METHODOLOGY
STUDY POPULATION

School children in the age group of 10-15 years in Alappuzha, Palakkad, Thrissur and Kollam districts of Kerala constituted the study population. Children in this age group were selected because dental fluorosis develops in the vulnerable population during the period of calcification of teeth from infancy to fourteen years of age. The districts of Alappuzha and Palakkad were suggested to be endemic for fluorosis on the basis of the water fluoride levels observed in those districts. Hence those districts were selected. Thrissur was taken as a non endemic neighbouring district to Palakkad and Kollam was taken as non endemic neighbouring district to Alappuzha.

SAMPLE SIZE

With 5% alpha error and an assumed prevalence rate of 36% with an acceptable error of ± 3 % in the estimate, the minimum sample size estimated as about 980, which is rounded to 1000 in a district. Over sampling in the order of at least 10% was planned to compensate for any design effect and non-response. Total sample size targeted was a minimum of 4600 children from the identified four districts.
SAMPLING FRAME

List of all class divisions in the schools of the selected four districts constituted the sampling frame. Sampling was done from each taluk of the selected districts as detailed below.

SAMPLE SELECTION PROCEDURE

The Director of Public Instruction of Kerala was requested for the permission to conduct the study and the request was sanctioned. The list of schools having standards of 5th to 10th in Alappuzha, Palakkad Kollam and Thrissur were prepared contacting the District Education Officers. The total divisions in the above schools in each Taluk were numbered separately. Twenty divisions from each Taluk were selected using random number table. All the students in these divisions were surveyed to cover the sample size decided. The number of children selected from each district was as follows:

- Alappuzha: 1344
- Kollam: 1181
- Thrissur: 1067
- Palakkad: 1324

Thus a total of 4916 school children were surveyed during the period between July 2006 and February 2007.
DATA COLLECTION TOOLS

In order to collect relevant information for the study, a questionnaire was constructed adopting one structured by World Health Organization. This adapted questionnaire was modified according to the requirement for the present study and was translated to Malayalam. The questionnaire was pre-tested before finalizing. The dental condition of the children especially the fluorosis status was assessed by dental specialists.

INFORMATION COLLECTED

Information regarding age, sex, standard in which studying, the family history like house number, ward, Panchayath / Municipality, name of the guardian, other members of the family, occupation of the parents, family income, food habit, tea drinking habit, use of tooth paste, source of drinking water, duration of stay in the particular area etc. were collected and recorded. The children were examined to find out the presence of dental fluorosis.

DETECTION OF FLUORIDE IN WATER

The fluoride content of drinking water in each area has been obtained, as estimated by the Department of Ground Water, Kerala Water Authority and Fluorosis Resource Centre, T. D. Medical College, Alappuzha. The technique and procedure of fluoride estimation in water is enclosed as appendix 2.
EXECUTION OF STUDY

The District Education Officers in four selected districts were requested to give directions to the Heads of the institutions of upper primary and high schools in four districts selected for the study to co-operate with the programme. Dates for surveys were fixed in consultation with the school authorities. An education session on oral hygiene and dental fluorosis was conducted for the whole students in each class using audiovisual aides to motivate the students and staff to recognize the importance of dental health. Following the education session, the students were supplied with structured questionnaire in the class and were got filled by all the students explaining the details by the investigator one by one in the class in the presence of the class teacher. After finishing the survey part except dental screening, the questionnaires were collected from selected classes in the school. Next day a dental specialist examined the students surveyed to find out the presence or absence of dental fluorosis.

DATA ENTRY AND ANALYSIS

The data collected were entered in the computer in MS Excel and analyzed using SPSS for windows version 15. The prevalence of dental fluorosis as percentages and various bivariate associations were assessed. The statistical significance was assessed using Chisquare tests and P values less than .05 were considered for statistical significance.
INTER OBSERVER VARIABILITY

The students of two divisions in a school in Alappuzha were selected to determine the inter-observer variability. 85 students from the above classes were screened for dental fluorosis by another specialist. The inter-observer agreement was 97.6%. (Kappa statistical value: 0.9, excellent).