

6. Scope of the survey

The plan for the survey included the study of oral health behaviour, practices and status of the population in the seven districts of different states, selected from different corners of the country, to provide representative data for the country. However, since the variation in geography, culture and eating habits differ significantly among various states, the results from the study can not be extrapolated to whole country. Further, the selection of a district within a state was also “selection for operating convenience”, therefore the district may not be true representative of the state. It also aimed to study the gaps in oral disease burden and health care provision. The final goal was to recommend policy framework to reduce the oral disease burden and improve oral health of the people in this subcontinent.

For the above objectives, 4 index age groups as recommended by WHO (12,15, 35–44 and 65–74 yrs age groups) equally distributed in urban and rural area and further equally distributed among male and female were selected. The modified WHO Oral Health Survey Proforma 2004 and Modified Questionnaires on Oral Health for children and adult population by WHO–HQ, Geneva were used, for carrying out this survey.

There are few high ground water fluoride belts in the country and no consideration was given while selecting the site. For ex. Fluorosis was reported only from Delhi and Lucknow where as Rajasthan which is known to have high fluoride zones, were completely free of fluorosis.

The questionnaire or the assessment form did not have provision of recording the socio-economic status of the population, therefore it is anticipated that the report will not have any component on oral health disparities in different economic groups.

Oral health survey did not record tooth tissue loss due to attrition, abrasion, erosion and abfraction, gingival recession, dental trauma etc. and TMD since all these parameters would have taken a long time in examination of subjects.

However, in spite of these lacunae, the result of the study helps to understand prevalence and severity of various oral diseases, their correlation with dietary practices, oral hygiene methods, literacy level of parents and adult individuals and to give the recommendations for oral health prevention and promotion strategies.

Organization of the survey

Sample Size Calculation

As described by WHO, four age groups viz., 12 years, 15 years, 35–44 years and 65–74 years were identified as index age groups representative of permanent dentition, adult dentition and geriatric dentition. The sample was equally divided between both the genders and urban and rural location. The required minimum sample size for the study was computed based on the lowest prevalence rate which has been reported in literature as that for dental caries in children of 12 years of age, it is 35%. (This prevalence was taken as an average of isolated studies reported in the literature).

$$\text{Required minimum sample size} = (n) = \frac{4 \times p \times (100-p)}{L^2}$$

Where 'p' is the prevalence rate and L is the allowable error (20% of p). This formula applied for achieving 95% confidence Interval.

$$\text{Therefore} - n = \frac{4 \times 35 \times 65}{49} = \text{approx.} 200.$$

Since separate estimates of the prevalence rate of various dental disease was required for the each of the four age groups equally distributed in males and females both in urban and rural areas, the total sample size calculated to be covered in each centre was;

$$4 (\text{age groups}) \times 2 (\text{sex}) \times 2 (\text{urban/rural}) = 16 \times 200 = 3200$$

The distribution of the sample in each of the eight sub groups in urban/rural areas is indicated in the following table:

Age groups	Sex	Number of subjects	Total in age group	Total in urban/rural cluster
12 years	Male	200	400	1600
	Female	200		
15 years	Male	200	400	
	Female	200		
35–44 years	Male	200	400	
	Female	200		
65–74 years	Male	200	400	
	Female	200		

Sampling Procedures

Selection of states and sites

It was initially planned to include one site in each of the geographical regions of the country, but later due to some reasons, two more sites were selected for data collection on oral health. One institution in each of the states was selected for the task. The states were Arunachal Pradesh, Delhi, Maharashtra, Orissa, Puducherry, Rajasthan and Uttar Pradesh. Except Arunachal Pradesh and Delhi, one dental institution in each of the states was invited to participate in the data collection. However, Department of Health, Govt of Arunachal Pradesh and a Medical College in Delhi was invited. The institutions were given freedom to choose one administrative unit (District) of the state based on their convenience but having both urban and rural population.

Sampling Unit

House hold (HH) was taken as the sampling unit in the study. All the eligible persons in the adult and geriatric age groups (35–44 and 65–74 years) from the house hold were included in the study whereas the sample of children and adolescent age group (12 and 15 years) were selected from schools as described subsequently. However if any non school going child was found in the selected household, that child was also included in the study. Multistage sampling was applied for the selection of urban and rural areas.

Part I – Adult and Geriatric Age Groups

The first stage of selection in each centre was the District. Keeping in view the various aspects like expertise and facilities available, the District which is closest to the study centre was selected for the study. (This was left for the operational convenience of the investigators).

The second stage comprised of selecting Sub–districts (if any) from the already selected District. One of them was selected using the random method (lottery). In case the District was not divided into Sub–districts then direct next step for selection of rural and urban localities was undertaken.

In the third stage for the urban area, a complete list of cities and towns was obtained and four town areas were selected randomly by lottery method. Further list of wards in each of the selected towns was obtained. However, for rural areas, directly fourth stage was followed.

In the fourth stage, one ward was selected from the list of wards of each selected town by lottery method. Similarly in the rural area, a list of all villages was obtained from the already selected district and four villages were selected randomly by using lottery method. In case a district already selected was not having enough rural population (village), a nearby district having village was randomly selected.

In the fifth stage from each selected ward / village, a total of 400 households were selected for surveying the adult and geriatric age group. The selection of 400 household was allocated proportionately from each of the four selected wards (for urban area) or villages (for rural area).

In order to cover the selected number of households, the investigators went to one of the prominent places in the selected area (either ward or village) like market, temple, church etc. and then one direction was selected by random method and all the households in that direction were covered till the total number is not completed. In case the total number was not completed in that direction, the investigators went to another prominent location and again chose the direction randomly.

From each of the selected villages in blocks of HH, the adult and geriatric age group only was covered. If more than one person was identified in the HH out of these two age groups in males and females, all of them were examined for the survey. Once the required sample size was reached in both adult and geriatric age groups, the data collection was stopped.

Part – II Children and Adolescent Age Groups

Sample of 12 and 15 years age groups were studied through school based survey. If non-school going children in these age groups were identified in these HH, they were also included in the study.

Selection of Schools – For school survey, all the secondary schools located in the selected villages and wards were listed. Separate lists were prepared for Govt. and Private secondary schools. Out of this, one Govt. and one Private school were selected randomly for each of the selected villages and wards.

Selection of Classes – The required age groups (12 and 15 years in males and females) for this survey were mostly studying in 7th and 10th class, however it was instructed to examine all children in the age range of 12±1 years and

15±1 years studying in these classes . In case the said classes had more than one section, random selection method (lottery) was used to further select the section to be examined. Once a section or a class was selected for the survey, all the children studying in that section or class were included in the study.

In case there were no private schools, two Govt. schools were selected. Similarly, if there were separate schools for boys and girls, one boys school and one girls school were selected.

The total samples for these two age groups were as follows:

4 (Govt. schools) + 4 (Private schools) x 2 (age groups) x 50 (assumed number of children boys section) = 800.

Similarly 800 children were covered in rural area making total 1600.

Each of the seven regional centers was instructed to plan similar sampling methodology based on the guidelines for carrying out Multi Centric Oral Health Survey. Further, they were also asked to submit the sampling details to WHO – India and AIIMS and take the clearance before proceeding for the data collection.

As a sign of good gesture, the investigators were asked to offer oral health examination and advice on oral hygiene to other members of the selected households also. Similarly they were also asked to give oral health instructions in the schools visited.

Sampling tools

1. WHO Oral Health Assessment form (1997) as modified by WHO– HQ in year 2004 was used to assess the oral health status of the population. Following components were covered in this form:
 - Survey Identification and General Information
 - Extra Oral Examination and Denture wearing
 - Dentition status and Dental Caries
 - Periodontal status and Loss of attachment
 - Oral mucosa
 - Enamel Fluorosis

2. Apart from this, KAP questionnaire designed for children and adults (WHO 2004) were also used to assess the Knowledge, Attitudes and Practices being followed in respect of oral health by the selected subjects.

The data collection was performed by field investigators at different centres using the WHO Oral Health Assessment Form (2004) and specially designed questionnaires for adults and children. They were asked to take informed consent before beginning the work on printed consent form. The data was entered into computer using SPSS Data Entry Builder and SPSS Data Entry Station provided by WHO-HQ, Geneva at all seven sites. The soft copy of data was then submitted to the WHO-India.

Collection and Storage of Survey forms and Questionnaire

The surveying teams were instructed to keep the oral health assessment forms and questionnaires together for same ID number. Then the forms were to be arranged in serial number and stacked together in bundles of 50 or 100, label the bundles with ID numbers, cluster and date of recording and keep them ready for data entry. They were also instructed to do the data entry on same day or within 2-3 days so that if any discrepancy was found, it could be corrected easily.

Data Assembly and Analysis

The centre investigators from all seven centers submitted the data in SPSS format to WHO-India office. The copies of the data on CDs from all seven centers were finally submitted to AIIMS for processing and analysis.

Inspection, Scrutiny and clarifications

The data received at AIIMS was inspected for completion and it was found that the data was not complete from many centers with regard to continuity of the numbers, problems in copying the data and missing ID's. Accordingly centres were contacted and asked for the complete data. Finally the data was received from all the centres and arranged for analysis. The centres were asked for re-sending the data only when entry for one or more stack of 50 or 100 was missing. Individual incomplete entries were excluded from the analysis in order to keep the data away from individual data entry bias.

Duplication, Out of Range and Missing value analysis

After carefully arranging the data in SPSS, it was converted into Strata 9.0 format for further analysis. The data from individual centres were subjected to duplication and missing value analysis. It was found to be satisfactory with almost all the centres.

Finally out of range test was applied to the data to find out errors in data entry. The amount of 'out of range' entries were found to be negligible and it was decided to discard individual entries with out of range data and not to include them while analyzing the overall data. Since the number of such entries was small, it was thought that it will not have any impact on final analysis.

Relational Checks

The data was then subjected to relational checks to find out any discrepancy in the data due to data entry mistakes. It was decided to exclude wrong entries wherever the answers were mutually exclusive. However, if some relational discrepancy was found, that particular ID was excluded from analysis of that parameter.

Data Preparation

The data thus arranged was then finally prepared in terms of recoding for sextants in periodontal indices, calculation of d, m, f, D, M and F etc.

Data Analysis

The data was then subjected to analysis using specially developed software in STATA 9.0. The software was initially cross checked for small group of data manually and on verification of finding, the software was used on whole data. The data was subjected to analysis for all 7 centers and all four age groups separately. The data thus obtained was then compiled in form of tables MS Word (MS Office XP Home) for further use.

Cross tabulations and analysis of correlations, associations

In order to find out correlations between various factors, cross tables were prepared for selected parameters and appropriate correlation tests were applied to find out the associations, correlations and goodness of fit.

Report writing

The data thus generated was then assembled and various in house discussions were conducted to write the salient features of the data thus obtained. The data was then presented before the investigators of different centres and representatives from Dte. GHS and WHO-India. During presentation several issues were discussed and clarifications were obtained from various centres. Finally, the report compilation and writing started in October 2006.