and Services Administration (HRSA); HRSA regional dental consultants; dental directors from key community, migrant and homeless health centres; the primary investigator and other interested parties. After designing the questionnaire, we sent it to the 10 regional dental directors and other experienced CHC dental directors to test for validity and reliability. The authors eliminated redundant or ambiguous questions in this process. The institutional review board of the Texas A&M Health Science Centre, Baylor College of Dentistry, Dallas, approved the questionnaire and survey process. The addresses of all known CHC dentists were obtained from the 10 HRSA regional dental consultants or their counterparts. The survey was sent to all dentists employed by CHCs that had dental components. The survey addressed general job satisfaction determinants and included questions about salaries and benefits. CHC dentists nationwide were surveyed regarding salary and job satisfaction indicators. The authors mailed 569 surveys, and the response rate was 73.8 percent. The authors explored associations between job satisfaction indicators, salaries and dentists’ intentions to leave the CHCs.
The participants were asked to indicate their level of agreement or disagreement with the statements on a five-point Likert scale with '1' indicating strong disagreement (and hence strong dissatisfaction) and '5' indicating strong agreement (and hence strong satisfaction).

Differences in job satisfaction between male and female dentists related to the personal time dimension. Differences in satisfaction between dentists of different age groups were attributable to six dimensions: relationships with colleagues, with patients and with staff, personal time, community and administrative responsibilities. Differences between levels of satisfaction among private and public dentists related to autonomy, relationships with patients, remuneration and resources.

Results of the stepwise multiple regression showed that 60% of the variance of the dependent variable, overall job satisfaction, was attributable to six job facets: respect, perception of income, delivery of care, stress, patient relations, and professional time. The most significant predictors of dental job satisfaction involved the intrinsic rewards of being a dentist and the delivery of dental health services. Less satisfying aspects of dentistry included business operations, including practice management and financial planning. Despite concern among educators about the potential influence of student loan debt, there was no significant correlation between student loan debt and overall job satisfaction.

Practitioners in private practice are the largest group of dentists recruited by CHCs (54.5 percent). However, 31.2 percent of currently employed dentists do not intend to remain in CHC dental practices. Salary was not associated significantly with the intention to leave. Years of experience, freedom of professional judgment, altruistic motivation, importance placed on loan repayment and amount of administrative time allowed were associated significantly with career change intentions. Employment opportunities in public non profit practices are increasing under federal grant programs. However, unless job satisfaction issues are addressed adequately with dentists in social safety net programs, additional work force needs will not be met.


Dimensions with which dentists were less satisfied were compensation and administrative responsibilities. The compensation dimension was measured by items relating to satisfaction with total remuneration package, whilst administrative responsibilities addressed satisfaction with paperwork requirements and the amount of administrative work to be done.

Findings from this study have implications for student recruitment, dental school curriculum design, and dental workforce planning. Job satisfaction has been called a barometer of the dental profession.

Periodic salary surveys can monitor factors associated with recruitment and retention of dentists in community and migrant health centers, and standardized exit surveys can identify factors causing dis-satisfaction among dentists who leave.
## 2.4 D1 – Oral Disadvantage due to Functional Limitation

### Main Reference

### Study Objectives
- The 1998 Adult Dental Health survey was the first of the decennial series of UK adult dental health surveys to use and report a measure of the self-perceived impact on people of the dental and periodontal diseases and other oral conditions.
- To determine the effectiveness of dental health care services in facilitating recovery from quality of life decrements in symptom-specific subgroups with the most prevalent chronic infectious diseases (periodontal disease and dental caries), and a 'stained teeth' subgroup.

### Method of Reference
- Shortened Oral Health Impact Profile (OHIP 14). The survey was carried out under the auspices of the Office of National Statistics together with the Universities of Birmingham, Dundee, Newcastle-upon-Tyne, and Wales.
- Data were taken from the prospective longitudinal Florida Dental Care Study.

### Population Studied
- For the 1998 survey, 4,984 addresses were identified at which all adults over 16 in residence were asked to take part; 21% of households refused and no contact was made at 5% of them. In total, 6,204 adults were interviewed following which those with some teeth were asked to undergo a dental examination: 3,817 (72%) of those eligible agreed. A weighting system based on some of the interview responses of those who consented to be dentally examined and those who were interviewed but not dentally examined was used to reduce bias from non response.
- 873 subjects who participated at baseline were 45 years old or older, had a telephone, did not reside in an institutional setting, resided in one of four counties in north Florida, could engage in a coherent telephone conversation, and had at least one tooth.

### Information Collection Method
- The Oral Health Impact Profile (OHIP) scale is one of the dental family of health ‘quality of life’ scales that span the whole range of medical conditions. The original OHIP scale consisted of 49 questions organized into seven categories or dimensions. This long form of the OHIP scale would be suitable for use in clinical practice where a practitioner might want to establish an objective baseline against which to assess the impact of a course of dental care. This shortened scale (OHIP-14) was the more practical to use in the context of the Adult Dental Health survey where many other questions needed to be asked. Shortening the scale did mean that some of the comprehensiveness of the original OHIP scale was lost. However, it still allowed a basic overall measure of the impact of oral health on a national basis to be assessed.
- Question: "How often during the past 12 months have you experienced difficulties with eating and chewing food due to mouth and teeth problems."
  - For data entry, responses were coded never=0, hardly ever=1, occasionally=2, fairly often=3, fairly often or very often=4.
- Other related EGOHID indicators: D2, D3, D4, D5
- Telephone conversation: Adjusting for age, race, gender, income, approach to dental care, and signs/symptoms, any dental visit, corrective treatment, denture visit or extraction were positively associated with recovery. Upon conditioning the analyses on specific symptoms, point estimates increased substantially for most service types, and dental cleaning was associated with recovery for the stained teeth subgroup.
Oral Health Related Quality of life
D1 – Oral Disadvantage due to Functional Limitation

Other related EGOHID indicators:
D3 - avoiding laughing or smiling because of unattractive teeth or gums.
D3 - avoiding talking to someone because of unattractive teeth or gums or bad breath.
D4 - being embarrassed by the appearance or bad health of teeth or gums.
D2 - The tooth disease subgroup had a toothache, cavity or abscess.

Comments
- Practical aspect: OHIP 14 is a validated questionnaire widely used and standardized method of assessing OHRQL and has a high level of international acceptance.
- Telephone interviewing is a widely used method of collecting data on OHRQoL. It has to be performed using a standardized questionnaire and interview methodology. Its reliability is also based on people's attitude in answering. Logistic regression modelling quantified associations between recovery from oral health-related quality of life decrements ('recovery') and dental services.

References

Major Issues
- Pain and psychological discomfort were the most frequently reported problems; social physical and psychological disability being in the middle of the order; and handicap being the least frequently experienced problem.

There is a need for dentists and dental epidemiologists to consider how people live with their oral health state through the use of measures such as OHIP in order to appreciate where a person is so adversely affected by their dental condition that they are handicapped by it.

- Dental care was highly effective in treating quality of life decrements. Treatment effectiveness increased substantially when analyses were restricted to symptom-specific subgroups similar to selection criteria of randomized clinical trials (RCTs). Restricted cohort analyses can be applied to many other health outcomes for which RCTs are not feasible or ethical.
2.4 D2 – Physical Pain due to Oral Health Status

Main Reference

Study Objectives
- To develop Spanish version (OHIP-Sp) of the Oral Health Impact Profile and to evaluate its convergent and discriminative validity, and its international consistency.
- To assess the reliability and construct validity of the Child Oral Health-Related Quality of Life for 8–10-year-olds using confirmatory factor analysis and to test the measurement properties of latent variables believed to define the multidimensional construct of OHRQoL.

Method of Reference
- Interview Surveys with original 49-items OHIP.
- Child Oral Health-Related Quality of Life using confirmatory factor analysis. Coopersmith Self-Esteem Inventory-School Form.

Population Studied
- The study group was sampled using a multistage random cluster procedure yielding 9,203 high school students aged 12-21 years from the Province of Santiago, Chile.
- A convenience sample of 270 Year 4 children attending primary schools in the targeted area of Northern Ireland was obtained. Schools were selected from areas of low socio-economic status which broadly represented the segregated school system that operates in Northern Ireland (i.e. state, or non-denominational schools, and denominational, or Catholic, schools). Consent of all children, parents/ guardians of the participating pupils was obtained.

Information Collection Method
- The original 49-items OHIP was translated into Spanish. The data originated in a cross sectional study conducted among high school students from the Province of Santiago, Chile. All selected students were invited to participate and all filled a questionnaire with information on socio-demographic factors; oral health related behaviors, and self-reported oral health status.
- Of the 9,203 students who completed the questionnaire, 9,163 students also filled in a detailed questionnaire on socio-economic indicators and received a clinical examination. The participation rate was high (99.9%), with OHIP-Sp students answering at least 44 items and 87.2% of the subjects answering all of the questions.
- D2 related Question: “How often have you experienced tooth ache/painful gums/sore spots in the past 12 months”.
- For data entry, responses were coded; never = 0, hardly ever = 1, occasionally = 2, fairly often = 3, fairly often or very often = 4.

Other related EGOHID indicators: D1, D3, D4, D5.
- A member of the research team made preliminary contact with the targeted schools. The schools were issued with a sample of the questionnaire, the parent and child consent forms and offered the opportunity to express any concerns in relation to their content. The Principal, the Senior Management Team and class teachers in each school were met and reassured and encouraged to stress the ‘fun’ aspect of the whole process of the questionnaire administration with the children. A standardized protocol was employed when administering the questionnaire which required that the researcher be present in the classroom to provide assistance and ensure independent and confidential responding, to read out the instructions and items verbatim to the children, and to give advice to them, explaining the answering scheme if necessary. The researcher collected the consent forms and questionnaires. The questionnaire consisted of three parts:
- The first inquired of the children’s age, and gender. A third question asked the children if their teeth
or mouth had bothered them. This question was assessed on a four-point Likert scale ranging from 'not at all' (score 4) to 'a lot' (score 1).

The second part was the 25-item COHRQoL questionnaire designed by Jokovic (10) at the University of Toronto. The questions were related to the teeth and mouth and whether in the last 4 weeks children experienced pain, sore spots, pain when drinking or eating cold drinks or foods, food packing or bad breath. The remaining questions assessed, whether in the last 4 weeks the children had, as a result of their teeth or mouth, difficulty in eating, sleeping, talking, smiling, laughing, socializing, concentrating or speaking out in class or had felt shy, worried or had been teased or questioned by other children about their teeth or mouth. Responses to the questions were assessed on a five-point Likert scale. The responses ranged from 5, 'Never'; 4, 'Once or twice'; 3, 'Sometimes'; 2, 'Often'; to 1, 'Everyday or almost everyday'.

The third part of the questionnaire was the Coopersmith Self-Esteem Inventory-School Form (Coopersmith SEI-SF), for 8–15-year olds. The Coopersmith SEI-SF was developed as a measure to assess children's attitudes towards themselves in general, and within particular social contexts – with regard to their relationships with peers and parents; their self-esteem in school-based situations and the extent to which their self-esteem impacts upon their personal interests. The Coopersmith SEI-SF has high reliability and validity.

Other related EGOHID indicators: D1, D3, D4, D5.

**Comments**

- Practical aspects of original 49-items OHIP translation and validation process were well described.
- It is important that attention is paid to terms and cultural aspects during language translation. The OHIP-Sp revealed suitable convergent and discriminative validity and appropriate internal consistency (Cronbach's $\alpha$). Further studies on OHIP-Sp warrant the inclusion of populations with a higher disease burden; and the use of test-retest reliability exercises to evaluate the stability of the test.

**References**


**Major Issues**

- The original 49-items OHIP is a validated questionnaire widely used to assess OHRQoL in different health fields. Its application can be difficult due to the questionnaire length.
- Reliability and construct validity were demonstrated for COHRQoL and supported the scale for adoption as an epidemiological and scientific tool for group comparisons. Confirmatory Factor Analysis showed that the three constructs or latent variables underlying the overall COHRQoL ratings were discrete measures that can be reliably assessed in children. Further model testing with additional data will increase generalization of these findings.
### 2.4 D3 – Psychological Disability Due to Oral Health Status

**Main Reference**

**Study Objectives**
- To compare the dimensions of oral health related quality of life measured by a generic health state measure, the EuroQol and a specific oral health measure, the 14 item Oral Health Impact Profile.

**Method of Reference**
- Interview Survey including EuroQol (EQ-SD+) and 14 – items version of the Oral Health Impact Profile (OHIP-14).

**Population Studied**
- A total of 378 dentists in Australia responded to the survey (response rate 60%). Data were available from 375 patients (response rate 72%). Data were collected in 2001 – 2002 from a random sample of South Australian dentist using mailed self-completed questionnaires.

**Information Collection Method**
- Data were collected during 2001 – 2002 in Australia with a primary approach letter sent initially to each dentists, followed a week later by the survey materials, with a reminder card two weeks later. Diagnosis of dental conditions was collected from dentists and patients questionnaires were sent out. Dentists recorded the diagnosis of dental problems and provided patients with self – completed questionnaires to record the nature, severity and duration of symptoms using EuroQol (EQ-SD+) and 14 – items version of the Oral Health Impact Profile (OHIP-14) instruments. Factor analysis and hierarchical cluster analysis were used. Question: “How often you felt tense because of teeth, mouth or denture problems in the past 12 months?” For data entry, responses were coded; never = 0, hardly ever = 1, occasionally = 2, fairly often = 3, fairly often or very often = 4. Other related EGOHID indicators: D1, D2, D4, D5.

**Comments**
- Practical aspect: OHIP 14 is a widely used and standardized method of assessing OHRQL with a high level of international acceptance. Despite being a generic measure, the EuroQol has shown discriminant validity in relation to a range of dental patient, visit and oral health measures. Ethical issues: the research project was reviewed and approved by the Human Research Ethics Committee of the University of Adelaide.

**References**
- Brennan DS, Spencer AJ. Mapping oral health related quality of life to generic health state values. BMC Health Serv Res. 2006 Aug 7;6:96.

**Major Issues**
- The partial separation in the domains of both instruments confirms that generic and specific measures can be used in combination to capture different elements of quality of life. EuroQol taps daily activities such as self-care and usual activities and OHIP deals with oral health-specific aspects.
Main Reference


Study Objectives

- Oral health studies conducted so far in Nigeria have documented prevalence and incidence of dental disease using traditional clinical measures. However, none have investigated the use of an oral health-related quality of life (OHRQoL) instrument to document oral health outcomes. The aims of this study were to describe how oral health affects and impacts quality of life (QoL) and to explore the association between these effects and the oral health care seeking behavior of adults in Benin City, Edo State, Nigeria.
- The study compared the validity of the short form of the Oral Health Impact Profile and Oral Impacts on Daily Performance (OIDP) as measures of oral health-related quality of life in patients with xerostomia in the UK.

Method of Reference

- Interview survey. The closed-ended questionnaire was prepared in English and consisted of the 16 key questions of OHRQoL identified in the OHQoL-UK© by McGrath et al. 2000.
- Interview survey including clinical indicators for xerostomia (salivary flow, clinical signs, and salivary gland condition and Xerostomia Inventory, OHIP14, OIDP and speech function assessment (Assessment of Intelligibility of Dysarthric Speech and the Robertson Dysarthria Profile).

Population Studied

- For the study, 426 people were recruited, of which 356 (83%) had complete usable information. Participants aged 18–64 years were recruited from two large out-patient medical care facilities (University of Benin Teaching Hospital and Central Hospital), and from the adjacent university community. Three interviewers were trained by one of the authors.
- A cross-sectional comparison of OHIP14 and OIDP with measures of clinical indicators, xerostomia symptom status, speech function, global oral health ratings and psychological well-being, in 85 patients attending outpatient clinics. Of 136 people who were invited to participate, 92 were recruited but six declined because of work commitments, ill health, lack of interest or childcare commitments. For one participant, the majority of clinical data were missing, leaving a total of 85 participants. Of these 85 (20 men, 65 women), the mean age was 59.8 (SD = 11.5) and they had had xerostomia for an average 6.3 years (SD = 6.3). Seventy-four participants (87%) were identified as white, with eight (9%) describing themselves as Black African, Black Caribbean, or Black other. Most of the sample was retired (58%).
- Inclusion criteria for participation were: (i) one or more symptoms of xerostomia from the European screening questionnaire (19), and (ii) whole unstimulated salivary flow <0.2 ml/min, which encompassed those with symptomatic xerostomia and secondary Sjogren's syndrome. Participants meeting the above criteria but who had: (i) clinical evidence of candidiasis on visual examination or Candida spp. colony counts >1000 cfu/ml from initial microbiology tests on saliva, or (ii) had taken antifungals in the previous month, were excluded from the study. Patients who required hospital transport or were unable to understand and complete the questionnaires were excluded.

Information Collection Method

- The questionnaire was pre-tested among a group of medical hospital out-patients and university students before it was administered to the study participants. The questions of how oral health is related to quality of life was patterned after OHQoL-UK and described in two dimensions “effects” and “impacts”. The interviewers conducted face-to-face interviews with the adult participants at the waiting area of the medical outpatient clinics over a 5-week period in the summer of 1999. On average, it took 10 minutes of contact time between the interviewer and the participant in the outpatient waiting area.
to complete one questionnaire. The importance of collecting this data was explained to participants and their participation was strictly voluntary with no incentives offered. Closed-ended oral health questionnaire with "effect and impact" item-questions from the OHQoL-UK© instrument was administered by trained interviewers. Collected data included socio-demographic, dental visits, and effects and impact of oral health on quality of life (QoL). Univariate and bivariable analyses were done and a chi-square test was used to test differences in proportions. Multivariable analyses using ANOVA examined the association between QoL factors and visits to a dentist. Complete data was available for 83% of the participants. About 62% of participants perceived their oral health as affecting their QoL. Overall, 82%, 63%, and 77% of participants perceived that oral health had an effect on their eating or enjoyment of food, sleep or ability to relax, and smiling or laughing, respectively. Some 46%, 36%, and 25% of participants reported that oral health impacted on their daily activities, social activities, and talking to people, respectively. Dental visits within the last year were significantly associated with eating, speech, and finance. The summary score for the oral health effects on QoL ranged from 33 to 80 with a median value of 61 (95% CI: 60, 62) and interquartile range of 52–70. Multivariable modeling suggested a model containing only education. The mean of effects sum score for those with secondary/tertiary education levels was significantly higher than those with lower than secondary level of education.

Other related EGOHID indicators: D1, D2, D3, D5.

Patients attending outpatient rheumatology, liver, pain management, oral medicine, speech and language and Sjogren’s syndrome clinics at two London teaching hospitals who met the study criteria were invited to participate. After obtaining informed consent, demographic and clinical data were collected. Following this, whole-mouth saliva tests (unstimulated flow rates) were taken. Participants were then given the measures of symptom status, the OHIP14, global oral health, and psychological well-being to take away with them. They returned approximately 1-week later to the clinic with the completed questionnaires, at which time they completed the OIDP. Participants then completed the two speech tests.

Other related EGOHID indicators: D1, D2, D3, D5.

Comments

Practical aspects: The OHQoL-UK© instrument is a widely used and validated method. In this paper its application was in non English-speaking populations. It is important that attention is paid to terms and cultural aspects during language translation.

Practical Aspects: Several assessment methodologies were used in this paper to evaluate the reliability of OHRQoL measurements in relation to xerostomia and speech impairments. The studies demonstrated a good validation level and used internationally recognized methods.

Ethical Issues: The project was approved by the Research Ethics Committee of King’s College Hospital, and written consent was obtained from all participants.

References

Major Issues

- Most adults in the study reported that oral health affected their quality of life. Dental visits within the last year were associated with eating, speech, and finance.
- Both OHIP-14 and OIDP have good psychometric properties and appear useful measures of OHRQoL in xerostomia. Overall, the OHIP-14 performed better than did OIDP. For both measures, the additive scoring method may be more relevant for this population than the number of impacts.
2.4 D5 – Social Disability due to Oral Health Status

Main Reference

Study Objectives
- To assess whether there was an association between diet, oral health related quality of life and social resources in a population of older edentulous adults, and, to assess the impact of provision of new complete replacement dentures.
- To assess the dental needs of Thai primary school children, and integrate an oral health-related quality of life measure (OHRQoL) into oral health service planning. The results of this socio-dental assessment was then compared with standard estimates of a child’s oral health needs.
- The sense of coherence (SOC), as a psycho-social resource, could include features that have modifying effects on the OHIP via oral health behaviour and oral health. In addition, the SOC might have a direct association with the development of subjective assessments of oral health. The aim of the study was to examine the association between the SOC and the OHIP, and to investigate whether oral health behaviours, oral health, and socio-economic status alter the above-mentioned association in 30–64-yr-old dentate adults. The relationship of the SOC with seven subscales of the OHIP is also described.

Method of Reference
- Interview survey with the 19-item subset of the Oral Health Impact Profile (OHIP-EDENT) developed by Allen and Locker for use with edentulous patients. The six-item form of the Interpersonal Support Evaluation List was used to assess the extent of a person’s dependence on social resources. Nutritional status was assessed with the Mini Nutritional Assessment score.
- Interview survey using child-OIDP.
- SOC (12-item) and the Oral Health Impact Profile scales (OHIP-14).

Population Studied
- Consecutive edentulous patients attending the University Dental School and Hospital, Cork, Ireland were invited to participate in this prospective study. Thirty-five independently living patients (23 female, 12 male) ranged in age from 52 to 77 years (median 65 years) agreed to take part in the study.
- A cross-sectional study of all 1034 grade-6 children (11–12 years old) in Suphan-buri Province, Thailand.
- A nationally representative Health 2000 survey was carried out in 2000–2001 by the National Public Health Institute of Finland. The original survey sample consisted of 8,028 subjects aged 30 or older. Edentate subjects and subjects who were > 65 yr of, living permanently in institutional care, and those who had missing data regarding SOC, OHIP14, SES and clinical variables were excluded.

Information Collection Method
- In this prospective clinical study, 35 edentulous adults who requested new complete dentures completed pre-treatment questionnaires which included validated oral health status, social resources and nutritional assessment questionnaires. New dentures were provided and the impact of treatment on oral health related quality of life, diet and ability to chew food was assessed. Satisfaction with dentures and oral health related quality of life improved following provision of new dentures. However, food choice remained similar to pre-treatment choice, and subjects were rated as medium risk for poor nutritional status on the Mini Nutritional Assessment (MNA) score. Oral health related quality of life and diet were not correlated. Three quarters of the sample felt they had no nutritional problems. However, approximately 70% reported that they had changed their food choices because of dental problems and that financial cost was a barrier to dental treatment.
The OHIP-EDENT nineteen items are grouped into seven conceptual domains, namely, functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. The wording of each question was "During the past 3 months, have you had... because of problems with your teeth, mouth or dentures?" and responses were on a Likert response format (1 - never to 5 - very often). Responses were summed to give an overall OHIP score, higher scores indicating poorer oral health status.

The six-item form of the Interpersonal Support Evaluation List and a subset of pertinent items from Duke University's Older Americans Resources and Services Program (OARS) scales were used to assess the extent of a person's dependence on social resources. An assessment is made of varying abilities in carrying out activities of daily living (ADL).

A section entitled food consumption information provided data necessary to evaluate the consistency, and adequacy of dietary intake. Constructed from the Dietetic and Subjective Assessments of the Mini Nutritional Assessment (MNA) (17), this subset instrument allows a brief evaluation of nutritional risk based on adequacy of intake for regular consumption patterns.

Other related EGOHID indicators: D1, D2, D3, D4.

A stratified, two-stage cluster sampling design was used in the survey. Data were obtained from subjects who had participated in an interview, were clinically examined, and had returned a self-administered postal questionnaire (n = 6,019). Subjects were considered dentate if they had at least one natural tooth of their own, as observed in the clinical examination. The final sample population comprised 4,039 30–64-yr-old individuals (1,899 males and 2,140 females).

The interviews were carried out by trained interviewers and included information about health and functional status, use of health services, socio-economic and demographic factors, and psycho-social and behavioural variables, such as dental attendance pattern and tooth-brushing frequency. The questionnaire included a SOC scale, including 12 seven point Likert-type items with descriptive end-points derived from the short version of the SOC scale (SOC-13) proposed by Antonovsky. An individual with a strong SOC has the ability to define life events as less stressful (comprehensibility), to mobilize resources to deal with encountered stressors (manageability), and possesses the motivation, desire and commitment to cope (meaningfulness). All three components of the SOC, including comprehensibility, manageability and meaningfulness, were measured by 4 items each, in order to give equal importance to all components.

The OHIP was measured by using a self-administered 14 six-point items version of the OHIP-scale. Other related EGOHID indicators: D1, D2, D3, D4, B18.

Comments: Practical aspect: OHIP-EDENT is a standardized method of assessing OHRQL for edentulous patients. High level of scientific acceptance.

Ethical Issues: All participants in the study provided informed consent using the consent pro-forma recommended by the Clinical Research Ethics Committee, Cork University Hospital.

Practical aspects: the Child-OIDP is a valid and reliable index to be used among schoolchildren which also takes into account socio-dental factors in assessing orthodontic treatment needs.
Practical aspects: The strengths of the study include a large nationally representative sample that enabled stratification of the data into several subcategories. The methodology has scientific recognition.

References


Major Issues

- The findings of this study indicate that significant change in diet is unlikely to occur following provision of new complete replacement dentures. Although oral health related quality of life and denture satisfaction improved significantly, this population still had a moderate risk of poor nutritional status. There appears to be a lack of knowledge in relation to nutritional value of foods consumed in this older adult group. There was no association between diet and oral health related quality of life. Further research is needed to improve our understanding of the relationship between oral health and diet.
- There was a marked difference between the standard normative and the socio-dental needs assessment approach, with the latter approach showing a 60% lower assessment of dental health care needs in Thai 11–12-year-old children. Different levels of “impacts” on daily life can be used to prioritize children with needs.
- Previous studies have shown the association of SOC with experience of health, health-oriented behaviours and socio-economic status. A strong SOC has been reported to associate positively with self-reported good health and negatively with experiences of stress, somatic symptoms and health complaints. A weak SOC has been found to promote the psycho-social effects of health problems. In conclusion, subjects with a strong SOC had fewer oral problems than those with a weak SOC. The SOC was also associated with all of the subscales of the OHIP. The results suggest that the SOC could be a psychosocial determinant of the OHIP. The SOC also has the resources needed to deal with health-threatening stressors in general. This leads to an assumption that oral health could have an essential part in the wider concept of health-related quality of life. The OHIP is also known to have relevance in relation to oral health (35). The comprehensive association of the SOC and the OHIP emphasizes that the SOC could also be a determinant of oral health.
Oral Health Interviews and Clinical Surveys: Overviews

Appendices
## Oral Health Interviews and Clinical Surveys: Overviews

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Review of selected published scientific information

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<td>B6 Listening to patients: local health services survey. Camden PCT. Chesterfield: Quality Health Ltd; 2003.</td>
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<td>Association between diet, social resources and oral health related quality of life in edentulous patients. Allen PF. <em>J Oral Rehabil.</em> 2005 Sep;32(9):623-8.</td>
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As stated before, the goals of EGOHID Phase II Working Package 5 - Oral Health Interviews and Clinical Surveys: Overview, were to review and analyze the existing methodological instruments at global and regional level in order to facilitate the development of common instruments, including clinical survey forms, questionnaires, translation processes and fundamental methods for the following Work Packages.

The insertion of this appendix, "Methods of Collecting Data. Interviews and Questionnaires in Practice", is aimed to provide to partners in charge of developing the common Oral Health Interviews Survey Instruments technical methods and protocols for questionnaires and interview design.

1. Research strategy: quantitative and qualitative

Many writers on methodological issues find it helpful to distinguish between quantitative and qualitative research. There would seem to be little to the quantitative/qualitative distinction other than the fact that quantitative researchers employ measurement and qualitative researchers do not. It is certainly the case that there is a predisposition among researchers along these lines, but many writers have suggested that the differences are deeper than the superficial issue of the presence or absence of quantification.

For many writers, quantitative and qualitative research differ with respect to their epistemological foundations and in other respects too. Quantitative and qualitative research can be taken to form two distinctive clusters of research strategy. Table 1 outlines the differences between quantitative and qualitative research in terms of the three areas.

Thus, quantitative research can be construed as a research strategy that emphasizes quantification in the collection and analysis of data and that a) entails a deductive approach to the relationship between theory and research, in which the accent is placed on the testing of theories; b) has incorporated the practices and norms of the natural scientific model and of positivism in particular; and c) embodies a view of social reality as an external, objective reality.

By contrast, qualitative research can be construed as a research strategy that usually emphasizes words rather than quantification in the collection and analysis of data and that d) predominantly emphasizes an inductive approach to the relationship between theory and research, in which the emphasis is placed on the generation of theories; e) has rejected the practices and norms of the natural scientific model and of positivism in particular in preference for

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an emphasis on the ways in which individuals interpret their social world; and f) embodies a view of social reality as a constantly shifting emergent property of individuals' creation.

These epistemological choices impact on what you decide to consider ad data of your research.

2. Indicators - Relating your ideas to the empirical world

The ideas that we use for our theories cannot just be applied to the empirical world. We need to convert the concepts in the theories to things we will use as indicators of those concepts.

"Let us suppose that you have a theory from which you have derived the hypothesis that academic success amongst sociology students increases with political involvement" (Ford, J. 1975, p.173).

The hypothesis seems clear enough: The more politically involved your sociology students, the more you expect them to be academically successful. The things that change are called variables. So the variables in this hypothesis are political involvement and academic success. You have to decide what you will use as the indicator of these variables. Here are two simple possibilities:

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<td>political involvement</td>
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<td>academic success</td>
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Indicators must be valid and reliable:

By valid is meant that it is a good indicator of what we want to count or measure. For example, you want to count the number of people who are working class and the number who are not. Would how much each earns be a good indicator? Or, perhaps we should ask how good an indicator it would be.

By reliable is meant that the indicator produces results that do not vary in an irrelevant way. For example: You might put coins in piles of tens and then check that there are ten in each pile by measuring the height of the pile. This is reliable if all the coins are the same thickness. If some are thinner than others, it is not reliable.

Devising valid and reliable empirical indicators for the concepts in a hypothesis is called operationalisation or operationalising concepts - because it makes the hypothesis operational or ready to be used.

3. Structured and Unstructured Data

Structured data is organised, unstructured data is relatively disorganised. Structured data can be produced by closed questions, unstructured data can be produced by open questions.

Closed questions can make analysing the data relatively easy, but they restrict the responses. For example, on many courses students are given a standard list of features (e.g. lectures, books, assessment, tutorial support) and asked to indicate on a five point scale how satisfied or dissatisfied they are with the feature. These are highly structured (precoded) closed questions.

The same form may have a space for the student to make any comments he or she wishes to make on the course. This is an open question which will produce almost completely unstructured data. Although the open question produces data that is difficult to organise and code, it allows subjects to respond freely and express shades of opinion rather than forcing them to have precoded opinions.

4. Questionnaires and Surveys

A questionnaire is a series of written questions a researcher supplies to subjects, requesting their response. Usually the questionnaire is self-administered in that it is posted to the subjects, asking them to complete it and post it back. (Macionis, J. and Plummer, K. 1998 p.44)

The way you will be analysing the data may influence the layout of the questionnaire. For example, closed questions provide boxes for the respondent to tick (giving easily coded information), whereas an open question provides or a box for the respondent to write answers in (giving more freedom of information, but more difficulty coding).
Questionnaire design should bear in mind who your respondents will be, and what personal details you need to know about them. Keep your questionnaire short, less than thirty items. Do not ask for information just for the sake of it; only ask what you need to know. Consider whether you will ask them the questions yourself or leave them to fill in the answers by themselves. You may use a questionnaire with only a few respondents. In this case you will probably use a detailed questionnaire. But a shorter one can be used as a method of extracting attitudes and opinions from a sizeable sample of respondents. This is a survey.

Box 2 - Eurobarometer surveys
The **standard Eurobarometer** was established in 1973. Each survey consists in approximately 1000 face-to-face interviews per Member State (except Germany: 2000, Luxembourg: 600, United Kingdom 1300 including 300 in Northern Ireland). Conducted between 2 and 5 times per year, with reports published twice yearly.

**Special Eurobarometer (EB)** reports are based on in-depth thematical studies carried out for various services of the European Commission or other EU Institutions and integrated in Standard Eurobarometer’s polling waves.

**Candidate Countries Eurobarometer (CCEB)** First wave carried out in October 2001 in all the 13 countries applying for membership. Its methodology is almost identical to that of the Standard Eurobarometer. One report is published each year, excluding the special reports. It replaces the Central and Eastern Eurobarometer (CEEB).

**Flash Eurobarometer (EB)** Ad hoc thematical telephone interviews conducted at the request of any service of the European Commission or other EU Institutions. The Flash Eurobarometer surveys enable the Commission to obtain results relatively quickly and to focus on specific target groups, as and when required (i.e. doctors, SMEs, etc.)

**Qualitative Study** The qualitative studies investigate in-depth the motivations, the feelings, the reactions of selected social groups towards a given subject or concept, by listening and analysing their way of expressing themselves in discussion groups or with non-directive interviews.

5. Interviews
An interview is a series of questions a researcher addresses personally to respondents (Macionis, J. and Plummer, K. 1998 p.44).

An interview may be **structured** (where you ask clearly defined questions) or **unstructured**, where you allow some of your questioning to be led by the responses of the interviewee. Especially when using unstructured interviews, using a tape recorder can be a good idea, if it does not affect the relationship with the person being interviewed.

Complex research projects usually use a mix of both questionnaires and interviews (cfr. Box 2).

6. Methods are not simply neutral tools
Whether you are using questionnaires or interviews you have to be aware that they are never neutral tools. Methods are linked to the ways in which social scientists envision the connection between different viewpoints about the nature of social reality and how it should be examined. Secondly, there is the question of how research methods and practice connect with the wider social scientific enterprise.

Social researchers generate massive data by asking people to talk about their lives; results, findings or knowledge come from conversations. Although these conversations may be variously configured as highly structured, standardized, quantitatively oriented surveys, as semiformal guided interviews, or as free-flowing exchanges, all interviews are interactional events. Their narratives may be as truncated as forced-choice survey answers or as elaborate as life histories, but, in any case, they are constructed in situ, a product of the talk between interview participants.

Most researchers recognize interviews as social interactions, but the literature on interview strategy and technique remains primarily concerned with maximizing the flow of valid, reliable information while minimizing distortions of what the respondent knows (Holstein & Gubrium 1995). The interview conversation is thus framed as a potential source of bias, error, misunderstanding, or misdirection, a persistent set of problem to be minimized. The corrective is simple: If the interviewer merely asks questions properly, the respondent will emit the desired information.

This approach, however, treats the interview conversation as a pipeline for transmitting knowledge. A recent 'linguistic turn' in social inquiry – an interest shared by poststructuralist, postmodernist, constructionist, and ethnmethodological perspectives – has raised a number of questions about the sheer possibility of collecting knowledge in the manner this approach presupposes. In varied ways, these perspectives hold that meaning is socially constituted; all knowledge is created from the action taken to obtain it. This further suggests that what passes for knowledge is itself a product of interaction.
(Cicourel 1964; Garfinkel 1967). Treating interviewing as a social encounter leads us rather quickly to the possibility that the interview is not merely a neutral conduit or source of distortion but rather the productive site of reportable knowledge itself. Like all other speech events, interviews fundamentally, not incidentally, shape the form and content of what is said. The merging lesson is that interviewers are deeply and unavoidably implicated in creating meanings that ostensibly reside within respondents (see Manning 1967). Therefore, the issue is not how to minimize distortions but becomes how to pose questions in ways that are appropriate and meaningful to respondents, acknowledging that questions-answer exchanges both provide a context and call on cultural assumptions and local linguistic practices.

In an example of mothers with children under five, the focus of inquiry might be their views about adult education opportunities for themselves, and their aspirations for their children. Not only the wording of these questions but also the setting itself can easily imply that adult education or certain kinds of educational aspirations are something the researcher values, and therefore the mother may feel she is expected to make particular choices. We can project researcher’s biases also in standardized questionnaires and not only through questions, as when we choose a kind of response set instead of another:

Therefore, the issue is not how to minimize distortions but becomes how to pose questions in ways that are appropriate and meaningful to respondents. Interview data are unavoidably collaborative. Attempts to strip interviews of their interactional ingredients will be futile.

7. Group Interviews

If the narrative force of significant others helps shape the stock of knowledge accessed by interview participants, consider the parallel force of group interviews. One well known variation, the focus group, is usually composed of 5 to 10 participants, who, with the guidance of a moderator, discuss a topic such as the advantages and disadvantages of particular marketing strategies (Zammuner 2003).

Morgan (1988) lists the visibility of interaction as one of main advantages of group interviews. The parries and challenges of group discussion highlight the agreements and disagreements in a particular population. As Morgan points out, the give-and-take of group interviews allow diverse categorizations and sentiments to emerge, showing how participants flesh out, alter, or reconstruct viewpoints in response to challenges. Group interviews also display in bold relief the local inventiveness of the interview process, displaying emerging and complex narrative linkages and the diversity of narrative horizons.

8. Handcrafting the standardized questionnaire. The enduring counsel for simplicity.

Questionnaires are often difficult to understand and to answer. It is common for questionnaires to be overwritten, overcomplicated, and too demanding for the respondent (Converse and Presser 1986). This means, in turn, that writing sufficiently clear and ‘simple’ questions is hard-won, heavy-duty work for survey researchers. It requires special measures to cast questions, among which:

Speaking in common tongues. Speaking in common language means finding synonyms for difficult, technical, unusual words. ‘Intelligible’ is rarely as good as ‘clear’ or ‘understandable’.

Specific questions are better than general ones. The more general the question, the wider the range of interpretation it may be given. By contrast, wording that is specific and concrete is more apt to communicate uniform meaning.

Omit the middle alternative. Survey researchers disagree whether or not middle alternatives should be included in the wording questions. Offering a middle position make less difference to individuals who feel strongly about an issue than it does to those who do not feel strongly.

Use forced-choice questions, not agree/disagree statements. The agree/disagree statement suffers from ‘acquiescence response set’, the tendency of respondents to agree irrespective of item content.

The problem of question order. Survey respondents are sensitive to the context in which a question is asked, as well as to the particular words used to ask it. As a result, the meaning of almost any question can be altered by a preceding question.

Pilot your questionnaire. Pretesting your questions on a pilot study will help to ensure that you give your respondents appropriate questions and all the relevant choices of answers.

A pilot is a test run of something to see how it works before you commit yourself to the full version. If you can allow the time, it is an excellent idea to carry out a small Pilot Study. That is, collect and analyse a small amount of data before you start to collect your main data. It is best to discover any obvious problems with your methods right at the start.
It is particularly important to pilot questionnaires and interviews before you start your proper research. You should get several people to complete the questionnaire to see whether they are able to understand and answer the questions. Similarly you should carry out at least one interview, where you can also get an idea of how much time the interviews might take.

9. Avoiding traps when writing questions

This is a list of traps to avoid when you write your questions. Some of them are based on common sense, but others might strike you only when you get baffling or useless replies. A question that to you seems extra carefully worded may be a mindbender to your respondents.

The double question: Like ‘Do you walk to school or carry your lunch?’ The wording of such questions makes them difficult or impossible to answer accurately. Some may contain two or more unrelated parts. Some may contain contradictory parts, the answers to which may be different. ‘Would you agree that it is not unlikely that our next mayor will not be a woman?’

The wrong choice question: ‘Is your hair yellow, purple, green or blue?’ needs to have an alternative. Commonsense is often not enough to ensure you give respondents enough choice, for what may appear bizarre or unthinkable behaviour to you (and therefore ignored in your questionnaire) may be a way of life to some of your respondents.

The ‘fuzzy word’ question: ‘Should middle-aged people live it up?’ has two problems. ‘Middle-aged’ does not mean the same age group to everyone, and ‘living it up’ can mean anything from wearing red to keeping a harem. Fuzzy words can creep into almost any question: ‘Do you attend dances frequently?’ (or ‘rarely’ or ‘occasionally’ or ‘often’) will give meaningless answers.

The cover the world question: ‘What do you think of the President?’ could refer to the man or woman personally, or to how s/he is carrying out the role of president of a company or a nation. ‘What’s the neighbourhood like?’ is useful in some interviews, but if you know what aspect of the neighbourhood interests you, ask specifically about that.

Jargon questions: Jargon and technical terms should be avoided. ‘Do you feel that your husband has a self actualising autonomous personality structure?’ is an affront to the respondent and also to the English language. Also, be careful about words that have one meaning to the professionals in your field and another, or none, to the public. ‘Culture,’ ‘personality,’ ‘role,’ or ‘institution,’ cannot be treated as if all respondents shared a common understanding of the professional meaning you intended. More generally, the language and style of the questionnaire must be comfortable to the respondent. ‘Writing down’ is insulting, and using dialect or ‘in’ words to reach a group of which you are obviously not a member is usually inappropriate.

The kitchen sink question: ‘Please list all the places you have worked in the past five years, the type of work done and salary received, and why you left.’ To save confusion in replying, recording and coding the answers, ask each part of the question separately.

Dream questions: Hypothetical questions do not necessarily produce comparable answers from different respondents. ‘What kind of education would you like for your child?’ might produce a ‘sky’s the limit’ answer from a person who is stating an absolute ideal; from another person you might receive a modest statement of the best he or she thinks the child is likely to get. Make sure you know whether your question examines wishes or expectations.

Leading questions: ‘Why are you happy here in Newtown?’ or ‘Why do you think the community looks up to doctors?’ gives the respondent little opening to say s/he is miserable in Newtown and thinks that most of the people in the community feel that doctors are charlatans.

Hearsay questions: ‘Do you think your neighbours are happy about the new school?’ Do not ask one person the opinions or attitudes of another, unless you wish to compare the first person’s impressions with facts that you will establish from the second person. (Or unless you are a social scientist studying perception). You cannot cut down on your sample number by asking a small number of people what they think the attitudes of other people might be.

Fallout questions: These are sets of questions in which something important gets lost on the way. Here is a real life example: a woman who normally dyes her hair red went to a hairdresser who required that his clients fill out a questionnaire before getting their hair done. Bad dyes of any colour will turn hair red. The questionnaire asked:

1. Do you colour your hair? Yes / No
2. If yes, does it ever turn red? Yes / No
3. If yes, what product do you use? Yes / No

The conclusion which the hairdresser drew was that anyone who answered ‘yes’ to Question 2 was using bad hair dye a conclusion that was invalidated by the women purposely dying their hair red.
The initial evidence or raw data that a researcher collects has to be converted (coded) into a form of language that can be written clearly and unambiguously in standardised symbols that can be used for analysis. The standardised symbols are often numbers. But they may be letters (A, B, C, D, etc) or tags of three or four letters (For example: FAT, SKI, ATH, for fat, skinny and athletic).

To begin translating raw data into the symbols, the researcher defines the coding units and creates a coding frame. How difficult this will be will largely depend on the kind of data your research has produced.

At one extreme will be data like that from highly structured questionnaires that may be precoded (already coded). For example, a questionnaire with the following instructions has precoded the answers as in Box 1 (see page 173):

> The ticks on this questionnaire will already be distributed along a scale from -2 to +2. This is structured data.

At the other extreme the data may be very raw - a pile of photographs, tape recordings, unstructured handwritten notes from interviews or fieldwork diaries. Data like this will need much more work doing on it before it can be analysed.

Coded data will be arranged on scales of numbers and symbols. Only some of these scales will be of the real numbers that we use in measurement. The researcher needs to know the kind of scale that is being used in order to know what kind of operations can be performed with it (cfr box 3).

Box 3 – Scales

There are five different sorts of scale which may emerge from your data. The way to understand any one of them is to understand all five, so that you can see how they relate to each other.

**Ratio scales** are most often found in engineering and the natural sciences. Frances Clegg says that "chemists, physicists and biologists" do not have many difficulties about the kind of scale (level of measurement) they are using, because the ones they mostly deal with are ratio scales or interval scales "and quite suitable for sophisticated arithmetical treatment". (Clegg, F. 1990 p. 84). Ratio scales have an absolute zero as well as equal intervals between the items. A tape measure is an example of a ratio scale. Zero (0) on the tape measure really is nothing. That is where the measuring starts. Having a true zero also means (by implication) that there is a range of negative numbers possible. With a ratio scale we can say that one point on the scale is so much more or less than another. 10 centimetres is twice 5 centimetres and half of 20 centimetres. We cannot do this with simple interval scales. The year 1998 is not twice a previous year or half of a future year. Ratio scales are real numbers. They have order, equal intervals and an absolute zero. It is because real numbers have these characteristics that we can perform the operations of mathematics with them. Real numbers and ratio scales can be added, subtracted, multiplied and divided. They can also be raised to powers or brought down to roots, and this means that we can take logarithms and use calculus with them. An interval scale puts the items at an equal distance from one another (the interval), as well as ranking them in order. Years are counted on interval scales. There is the same distance between one year and its neighbours as there is between any other year and its neighbours. 1997 is the same distance from 1996 and 1998 as it was from 1952 and 1954. Interval scales do not have "absolute zeros" or real starting points. The year 1996 is numbered from the birth of Christ (which is labelled 1), but there are years before that. We can use real numbers to add to, subtract from, multiply and divide by items on the interval scale. The year 1996 divided by 2 is the year 998. This is not "half" of the year 1996, however, because an interval scale does not have an absolute zero. But we can take two numbers on the scale and divide by two (average) to find out the date that is half way between the two: 1998 is half way between the year 10 and the year 1986 because 10 plus 1986 = 1996, which divided by two equals 998. Similarly, we can take any other arithmetic mean: The average of 1991, 1993, 1997 and 1998 is (1991 + 1993 + 1997 + 1998) divided by four, which equals 1994.75 (the autumn of 1994).

**Ordinal scales**. The ordinal scale puts things in an order or rank, as well as labelling and classifying them. House numbers are usually on an ordinal scale because 1 is usually at the beginning of the road and the higher the number the further down the road it is. They are frequently produced by questionnaires when respondents are asked how strongly they agree or disagree with a statement. To distinguish ordinal scales from ratio and interval scales, they should all be coded by letters in alphabetical order (A, B, C, D etc). All such scales should be turned the same way for coding so that A is always the highest value.

Nominal scales and binary scales are typical of unstructured data, but are also produced by some questions in precoded questionnaires. In a nominal scale, names (which may be numbers) are given to things just to label and classify them. Dividing people into male and female is a nominal scale. Putting numbers on buses to identify the route is a nominal scale. Putting numbers on football players to identify their position on the field is a nominal scale. Arithmetical operations are meaningless on nominal scales. To add a 44 bus to a 102 bus and get a 146 bus is nonsense. But if data has been classified nominally you can make a Frequency Distribution - you can count how many 102 buses and how many 146 buses there are, for example.
10.2 Quantitative Data Analysis: Looking for Patterns in the Data

Steps for analysing quantitative data are:

Calculate averages: Used with “continuous” data: infinite number of values
Add numbered responses
Divide by number of responses
2 + 4 + 6 + 10 = 22. 22/4 = 5.5

Count frequencies: Used with “discrete” data: set number of response categories
Count number of responses
Number “yes”, number “no”
Number of choice “A”, Number of choice “B”, etc.

Calculate proportions (Standardized):
Equation: % = # of responses/ total # of respondents X 100
Example: 45 females/ 100 respondents X 100 = 45% of the respondents were female

Calculate rates
(Similar to proportions; also standardized): Easier to compare
Equation: Rate = freq of event in pop/ total pop X 100,000
Example: 15 cases of lung cancer/ population of 3,500 X 100,000 = 428 persons per 100,000 have lung cancer

Compare averages, frequencies, proportions, rates.
Compare data from different populations:
County vs. County
County vs. State
State vs. US

Compare data from different segments of a population:
Male vs. female
African American, white, Latino, Asian, American Indian, etc.
Children, teens, adults, seniors
Clientele of your program vs. those who are not
Different income or health insurance levels
Married vs. single
Smokers vs. not

Present the data in different ways to see additional patterns and relationships:
Chart/ table – shows averages, counts, proportions, or rates side-by-side
Pie graph – demonstrates percentages of the whole
Bar graph – compares quantities
Line graph – shows trends over time

Determine your findings:
Interesting results?
Interesting patterns or relationships?

10.3 Qualitative Data Analysis: Looking for Themes in the Data

Qualitative data analysis can be deceptively trickier. Qualitative data is by nature “bigger”. Analysis requires more analytical thinking and interpretation.

Qualitative data analysis is more open to “bias”. Analysts bring their values, assumptions and opinions. Analysts may think they “know” how people feel.

Include at least 2, preferably 3 people in each stage of data analysis to avoid bias.

Create as structured of a process as possible to avoid bias.

Read through all of the data at least twice. Stay “close” or “grounded” in the data.

Create categories.

List themes that emerge from interviews.

Rank order according to frequency of appearance.

Summarize interviews around each theme.

Determine your findings.
11. Verify Findings

You now have some patterns and relationships you found in your quantitative data and/or some themes and categories you found in your qualitative data.

Based on the results you tallied and summarized, pull out the main findings of each method you used. Verify these findings by re-tallying and re-summarizing the data to make sure you get the same results. You can also verify your findings by comparing the results reached by 2 analysts independently.

12. Interpret Findings and Draw Conclusions

Determine what interpretations can be drawn from each finding. Invite different perspectives from different people (colleagues, patients, clients...), as this will make your conclusions stronger. Are the results similar to what you expected? If not, discuss why you think they are different. Brainstorm alternative explanations for your results to make sure you have considered all possibilities. Make sure the conclusions answer the original assessment questions. Draw conclusions and recommendations that can be shared with external audiences.

13. Ethical principles

When you are interviewing, be sure that your interviewees are happy to talk with you. Do not demand too much of their time. If necessary, clear the interview with their 'superiors'.

With the people whom you are observing or interviewing be clear about what will happen with the data you collect. Assure them that what they tell you will be kept anonymous and confidential.

Give them a participant information sheet guidelines and a consent form to sign (cfr. box 4).

**BOX 4: Participant information sheet guidelines examples**

Participant information sheets should be headed with the following information:
- the division and school or unit from which the research is being conducted
- the plain English title of the research project
- the names, highest qualifications and contact telephone number of the researchers

All participant information sheets should include:
- an invitation to potential participants to participate in the research study, stating that participation is voluntary
- a clear explanation of the purpose of the study
- a summary of what the participant will be expected to do, or have done to them, during the research
- a statement that the participant may withdraw from the research at any time without affecting their position, treatment or care
- the possible benefits or risks to the participant in participating in the research
- a description of measures which will be taken if the participant suffers adverse events as a result of participating in the research
- a statement that all information collected as part of the study will be retained for seven years and details of where the information will be stored and the form in which it will be stored
- a statement that all records containing personal information will remain confidential and no information which could lead to identification of any individual will be released OR if individuals will be able to be identified, a statement should be included making them aware of this
- the name and telephone number of the Executive Officer of the ethics committee, stating they will be available to discuss
- any ethical concerns about the project or answer questions about the rights of participants
- details about how and when participants will be provided with either a copy of the final research report or summary of the research findings.
Methods of Collection Data

Email or internet distribution
If you will use email or the internet to distribute questionnaires and receive responses you should include the following statement in the information provided to participants.
The researcher will take every care to remove responses from any identifying material as early as possible. Likewise individuals’ responses will be kept confidential by the researcher and not be identified in the reporting of the research. However the researcher cannot guarantee the confidentiality or anonymity of material transferred by email or the internet.

Collection of data on audio or videotapes
If audio or videotapes will be used for data collection the information sheet should be adapted to ensure that participants are informed that:
- information will be taped.
- they should also be reminded of this before data is collected the tape or a certified transcript of the tape is raw data and will be securely retained for seven years
- their identity can be masked if they request this
In addition the participant must be informed if another organisation or person has rights of access to the data collected on tape.them that what they tell you will be kept anonymous and confidential. Give them a participant information sheet guidelines and a consent form to sign (cfr. box 4).

References

CONSENT FORM

Project title

Researcher’s name

Supervisor’s name (if the researcher is a student)

I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.

I understand the purpose of the research project and my involvement in it.

I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.

I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential. If other arrangements have been agreed in relation to identification of research participants this point will require amendment to accurately reflect those arrangements.

I understand that the tape will be (if tape is to be retained, insert details of how and where the tape will be stored, who will have access to it and what limits will be placed on that access)

I understand that I will be audiotaped / videotaped during the interview. Omit this point if the interview will not be taped.

I understand the statement in the information sheet concerning payment to me for taking part in the study. Omit this point if no payment will be made.

Participants under the age of 18 normally require parental consent to be involved in research. The consent form should allow for those under the age of 18 to agree to their involvement and for a parent to give consent.

Name of participant

Signed Date

I have provided information about the research to the research participant and believe that he/she understands what is involved.

Researcher's signature and date
CONSENT FORM TO USE WHEN TAPED MATERIALS, PHOTOGRAPHS OR ORIGINAL WORKS ARE TO BE RETAINED

Project Title

Researcher’s name

Supervisor’s name

I have read the Participant Information Sheet, and the nature and the purpose of the research project has been explained to me. I understand and agree to take part.

I understand that I may not directly benefit from taking part in the project.

I understand that I can withdraw from the study at any stage and that this will not affect my status now or in the future.

I confirm that I am over 18 years of age.

I understand that I will be audiotaped / videotaped during the study

I understand that the tape will be (insert details of how and where the tape will be stored, who will have access to it and what limits will be placed on that access)

I grant the University the exclusive and royalty free right to reproduce and use in its ongoing activities photographs, video, or any other recording by any means of my voice or physical likeness which is produced in the course of the project. (delete if the taped material is not to be used by the university for any purpose beyond the current study)

I understand that the University shall not be required to make any payment to me arising out of its exercise of this right. (delete if the taped material is not to be used by the university for any purpose beyond the current study)

I understand that wherever practical, the University will acknowledge my participation in the project in exercising this right. (delete if the taped material is not to be used by the university for any purpose beyond the current study)

Name of participant

Signed Date

I have explained the study to subject and consider that he/she understands what is involved.

Researcher’s signature and date
This report was produced by a contractor for Health & Consumer Protection Directorate General and represents the views of the contractor or author. These views have not been adopted or in any way approved by the Commission and do not necessarily represent the view of the Commission or the Directorate General for Health and Consumer Protection. The European Commission does not guarantee the accuracy of the data included in this study, nor does it accept responsibility for any use made thereof.