SECTION 3

5-year old children

Introduction

The 5-year old children covered in this survey were all born in 1995. As primary schools in Hong Kong only admit children who reach age 6 or above to primary grade one (P1) by the end of each calendar year, it was assumed that all children in P1 were 6 years old at the beginning of the calendar year. Hence, the survey for the 5-year old children was intentionally timed at the beginning of 2001. Most of the 5-year old children were in kindergarten three level (K3), or nursery four level (N4) of child care centres.

Survey objectives

The objectives of the survey of the 5-year old population were :

1. to assess the oral health status (mainly tooth decay and oral hygiene status);
2. to collect information on the oral health care behaviour;
3. to collect information on the parents' knowledge on dental diseases; and
4. to collect information on parents' attitudes towards their children's oral health.

A brief description on the survey methods employed is presented in the following paragraphs. Details on data collection, methodology and statistical methods in sampling and computation of results, can be referred to in a separate Technical Report of the Oral Health Survey 2001. Readers who wish to go direct to survey findings can proceed to quick reference sections found in green text boxes.

Sample design

The sample size was determined by taking into consideration the precision level, prevalence of tooth decay, sample design effect, anticipated response rate, proportion of 5-year old K3 and N4 students and resources availability.

The sample of 5-year old children was drawn using either kindergartens or child care centres as the primary sampling unit. Kindergartens were selected from the database containing all local kindergartens obtained from the Education Department. Child care centers were drawn from the database containing all child care centres obtained from the Social Welfare Department. A total of 42 kindergartens with 4 116 K3 places, and 22 child care centres with 699 N4 places were selected.

Data collection method

The oral health status was assessed by clinical examination according to the method and criteria recommended by the World Health Organization[1]. The clinical examination was carried out by two dental officers (examiners) all through the survey. Steps were taken to minimize the error arising from differences in clinical judgment, through repeated calibration exercises before the survey. During the survey, children were randomly assigned to the two examiners for clinical examination. A random sub-sample of one in every ten children (about 10%) were cross-examined, to monitor the examination reproducibility, and this was maintained at a very good level.

Information on the behaviour of children and information on parents were collected using a questionnaire completed by the children's parents. The questionnaire was a modification of another questionnaire used in the 1995 Oral Health Survey on Primary School Children[2]. The draft questionnaire was pre-tested on parents of younger students attending School Dental Clinics, and several revisions were made before being finalized.

Enumeration results

The response from selected kindergartens and child care centres was very good. Except for 2 kindergartens and 6 child care centres where there were no K3 or N4 class, all of the remaining selected kindergartens and child care centres agreed to participate. All K3 and N4 students in the selected kindergartens and child care centres with 4 451 places were invited to participate in this survey.

All children with parental consent were examined, although only the 5-year old children were included in the final analysis. At the final tally, 3 733 eligible 5-year old children were examined.

With statistical adjustment and weighting, the results of this survey could be inferred to some 67 300 children aged 5 enrolled in the local kindergartens and child care centers in Hong Kong. According to the 2001 Population Census, there were 76 100 children aged 5 in Hong Kong at the time of survey. Hence, this survey had covered 88% of all 5-year old children. Children not covered were either enrolled in non-kindergarten or non-child care centre institutions, in international kindergartens, or not enrolled in any of these institutions.

Limitations

The findings were reported at the aggregate level. For Tables presented in the report, figures may not add up to the totals due to rounding.

Results of the Oral Health Survey may be subject to errors. The estimates contained in this report were based on information obtained from a particular sample, which was one of a large number of possible samples that could be selected using the same sample design. By chance, estimates derived from different samples would differ from each other. Due to this possible variation of results, a zero figure may mean a non-zero figure of small magnitude. These estimates should be interpreted with caution. Some results were derived from small sub-group of the sample and the limitation should be noted in its interpretations.

What was the oral health status of 5-year old children in Hong Kong?

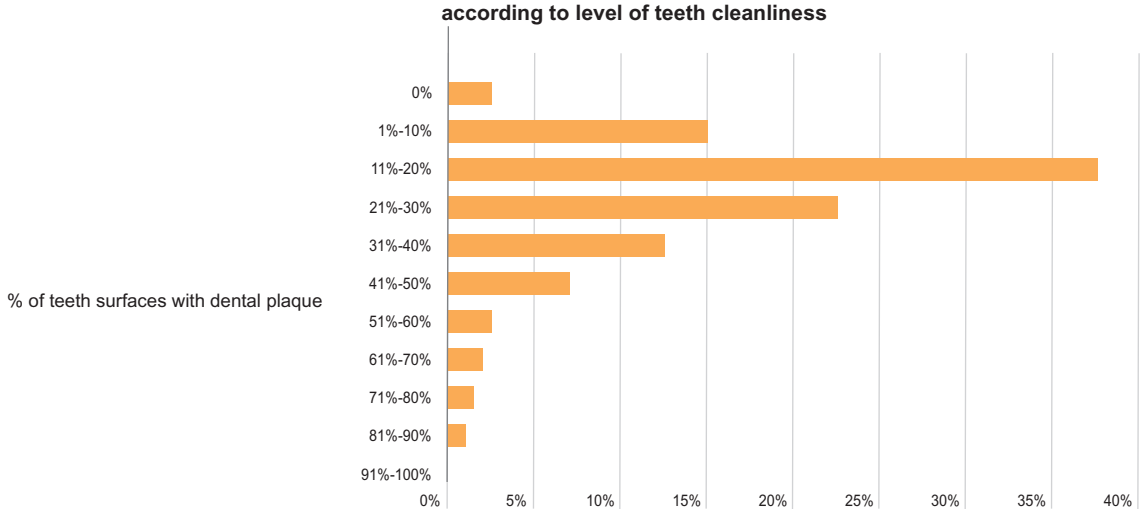
Teeth status - how many teeth were there ?

Each 5-year old child had an average of 19.4 primary teeth (milk teeth), out of the normal 20 teeth in a full set of primary dentition. The mean number of permanent teeth present was 1.1. This was considered normal as some of the 5-year old children could have the first permanent molar teeth (the 6-year old molar) erupted, and some children could have shed some primary teeth during normal change of dentition.

Teeth status - how clean were the teeth ?

The cleanliness of the children's teeth was measured by the Visible Plaque Index (VPI), which shows the percentage of teeth surfaces covered with dental plaque found on visual examination. The mean VPI among 5-year old children was 23.5%. The percentage distribution of children according to level of teeth cleanliness is shown in Figure 3.1. Only 2.4% (1 600) children had no visible dental plaque on their teeth, while most children had a small quantity of plaque, and 4.3% (2 900) had visible plaque on more than half of their teeth surfaces (VPI>50%). Therefore, the oral hygiene of 5-year old children was considered fair.

Figure 3.1
Distribution of 5-year old children according to level of teeth cleanliness



Teeth status - what was the level of tooth decay ?

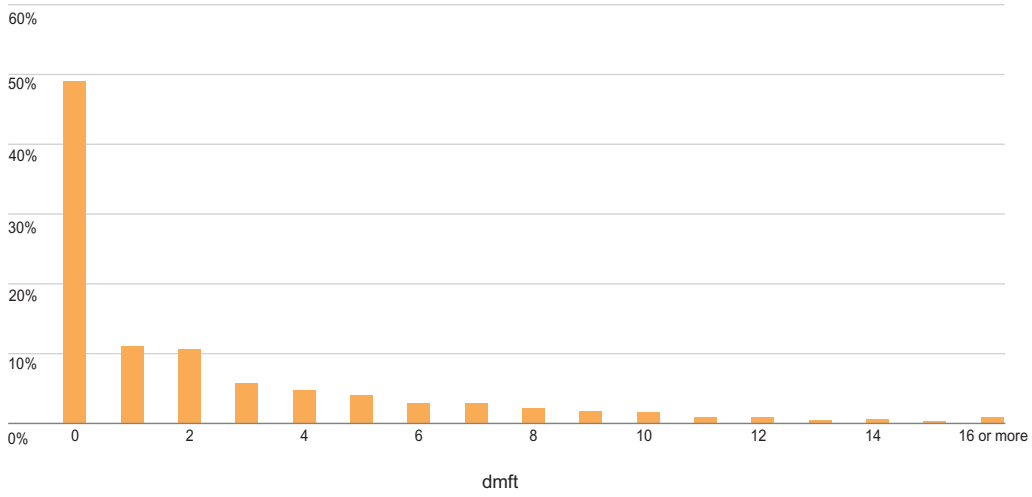
The level of tooth decay as measured by the dmft index is summarized in Table 3.1 The mean dmft value among the 5-year old population was 2.3. 91.3% of the decayed teeth (dmft) were untreated (dt).

Table 3.1
Level of tooth decay as measured by the dmft index among 5-year old children

	dmft	**dt** (decayed)	**mt** (missing)	**ft** (filled)
Mean value	2.3	2.1	<0.05	0.2
% Among population	51.0	49.4	1.3	7.4

The distribution of children according to their dmft value is shown in Figure 3.2. 49% (33 000) of the 5-year old children were free from tooth decay. On the other hand, 23.6% (15 900) had four or more teeth with decay experience. The latter group of children had around 78% of all the teeth affected by tooth decay. Therefore, the distribution of decayed teeth among 5-year old children was highly polarized.

Figure 3.2
Distribution of 5-year old children according to dmft value



Teeth status - presence of dental abscess

Dental abscess was found in 5.7% (3 800) children. Most of these abscesses were probably associated with extensively decayed teeth.

Teeth status - decay in permanent teeth

The number of permanent teeth present in this age group was small and tooth decay found in permanent teeth was negligible with a mean DMFT at <0.01.

Teeth cleanliness needed improvement. Most of the children were found to have some dental plaque on their teeth.

Most of the decayed teeth were untreated. More than 90% of the teeth with decay experience (dmft) were actually untreated decay (dt). A small proportion (5.7%) of children were found to have dental abscess.

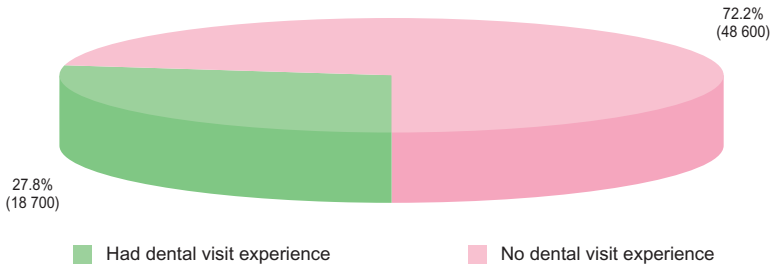
The distribution of tooth decay among 5-year old children was very uneven. A high degree of polarization in the problem of tooth decay was found among this population. Almost half of the children were not affected by tooth decay, while 23.6% of children had around 78% of all the teeth with decay experience. Each of these children had four or more teeth with decay experience.

What was the pattern of usage of oral health care services among the 5-year old children ?

How many children had visited a dentist ?

Among the 5-year old children, it was found that 27.8% (18 700) had visited a dentist. In other words, 72.2% (48 600) of the children had never been to a dentist (Figure 3.3).

Figure 3.3
Distribution of 5-year old children according to dental visit experience



For those children who had visited a dentist, the main reason for their latest visit was explored. The results are shown in Table 3.2. Of those children who had stated a reason for their latest dental visit, 37.4% (7 000) visited the dentist for regular checkup and 2.4% (400) went for professional teeth cleaning. More than half of them went to the dentist because of problems.

Table 3.2
Number and percentage of 5-year old children who had dental visit experience according to the reported reasons for their latest dental visit

Reason for dental visit	Number	Percentage
Checkup	7 000	37.4
Professional teeth cleaning	400	2.4
Suspect tooth decay	3 800	20.5
Toothache	2 300	12.2
Extract mobile primary teeth	900	5.0
Extraction (unspecified)	1 100	6.1
Trauma	1 000	5.2
Other reasons/reason not stated	2 100	11.2

The utilization of oral health care services by 5-year old children was low. Almost three quarters of the 5-year old population had never visited a dentist.

Most 5-year old children visited the dentist because of oral health problems. Such problems included toothache, abscess or trauma, or suspected tooth decay. The removal of loose primary teeth was also a common reason for the dental visit.

What was the oral health related behaviour of the 5-year old children ?

Toothbrushing - how often did the children brush ?

The frequency of the children's toothbrushing as reported by their parents are shown in Table 3.3. 54.4% (36 600) of the 5-year old children brushed twice or more times daily.

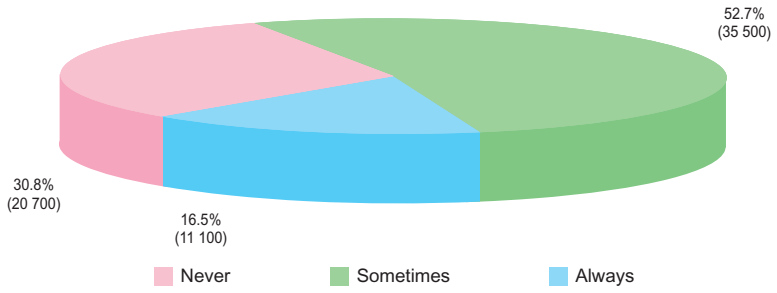
Table 3.3
Distribution of 5-year old children
according to their reported toothbrushing habit

Toothbrushing habit	Number	Percentage
Three times daily or more	900	1.4
Twice daily	35 700	53.0
Once daily	24 600	36.5
Less than once daily	6 100	9.1

Toothbrushing - did the children receive parental assistance while they brushed?

As shown in Figure 3.4, only 16.5% (11 100) parents reported to have always assisted their children when they brushed their teeth, and 30.8% (20 700) never helped their children at all.

Figure 3.4
Distribution of 5-year old children
according to the reported parental assistance in toothbrushing

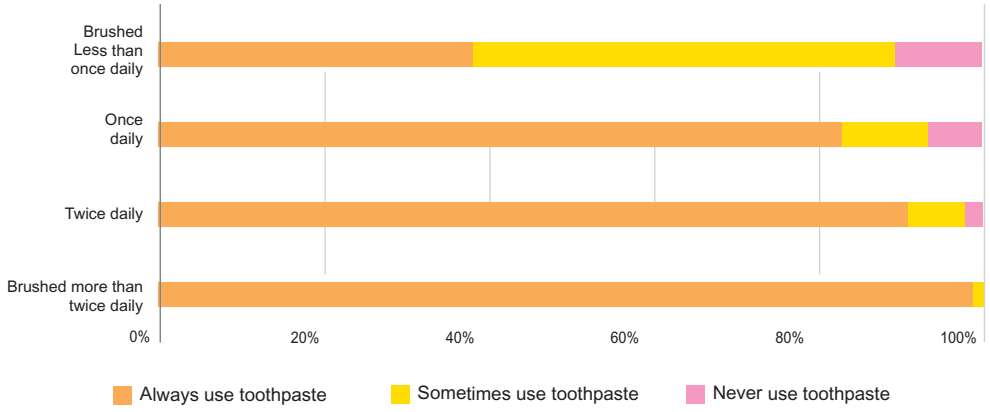


Toothbrushing - was fluoride toothpaste used ?

It was found that 84.5% (56 900) children always used toothpaste when they brushed their teeth, 12.5% (8 400) used toothpaste occasionally, while 3% (2 000) never used toothpaste.

The relationship of toothbrushing frequency and use of toothpaste is shown in Figure 3.5. It was observed that the more irregular the brushing habit, the more irregular was the use of toothpaste during toothbrushing.

Figure 3.5
Use of toothpaste and the reported toothbrushing frequency among 5-year children



The parents were asked whether the toothpaste used by their children contained fluoride, and the results are shown in Table 3.4. Nearly half of the parents did not know whether or not fluoride was present in the toothpaste.

Table 3.4
Distribution of parents of 5-year old children according to their knowledge on whether toothpaste used contained fluoride

	Number	Percentage
Yes	28 900	44.2
No	4 000	6.1
Don't know	32 500	49.7

Over half of the 5-year old population brushed their teeth twice daily. Almost 10% did not brush their teeth on a daily basis and the use of toothpaste was very irregular among those who brushed occasionally.

Almost one-third of the parents never assisted their children in toothbrushing. According to the recommendations of the British Society of Paediatric Dentistry, children up to the age of seven should brush their teeth with parental assistance. Only 16.5% of the 5-year old children in Hong Kong always had parental assistance when they brushed.

Almost half of the parents did not know whether the toothpaste used had fluoride or not. Although most children's toothpaste in Hong Kong contains fluoride, some of the children could be using non-fluoride toothpastes which may not be effective in preventing tooth decay.

Snacking habit

Snacking was referred to as any food, snack or drink (except water) intake in between normal meals. Snacking was found to be a common practice in this age group, as was reported by 90.4% (60 800) of their parents.

Parents were asked to report on the frequency of snacking by their children on the day prior to the survey. The results are shown in Table 3.5. 95.2% (64 100) of parents reported that their children had taken snacks on the day prior to the survey. Most of the children surveyed snacked only once (31.0%) or twice (44.5%). Up to one-fifth (19.6%) snacked three or more times in addition to their regular meals.

Table 3.5
Distribution of 5-year old children
according to the reported snacking frequency on the day prior to the survey

Snacking frequency	Number	Percentage
None	3 200	4.8
Once	20 900	31.0
Twice	30 000	44.5
Three time or more	13 200	19.6

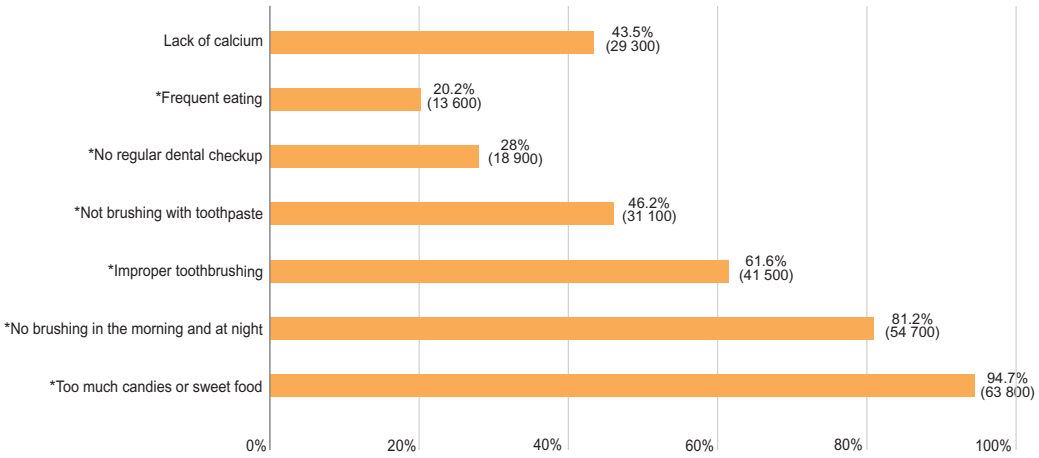
Snacking was found to be a common practice among the 5-year old population. Frequent snacking habit is considered as a risk factor in developing tooth decay. About one-fifth of the 5-year old children snacked three or more times.

What did the parents know about dental diseases ?

What did the parents know about the factors leading to tooth decay?

Parents were asked about their perceived factors leading to tooth decay, and the results are shown in Figure 3.6. The mostly reported factor was *eating too much candies or sweet food*, followed by *not brushing in the morning and at night and incorrect toothbrushing method. Lack of calcium* as a factor leading to tooth decay was a common misconception by parents. What was considered as important by the dental profession, such as *frequent intake of food/drink*, was reported by fewer parents.

Figure 3.6
Number and percentage of parents according to the perceived factors leading to tooth decay

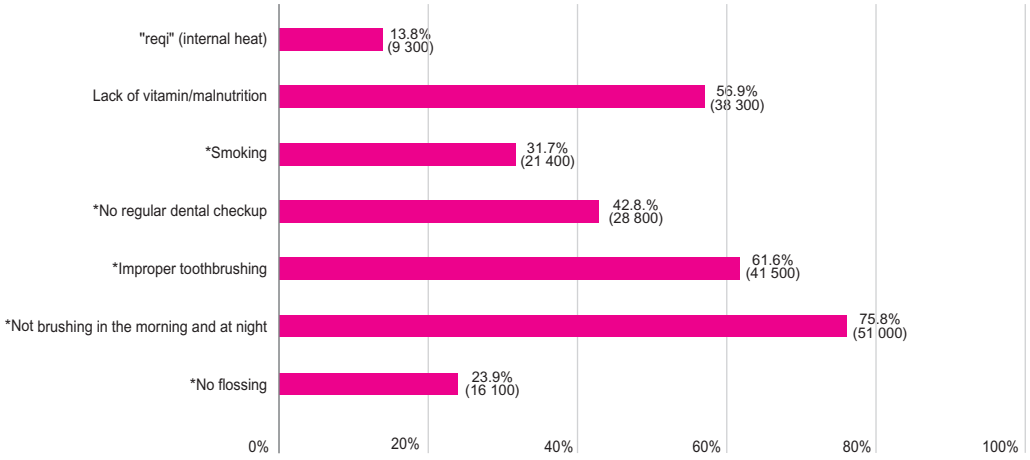


Respondents allowed to choose multiple answers
* Relevant factors

What did the parents know about the factors leading to gum disease?

The perceived factors leading to gum disease reported by parents are shown in Figure 3.7. *Not brushing in the morning and at night and improper toothbrushing* were mostly reported. *Smoking*, which has been shown to be a high risk factor for gum disease, was not reported by majority of the parents. Few parents could report that *no flossing* may lead to gum disease.

Figure 3.7
Number and percentage of parents according to the perceived factors leading to gum disease

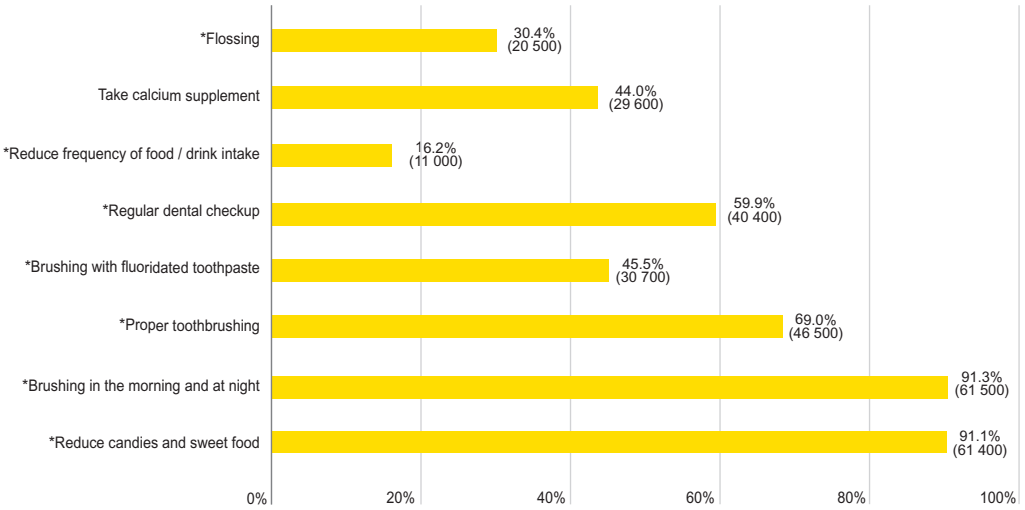


Respondents allowed to choose multiple answers
* Relevant factors

What did the parents know about prevention of tooth decay?

The methods in the prevention of tooth decay as perceived by the parents are shown in Figure 3.8. *Reduce consumption of candies and sweet food* was also commonly reported, but relatively few parents could point out the significance of *reduce frequency of food/drink intake. Brush in the morning and at night and proper toothbrushing* were commonly reported measures. The misconception of taking calcium supplement to prevent tooth decay was common.

Figure 3.8
Number and percentage of parents according to the perceived methods to prevent tooth decay

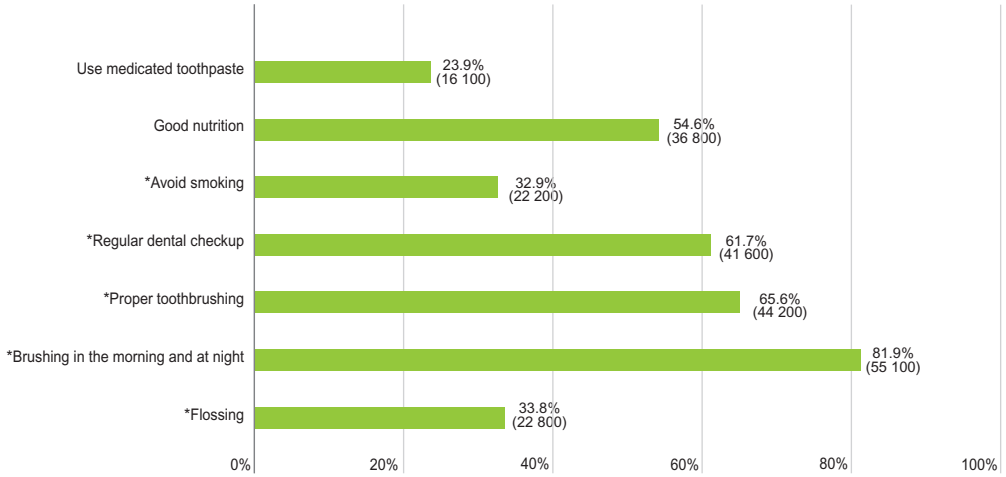


Respondents allowed to choose multiple answers
* Relevant factors

What did the parents know about prevention of gum disease?

The methods in the prevention of gum disease as perceived by the parents are shown in Figure 3.9. *Brush in the morning and at night* was reported by majority of the parents. Two-third of the parents reported *proper toothbrushing* and 61.7% reported seek *regular dental checkup*. Only about one-third of the parents replied that gum disease could be prevented by *avoid smoking*.

Figure 3.9
Number and percentage of parents according to the perceived methods to prevent gum disease

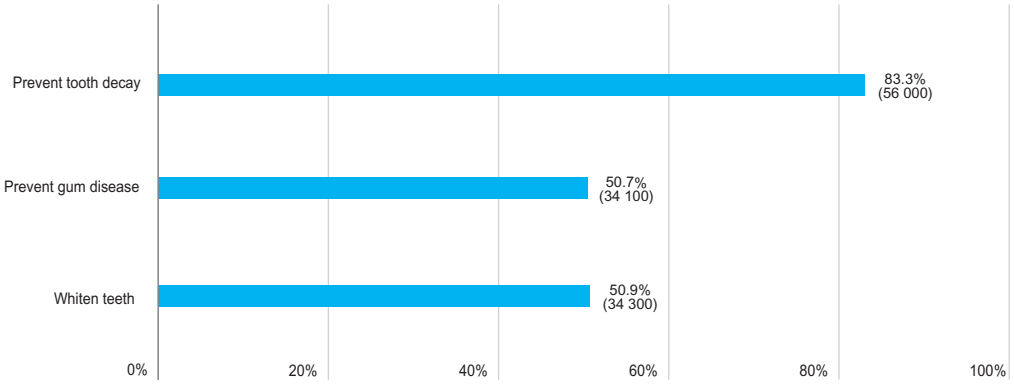


Respondents allowed to choose multiple answers
* Relevant factors

Did the parents know about the benefits of fluoride?

Most (83.3%) parents correctly indicated that fluoride could prevent tooth decay. However, around half of the parents also incorrectly believed that fluoride could prevent gum disease and could whiten teeth (Figure 3.10).

Figure 3.10
Number and percentage of parents according to their knowledge on the benefits of fluoride



Respondents allowed to choose multiple answers

Parents did not know that besides candies and sweet food, frequent food and drink intake is also a risk factor for tooth decay development. Most parents correctly pointed out *candies and sweet food consumption* as a factor leading to tooth decay, but relatively few could point out the importance of frequency of food or drink intake.

Many parents had the misconception that tooth decay was due to lack of calcium in the teeth. This misconception was reported by 43.5% of parents. Consequently, 44% of parents believed that taking calcium supplement could prevent tooth decay.

The function of fluoride was not fully understood. More than 80% of parents knew that fluoride is useful in preventing tooth decay. However, around half of the parents misunderstood that fluoride could also prevent gum disease and could whiten teeth.

Parents knew that regular dental checkup is important in preventing tooth decay and gum disease. This was mentioned by around 60% of parents, which ranked third behind *toothbrushing in the morning* and *at night* and *proper tooth brushing method*.

The hazardous effect of smoking on oral health was not widely known. Only 31.7% of parents reported that smoking could lead to gum disease.

What were the parent's preferred treatment for the decayed primary teeth in their children ?

Parents were asked on their choice of treatment for decayed primary teeth. Their responses are shown in Figure 3.11. Over 40% of parents chose to restore their children's decayed teeth. However, more than one-third chose either to leave the decayed teeth or to remove them (extraction).

What were the parents' perceptions on the oral health of their 5-year old children ?

The parents were asked to rate the perceived oral health condition of their children, and the results are shown in Figure 3.12. Almost half of the parents rated their children's oral health as *good* or *very good*, and less than 10% rated their children's oral health as *bad* or *very bad*.

Figure 3.11
Distribution of parents according to their preferred treatment for decayed primary teeth

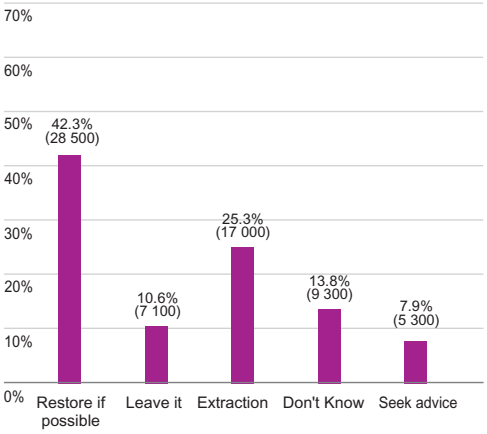
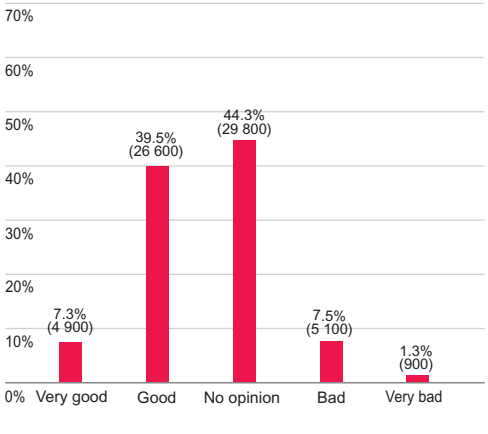


Figure 3.12
Distribution of parents according to their perception of the oral health condition of their children



How did the parents' perceptions correspond with the children's oral health status ?

What was the need for dental treatment as assessed by the survey method ?

The need for dental treatment among 5-year old children as assessed by the survey method is shown in Table 3.6.

Table 3.6
Dental treatment need of 5-year old children as assessed by the survey method

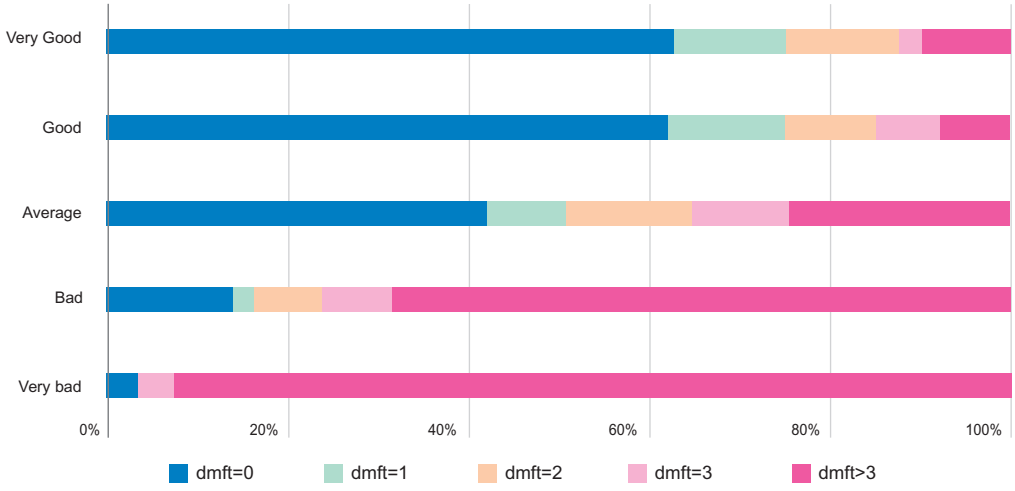
Dental treatment need	Mean number of teeth	Percentage
Filling (1-surface)	0.4	23.7
Filling (2-surface)	1.5	43.9
Pulp treatment	0.1	4.4
Removal of teeth	0.1	5.2
Fissure sealant *	0.2	10.5

* On permanent teeth

Were the parents' perception in agreement with the true situation ?

The tooth decay experience of the 5-year old children was compared with their parents' perception of their oral health, and the results are shown in Figure 3.13. The parents' perceptions of *bad* or *very bad* oral health were in agreement with their children's actual oral health condition, as 91.3% of the children rated as having *very bad* oral health condition had more than three decayed teeth. However, the parents' perceptions of *good* or *very good* oral health were not very accurate, as almost 40% of the children being rated as *good* or *very good* had tooth decay, and up to 10% of them actually had more than three decayed teeth.

Figure 3.13
Oral health condition of 5-year old children as perceived by their parents and the children's decay experience



Some parents were not aware of their children's oral health problems. Among children whose parents rated them as having good oral health, almost 40% actually had tooth decay, and up to 10% of them had more than three decayed teeth.

Did the parents' dental schemes coverage encourage the usage of oral health care service ?

Only 20.5% (13 800) of the parents reported that they had dental scheme coverage. Most (77.6%) of these dental schemes were dental benefit schemes provided by their employers. Among the parents with dental schemes coverage, 7 100 indicated that their children were also covered which comprised 10.5% of all 5-year old children.

The use of oral health care services in relation to dental scheme coverage is shown in Figure 3.14. For those children who were covered by dental schemes, there was a higher proportion (63.3%) who had visited the dentist. As shown in Table 3.7, a high proportion (66.7%) of these children visited dentists for checkup and professional cleaning.

Figure 3.14
Dental scheme coverage and dental visit experience

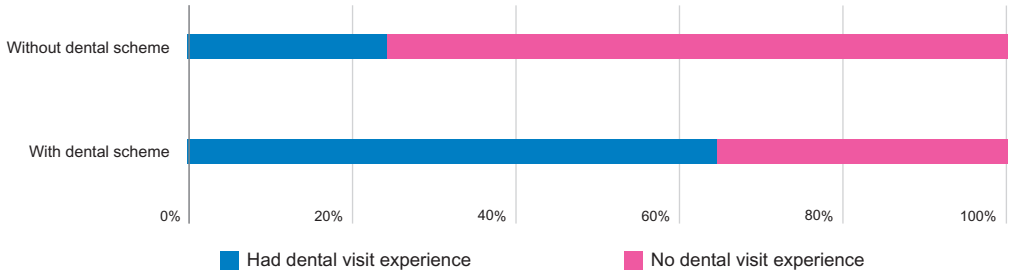


Table 3.7
Reasons of last dental visit and dental scheme coverage

Reason of dental visit	Covered	Not covered
For regular checkup / cleaning	3 000 (66.7%)	4 300 (30.9%)
For treating problems	1 500 (33.3%)	9 600 (69.1%)

Coverage by parents' dental schemes was associated with the relatively higher usage of oral health care services. Dental scheme coverage was found to be associated with a higher proportion of visit for checkup purpose.

SECTION 3 - SUMMARY

Tooth decay, which was the main oral health concern in this age group, was unevenly distributed among the 5-year old children.

Tooth decay was found to be unevenly distributed and mostly untreated. About half of the 5-year old population was not affected by tooth decay. On the other hand, 23.6% of the children were considered high risk, as this group had around 78% of all the teeth affected by tooth decay. More than 90% of the decayed teeth were left untreated. Some children were found with dental abscess.

Current oral health behaviour needed improvement.

For young children to achieve optimal oral health, the dental profession worldwide has recommended the following:

- brushing at least twice daily with fluoridated toothpaste with assistance of an adult;
- reduction in frequency of food intake outside regular meal-time;
- dental consultation at age 3 for checkup purpose; and
- regular dental checkup for early diagnosis and treatment of dental disease and oral health education to the parents.

Survey data showed that some of these advocated behaviour were still inadequately practised. Over 40% of the children actually brushed less than twice daily. Over 30 % of the children never had any adult assistance when they brushed their teeth. About one-fifth of children had frequent snacking habit. Over 70% of the children had never seen a dentist at age 5. Therefore, much of the tooth decay remained undetected and untreated. Even for those who did have a dental consultation, more than half of them sought help from the dentist for dental problems and not for regular checkup.

Parental knowledge of dental diseases was insufficient.

Very few parents knew that frequent food / drink intake increased the chance of developing tooth decay, and that reduction in food / drink intake frequency could help prevent tooth decay. Up to 40% of the parents had the misconception that lack of calcium lead to tooth decay and that taking calcium supplements could help prevent it. Many parents did not know whether their children's toothpaste contained fluoride. A large proportion of the parents even thought that fluoride could whiten teeth and prevent gum disease. Not many parents were aware of the hazardous effect of smoking on oral health.