

# CHAPTER I

## INTRODUCTION

### 1.1 Background and Problems

Over recent years, the dental caries and periodontal diseases are considered as social diseases after cardiac disease and cancer because nearly 80 % of the population suffer from these diseases. People can get these diseases at very young age and the treatment costs are quite expensive. (Truong, 1990 ) For example, a treatment of one caries may cost one tenth of a man's salary. Although these diseases seem seldom life-threatening, they can lead to bad consequences which affect human health in general and children's health in particular. Dental caries and periodontal diseases can cause not only many kinds of diseases such as heart diseases, kidney diseases, etc. but also have effect on the esthetics of people. Among oral diseases, while periodontal diseases cause the missing of teeth of older people, dental caries causes the missing of teeth of younger people especially children. These diseases are major problems and very common in the population in general and in school children in particular.

Among these diseases, if anaerobe together with other bacteria in the mouth are the causes of periodontal diseases, Streptococcus Mutans with the weakness of enamel of teeth and the fermentable carbohydrates derived from sugar are main causes of dental caries.

According to the epidemiological data available to WHO, the prevalence of dental caries varies widely in various areas of the world. The latest information from the WHO global oral data bank, as of March 1983, confirms two major trends in oral health status

- Deterioration for most of the developing countries.
- Improvement for most of the highly industrialized countries.

There has been a remarkable reduction in industrialized countries (Table 1.1). A case in Australia showed that the highest DMFT index of children at 12 years of age was 9.3 in 1956 and this index decreased to 2.1 (the lowest figure) in 1982.

Dental caries are seen to increase continuously over years in the developing countries especially in the urban populations (Table 1.2). From the Table 1.2, the highest DMFT index of children at 12 years of age in Chile was 2.8 in 1960 and this index increased to 6.3 (lowest figure) in 1978.

The prevalence rate of dental caries is evaluated by the decayed, missing due to caries and filled teeth (DMFT index) <sup>(1)</sup> or decayed, missing due to caries and filled teeth surfaces (DMFS index) <sup>(2)</sup>. Mean DMFT, DMFS indices are derived as measure to express the average level of dental caries in a community (WHO, 1994 ). Economic implications of dental caries are beside the pain that the person suffering from dental caries incurred, his psychology will be injured, a lot of his time are missed from school or work. The treatment for these diseases is very costly not only to the patient but also to the government

The application of primary dental health care is the best way to prevent these diseases for everybody especially for children. This programme was conducted many years ago in many countries now it has been expanded widely to all countries in the world.

**Table 1. 1:** DMFT Index in Industrialized Countries Reported at Two Different Points of Time.

DMFT index of children at 12 years of ages				
Countries	Highest		Lowest	
	Index	Year	Index	Year
Australia	9.3	1956	2.1	1982
Canada	7.4	1958	2.9	1979
US	7.6	1946	2.0	1980
Poland	7.5	1975	4.0	1981
Japan	5.9	1975	2.0	1979
Norway	12.0	1940	4.5	179
New Zealand	10.7	1973	3.3	1982
Sweden	7.8	1937	3.4	1979
Switzerland	9.6	1961	1.7	1980

Source: Quang Vo The (1991). Dental Health Status of Vietnamese children and the solution since 1990-2000.

<sup>(1)</sup> DMFT index is average of decayed teeth plus average of missing teeth due to caries plus filled teeth per person

<sup>(2)</sup> DMFS index is average of decayed teeth surface plus average of missing teeth due to caries plus filled teeth surface per person

**Table 1. 2: The Increasing Trend of DMFT Index in Developing Countries**

Countries	DMFT index of children at 12 year of ages			
	Highest		Lowest	
	Index	Year	Index	Year
Chile	2.8	1960	6.3	1978
Ethiopia	0.2	1958	1.5	1975
Iran	2.4	1974	4.9	1976
Israel	2.4	1966	3.7	1976
Jordan	0.2	1962	2.7	1981
Zaire	0.1	1971	2.3	1983
Libyan	1.2	1961	3.6	1974
Mexico	2.7	1972	5.3	1976
Uganda	0.4	1966	1.5	1982
Philippine	1.4	1967	2.9	1981
Thailand	0.4	1960	2.7	1977

Source: Quang Vo The(1991). Dental Health Status of Vietnamese children and the solution since 1990-2000

The primary dental health care programme comprised many services that are presented in the following outline:

#### I Primary preventive services provided in the community

- A. Community water fluoridation.
- B. School water fluoridation.
- C. Fluoride supplement programs.
- D. Fluoride mouthrinse programs.
- E. School sealant programs.

## II. Primary preventive services provided by the dental professional

- A. Professional topical fluoride applications
- B. Pit and fissure sealants
- C. Diet counseling
- D. Plaque control programs
- E. Dental caries activity tests

## III. Primary preventive provided by the individual

- A. Fluoride dentifrices
- B. Self - applied topical fluoride products
- C. Oral hygiene practices

Together with applying Primary Dental Health Care programme in the community, this programme was also implemented in primary school and it was called the school-based oral health programme and this programme consists of four services as follows:

1. Dental health education including correct tooth brushing technique with fluoride toothpaste. This task is given by a dental nurse at the beginning and the teacher will go on with this task. Together with giving dental health education, under guidance and supervision of the teachers students were encouraged to practice brushing and were checked after brushing by colored water.

2. Weekly mouth rinsing with 0.2% sodium fluoride was performed by dental nurse and then by teacher. The students rinse and keep water in their mouth for two minutes.

3. Regular periodical examination to detect dental caries and early treatment every year. This activity was performed by dental nurse.

4. Pit and fissure sealant application: performed by dental nurse

In Vietnam, dental caries was not a matter for any attention, the prevalence of this disease was high, about 70-80 %, the DMFT was 3.8 at age groups from 12 to 44 (Truong, 1989). The prevalence of this disease has increased year by year. At present the number of children under 14 years of age make up 42% of the total population, among which 13 million are primary school pupils and pre-school children distributed among 14,456 schools. Some previous surveys showed that almost 50% of our children and pupils have dental caries (Quang, 1990).

In 1983 the prevalence of dental caries among children of 12 years of age was 19.3 %, the DMFT Index was 0.44 in the North and in the South, the prevalence 76.3 % was

with a DMFT Index 2.15. But by 1990 the prevalence of dental caries and the DMFT Index at this age increased to 57.3 % and 1.82 in the whole country. (43.33 % and 1.15 in the North, 79.3% and 2.93 in the South). If compared to the global DMFT Index of 27 Western Pacific countries, Vietnam is ranked 7th position (Quang, 1991).

As a part of the country's health system, the Institute of Odonto - Stomatology has set its main goals to reduce the prevalence of dental caries and to prevent these diseases in the population in general and in school children in particular. But because of budget limitation and lack of manpower, the coverage of the Primary Dental Health Care programme in Vietnam is still low 1 % (Truong, 1990).

Beside fluorided toothpaste and information in mass media, in an attempt to achieve these goals in preventing dental caries for children, with cooperation and support of WHO the School - based Oral Health programme was started at pilot schools in Ho Chi Minh City in 1976 and Hanoi in 1985. At the beginning, the programme was implemented in 36 primary schools in 9 provinces and cities in the South of Vietnam. At the end of 1985 and 1986 this figure increased to 19 provinces and cities in the South and 10 provinces and cities in the North including 269 schools. In 1989, the number of schools receiving this programme increased to 412. This programme has also been expanded to other provinces and in most of the provincial cities year by year.

In National Workshop on Primary Dental Health Care in Hanoi Institute of Odonto Stomatology Maxillo Facial Surgery, the objectives of Oral Health Programme in Vietnam was set for the period 1990-1994 (Truong, 1990)

With the cooperation and support of WHO, the expected targets by the end of 1994 are

- 80 % of school children in primary school covered by oral health care
- Reduction of dental caries in permanent teeth among primary school children
- School teachers are able to teach their pupils in tooth cleaning and nutrition
- Some school teachers are trained in tooth sealant.

The programme has started in some districts such as Tu Loc of Hai Hung Doan Hung of Vinh Phu and Quynh Phu of Thai Binh. In each provincial city where school health is being implemented there are 2-4 schools and each school has about 1000-1500 pupils. Even though the programme has been expanded, because of the limit of budget and the lack of manpower, the proportion children receiving dental health care is still very low, below 2% of total children in the North of Vietnam. Dental caries continue to be one of major public health problem in Vietnam. (Truong, 1991).

From the beginning, the programme costs were supported largely by WHO and the rest was supported by the Ministry of Health, Ministry of Education, Local government. Since this programme was applied in Vietnam, some research has been done to evaluate the impact of this programme on the medical side. No research has been done to consider the effects of this programme on dental diseases in economic terms.

This study is to examine the costs to providers of implementing this programme and its impact on dental caries with the purpose to suggest what the most cost-effective approaches are likely to be in financing for this programme in the future when the support of WHO stops.

## **1.2 Research Questions**

- 1.2.1 How much does it cost to establish and run the school-based oral health programme?
- 1.2.2 Does the school-based oral health programme have any effects on dental caries?
- 1.2.3 What impact do the input costs have on the outcome of the programme ?
- 1.2.4 What is the cost-effectiveness of the programme ?

## **1.3 Research Objectives**

### **1.3.1 General Objectives**

To analyze the costs to the provider of implementing the school-based oral health programme at primary school in the North of Vietnam and the impacts of this programme on dental caries.

### **1.3.2 Specific Objectives**

- To analyze the costs to the provider in implementing the school-based oral health programme at primary school in the North of Vietnam.
- To examine the differences in the outcome between the group of school children implementing the programme and the group of school children not implementing the programme in the North of Vietnam.
- To analyze the impacts of input costs on the outcome of the programme

- To analyze the cost-effectiveness of the school-based oral health programme in the North of Vietnam.

#### **1.4 Scope of the Study**

Vietnam has two main Institutes of Odonto - Stomatology. While the Institute of Odonto - Stomatology of Ho Chi Minh city is responsible for the Oral Health programme in 34 provinces and cities in the South of Vietnam, the Institute of Odonto-Stomatology of Hanoi is responsible for the Oral Health programme in 21 provinces and cities of the North of Vietnam from Hue northward. Based on population and social economic factors each area was divided into rural area and urban area.

This study was limited to examining the costs to the provider in running the school-based oral health programme and its impact on dental caries of school children at primary schools in the North of Vietnam.

#### **1.5 Research Hypothesis**

There is a difference of outcome between two groups of school children one implementing the Oral Health programme and the other not implementing the programme

#### **1.6 Limitation of the Study**

Even though there is a relation between dental caries and other diseases such as kidney and heart diseases, the impact of applying this programme on these diseases has not been measured yet and no research on the relation between dental caries and these diseases has been done in Vietnam

The cost to school children having the bad teeth also has not been measured

Some factors such as advertisement on consumption of sugar, the interaction between students in two groups school children, etc. cannot be controlled

#### **1.7 Benefit of the Study**

The classification of the cost to the provider in establishing and operating the school-based oral health programme and the impact of the programme on the dental caries from this study can be of value to planners in financing and improving the dental care programme in order to achieve the most effective outcome