

WORLD ORAL HEALTH

STANDARD DESCRIPTIVE TABLES
IN
WHO ORAL HEALTH EPIDEMIOLOGICAL STUDIES



The Oral Health Programme
World Health Organization

1. THE IMPACT OF COMPUTER TECHNOLOGY ON STANDARDIZATION OF ORAL HEALTH EPIDEMIOLOGICAL DATA
2. LIST OF RECOMMENDED WHO STATISTICAL TABLES
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Annex: Example of oral examination recording form

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THE IMPACT OF COMPUTER TECHNOLOGY ON STANDARDIZATION
OF ORAL EPIDEMIOLOGICAL DATA

I. INTRODUCTION

Since 1965, the Oral Health unit of the World Health Organization (WHO/ORH) in Geneva has contributed much to the launching, promotion and development of epidemiological surveys of all types in the field of oral health.¹⁻⁸

Studies of disease prevalence and trends and evaluations of needs or care programmes have been conducted at local, national or multinational levels, focusing particularly on carious and gingival lesions. WHO has established a data bank containing the results of these surveys and has reported much of the data.⁹⁻¹⁵

Although most of these studies are based on the use of indices and methodological approaches that are fairly widely accepted and more or less comparable, WHO/ORH has always endeavoured, as is its role, to develop and promote common strategies and standardized methods and practices for oral health surveys.

Prior to the advent of personal computers which are now relatively inexpensive and widely available, the standardization promoted by WHO/ORH concentrated mainly on the phases involved in the preparation of surveys.

WHO's work in this area has included:

- definition of systematic approaches to the collection/gathering of data (choice of objectives, populations, etc.);
- dissemination of objective and reliable techniques of measurement appropriate to each type of survey (choice of indices, instruments, tools and diagnostic procedures, etc.);
- recommendations relating to the practical implementation of surveys (calibration of examiners, protocols for oral/dental examinations, etc.);
- logistics for the gathering of data to be processed by computer: provision of objective questionnaires with precise descriptions of the information to be gathered (in type and in kind), its coding and, increasingly, its validation.

As personal microcomputers perform these tasks with increasing efficiency and ever more powerful software, many investigators feel that they would like to store and process their survey data on this now familiar type of equipment.

This phase of processing and analysis was hitherto difficult to standardize because of the wide variation in types of facilities which were

used (large and inaccessible computers with specific languages and software, pocket calculators, and even manual calculation). Given the nature of microcomputers and the compatible (if not standardized) software which can be used, it is now possible to adopt formal and uniform approaches, provided that strategies for processing the data (methodology or logical sequence) are clearly and precisely defined.

The comparability and reliability of epidemiological surveys can be assured only if the nature and presentation of the results sought, and the algorithms or logical procedures from which they are derived, are described with rigour and accuracy. The exchange of results in all forms (raw or pre-processed data, data processing programmes, etc.) is now possible through the media of diskettes or data transmission networks, and offers a greater degree of reliability.

This document therefore sets out to offer an illustrative list of descriptive statistical tables prepared by the WHO/ORH technical team, and to explain their logical basis. These statistics are based on clinical data recorded on the Oral Examination Form used in the International Collaborative Study of Oral Health Outcomes (ICS-II) organized by WHO and currently in progress.

Recording forms for coding and collecting data to which the same logical criteria are applied, but which differ in their layout and their number of fields, may also be used by investigators if considered more appropriate to their survey requirements. The procedure for data collection is described in detail in the ICS-II protocol.

The ORH/WHO clinical examination covers the following:

- basic sociogeographic parameters: country, region, area, age, sex;
- periodontal status as evaluated by the Community Periodontal Index of Treatment Needs (CPIITN), loss of attachment, and the ensuing treatment needs as evaluated by the examiner;
- decayed, missing or filled (DMF) status of primary and permanent teeth, and related needs for restorative treatment;
- any dento-facial anomalies, quantified in terms of about a dozen parameters, fixed or removable dentures, and condition of enamel.

II. STATISTICAL TABLES: GENERAL DESCRIPTION

Seven classes of statistical tables are proposed:

1. Statistical description of the samples studied in terms of the geographical and socioeconomic parameters selected.
2. Periodontal findings: periodontal status and related needs.

3. Status of loss of attachment.
4. Findings related to caries status of primary and permanent dentition and treatment required.
5. Dento-facial anomalies (young subjects only).
6. Status/requirements for fixed or removable dentures.
7. Condition of enamel (fluorosis, opacities).

To calculate certain statistics accurately, especially percentages and mean values, it is necessary to specify clearly the number and nature of the subjects to which they refer and, in particular, whether or not the totally edentulous subjects encountered in the course of the survey should be included.

It is therefore recommended that two versions of certain tables should be produced, one including the edentulous subjects and the other excluding them.

In oral health epidemiology age is an important and natural factor; almost all results will be produced with a breakdown by age group.

The standard age groups used by WHO/ORH are : 6-7 years, 12-13 years, 20-24 years, 25-29 years, 30-34 years, 35-44 years, 45-54 years, 55-64 years and 65-74 years. Specific age groups used must be chosen in the light of the objectives of the survey to be carried out. The standardization and comparability of results depend upon the use of these same age groups.

When calculating certain tables, it is necessary to construct new variables (calculated variables), to which reference can be made when needed.

III. CONCLUSIONS

The use of microcomputers and increasingly powerful software and the compatibility of these tools, now make it possible to analyse epidemiological survey data in a manner that is inexpensive, interactive and at all times verifiable.

Any investigator who wishes to conduct a survey can access fairly readily a personal computer with standardized software or specific programmes to carry out the various stages of processing survey data.

In order to obtain results of greater comparability, quality and reliability, WHO/ORH is helping to define, promote and disseminate standardized techniques and methods that can be used by anyone interested in oral health epidemiological surveys (clinical research, evaluation of treatment needs, evaluation of oral health programmes, etc.).

The detailed description of the layout, titles and method of calculation (simple algorithms) of these tables of results will avoid ambiguities and ensure the best possible comparability, while leaving the survey processing team free to choose the equipment and software it will use.

This standardization of data processing will produce the complete compatibility that is possible with microcomputer technology, permitting the transfer and exchange of raw or pre-processed data, results or processing programmes, by means of diskettes or over the telephone network.

It is obvious that the selection of tables offered in this document is not exhaustive, and that all the tables are not necessarily required for every survey. Depending on needs, survey objectives, and the extent to which the questionnaire to be used is compatible with the WHO/ORH questionnaire, investigators will be able to decide which tables they wish to produce.

These tables are no more than the simple descriptive results that can be produced with any statistical software package on a microcomputer.

WHO/ORH will then carry out more complicated processing, including tests of comparison between groups, correlation between CPITN/loss of attachment data, CPITN/DMF, etc.

WHO/ORH is already distributing an independent software package for the management/preparation of data (capture, validation, update, printing of sorted lists, etc.) and automatic production of some of the tables shown in this document.

WHO/ORH is also planning to develop recommendations for the inclusion of environmental or general health data on the subjects examined in the clinical examination questionnaire.

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LIST OF WHO RECOMMENDED STATISTICAL TABLES

GENERAL DESCRIPTIVE TABLES FOR THE TOTAL SAMPLE

01. Distribution of total sample by age group
02. Distribution of total sample by area type
03. Distribution of total sample by examiner
04. Crosstabulation of age group by sex for total sample
05. Crosstabulation of age group by area type for total sample

PERIODONTAL STATUS AND TREATMENT NEEDS

06. Distribution of total sample by periodontal status: number and percentage of dentate and edentulous subjects. A person is considered edentulous when all six sextants have been coded X. Any subject with any coded other than X, including 9, is considered dentate.

The following tables have been calculated on dentate subjects only. The mean number of sextants (Tables 9 - 18) are obtained by dividing the total number of sextants affected by the total number of subjects in the age group.

07. Percentage of subjects according to highest score
08. Mean number of sextants per subject with no periodontal disease
09. Mean number of sextants per subject with score 1 (bleeding) or higher
10. Mean number of sextants per subject with score 2 (calculus) or higher
11. Mean number of sextants per subject with scores 3 or 4 (pockets)
12. Mean number of sextants per subject with score 4 (deep pockets)
13. Mean number of sextants per subject with score X (excluded)
14. Mean number of sextants per subject with score 9 (cannot be determined)
15. Percentage of subjects needing oral hygiene instruction (TN1): subjects with any sextant scored 1 or higher
16. Percentage of subjects and mean number of sextants per subject needing prophylaxis (TN2): subjects with any sextant scored 2 or higher

17. Percentage of subjects and mean number of sextants per subject needing complex care (TN3):
subjects with any sextant scored 4
18. Number and percentage of subjects by number of healthy sextants
19. Number and percentage of subjects by number of sextants scored 4

LOSS OF ATTACHMENT

For adults only, minus excluded subjects. A subject is excluded when six code X are scored.

20. Distribution of total sample by loss of attachment status:
The following two tables have been calculated on dentate subjects only
21. Number and percentage of subjects by highest score
22. Mean number of sextants scored 1, 2, 3, 4, X, 9

CARIES STATUS AND TREATMENT NEED TABLES

Two sets of tables are provided. For the first, all calculations have been applied to the total sample by age group: for the second, they have been applied to dentate subjects only.

23. Number and percentage of dentate and edentulous subjects by age group

PRIMARY DENTITION - TOTAL SAMPLE
(children only)

24. Number and percentage of subjects with caries of the primary dentition:
(codes B, C, D, E)
25. Number and percentage of subjects with decayed primary teeth:
(codes B, C)

26. Number and percentage of subjects with missing primary teeth, calculated for teeth 55-65 and 85-77:
(code E)
27. Number and percentage of subjects with filled primary teeth, with or without decay:
(codes C, D)
- 28.(i) Mean number of decayed, missing and filled primary teeth per subject (dmf):
(codes A, B, C, D, F, G)
- 28.(ii) Mean number of primary teeth decayed, filled, filled without decay, missing, present, decayed & missing & filled per subject (dmft)
29. Mean number of primary teeth present per subject:
(codes A, B, C, D, F, G)

PERMANENT DENTITION - TOTAL SAMPLE
(all age groups)

The calculations for the following tables are based on 32 teeth.

30. Number and percentage of subjects with caries of the permanent dentition:
(codes 1, 2, 3, 4)
31. Number and percentage of subjects with decayed permanent teeth:
(codes 1, 2)
32. Number and percentage of subjects with permanent teeth missing due to caries:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
33. Number and percentage of subjects with permanent teeth missing due to caries, excluding third molars:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
34. Number and percentage of subjects with filled teeth, with or without decay:
(codes 2, 3)
35. Number and percentage of subjects with filled teeth, with decay:
(code 2)
36. Number and percentage of subjects with filled teeth, without decay:
(code 3)
37. Mean number of decayed permanent teeth per subject:
(codes 1, 2)
38. Mean number of permanent teeth missing due to caries:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
39. Mean number of permanent teeth missing due to caries, excluding third molars:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
40. Mean number of filled permanent teeth with or without decay:
(codes 2, 3)
41. Mean number of filled permanent teeth, with decay:
(code 2)
42. Mean number of filled permanent teeth, without decay:
(code 3)

43. Mean number of decayed, missing and filled permanent teeth (DMF) per subject:
(codes 1, 2, 3, 4, 5)
44. Mean number of permanent teeth present per subject:
(codes 0, 1, 2, 3, 4, 6, 7, 9, T)
45. Mean number of permanent teeth present per subject, excluding third molars:
(codes 0, 1, 2, 3, 4, 6, 7, 9, T)

TREATMENT NEEDS

For tables 47-60, all calculations have been applied to the total sample by age group: for tables 61-76, they have been applied to dentate subjects only.

46. Number and percentage of subjects with teeth needing extraction:
(code 7)
47. Mean number of teeth per subject needing extraction:
(code 7)
48. Number and percentage of subjects needing arresting care or sealants:
(code 1)
49. Mean number of teeth per subject needing arresting care or sealants:
(code 1)
50. Number and percentage of subjects needing fillings:
(code 2, 3)
51. Mean number of teeth per subject needing fillings:
(codes 2, 3)
52. Number and percentage of subjects needing crowns or bridges:
(codes 4, 5)
53. Mean number of teeth per subject needing crowns or bridges:
(codes 4, 5)
54. Number and percentage of subjects needing pulp care:
(code 6)
55. Mean number of teeth per subject needing pulp care:
(code 6)
56. Number and percentage of subjects needing any type of restorative care:
(codes 2, 3, 4, 5, 6)
57. Mean number of teeth per subject needing any type of restorative care:
(codes 2, 3, 4, 5, 6)
58. Number and percentage of subjects needing special care:
(codes 8, 9)
59. Mean number of teeth per subject needing special care:
(codes 8, 9)

PERMANENT DENTITION - DENTATE SAMPLE
(all age groups)

60. Number and percentage of dentate subjects with caries of the permanent dentition:
(codes 1, 2, 3, 4)
61. Number and percentage of dentate subjects with decayed permanent teeth:
(codes 1, 2)
62. Number and percentage of dentate subjects with permanent teeth missing due to caries:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
63. Number and percentage of dentate subjects with permanent teeth missing due to caries, excluding third molars:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
64. Number and percentage of filled permanent teeth per dentate subject, with or without decay:
(codes 2, 3)
65. Number and percentage of filled permanent teeth per dentate subject, with decay:
(code 2)
66. Number and percentage of filled permanent teeth per dentate subject, without decay:
(code 3)
67. Mean number of decayed permanent teeth per dentate subject:
(codes 1, 2)
68. Mean number of permanent teeth missing per dentate subject due to caries:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
69. Mean number of permanent teeth missing per dentate subject due to caries, excluding third molars:
(code 4 for age groups 2, 3, 5: codes 4, 5 for age group 4)
70. Mean number of filled permanent teeth per dentate subject, with or without decay:
(codes 2, 3)
71. Mean number of filled permanent teeth per dentate subject, with decay:
(code 2)
72. Mean number of filled permanent teeth per dentate subject, without decay:
(code 3)
73. Mean number of decayed, missing and filled permanent teeth (DMF) per dentate subject:
(codes 1, 2, 3, 4, for age groups 2, 3, 5: codes 1, 2, 3, 4, 5 for age group 4)
74. Mean number of permanent teeth present per dentate subject:
(codes 0, 1, 2, 3, 6, 7, 9, T)
75. Mean number of permanent teeth present per dentate subject, excluding third molars:
(codes 0, 1, 2, 3, 6, 7, 9, T)

DENTOFACIAL ANOMALIES

76. *Number and percentage of subjects by treatment status and treatment need*

FLUOROSIS

77. *Number and percentage of subjects affected by fluorosis*
78. *Number and percentage of subjects by severity of fluorosis*

OPACITIES AND OTHER ENAMEL DISORDERS

79. *Number and percentage of subjects by level of opacities*
80. *Mean number of teeth affected by opacities and other enamel disorders*
81. *Number and percentage of dentate subjects needing treatment.*

HOW TO CONSTRUCT THE DESCRIPTIVE STATISTICAL TABLES AND CORRESPONDING VARIABLES

The tables referred to in this section can be considered as the basic descriptive statistics needed from any oral health survey performed using the WHO standard, or similar, recording form.

They can be presented in various ways: the computed figures can be blocked in a single table, or divided into sub-tables. The order and way of numbering may be altered, if necessary, but their titles should be written in such a way as to enable comparisons to be made between surveys.

The logic used for each table is one example of how the results may be calculated. Others can be applied depending on the statistical software used. For example, many descriptive tables can be produced by means of either simple frequency or cross-tabulation procedures. The latter is preferable as it provides more detailed and complete results, and better validity checks such as row and column totals.

From a technical point of view, these tables could be produced using almost any statistical software available on the market. Alternatively, specific programmes could be written in BASIC.PASCAL to compute and produce tables of means and percentages, or cross-tabulations.

For the descriptive tables, it is assumed that each item/field of raw data entered on the recording sheet is associated with a variable such as sex, age, etc. Some tables may require constructed variables. The names of these variables may be adapted according to the user's program or procedures.

All statistics should be provided by the ages/age groups recommended by WHO: 12, 15, 35-44 and 75-74 years.

Caution should be exercised when processing 'missing' information: for example, items left blank, or coded "X" for CPITN or Loss of Attachment on the recording form. The code "9" may also be misleading when computing the maximum severity code for CPITN or Loss of Attachment.

GENERAL DESCRIPTIVE TABLES FOR THE TOTAL SAMPLE

01. Distribution of total sample by age group

LOGIC: Perform simple frequency procedure (number and % of the age variable (AGRP)).

Note: specify missing data, if any.

Same tables for any socio-economic or sociogeographic information collected.

04. Crosstabulation of age group by sex for total sample

LOGIC: Perform a crosstabulation between the age variable (AGRP) and any other parameter of interest such as geographic location, area type, ethnic group, etc.

PERIODONTAL STATUS AND TREATMENT NEEDS

06. Distribution of total sample by periodontal status:
number and percentage of dentate and edentulous subjects

LOGIC: A subject is considered edentulous when all 6 sextants have been coded X in boxes 13 to 18 on the recording sheet. If any code other than X has been entered in these boxes, the subject is considered dentate.

To prepare this table, create and compute 2 new variables:

- CPMAX for the maximum, highest score, value of 6 (which will be used later for other tables).

As 9 and X are ranked less than 0 on the severity scale, proceed as follows:

- CPMAX = X if all 6 values are X
- CPMAX = 9 if at least one value is 9 and all others are X

- CPMAX = 0 if at least one value is 0 and all other are X and 9
 - CPMAX = 1 if at least one value is 1 and all others are 0, 9 or X
 - CPMAX = 2 if at least one value is 2 and all others are 1, 0, 9 or X
 - CPMAX = 3 if at least one value is 3 and all others are 2, 1, 0, 9 or X
 - CPMAX = 4 if at least one score is 4.
- PEDENT is a temporary variable which is equal to 0 if the subject is dentate (i.e. CPMAX not equal to X) and equal to 1 if edentulous (i.e. CPMAX is equal to X)

Then perform a crosstabulation between the 2 variables AGRP and PEDENT.

It is important to note that CPMAX and PEDENT are computed on 10 teeth only and not on 28 or 32. This is particular to CPITN analysis.

07. Percentage of subjects according to highest score

Age	Total Subjects	X Edentulous	Total Dentate	0 No Perio- dental Disease	1 Bleeding Only	2 Calculus	3 Shallow Pockets	4 Deep Pockets
06-07								

65-74								

LOGIC: This table is a crosstabulation between age group (AGRP) and CPMAX. Only dentate subjects are included.

08. Mean number of sextants per subject with no periodontal disease
09. Mean number of sextants per subject with score 1 (bleeding) or higher
Mean number of sextants per subject with score 2 (calculus) or higher
11. Mean number of sextants per subject with scores 3 or 4
12. Mean number of sextants per subject with score 4
13. Mean number of sextants per subject with score X
14. Mean number of sextants per subject with score 9

LOGIC: To build this table, compute 7 new temporary variables: CP0, CP14, CP24, CP34, CP4, CP9, CPX for each individual with the number of sextants scored 0, 1 or 2 or 3 or 4, 2 or 3 or 4, 3 or 4, 4, 9, X respectively. Prepare the mean and standard deviation of these variables by age group. Specify if the mean is based on the whole age group or only on subjects affected with the age group.

15. Percentage of subjects needing oral hygiene instruction (TN 1):
subjects with any sextant scored 1 or higher
16. Percentage of subjects and mean number of sextants per subject needing
prophylaxis (TN 2)
subjects with any sextant scored 2 or higher
17. Percentage of subjects and mean number of sextants per subject needing
complex care (TN 3):
subject with any sextant scored 4

LOGIC: First select subjects to be included in each category.

For TN1: use either condition $CPMAX \leq X$ and $CPMAX > 0$ and $CPMAX < 9$, or condition $CP14 > 0$.

For TN2: use condition $CPMAX \leq X$ and $CPMAX < 9$ and $CPMAX > 1$, or condition $CP24 > 0$.

For TN3: use condition $CPMAX = 4$, or condition $CP4 > 0$.

For each category, build a temporary variable which is 0 or 2YES" if a subject belongs to that category, otherwise 0 or "NO", then perform a crosstabulation between that variable and the age group which will give the frequencies and percentages requested.

For the mean number of sextants, select subjects in TN2, then perform a mean and standard deviation and standard error by age group computations using variables CP24 and CP4 respectively.

It is important to label these tables appropriately because the mean numbers obtained are based not on all subjects in each age group, but on subjects within the age group of the category concerned, although it is useful to know both values.

18. Number and percentage of subjects by number of healthy sextants

Frequency Row Pct	0	1	2	3	4	5	6
06-07							

65-74							

19. Number and percentage of subjects by number of sextants scored 4

LOGIC: Perform a crosstabulation between age variable and variables CP0, CP4 and CPX respectively.

LOSS OF ATTACHMENT

The following tables apply to data recorded in boxes 19 to 24 and have been calculated for dentate adult subjects. A subject is considered dentate if any score other than X has been recorded.

20. Distribution of total sample by loss of attachment status

LOGIC: Create 2 new variables LASMAX and LEDENT.

LASMAX holds the highest score of the 6 values in boxes 19-24 (codes 9 and X are ranked less than 0). Compute LASMAX as follows:

- LASMAX = X if all 6 values are X.
- LASMAX = 9 if at least one value is 9 and others are X or 9.
- LASMAX = 0 if at least one value is 0 and others are 0, 9 or X.
- LASMAX = 1 if at least one value is 1 and others are 1, 0, 9 or X
- LASMAX = 2 if at least one value is 2 and others are 2, 1, 0, 9 or X
- LASMAX = 3 if at least one value is 3 and no 4
- LASMAX = 4 if at least one value is 4.

LESDENT will be 0 if subject is dentate (i.e. LASMAX<>X) and 1 if edentulous (i.e. LASMAX = X).

Perform a crosstabulation between age variable and LEDENT.

21. Number and percentage of subjects by highest score

Frequency	0	1	2	3	4	9
Row Pct						
06-07						

65-74						

LOGIC: Select adult dentate from the survey file (LASMAX<>X and AGRP>2), then crosstabulate between age AGRP and LASMAX variables.

22. Mean number of sextants scored 1, 2, 3, 4, X, 9

		Code 0	Code 1	Code 2	Code 3	Code 4	Code 9	Code X
Age Group								
	N							
	Mean							
	STD							

LOGIC: LASMAX<>X and AGRP>2.

Compute 7 new temporary variables LAS0, LAS1, LAS2, LAS3, LAS4, LAS9 and LASX, for each individual, for the number of sextants scored 0, 1, 2, 3, 4, 9, or X respectively.

Calculate the mean and standard deviations for each of these variables, by age group.

The means should be based on each total age-group count, although other means based on affected subjects only could also be useful.

CARIES STATUS AND TREATMENT NEED TABLES

If children are surveyed, statistics on primary teeth status may be required. For all age groups over and above 9 years, statistics on permanent teeth status are prepared based on the total sample (including edentulous subjects) and on dentate subjects only.

PRIMARY DENTITION - TOTAL SAMPLE

24. Number and percentage of subjects with caries of the primary dentition

LOGIC: Select only subjects with teeth decayed, filled with/without caries, or missing due to caries (i.e. subjects with at least code B or C or D or E in boxes 73-82 and 121-130) then compute a new variable XDECBE which equals 0, or if none found, 1.

Perform a crosstabulation of AGRP 1 and 2 only and XDECBE variables.

25. Number and percentage of subjects with decayed primary teeth

LOGIC: compute a new variable XDEC which is 1 if a subject has at least one decayed primary tooth (i.e. at least one code B or C in boxes 73-82 and 121-130), otherwise 0, then perform a crosstabulation between AGRP and XDEC

26. Number and percentage of subjects with missing primary teeth, calculated for teeth 55-65 and 85-77

27. Number and percentage of subjects with filled primary teeth, with or without decay

28.(i) Mean number of decayed, missing and filled primary teeth per subject (dmf)

LOGIC: As above, with titles and subheadings adapted appropriately according to the the following subject selection conditions:

Create new variables XMISS, XFILCD, CFILd, XDMF:

- XMIS=1 if a subject has at least one missing primary tooth (i.e. at least one code E), otherwise 0
- XFILCD=1 if a subject has at least one filled primary tooth (i.e. at least one code C or D) otherwise 0
- XDMF=1 if a subject has at least one code B or C or D or E or F or G

Perform crosstabulation between AGRP and each of these variables.

28.(ii) Mean number of primary teeth decayed, filled, filled without decay, missing, present, decayed & missing & filled per subject (dmft)

		Primary Teeth dmft codes: B,C,D,E,F,G	Primary Teeth Present codes A.B.C,D,F,G
Age Group	N		
	Mean		
	STD		

LOGIC: To prepare this table, create 6 new variables TDEC, TFILCD, TFILd, TMIS, TDMF respectively, computed as follows for each subject:

TDEC = number of decayed primary teeth; codes B or C
 TFILCD = number of filled primary teeth with or without decay, codes C, D
 TFILD = number of filled primary teeth without decay: code D
 TMIS = number of missing primary teeth: code E
 TPRS = number of primary teeth present: codes A, B, C, or D
 TDMF = number of decayed or filled or missing primary teeth: codes B, C, D, E, F, G

Calculate the means, standard deviations and standard errors of these variables, indicating if the means are based on all subjects in an age group, or on other subgroups such as those affected by caries only in each age group.

PERMANENT DENTITION - TOTAL SAMPLE

It is recommended that the same set of tables as for the primary dentition be produced, for the total sample (edentulous subjects included) and for dentate subjects only.

Number and percentage of dentate and edentulous subjects by age

LOGIC: Create a new temporary variable PEDENT as follows:

CREDEnt = 1 if a subject is edentulous, otherwise 0

For this and subsequent tables, a subject is considered edentulous if all 32 teeth (including third molars) are scored 4 (extracted due to caries), or 5 (extracted for any reason), or 8 (unerupted or missing): if any other code is found, the subject is considered dentate.

Perform a crosstabulation between AGRP and CEDENT.

30. Number and percentage of subjects with caries of the permanent dentition

LOGIC: Create a new variable YDEC14. For each subject YDEC14 = 1 if any permanent tooth is scored 1, 2, 3 or 4 in boxes 70-85 and 118-133, otherwise YDEC14 = 0, then perform a simple crosstabulation between AGRP and YDEC14 variables.

The following tables follow the same logic and apply to the total sample:

31. Number and percentage of subjects with decayed permanent teeth

32. Number and percentage of subjects with permanent teeth missing due to caries
33. Number and percentage of subjects with permanent teeth missing due to caries, excluding third molars
34. Number and percentage of subjects with filled teeth, with or without decay
35. Number and percentage of subjects with filled teeth, with decay
36. Number and percentage of subjects with filled teeth, without decay

LOGIC: Create new variables YDEC, YMIS32, YMIS28, YFIL23, YFIL2, YFIL3 respectively, as follows:

YDEC = 1 if any code 1 or 2 is recorded, otherwise 0
YMIS32=1 if any code 4 (any age) or 5 (age>65) is found, otherwise 0
YMIS28=1 as for YMIS32, except that codes 4 and 5 should be looked for on 28 teeth only (boxes 71-84 and 119-132)
YFIL23=1 if any code 2 or 3 is found, otherwise 0
YFIL2 =1 if any code 2 is found, otherwise 0
YFIL3 =1 if any code 3 is found, otherwise 0

Then perform crosstabulations between AGRP and each of the above variables.

LOGIC: Create 9 new variables for each subject:

PDEC = number of decayed permanent teeth (codes 1 or 2)
PMIS32 = number of missing permanent teeth (any code 4 + code 5 if age >64), for all 32 teeth (3rd molars included)
PMIS28 = same as PMIS32, but for 28 teeth (3rd molars excluded)
PFIL23 = number of permanent filled teeth with or without decay (codes 1 or 2)
PFIL2 = number of filled permanent teeth with decay (code 2)
PFIL3 = number of filled permanent teeth without decay (code 3)
PPRS32) = are the number of permanent teeth present (for 32 and 28 teeth respectively) coded 0, 1, 2, 3, 6, 7, 9, T
PDMF = number of decayed, missing or filled permanent teeth (codes 1 or 2 or 3 or 4 or 5 (when age >64)

Compute the means, standard deviations and standard errors for each of the above variables, by age group, indicating if they are based on total age group counts, or on other subgroups.

TREATMENT NEEDS

The following tables can be prepared for all subjects combined, by age group, or for dentate subjects only. They combine both primary and permanent teeth treatment needs and are calculated from data recorded in boxes 86-101 and 134-149.

46. Number and percentage of subjects with teeth needing extraction
50. Number and percentage of subjects needing fillings
52. Number and percentage of subjects needing crowns or bridges
54. Number and percentage of subjects needing pulp care
56. Number and percentage of subjects needing any type of restorative care
58. Number and percentage of subjects needing special care

These statistics could be presented in one single table, but for ease of labelling and reference it may be preferable to separate them.

LOGIC: Create a new temporary variable:

Y7 = 1 if a subject needs a tooth extracted, i.e. if a code 7 has been recorded, otherwise 0.

Perform a crosstabulation between age and Y1.

For other results scan the Treatment Need boxes with variables:

Y1 = 1 if caries arresting care is needed (code 1), otherwise 0
 Y23 = 1 if fillings needed (code 2 or 3), otherwise 0
 Y45 = 1 if crowns or bridges are needed (code 4 or 5), otherwise 0
 Y6 = 1 if pulp care is needed (code 6), otherwise 0
 Y26 = 1 if any type of restorative care needed (codes 2, 3, 4, 5 or 6), otherwise 0
 Y89 = 1 if special care is needed (code 8 or 9), otherwise 0

Perform a crosstabulation between age and each of the above variables.

47. 49. 51. 53. 55. 57. 59.

Mean number of teeth per subject needing: extraction, arresting care, fillings, crowns or bridges, pulp care, restorative or special care

One possible presentation could be:

Age Group	Variable	Label Permanent Teeth	Total	Mean	Standard Deviation	Standard Error
06-07	TN1	Caries Arresting				
"	TN23	Surface Fillings				
"	TN45	Crowns Bridges				
"	TN6	Pulp Care				
"	TN26	Restorative Care				
"	TN7	Extraction				
"	TN89	Other				

LOGIC: Create 7 new variables: TN1, TN23, TN45, TN6, TN7, TN89 covering, respectively, the number of teeth needing:

- arresting care (code 1)
- fillings (codes 2 or 3)
- crowns or bridges (codes 4 or 5)
- pulp care (code 6)
- any type of restorative care (codes 2-6)
- other care (codes 8 or 9)

Compute the means, with standard deviations and standard errors.

It should be noted that all the means are based on whole age group counts and not on treatment need categories, i.e. subjects that need at least one of the treatments listed above.

The following table reports the same means, but based on each category of care.

Mean number of teeth per subject needing care (count by category of care)

To compare the two methods of calculation, let us suppose that age group 35-44 has a total of 603 subjects, of which 258 have at least one tooth needing extraction, making a total of 748. The first method would show a mean number of $748/603=1.24$ teeth per subject, while the second method would show a mean number of $748/258=2.90$ teeth.

LOGIC: Depending on the software used, the results can be computed either one by one, as follows: select subjects with teeth needing extraction and apply $TN7>0$ or $Y7=1$, or by computing the mean, standard deviation and standard error of the variable TN7 for that subgroup of subjects only.

The obtain the status of the permanent dentition of dentate subjects only, and their treatment needs, first apply $PEDENT=0$ to select the dentate subjects and then apply the same logic as already described.

DENTOFACIAL ANOMALIES

60. Number and percentage of subjects by treatment status and by treatment need

The following distribution tables by number of subjects and severity of anomaly apply to age group 2 only (12-13 years):

- type of anomaly (box 166)
- level of crowding (box 167)
- level of incisal spacing (box 168)
- level of diastema (box 169)
- largest anterior irregularity in maxilla (box 170)
- largest anterior irregularity in mandibula (box 171)
- level of anterior maxillary overjet (box 172)
- level of anterior mandibular overjet (box 173)
- level of vertical anterior openbite (box 174)
- level of anterior-posterior molar relationship (box 175)
- treatment status (box 176)
- treatment need (box 177)

LOGIC: Select children, either through an additional selection condition such as AGE GROUP = 2 or by creating a separate subfile, and then construct simple frequency tables for each variable associated to boxes 166-177.

The Dental Aesthetic Index (DAI) can also be applied.

LOGIC: Create and compute the following variable:
 $DAI = 13 + (\text{box } 166) * 6 + (\text{box } 167) + (\text{box } 168) + (\text{box } 169) * 3 + (\text{box } 170) + (\text{box } 171) + 2 * (\text{box } 172) + (\text{box } 173) * 4 + (\text{box } 174) + (\text{box } 175) * 3.$

Additional tables can be produced combining two or more of the above conditions.

FLUOROSIS

77. Number and percentage of subjects affected by fluorosis

Calculated for dentate subjects only.

LOGIC: Perform a frequency procedure by age on subjects satisfying the condition $FLIS > 0$ where $FLIS$ is the numeric variable associated to box 191.

or

Create a new temporary variable FLX which is equal to 1 if $FLIS > 0$, otherwise 0, then crosstabulate between age and FLX variables.

78. Number and percentage of subjects by severity of fluorosis

Frequency Row Pct	Mild	Missing	Moderate	Normal	Questionable	Very Mild
Age Group 06-07						

65-74						

Total

LOGIC: Crosstabulate between age and FLIS variable.

OPACITIES AND OTHER ENAMEL DISORDERS

79. Number and percentage of subjects by level of opacities

Frequency Row Pct	Not Listed	None	Opacities	Hypoplasia
Age Group 06-07				

65-74				

Total

LOGIC: For dentate subjects only, crosstabulate between age and OPED1, the variable for values in box 192.

80. Mean number of teeth affected by opacities and other enamel disorders

		No. of teeth affected by opacities		
		N	Mean	STD
Age Group	Opacity			
06-07	not listed none opacity hypoplasia			
12-13	not listed none opacity hypoplasia			
35-44	not listed none			
65-74	not listed none			
All	not listed none opacity hypoplasia			

LOGIC: Calculate the mean, standard deviation and standard error of variable OPED2 (boxes 193-194) by age and by level of variable OPED1 (box 192).

Number and percentage of dentate subjects needing treatment

LOGIC: Perform a crosstabulation between age and OPED3 (box 195).

INTERNATIONAL COLLABORATIVE STUDY OF ORAL HEALTH OUTCOMES (ICS II)

Date: _____

Oral Examination Form

NAME											
Country	Identification Number	Duplicate Exam.	Examiner	Sex	Age						
(1) <input type="text"/> (2) <input type="text"/>	(4) <input type="text"/> (7) <input type="text"/>	<input type="checkbox"/> (8)	(9) <input type="text"/> (10) <input type="text"/>	1 = M <input type="checkbox"/> (11)	1 = 06-07 2 = 12-13 3 = 35-44 4 = 65-74 5 = 20-24 <input type="checkbox"/> (12)						
1 = metro 2 = non-metro <input type="checkbox"/> (3)											

PERIODONTAL STATUS	Loss of Attachment																																
<p>CPITN</p> <p>17/16 11 26/27</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: 1px solid black; height: 20px;">(13)</td> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> <td style="width: 25%; border: 1px solid black; height: 20px;">(15)</td> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border: 1px solid black; height: 20px;">(16)</td> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;">(18)</td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table> <p>47/46 31 36/37</p> <p>0 = healthy 1 = bleeding 2 = calculus *3 = pocket 4-5 mm (black band of probe partially visible) *4 = pocket 6 mm or more (black band of probe not visible) *9 = cannot be determined x = excluded sextant *not coded for age groups 6-7 and 12-13</p>	(13)		(15)		(16)		(18)		<p>17/16 11 26/27</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; border: 1px solid black; height: 20px;">(19)</td> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> <td style="width: 25%; border: 1px solid black; height: 20px;">(21)</td> <td style="width: 25%; border: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border: 1px solid black; height: 20px;">(22)</td> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;">(24)</td> <td style="border: 1px solid black; height: 20px;"></td> </tr> </table> <p>47/46 31 36/37</p> <p>mm</p> <p>0 = 0-3 1 = 4-5 2 = 6-8 3 = 9-11 4 = 12 or more 9 = cannot be determined x = excluded or missing sextant/tooth</p> <p>(CEJ within black band) (CEJ between upper limit of black band & 8.5 mm ring) (CEJ between 8.5-11.5 mm ring) (CEJ beyond 11.5 mm ring) (CEJ not visible nor detectable)</p> <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28</td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> <tr> <td style="border: 1px solid black; height: 20px;">(25)</td> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;">(40)</td> <td style="border: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border: 1px solid black; height: 20px;">(41)</td> <td style="border: 1px solid black; height: 20px;"></td> <td style="border: 1px solid black; height: 20px;">(56)</td> <td style="border: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38</td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> </table>	(19)		(21)		(22)		(24)			18 17 16 15 14 13 12 11 21 22 23 24 25 26 27 28			(25)		(40)		(41)		(56)			48 47 46 45 44 43 42 41 31 32 33 34 35 36 37 38		
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Oral Examination Form

NAME

Identification Number

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DENTOFACIAL ANOMALIES (applicable to 12-13 age group only)

Dentition

 (166)

missing incisor, canine and premolar teeth - maxillary and mandibular - enter number of teeth

Space

 (167)

crowding in the incisal segments:

- 0 = no crowding
- 1 = 1 segment crowded
- 2 = 2 segments crowded

 (168)

spacing in the incisal segments:

- 0 = no spacing
- 1 = 1 segment spaced
- 2 = 2 segments spaced

 (169)

diastema in mm

 (170)

largest anterior irregularity - maxilla in mm

 (171)

largest anterior irregularity - mandibular in mm

Occlusion

 (172)

anterior maxillary overjet in mm

 (173)

anterior mandibular overjet in mm

 (174)

vertical anterior openbite in mm

 (175)

antero-posterior molar relation:

- 0 = normal
- 1 = half cusp
- 2 = full cusp

Treatment Status

 (176)

- 0 = not being given
- 1 = completed
- 2 = being given

Treatment Need

 (177)

- 0 = no need for treatment
- 1 = preventive treatment
- 2 = interceptive treatment
- 3 = corrective treatment

 (178)

DENTURE STATUS*

upper lower

 (179) (180)

- 0 = no denture
- 1 = partial denture, wearing
- 2 = full denture, wearing
- 3 = partial denture, not wearing
- 4 = full denture, not wearing

*not coded for age groups 6-7 and 12-13

NEED FOR DENTURES*

upper lower upper lower

 (181) (182) (183) (184)

- 0 = no denture needed
- 1 = need for full denture
- 2 = need for partial denture
- 3 = need to repair full denture
- 4 = need to repair partial denture

*not coded for age groups 6-7 and 12-13

BRIDGE STATUS*

upper lower

 (185) (186)

- 0 = no bridge
- 1 = 1 bridge
- 2 = 2 or more bridges

*not coded for age groups 6-7 and 12-13

NEED FOR BRIDGE*

upper lower upper lower

 (187) (188) (189) (190)

- 0 = no bridge needed
- 1 = 1 new bridge
- 2 = 2 or more new bridges
- 3 = 1 replacement bridge
- 4 = 2 or more replacement bridges

*not coded for age groups 6-7 and 12-13

FLUOROSIS*

 (191)

- 0 = normal
- 1 = questionable
- 2 = very mild
- 3 = mild
- 4 = moderate
- 5 = severe

*coded for age groups 6-7 and 12-13

OPACITIES AND OTHER ENAMEL DISORDERS*

Status

 (192) (193) (194) (195)

- 0 = none
 - 1 = opacities
 - 2 = hypoplasia
 - 3 = tetracycline
- number of teeth affected
- 0 = no
 - 1 = yes

*coded for age groups 6-7 and 12-13

OTHER CONDITIONS

 (196)

REFERRAL FOR CARE