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**STANDARDIZATION  
OF REPORTING OF DENTAL DISEASES  
AND CONDITIONS**

**Report  
of an Expert Committee on Dental Health**

WORLD HEALTH ORGANIZATION

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# **STANDARDIZATION OF REPORTING OF DENTAL DISEASES AND CONDITIONS**

## **Report of an Expert Committee on Dental Health**

The Expert Committee on Dental Health met in Geneva from 14 to 20 November 1961 to discuss the standardization of reporting of dental diseases and conditions. The meeting was opened by Dr. F. Grundy, Assistant Director-General, who outlined the functions of an Expert Committee and the purposes for which the meeting had been called. He referred to the basic importance of the subject to the dental profession and to public health authorities throughout the world. Dental epidemiological studies were being conducted on an ever-increasing scale, but very few of the results were comparable, owing to the differences in terminology and diagnostic criteria and to the varying methods employed in examinations and in the recording and reporting of data. The purpose of the Committee was to formulate standards in these matters which would be generally acceptable to all countries and so would bring about uniformity and international comparability in dental health statistics.

Dr J. W. Knutson was elected Chairman of the Committee, Dr V. Rudko Vice-Chairman and Dr G. N. Davies Rapporteur.

### **1. INTRODUCTION**

The development of dental health statistics is not new and has proceeded parallel to the other fields of health statistics. With the upsurge of interest in dental public health, it becomes highly desirable to establish international standards upon which surveys can be based for the planning and evaluation of dental services and for epidemiological studies.

At the outset the Committee therefore set itself the task of ascertaining what essential basic facts were required and how they could be obtained simply but with reasonable accuracy. In doing so, the Committee avoided unduly complex procedures as it considered that persons wishing to do so could add refinements to the basic data recommended, according to their special interests.

The Committee endeavoured to formulate guide-lines for the assessment of dental diseases and conditions which would not only provide an estimation of public dental health needs but would stimulate intelligent action in solving them. Also kept in mind was the need for base-line data against which the progress and value of dental health programmes could be measured and which could be used to make comparisons between different areas and between one country and another.

Standard definitions of dental diseases and conditions are essential to the study of problems in dental health and depend to some extent upon the use for which the data are collected. However, the main purpose of obtaining data on dental diseases and conditions is to provide quantitative information that will answer questions pertaining to population groups.

A practical scheme for the definition of dental diseases and conditions therefore involves various compromises. Nevertheless, all scientific generalization must be based upon data which are comparable and reproducible. In the past, definitions based on etiology and pathology have failed because dentists in different countries, and indeed even dentists within the same country, placed different interpretations on such definitions.

For this and other reasons the Committee decided that the first requirement in the collection of data on dental diseases and conditions is to ensure that the data are reliable and reproducible. This requirement is likely to be fulfilled only if it is possible for the examiners to have a series of training trials to minimize differences in interpretation of the diagnostic criteria.

Because over a period of time the examiners change, it is best to have several examiners share in each survey. In this way, the standards will be maintained, not only through the continuity of at least some of the examiners from year to year, but because the average estimate of a large number of examiners is likely to be nearer the truth than one made by an individual examiner. It is possible to have groups of calibrated examiners within some countries, but in order to achieve this between different countries, it is fundamental to formulate definitions of dental diseases and conditions which are specific yet can be easily understood by dentists of many countries with different national attitudes, scientific concepts, training and experience.

## **2. THE PURPOSES OF COLLECTING STATISTICAL DATA ON DENTAL DISEASES AND CONDITIONS**

The Committee recognized many reasons for collecting data on dental diseases and conditions but confined itself to a consideration of surveys for public health purposes. It acknowledged the excellent work of the

Special Commission on Oral and Dental Statistics of the Fédération Dentaire Internationale.

The aims<sup>1</sup> of dental surveys for public health purposes are :

- (a) to determine the type, extent and severity of dental diseases and conditions relative to other health problems ;
- (b) to assess the extent to which a community or nation can and will support an effective curative and preventive programme ;
- (c) to obtain objective data which can be used in evaluating the effectiveness of dental health programmes ;
- (d) to stimulate and maintain public awareness of the importance of dental health ;
- (e) to determine for epidemiological research purposes the prevalence and incidence of dental diseases and conditions in different groups of people and to elucidate the factors responsible for or associated with the differences manifested between groups.

### 3. THE ASSESSMENT OF DENTAL DISEASES AND CONDITIONS

The specific dental diseases and conditions considered in this report are dental caries, periodontal diseases, calculus, handicapping dentofacial anomalies, and absence of teeth.

These diseases and conditions should be related to descriptive characteristics of the groups examined. The Committee recommended that the characteristic of age should always be included. The use of other characteristics such as sex, ethnic group, place of birth, residential history and the number of teeth present is optional and will depend upon the purposes of the survey.

#### 3.1 Definitions and discussion of terms common to all assessments

##### 3.1.1 *Point prevalence*

Point prevalence is the term recommended for use to describe the frequency of a disease or condition in existence at a particular point of time.

When the term "prevalence" is used in this report it means "point prevalence".

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<sup>1</sup> General principles concerning the international standardization of dental caries statistics, *Int. dent. J.*, Vol. 12, March 1962.

### 3.1.2 Incidence

Incidence (increment) is the term recommended for use to describe the frequency with which new lesions and new conditions appear during a stated period of time (usually one year). It may also refer to the frequency with which new cases appear (i.e., persons affected).

### 3.1.3 Age group

The Committee took note of the age classifications stipulated in Article 6 of the WHO Nomenclature Regulations,<sup>1</sup> but found the age groups too broad for an analytical study of dental statistics. Accordingly it recommended that data be tabulated separately for each year of age at least for persons under fifteen years and thereafter in five- or ten-year age groups as follows : 15-19, 20-24, 25-29, 30-34, 35-44, 45-54, 55-64, 65-74, 75 and over.

### 3.1.4 Ethnic groups

The United Nations publication, *Principles and Recommendations for National Population Censuses*,<sup>2</sup> explains the difficulties associated with classifying people according to race or ethnic group for census purposes as follows :

“The type of investigation of nationality or ethnic characteristics is dependent upon national conditions and needs. In different countries, ethnic groups are identified on various bases : country or area of origin, race, colour, lingual affiliation, religion, customs of dress or eating, tribal membership, or various combinations of these characteristics. In addition, some of the terms used, such as ‘race’ or ‘origin’, have a number of different connotations. The definitions and criteria applied by each country investigating any aspect of ethnic characteristics of the population must, therefore, be determined by the groups which it desires to identify. By the nature of the subject, these groups will vary widely from country to country, so that no internationally accepted criteria can be recommended.

“Because of the interpretative difficulties which may occur, it is important that where such an investigation is undertaken the basic criteria used should be clearly explained in the census report so that the meaning of the classification will be readily apparent.”

The same principles apply to the classification of persons according to ethnic group for the purposes of dental statistics. Whether or not this characteristic is used is optional and will depend on the purposes of the survey.

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<sup>1</sup> World Health Organization (1957) *Manual of the international statistical classification of diseases, injuries, and causes of death*, Geneva, Vol. 1, p. 39.

<sup>2</sup> United Nations (1958) *Principles and recommendations for national population censuses*, New York (United Nations Statistical Papers, Ser. M, No. 27).

### 3.1.5 Residential history

In general it is necessary to record only the name of the place where the examinations are conducted. However, in detailed epidemiological studies in which it is proposed to determine the validity of differences in the prevalence of dental diseases between groups of people it may be necessary to specify the place of birth and residential history of each person examined.

### 3.1.6 Number of teeth

If it is deemed desirable to obtain information on the time of eruption of different teeth, a count of the number of teeth present at the time of the examination may be made. A tooth is counted as erupted if any part of it can be touched with a probe. This tooth count should be done separately for primary teeth and for permanent teeth and should be reported as age-specific averages.

## 4. THE ASSESSMENT OF DENTAL CARIES

### 4.1 Definitions

#### 4.1.1 Dental caries

Dental caries is defined as a localized, post-eruptive, pathological process of external origin involving softening of the hard tooth tissue and proceeding to the formation of a cavity.

#### 4.1.2 Clinical caries

Clinical caries is defined, for the purposes of recording, as a cavity diagnosed by mouth mirror and probe examination.

It must be emphasized that clinical caries is a *stage* in the process of dental caries. Dental caries proceeds from a microscopic lesion, which cannot be positively diagnosed by present clinical methods, to a cavity (or clinical caries) which can be diagnosed by a clinical examination.

The stages of dental caries which precede cavitation as well as other conditions which are similar to the early stages of caries have been deliberately excluded because they cannot be diagnosed positively. Among these are :

white and/or chalky spots ;

discoloured or rough spots ;

hard, stained pits or fissures in enamel which catch an explorer but do not have a detectably softened cavity floor, undermined enamel or a breakdown in the walls of the pit or fissure.

#### 4.1.3 *Past caries*

Past caries as well as existing clinical caries is of interest in either an epidemiological or a public health survey. Past caries is manifested either by a filling or by loss of the tooth due to dental caries. Care needs to be exercised in discriminating between teeth missing because of caries and those missing due to other causes such as periodontal diseases.

#### 4.1.4 *Life caries experience*

Past caries and existing clinical caries together constitute the *life caries* experience. This may be expressed as the sum of the number of decayed, missing and filled teeth.

#### 4.1.5 *Prevalence of clinical caries*

This is the term used to express the frequency of clinical dental caries in existence at a particular point of time. When the prevalence is expressed as a rate, the denominator should be the number of persons examined.

#### 4.1.6 *Incidence (increment) of clinical caries*

This is the term used to express the frequency with which new cavities appear during a stated period of time. It is customary to express incidence as an average annual rate per person.

### 4.2 **Indices of dental caries**

The actual index to be used is determined by the purpose of the survey and should be that one which fulfills the purpose of the survey in the simplest, most economical and reliable manner. Although the Committee was aware of many indices, it gave consideration only to those most appropriate for dental public health surveys. These indices serve two purposes.

#### 4.2.1 *Measurement of prevalence*

The first purpose is to provide a measure of the *prevalence* of clinical caries, of teeth missing due to caries or of filled teeth in terms of the proportion of persons affected. The calculation of these indices involves a count of the number of persons with one or more cavities (clinical caries), with one or more teeth missing because of caries, or with one or more teeth filled. These numbers are divided by the number of persons examined and multiplied by 100.<sup>1</sup> The resulting figures are the *point prevalence rates* of clinical caries, of teeth missing due to caries and of

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<sup>1</sup> It should be noted that the point prevalence rates indicate the percentage of the population affected, whereas the DMF and df indices indicate the average number of teeth affected per person.

filled teeth. Such rates should be expressed specifically for age and optionally for sex and ethnic groups. They should also be calculated separately for primary and permanent teeth. Prevalence rates of this type will provide answers to the following questions : What proportion of the people require treatment for clinical caries? What proportion of the people have teeth missing because of caries? What proportion of the people have teeth filled? What proportion of the people are caries-free?

#### 4.2.2 *Measurement of intensity*

The second purpose is to measure the *intensity or extent* of dental caries in terms of the number of teeth affected per person. The indices which the Committee recommends are the DMF index and the df index. These are defined as follows :

The *DMF index* is the average number of permanent teeth per person which are decayed (D), missing because of caries (M), or filled (F). It is a quantitative expression of the life-time caries experience of the permanent teeth. In the calculation of the DMF index, the numerator is the total number of DMF teeth and the denominator is the total number of persons examined.<sup>1</sup>

The *df index* is a quantitative expression of primary teeth which are decayed (d) or filled (f). In the calculation of the index the numerator is the total number of primary teeth which have clinical caries or which have been filled. The denominator is the total number of persons examined.<sup>1</sup>

As it is difficult to differentiate between a missing primary tooth which has been exfoliated naturally and a missing primary tooth which has been lost because of caries, the Committee recommended the df index as being the best method of assessing caries experience in primary teeth. However, for particular reasons it may be desirable to include an assessment of primary teeth lost because of caries.

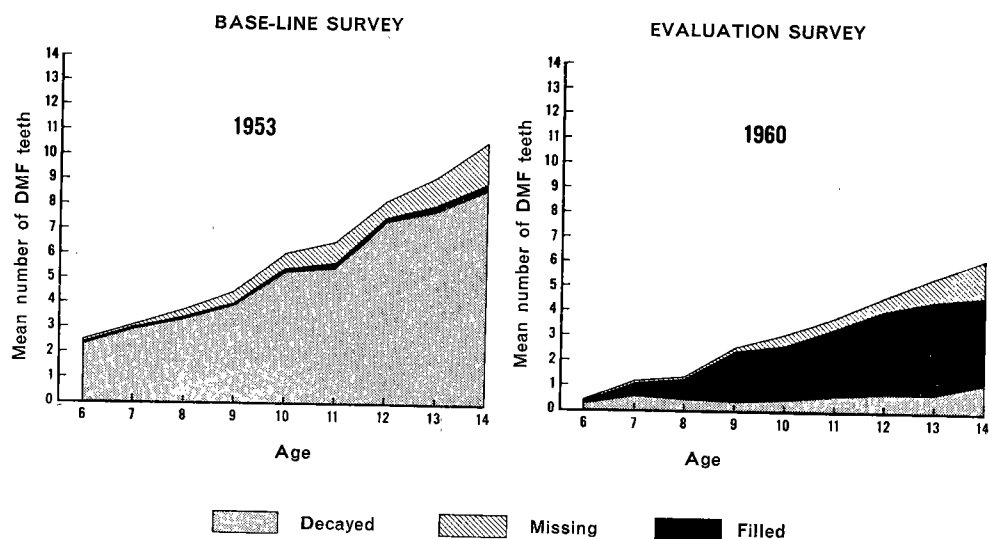
In both the DMF and df indices a tooth is counted only once. If a tooth is both filled and carious it is counted as decayed.

The main advantage of the indices recommended by the Committee is their flexibility. When it is desired to measure the extent of caries experience in a population, the DMF and df indices can be used as defined. It is also possible to use the components of each index to provide additional information of practical importance in planning and evaluating dental public health programmes, as shown by the figure on page 12.

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<sup>1</sup> It should be noted that the point prevalence rates indicate the percentage of the population affected, whereas the DMF and df indices indicate the average number of teeth affected per person.

**RESULTS OF AN INCREMENTAL PROGRAM FOR SCHOOL CHILDREN  
IN THE CITY OF BAIXO GUANDÚ, BRAZIL, INCLUDING WATER FLUORIDATION  
AND ONE-YEAR TREATMENT CYCLES \***



\* Source : SESP Foundation, Brazil (unpublished data).

The mean number of teeth per person which require filling can be calculated by dividing the number of D or d teeth by the number of persons examined. Similarly, the mean number of teeth which have already been filled is the number of F or f teeth divided by the number of persons examined; the mean number of permanent teeth which are missing because of caries is the number of M teeth divided by the number of persons examined.

#### 4.2.3 Measurement of incidence

The incidence of clinical caries in permanent teeth can be determined by conducting two surveys separated by a specified interval of time (usually one year). The difference between the mean numbers of DMF teeth at the first and second examinations is the incidence of dental caries for the specified period of time. This figure can be adjusted arithmetically so that the incidence can be expressed as the mean number of newly decayed permanent teeth per person per year.

When age-specific DMF rates are used it is possible to estimate the incidence of clinical caries in permanent teeth between any two ages, for example from 6 to 7 years, by subtracting the mean number of DMF teeth per person at the younger age (6) from the mean number of DMF teeth per person at the higher age (7).

The incidence of clinical caries in primary teeth can be calculated in a similar way for children under 6 years of age. In older children, however, the calculation is complicated by the natural exfoliation of primary teeth.

#### 4.2.4 DMF and df surface indices

The Committee considered that although indices in which the unit of counting is a tooth surface may be valuable for highly specialized studies, they are not suitable for use in dental surveys for general public health purposes.

#### 4.2.5 Conversion tables

It has been shown that there is a close association between the age-specific percentage of children with one or more DMF permanent teeth and the age-specific mean number of DMF permanent teeth per child. This concept is of fundamental importance because it establishes that the simple count of persons with one or more DMF teeth provides a valid assessment of total caries experience. Further work is required, however, to determine the variability in this relationship in different areas.<sup>1, 2</sup>

### 4.3 Method of examination

The appropriate method of examination for public health surveys involves the use of good natural daylight or artificial light, plane mouth mirrors and sharp probes. Radiographs are not recommended for use in this type of examination because of the impracticability of making them a standard requirement.

The extent of the clinical examination will depend upon the type of data to be collected. If it is to be limited to a determination of the proportion of the population with one or more DMF or df teeth (point prevalence rate), then the examination of each person will be terminated as soon as one affected tooth is detected. In those who apparently are caries-free, each tooth is carefully examined to confirm the diagnosis. On the other hand, if the mean number of DMF or df teeth per person is to be determined, then each tooth of each person must be examined.

### 4.4 Recording of data

4.4.1 In order to determine the *age-specific percentage of persons with one or more DMF or df teeth* it is necessary only to record whether one

<sup>1</sup> Knutson, J. W. (1944) An index of the prevalence of dental caries in school children, *Publ. Hlth Rep. (Wash.)*, 59, No. 8.

<sup>2</sup> Lilienthal, B. & Andrews, N. H. (1961) The applicability of Knutson's index of prevalence of dental caries to data for Australian, Formosan and Indonesian children, *Arch. oral Biol.*, 3, 207.

or more permanent teeth are affected, or whether one or more primary teeth are affected. This can be recorded by entering a tick (✓) in the appropriate blocks (see also Annex 1):

df teeth :           None            One or more   
 DMF teeth :       None            One or more

4.4.2 In order to determine the *DMF* or *df* rates based on the examination of each tooth it is necessary to record the number of permanent teeth which are D, M or F and the total DMF, and the number of deciduous teeth which are d or f and the total df (see also Annex 1):

|                   |           |         |                          |           |                          |
|-------------------|-----------|---------|--------------------------|-----------|--------------------------|
| Number of teeth : | Decayed : | Primary | <input type="checkbox"/> | Permanent | <input type="checkbox"/> |
|                   | Missing : |         |                          | Permanent | <input type="checkbox"/> |
|                   | Filled :  | Primary | <input type="checkbox"/> | Permanent | <input type="checkbox"/> |
| <hr/>             |           |         |                          |           |                          |
|                   | Total :   | Primary | <input type="checkbox"/> | Permanent | <input type="checkbox"/> |

## 5. THE ASSESSMENT OF PERIODONTAL DISEASES

### 5.1 Definitions

#### 5.1.1 *The periodontium*

All the elements supporting the tooth, represented by cementum, the periodontal membrane, the alveolar bone and the gingiva, constitute the periodontium.<sup>1</sup>

#### 5.1.2 *Periodontal diseases*

Periodontal diseases are those pathological processes of an inflammatory and degenerative type that involve the periodontium. They are generally characterized clinically by gingivitis, pocket formation, loss of alveolar bone, and eventually loss of teeth.

### 5.2 Classification

At present it is not possible to adopt a universally acceptable system of classification of periodontal diseases which is based on etiology or pathology, as this type of assessment lacks sufficient precision. However, for the purposes of international reporting it is acceptable to assess perio-

<sup>1</sup> World Health Organization (1961) *Periodontal disease: Report of an Expert Committee on Dental Health*, Geneva (*Wld Hlth Org. techn. Rep. Ser.*, 207).

dontal diseases by recording clinical signs only. Persons with periodontal diseases may thereby be classified in two groups: those with *superficial lesions* who have inflammation of the gingiva only, and those with *deeper lesions* who have pocket formation with or without associated inflammation.

#### 5.2.1 *Inflammation of the gingiva*

The presence of inflammation of the gingiva is recorded when there is evidence of any one or more of the following signs around one or more teeth: redness, swelling, ulceration and bleeding.

#### 5.2.2 *Periodontal pocket*

A pocket is recorded if it is more than 3 mm in depth. It should be emphasized that this is an arbitrary but objective criterion. In this assessment no specific attempt is made to differentiate between true pockets and false pockets.

### 5.3 **Indices**

#### 5.3.1 *Measurement of prevalence*

The Committee considered that a classification based on clinical signs should be used as a basis for estimating *prevalence rates* in terms of persons affected. Under this system the appropriate indices are:

- (a) the percentage of persons with one or more signs of periodontal disease—either inflammation of the gingiva or pockets or both;
- (b) the percentage of persons with one or more signs of inflammation of the gingiva around one or more teeth;
- (c) the percentage of persons with one or more pockets.

These indices are expressed as age-specific prevalence rates (see 3.1.3). They can be used to estimate the proportion of a population which requires periodontal treatment. They also give some indication of the intensity of periodontal diseases in a population, as persons with inflammation only can be classified as having superficial lesions, while those with pockets and those with both inflammation and pockets can be classified as having deeper lesions.

#### 5.3.2 *Measurement of intensity*

In some surveys it may be desirable, for epidemiological purposes, to measure the *extent or intensity* in more detail. A simple way to do this is to make a count of the number of gingival units which show signs

of inflammation and of the number of pockets present in each patient, and from these compute the averages per person. Other more detailed methods are described in a Report of the Expert Committee on Dental Health.<sup>1</sup>

#### 5.4 Methods of examination

The presence of inflammation of the gingiva can be determined by inspection, using good natural or artificial light and a plane mouth mirror.

The presence of a pocket can be determined by the use of a blunt periodontal probe which has a mark 3 mm from the tip. Each tooth is tested with this probe interproximally, labially and lingually, and when the mark is not visible a pocket is diagnosed as present and is recorded. If the survey is limited to a determination of the proportion of the population with one or more pockets, then the examination of each person is terminated as soon as one pocket is detected. In those who apparently are free of pockets, each tooth is examined to confirm the diagnosis. The measurement of intensity also necessitates the examination of each tooth.

#### 5.5 Recording of data

The presence or absence of inflammation of the gingiva and of periodontal pockets can be recorded by entering a tick (✓) in the appropriate blocks (see also Annex 1):

Inflammation of gingiva :    No        Yes      
 Periodontal pockets :        None     One or more

#### 5.6 Calculus

Since the relation between certain types of periodontal diseases and calculus is so marked and uniform it is advisable to include an assessment of calculus in a survey of periodontal diseases.

Supragingival calculus is recorded as present if definite hard deposits are found on one or more teeth.

Subgingival calculus is recorded if it is detected on one or more teeth.

The presence or absence of each type of calculus can be recorded by entering a tick (✓) in the appropriate blocks (see also Annex 1):

None                       Supragingival                       Subgingival

<sup>1</sup> World Health Organization (1961) *Periodontal disease: Report of an Expert Committee on Dental Health*, Geneva (*Wld Hlth Org. techn. Rep. Ser.*, 207).

## 6. THE ASSESSMENT OF HANDICAPPING DENTOFACIAL ANOMALIES

### 6.1 Definition

A handicapping dentofacial anomaly is one which causes disfigurement or which impedes function.

### 6.2 Classification

Since the assessment of a handicapping dentofacial anomaly depends upon the subjective judgement of the examining dentist, no attempt is made to classify these anomalies other than on the basis of whether or not they require treatment.

An anomaly should be regarded as requiring treatment if the disfigurement or functional defect is or is likely to be an obstacle to the patient's physical or emotional well-being.

### 6.3 Index

The index recommended by the Committee is the age-specific percentage of persons who, in the judgement of the examiner, have a handicapping dentofacial anomaly which requires treatment. This is recorded by entering a tick ( $\checkmark$ ) in the appropriate block as shown below :

Treatment required?    Yes                       No

If treatment is recorded as necessary, a tick ( $\checkmark$ ) should be placed in the appropriate block (or blocks) to indicate the reason :

|               |                          |                    |                          |
|---------------|--------------------------|--------------------|--------------------------|
| Cleft palate  | <input type="checkbox"/> | Cleft lip          | <input type="checkbox"/> |
| Prognathism   | <input type="checkbox"/> | Retrognathism      | <input type="checkbox"/> |
| Deep overbite | <input type="checkbox"/> | Open bite          | <input type="checkbox"/> |
| Crowding      | <input type="checkbox"/> | Spacing            | <input type="checkbox"/> |
| Other         | <input type="checkbox"/> | -----<br>(specify) |                          |

(Note : If treatment is required for reasons other than those for which provision is made on the form, a tick ( $\checkmark$ ) should be placed in the block marked "Other" and the type of anomaly should be specified.)

These categories are not mutually exclusive. Thus it is possible to place a tick ( $\checkmark$ ) in one or more of the blocks.

The results of this type of assessment can be expressed as the age-specific percentage of persons who require treatment for one or more anomalies or the age-specific percentage of persons with a specific anomaly.

#### 6.4 Notification of cleft palate and cleft lip

Because of their importance it was recommended that the WHO Expert Committee on Health Statistics should consider the inclusion of these deformities in the list of diseases and conditions which are required to be notified at birth.

### 7. THE ASSESSMENT OF NEEDS FOR DENTAL PROSTHESES

The Committee recognized that the absence of teeth also constitutes a functional handicap or disfigurement. Accordingly, a separate assessment should be made of persons who are considered by the examining dentist to require prosthetic treatment.

The presence or absence of the following items should be recorded by entering a tick ( $\nu$ ) in the appropriate blocks (see also Annex 1) :

|  | <i>Upper jaw</i>             |                             | <i>Lower jaw</i>             |                             |
|--|------------------------------|-----------------------------|------------------------------|-----------------------------|
| All natural teeth absent :                             | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| All remaining natural teeth indicated for extraction : | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Wearing full dentures :                                | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

(Note : If a person has his natural teeth absent and is wearing a full denture, both items are recorded.)

The results can be expressed as the percentage of persons who require extraction of their remaining natural teeth, the percentage of persons who have lost all their natural teeth and the percentage of persons who are wearing full artificial dentures. These rates can be expressed separately for the upper and lower jaws. All rates should be expressed as age-specific percentages (see 3.1.3).

The presence of or need for partial dentures can also be assessed, provided this is done separately.

### 8. PRINCIPLES OF PLANNING, REPORTING AND WRITING RESULTS

#### 8.1 Training of examiners for dental surveys

Intelligent recognition and recording of dental diseases and conditions requires that the examiners be properly trained and experienced in rendering definitive clinical judgements. Although, in general, the criteria recommended in this report for making such judgements reduce the number

of categories commonly used in the classifications employed by dental clinicians, this does not reduce the need for care in making the broader classifications.

Training and field trials of the examiners are an essential preparatory phase of any dental survey. Training should be conducted so as to ensure uniform interpretation and understanding of the criteria of the dental diseases and conditions to be observed, classified and recorded and to maximize the reproducibility of the clinical findings of each examiner and between different examiners. Neither an oversensitive examination nor a cursory one is reproducible to a high degree.

Training directed towards the development of reproducibility of an examiner's clinical findings is provided by requiring that the examiner make a series of independent recordings of his clinical findings on different days on the same group of patients. The number of re-examinations and comparisons necessary in order to attain acceptable reproducibility will vary for each examiner.

In large-scale surveys provision should be made to assess interexaminer differences so that comparability between one examiner and another can be assured.

## **8.2 Planning**

In order to ensure that a survey will be properly designed, the Committee emphasized the need for the collaboration of the statistician from the outset of the planning. Mutual understanding between the statistician and the dental health worker is indispensable for achieving satisfactory results. The purpose of the survey should be correctly formulated so that the statistician knows on what specific items the survey should elicit information ; what relationships or comparisons are to be studied for dental diseases and conditions on the one hand and associated factors on the other ; in what form the analysis of the data will be required ; and what practical use of the results is visualized. Some indication of the factors already known to produce major differences in the pattern of disease among the different population groups will be useful for producing an acceptable stratification plan. The precision with which the survey should provide estimates of the various indices should be specified so that the sample size can be determined.

The Committee also wished to emphasize that the purpose of the proper design of a survey is not merely to provide a representative sample of the population or to produce the required information most economically, but also to indicate how reliable the information is with regard to sampling error and to the variability in the diagnostic ability of different examiners.

### 8.3 Record forms

Two comprehensive dental-inspection record forms are presented as examples of forms which could be used for recording observations on all the dental diseases and conditions referred to in this report. They are presented in Annexes 1 and 2.

Annex 1 is an example of a form which could be used for individual dental examinations. When the examinations of the required group of persons have been completed, the dental-inspection forms are arranged in age groups, the various items are totalled, and the totals are entered in the appropriate columns on the dental-health-survey report form (Annex 2).

The average *df* and DMF teeth per person in each age group are then computed and also entered on the survey report form.

If it is desired to express the data in terms of percentages, a further form should be used (similar to Annex 2).

### 8.4 Preparation of reports

The Committee noted that the United Nations Sub-Commission on Sampling<sup>1</sup> and the FDI Commission on Oral and Dental Statistics<sup>2</sup> have made special recommendations regarding the preparation of sample survey reports, the adoption of which will facilitate comparisons of results from different surveys. The Committee suggested that dental-survey reports conform as far as possible to the general principles set out in the above-mentioned publications.

## 9. SUMMARY

In this report, the Committee has specified the basic data which it considers important in the field of dental public health and has recommended criteria and indices for use in obtaining such data.

Examination procedures and the method of reporting the data have purposely been kept as simple as possible in order to promote their wide use and to establish standards which will be internationally acceptable and comparable.

The dental diseases and conditions covered in this report are those which constitute major public health problems in many countries, namely, dental caries, periodontal disease, calculus, handicapping dentofacial anomalies, and absence of teeth.

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<sup>1</sup> United Nations Sub-Commission on Sampling (1959) *The preparation of sampling survey reports*, New York (United Nations Statistical Papers, Ser. C, No. 1).

<sup>2</sup> General principles concerning the international standardization of dental caries statistics, *Int. dent. J.*, Vol. 12, March 1962.

The principles of planning surveys, recording and reporting data, and the preparation of reports have been mentioned briefly.

#### **ACKNOWLEDGEMENT**

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## Annex 1

## EXAMPLE OF A DENTAL-INSPECTION FORM

Name: ..... Age last birthday:  years  
 \* Ethnic group: .....  
 \* Location: ..... Sex: M  F

|  |   |
|--|---|
| * NUMBER OF TEETH PRESENT: Primary <input type="checkbox"/> Permanent <input type="checkbox"/>                             |   |
| <b>DENTAL CARIES</b>   |   |
| df teeth:  | None <input type="checkbox"/> One or more <input type="checkbox"/>  |
| DMF teeth:   | None <input type="checkbox"/> One or more <input type="checkbox"/>  |
| Number of teeth:   | Decayed: Primary ..... Permanent .....  |
|  | Missing: Primary ..... Permanent .....  |
|  | Filled: Primary ..... Permanent .....   |
| Total:   | Primary ..... Permanent .....   |
| <b>PERIODONTAL DISEASES</b>  |   |
| Inflammation of gingiva:   | No <input type="checkbox"/> Yes <input type="checkbox"/>  |
| Periodontal pockets:   | None <input type="checkbox"/> One or more <input type="checkbox"/>  |
| <b>CALCULUS:</b> None <input type="checkbox"/> Supragingival <input type="checkbox"/> Subgingival <input type="checkbox"/> |   |
| <b>HANDICAPPING DENTOFACIAL ANOMALIES</b>  |   |
| Treatment required?  | Yes <input type="checkbox"/> No <input type="checkbox"/>  |
| Reasons for treatment:<br>(check, if applicable)   | Cleft palate <input type="checkbox"/> Cleft lip <input type="checkbox"/><br>Prognathism <input type="checkbox"/> Retrognathism <input type="checkbox"/><br>Deep overbite <input type="checkbox"/> Open bite <input type="checkbox"/><br>Crowding <input type="checkbox"/> Spacing <input type="checkbox"/><br>Other <input type="checkbox"/> .....<br>(specify) |
| <b>NEED FOR DENTAL PROSTHESES</b>  |   |
|  | <i>Upper jaw</i> <i>Lower jaw</i>   |
| All natural teeth absent:  | Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>   |
| All remaining natural teeth<br>indicated for extraction:   | Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>   |
| Wearing full dentures:   | Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>   |

\* [Other information for special purposes of the survey] .....

\* Remarks: .....

Date of examination: ...../...../19..... Signature of examiner: .....

\* Optional