MESSAGE FROM THE DIRECTOR OF HEALTH

The Department of Health is the health adviser of the Government of the Hong Kong Special Administrative Region and an executive arm in health legislation and policy. Our main role is to safeguard the health of the community through various promotive and preventive services, while also providing some curative and rehabilitative services. Over the years, there is a growing public expectation for the Department to strengthen our role in health promotion to safeguard public health and improve the quality of life of the population.

Oral health is essential to every person's general health and well-being. In oral health care, the Government's objective is to improve the oral health of the population by promoting oral hygiene and oral health awareness in the community and by facilitating the proper use of oral care services. Preventive and promotive oral health care services are provided to the general public. Our School Dental Care Service promotes oral hygiene and provides basic and preventive oral health care to primary school children. Our Oral Health Education Unit fulfils the Government's objective in promoting oral health.

The Department's motto is ***Partnership in Health*** which calls for active involvement of the community as well as other health care professionals, in a joint effort to improve the health of the people of Hong Kong. Every individual of the community has the ultimate responsibility of knowing what and how best to improve their health and oral health.

This report should be of interest to the dental profession and other health care professionals. It should also arouse a sense of control for every individual to improve their oral health. The report should also be of use to all those who believe that good oral health is an integral part of one's general health.

Dr. Margaret Chan, JP
Director of Health
Government of the Hong Kong Special Administrative Region

FOREWORD

How it came to pass

Past surveys by the then Medical and Health Department and subsequently by the Department of Health, had focused on primary school children to monitor the preventive (dental) effects of water fluoridation and the School Dental Care Service. Other major albeit sporadic surveys on various age groups were also carried out by the Faculty of Dentistry, University of Hong Kong.

To better coordinate the oral health surveillance activities in Hong Kong, a *Liaison Group on Oral Health Surveillance in Hong Kong* was formed in 1999, comprising of the Department of Health, the Faculty of Dentistry University of Hong Kong, and the Hong Kong Dental Association. Since then, the Department of Health has taken up the responsibility to conduct oral health surveys at regular intervals. This undertaking, which is in keeping with the World Health Organization's advice in advocating epidemiological studies as a major component in the planning and evaluation of oral health care services, is now included as part of the Department's corporate plan. The commitment of doing such surveys at every 10-year interval signaled an important milestone.

Oral Health Survey 2001 and its objectives

Hence, the first population-wide oral health survey for Hong Kong was conducted in 2001. The timing of this survey took into account two events, which were, the last survey carried out by the University of Hong Kong in 1991, and the timing of Hong Kong's major census surveys. Timing it in 2001 meant that we would be able to compare relevant information with that obtained a decade ago, and the relative proximity to the major household surveys provided us with the most up to date household information of the population.

This survey set out to ascertain the oral health status and relevant oral health related behaviour of the community. The information obtained would be useful in planning and evaluating oral health programmes, and for monitoring the oral health status and formulation of oral health goals for the community.

Focus of the Oral Health Survey 2001 report

With the set objectives, it was considered prudent that the first oral health survey report should focus mainly on the two most common, yet much overlooked dental diseases, i.e. tooth decay *(dental caries)* and gum disease *(periodontal disease)*, affecting the people of

Hong Kong. This report provided a descriptive account of the various oral health indicators related to tooth decay and gum disease, and relevant oral health related behaviour. Other data derived from the same survey on less common conditions will provide the basis for supplementary reports.

Although oral health is more than just healthy teeth and gums, its most common problems are considered important public health concerns because almost everyone in our community is affected by either or both of these two diseases. The fact to the matter is that these diseases are preventable. The community usually downplays or ignores these conditions, since these are not life-threatening and its consequences are relatively mild compared to other health problems. However, when one does experience pain, discomfort and/or tooth loss, the affected people will no doubt be left with various degrees of impaired functions, which may have an impact on people's quality of life. From an economic point of view, the affected people stand to lose since it may affect, in some way or the other, on the work productivity (arising from pain and discomfort and lengthy treatment procedures, etc), not to mention the inconvenience and the cost factor to the individual, to meet the curative and rehabilitative treatment so required.

Safe, effective and proven preventive measures are available for both the diseases mentioned. However, these measures demand the adoption of certain behaviour and life style by individuals. The behaviour and life style conducive to healthy teeth and gums are in fact, also the same ones needed to better one's overall oral health and general health.

Selecting index age groups to represent Hong Kong's population

The survey methodology followed the basic principles recommended by the World Health Organization of using index ages and age groups. Considerations had been given to important dental developmental stages as well as the ease for drawing a representative sample from the population. The following were the index ages and age groups surveyed : (a) 5-year old - practical age at which to evaluate the status of the primary dentition; (b) 12-year old - represents the completion of the change from primary dentition to permanent dentition, when all permanent teeth, except third molars (wisdom teeth), will have erupted, and the age group in most countries at which a reliable sample may be obtained through the school system; (c) 35 to 44-year old - the standard monitoring group for health conditions of adults, where the full effect of tooth decay, severe gum conditions and the general effects of care provided can be assessed; and (d) 65 to 74-year old - an age group which has become more important with the increasing life-span.

Useful findings

To a certain extent, this survey had identified some of the inadequacies in the population's personal behaviour in the oral health context. The findings should provide the basis with which to modify, strengthen or change oral health promotion strategies. Also with the information at hand, it is hoped that it will arouse attention and interest from individuals towards improving their oral health. The goal is for participatory care to promote self-reliance, minimize or prevent diseases and disabilities, and improve the quality of life and functional capacity. Hopefully, the conditions would be favourable to create an enabling environment in bringing about positive changes towards better oral health and general health for the people of Hong Kong.

Behind the scenes

In hindsight, the most rewarding aspect of this project was the appreciation of the strength of teamwork and team spirit. I considered myself fortunate to be able to call upon the involvement of a team of dental epidemiologists and public health dentists. The team leaders of the Oral Health Survey 2001 Committee, who steered the various working groups, were all experienced specialists in their own right, and had performed various epidemiological tasks for Department of Health and/or the University of Hong Kong. I had conveyed to everyone involved with this project my personal appreciation at every opportunity I got. It's never too much to congratulate all the team members of the Oral Health Survey 2001 for making it possible to produce this report.

Dr. Elizabeth L. Kwan, JP
Consultant in-charge Dental Service
Department of Health

ACKNOWLEDGEMENTS

This major undertaking has received the whole-hearted support of many individuals. We are grateful to our external advisers, Dr. Edward Lo and Dr. Eli Schwarz, for their professional advice and experience sharing. We thank members of the Oral Health Survey 2001 Committee, Dr. LY Tse (Disease Prevention and Control Division), Dr. Deborah Chan (Oral Health Education Unit), Ms. Debbie Ho (Information and Public Relations Unit), and Mr. Simon Yeung (Statistics Unit), for imparting their value added time, effort, and expertise.

Our heartfelt appreciation also goes to the other members of the Committee, the project's overall coordinator and Committee's secretary, Dr. Frankie So; and the respective team leaders of the index age groups covered in the survey, Dr. Joseph Chan (i.e. 5 and 12-year old groups), Dr. Michael Ho (i.e. 35 to 44-year old group), and Dr. Felix Yu (i.e. 65 to 74-year old non-institutionalized and the institutionalized older persons groups), for the meticulous planning, implementation, survey documentations and reports. We also appreciate the reliable and energetic efforts of our colleagues who carried out the fieldwork, despite having to work at odd hours and at weekends. Acknowledgement is also due to Dr. Wendy Cham, Dr. Samuel Chan, and Dr. Denise Fung, who were tasked by the respective team leaders to support the critical aspects of the team's work; and to those who provided the administrative and logistic support which facilitated the production of this report, Dr. Alison Wai, Ms. Denise Kwan, Mr. Dickson Chan, and Mr. K W Fan. The secretarial support was capably provided by Ms. Diana Kong and Ms. Rebecca Chan.

Our gratitude also goes to the following organizations for their cooperation and valuable assistance which facilitated the survey :

Bureaux and Departments

Census and Statistics Department
Finance Bureau
Education Department
Health, Welfare and Food Bureau (then Health and Welfare Bureau)
Housing Department
Social Welfare Department

Kindergartens/Nurseries

AGAPE Methodist Church Kindergarten
A-one Kindergarten

Bonnie Kindergarten
Carbo International Nursery School
Caritas Day Nursery-Shatin
CECES Organized Aetna Preschool
Church of Christ in China Kei Chun Kindergarten
Faith Lutheran Church Kindergarten
Free Methodist Church Bradbury Chun Lei Nursery
Garden Estate Baptist Nursery
Good Time Kindergarten
Green Leaves Kindergarten
HK & Macau Lutheran Church Living Stone Kindergarten
HK Society for the Protection of Children Mr & Mrs Thomas Tam Day Nursery
HK Society for the Protection of Children Portland Street Day Nursery
Holford Anglo-Chinese Kindergarten
Holy Trinity Centre Day Nursery
Hong Kong (Ascot) Preschool & Play School
Hong Kong Ling Liang Church Kindergarten
Jimmy's Kindergarten
Karlam Nursery
Kiangsu Chekiang Primary School (Kindergarten / Nursery Section)
Ming Anglo-Chinese Kindergarten
NTWJWA Leung Sing Tak Anglo-Chinese Kindergarten (Sheung Tak Estate)
Our Lady's Kindergarten
Peace Evangelical Centre Kindergarten
Po Leung Kuk Kinder Section
Pok Oi Hospital Chan Hsu Fong Lam Day Nursery
Regina Coeli Anglo-Chinese Kindergarten
Sam Shui Natives Association Kindergarten
Shan King Estate Baptist Kindergarten
Sheng Kung Hui Kindergarten (Mount Butler)
Sheung Shui Church Kindergarten
Shin Yat Tong On Yat Kindergarten
SKH All Saints' Kindergarten
SKH Kindly Light Church Holy Carpenter Kindergarten
SKH Lady MacLehose Centre Day Nursery
St James' Church Kindergarten
St James' Settlement Causeway Bay Child Care Centre
St James' Settlement Kathleen McDouall Child Care Centre

St Lorraine English Kindergarten
St Margaret Mary's Catholic Kindergarten
St Monica's Anglo-Chinese Kindergarten (Tsuen Wan)
St. Louis Kindergarten
Sun Island English Kindergarten (To Kwa Wan Branch)
Sun Island English Kindergarten (Chuen Tak Branch)
Sun Island English Kindergarten (Kwai King Branch)
Tai Po Kindergarten
The Salvation Army Ng Kwok Wai Memorial Kindergarten
The Salvation Army Tin Ka Ping Kindergarten
Tin Yiu Estate Ho Kwang Hung Kindergarten
TWGHs Lui Fung Faung Memorial Kindergarten
TWGHs Tin Wan Kindergarten
WFB Wong Shing Tsang Nursery
Yuen Long Ching Sum Kindergarten (No.3)

Secondary Schools

Carmel Pak U Secondary School
Cheung Sha Wan Catholic Secondary School
Chiu Chow Association Secondary School
Chong Gene Hang College
Cotton Spinners Association Secondary School
Fung Kai Liu Man Shek Tong Secondary School
HKSKH Bishop Hall Secondary School
HKCWC Fung Yiu King Memorial Secondary School
Hoi Ping Chamber of Commerce Secondary School
Hong Kong True Light College
Lui Ming Choi Lutheran College
Pooi To Middle School
Pui Kiu Middle School
Salesian Don Bosco Ng Siu Mui Technical School
San Wui Commercial Society Secondary School
SKH All Saints' Middle School
St Paul's Co-ed College
YLPMSAA Tang Siu Tong Secondary School

Institutions

Hong Kong YWCA Cheung Ching Social Centre for the Elderly
Hong Kong YWCA Ellen Li Multi-Service Centre for the Elderly
Hong Kong YWCA Cheng Pong Hing Hostel for the Elderly
Hang On Baptist Church
Kiangsu & Chekiang Residents (HK) Association Tuen Mun Hostel for the Elderly
Heung Hoi Ching Kok Lin Association Buddhist Po Ching C & A Home for the Aged Women
Wing Kwing Care Home for the Elderly Family
Chi Lin Nunnery Chi Lin Home for the Elderly
Kai Kai Home for Aged
Pine Care Centre
St. James' Settlement True Light Home for the Aged
Kai Yan Institution of Old Aged
Kei Tak (Tai Hang) Home for Aged Ltd.
Yan Chai Hospital Chinachem C & A Home
Shun Fook Home for Aged
Wui Kong for the Aged
Oi Kwan Care for the Aged Home
The Chinese Rhenish Church-HK Synod Sze Tian Hostel for the Elderly
Healthway Care & Attention Home
Everbright Nursing Home
The Hong Kong Society for the Aged Quan Chuen Home for the Elderly

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Last but not the least, we would like to thank the people who had consented to participate in this survey, and were examined clinically, completed the survey questionnaire or were interviewed. Without their willingness to assist, this survey would not have been at all possible.

INTRODUCTION

What was the oral health condition among the citizens of Hong Kong ? What were the factors affecting their oral health condition ? What are the relevant information that can be harnessed to reflect upon, whether there is room for improvement, to better the oral health of the Hong Kong population ?

The Oral Health Survey 2001 was undertaken with these questions in mind, and efforts were geared at collecting information to address these questions. The survey was built on the contemporary knowledge and evidence on tooth decay and gum disease, which were described in **Section 1**.

To allow comparison with past surveys conducted locally and surveys of other countries, it was necessary to apply internationally adopted indicators to measure tooth decay and gum disease. The Oral Health Survey 2001 followed the recommendations by the World Health Organization, and the indices used for measurement of tooth decay and gum disease were described in **Section 2**.

The survey was carried out through a series of field activities over a one year period in the year 2001. The survey findings on the 5-year old children, 12-year old students, 35 to 44-year old adults, 65 to 74-year old non-institutionalized older persons (NOP), and the 65-year old and above institutionalized older persons (IOP), can be found in **Sections 3, 4, 5, 6 and 7**, respectively.

Section 8 provides an overview of the whole survey, by comparing some of the key modalities with those of other countries and also with previous local data, to ascertain any change in the oral health conditions among the Hong Kong population over the years. Attempts were also made in the overview section to predict future trends of changes in oral health, identify inadequacies and threats, and identify opportunities to better the oral health of the Hong Kong population.

This report had been penned in such a way that professional knowledge in dentistry would not be a prerequisite to comprehension of the report. In the event of uncertainties regarding some of the terms used, it may be helpful to refer to the **Glossary** section. Exact figures and percentages were presented in Tables or Figures, and individual Tables or Figures can be easily traceable from the **List of Tables** and **List of Figures**.

Readers who wish to have a cursory view of the whole report may focus on the **Green Text Boxes**, which show the highlights of the survey findings. The **Green Text Box** at the end of each section, i.e. from Section 3 to Section 7, contains the **Section Summary** for each index age group.

Important reminders and points to note are shown in the **Blue Text Boxes** found throughout the report.

For more information

Information related to oral health, and any new information from the Oral Health Survey 2001, may be browsed from the Oral Health Education Unit web site at : http://www.toothclub.gov.hk

SECTION 1

Tooth decay and gum disease

What is tooth decay ?

Tooth decay is caused by acid dissolution of the tooth surface. This occurs when bacteria colonize on the tooth surface in the form of a thin, sticky, colorless film (*dental plaque*). Soon after the intake of food, the bacteria in the dental plaque utilize the sugar from the food, to produce acid which dissolves the tooth surface. This leads to a loss of minerals from the tooth surface and results in tooth decay. If there is no intervention, constant loss of minerals causes the tooth surface to break down, and a cavity is formed.

The sectional view of a healthy tooth is shown in Figure 1.1. Tooth decay can develop in any part of a tooth. It usually develops on areas where dental plaque builds up easily and is difficult to remove, i.e. along the grooves on the biting surfaces, under contact areas between adjacent teeth, and around the gum margins, including the exposed root surfaces. Tooth decay at its initial stage is not noticeable and is symptom-free. It is only detectable by careful dental examination. Radiographic examination also picks up signs of decay especially when it spreads (Figure 1.2) beneath the outer surface of the tooth (*enamel*). Then, the affected tooth may become sensitive to temperature changes. The duration and severity of such sensitivity may increase as the decay progresses further and deeper towards the center of the tooth (*pulp*). At some stage, the *pulp* will become inflamed causing pain and discomfort. When the *pulp* is irreversibly damaged, the tooth becomes non-vital. Infection can easily set in and the infection can spread through the root ends (*apex*). The destruction of tooth structure will worsen without proper intervention. When the affected tooth is severely broken down, restoration may no longer be possible. The removal (*extraction*) of the tooth may become the only way out which results in tooth loss.

Figure 1.1
Sectional view of a healthy tooth

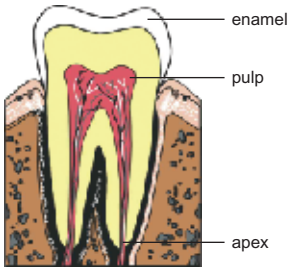


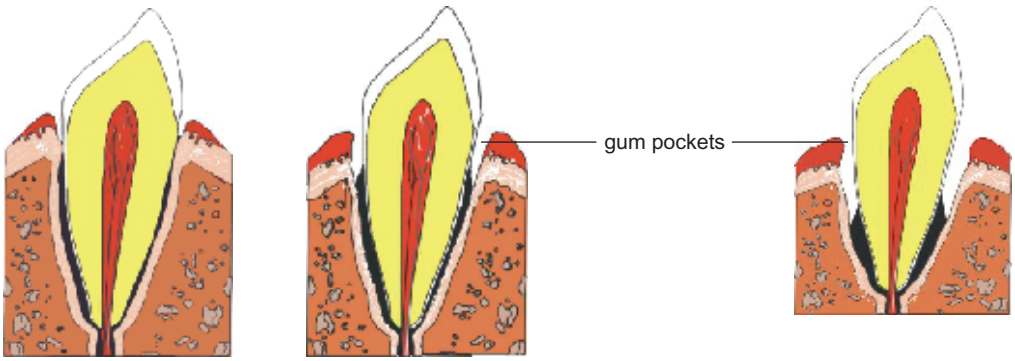
Figure 1.2
Diagrammatic illustration of progression of tooth decay

What is gum disease ?

Gum disease is a chronic disease of the supporting tissue around the teeth which include the gums, bone and connective tissue. Dental plaque is also the culprit of gum disease. If teeth are not effectively cleaned, dental plaque will accumulate on the tooth surfaces and crevices along gum margins. Furthermore, accumulated dental plaque may calcify into a hardened deposit called calculus. The rough surfaces of the calculus further promote plaque accumulation, thus hastening the progress of gum disease.

The bacteria in the dental plaque release toxins which irritate the gum tissue it comes in contact with, leading to gum inflammation, a condition which is still reversible. However, if left untreated, gum inflammation may progress further and affect the tooth's supporting tissue. It is manifested when the gums, which originally were tightly attached to the root surfaces, will detach, leading either to the formation of gum (*periodontal*) pockets (Figure 1.3) or recession of the gum margins, or both. The total detachment of tooth support, including both gum pocket and gum recession, is referred to as the loss of attachment (LOA), a condition which is now irreversible.

Figure 1.3
Diagrammatic illustration of progression of gum disease



Gum pocket is significant because the affected person cannot clean the inside of the pocket, and can only be managed by professional care. Shallow pocket refers to pocket depth (measured from gum margin to the base of the gum sulcus) of 4 to 5 mm, and deep pocket refers to pocket depth of ≥ 6 mm. The deeper the gum pocket, the more complex professional treatment is required.

While healthy gums appear pink and firmly attached to tooth, inflamed gums appear swollen and bleed easily when touched or brushed. Gum inflammation is the mildest form of gum disease. There is usually little or no discomfort aside from gum bleeding. The loss of attachment in the form of gum pocket can hardly be perceived by the affected person. The loss of attachment in the form of recession, leads to the exposure of root surface and sensitivity. The affected person may soon notice an "elongation" of the tooth because of the gum recession and exposure of the root, which make the tooth appear longer but in fact is a manifestation that the tooth support has been destroyed thus exposing more of the tooth and root surface.

Accumulation and maturation of dental plaque in gum pockets may lead to more severe forms of inflammation, pus formation along the gum margin, and abscess formation. Foul smelling breath is also common in such situations. Persistent gum inflammation will lead to the destruction of bone support of the affected tooth. The affected tooth may drift away from its original position and may become loose (mobile). Without proper intervention, the supporting tissues may be completely destroyed and make the affected tooth very loose, and may even fall out easily.

SECTION 2

Measuring tooth decay and gum disease

How is tooth decay measured ?

The extent and severity of tooth decay is measured by an universally adopted measurement, known as the DMFT index.

The damage to the tooth caused by decay is irreversible. Therefore, the visible state of a decayed tooth can be : decayed and left untreated (DT), missing (i.e. extracted due to decay) (MT), or filled (FT). The total number of teeth affected by tooth decay in an individual is the sum of DT + MT + FT , which is known as the DMFT value. Each adult normally has 32 permanent teeth, and its DMFT value may range from 0 to 32. Small letters (dt, mt, ft and dmft) are used to denote decay experience in the primary teeth (milk teeth or baby teeth). Each child normally has 20 primary teeth, and its dmft value may range from 0 to 20.

The severity of tooth decay in the population is measured by the mean (average) DMFT value for age 12 and above, and the mean dmft value for children below age 6. The mean DMFT/dmft are useful values in making comparisons among population where almost everyone is affected by tooth decay. This may not be the case among population where prevention of tooth decay has been effective and a significant proportion within the population were free from tooth decay. Under such situation, the mean DMFT/dmft value can be misleading, as the average number of DMFT/dmft among affected people only, may be much higher than the mean DMFT/dmft among the whole population.

In addition to assessing the severity of tooth decay, it is equally important to assess the extent of tooth decay in the population. The extent of tooth decay is measured by the percentage of people with decay experience, i.e. DMFT > 0 for adults and dmft > 0 for children. 0 denotes no decay experience or free from tooth decay.

To more accurately assess the problem of tooth decay which are left untreated in a population, it is necessary to include the mean DT/dt value and the percentage of people with untreated decay, i.e. DT > 0 for adults and dt > 0 for children.

With the emerging presence of decay of root surfaces in the adult and older person groups, its presence is recorded separately for monitoring and surveillance purposes. The state of a root surface can either be decayed and left untreated (D-root) or filled (F-root), and the total experience of root surface decay for an individual is measured by the DF-root value.

How is gum condition measured ?

The health status of the gum and supporting tissue is measured by two indices, i.e. Community Periodontal Index (CPI) and the loss of attachment (LOA).

CPI measures and classifies gum condition into one of the following categories : healthy gum, presence of gum bleeding, presence of calculus deposit, presence of shallow pocket, and presence of deep pocket. According to the World Health Organization recommendation, examination for pockets do not apply to 5 and 12-year old children. This categorization does not represent the stages of progression of gum disease. Different category of gum condition merely indicates different levels of treatment need.

LOA measures the accumulative loss of tooth supporting tissues in millimeters (mm) from the original level of gum margin to the existing level of gum attachment. LOA ≥ 12mm and LOA ≥ 9mm are considered to be severe loss of gum attachment, LOA ≥ 6mm includes moderate and severe loss of gum attachment, and LOA ≥ 4mm includes any loss ranging from mild to severe.

While the DMFT value is a measure of decay experience in all the teeth present in a person's mouth, the CPI and LOA values for an individual are the highest corresponding values recorded on examination of the gums. Such examination may be performed on all teeth present, which is considered time consuming and not practical. The recommendation of the World Health Organization is to examine a representative tooth in each of the six sextants in the mouth. The mouth is divided into six sextants. The extent of gum disease in any person's mouth is represented by the number of sextants with a specific degree of destruction as measured by CPI or LOA. The number may range from 0 to 6.

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?

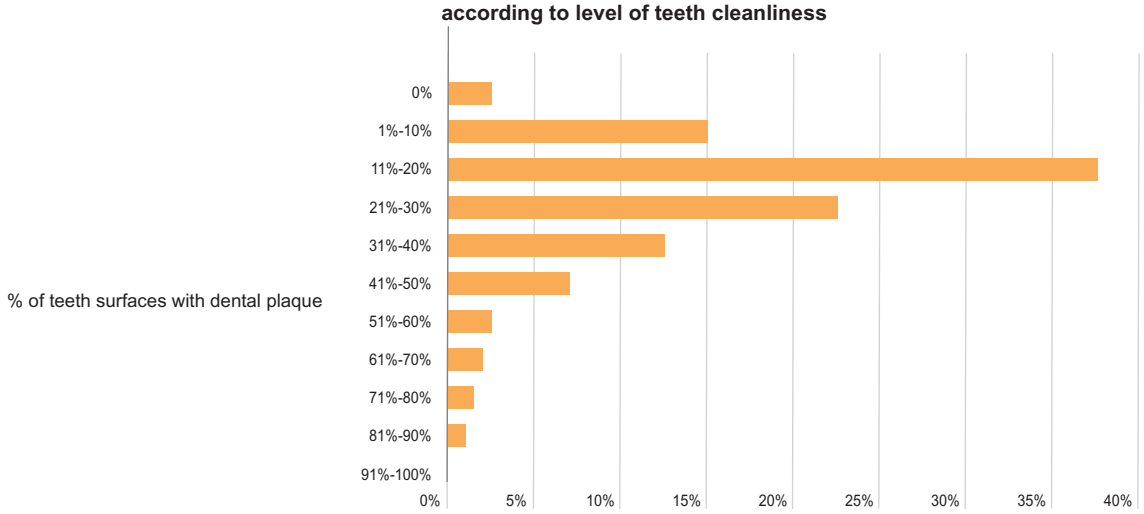
Teeth status - how many teeth were there ?

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 ?

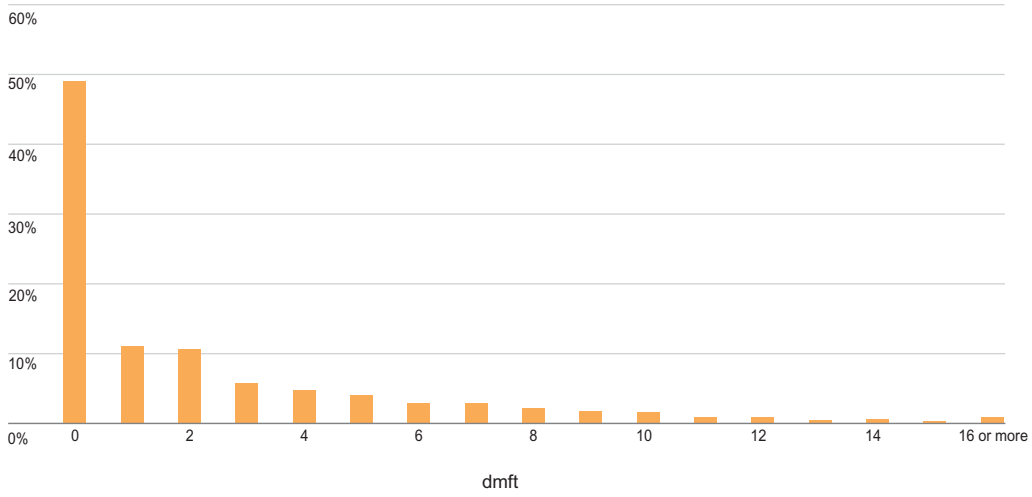
The level of tooth decay as measured by the dmft index is summarized in Table 3.1 The mean dmft value among the 5-year old population was 2.3. 91.3% of the decayed teeth (dmft) were untreated (dt).

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.

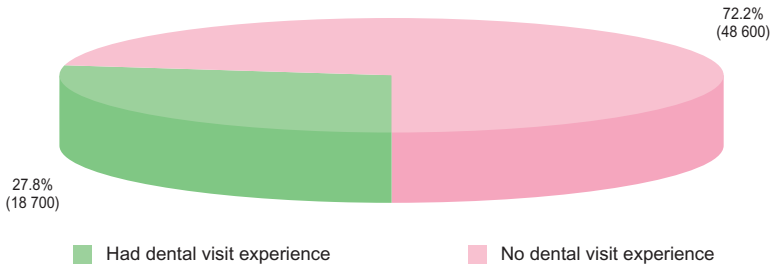
The distribution of tooth decay among 5-year old children was very uneven. A high degree of polarization in the problem of tooth decay was found among this population. Almost half of the children were not affected by tooth decay, while 23.6% of children had around 78% of all the teeth with decay experience.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

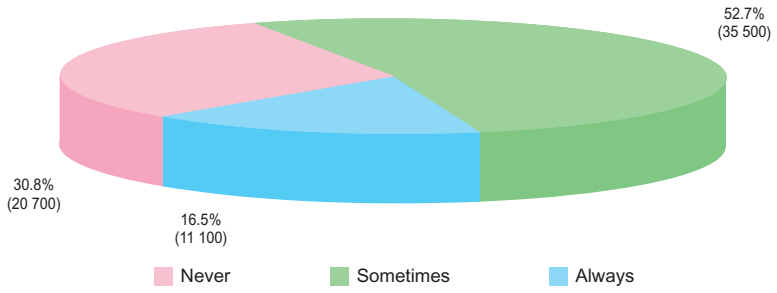
Table 3.3
Distribution of 5-year old children
according to their reported toothbrushing habit

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

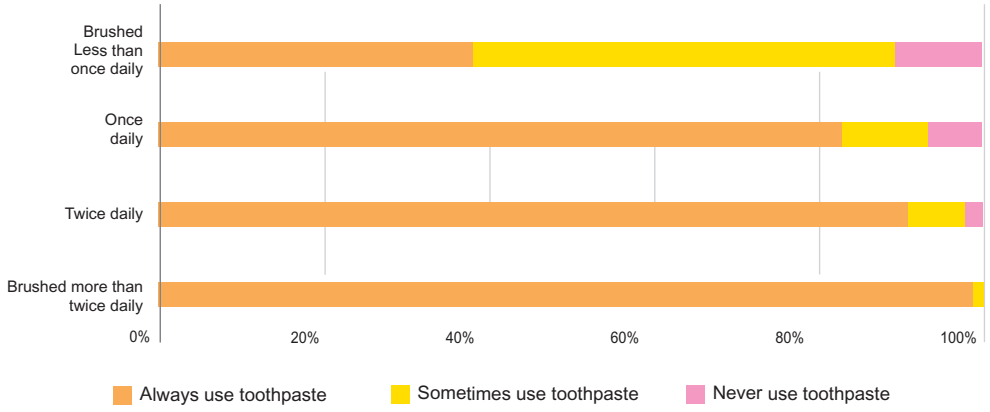


Toothbrushing - was fluoride toothpaste used ?

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

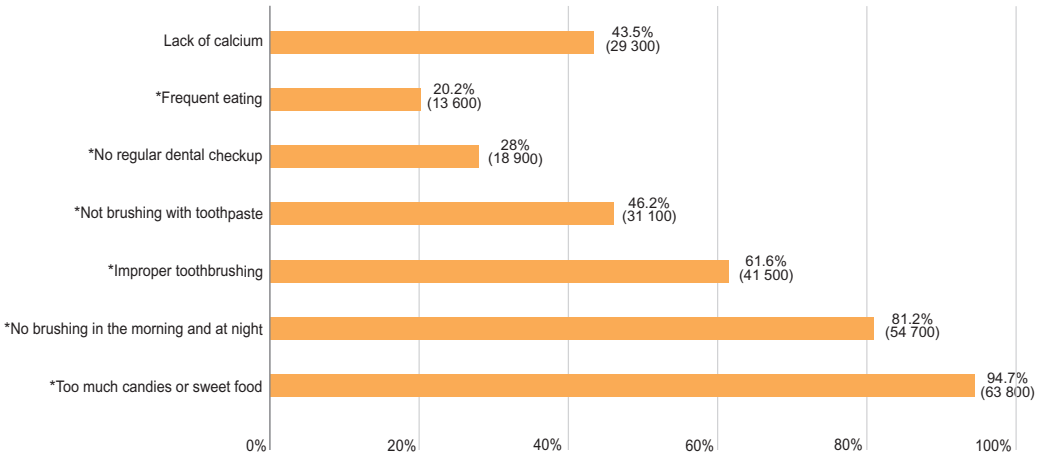
Snacking was found to be a common practice among the 5-year old population. Frequent snacking habit is considered as a risk factor in developing tooth decay. About one-fifth of the 5-year old children snacked three or more times.

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

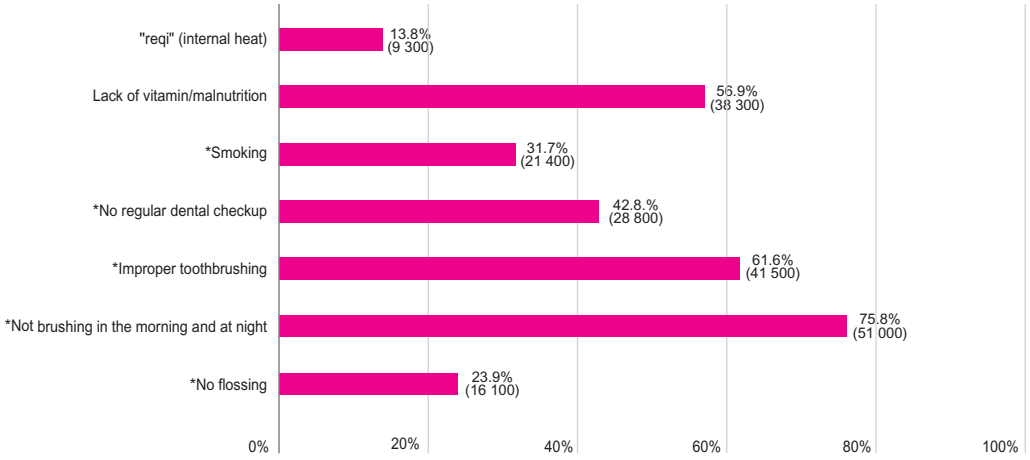


Respondents allowed to choose multiple answers
* Relevant factors

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

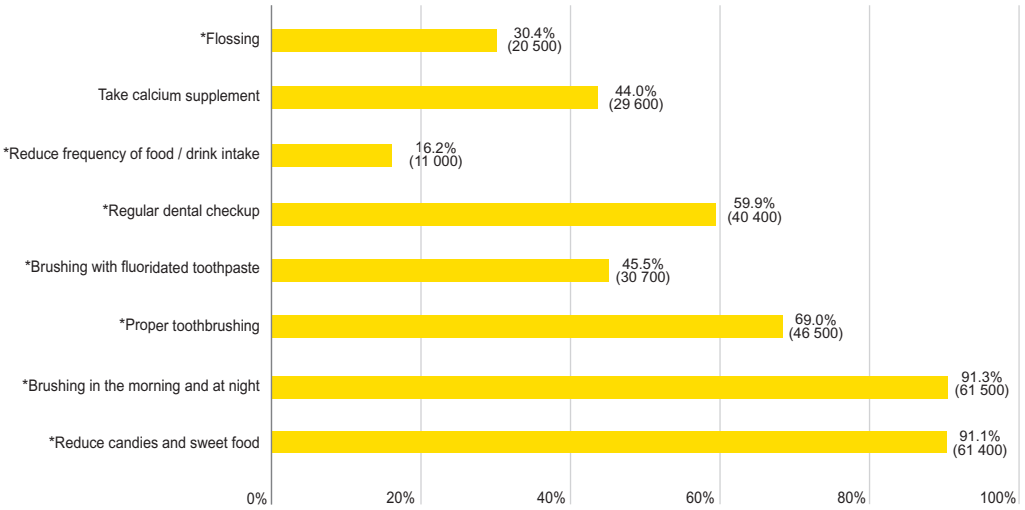


Respondents allowed to choose multiple answers
* Relevant factors

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

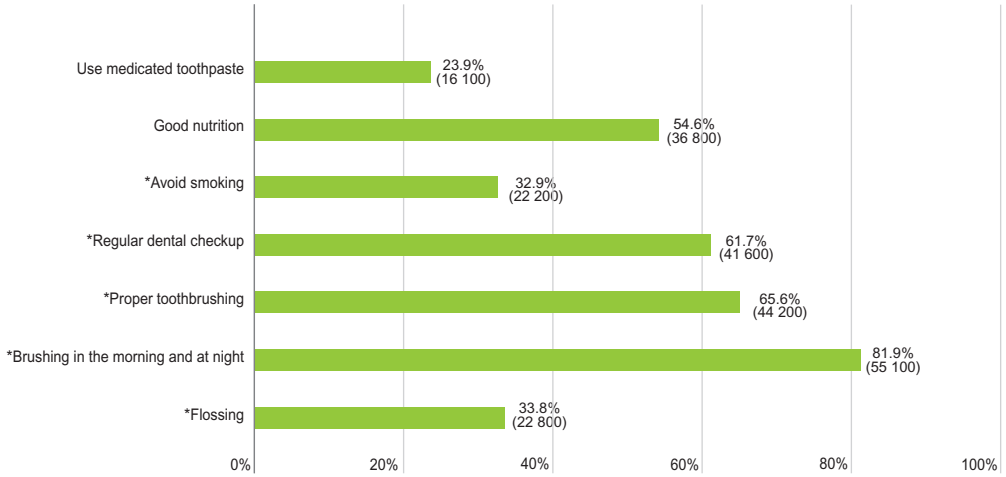


Respondents allowed to choose multiple answers
* Relevant factors

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

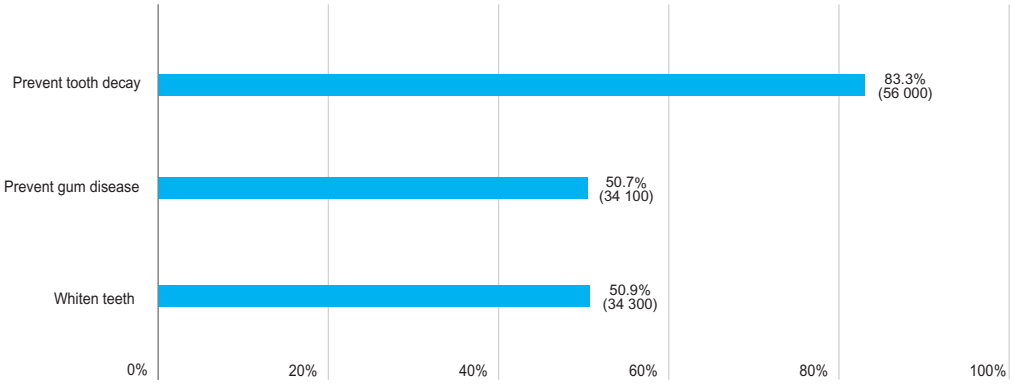


Respondents allowed to choose multiple answers
* Relevant factors

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

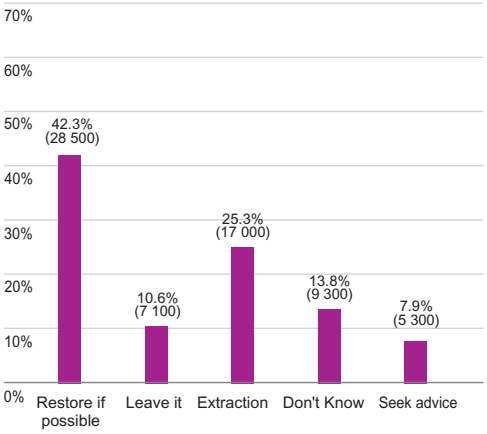
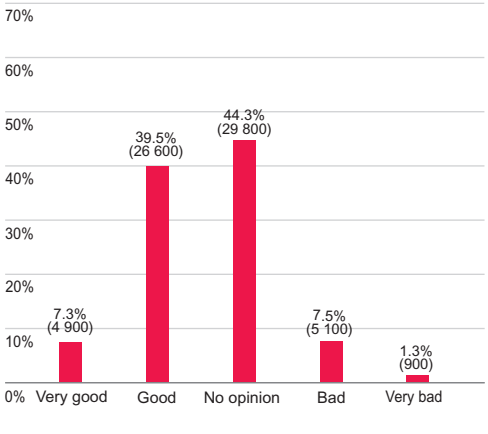


Figure 3.12
Distribution of parents according to their perception of the oral health condition of their children



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

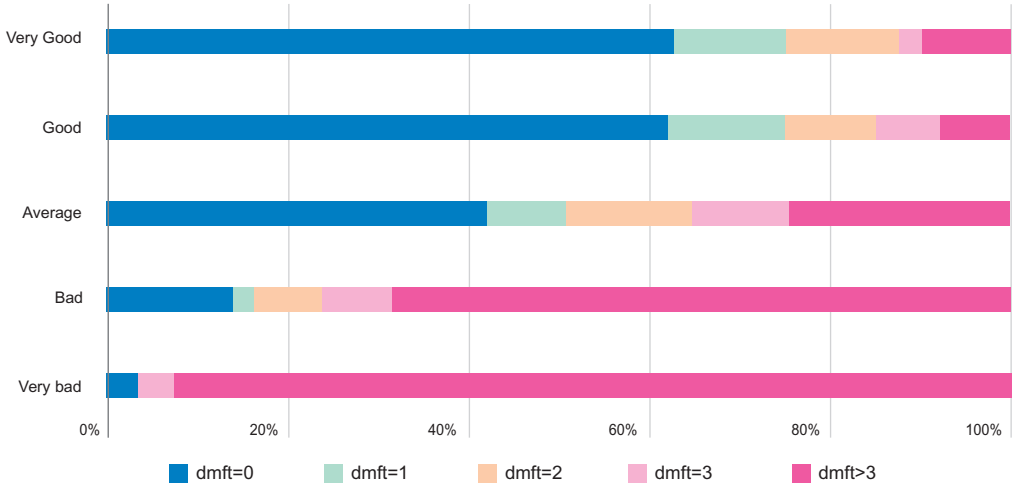
Dental treatment need	Mean number of teeth	Percentage
Filling (1-surface)	0.4	23.7
Filling (2-surface)	1.5	43.9
Pulp treatment	0.1	4.4
Removal of teeth	0.1	5.2
Fissure sealant *	0.2	10.5

* 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

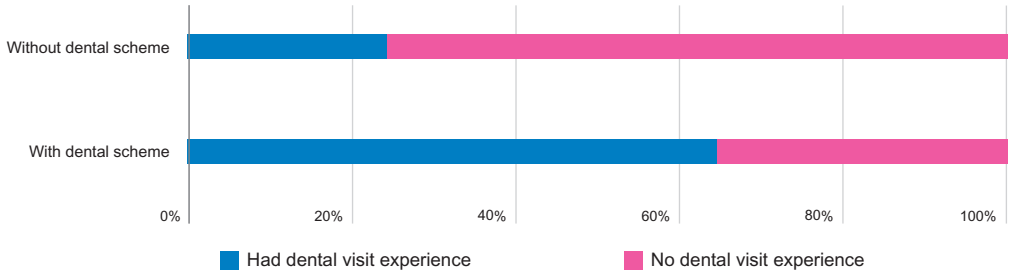


Table 3.7
Reasons of last dental visit and dental scheme coverage

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.

SECTION 4

12-year old students

Introduction

The 12-year old children covered in this survey were all born in 1988. According to the Laws of Hong Kong, it is mandatory for children to receive formal education up to Form three (F3) in secondary school unless under exceptional circumstances. Hence, almost all the 12-year olds must be within the school system in Hong Kong, and they are referred to in this survey as 12-year old students. However, students of this age may be found in either primary schools or secondary schools. Available information indicated that majority of the 12-year old students were in F1 and F2 of secondary schools. Therefore, for administrative convenience, the survey on this age group was targeted only at F1 and F2 students in secondary schools.

Survey objectives

The objectives of the survey of the 12-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 students' and parents' knowledge on dental diseases; and
4. to collect information on parents' attitudes towards their children's oral health and regular dental checkup.

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, the proportion of 12-year old students in F1 and F2 and resources availability.

The sample of 12-year old students was drawn using secondary schools as the primary sampling unit. 26 schools were selected from a database of all local secondary schools provided by the Education Department. All F1 and F2 students of the selected schools born in 1988 were invited to participate in a second stage of selection. Due to constraints in resources and to avoid undue disruption of classes in the selected schools, the number of students selected from each school was limited to a maximum of 50.

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, students were randomly assigned to the two examiners for clinical examination. A random sub-sample of one in every ten students (about 10%) were cross-examined, to monitor the examination reproducibility, and this was maintained at a very good level.

Information on the students and their parents were collected using two questionnaires, completed by students on site and by parents at home, respectively. The draft questionnaires were pre-tested on primary six students and their parents attending School Dental Clinics, and several revisions were made before being finalized.

Enumeration results

Out of the 26 selected schools, 18 schools agreed to participate, and 820 students from these 18 schools were selected and invited to participate in this survey. Selected students were examined only if parental consent had been received, and the survey was successfully completed on 793 students. With statistical adjustment and weighting, the results of this survey could be inferred to some 67 100 students aged 12 in Hong Kong. According to the 2001 Population Census, there were 91 800 children aged 12 in Hong Kong at the time of survey. Hence, this survey had covered 73% of 12-year old children. Children not covered were mostly studying in school grades other than F1 and F2.

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 the 12-year old students in Hong Kong?

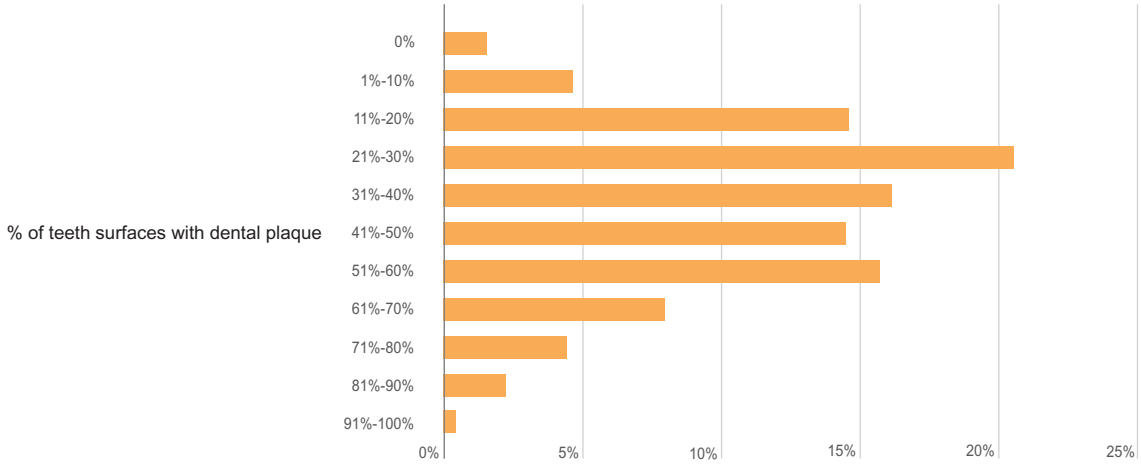
Teeth status - how many teeth were there ?

On average, each 12-year old student had 26.8 permanent teeth. The mean number of primary teeth still present was very small (0.5). Hence, the report on 12-year old students referred to their permanent dentition only.

Teeth status - how clean were the teeth ?

The cleanliness of the students' 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 12-year old students was 36.8%. The percentage distribution of students according to level of teeth cleanliness is shown in Figure 4.1. Only 1% (600) of students had no visible dental plaque on their teeth. 28.7% (19 200) were found to have visible dental plaque on more than half of their teeth surfaces (VPI>50%).

Figure 4.1
Distribution of 12-year old students according to level of teeth cleanliness



Teeth status - what was the level of tooth decay ?

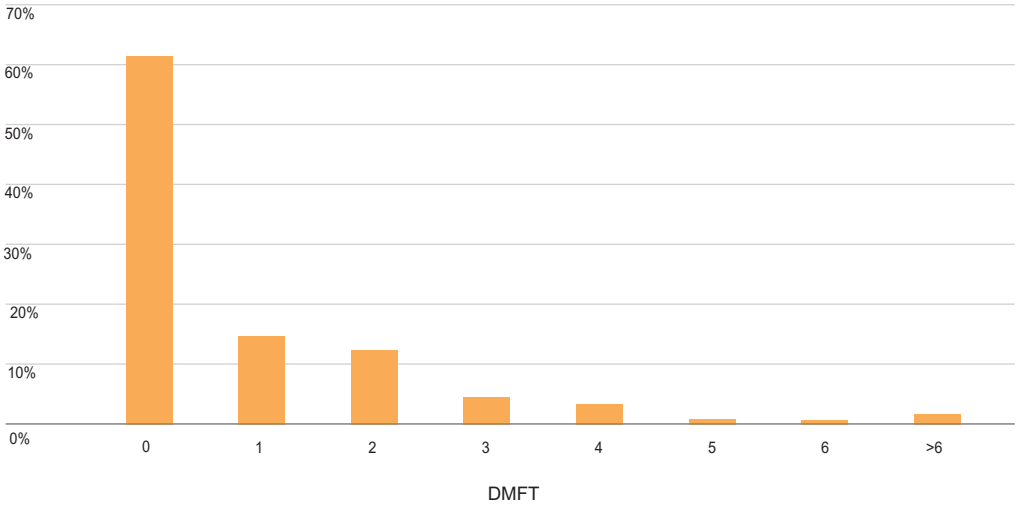
The level of tooth decay as measured by the DMFT index is summarized in Table 4.1. The mean DMFT value among the 12-year old population was 0.8. Most of the decay experience (DMFT) were filled components (FT). The proportion of untreated decay (DT) was relatively low.

Table 4.1
Level of tooth decay as measured by the DMFT index among 12-year old students

	DMFT	DT (decayed)	MT (missing)	FT (filled)
Mean value	0.8	0.1	0.1	0.6
% Among population	37.8	6.9	3.1	33.8

The distribution of students according to their DMFT value is shown in Figure 4.2. 62.2% (41 800) students were free from tooth decay. It was found that most of the affected students had one or two teeth with decay experience. Only 4.2% of 12-year old students had four or more teeth with decay experience.

Figure 4.2
Distribution of 12-year old students according to DMFT value



Teeth status - how many teeth were protected by fissure sealants?

Fissure sealant is a coat of resin applied to the teeth surfaces to prevent tooth decay. The mean number of sealed teeth per student was 2.3 indicating that many of these students had received some preventive care.

What was the gum condition of the students ?

The gum condition of the 12-year old students was measured by the Community Periodontal Index (CPI), and the results are shown in Table 4.2. On average, more than three sextants in the mouth of each 12-year old student had either bleeding gums or calculus deposit.

Table 4.2
Gum condition as measured by CPI among 12-year old students

	Healthy gums	Bleeding gums	Calculus deposits
Mean number of sextants affected	2.6	1.8	1.6
% Among population	5.5	35.0	59.5

Only 5.5% (3 700) students had healthy gums in all the six sextants, while 59.5% (39 700) students had calculus deposits.

Teeth cleanliness was not satisfactory. Almost all of the 12-year old students had visible dental plaque on their teeth. More than a quarter (28.7%) of the students had dental plaque on more than half of the teeth surfaces examined.

Tooth decay was not a problem among the 12-year old population. The proportion of students affected by tooth decay was relatively low. Most of the students with decay experience had one or two teeth affected, and most of the decayed teeth were treated.

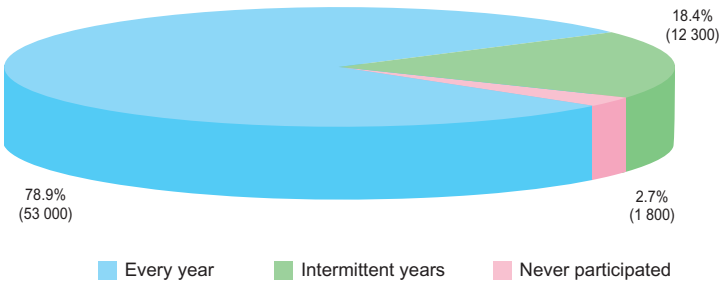
The gum condition warranted attention. Very few students (5.5%) had healthy gums. More than half of the population had calculus deposit. Along with the unsatisfactory level of teeth cleanliness, this population is at risk of developing gum disease.

What was the pattern of usage of oral health care services among the 12-year old students?

How many students had participated in the School Dental Care Service before entering secondary school ?

The reported participation in the School Dental Care Service (SDCS) during their primary school years is presented in Figure 4.3. Almost four out of every five students had participated every year, and only 2.7% (1 800) had never participated in the SDCS.

Figure 4.3
Distribution of 12-year old students according to SDCS participation



How many students had visited the dentist after entering secondary school?

Only 21% (14 100) of students had visited the dentist after entering secondary school. The treatment received during these dental visits are shown in Table 4.3. Majority of these students received professional teeth cleaning (scaling). A smaller proportion of students received curative treatment such as filling, orthodontic treatment and removal of teeth.

Table 4.3
Number and percentage of 12-year old students who had visited the dentist after entering secondary school according to treatment received

Treatment received	Number	Percentage
Professional teeth cleaning	10 200	72.2
Filling	4 200	29.5
Orthodontic treatment	2 600	18.5
Removal of teeth	2 600	18.4
Pulp treatment	400	3.0
Prostheses	200	1.3
Others	200	1.7

Respondents allowed to choose multiple answers

Among the 12-year old students, only 20.9% (14 000) claimed that they had visited the dentist for dental checkup after entering secondary school. There was no difference in this habit among students in F1 and F2.

Majority of the students received oral health care during their primary school years. Most of the 12-year old students had received some form of oral health care during their primary school years. Only a very small proportion (2.7%) had never participated in the School Dental Care Service.

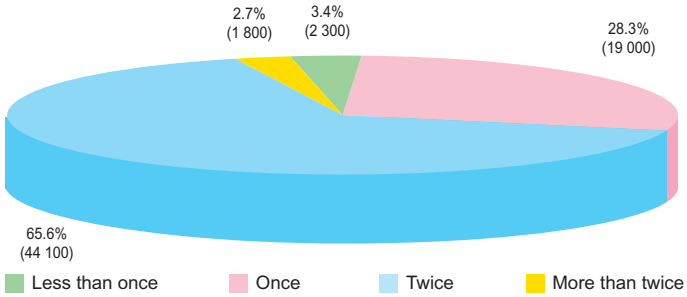
A large proportion of students had stopped receiving regular oral health care after entering secondary school. The use of oral health care services dropped dramatically after the students entered secondary school. Only 20.9% reported the seeking of dental checkup during secondary school years.

How did the 12-year old students practise oral self-care ?

Toothbrushing - how often did the students brush ?

The reported toothbrushing habit among 12-year old students is shown in Figure 4.4. Most students reported the habit of daily toothbrushing. Only 3.4% (2 300) students reported that their toothbrushing habit had been irregular.

Figure 4.4
Distribution of 12-year old students according to daily toothbrushing frequency

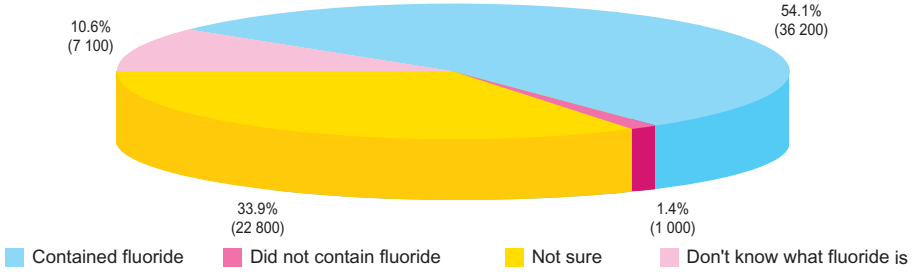


Toothbrushing - was fluoride toothpaste used ?

As many as 94.7% (63 600) students reported the use of toothpaste every time they brushed their teeth.

Students were asked whether the toothpaste they had been using contained fluoride, and the results are shown in Figure 4.5. Only 54.1% (36 200) reported that the toothpastes they used contained fluoride. A third of the students did not know whether fluoride was present in the toothpaste. One in every ten students did not know what fluoride was.

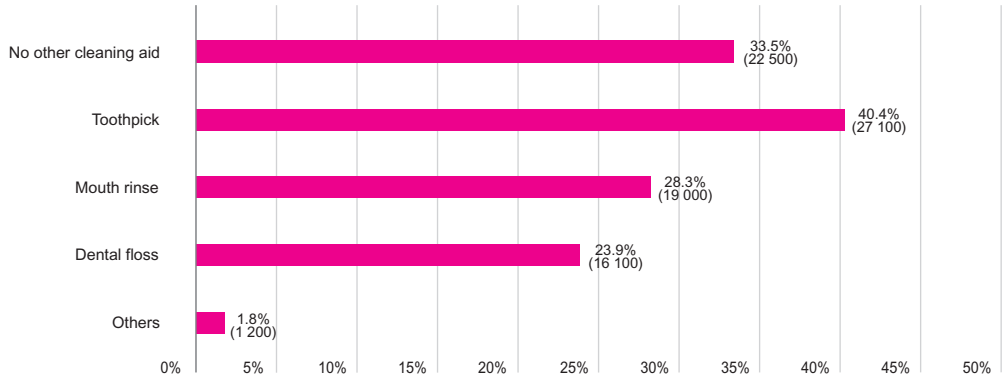
Figure 4.5
Distribution of 12-year old students according to their knowledge on whether their toothpaste contained fluoride



Did the students use additional oral cleaning aids?

The students were asked whether they used any additional oral cleaning aids to clean their teeth. The results are shown in Figure 4.6. Many students reported the use of toothpick or mouth rinse. Only 23.9% (16 100) of students claimed to have used dental floss.

Figure 4.6
Number and percentage of 12-year old students according to use of other oral cleaning aids



Two-thirds of the students brushed their teeth twice daily. Only 3.4% brushed less than once a day. The use of toothpaste was common among those who brushed.

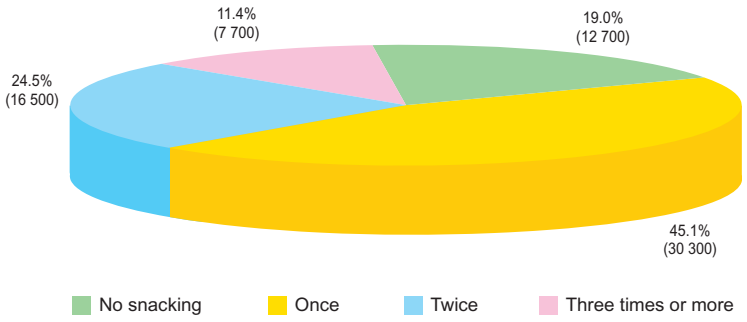
More than one-third of the students did not know whether the toothpaste used contained fluoride or not. As most toothpastes in Hong Kong contain fluoride, the chance of these students using non-fluoride toothpastes was small. However, a small number of students could be using non-fluoride toothpastes which may not be effective in the prevention of tooth decay.

Two-thirds of the students used additional oral cleaning aids, but only less than a quarter of students reported the use of floss. Different interdental cleaning aids are suited for different situations. For 12- year old students, the use of dental floss is more appropriate than toothpicks. Toothpicks, if used improperly, may cause trauma to the gums and even the loss of gum attachment.

Snacking habit

Snacking is referred to as any food, snack or drink (except water) intake in between normal meals. The reported snacking habit among 12-year old students is shown in Figure 4.7. Three out of every four students reported the habit of snacking. Only 11.4% (7 700) students reported snack intake of three or more times on the day prior to the survey. Students with this high snacking frequency could be at risk of developing tooth decay.

Figure 4.7
Distribution of 12-year old students according to snacking frequency

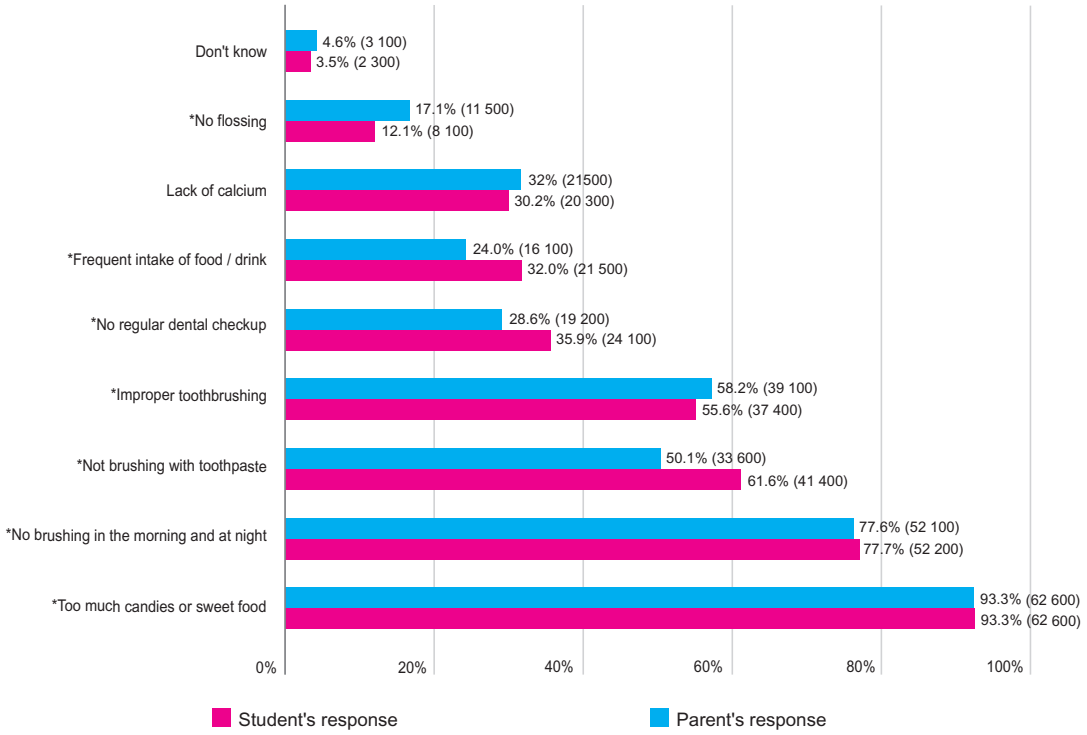


What did the students and their parents know about dental diseases?

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

The perceived factors leading to tooth decay by students and their parents are shown in Figure 4.8. The knowledge of students and parents on the factors leading to tooth decay was generally good. The mostly reported factor among both students and their parents was *eating too much candies or sweet food*, but relatively few could point out the importance of *frequent intake of food / drink*. The next mostly perceived factor was *no brushing in the morning and at night*.

Figure 4.8
Number and percentage of 12-year old students and their parents according to the perceived factors leading to tooth decay

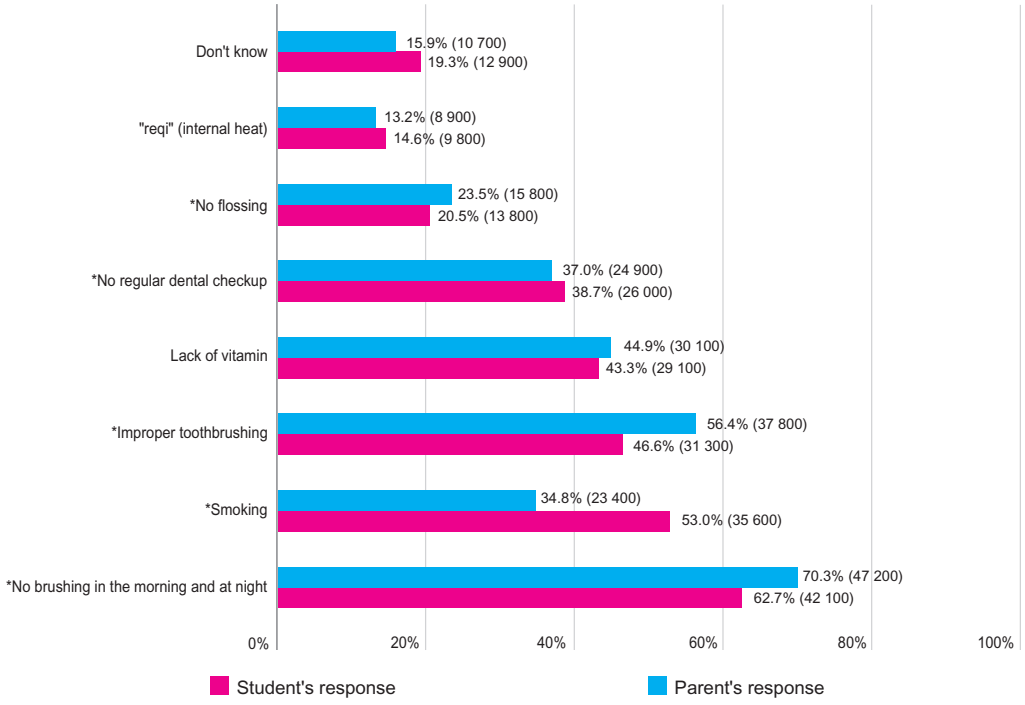


Respondents allowed to choose multiple answers
* Relevant factors

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

The perceived factors leading to gum disease provided by students and their parents are shown in Figure 4.9. The knowledge of students and parents on the factor leading to gum disease was not as good as compared with those of tooth decay. The mostly reported factor *of no brushing in the morning and at night* was shared by students and parents. Otherwise, parents considered *improper toothbrushing* and *lack of vitamin* as important. Students recognized *smoking* and *improper toothbrushing* as factors leading to gum disease. *No flossing* and *no regular dental checkup* were reported by relatively fewer students and parents.

Figure 4.9
Number and percentage of 12-year old students and their parents according to the perceived factors leading to gum disease

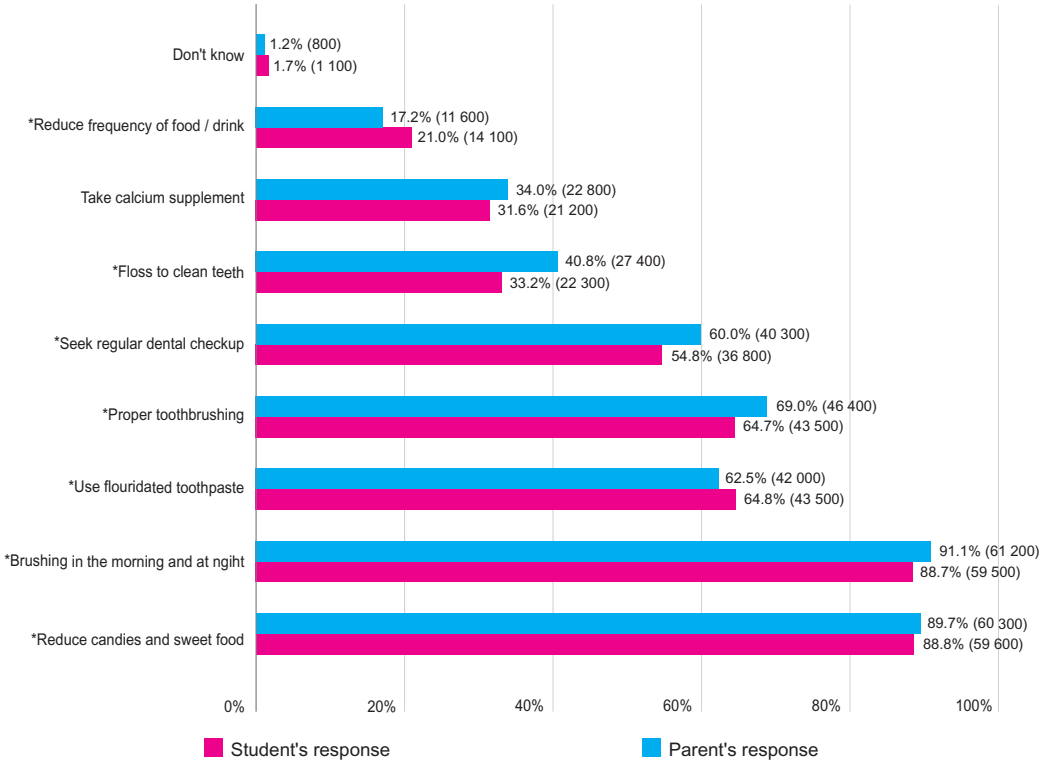


Respondents allowed to choose multiple answers
* Relevant factors

What did the students and their parents know about the prevention of tooth decay?

The methods as perceived by students and parents on the prevention of tooth decay are shown in Figure 4.10. *Reduce consumption of candies and sweet food* and *brushing in the morning and at night* were the mostly reported methods to prevent tooth decay, followed by use *fluoridated toothpaste* and *proper toothbrushing. Seek regular dental checkup* was mentioned by around 54.8% (36 800) students and 60% (40 300) parents. However, *reduce frequency of food or drink intake* was reported by relatively fewer students and parents. 31.6% (21 200) of students and 34% (22 800) parents indicated that taking calcium supplement could prevent dental decay. This general misconception needs to be clarified.

Figure 4.10
Number and percentage of 12-year old students and their parents according to the perceived methods to prevent tooth decay

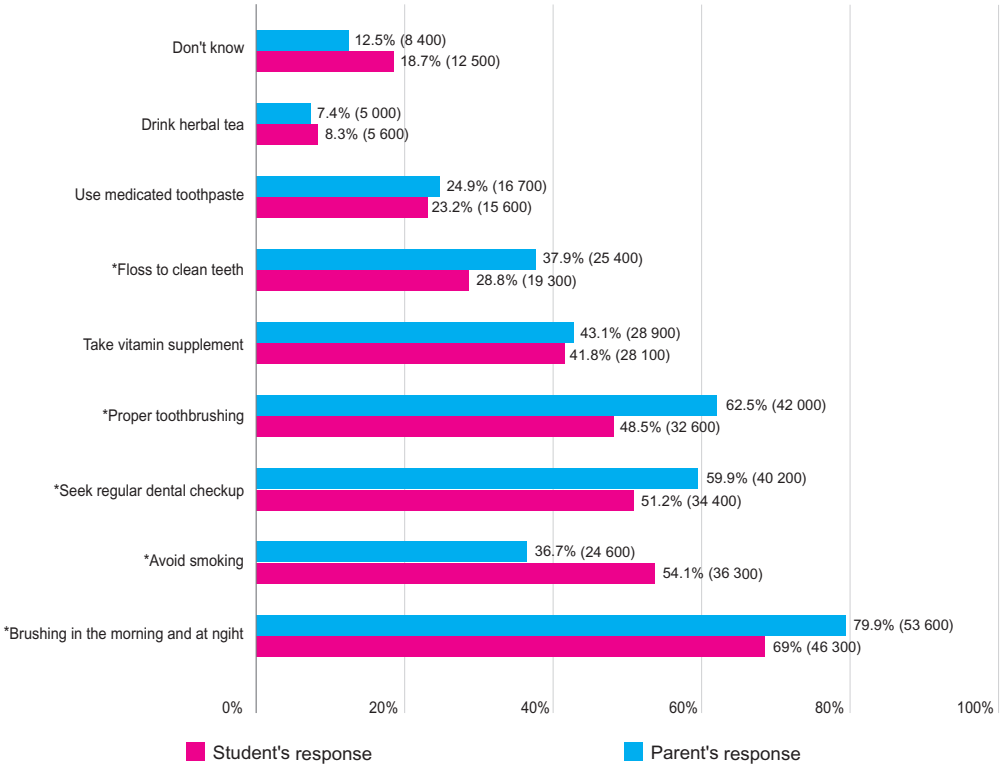


Respondents allowed to choose multiple answers
* Relevant factors

What did the students and their parents know about prevention of gum disease?

The methods as perceived by students and parents on the prevention of gum disease are shown in Figure 4.11. The responses from students and their parents were again different in this area. Parents accorded more importance to *brushing in the morning and at night*, followed by *proper toothbrushing* and *seek regular dental checkup*. Students mentioned the three preventive methods to a similar degree, and more students pointed out the importance to *avoid smoking* in the prevention of gum disease than their parents. *Floss to clean teeth* was only reported by 28.8% (19 300) of students and 37.9% (25 400) parents.

Figure 4.11
Number and percentage of 12-year old students and their parents according to the perceived methods to prevent gum disease

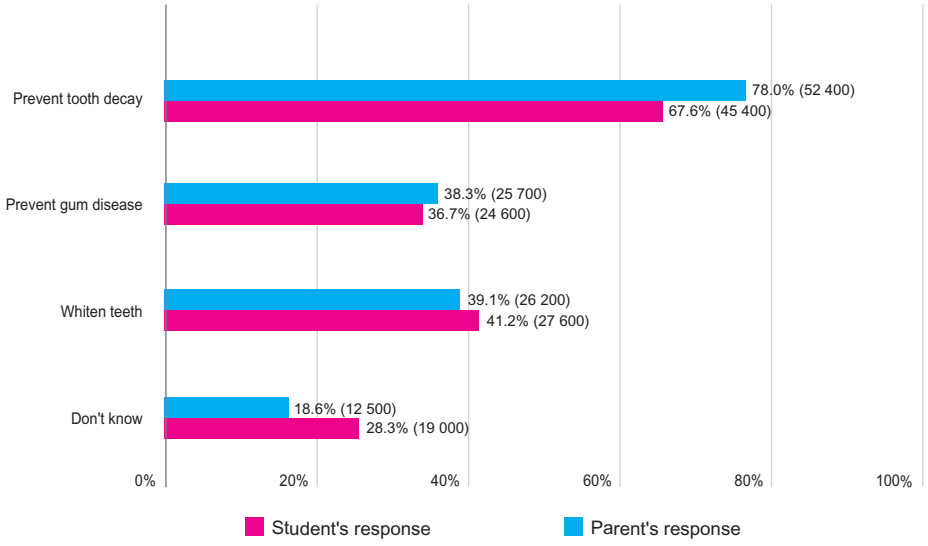


Respondents allowed to choose multiple answers
* Relevant factors

Did the students and their parents know about the benefits of fluoride ?

The perceived benefits of fluoride as reported by students and their parents are shown in Figure 4.12. 28.3% (19 000) students and 18.6% (12 500) parents replied *don't know*. Among those who could give an answer, most reported the benefit in the prevention of tooth decay. However, the *prevention of gum disease* and the *whitening of teeth* were also mentioned by more than one-third of students and parents.

Figure 4.12
Number and percentage of 12-year old students and their parents according to their knowledge on the benefits of fluoride



Knowledge on gum disease prevention needs to be reinforced. Among both the students and their parents, only six out of ten could point out the importance of use correct toothbrushing method (*proper toothbrushing*) in preventing gum disease, and even fewer (around three out of ten) could point out the importance of using *floss to clean teeth*. However, there were more students than their parents who pointed out the importance to *avoid smoking* in the prevention of gum disease.

The function of fluoride was not fully understood. About 70% of students and 80% of parents knew that fluoride is useful in preventing tooth decay. However, slightly more than one-third of the students and the parents thought that fluoride could also prevent gum disease or to whiten teeth.

Most students and their parents knew candies and sweet food are bad for the teeth, but many of them did not know the risk of developing tooth decay from frequent snacking. Less than one-third of the students and one-fourth of the parents knew of frequent snacking as a risk factor for developing tooth decay.

Many students and their parents knew that regular dental checkup is important in preventing tooth decay and gum disease, but only a minority had actually done so. More than 50% of the students and around 60% of the parents pointed out the importance of regular dental checkup in the prevention of tooth decay and gum disease. However, only around one in every five students had visited the dentist for checkup after entering secondary school.

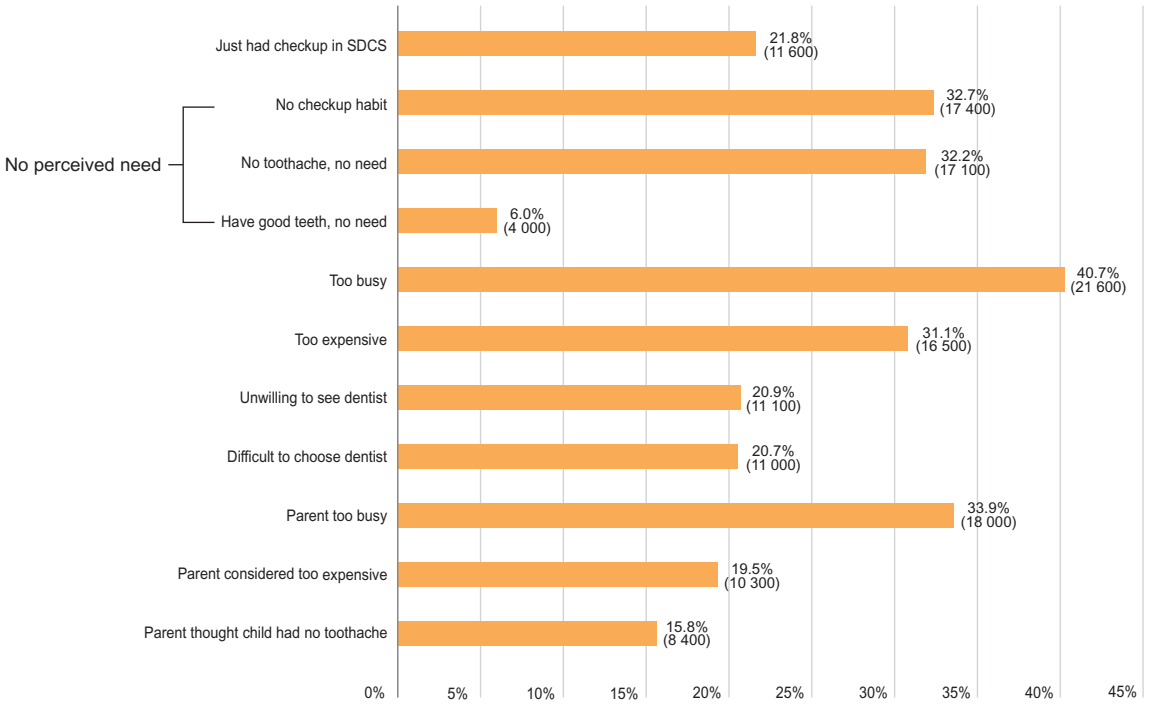
More students than their parents knew the harmful effect of smoking on gum health. Only about one-third of the parents were able to cite smoking as a causative factor, and avoidance of smoking as a method to prevent gum disease, while more than half of the students were aware of this.

What were the barriers to students seeking oral health care services after entering secondary school ?

What were the reasons for not seeking regular dental checkup among 12-year old students ?

Students who did not seek regular dental checkup after entering secondary schools were asked to state the reasons for not doing so. The reported reasons are listed in Figure 4.13. Reasons such as *no need because of good teeth, no need because of absence of pain* and *no checkup habit* were grouped together as *no perceived need*, which were collectively reported by 53.9% (28 600) students. *No perceived need* was the single most commonly stated reason given for not seeking dental checkup. *Too busy* was a reason given by 40.7% (21 600) of students, and the concern of cost (*too expensive*) was given by 31.1% (16 500) of students.

Figure 4.13
Number and percentage of 12-year old students according to reported reasons for not having regular dental checkup



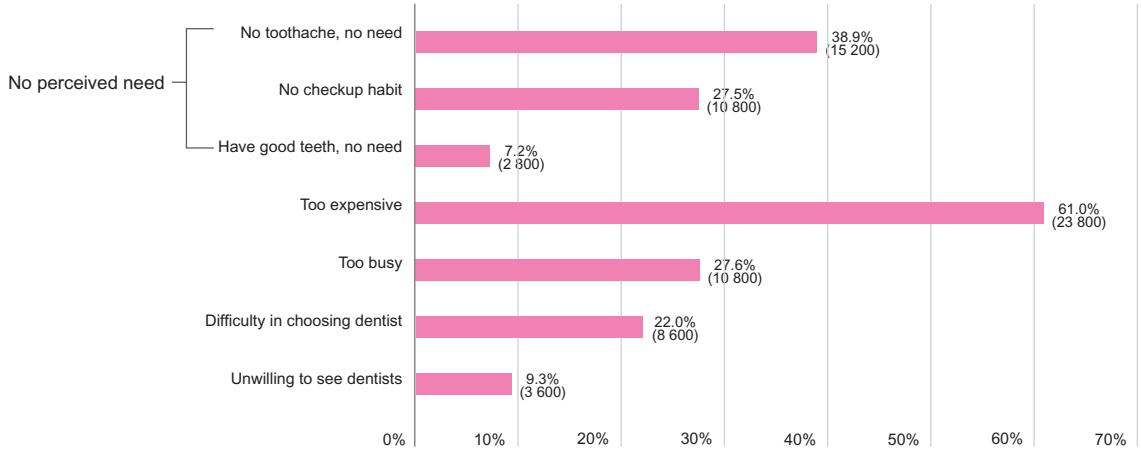
Did the parents intend to bring their children to seek dental checkup?

Only 41.7% of (28 000) parents claimed that they had intentions to bring their children for dental checkup and 58.3% (39 100) indicated that they had no such intentions.

What were the reasons for parents not intending to bring their children to seek dental checkup ?

The reported reasons are listed in Figure 4.14. The most commonly reported reason was *too expensive*, followed by *no perceived need due to the absence of pain, no checkup habit*, and parents *too busy*.

Figure 4.14
Number and percentage of parents according to their reported reasons of not intending to bring the students for dental checkup



Low perceived need was the most common reason given by students and their parents for not seeking oral health care service. The absence of pain, the perceived good health, and the lack of regular checkup habit were related to the low perceived need.

Parents also considered dental checkup for their children too expensive. The survey information was not sufficient to conclude whether the affordability of checkup or the lack of perceived value was the real concern behind the response of *too expensive*.

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

The dental treatment need among 12-year old students as assessed by the survey method is shown in Table 4.4.

Table 4.4
Dental treatment need of 12-year old students as assessed by the survey method

Dental treatment need	Mean number of teeth	Percentage
Filling (1-surface)	0.1	5.5
Filling (2-surface)	0.1	6.2
Pulp treatment	<0.05	0.1
Removal of teeth	<0.05	1.1
Fissure sealant	0.5	30.6
Professional teeth cleaning	N/A	59.5

N/A = not applicable

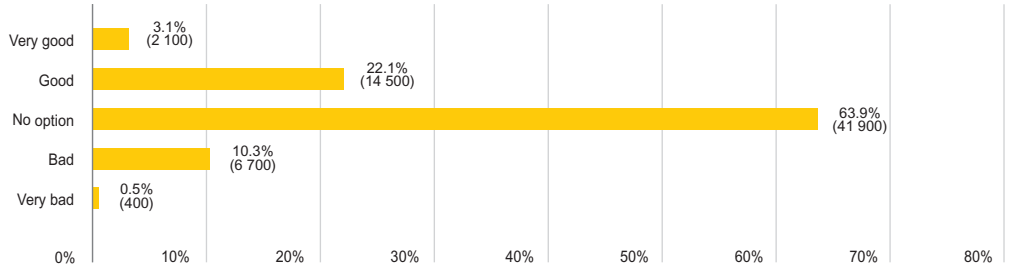
The main type of dental treatment needed was for preventive care. Many students brushed their teeth twice a day. However, the inefficient removal of plaque was reflected by 28.7% of students having visible plaque on more than half of the teeth surfaces and 35% of students having bleeding gums. Instruction on teeth cleaning skills, especially for those having inadequate oral hygiene is required. This can be carried out during regular dental checkup, alongside professional teeth cleaning to remove calculus.

Application of fissure sealant is a scientifically proven, safe, and effective preventive treatment for the prevention of tooth decay, especially for the permanent molar teeth. Such preventive treatment for 12-year olds is especially important as the remaining permanent molars erupt in place.

What was the self-perceived oral health condition of the students?

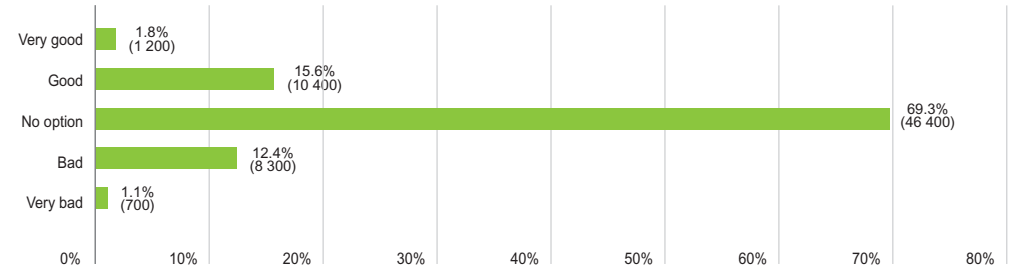
The students were asked how they perceived their own oral health. Their parents were also asked to indicate how they perceived their children's oral health. The results are shown in Figure 4.15 and Figure 4.16. Only 17.4% (11 600) of children perceived their own oral health as *good* or *very good*. More parents (25.2%, 16 600) perceived that their children as having *good* or *very good* oral health. Relatively fewer students 13.5% (9 000) and parents 10.8% (7 100) thought that their oral health status was *bad* or *very bad*. 69.3% (46 400) students and parents 63.9% (41 900) had *no opinion*.

Figure 4.15
Distribution of parents according to their perception of their children's oral health condition



1 700 parents gave no answer

Figure 4.16
Distribution of 12-year old students according to their perception of their own oral health condition



100 students gave no answer

How was the perceived students' oral health status compared to the assessed need?

The assessed need for curative treatment was very low among 12-year old students. However, the need for maintenance care and preventive treatment was high, as 35% of students had bleeding gums and 59.5% of students had calculus deposits. Since many students and their parents thought that they did not need to have regular checkup as their teeth had no problem, they would have missed the opportunity to get the much needed care.

Coverage by parents' dental schemes and the parents' intention to bring the students to seek dental checkup

Only 16% (10 700) of the parents reported that they had dental scheme coverage. Of these dental schemes, 72.1% were dental benefits provided by parents' employers. Other schemes included dental insurance and other types of schemes. Only 14.3% (9 600) students were also covered by their parents' dental schemes.

More of the parents (67.9%) with dental scheme coverage reported the intention to bring their children to seek dental checkup than those (38.9%) whose children had no dental scheme coverage. However, such inference was drawn from a small sub-group of the original sample and must be interpreted with caution.

Coverage by dental schemes was associated with higher intention reported by parents to bring their children to go for dental checkup. It should be noted that expressed intention may not necessarily be put into action. Therefore, the results should be interpreted with caution.

SECTION 4 - SUMMARY

The oral health condition of 12-year old students, in terms of tooth decay level, can be regarded as very good.

No major inadequacy in oral health was found among the 12- year old students in this regard. A relatively small proportion of students were affected by tooth decay. Most of those with tooth decay had only one to two affected teeth, and most of the decayed teeth were filled.

Inadequate teeth cleanliness and calculus deposits were indicators of risk to future disease development.

Very few students were free from visible dental plaque on examination. Gum inflammation as indicated by gum bleeding was found in one-third of the population. Calculus was also found in more than half of this population. The presence of plaque and calculus leads to greater risk of developing tooth decay and gum disease.

Toothbrushing was not effectively performed by most students. One-fourth of the students claimed to use dental floss to remove plaque between the teeth. Many students had calculus deposits and needed professional scaling. Promotion on maintaining teeth cleanliness and attending regular dental checkup need to be reinforced.

Frequent snacking is a risk factor for tooth decay.

Most of the students reported a snacking habit. High frequency of food intake, which is a well-established cause of tooth decay, could be cited by only a few students and parents. Some of them snacked three times or more daily, which is an undesirable habit for maintaining good oral health.

Not many students had regular dental checkup.

Regular dental checkup was mentioned by many students and parents as a method to help prevent tooth decay and gum disease. However, only one in every five students reported such habit.

It was commonly reported that there was no need to have a checkup since there was no toothache. Many students thought that their oral health condition was average or good, but actually, only a small proportion had healthy gums. As early tooth decay and gum disease cannot be detected by the students and parents themselves, regular dental checkup should be promoted.

Survey results indicated that parents were concerned about the cost of dental checkup. This may be interpreted as either the cost of dental checkup was too high and unaffordable, or the cost of checkup had not been perceived as worthy of its value.

Coverage by parents' dental schemes was associated with the relatively higher usage of oral health care services.

More parents were willing to bring their children for regular dental checkup if the children were covered by dental schemes. Similarly, more children who were covered by dental schemes did have regular dental checkup.

SECTION 5

35 to 44-year old adults

Introduction

The 35 to 44-year old age group has been specified by the World Health Organization as the standard monitoring group for health conditions of adults. The full effect of tooth decay, the level of severe gum involvement, and the general effects of oral health care services provided can be monitored using data collected from this age group.

Survey objectives

The objectives of the survey of the 35 to 44-year old adult population were :

1. to assess the oral health status (mainly tooth decay and gum disease status);
2. to collect information on the oral health care behaviour;
3. to collect information on the knowledge on dental diseases;
4. to collect information on attitudes towards oral health; and
5. to collect information on attitudes towards oral health care service.

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 survey on the 35 to 44-year old adults was conducted at the time the Thematic Household Survey of the first quarter in 2001 was in progress.

Thematic Household Survey is carried out by contracting-out mode under the coordination and management of the Census and Statistics Department on a regular basis, to meet the requests from Government policy bureaux and departments for statistical data and information on various social issues. It makes use of the frame of quarters maintained by the Census and Statistics Department as the sampling frame, which covers the land-based non-institutionalized population. Samples of quarters are selected from the frame in accordance with a scientifically designed sampling scheme.

A sub-sample of 35 to 44-year old subjects was selected from the Thematic Household Survey sample using a systematic random sampling method for the Oral Health Survey. The sample size was determined by taking into consideration the precision level, prevalence of gum pocket, sample design effect, anticipated response rate and resources availability.

Data collection method

Data on oral health status were collected by clinical examination performed by a team of dental officers (examiners). The examination procedure and recording criteria were based on the recommendation of the World Health Organization[1]. Clinical examination was performed using portable equipments, either at the home of the selected subject, or at a designated examination center set up by the Department of Health.

Data on personal behaviour, knowledge and attitudes related to oral health and usage of oral health service were collected through structured interview conducted by a team of trained dental surgery assistants.

Training sessions were arranged for both the dental officers and dental surgery assistants to familiarize them with the data collection methods and to calibrate them to ensure consistency. Calibration exercises were arranged once every two weeks during the survey period to ensure consistent performance of all staff involved in data collection.

Enumeration results

A sub-sample of 1 391 adults was selected, and the survey was successfully completed on 375 adults. The response rate was 27%. A follow up survey was performed with the purpose of evaluating the characteristics of the 1 016 non-respondents against the 375 respondents. The follow up survey was conducted on a sample of 80 quarters with eligible residents from the 1 016 subjects who declined to participate initially. Intensive enumeration and response enhancing procedures were applied during the follow up survey. There were 64 adults who responded to the follow up survey.

No significant difference was found in either oral health status or key oral health care behaviour between the respondents and non-respondents. With statistical adjustment and weighting, the final results could be inferred to some 1 354 700 adults aged 35 to 44 in Hong Kong. According to the 2001 Population Census, there were 1 360 500 adults of the same age at the time of survey. Hence, this survey had covered 99.6% of the 35 to 44-year old population in Hong Kong.

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 off.

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 the 35 to 44-year old adults in Hong Kong ?

Teeth status - how many teeth were there ?

None of the adults surveyed had total tooth loss (edentulous). 8.6% (116 500) of the adults had the full complement of 32 permanent teeth. However, it is not the goal of the dental profession for every individual to possess 32 teeth. There is also no optimal number nor minimum acceptable number of teeth agreed by the dental profession. For comparison purpose, 20 teeth has been used as the arbitrary minimum number of teeth for minimum level of function. From this survey, it was found that 99.2% (1 343 800) adults had ≥ 20 teeth. Retained roots, i.e. severely broken down teeth with only the roots left behind, were found in 9.6% (130 000) adults. The results are summarized in Table 5.1. The mean number of teeth present was 28.1. Of the teeth present, a mean of 0.1 tooth was retained root.

Table 5.1
Number and percentage of adults according to various indicators related to teeth status

Teeth status	Number	Percentage
No teeth left (edentulous)	0	0
With ≥ 20 teeth left	1 343 800	99.2
With 32 teeth left	116 500	8.6
With roots left	130 000	9.6

Teeth status - replacement of missing teeth

The proportion of 35 to 44-year old adults with various types of dental prostheses are shown in Table 5.2.

Table 5.2
Number and percentage of adults with dental prostheses

Type of dental prostheses	Number	Percentage
With any type of prostheses	252 000	18.6
With dental bridges	205 500	15.2
With partial dentures	56 900	4.2

Teeth status - what was the level of tooth decay ?

The level of tooth decay among the adult population are shown in Table 5.3. The level of root surface decay is shown in Table 5.4. Almost all adults had tooth decay experience. Most of this experience was manifested as missing teeth (MT). Untreated tooth decay (DT) was found in about a third of the adult population. Root surface decay (DF-root) was found in a small proportion of adults, and majority of the root surface decay was untreated (D-root).

The proportion of adults with root surface decay (Table 5.4) was already included in the proportion of adults with tooth decay (Table 5.3). Hence, it can be said that 10.6% of the adults with tooth decay in fact had root surface decay (3.4% out of 32.0%).

Table 5.3
Level of tooth decay as measured by the DMFT index among adults

	DMFT	DT (decayed)	MT (missing)	FT (filled)
Mean value	7.4	0.7	3.9	2.8
% Among population	97.5	32.0	91.4	66.6

Table 5.4
Level of root surface decay among adults

	DF-root	D-root (decayed)	F-root (filled)
Mean value	0.1	<0.05	<0.05
% Among population	4.2	3.4	1.0

Gum condition as measured by the loss of gum attachment (LOA)

The level of loss of gum attachment among the 35 to 44-year old adults are shown in Table 5.5. About two-thirds of the adults experienced some loss of gum attachment. Moderate to severe loss of gum attachment (≥ 6 mm) affected less than one-fifth of the adult population.

Table 5.5
Loss of gum attachment (LOA) among adults

	≥ 4 mm	≥ 6 mm	≥ 9 mm	≥ 12 mm
Mean number of sextants affected	1.9	0.3	0.1	<0.05
% Among population	67.0	16.8	4.5	1.4

Gum condition as measured by the Community Periodontal Index (CPI)

The gum condition as measured by the CPI can be found in Table 5.6. Only 0.7% (9 500) adults had healthy gums in all the six sextants. On average, calculus deposit was found in more than half of the mouth in every adult. Gum pockets were present in almost half of the adult population, and deep gum pockets were found in 7.1% (96 200) adults.

Table 5.6
Gum condition as measured by the highest CPI score among adults

	Healthy	Bleeding	Calculus	Shallow pocket	Deep pocket
Mean number of sextants affected	0.4	0.9	3.5	1.1	0.1
% Among population	0.7	3.4	49.9	38.9	7.1

As seen from Table 5.5, 67% (907 600) of the adults had loss of gum attachment of ≥ 4mm. Table 5.6 showed that 46% (623 100) of the adults had gum pockets, i.e. a loss of gum attachment of ≥ 4mm. At least 21% (284 500, by subtracting 46% from 67%) of adults had loss of gum attachment not in the form of gum pocket, but in the form of gum recession, as assessed by examining one tooth in each of the six sextants in the mouth.

About one-third of adults had untreated decay. There was a mean of 0.7 tooth with untreated decay among the adults. On average, each adult with untreated decay had more than two teeth that were affected.

Decay on root surfaces which was found in a small proportion of adults were mostly untreated. 3.4% of adults had root surface decay.

Both gum pockets and recession were common. 46% of adults had gum pockets in at least one of their teeth and at least 21% of adults had loss of gum attachment in the form of gum recession resulting in exposed root surfaces.

Tooth loss in the present adult population was not a major problem, but without effective intervention, tooth loss in the future cannot be ruled out. More than 90% of the 35 to 44-year old adult had missing teeth, but each adult still had 28.1 teeth on average. Very few had tooth loss to the extent of having less than 20 teeth present. None of the adults surveyed had total tooth loss. However, 1.4% of adults had at least one tooth with severe loss of gum attachment (≥ 12mm) and 9.6% adults had at least one of their teeth severely broken down with only the roots left. These were stages of tooth decay or gum disease beyond restoration or treatment where the loss of the affected teeth was imminent. Progressive destruction arising from the spectrum of existing tooth decay and gum disease, and the possibility of consequential tooth loss can be prevented with effective intervention.

A small proportion of adults had dental prostheses. Almost one in every five adults had either fixed or removable dental prostheses. As the use of dental prostheses can lead to dental plaque retention, its use justifies special attention on teeth cleaning practices.

What was the experience in oral health problems among the adult population ?

Aside from assessing the level of tooth decay and gum disease in adults, it was also the objective of the Oral Health Survey to have a better understanding of oral health in terms of their perception of well being. Part of the structured interview was designed to investigate their experience of oral health problems, and the care seeking behaviour when oral health problems had been perceived.

How many adults had experienced oral health problems, and what did they do to deal with the problems ?

The proportion of adults who had perceived oral health problems in the previous 12 months are shown in Table 5.7. *Bad breath* was a very common condition reported by three out of every four adults. However, *bad breath* is a complex oral problem that may or may not be directly related to teeth. The most common reported problems that were directly related to teeth were *bleeding gums*, followed by *tooth sensitivity to hot and cold*. Both problems were experienced by more than half of the adults. *Abscess* and *severe* pain were the least reported problems, but they were perceived by around one out of six adults, indicating that those problems were not that uncommon.

The actions taken by the affected adults for the problems perceived are also shown in Table 5.7. For problems that were directly related to teeth, such as *bleeding gums*, *tooth sensitivity to hot and cold* and *mobile teeth*, more than half of the affected adults did not take any action. For non-specific problems like *bad breath* and *dryness of mouth*, more than 75% of the affected adults managed the problems on their own. The seeking of professional advice and care was the least likely course of action. The tendency to seek oral health care was relatively higher in situations like mobile teeth, abscess and severe pain. However, less than half of those affected sought care even for the most severe condition of *pain that disturbed sleep*.

Table 5.7
Perceived oral health problems by adults and the actions taken

Condition	Percentage	Actions taken by the affected adults			
		No action	Self manage	TCM* / Doctor	Dentist
Bad breath	74.3	15.4%	76.2%	4.5%	3.9%
Bleeding gums	59.5	57.2%	36.2%	1.2%	5.4%
Sensitivity to hot or cold	54.5	57.8%	28.0%	0	14.2%
Dryness of mouth on eating	33.1	17.7%	78.9%	2.8%	0.6%
Mobile teeth	23.5	56.3%	10.8%	0.9%	32.0%
Difficulty in chewing	22.4	35.7%	37.5%	3.6%	23.2%
Abscess	17.5	34.7%	28.9%	5.2%	31.2%
Pain that disturbed sleep	15.4	9.2%	35.5%	7.9%	47.4%

* TCM = traditional Chinese medicine practitioner

Some oral health problems that may or may not be directly related to teeth were also apparent, such as mobile teeth, abscess and pain that disturbed sleep.

The affected adults tended to manage the perceived oral health problems by themselves. To seek professional oral health care was the less likely course of action. Less than half of those affected sought care from dentist, even for the most severe condition of pain that disturbed sleep.

What was the impact of the conditions of the teeth, mouth and dental prostheses on the daily life of the adult population ?

The impact of oral conditions on adults' various aspects of daily life was measured by a locally validated set of questions, ie. Oral Health Impact Profile (OHIP-14).

The proportion of adults who responded negative impact on various aspects of daily life are shown in Table 5.8. The two aspects of daily life with the highest reported negative impact were related to eating, but such negative impact was only reported by 6% of the adults. The negative impact on other aspects of daily life in OHIP-14 was even lower.

Table 5.8
Percentage of adults expressing negative impact on aspects of daily life in OHIP-14

Impact on daily life	Percentage
Have had to interrupt meals	6.0
Have found it uncomfortable to eat any food	6.0
Have been a bit embarrassed	2.9
Have had difficulty chewing any food	2.4
Have had trouble pronouncing any words	2.3
Have had sore spots in mouth	1.7
Have been miserable	1.5
Have been worried	1.4
Have felt that there has been less flavour in food	1.4
Have been upset	0.9
Have been unable to work to full capacity	0.4
Have been totally unable to function	0.2
Have avoided going out	0.2
Have had troubles getting along with other people	0.2

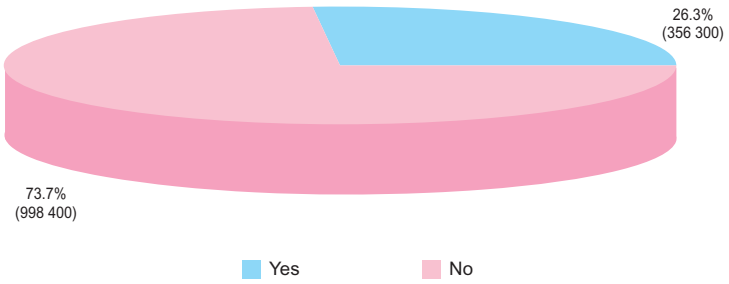
Only 6% of the adult population in Hong Kong expressed negative impact arising from their oral health conditions on eating. Negative impact on other aspects of daily life was even lower. This may have been due to either a true low impact (adults did not perceive functional difficulty arising from their oral health conditions) or the inability to express the negative impact (functional difficulty arising from their oral health conditions was perceived but the adults were not used to expressing such difficulty).

What was the pattern of usage of oral health care services like among the 35 to 44-year old adults ?

How many adults had the habit of seeking regular dental checkup ?

About one-fourth of the adult population reported that they had the habit of seeking dental checkup. (Figure 5.1)

Figure 5.1
Distribution of adults according to habit of regular dental checkup



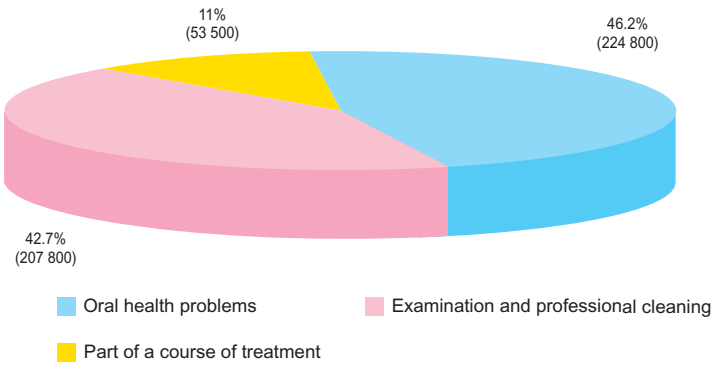
When was the last dental visit made by the adults ?

The time when the adults made their last visit to dentist is shown in Table 5.9. Almost one-third of the adult population had not visited a dentist for at least 3 years. More than one-third had visited a dentist within the past year. Among those who had visited a dentist in the previous 12 months, 46.2% did so because of oral health problems (Figure 5.2) while 42.7% went for oral examination or cleaning.

Table 5.9
Distribution of adults according to time of last dental visit

Time of last dental visit	Number	Percentage
1 year or less	486 100	35.9
1 to 3 years	408 200	30.1
More than 3 years	330 300	24.4
Never visited dentist	110 600	8.2
Could not remember	19 500	1.4

Figure 5.2
Distribution of adults who had visited dentist in the previous year according to the reported reason of visit



Only about a quarter of the adult population reported the habit of regular dental checkup and only about a third had visited the dentist in the previous year. About one-quarter of the adults had not visited a dentist for at least three years, and almost one out of ten adults reported that they had never visited a dentist before.

Most of the dental visits made in the previous year were curative treatment for oral health problems. Oral health problems actually accounted for almost half of the dental visits made. Checkup visits constituted less than half of all visits.

How did the 35 to 44-year old adults practise oral self-care ?

Toothbrushing - how often did the adults brush ?

The toothbrushing habit reported by the adults is shown in Table 5.10. Almost all adults reported the habit of daily toothbrushing.

Table 5.10
Distribution of adults according to toothbrushing habit

Toothbrushing habit	Number	Percentage
Brushed everyday	1 341 600	99.1
Brushed occasionally	3 300	0.2
Never brushed	9 000	0.7

Toothbrushing - what time did the adults usually brush ?

The time of brushing is shown in Figure 5.11. Among those who reported a habit of daily toothbrushing, almost all did so in the morning. Brushing before going to bed was reported by three out of every four adults. Only 0.5% reported brushing after every meal.

Table 5.11
Number and percentage of adults who brushed everyday according to time of toothbrushing

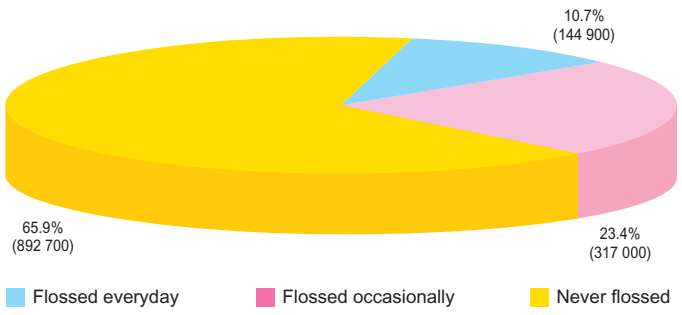
Time of day	Number	Percentage
In the morning	1 330 900	99.2
Before bed	1 012 900	75.5
After dinner	71 100	5.3
After lunch	53 700	4.0
After eating	6 700	0.5

Respondents allowed to choose multiple answers

How many adults flossed as part of interdental cleaning ?

The habit of flossing is shown in Figure 5.3. Only 10.7% of adults reported that they flossed on a daily basis.

Figure 5.3
Distribution of adults according to flossing habit



What were the barriers to those adults who did not floss ?

Those who reported that they had never flossed were asked the reason for not doing so. The reported reasons are shown in Table 5.12. Among those who responded, the most common reason was *don't know how to floss*, followed by *don't want to take the time or trouble to floss*, and *flossing is useless*. This was an indication on the lack of awareness regarding the value of flossing and a lack of personal skill in flossing. The reason for the large proportion who gave *no answer* was not fully known. It might be an indication that a large proportion of adults was actually not aware of such teeth cleaning method.

Table 5.12
Number and percentage of adults who did not floss everyday according to reasons for not doing so

Reasons for not flossing	Number	Percentage
Did not know how to floss	279 400	23.1
Did not want to take time / trouble	229 800	19.0
Considered flossing as useless	99 200	8.2
No time	87 100	7.2
No answer	337 500	27.9

Respondents allowed to choose multiple answers

Virtually all adults reported the habit of daily toothbrushing, and about three out of every four adults brushed twice daily.

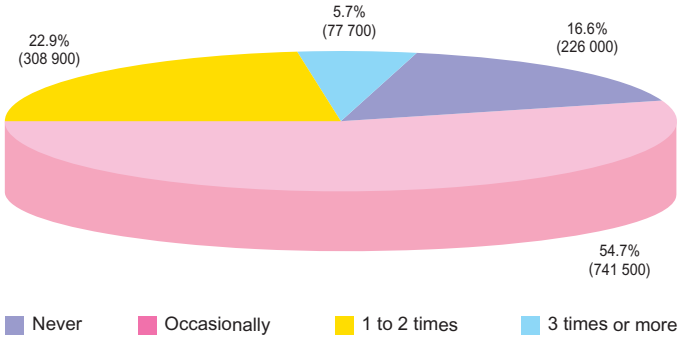
Only one in every ten adults flossed their teeth everyday, and two out of every three adults had never flossed. Among those who provided a reason, the most common reason reported for not flossing was *don't know how to floss*, followed by reluctance to spend time or take the trouble to floss.

What was the dietary pattern in relation to oral health among the 35 to 44-year old adults ?

Snacking habit

Snacking was referred to as any food, snack or drink (except water) intake in between normal meals. The reported snacking habit of the 35 to 44-year old adults is shown in Figure 5.4. The habit of daily snacking was reported by 28.6% of adults, while 5.7% of adults reported three or more snack intake everyday.

Figure 5.4
Distribution of adults according to daily snacking frequency



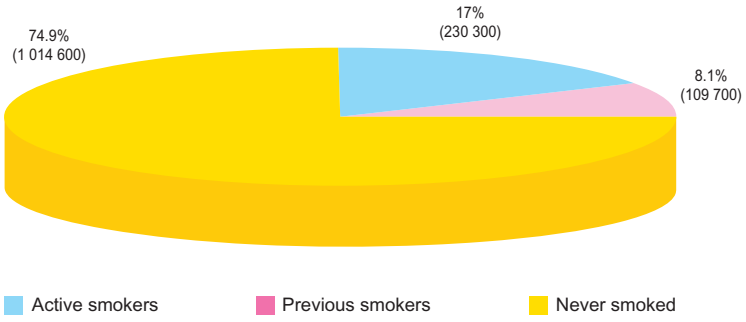
Snacking did not seem to be a major problem among the adult population. Only 5.7% of adults reported snacking three or more times a day. High snacking frequency is considered by the dental profession worldwide as a risk factor in developing tooth decay.

What was the smoking habit among the 35 to 44-year old adults ?

Smoking

The smoking habit of the adults is shown in Figure 5.5. About one in every four adults had experienced smoking. 17% (230 300) were active smokers.

Figure 5.5
Distribution of adults according to smoking habit



Smoking habit was reported by 17% of the adult population.

Summary on oral health status and oral health behaviour

Tooth loss was not a problem in the adult population. However, one-third of adults had untreated tooth decay and almost half of the adults had gum pockets. With only slightly more than a quarter of the adult population who had the habit of regular dental checkup, most of these existing diseases may progress without being noticed by the affected individual. Even when some of these diseases were to progress to a stage to cause discomfort, it was likely that some of the adults would not seek professional care based on the surveyed behaviour. In other words, the observed behaviour was unlikely to prevent further deterioration of the diseases.

The presence of gum recession and exposed root surfaces, abundant calculus deposits, and use of dental prostheses, along with inadequate teeth cleaning practice, low usage of regular dental checkup, were all risk factors to the development of new tooth decay and gum disease and deterioration of existing diseases.

In summary, there were possibilities that adults would have new tooth decay and gum disease, and/or further disease progression leading to tooth loss. However, such prospects should not be too pessimistic if there were opportunities for improvement in the oral health life-style. Tooth loss can be prevented and oral health can be maintained with positive changes in oral health behaviour.

What were the possible explanations to the inadequacies in oral health related behaviour ?

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

The factors leading to tooth decay as perceived by the adult population are shown in Table 5.13. The main factor perceived was *eating too much candies or sweet food*. However, only 1.6% could precisely point out that *frequent intake of food or drinks* was related to tooth decay. The second most commonly cited factor was *improper cleaning of teeth*. Other factors were reported by less than 10% of the adults, and 7.0% replied *don't know*.

Table 5.13
Number and percentage of adults
according to perceived factors leading to tooth decay

Perceived factors	Number	Percentage
Eating too much candies / sweet food *	1 017 000	75.1
Improper cleaning of teeth *	795 200	58.7
Sour food	122 700	9.1
Dental plaque / bacteria *	48 300	3.6
Lack of calcium / nutrients	39 500	2.9
Inherited	36 800	2.7
Poor general health	21 700	1.6
Too frequent food / drink intake *	21 800	1.6
No regular dental checkup *	13 800	1.0
Don't know	94 300	7.0

Respondents allowed to choose multiple answers
* Relevant factors

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

The factors leading to gum disease as perceived by the adult population are shown in Table 5.14. *Improper cleaning of teeth* was the mostly reported factor, followed by *traditional Chinese medicine beliefs* - mainly "reqi" (internal heat 熱氣). *Smoking* was only cited by 1.0% of adults. The adult population were not too certain about the factors leading to gum disease, as illustrated by the higher proportion which replied *don't know*.

Table 5.14
Number and percentage of adults according to perceived factors leading to gum disease

Perceived factors	Number	Percentage
Improper cleaning of teeth *	513 800	37.9
"reqi" / traditional Chinese medicine beliefs	362 900	26.8
Dental plaque / bacteria *	153 600	11.3
Accumulation of calculus	69 800	5.2
Poor general health	60 000	4.4
Lack of vitamin / nutrients	39 800	2.9
No regular dental checkup *	36 900	2.7
Smoking *	13 400	1.0
Don't know	332 000	24.5

Respondents allowed to choose multiple answers
* Relevant factors

What did the adults know about prevention of tooth decay ?

When asked what could be done to prevent tooth decay, the adults considered *proper cleaning of teeth* as the most important measure. Other methods are listed in Table 5.15. Although eating *too much candies or sweet food* was the most commonly given factor leading to tooth decay (75.1% in Table 5.13), *reduce consumption of candies or sweet food* was only reported by 23.5% as a measure to prevent tooth decay. *Seek regular dental checkup* was reported by 15.2% of adults. Only a very small proportion of adults (1.7%) mentioned *reduce frequency of food/drink intake*, while 6.9% replied *don't know* to this question.

Table 5.15
Number and percentage of adults according to perceived methods to prevent tooth decay

Perceived metheds	Number	Percentage
Proper cleaning of teeth *	1 132 300	83.6
Reduce consumption of candies/sweet food *	317 900	23.5
Seek regular dental checkup *	205 600	15.2
Rinsing with water / salt water	192 600	14.2
Use commercial mouth wash	109 000	8.0
Take calcium / nutrients supplement	53 800	4.0
Avoid certain food	50 200	3.7
Reduce sour food	39 500	2.9
Reduce frequency of food / drink intake *	23 000	1.7
Don't know	93 100	6.9

Respondents allowed to choose multiple answers
* Relevant factors

What did the adults know about prevention of gum disease ?

The mostly cited way to prevent gum disease was *proper cleaning of teeth*, followed by *avoidance of certain food*. Other methods reported are listed in Table 5.16. 14.5% (195 800) of adults cited *regular dental checkup* and very few (1.1%) mentioned *avoid smoking*. The uncertainty of the adult population about gum disease was again illustrated by the relatively high proportion (33.1%) who replied *don't know* to this question. A host of other methods were also suggested, albeit by a small proportion of adults, on ways to prevent gum disease. Methods like *taking Chinese medicine or herbal tea, eating nutritious food (vitamin supplements, fruits)*, and *have good rest* were more related to the traditional Chinese medicine beliefs. The actual use and benefits of commercial mouthwashes may need attention, as the public may have received an inappropriate message that using mouthwash alone was effective in preventing dental disease.

Table 5.16
Number and percentage of adults according to perceived methods to prevent gum disease

Perceived methods	Number	Percentage
Proper cleaning of teeth *	554 100	40.9
Seek regular dental checkup *	195 800	14.5
Avoidance of certain food	142 700	10.5
Rinsing with water / salt water	79 300	5.9
Use commercial mouthwashes	75 200	5.6
Taking Chinese medicine / herbal tea	74.300	5.5
Nutrition, vitamin supplements, fruits	45 600	3.4
Have good rest	34 000	2.5
Avoid smoking *	15 000	1.1
Don't know	448 200	33.1

Respondents allowed to choose multiple answers
* Relevant factors

There were more adults who were not certain about gum disease than about tooth decay. More adults replied *don't know* to the factors leading to gum disease and the preventive methods than to those of tooth decay. Traditional Chinese medicine beliefs were commonly referred to for gum disease.

***Proper cleaning of teeth* was the main preventive method for both tooth decay and gum disease as cited by the adults.** Only very few could point out *dental plaque* or *bacteria* as the causative agent and the removal of dental plaque as a preventive method. It was very likely that the adults did not have the knowledge that the purpose of brushing is to remove dental plaque. Also very few pointed out the importance of flossing. With respect to snacking, three-quarters of adults mentioned *eating too much candies or sweet food* as a factor leading to tooth decay. It was not clear what context the adults referred to in this reported factor. As only 1.6% pointed out that *frequent intake of food or drinks* as a relevant factor, it was probable that the meaning of *too much* by adults was "quantity" rather than *frequency of intake*. Besides, most adults mentioned *candies and sweet food* as related to tooth decay. There seemed to be a lack of awareness that any sugar-containing food or drinks consumed outside normal meal are risk factors for tooth decay.

Some other factors considered as important by the dental profession, such as *regular dental checkup* and *smoking* were rarely mentioned by the adults in relation to tooth decay and gum disease.

Toothbrushing - as perceived by the adults, what were the most effective ways to brush their teeth ?

The adults were asked to indicate what they thought were the most effective ways to brush their teeth. The results are shown in Table 5.17. The most commonly reported answer was the brushing methods acquired from non-professional sources (e.g. acquired from family during childhood) or professional messages not delivered on a personal basis (e.g. posters, pamphlets, video demonstration). Only 19.8% of adults perceived that the most effective way to brush their teeth were to follow *personal instruction given by dental professionals*.

Table 5.17
Number and percentage of adults according to perceived effective toothbrushing method

Perceived effective toothbrushing method	Number	Percentage
Methods from non-professional / non-personal sources	788 900	58.8
Personal instruction by dental professionals	265 600	19.8
Brush longer time / harder	119 400	8.9
Use toothpaste	85 900	6.4
Use electric / special design toothbrush	37 600	2.8
Don't know	88 500	6.6

Respondents allowed to choose multiple answers

Proper teeth cleaning was the most commonly reported method to prevent tooth decay and gum disease. As perceived by the adults, the most effective toothbrushing method was derived from non-professional sources (e.g. acquired from family during childhood) or professional messages not delivered on a personal basis (e.g. posters, pamphlets, video demonstration). Without proper instruction and reinforcement, people practising teeth cleaning might not be able to recognize the inadequacies in their teeth cleaning practices.

What were the reasons for not seeking regular dental checkup ?

The reasons for not seeking regular dental checkup were sought from the 998 400 adults who did not have this habit. The results are shown in Table 5.18. The most commonly reported reason was *no perceived need* due to their perception of having good teeth and also to absence of pain. The second most commonly reported reason was *no time* / *could not get off work*, followed by *uncertainty of cost* / *worry of high cost*. Some were not aware or had never thought about dental checkup. A small proportion of adults felt that they had some oral health problems but did not perceive the need for checkup.

Table 5.18
Number and percentage of adults who did not seek regular dental checkup according to the reported reasons for not doing so

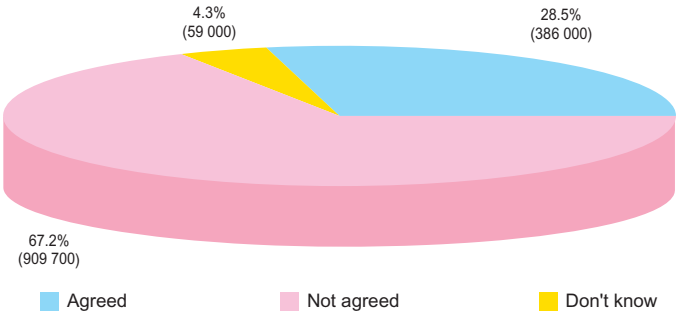
Reasons	Number	Percentage
Teeth were good / no pain / no need	292 500	29.3
No time, could not get off work	275 600	27.6
Uncertainty of cost / worry of high cost	193 700	19.4
Did not know / never thought about checkup	144 800	14.5
Did not know how to find dentist	38 900	3.9
Teeth had minor problems only, no need	36 900	3.7

Respondents allowed to choose multiple answers

Perceived benefit and worthiness of regular dental checkup

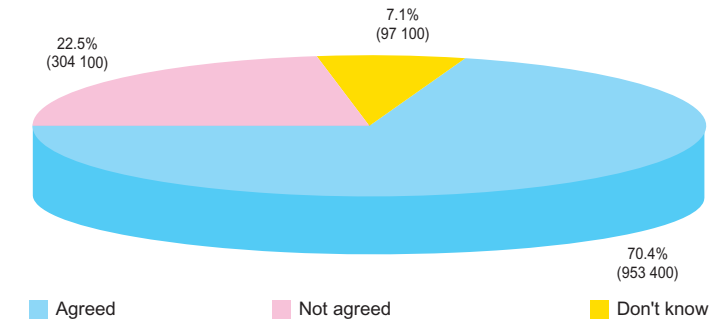
The perceived benefit of regular dental checkup was inferred by the agreement to the statement *teeth will be fine even without regular checkup*, and the results are shown in Figure 5.6. Majority of the adults disagreed, but more than one-fourth did not perceive any benefit from regular dental checkup.

Figure 5.6
Distribution of adults according to agreement that *teeth will be fine without regular checkup*



As shown in Figure 5.7, majority of the adults agreed that *it is worthy to spend money on regular dental checkup*, but then again about one-fourth disagreed with the statement.

Figure 5.7
Distribution of adults according to agreement that *it is worthy to spend money on regular dental checkup*



No perceived need was the reason provided by almost a third of adults for not seeking regular dental checkup. The perception of no need was due to the self-perceived good teeth and also to absence of pain.

There were conflicting attitudes concerning regular dental checkup. More than two-thirds of the adults perceived that regular dental checkup may help to keep their teeth fine and it was worthy to spend money on dental checkup. This should be an indication that some kind of need and value regarding dental checkup had been perceived by around two-thirds of the adults. However, only one out of every four adults sought regular dental checkup. Among some of the adults with perceived need for regular dental checkup, there were barriers to the transformation of perceived need into demand.

How was the adults' perceived need for dental treatment as compared to the need assessed by the survey method ?

The treatment need perceived by the adult population was compared to the assessed need based on the survey method in Table 5.19. Generally speaking, the perceived need was lower than the assessed need. The disparity was especially noted in preventive treatment such as oral hygiene instruction and scaling.

Table 5.19
Dental treatment need perceived by the adults compared with the assessed need based on the survey method

Dental treatment need	Perceived	Assessed
Oral hygiene instruction	2.6%	99.3%
Scaling	18.4%	95.9%
Tooth filling	22.5%	27.4%
Tooth extraction	5.5%	11.9%
Dental prostheses	7.8%	8.2%
Advanced periodontal treatment	3.8%	7.1%
Dental pulp care	2.5%	1.6%
Crown fabrication	1.2%	1.0%

The treatment need perceived by the adults was found to be lower than the assessed need. Low perceived need was the main reason given for not seeking regular dental checkup. The problem was that some of the treatment need assessed using the survey methods had not been perceived by the adults, especially the need for preventive treatment.

In the structured interview, a set of hypothetical tooth decay situations were presented to the adults, and they were asked to propose their course of action when confronted with such situations. The purpose was to study the considerations in adults' proposed actions under different tooth decay situations, and to investigate if there were any difference in the management of problems of front teeth or back teeth, and when the problems were associated with pain or not .

What would the adults do in case of tooth decay problems ?

The proposed actions of the adults under the various tooth decay situations are summarized in Table 5.20.

Table 5.20
Proposed actions of the adults under various tooth decay situations

	Front teeth	Back teeth
Decayed with no pain	27.0% no action	41.2% no action
	0.2% self manage	0.4% self manage
	3.9% seek removal of tooth	3.2% seek removal of tooth
	67.2% see dentist	53.7% see dentist
	0.6% see medical doctor	0.6% see medical doctor
	1.1% could not decide	0.9% could not decide
Decayed with pain	0.7% no action	1.1% no action
	3.1% self manage	4.0% self manage
	11.5% seek removal of tooth	14.6% seek removal of tooth
	82.6% see dentist	78.4% see dentist
	1.7% see medical doctor	1.7% see medical doctor
	0.4% could not decide	0.2% could not decide

Under the hypothetical tooth decay situations, majority of the adults proposed to see dentist and very few proposed self-management. The proposed actions were not consistent with the actual behavior reported in the previous experience of other oral health problems, where majority of the adults tended to manage the problems by themselves and relatively few sought professional care (Table 5.7).

The proposed actions under hypothetical situations were not consistent with the actual behaviour reported when problems had been perceived. Majority of the adults proposed to see dentist in all hypothetical situations, whereas in their previous experience with oral health problems, majority of them tended to manage the problems by themselves.

The value of the front teeth was higher than the back teeth. More adults would take action for the front teeth even if there was no pain, and fewer adults considered taking the front teeth out if there was pain.

Pain was an important determining factor in taking action. It was observed that 27% to 41.2% of adults would not take action if there was no pain, even if decay was apparent.

The removal of the offending tooth was an expedient solution among a small proportion of the adults. About 3.2% to 3.9% would seek removal of a decayed tooth even if there was no pain, and 11.5% to 14.6% indicated the same action if there was associated pain.

What were the reasons for not proposing to seek oral health care services in hypothetical situations ?

The reasons given by the adults for not seeking care in hypothetical tooth decay situations are listed in Table 5.21. Irrespective of the presence of pain, the main reason given was that *the condition would relieve by itself*. When there was pain, the proportion of adults that did not see dentist because of *worry about the cost of care* increased significantly.

Table 5.21
Proportion of adults who did not propose to seek care in hypothetical tooth decay situations according to reasons for not doing so

Reasons	No pain	Pain
Minor problem will relief by itself	60.8%	36.8%
Uncertainty of cost / worry of high cost	13.6%	30.1%
No time / could not get off from work	14.3%	16.9%
Fear of pain	5.5%	3.8%
Fear (could not specify)	3.3%	6.9%
Don't know how to find dentist	1.4%	3.4%

Respondents allowed to choose multiple answers

Tooth decay and pain had been perceived as minor problems which could be relieved by itself. There was also an apparent lack of knowledge that both tooth decay was progressively destructive, and the fact that pain usually followed at a very late stage.

There were barriers to seeking oral health care service. Similar to the reasons reported for not seeking regular dental checkup, some of the reasons were related to the oral health care service. These included the *uncertainty of cost / worry of high cost, no time and could not get off work*.

What were the attitudes of the adult population towards oral health care services ?

The attitudes of the adults towards oral health care services were evaluated by their agreement to a series of statements / questions related to oral health services. The results are shown in Table 5.22. Quite a substantial number of adults replied *don't know* to some of the questions. The proportion of adults answering *don't know* ranged from 1.9% to 14.1% (25 400 to 191 600) among all adults. The adults might have replied *don't know* simply because they did not understand the question, or they had no knowledge whatsoever.

Table 5.22
Attitudes of adults towards oral health care services

Statements / questions	Responses	Number of adults	Percentage
Do you agree that dentists can solve your oral health problems ?	Yes	1 283 800	97.8
	No	29 300	2.2
	41 600 replied don't know		
Dentists are more concerned on treatment than to teach people how to prevent dental diseases.	Agree	687 300	52.9
	Disagree	612 400	47.1
	55 000 replied don't known		
Do you think dentists will perform treatment for you that is unnecessary?	Yes	352 400	27.9
	No	910 800	72.1
	91 500 replied don't know		
Visiting a dentist must be painful and uncomfortable?	Agree	638 800	49.2
	Disagree	659 700	50.8
	56 100 replied don't know		
Are you worried about contracting contagious diseases from dentists' equipment?	Yes	533 800	40.2
	No	795 500	59.8
	25 400 replied don't know		
The dentists' fees are worthy of the value.	Agree	561 700	48.3
	Disagree	601 300	51.7
	191 600 replied don't know		

Generally speaking, the adult population had confidence in the dental profession. The adult population had confidence in the dentists' technical ability to solve their oral health problems. As to the issue of unnecessary treatment, majority of the adults also had confidence in dentists.

The dental profession should take note of the views of a minority from this group. There were conflicting views on aspects like clinic hygiene standard, and the possibility of pain and discomfort associated with dental visit. As to the worry of unnecessary treatment, it was still a significant revelation when 27.9% of adults had this concern. Such perceptions and attitudes are not to be interpreted as the presence of such phenomenon among the dental profession. Yet, these attitudes are viewed as potent barriers to the use of oral health care services.

Almost half of the adults disagreed to the statement that dentists' *fees are worthy of the value*. The problem might be due to the inability of the adults to appreciate the worth of the dentists' fees, or perhaps they had simply considered that dentists' fees as too high.

What was the perceived cost for dental visit ?

The *uncertainty of cost* / *worry of high cost* was one of the factors given for not visiting the dentist. To evaluate the perceived cost of dental visit, the adults were asked to estimate the cost for a dental checkup plus professional tooth cleaning (scaling). 6.5% (88 100) adults could not give an estimate. Among those who could estimate the cost, the 25th percentile was HK$250, the median was HK$300, and the 75th percentile was HK$500.

Dental schemes and the usage of oral health care services

The proportion of adults with coverage by dental schemes is shown in Table 5.23. 14.1% (191 200) of adults reported being covered by dental schemes. More than three quarters of such schemes were provided by employers.

Table 5.23
Distribution of adults according to coverage by dental schemes

Types of dental schemes	Number	Percentage
No coverage	1 163 300	85.9
Employer provided dental benefits (public service)	80 800	6.0
Employer provided dental benefits (private service)	74 700	5.5
Dental benefits provided by credit card company	19 200	1.4
Self-purchased dental insurance	13 600	1.0
Self-purchased medical insurance (with dental)	2 900	0.2

The usage of oral health care services based on the dental schemes is shown in Table 5.24. The proportion who reported the habit of regular dental checkup and the proportion who reported dental visit within the previous 12 months were significantly higher in the group of adults with dental scheme coverage. Furthermore, there was a higher proportion among adults with such coverage to have visited the dentist for checkup in the previous 12 months.

Table 5.24
Use of oral health care services by adults and dental scheme coverage

Behaviour	Covered	Not covered
Regular dental checkup	65.8%	19.6%
Visited dentist within previous 12 months	68.1%	31.4%
Visited in previous 12 months for checkup	61.3%	35.2%

Coverage by dental schemes was found to be associated with a more favourable pattern on the usage of oral health care services. However, this was not sufficient to suggest that dental schemes led to better use of oral health care services. It could well be, that such schemes might have enhanced regular dental checkup by removing part of the financial barriers, or removing the uncertainty on cost. Despite the coverage by dental schemes, around one-third of the adults did not seek regular dental checkup nor visited a dentist in the previous 12 months.

What were the attitudes of 35 to 44-year old adults towards tooth loss ?

The adults were asked whether they agreed to the statement *tooth loss is a part of aging*. The results are shown in Table 5.25. Although the majority disagreed with the statement, which was a favourable response, there were 41.2% who agreed to the statement, which was a cause for concern.

Table 5.25
Distribution of adults according to agreement that *tooth loss is a part of aging*

Agreement to the statement	Number	Percentage
Agree	558 700	41.2
Disagree	754 800	55.7
Don't know	41 200	3.0

SECTION 5 - SUMMARY

Tooth loss was not a major problem for the adult population, but there was still the risk of further tooth loss in the future.

There were existing tooth decay and gum disease, and there were also risk factors for the development of new tooth decay and gum disease. The observed oral health behaviour, both in terms of self-care and the use of professional oral health care, was not favourable to maintaining a healthier level of oral health.

Inadequate oral health behaviour may likely be related to the inadequate knowledge on tooth decay and gum disease, barriers to oral health care services, and attitude regarding tooth loss and oral health.

Proper teeth cleaning had been perceived as an important preventive method for both diseases, and yet there was an apparent lack of awareness that proper interdental cleaning is complimentary to toothbrushing, and an apparent lack of knowledge that teeth cleaning might have been inadequate without reinforcement. Other important factors like dental plaque, frequency of snacking and smoking were less familiar among the adults.

The low proportion of adults who mentioned *regular dental checkup* in the preventive methods, may be one of the factors to the low usage of oral health care services. However, the higher proportion of disagreement to the statements *teeth will be fine even without regular dental checkup* and *it is worthy to spend money on regular dental checkup* indicated that there might be other factors behind the expressed low perceived need for dental checkup.

It was found that the adult population had confidence in the dental profession as a whole. However, there were varying perceptions, despite reported by a relatively smaller proportion which is worth taking note of. Such perceptions included *dentists are more concerned with treatment than to teach people how to prevent dental diseases, dentists may perform treatment that is unnecessary, visiting a dentist must be painful,* and the *worry of contracting diseases from dentists' equipments*. About half of the adults did not agree that *dentists' fees as worthy of the value*. The cited median cost of a dental checkup and professional cleaning was estimated to be $300. It was not conclusive as to whether this had been considered as too costly or the services had not been considered as worthy of this value.

The coverage by dental schemes was found to be associated with relatively better usage of oral health care services. Even so, about one-third of the adults with dental scheme coverage did not seek oral health care service. The proper use of

oral health care services might have been influenced by a host of other factors and barriers. Findings from the current survey was not sufficient to provide a clearer understanding of the matter.

Tooth loss was considered by almost half of the adult population as part of aging.

This may be the biggest challenge to attaining desirable behavioural change. The value of teeth and oral health in the minds of 35 to 44-year old adult is difficult to evaluate. Findings from this survey suggested that teeth were not seen as a priority issue by some of the adult population. In one of the hypothetical tooth decay situations raised when there was decay with no pain, 27% of adults would not take action for the front teeth and 41% of them would not take action for the back teeth. Around 3% to 4% of adults would seek removal of teeth directly. The proportion who indicated removal of teeth rose to 11.5% and 14.6% for front teeth and back teeth, respectively, if there was associated pain. There were apparent risks of more tooth loss in the future for the adult population, and such loss may be prevented. To motivate the adult population to act early to prevent tooth loss, the population has to be convinced first that the possibility of tooth loss at old age can be minimized.

SECTION 6

65 to 74-year old non-institutionalized older persons (NOP)

Introduction

The 65 to 74-year old older persons group has become a focus for attention as Hong Kong's population continues to age. The growing longer life expectancy and low mortality rates have contributed to this population-aging phenomenon. It is expected that one in every five of our population will be aged 65 or above by 2029[3].

The World Health Organization has recommended that both active and housebound older persons of this age group must be included. Housebound older persons has been defined as older persons living in residential care homes in the local context, and a separate survey has been performed on the institutionalized older persons which will be presented in Section 7.

Survey objectives

The objectives of the survey of the 65 to 74-year old NOP were :

1. to assess the oral health status (mainly tooth decay and gum disease status);
2. to collect information on the oral health care behaviour;
3. to collect information on the knowledge on dental diseases;
4. to collect information on attitudes towards oral health; and
5. to collect information on attitudes towards oral health care service.

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 survey on the 65 to 74-year old NOP group was conducted at the time the Thematic Household Survey of the first quarter in 2001 was in progress.

Thematic Household Survey is carried out by contracting out mode under the coordination and management of the Census and Statistics Department on a regular basis, to meet the requests from Government policy bureaux and departments for statistical data and information on various social issues. It makes use of the frame of quarters maintained by the Census and Statistics Department as the sampling frame, which covers the land-based non-institutionalized population. Samples of quarters are selected from the frame in accordance with a scientifically designed sampling scheme.

A sub-sample of 65 to 74-year old subjects was selected from the Thematic Household Survey sample using a systematic random sampling method for the Oral Health Survey. The sample size was determined by taking into consideration the precision level, prevalence of gum pocket, sample design effect, anticipated response rate and resources availability.

Data collection method

Data on oral health status was collected by clinical examination performed by a team of dental officers (examiners). The examination procedure and recording criteria were based on the recommendation of the World Health Organization[1]. Clinical examination was performed using portable equipments, either at the home of the selected subject, or at a designated examination center set up by the Department of Health.

Data on personal behaviour, knowledge and attitudes related to oral health and usage of oral health service were collected through structured interview conducted by a team of trained dental surgery assistants.

Training sessions were arranged for both the dental officers and dental surgery assistants to familiarize them with the data collection methods and to calibrate them to ensure consistency. Calibration exercises were arranged once every two weeks during the survey period to ensure consistent performance of all staff involved in data collection.

Enumeration results

A sub-sample of 1 069 NOP was selected, and the survey was successfully completed on 316 NOP. The response rate was 29.6%. A follow up survey was performed with the purpose of evaluating the characteristics of the 753 non-respondents against the 316 respondents. The follow up survey was conducted on a sample of 80 quarters with eligible residents from the 753 subjects who declined to participate initially. Intensive enumeration and response enhancing procedures were applied during the follow up survey. There were 59 NOP who responded to the follow up survey.

No significant difference was found in either oral health status or key oral health care behaviour between the respondents and non-respondents. With statistical adjustment and weighting, the final results could be inferred to some 445 500 NOP aged 65 to 74 in Hong Kong. There were 458 300 older persons aged 65 to 74, including older persons in hospitals, residential care homes and correctional institutions, at the time of survey according to the 2001 Population Census. The number of 65 to 74-year old NOP residents in Hong Kong was not precisely known.

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 off.

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 the 65 to 74-year NOP in Hong Kong?

Teeth status - how many teeth were there?

Only 1.9% (8 500) NOP had the full complement of 32 permanent teeth. However, it is not the goal of the dental profession for every individual to possess 32 teeth. There is also no optimal number nor minimum acceptable number of teeth agreed by the dental profession. For comparison purpose, 20 teeth has been used as the arbitrary minimum number of teeth for minimum level of function. From this survey, it was found that 49.7% (221 400) NOP had ≥ 20 teeth. 8.6% (38 300) NOP had no teeth at all (edentulous). Retained roots, i.e. severely broken down teeth with only the roots left behind, were found in 30.2% (134 500) NOP. The results are summarized in Table 6.1. The mean number of teeth present was 17. Among the teeth present, a mean of 0.6 tooth was retained root.

Table 6.1
Number and percentage of NOP according to various indicators related to teeth status

Teeth status	Number	Percentage
No teeth left (edentulous)	38 300	8.6
With ≥ 20 teeth left	221 400	49.7
With 32 teeth left	8 500	1.9
With roots left	134 500	30.2

Teeth status - replacement of missing teeth

Two-thirds of the NOP had dental prostheses. The proportion of NOP with various types of dental prostheses are shown in Table 6.2.

Table 6.2
Number and percentage of NOP with dental prostheses

Type of dental prostheses	Number	Percentage
With any type of prostheses	303 500	68.1
With dental bridges	134 400	30.2
With partial dentures	149 500	33.6
With full dentures	88 100	19.8

Teeth status - what was the level of tooth decay?

The level of tooth decay among the NOP population are shown in Table 6.3. The level of root surface decay is shown in Table 6.4. Virtually all NOP had tooth decay experience. A large proportion of this experience was manifested as tooth loss (MT). Untreated decay (DT) was found in more than half of the NOP population. Decay on root surfaces (DF-root) was found in almost a quarter of the NOP, and almost all of the decay on root surfaces were untreated (D-root).

The proportion of NOP with root surface decay (Table 6.4) was already included in the proportion of NOP with tooth decay (Table 6.3). Hence, it can be said that 40.6% of the NOP with untreated tooth decay in fact had root surface decay (21.5% out of 52.9%).

Table 6.3
Level of tooth decay as measured by the DMFT index among NOP

	DMFT	DT (decayed)	MT (missing)	FT (filled)
Mean value	17.6	1.3	15.1	1.2
% Among population	99.4	52.9	98.1	40.3

Table 6.4
Level of root surface decay among NOP

	DF-root	D-root (decayed)	F-root (filled)
Mean value	0.4	0.3	<0.05
% Among population	22.6	21.5	3.1

Gum condition as measured by the loss of gum attachment (LOA)

The level of loss of gum attachment among the NOP population are shown in Table 6.5. Around nine out of every ten NOP had experienced some loss of gum attachment and more than half of them had moderate to severe loss of gum attachment (≥ 6 mm).

Table 6.5
Loss of gum attachment (LOA) among NOP

	≥ 4 mm	≥ 6 mm	≥ 9 mm	≥ 12 mm
Mean number of sextants affected	2.7	1.0	0.2	0.1
% Among population	91.7	51.8	15.5	4.8

19.5% (86 800) NOP, and 1.5 sextants were excluded due to insufficient number of teeth present or unable to be examined according to the criteria.

Gum condition as measured by the Community Periodontal Index (CPI)

The gum condition as measured by the CPI can be found in Table 6.6. None of the 65 to 74-year old NOP surveyed had healthy gums in all the sextants examined. Gum pockets were present in more than half of the NOP population, and deep gum pockets were found in 11% (39 000) NOP.

Table 6.6
Gum condition as measured by the highest CPI score among NOP

	Healthy	Bleeding	Calculus	Shallow pocket	Deep pocket
Mean number of sextants affected	0.1	0.2	2.9	1.2	0.1
% Among population	0	1.7	43.0	44.3	11.0

19.5% (86 800) NOP, and 1.5 sextants were excluded due to insufficient number of teeth present or unable to be examined according to the criteria.

As seen from Table 6.5, 91.7% (328 800) had loss of gum attachment of ≥ 4mm. Table 6.6 showed that 55.3% (198 300) had gum pockets, i.e. a loss of gum attachment of ≥ 4mm. At least 36.4% (130 500) (by subtracting 55.3% from 91.7%) had loss of gum attachment not in the form of gum pocket, but in the form of gum recession, as assessed by examining one tooth in each of the six sextants in the mouth.

More than half of the NOP had untreated decay. Among them, 40.6% had decay on root surfaces. With only an average of 17 teeth remaining among the NOP, 1.3 teeth were affected by untreated decay, and of these, 0.6 tooth was severely broken down with only the root left. Tooth decay was a genuine threat to the NOP population. The problem of decay on root surfaces was also significant as most of these were untreated.

Both gum pockets and gum recession were common. About half of the NOP population had lost half of the total gum attachment (≥ 6mm) on at least one of the remaining teeth. Severe loss of gum attachment (≥ 9mm) was found in 15.5% of NOP. Gum pockets were found in more than half of the NOP.

Tooth loss was a problem and there was risk of more tooth loss in the future. Half of the NOP population had lost their teeth to the extent of having less than 20 teeth remaining. Almost one in every ten NOP had no teeth at all. With the prevailing loss of gum attachment and decay on root surfaces, the loss of more affected teeth is highly probable.

Around two-thirds of NOP had dental prostheses. As the use of dental prostheses can lead to dental plaque retention, its use justifies special attention on teeth cleaning practices.

What was the experience in oral health problems among the NOP population?

Aside from assessing the level of tooth decay and gum disease in NOP, it was also the objective of the Oral Health Survey to have a better understanding of oral health in terms of their perception of well being. Part of the structured interview was designed to investigate their experience of oral health problems, and the care seeking behaviour when oral health problems had been perceived.

How many NOP had experienced oral health problems, and what did they do to deal with the problems?

The percentage of NOP who had perceived oral health problems in the previous 12 months is shown in Table 6.7. *Bad breath* was the mostly reported problem. However, *bad breath* is a complex oral problem that may or may not be directly related to teeth. The most common problems reported that were directly related to teeth was *mobile teeth*, followed by *tooth sensitivity to hot and cold*. *Abscess* and *severe pain* were the least reported problems, but they were perceived by around one out of seven NOP, which showed that these problems were not that uncommon.

The actions taken by the affected NOP for the problems perceived are also shown in Table 6.7. For problems that were directly related to teeth, such as *mobile teeth* and *tooth sensitivity to hot and cold*, more than half of the affected NOP did not take any action. For non-specific problems like *bad breath* and *dryness of mouth*, around seven in ten of the affected NOP managed the problems on their own. The seeking of professional advice and care was the least likely course of action. However, less than half of those affected sought care even for the most severe condition which was *pain that disturbed sleep*.

Table 6.7
Perceived oral health problems by NOP and the actions taken

Condition	Percentage	Actions taken by the affected NOP			
		No action	Self manage	TCM* / Doctor	Dentist
Bad breath	59.7	25.6%	69.3%	3.7%	1.3%
Mobile teeth #	42.4	63.9%	10.2%	0.7%	25.1%
Sensitivity to hot or cold #	40.9	51.2%	37.2%	2.0%	9.6%
Dryness of mouth on eating	36.8	23.0%	73.1%	3.0%	0.8%
Difficulty in chewing	35.2	41.0%	42.8%	1.7%	14.5%
Bleeding gums #	28.6	46.4%	43.5%	4.0%	6.1%
Pain that disturbed sleep	14.7	15.0%	37.4%	7.5%	40.1%
Abscess	13.0	34.6%	30.7%	11.0%	23.6%

* TCM = traditional Chinese medicine practitioner
# Conditions affecting remaining teeth

Bad breath was perceived by 59.7% of NOP, and other oral health problems were also reported by less than half of the NOP, such as mobile teeth, abscess and pain that disturbed sleep.

The affected NOP tended to manage the problems by themselves. To seek professional oral health care was the least likely course of action. Less than half of those affected sought care, even for the most severe condition which was *pain that disturbed sleep*.

What was the impact of the conditions of the teeth, mouth and dental prostheses on the daily life of the NOP population?

The impact of oral conditions on NOP's various aspects of daily life was measured by a locally validated set of questions, ie. Oral Health Impact Profile (OHIP-14).

The proportion of NOP who responded negative impact on various aspects of daily life are shown in Table 6.8. The three aspects of daily life with the highest reported negative impact were all related to eating, and such negative impact was reported by around 12% to 18% of NOP. The negative impact on other aspects of daily life in OHIP-14 was even lower.

Table 6.8
Percentage of NOP expressing negative impact on aspects of daily life in OHIP-14

Impact on daily life	Percentage
Have found it uncomfortable to eat any food	18.2
Have had difficulty chewing any food	18.1
Have felt that there has been less flavour in food	11.7
Have had trouble pronouncing any words	8.4
Have had to interrupt meals	5.9
Have been a bit embarrassed	5.3
Have been miserable	5.3
Have been worried	4.2
Have had sore spots in mouth	3.8
Have been upset	3.3
Have had troubles getting along with other people	1.7
Have been unable to work to full capacity	1.6
Have avoided going out	1.6
Have been totally unable to function	0.8

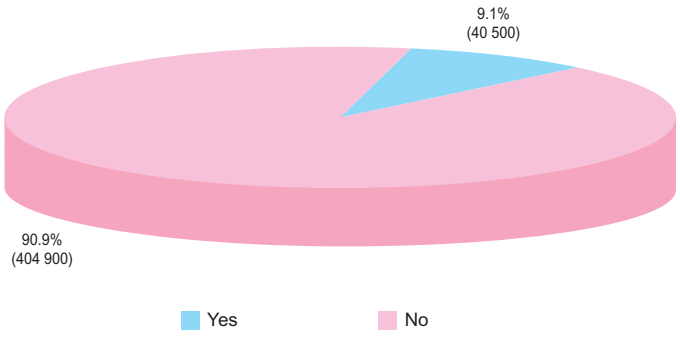
Around 12% to 18% of the NOP population in Hong Kong expressed negative impact arising from oral health conditions on eating. Negative impact on other aspects of daily life was lower. This may have been due to either a true low impact (NOP did not perceive functional difficulty arising from their oral health conditions) or the inability to express the negative impact (functional difficulty arising from oral health conditions was perceived but the NOP were not used to expressing such difficulty).

What was the pattern of usage of oral health care services like among the 65 to 74-year old NOP?

How many NOP had the habit of seeking regular dental checkup?

Only 9.1% (40 500) of NOP reported that they had the habit of regular dental checkup. (Figure 6.1)

Figure 6.1
Distribution of NOP according to habit of regular dental checkup



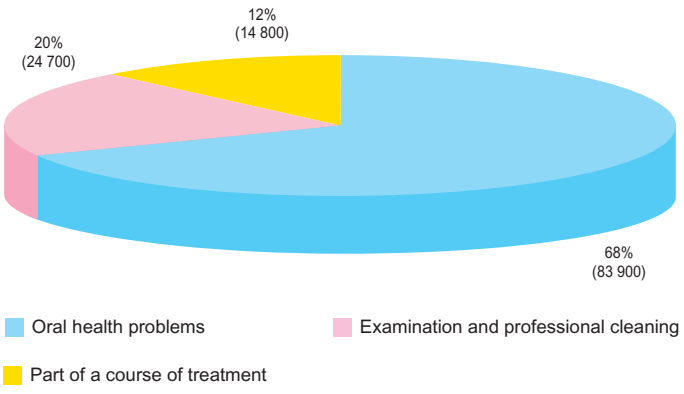
When was the last dental visit made by the NOP?

The distribution of NOP according to the time when the NOP made their last visit to the dentist is shown in Table 6.9. Less than one-third had visited a dentist within the past year. Among the 27.7% (123 400) NOP who had visited a dentist in the previous 12 months, 68% did so because of oral health problems (Figure 6.2).

Table 6.9
Distribution of NOP according to time of last dental visit

Time of last dental visit	Number	Percentage
1 year or less	123 400	27.7
1 to 3 years	93 100	20.9
More than 3 years	194 200	43.6
Never visited dentist	16 000	3.6
Could not remember	18 800	4.2

Figure 6.2
Distribution of NOP who had visited dentist in the previous year according to the reported reason of visit



Only 9.1% of the NOP had the habit of regular dental checkup. And only 27.7% had visited the dentist in the previous year. A small group (3.6%) reported that they had never visited a dentist.

Most of the dental visits made in the previous year were curative treatment for oral health problems. Oral health problems actually accounted for 68% of those visits. Only 20% of those visits were for checkup

How did the 65 to 74-year old NOP practise oral self-care ?

As 8.6% (38 300) of the NOP had no teeth at all, the following description on toothbrushing and flossing will be limited to those NOP with teeth remaining, and they are referred to as **dentate NOP**.

Toothbrushing - how often did the dentate NOP brush?

The toothbrushing habit reported by the dentate NOP is shown in Table 6.10. 98.7% (401 900) of dentate NOP reported the habit of daily toothbrushing.

Table 6.10
Distribution of dentate NOP according to toothbrushing habit

Toothbrushing habit	Number	Percentage
Brushed everyday	401 900	98.7
Brushed occasionally	1 300	0.3
Never brushed	4 000	1.0

Toothbrushing - what time did the dentate NOP usually brush?

The time of brushing is shown in Table 6.11. Among those who reported a habit of daily toothbrushing, almost all did so in the morning. Brushing before going to bed was reported by less than two-thirds of dentate NOP.

Table 6.11
Number and percentage of dentate NOP who brushed everyday according to time of toothbrushing

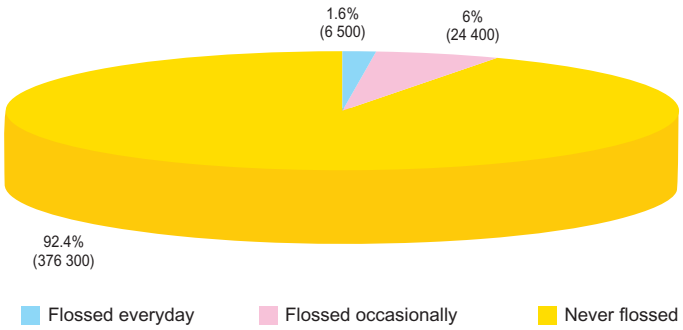
Time of day	Number	Percentage
In the morning	395 500	98.4
Before bed	252 400	62.8
After dinner	29 700	7.4
After lunch	23 300	5.8
After eating	14 500	3.6

Respondents allowed to choose multiple answers

How many dentate NOP flossed as part of interdental cleaning ?

The habit of flossing is shown in Figure 6.3. Only 1.6% (6 500) of dentate NOP reported that they flossed on a daily basis.

Figure 6.3
Distribution of dentate NOP according to flossing habit



Around 60% of dentate NOP brushed twice daily. This was deduced from the fact that almost all of those who had the brushing habit did so in the morning, and 62.8% also reported brushing at night time.

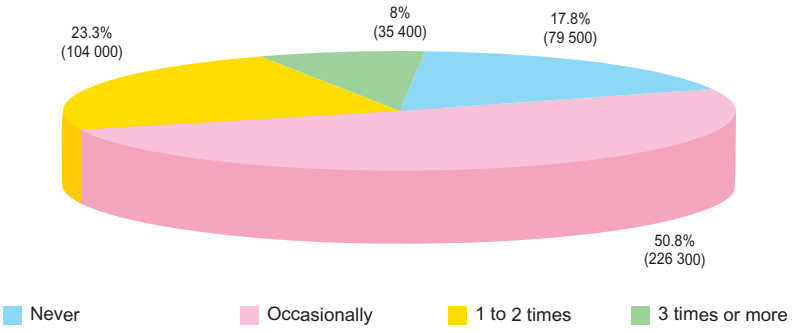
Only 1.6% of NOP reported that they flossed their teeth everyday.

What was the dietary pattern in relation to oral health among the 65 to 74-year old NOP?

Snacking habit

Snacking was referred to as any food, snack or drink (except water) intake in between normal meals. The reported snacking habit of NOP is shown in Figure 6.4.

Figure 6.4
Distribution of NOP according to the daily snacking frequency



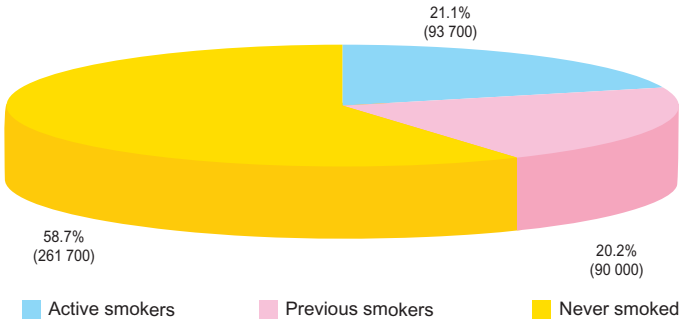
Snacking did not seem to be a major problem among the NOP population. Only 8% of NOP snacked three or more times a day. High snacking frequency is considered by the dental profession worldwide as a risk factor in developing tooth decay.

What was the smoking habit among the 65 to 74-year old NOP?

Smoking

The smoking habit among the NOP is shown in Figure 6.5. It was found that 21.1% (93 700) were active smokers.

Figure 6.5
Distribution of NOP according to smoking habit



Smoking habit was reported by one in every five NOP.

Summary on oral health status and oral health behaviour

Most NOP had experienced tooth loss, and almost one in every ten NOP had total tooth loss.

More than half of the NOP had untreated tooth decay, and gum pockets were also found in more than half of the NOP. With only one-fifth of the NOP population who had the habit of regular dental checkup, most of these existing diseases may progress without being noticed by the affected individual. Even when some of these diseases were to progress to a stage to cause discomfort, it was likely that some of the NOP would not seek professional care based on the surveyed behaviour. In other words, the observed behaviour was unlikely to prevent further deterioration of the diseases.

The presence of gum recession leading to exposed root surfaces, abundant calculus deposits, and use of dental prostheses, along with inadequate teeth cleaning practice, low usage of regular dental checkup, were all risk factors to the development of new tooth decay and gum disease and deterioration of existing diseases.

In summary, there were possibilities that NOP would have new tooth decay and gum disease, and/or further disease progression leading to tooth loss. However, such prospects should not be too pessimistic if there were room for improvement in the oral health life-style. Tooth loss can be prevented and oral health can be maintained with positive changes in oral health behaviour.

What were the possible explanations to the inadequacies in oral health related behaviour?

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

The factors leading to tooth decay as perceived by the NOP population are shown in Table 6.12. The main factor perceived was *eating too much candies or sweet food*. However, only less than 1% pointed out that *frequent intake of food or drink* as related to tooth decay. The second most commonly cited factor was *improper cleaning of teeth*. Other factors were reported by less than 10% of the NOP, and more than a quarter of NOP replied *don't know*.

Table 6.12
Number and percentage of NOP
according to perceived factors leading to tooth decay

Perceived factors	Number	Percentage
Eating too much candies / sweet food *	207 500	46.6
Improper cleaning of teeth *	161 100	36.2
Traditional Chinese medicine beliefs	15 100	3.4
Sour food / drink	13 600	3.1
Lack of calcium / nutrition	10 000	2.2
Poor general health	7 600	1.7
Inherited	6 200	1.4
Dental plaque / bacteria *	3 600	0.8
Too frequent food / drink intake *	3 800	0.8
No regular dental checkup *	1 300	0.3
Don't know	125 200	28.1

Respondents allowed to choose multiple answers
* Relevant factors

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

The factors leading to gum disease as perceived by the NOP population are shown in Table 6.13. Almost half of the NOP replied *don't know* to this question, indicating that the NOP population were not at all certain about the factors leading to gum disease. *Traditional Chinese medicine beliefs* - mainly "reqi" (internal heat 熱氣) was the most commonly perceived factor, followed by *improper cleaning of teeth. Smoking* was mentioned by very few NOP.

Table 6.13
Number and percentage of NOP
according to perceived factors leading to gum disease

Perceived factors	Number	Percentage
"reqi" / traditional Chinese medicine beliefs	129 400	29.0
Improper cleaning of teeth *	54 400	12.2
No avoidance of certain food	18 500	4.2
Dental plaque / bacteria *	15 800	3.5
Accumulation of calculus	11 100	2.5
Poor general health	7 500	1.7
Lack of vitamin / nutrition	6 300	1.4
No regular dental checkup *	4 900	1.1
Smoking *	3 700	0.8
Don't know	198 300	44.5

Respondents allowed to choose multiple answers
* Relevant factors

What did the NOP know about the prevention of tooth decay?

When asked what could be done to prevent tooth decay, more than half of NOP cited *proper cleaning of teeth* - mainly toothbrushing. Other perceived methods are listed in Table 6.14. *Reduce consumption of candies or sweet food* was reported by 19.8% (88 200) of NOP as a measure to prevent tooth decay, while only 0.3% (1 300) mentioned *to reduce frequency of food / drink intake. To seek regular dental checkup* was reported by only 3.6% (16 100) of NOP. 30.9% (137 600) replied *don't know* to this question, indicating the uncertainty of the NOP about prevention of tooth decay.

Table 6.14
Number and percentage of NOP
according to perceived methods to prevent tooth decay

Perceived methods	Number	Percentage
Proper cleaning of teeth *	228 500	51.3
Reduce consumption of candies / sweet food *	88 200	19.8
Rinsing with water / salt water	43 600	9.8
Use commercial mouth wash	17 600	3.9
Avoid certain food	17 200	3.9
Seek regular dental checkup *	16 100	3.6
Drink herbal tea / Chinese medicine	7 400	1.7
Take calcium / nutrient supplements	6 300	1.4
Avoid sour food / drink	5 000	1.1
Reduce frequency of food / drink intake *	1 300	0.3
Use fluoride toothpaste *	1 200	0.3
Don't know	137 600	30.9

Respondents allowed to choose multiple answers
* Relevant factors

What did the NOP know about the prevention of gum disease?

The perceived methods to prevent gum disease as reported by NOP are listed in Table 6.15. As many as 62.1% (276 600) of the NOP replied *don't know* to this question. This clearly showed that more than half of the NOP were not aware of how to prevent gum disease.

Table 6.15
Number and percentage of NOP
according to perceived methods to prevent gum disease

Perceived methods	Number	Percentage
Avoid certain food	46 100	10.3
Proper cleaning of teeth *	40 900	9.2
Taking Chinese medicine / herbal tea	34 700	7.8
Rinsing with water / salt water	22 600	5.1
Seek regular dental checkup *	15 000	3.4
Take vitamin / nutrient supplements / fruits	12 400	2.8
Use commercial mouthwashes	9 800	2.2
Use medicated toothpaste	1 300	0.3
Avoid smoking *	0	0
Don't know	276 600	62.1

Respondents allowed to choose multiple answers
* Relevant factors

Knowledge on tooth decay and gum disease was poor. For tooth decay, 28.1% did not know anything about its causative factor and 30.9% did not know any preventive method. The knowledge about gum diseases was even worse, 44.5% did not know the causative factor and 62.1% did not know any preventive method.

Proper cleaning of teeth was the main preventive method for both tooth decay and gum disease. This was followed by about 8% who cited taking *Chinese Medicine*/*herbal tea*. Little else was known of other relevant factors to prevent tooth decay and gum disease.

Toothbrushing - as perceived by the NOP, what were the most effective ways to brush their teeth ?

The dentate NOP were asked to indicate how they thought was effective brushing method. The results are shown in Table 6.16. More than half of the dentate NOP regarded their own brushing methods acquired from non-professional sources (e.g. acquired from family during childhoold) or professional messages not delivered on a personal basis (e.g. posters, pamphlets, video demonstration) as adequate. More than a quarter of them also considered the *use of toothpaste* as important. Only 9.4% (37 800) of dentate NOP pointed out that *personal instructions given by dental professionals* was an effective method.

Table 6.16
Number and percentage of dentate NOP who brushed everyday according to perceived effective toothbrushing method

Perceived effective toothbrushing method	Number	Percentage
Methods from non-professional / non-personal sources	232 700	57.9
Use toothpaste	108 100	26.9
Personal instruction by dental professionals	37 800	9.4
Brush longer time / harder	10 400	2.6
Use electric / special design toothbrush	6 400	1.6
Don't know	20 900	5.2

Respondents allowed to choose multiple answers

Proper teeth cleaning was the most commonly reported preventive method to tooth decay and gum disease. As perceived by the NOP, the most effective toothbrushing method was derived from non-professional sources (e.g. acquired from family during childhood) or professional messages not delivered on a personal basis (e.g. posters, pamphlets, video demonstration). Without proper instruction and reinforcement, NOP practising teeth cleaning might not be able to recognize the inadequacies in their teeth cleaning practices.

What were the reasons for not seeking regular dental checkup?

The reasons for not seeking regular dental checkup were sought from the 90.9% (404 900) NOP who did not report this habit. The results are shown in Table 6.17. The most commonly reported reason was *no perceived need* due to the *perception of good teeth* and also to *absence of pain*. The second most reported reason was *uncertainty of cost* / *worry of high cost*. Other reasons were reported by a relatively smaller proportion of NOP.

Table 6.17
Number and percentage of NOP who did not seek regular dental checkup according to the reported reasons for not doing so

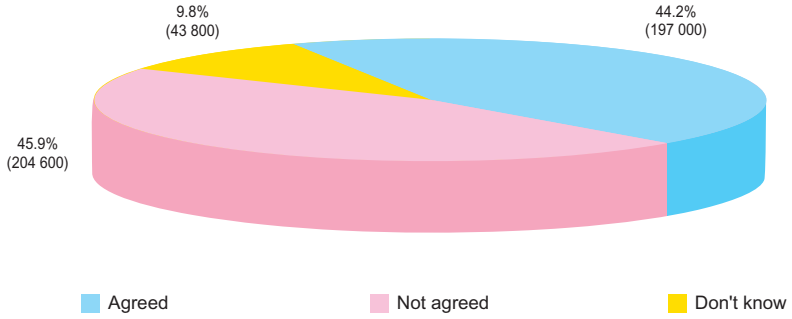
Reasons	Number	Percentage
Teeth were good / no pain / no need	146 200	36.1
Uncertainty of cost / worry of high cost	119 400	29.5
Did not know / never thought about checkup	50 600	12.5
No time/could not get off work	36 400	9.0
Did not know how to find dentist	34 000	8.4
No teeth, no need to go	24 700	6.1
Teeth had minor problems only, no need	18 200	4.5

Respondents allowed to choose multiple answers

Perceived benefit and worthiness of regular dental checkup

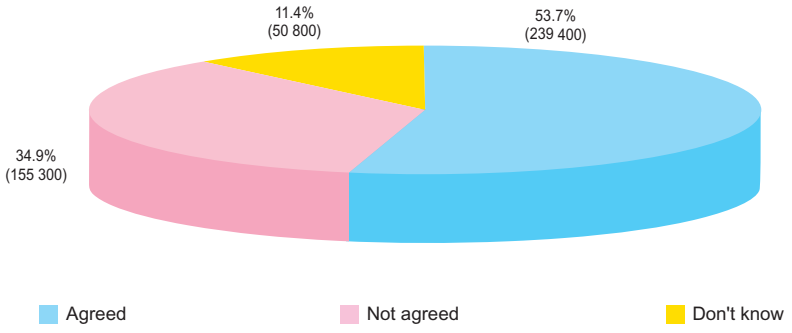
The perceived benefit of regular dental checkup was inferred by the agreement to the statement *teeth will be fine without regular checkup*, and the results are shown in Figure 6.6. Almost half of the NOP agreed to the statement, indicating that they did not perceive any benefit from regular dental checkup.

Figure 6.6
Distribution of NOP according to agreement that *teeth will be fine without regular checkup*



As shown in Figure 6.7, majority of the NOP agreed that *it is worthy to spend money on regular dental checkup*, but then again about one-third disagreed to the same statement.

Figure 6.7
Distribution of NOP according to agreement that *it is worthy to spend money on regular dental checkup*



No perceived need was the reason provided by more than one-third of the NOP for not seeking regular dental checkup. The absence of perceived need was due to the self-perceived good oral health and the absence of pain.

There were conflicting attitudes concerning regular dental checkup. Around half of the NOP perceived that regular dental checkup may help to keep their teeth fine and it was worthy to spend money on dental checkup. This should be an indication that some kind of need and value regarding dental checkup had been perceived by half of the NOP. However, nine out of ten NOP did not seek regular dental checkup. Among the NOP with perceived need for regular dental checkup, there were barriers to the transformation of perceived need into demand.

How was the NOP's perceived need for dental treatment as compared to the need assessed by the survey method?

The treatment need perceived by the NOP was compared to the assessed need based on the survey method in Table 6.18. Generally speaking, the perceived need was lower than the assessed need. The disparity was especially noted in preventive treatment such as oral hygiene instruction and scaling.

Table 6.18
Dental treatment need perceived by the NOP compared with the assessed need based on the survey method

Dental treatment need	Perceived	Assessed
Oral hygiene instruction	0.8%	100%
Scaling	3.9%	98.3%
Dental prostheses	22.2%	36.6%
Tooth extraction	8.6%	36.1%
Tooth filling	8.7%	32.6%
Advanced periodontal treatment	1.7%	11.0%
Dental pulp care	1.1%	3.4%
Crown fabrication	0.8%	1.1%

The treatment need perceived by the NOP was found to be far lower than the assessed need. No perceived need was the most commonly reported reason for not seeking regular dental checkup. Most of the treatment need as assessed using the survey methods had not been perceived by the NOP, especially the need for preventive treatment.

In the structured interview, a set of hypothetical tooth decay situations were presented to the NOP, and they were asked to propose their course of action when confronted with such situations. The purpose was to study the considerations in NOP's proposed actions under different tooth decay problems, and to investigate if there were any difference in the management of problems of front teeth or back teeth, and when the problems were associated with pain or not.

What would the NOP do in case of tooth decay problems ?

The proposed actions of the NOP under the various tooth decay situations are summarized in Table 6.19

Table 6.19
Proposed actions of the NOP
under various tooth decay situations

	Front teeth	Back teeth
Decayed with no pain	49.0% no action 1.4% self manage 7.2% seek removal of tooth 29.5% see dentist 12.8% could not decide	51.0% no action 3.3% self manage 8.4% seek removal of tooth 24.4% see dentist 12.9% could not decide
Decayed with pain	4.7% no action 7.8% self manage 29.1% seek removal of tooth 44.2% see dentist 2.2% see medical doctor 12.1% could not decide	3.9% no action 9.7% self manage 30.9% seek removal of tooth 41.5% see dentist 2.5% see medical doctor 11.5% could not decide

Under the hypothetical tooth decay situations, majority of the NOP proposed to see dentist and very few proposed self-management. The proposed actions were not consistent with the actual behavior reported in the previous experience of other oral health problems, where majority of the NOP tended to manage the problems by themselves and relatively few sought professional care (Table 6.7).

For the proposed actions under various hypothetical tooth decay situations, only very few NOP cited self-management and yet this had been commonly practised in previous oral health problem experience.

Pain was an important determining factor in taking action. Around half of the NOP would not take any action if there was no pain, even if decay was apparent.

The removal of the offending tooth was an expedient solution among some of the NOP. Around 8% would ask for tooth removal if there was decay even without pain. The proportion increased to around 30% if there was associated pain.

Some would not take any action even in pain. Around 5% would not take any action even if there was associated pain.

What were the reasons for not proposing to seek oral health care services in hypothetical situations?

The reasons given by the NOP for not seeking care in hypothetical tooth decay situations are listed in Table 6.20. When there was no pain, the main reason for not seeking oral health care was the belief that *the condition would relieve by itself*, followed by *uncertainty of cost* / *worry of high cost*. When there was pain, the *uncertainty of cost* / *worry of high cost* became the most important reason.

Table 6.20
Proportion of NOP who did not propose to seek care in hypothetical tooth decay situations according to reasons for not proposing so

Reasons	No pain	Pain
Minor problem will relief by itself	58.5%	33.8%
Uncertainty of cost / worry of high cost	24.9%	41.6%
No time / could not get off work	5.8%	9.8%
Don't know how to find dentist	5.4%	6.6%
Fear of pain	4.0%	6.6%

Respondents allowed to choose multiple answers

Tooth decay and pain had been perceived as minor problems which could be relieved by itself. This reason was more important when there was no pain associated with the oral health problem. There was an apparent lack of knowledge that tooth decay was progressively destructive.

There were barriers to seeking oral health care services. Similar to the reasons reported for not seeking regular dental checkup, some of the reasons were related to the oral health care services. These included the *uncertainty of cost* / *worry of high cost, no time* and *could not get off work*.

What were the attitudes of the NOP population towards oral health care services?

The attitudes of the NOP towards oral health care services was evaluated by their agreement to a series of statements / questions related to oral health care services. The results are shown in Table 6.21. Quite a substantial number of NOP replied *don't know* to some of the questions. The proportion of NOP who answered *don't know* ranged from roughly 4% to 20% (18 500 to 91 000) among all NOP. The NOP might have replied *don't know* simply because they did not understand the question, or they had no knowledge whatsoever. The NOP had difficulty in responding to questions like *do you think dentists will perform treatment for you that is unnecessary* and *are dentists' fees worthy of the value*.

Table 6.21
Attitudes of NOP towards oral health care services

Statements / questions	Responses	Number of NOP	Percentage
Do you agree that dentists can solve your oral health problems ?	Yes	390 600	94.0
	No	24 800	6.0
	30 000 replied don't know		
Dentists are more concerned on treatment than to teach people how to prevent dental diseases.	Agree	250 600	64.9
	Disagree	135 200	35.1
	59 700 replied don't known		
Do you think dentists will perform treatment for you that is unnecessary?	Yes	60 700	17.1
	No	293 800	82.9
	91 000 replied don't know		
Visiting a dentist must be painful and uncomfortable?	Agree	165 300	38.7
	Disagree	261 700	61.3
	18 500 replied don't know		
Are you worried about contracting contagious diseases from dentists' equipment?	Yes	145 800	35.0
	No	269 700	65.0
	29 900 replied don't know		
The dentists' fees are worthy of the value.	Agree	230 800	62.4
	Disagree	138 900	37.6
	75 800 replied don't know		

Generally speaking, the NOP population had confidence in the dental profession. The NOP population had very high confidence on the dentists' technical ability to solve their oral health problems. They also believed that dentists would not perform unnecessary treatment.

The dental profession should take note of the views from the minority of this group. Around one-third of the NOP expressed doubts on aspects such as clinic hygiene standard, the association of pain and discomfort with dental visit and the worthiness of dentists' fee.

Around one-third of the NOP disagreed to the statement that *dentists' fees are worthy of the value* The problem might be due to the inability of the NOP to appreciate the worth of the dentists' fees, or perhaps they had simply considered the dentists' fees as too high.

What was the perceived cost for dental visit?

The *uncertainty of cost* / *worry of high cost* was one of the factors given for not visiting the dentist. To evaluate the perceived cost of dental visit, the NOP were asked to estimate the cost for a dental checkup plus professional tooth cleaning (scaling). Care should be taken to interpret the result as 29.5% of the NOP were not able to give an estimate. Among those who made an estimation on the cost of checkup and scaling, the 25th percentile was HK$200, the median was HK$300, and the 75th percentile was HK$500.

Dental schemes and the usage of oral health care services

The proportion of NOP with coverage by dental schemes is shown in Table 6.22. Only 6.4% of NOP reported being covered by dental schemes. Majority of these schemes were dental benefits provided by public service, most likely benefits provided by the Government for retired civil servants.

Table 6.22
Distribution of NOP according to coverage by dental schemes

Types of dental schemes	Number	Percentage
No coverage	417 000	93.6
Employer provided dental benefits (public service)	21 900	4.9
Employer provided dental benefits (private service)	3 900	0.8
Self-purchased dental insurance	2 600	0.6

The usage of oral health care services based on the dental schemes is shown in Table 6.23. There was a higher proportion of NOP with dental schemes who had regular dental checkup, had visited a dentist in the previous 12 months, and who visited dentist for checkup.

Table 6.23
Usage of oral health care services by NOP and dental scheme coverage

Behaviour	Covered	Not covered
Regular dental checkup	68.0%	4.7%
Visited dentist within previous 12 months	72.5%	24.6%
Visited in previous 12 months for checkup	50.3%	15.2%

Coverage by dental schemes was found to be associated with a more favourable pattern on the usage of oral health care services. The coverage by dental schemes was uncommon among the NOP. Even with such coverage, some NOP still did not visit the dentist.

What were the attitudes of 65 to 74-year old NOP towards tooth loss?

The NOP were asked whether they agreed to the statement *tooth loss is a part of aging*. The results are shown in Table 6.24. Almost two-thirds of the NOP believed that *tooth loss is just a part of aging*, which was a cause for concern.

Table 6.24
Distribution of NOP according to agreement that *tooth loss is a part of aging*

Agreement to the statement	Number	Percentage
Agree	279 200	62.7
Disagree	146 400	32.9
Don't know	19 900	4.5

SECTION 6 - SUMMARY

Tooth loss had been experienced by almost all NOP, but there was still the risk of further tooth loss in the future.

There were existing tooth decay and gum disease, and there were also risk factors for the development of new tooth decay and gum disease. The observed oral health behaviour, both in terms of self-care and the use of professional oral health care, was not at all favourable to maintaining a healthier level of oral health.

Inadequate oral health behaviour may likely be related to the inadequate knowledge on tooth decay and gum disease, barriers to oral health care services, and attitude regarding tooth loss and oral health.

The knowledge of the NOP population on tooth decay and gum disease was poor. About one-third to two-thirds of NOP replied *don't know* to the perceived causative factors of and preventive methods for tooth decay and gum disease. There was insufficient knowledge on tooth decay and gum disease among those NOP who provided responses. Proper toothbrushing had been perceived as an important preventive method for both diseases, but there was an apparent lack of awareness that proper interdental cleaning is complimentary to toothbrushing, and an apparent lack of knowledge that teeth cleaning might have been inadequate without reinforcement. Other important factors like dental plaque, frequency of snacking and smoking were not even familiar among the NOP.

The low proportion of NOP who mentioned *regular dental checkup* in the preventive methods, may be one of the factors to the low usage of oral health care services. However, the relatively high proportion of disagreement to the statements *teeth will be fine even without regular dental checkup* and *it is worthy to spend money on regular dental checkup* indicated that there might be other factors behind the expressed low perceived need for dental checkup.

It was found that the NOP population had confidence in the dental profession as a whole. However, there were varying perceptions reported by a relatively smaller proportion worth taking note of. Such perceptions included *dentists are more concerned with treatment than to teach people how to prevent dental diseases, visiting a dentist must be painful*, and the *worry of contracting diseases from dentists' equipments*. About one-third of the NOP did not agree *dentists' fees as worthy of the value*. The cited median cost of a dental checkup and professional cleaning was estimated to be $300. It was not conclusive as to whether this had been considered as too costly or the services had not been considered as worthy of this value.

The coverage by dental schemes was found to be associated with relatively better usage of oral health care services. Even so, the few NOP with dental scheme coverage did not seek oral health care service. The proper use of oral health care services might have been influenced by a host of various factors and barriers. Findings from the current survey was not sufficient to provide a clear understanding of the matter.

Tooth loss was considered by more than half of the NOP population as part of aging.

This may be the biggest challenge to attaining desirable behavioural change. Findings from this survey suggested that teeth were accorded low priority among the NOP population. In one of the hypothetical tooth decay situations, around half of the NOP would not take action if there was no pain, even if decay was apparent. Around 8% of NOP would seek removal of teeth directly. The proportion who indicated removal of teeth rose to around 30% if there was associated pain. There were apparent risks of more tooth loss in the future for the NOP population, and such loss may be prevented. To motivate the NOP population to act early to prevent tooth loss, the population has to be convinced first that the possibility of tooth loss at old age can be minimized.

SECTION 7

65-year old and above institutionalized older persons (IOP)

Introduction

The Oral Health Survey on institutionalized older persons (IOP) covered all older persons living in licensed residential care homes. There are two categories of residential care homes for older persons in Hong Kong. Homes managed by subvented and self-financing non-profit making organizations under the purview of the Social Welfare Department, and there is an established mechanism in assessing the needs of the older persons and matching the needs with the most appropriate care. The other category is private homes. 65 is the minimum eligible age for admission to residential homes under the purview of the Social Welfare Department. Older persons aged 60 to 64 can also apply if there is a proven need. Effectively, the survey on the IOP covered residents aged 60 or above, but the proportion of IOP aged 60 to 64 was very small.

Survey objectives

The objectives of the survey of the 65-year old and above IOP were :

1. to assess the oral health status (mainly tooth decay and gum disease status);
2. to collect information on the oral health care behaviour;
3. to collect information on the knowledge on dental diseases;
4. to collect information on attitudes towards oral health; and
5. to collect information on attitudes towards oral health care service.

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 gum pocket, sample design effect, anticipated response rate and resources availability.

In Hong Kong, all residential care homes for older persons are licensed by the Social Welfare Department. It maintains two separate lists for the two categories of residential care homes for older persons. The sample of IOP was drawn in clusters with residential care home as a unit from the two lists, using a scientific sampling method.

Data collection method

Data on oral health status was collected by clinical examination performed by a team of dental officers (examiners). The examination procedure and recording criteria were based on the recommendation of the World Health Organization[1]. Clinical examination was performed at the selected residential care homes using portable equipments.

Data on personal behaviour, knowledge and attitudes related to oral health and oral health service were collected through structured interview conducted by a team of trained dental surgery assistants.

Training sessions were arranged for both the dental officers and dental surgery assistants to familiarize them with the data collection methods and to calibrate them to ensure consistency.

Enumeration results

A total of 20 homes were selected and invited to participate in the survey. 17 out of the 20 selected homes agreed to participate. Due to difficulties in conducting the survey on all residents in very large homes, a sub-sample of residents was drawn from each of the three homes with more than 80 residents. The selected residents from the three larger homes and all residents of the other 14 smaller homes were invited to participate in the survey. A total of 844 invitations were sent out, with 617 consents received.

At the end of the survey, a total of 530 IOP were clinically examined and 363 of them were interviewed. Those who could not be interviewed had problems either in understanding the questions or in giving responses. It was expected for this group as impairment in physical and cognitive ability was one of the criteria for admission into publicly funded homes. With statistical adjustment and weighting, the final results could be inferred to some 46 600 older persons living in residential care homes, while information collected through the structured interview were estimated to 32 400 of this group.

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 off.

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 the 65-year old and above IOP in Hong Kong?

Teeth status - how many teeth were there?

Only 0.5% (200) of the IOP had the full complement of 32 permanent teeth. However, it is not the goal of the dental profession for every individual to possess 32 teeth. There is also no optimal number nor minimum acceptable number of teeth agreed by the dental profession. For comparison purpose, 20 teeth has been used as the arbitrary minimum number of teeth for minimum level of function. From this survey, it was found that 24.1% (11 200) IOP had ≥ 20 teeth. 27.2% (12 700) IOP had no teeth at all (edentulous). Retained roots, i.e. severely broken down teeth with only the roots left behind, were found in 46% (21 400) IOP. The results are summarized in Table 7.1. The mean number of teeth present was 10.3. Among the teeth present, a mean of 1.9 teeth were retained roots.

Table 7.1
Number and percentage of IOP according to various indicators related to teeth present

Teeth status	Number	Percentage
No teeth left (edentulous)	12 700	27.2
With ≥ 20 teeth left	11 200	24.1
With 32 teeth left	200	0.5
With roots left	21 400	46.0

Teeth status - replacement of missing teeth

Less than half of the IOP had dental prostheses. The proportion of IOP with various types of dental prostheses are shown in Table 7.2.

Table 7.2
Number and percentage of IOP with dental prostheses

Type of dental prostheses	Number	Percentage
With any type of prostheses	22 500	48.2
With dental bridges	6 500	14.0
With partial dentures	7 000	14.9
With full dentures	13 100	28.2

Teeth status - what was the level of tooth decay?

The level of tooth decay among the IOP population are shown in Table 7.3. The level of root surface decay is shown in Table 7.4. Virtually all IOP had tooth decay experience. Majority of this experience was manifested as tooth loss (MT). Untreated decay (DT) was found in more than half of the IOP. Decay on root surfaces (DF-root) was found in almost a quarter of the IOP, and almost all of the decay on root surfaces were untreated (D-root).

The proportion of IOP with root surface decay (Table 7.4) was already included in the proportion of IOP with tooth decay (Table 7.3). Hence, it can be said that 41.1% of the IOP with untreated tooth decay in fact had root surface decay (22.7% out of 55.2%).

Table 7.3
Level of tooth decay as measured by the DMFT index among IOP

	DMFT	**DT** (decayed)	**MT** (missing)	**FT** (filled)
Mean value	24.5	2.6	21.6	0.3
% Among population	99.8	55.2	99.5	17.0

Table 7.4
Level of root surface decay among IOP

	DF-root	**D-root** (decayed)	**F-root** (filled)
Mean value	0.4	0.4	<0.05
% Among population	23.6	22.7	1.0

Gum condition as measured by the loss of gum attachment (LOA)

The level of loss of gum attachment among the IOP population is shown in Table 7.5. Loss of gum attachment was almost universal among the IOP and moderate to severe loss (≥ 6 mm) was also common.

Table 7.5
Loss of gum attachment (LOA) among IOP

	≥ 4 mm	≥ 6 mm	≥ 9 mm	≥ 12 mm
Mean number of sextants affected	2.1	0.6	0.1	<0.05
% Among population	84.7	37.3	7.4	2.8

50.4% (23 500) IOP, and 2.6 sextants were excluded due to insufficient number of teeth present or unable to be examined according to the criteria.

Gum condition as measured by the Community Periodontal Index (CPI)

The gum condition as measured by the CPI can be found in Table 7.6. Gum pockets were present in half of the IOP population. Though there were no gum pockets in the other half of the IOP population, almost all of them had calculus. Only 0.3% of the IOP had healthy gum condition in all the sextants examined.

Table 7.6
Gum condition as measured by the highest CPI score among IOP

	Healthy	Bleeding	Calculus	Shallow pocket	Deep pocket
Mean number of sextants affected	<.05	<.05	2.4	0.9	0.2
% Among population	0.3	0	49.8	36.7	13.2

50.4% (23 500) IOP, and 2.6 sextants were excluded due to insufficient number of teeth present or unable to be examined according to the criteria.

As seen from Table 7.5, 84.7% (19 600) had loss of gum attachment of ≥ 4mm. Table 7.6 showed that 49.9% (11 500) had gum pockets (i.e. loss of gum attachment ≥ 4 mm). At least 34.8% (8 100, by subtracting 49.9% from 84.7%) had loss of gum attachment not in the form of gum pocket, but in the form of gum recession, as assessed by examining one tooth in each of the six sextants in the mouth.

Was there any difference in oral health status between the group of IOP who could complete the interview and the group who could not?

Key oral health indicators of the two sub-groups of IOP are listed in Table 7.7. Significantly more IOP who were unable to complete the interview had untreated tooth decay. Otherwise, both groups were similar.

Table 7.7
Key variables on oral health status between IOP who could complete the interview and those who could not

Oral health indicators	IOP who could complete interview	IOP who could not complete interview
% With loss of tooth supporting tissue (≥ 6 mm)	35.6	43.5
% With loss of tooth supporting tissue (≥ 4mm)	83.4	89.4
% With gum pockets	47.8	58.2
% With DT	51.8	62.9
% With DMFT	99.8	100.0
% Edentulous	28.2	24.9
% With ≥ 20 teeth left	23.7	24.8

More than half of the IOP had untreated tooth decay. Most decayed teeth were found to be beyond restoration. With only an average of 10.3 teeth remaining among the IOP, 2.6 teeth were affected by untreated tooth decay, and of these, 1.9 teeth were severely broken down with only the roots left behind.

Among the dentate IOP, more than 80% had some loss of gum attachment. Both gum pockets and gum recession were common. Gum pockets were found in half of the dentate IOP.

Tooth loss was extensive among the IOP. On average, each IOP had only 10.3 teeth left. Total tooth loss was found in 27.2% of IOP.

Less than half of the IOP had dental prostheses. Most of the dental prostheses were removable prostheses (dentures). As the use of dental prostheses can lead to dental plaque rentention, its use justifies special attention on teeth cleaning practices.

More IOP who could not complete the interview than those who could were found to have untreated tooth decay. Otherwise there was no significant difference between the two sub-groups of IOP.

What was the experience in oral health problems among the IOP population?

Aside from assessing the level of tooth decay and gum disease in IOP, it was also the objective of the Oral Health Survey to have a better understanding of oral health in terms of their perception of well being and the perceived oral functions. Part of the structured interview was designed to investigate their experience of oral health and functional problems, and the care seeking behaviour when such problems had been perceived.

[Note : The following sections provide information on the experience, behaviour, knowledge and attitude among the 69.6% (32 400) IOP who could complete the interview, and therefore represented only the findings of this sub-group of IOP.]

How many IOP had experienced oral health problems, and what did they do to deal with the problems ?

The proportion of IOP who had perceived oral health problems in the previous 12 months are shown in Table 7.8. The most commonly perceived problem was *dryness of mouth on eating*, which is a problem associated with degeneration of the salivary glands and not directly related to teeth. *Bleeding gums, mobile teeth* and *tooth sensitivity to hot and cold* are problems directly related to teeth. *Abscess* was the least perceived problem.

Table 7.8
Perceived oral health problems by IOP and the actions taken

Condition	Percentage	Actions taken by the affected IOP		
		No action	Self manage	Dentist
Dryness of mouth on eating	29.3	33.8%	64.2%	2.0%
Bleeding gums *	15.2	54.6%	34.9%	10.5%
Mobile teeth *	14.4	72.2%	16.7%	11.1%
Bad breath	13.6	36.0%	61.0%	2.9%
Sensitivity to hot or cold *	11.7	44.4%	44.4%	11.1%
Abscess	3.8	12.8%	43.6%	43.6%

* Conditions affecting remaining teeth

The actions taken by the affected IOP for the problems perceived are also shown in Table 7.8. It should be noted that majority of the affected IOP did not take any action for *mobile teeth* and *bleeding gums*. These two conditions would only have occurred among IOP with teeth remaining. It appeared that the affected IOP were not keen to treat problems on their remaining teeth.

More IOP took action for *dryness of mouth* and *bad breath*, but action was limited to self management. It was only in one condition, i.e. *abscess*, where 87.2% of the affected IOP took action and half of them sought professional care. Generally speaking, the seeking of oral health care services upon perception of oral health problems was very low.

Did the IOP perceive any problem in oral functions, and what were their actions to deal with the perceived problems?

The proportion of IOP who perceived functional problems related to the mouth and teeth are shown in Table 7.9. It was found that *dissatisfaction with appearance* of teeth was the most reported, followed by *problems in eating*. The *appearance of teeth* was an important functional concern among the IOP and many of them still perceived it as a problem. This was an indication that the psychological discomfort on the IOP should not be overlooked.

Table 7.9
Perceived oral functional problems by IOP

Functional Problems	Condition	Prevalence
Pain	Pain, only when touched	16.7%
	Pain, spontaneous	10.6%
	Severe pain that disturbed sleep	3.4%
Problems in eating	Discomfort on eating	19.2%
	Denture causing problem on eating	8.3%
	Chewing not efficient	19.2%
Difficulty in speech	Difficulty in speech	12.0%
Dissatisfaction with appearance	Feeling that teeth do not look good	21.6%

The action taken by the affected IOP for various perceived functional problems are also shown in Table 7.10. Pain was the functional problem that drove more of the affected IOP to see a dentist. Even then, only 26.3% afflicted by pain had sought care from the dentist. On the whole, the seeking of oral health care services upon perception of functional problems was very low.

Table 7.10
Proportion of IOP who sought care upon perceived oral functional problems

Functional Problems	Proportion of affected IOP who saw dentist
Pain	26.3%
Problems in eating	16.0%
Difficulty in speech	8.2%
Dissatisfaction with appearance	15.3%

Oral health and functional problems were reported by less than 30% of the IOP. *Dryness of mouth* was the mostly reported oral health problem, which was more likely to be the result of degeneration of the salivary glands associated with aging. Apart from that, *dissatisfaction with appearance*, and *discomfort on eating* were the most perceived oral functional problems. *Dissatisfaction with appearance* may be the direct result of tooth loss, especially the front teeth. Dental problems which were not reported as much included *abscess, bleeding gums* and *mobile teeth*. The relatively low prevalence of oral health problems among the IOP was not surprising in view of the extensive tooth loss, and with fewer susceptible teeth remaining.

The demand for curative care was very low. For more severe problems like *abscess* and *pain*, only less than half of the affected IOP sought professional care. For most of the other oral health problems perceived, the affected IOP either took no action, or managed the problems by themselves. In particular, the tendency of not taking action at all was more common in problems affecting the teeth itself, i.e. *bleeding gums, mobile teeth* and *tooth sensitivity*.

What was the impact of the conditions of the teeth, mouth and dental prostheses on the daily life of the IOP population?

The impact of oral conditions on NOP's various aspects of daily life was measured by a locally validated set of questions, i.e. Oral Health Impact Profile (OHIP-14).

The proportions of IOP who expressed negative impact on various aspects of daily life are shown in Table 7.11. Among various aspects of daily life, oral condition had more negative impact on chewing food and psychological aspects (i.e. worrying), reported by 11.5% and 10.7% IOP, respectively. Negative impact on other aspects of daily life of OHIP-14 was even lower.

Table 7.11
Percentage of IOP expressing negative impact on aspects of daily life in OHIP-14

Impact on daily life	Percentage
Have had difficulty chewing any food	11.5
Have been worried	10.7
Have found it uncomfortable to eat any food	8.9
Have had trouble pronouncing any words	7.3
Have been totally unable to function	6.6
Have had sore spots in mouth	5.9
Have been miserable	5.6
Have been a bit embarrassed	5.3
Have felt that there has been less flavour in food	4.4
Have had to interrupt meals	4.2
Have avoided going out	2.2
Have been upset	1.9
Have had troubles getting along with other people	1.7
Have been unable to work to full capacity	1.5

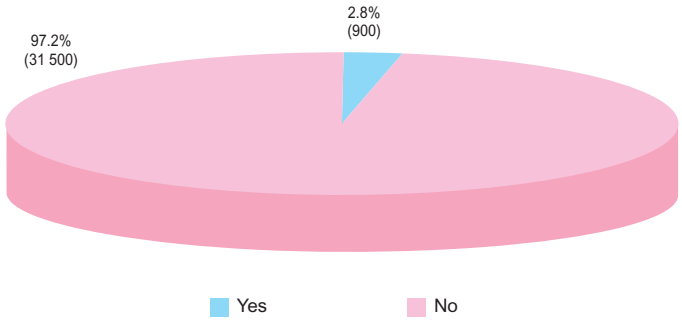
Around 11% of IOP expressed negative impact on chewing function and psychological discomfort arising from oral health conditions. Negative impact on other aspects of daily life was even lower. This may have been due to either a true low impact (IOP did not perceive functional difficulty arising from their oral health conditions) or the inability to express the negative impact (functional difficulty arising from oral health conditions was perceived but the IOP were not used to expressing such difficulty).

What was the pattern of usage of oral health care services like among the 65-year old and above IOP?

How many IOP had the habit of seeking regular dental checkup?

The behaviour of seeking regular dental checkup is shown in Figure 7.1. Only 2.8% (900) IOP had the habit of regular dental checkup.

Figure 7.1
Distribution of IOP according to habit of regular dental checkup



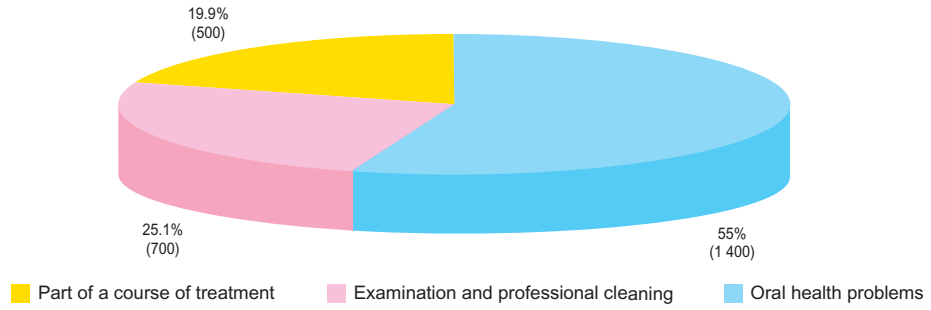
When was the last dental visit made by the IOP?

The distribution of IOP according to the time when they made their last visit to the dentist is shown in Table 7.12. Only 15% (4 800) of the IOP had visited a dentist in the past 3 years. Among the 8.1% (2 600) NOP who had visited a dentist in the previous 12 months, 55% (1 400) did so because of oral health problems (Figure 7.2).

Table 7.12
Distribution of IOP according to time of last dental visit

Time of last dental visit	Number	Proportion
1 year or less	2 600	8.1
1 to 3 years	2 200	6.9
More than 3 years	10 400	32.1
Never visited dentist	7 900	24.4
Could not remember	9 300	28.5

Figure 7.2
Distribution of IOP who had visited dentist in the previous year according to the reported reason of visit



Only 2.8% of the IOP reported the habit of regular dental checkup, and only 8.1% of the IOP had visited the dentist in the previous year. 28.5% could not remember when was the last dental visit made. One-quarter of the IOP reported that they had never visited a dentist. Of the dental visits made in the previous year, more than half were due to oral health problems.

How did the 65-year old and above IOP practise oral self-care?

The following description on toothbrushing and flossing will be further limited to those IOP with teeth remaining among those who could complete the interview. They are referred to as **dentate IOP**.

Toothbrushing - how often did the dentate IOP brush?

Information on toothbrushing habit was sought from dentate IOP. 84.1% (18 300) of the dentate IOP reported the habit of daily toothbrushing. (Table 7.13)

Table 7.13
Distribution of dentate IOP according to toothbrushing habit

Toothbrushing habit	Number	Percentage
Brushed everyday	18 300	84.1
Brushed occasionally	600	2.8
Never brushed	2 800	13.0

How many dentate IOP flossed as part of interdental cleaning?

Only 1% (200) did so occasionally. (Table 7.14)

Table 7.14
Distribution of dentate IOP according to flossing habit

Flossing habit	Number	Percentage
Flossed everyday	0	0
Flossed occasionally	200	1
Never flossed	21 600	99

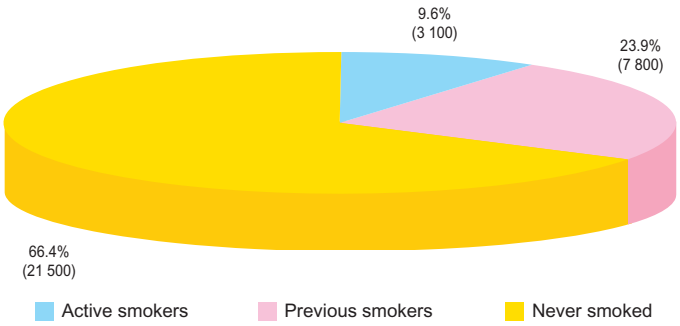
More than 80% of the dentate IOP reported the habit of daily toothbrushing. Flossing was virtually not practised.

What was the smoking habit among 65-year old and above IOP?

Smoking

9.6% (3 100) IOP were found to be active smokers. (Figure 7.3)

Figure 7.3
Distribution of IOP according to smoking habit



9.6% IOP had the smoking habit.

Summary on oral health status and oral health behaviour

A closer look at the tooth decay data revealed that majority of the tooth decay had already reached a stage beyond restoration. The gum condition was also poor as deep gum pockets were found in 13.2%, and moderate to severe loss of gum attachment was found in 37.3% of dentate IOP. Tooth loss was common, as three-quarters of the IOP had lost their teeth to the extent of having less than 20 teeth remaining.

Among the various oral health problems experienced by the IOP, bleeding gums and mobile teeth ranked second and third in terms of the proportion of IOP reporting such experiences. Functional problems, mainly in eating function and dissatisfaction with appearance, and negative impact on psychological comfort were also reported.

Their use of professional oral health care services, both for regular dental checkup and for resolving oral health problems, was low. The demand for curative care was very low. In other words, despite the presence of existent oral health problems, professional services were not sought.

What were the possible explanations to the inadequacies in oral health related behaviour?

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

The factors leading to tooth decay as perceived by the IOP are shown in Table 7.15. More than half of the IOP replied *don't know*, and very few could mention the relevant factors on tooth decay.

Table 7.15
Number and percentage of IOP
according to perceived factors leading to tooth decay

Perceived factors	Number	Percentage
Improper cleaning of teeth *	7 900	24.3
Eating too much candies / sweet food *	6 900	21.2
Too frequent food / drink intake *	1 000	3.0
No avoidance of certain food	700	2.2
Sour food / drink	500	1.5
Lack of calcium / nutrition	300	1.0
Dental plaque / bacteria *	200	0.6
No regular dental checkup *	200	0.5
Don't know	18 800	57.9

Respondents allowed to choose multiple answers
* Relevant factors

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

The factors leading to gum disease as perceived by IOP are shown in Table 7.16. More than three-quarter of IOP replied *don't know. Improper cleaning of teeth* and the *traditional Chinese medicine beliefs* - mainly "reqi" (internal heat 熱氣) were reported as important explanations for gum disease by the IOP. Very few could mention the factors that the dental profession considered as important.

Table 7.16
Number and percentage of IOP
according to perceived factors leading to gum disease

Perceived factors	Number	Percentage
Improper cleaning of teeth *	4 800	14.7
"reqi" / traditional Chinese medicine beliefs	4 200	13.0
No avoidance of certain food	400	1.2
Dental plaque / bacteria *	200	0.5
No regular dental checkup *	100	0.3
Not flossing *	100	0.3
Smoking *	0	0
Don't know	24 900	76.7

Respondents allowed to choose multiple answers
* Relevant factors

What did the IOP know about the prevention of tooth decay?

The IOP were asked to report on any method that they could think of in the prevention of tooth decay. The results are shown in Table 7.17. Majority of the IOP had no idea about the prevention of tooth decay, as 69.4% (22 500) IOP replied *don't know*. The most commonly reported preventive methods were *proper cleaning of teeth* and *reduce consumption of candies and sweet food*. Professionally recommended behaviour such as *reduce frequency of food or drink intake* and *seek regular checkup* were rarely mentioned.

Table 7.17
Number and percentage of IOP
according to perceived methods to prevent tooth decay

Perceived methods	Number	Percentage
Proper cleaning of teeth *	8 000	24.5
Reduce consumption of candies / sweet food *	4 400	13.4
Rinse with water / salt water	1 500	4.7
Avoid certain food	700	2.2
Use commercial mouth wash	400	1.2
Seek regular dental checkup*	300	1.0
Reduce frequency of food / drink intake*	200	0.6
Don't know	22 500	69.4

Respondents allowed to choose multiple answers
* Relevant factors

What did the IOP know about the prevention of gum disease?

The perceived methods to prevent gum disease as reported by IOP are shown in Table 7.18. Majority of the IOP did not know about the prevention of gum disease. *Seek regular checkup* and *avoid smoking* were rarely mentioned.

Table 7.18
Number and percentage of IOP
according to perceived methods to prevent gum disease

Perceived methods	Number	Percentage
Proper cleaning of teeth *	4 900	15.2
Taking Chinese medicine / herbal tea	2 200	6.8
Rinsing with water / salt water	800	2.4
Seek regular dental checkup *	500	1.5
Avoid certain food	400	1.2
Avoid smoking *	300	0.8
Don't know	26 000	80.1

Respondents allowed to choose multiple answers
* Relevant factors

More than half of the IOP did not know the factors leading to and methods to prevent tooth decay and gum disease. Factors considered as relevant by the dental profession, such as dental plaque, flossing, snacking, smoking and regular dental checkup, were rarely mentioned.

What were the reasons for not seeking regular dental checkup?

Majority of the IOP did not report the habit of regular dental checkup. The reasons given for not having regular checkup are listed in Table 7.19. Almost half of the IOP perceived good oral health, no pain and no need. Some had never thought about dental checkup or did not know about it. Besides these, the *uncertainty of cost* / *worry of high cost* was also mentioned as an important reason.

Table 7.19
Number and percentage of IOP who did not seek regular dental checkup according to the reported reasons for not doing so

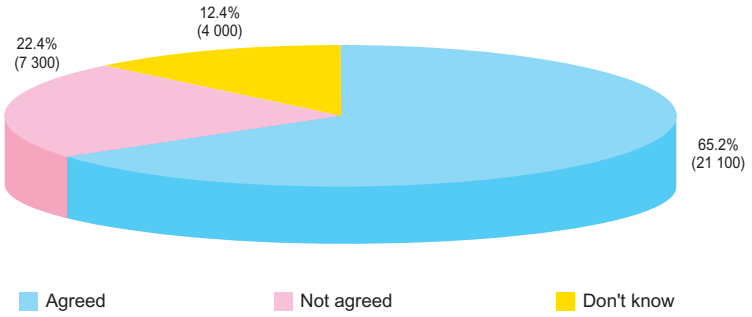
Reasons	Number	Percentage
Teeth were good / no pain / no need	14 200	45.2
Did not know checkup / never thought about checkup	7 300	23.1
Uncertainty of cost / worry of high cost	3 600	11.5
Poor general health, could not go to checkup	2 500	7.9
Did not know how to find dentist	1 700	5.5

Respondents allowed to choose multiple answers

Perceived benefit and worthiness of regular dental checkup

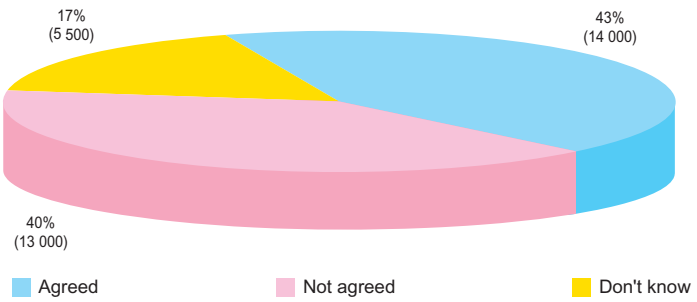
The perceived benefit of regular dental checkup was inferred by the agreement to the statement *teeth will be fine even without regular checkup*, and the results are shown in Figure 7.4. Majority of the IOP did not perceive any benefit in having regular dental checkup.

Figure 7.4
Distribution of IOP according to agreement that *teeth will be fine even without regular checkup*



As shown in Figure 7.5, less than half of the IOP agreed that *it is worthy to spend on regular dental checkup*, but then again, there were 40% (13 000) who disagreed to the same statement.

Figure 7.5
Distribution of IOP according to agreement that *it is worthy to spend on regular dental checkup*



Almost two-thirds of the IOP did not consider regular dental checkup as beneficial and 40% did not perceive it as worthy. No perceived need was the mostly reported reason for not seeking regular dental checkup. No need had been perceived because of the self-perceived good oral health and the absence of pain. Some simply had no idea about dental checkup.

The inability to seek care due to poor general health was also mentioned. This factor was worth noting although it was mentioned by only a small percentage of IOP.

How was the IOP's perceived need for dental treatment as compared to the need assessed by the survey method ?

The treatment need perceived by the IOP was compared to the assessed need based on the survey method in Table 7.20. Generally speaking, the perceived need in almost all aspects were much lower than the assessed needs.

Table 7.20
Dental treatment need perceived by the IOP
compared with the assessed need based on the survey method

Dental treatment need	Perceived	Assessed
Dental prostheses	11.9%	59.0%
Oral hygiene instruction	0%	49.9%
Scaling	0.6%	49.9%
Tooth extraction	2.3%	47.6%
Tooth filling	1.8%	29.2%
Advanced periodontal treatment	0.3%	6.6%
Dental pulp care	0%	1.9%
Crown fabrication	0.3%	0.2%

The treatment need perceived by the IOP was found to be much lower than the assessed need. No perceived need was the most commonly reported reason for not seeking regular dental checkup. Treatment need assessment based on the survey methods had not been perceived by the IOP, especially the need for preventive treatment.

In the structured interview, a set of hypothetical tooth decay situations were presented to the dentate IOP, and they were asked to propose their course of action when confronted with such situations. The purpose was to study the considerations in dentate IOP's proposed actions under different tooth decay problems, and to investigate if there were any difference in the management of problems of front teeth or back teeth, and when the problems were associated with pain or not .

What would the dentate IOP do in case of tooth decay problems?

The proposed actions of the dentate IOP under the various tooth decay situations are summarized in Table 7.21.

Table 7.21
Proposed actions of the dentate IOP under various tooth decay situations

	Front teeth	Back teeth
Decayed with no pain	58.2% no action	59.0% no action
	1.0% self manage	2.1% self manage
	9.0% seek removal of tooth	10.1% seek removal of tooth
	18.0% see dentist	16.5% see dentist
	0.9% see medical doctor	0.9% see medical doctor
	12.9% could not decide	11.4% could not decide
Decayed with pain	9.1% no action	9.1% no action
	3.6% self manage	4.1% self manage
	34.0% seek removal of tooth	35.8% seek removal of tooth
	35.9% see dentist	35.0% see dentist
	2.2% see medical doctor	1.5% see medical doctor
	15.3% could not decide	14.5% could not decide

Pain was an important determining factor in taking action. More than half of the dentate IOP would not take any action if there was no pain, even if decay was apparent.

The removal of the offending tooth was an expedient solution to problem. Around 10% would ask for tooth removal if there was decay even without pain. The proportion increased to over 30% if there was associated pain.

Some would not take any action even in pain. Around 9% would not take any action even if there was associated pain.

There was no significant difference in the proposed actions for front teeth and back teeth.

What were the reasons for not seeking oral health care services when oral health problems had been perceived?

The low demand for care when there were perceived oral functional problems was already reported in Table 7.10. The reported reasons for not seeking oral health care services in those situations are shown in Table 7.22. The two main reasons reported were the same in all functional problems studied. The mostly reported reason was the perception that *it was only a small problem*. The next reason was *uncertainty of cost / worry of high cost*.

Table 7.22
Distribution of IOP according to reasons for not seeking care when there was perceived functional problem

Functional Problems	Main reason (prevalence)	Other reason (prevalence)
Pain	small problem (54.8%)	uncertainty of cost / worry of high cost (19.5%)
Problems in eating	small problem (45.7%)	uncertainty of cost / worry of high cost (15.2%)
Difficulty in speech	small problem (44.0%)	uncertainty of cost / worry of high cost (20.7%)
Dissatisfaction with appearance	small problem (39.6%)	uncertainty of cost / worry of high cost (25.6%)

What were the reasons for not proposing to seek oral health care services in hypothetical tooth decay situations?

The reasons given by the IOP for not seeking care in hypothetical tooth decay situations are listed in Table 7.23. Again the main reason given was the perception that *the problem was minor*, and the next main reason was the *uncertainty of cost* / *worry of high cos*t.

Table 7.23
Percentage of IOP who did not propose to seek care in hypothetical tooth decay situation according to reasons for not proposing so

Reasons	No pain	Pain
Problem is minor	55.2%	49.1%
Uncertainty of cost / worry of high cost	23.6%	20.4%
Don't know how to find dentist	6.1%	9.4%
Could not go due to physical problems	4.8%	10.6%
Fear	0.7%	2.4%

Why was there the perception that the oral health problems was only a small problem?

It might help to look into some of the verbatim responses.

- *"老人院冇牙醫提供 (the home did not provide dentist's service)"*
- *"食嘢時間唔多，可以得咪唔駛睇牙醫 (not spending much time on eating, no need to see a dentist if it can be tolerated)"*
- *"唔想麻煩姑娘 (did not want to cause troubles to the nurses)"*
- *"年紀大，唔想睇 / 麻煩人 (so old already, did not want to check / cause troubles to others)"*

It was apparent that the IOP were more concerned about the troubles that they might cause to the people around them. They would rather tolerate the discomfort than bother people. IOP would only ask for assistance to seek oral health care services when the discomfort developed to an intolerable stage.

The perception of tooth decay problems as minor problems indicated that there were issues of greater importance relative to the oral health problems. The immediate reason given by most of the IOP with perceived functional problems for not seeking care was the notion that *it was a small problem* that did not warrant any trouble in seeking care. In other words, seeking oral health care was deemed as troublesome. Physical impairment was one of the admission criteria to residential care services, and this would obviously be a significant barrier to the use of oral health care services. The *inability to go to dental clinic due to poor general health* has been mentioned in Table 7.19. The need for assistance or escort by caregivers to go to the dental clinic, and the inconvenience to other IOP when the caregiver was away on such tasks, were perceived as troubles caused to the caregivers and other residents. Relative to the troubles caused, the IOP perceived their own oral health problems as minor.

The other possible barrier was the uncertainty of cost / worry of high cost. It was not clear from this study whether the barrier was the actual cost, or the lack of price information.

What were the attitudes of the IOP population towards oral health care services?

The attitudes of the IOP towards oral health care services was evaluated by their agreement to a series of statements / questions related to the oral health care services. The results are shown in Table 7.24. Quite a substantial number of IOP replied *don't know* to some of the questions. The number and percentage of IOP who answered *don't know* ranged from 16% to 32.4% (4 900 to 10 500) among all IOP. The IOP might have replied *don't know* simply because they did not understand the question, or they had no knowledge whatsoever.

Generally speaking, the IOP population had confidence on the dentists' ability to solve their oral health problems. There were some who worried about the possible pain and discomfort. The uncertainty on cost of dental care had been mentioned earlier. The IOP were also uncertain about the role of dentists in teaching people on ways to prevent oral disease. This could be explained by their lack of experience and exposure to dental visits.

Table 7.24
Attitudes of IOP towards oral health care services

Statements / questions	Responses	Number of IOP	Percentage
Do you agree that dentists can solve your oral health problems ?	Yes	21 300	83.2
	No	4 300	16.8
	6 800 replied don't know		
Dentists are more concerned on treatment than to teach people how to prevent dental diseases.	Agree	9 300	42.3
	Disagree	12 700	57.7
	10 500 replied don't known		
Do you think dentists will perform treatment for you that is unnecessary?	Yes	3 000	12.1
	No	21 900	87.9
	7 500 replied don't know		
Visiting a dentist must be painful and uncomfortable?	Agree	8 500	30.8
	Disagree	19 000	69.2
	4 900 replied don't know		
Are you worried about contracting contagious diseases from dentists' equipment?	Yes	4 800	17.6
	No	22 600	82.4
	5 100 replied don't know		
The dentists' fees are worthy of the value.	Agree	16 600	69.9
	Disagree	7 200	30.1
	8 600 replied don't know		

Generally speaking, the IOP population had confidence in the dental profession. The IOP population had confidence on the *dentists' technical ability to solve their oral health problems*. Most of them also believed that *dentists would not perform unnecessary treatment*, and most of them did not *worry about contracting contagious disease* at the dental clinic.

The dental profession should take note of the views from the minority of this group. Around one-third of the IOP expressed doubts on aspects such as the association of *pain and discomfort with dental visit* and *the worthiness of dentists' fees*. Even more were in doubt about *dentists' concern on teaching people how to prevent diseases*.

What were the attitudes of 65-year old and above IOP towards tooth loss?

The IOP were asked whether they agreed to the statement *tooth loss is a part of aging*. The results are shown in Table 7.25. As many as 70% of the IOP agreed that tooth loss was just part of aging. As observed from the findings of their oral health status, the life experience of this group actually supported this attitude.

Table 7.25
Distribution of IOP according to agreement that *tooth loss is a part of aging*

Agreement to the statement	Number	Percentage
Agree	22 700	70.0
Disagree	7 800	24.0
Don't know	2 000	6.0

SECTION 7 - SUMMARY

Tooth loss had been experienced by almost all IOP.

There were existing tooth decay and gum disease and there were also risk factors. The observed oral health behaviour, both in terms of self-care and the use of professional oral health care, was not at all favourable to maintaining a healthier level of oral health.

Tooth loss was considered by 70% of the IOP population as part of aging.

The circumstances of being confined to residential care homes might have played a part in their oral health related behaviour.

The possible impact of being in residential care homes coupled with the inability to seek care due to poor general health had been mentioned as reasons for not seeking care. The perceived inconvenience on the need for assistance or escort by caregivers, may have accounted for the perception that their own oral health problems were minor issues.

An important consideration in planning care for IOP would be their ability for self-care.

Physical and cognitive disabilities are the main considerations in the assessment mechanism of the Social Welfare Department in admitting older persons into residential care homes. The fact that 30.4% of the IOP were unable to complete the interview was an indication that a significant proportion of the IOP might be lacking in self-care ability. Even among those who could complete the interview, there might be some IOP who lacked the physical ability in performing self-care.

Data on dental treatment need should be carefully interpreted.

The survey criteria in assessing the IOP dental treatment need were the same as the criteria used for the adults and NOP. This enabled comparison among these population groups. While such criteria would be considered acceptable on individuals who are relatively fit and healthy, the same criteria may not be realistic for the IOP. For instance, the use of dental prostheses require attention in self-care and cleaning, which may not be user-friendly for IOP who are incapable of taking care of themselves. The general health condition of the IOP had not been taken into account in the survey's assessment of treatment need. Hence, the course of treatment itself, such as the removal of teeth or the filling of decayed teeth, may possibly lead to distress for some IOP.

The dental profession is still working on the definition of assessment criteria in determining the realistic dental treatment need for special needs groups like the IOP. Before a set of internationally acceptable criteria is available, the current assessment should be interpreted with caution.

To partly address the oral health care needs among the IOP, some peripheral factors, i.e. the residential care homes, caregivers and family members, should also be considered.

It was apparent that any desirable change in life-style among the IOP would have to be facilitated at the residential care homes, and through the co-operation of caregivers and family members. For IOP capable of self-care, reinforcing their oral health knowledge and attitudes are still important in the motivation of behavioural change. Efforts in oral health promotion directed to caregivers and family members, to assist in improving the oral health of those IOP who could not take care of themselves, would certainly be useful. Preventive and curative treatment have to be delivered according to the realistic needs of the IOP, and according to other specific needs, e.g. administrative and financial need, of the residential care homes.

SECTION 8

Overview

What was the level of oral health of the Hong Kong population when compared with those of other countries ?

Global oral health data are collated and maintained under the Oral Health Country / Area Profile Programme by the World Health Organization (http://www.whocollab.od.mah.se/index.html). Tooth decay level of the 12-year old age group is a major indicator for monitoring the oral health at the global level. The 35 to 44-year old age group has also been specified by the World Health Organization as the standard monitoring group for international comparison. The main oral health indices of this age group were compared to several selected countries, chosen for its geographical proximity to Hong Kong and similarity in economic development.

International comparison - tooth decay level of 12-year old students

As at September 2001, the mean DMFT value from a global perspective was 1.7. The mean DMFT values of 12-year old students of the different countries are shown in Table 8.1. The mean DMFT value for Hong Kong's 12-year old students was 0.8, which ranked as the most favourable alongside the Australian counterparts.

Table 8.1
Level of tooth decay as measured by the DMFT index of 12-year old students compared with those of other countries[4]

Country	DMFT
Australia	0.8
Hong Kong	0.8
England & Wales	0.9
China	1.0
Singapore	1.0
USA	1.4
New Zealand	1.5
Malaysia	1.9
Macau	2.0
Japan	2.4

International comparison - oral health of 35 to 44-year old adults

It can be seen from Table 8.2 that none of Hong Kong's 35 to 44-year old adults had total tooth loss (edentulous). In fact, compared with the countries tabulated, Hong Kong's adults ranked the best in this respect. Their tooth decay level ranked as the lowest at 7.4. In terms of gum conditions, Hong Kong's adults appeared better than the American and British counterparts.

Table 8.2
Oral health indicators of 35 to 44-year old adults compared with those of other countries[4]

Country	%Edentulous	DMFT	DT	%With pockets
Hong Kong	0	7.4	0.7	46
USA	2.5-5.8	13.3	0.8	58
UK	1.0	16.6	1.4	59
Australia	N/A	17.3	1.3	N/A
Japan	N/A	13.7	1.3	N/A
Singapore	0.6	9.8	0.8	N/A

N/A : data not available

From a global perspective, the oral health of the Hong Kong population was found to be in the same ranking if not better than most developed countries in the world. The level of tooth decay among the 12-year old students was actually among the world's lowest. Furthermore, with a global mean DMFT of 1.7, Hong Kong's 12-year olds ranked as among the world's lowest at 0.8. The oral health status of Hong Kong's adult population, in terms of tooth decay level (DMFT) and gum condition, had the same ranking if not better, than the counterparts from most developed countries in the world. In fact, of the countries compared with, only Hong Kong's adults boasted a 0% in terms of total tooth loss.

What was the level of oral health of the Hong Kong population in 2001 when compared with past data?

Comparison with previous oral health surveys done in Hong Kong is useful to show the changes in oral health status over the years. However, interpretation made on any observed changes should be guarded at best, as the changes may be the result of one or a combination of the following factors :

- a genuine change in oral health status
- variation in examination methods and criteria
- variability amongst examiners
- statistical variation arising from survey on a sample instead of a total enumeration.

In the following comparisons, previous surveys selected were confined to those which used the methodology recommended by the World Health Organization.

The level of tooth decay among the 5-year old children over the past 13 years are shown in Table 8.3. In terms of proportion with decay experience and the mean dmft, the tooth decay level had decreased as compared with 1988. However, the high proportion of untreated decay (dt) among those with decay experience remained the same. Similar to the 1988 data, over 90% of those with decay experience (dmft) was untreated decay (dt).

Table 8.3
Level of tooth decay as measured by the dmft index of 5-year old children from 1988 to 2001

Year	% Experienced tooth decay	dmft	dt	mt	ft
1988 [5]	63	3.2	2.9	<0.05	0.2
1995 [2*]	66	3.0	2.3	0.2	0.5
2001	51	2.3	2.1	<0.05	0.2

*Results of 6-year old children in primary schools

The oral health indices among the 12-year old students over the past 19 years are shown in Table 8.4. The tooth decay level both in terms of proportion with decay experience and the mean DMFT had decreased dramatically over the years. The proportion of untreated decay (DT) among those with decay experience (DMFT) dropped significantly from 75% in 1982, to 12.5% in 2001. As for gum conditions, almost 60% of the students had calculus deposits. Whether this reflected a deterioration of the gum condition from 1995 to 2001 would have to be guarded at best, since the 1995 survey sample were drawn from the primary school population, and that of 2001 were drawn from the secondary school population.

Table 8.4
Oral health indices of 12-year old students from 1982 to 2001

Year	% Experienced tooth decay	DMFT	DT	%With bleeding gums	%With calculus
1982 [6]	N/A	2.8	2.1	N/A	N/A
1986 [7]	60	1.5	0.6	N/A	N/A
1995 [2]	48	0.9	0.2	41	50
2001	37.8	0.8	0.1	35	59.5

N/A : data not available

The oral health indices among the 35 to 44-year old adults over the past 17 years are shown in Table 8.5. The proportion of adults affected by tooth decay increased from 1984 to 1991, after which it remained unchanged, and the proportion of untreated decay (DT) among those with decay experience (DMFT) dropped steadily from 13.7% in 1984 to 9.5% in 2001. Although there had been an improvement in terms of proportion of adults with gum pockets as compared with the data in 1984, the fact remained that almost half of Hong Kong's adults were found with calculus deposits and similarly with gum pockets.

Table 8.5
Oral health indices of 35 to 44-year old adults from 1984 to 2001

Year	% Experienced tooth decay	DMFT	DT	% With bleeding gums	% With calculus	% With pockets
1984 [8]	90.0	7.3	1.0	0	28	72
1991 [9,10]	98.0	8.7	1.0	0	26	74
2001	97.5	7.4	0.7	3.4	49.9	46

The oral health indices among the 65 to 74-year old non-institutionalized older persons (NOP) over the past 10 years are shown in Table 8.6. The proportion of NOP with total tooth loss (edentulous) had decreased, relative to the data obtained in 1991. Over this period of time, the proportion of NOP affected by tooth decay remained rather stable, and the ratio of untreated decay (DT) among those with decay experience (DMFT) remained at 7.4%. Although there had been an improvement in terms of proportion of NOP with gum pockets as compared with the data in 1991, the fact remained that more than a third of Hong Kong's NOP were found with calculus deposits and more than half of this population group had gum pockets.

Table 8.6
Oral health indices of 65 to 74-year old NOP from 1991 to 2001

Year	% Edentulous	% Experienced tooth decay	DMFT	DT	% With calculus	% With pockets
1991 [9.10]	12	100	18.9	1.4	34	66
2001	8.6	99.4	17.6	1.3	43	55

The oral health of the Hong Kong population showed improvement over the years. The level of tooth decay showed a definite downward trend among the 5 and 12-year olds, but had remained relatively stable among the adult and older persons groups. Hong Kong's 12 year-olds had one of the world's lowest decay experience. Calculus deposits, however, were present in more than half of the 12-year old population. Hong Kong could boast the fact that none of its adults had total tooth loss (edentulous), and this condition among the NOP showed a downward trend. For the adult and NOP groups, the gum conditions had generally improved over the years. However, calculus deposits and gum pockets remained prevalent, as almost half of the adults had calculus deposits and also close to half had gum pockets, while more than a third of NOP had calculus deposits and more than half had gum pockets. Although Hong Kong's standing compared to that of other developed countries was encouraging, the area of concern in this context, would be on the gum health of our population.

Since the introduction of water fluoridation in 1961, the prevalence and severity of tooth decay has declined in Hong Kong. Together with the wide availability of fluoride containing toothpastes and its use over the years, we have seen a further reduction in the level of tooth decay especially in the younger age population.

There were other significant milestones in the field of dentistry in Hong Kong, near and around the time the earlier sets of data were drawn from. In 1980, the Faculty of Dentistry, University of Hong Kong was established and took in its first batch of dental student trainees, who then became qualified dentists in 1985. Also in 1980, the then Medical and Health Department (now known as the Department of Health) started the School Dental Care Service to provide oral health care to the primary school children in Hong Kong. In 1989, the then Medical and Health Department set up an Oral Health Education Unit to fulfil Government's objective of promoting oral health to the community. Back in 1980, there were 638 registered dentists, and in 2001, the number increased to 1 663.

The effects from these important developments, no doubt, have collectively contributed to some of the positive changes over the years.

What is to be expected in the oral health of the Hong Kong population in the years to come ?

The oral health indices in the age groups examined in this survey are shown in Table 8.7. Care should be taken not to view this as a definitive trend for future development. However, looking at the findings tabulated in Table 8.7, the future does appear somewhat promising. This optimistic note starts with the expected and continued improvement in prevalence of tooth decay, as the post-fluoridation generation with a lower level of tooth decay progressively lives through the sequential age spectrum. The fact that 99.2% of Hong Kong's adults were found to have ≥ 20 teeth in 2001, it would be most unlikely to expect a downward spiral to the 8.6% (the proportion of NOP with total tooth loss based on 2001 findings) with total tooth loss, for these adults who will become Hong Kong's future NOP in 30 years' time. It would also be hard to imagine having almost every adult affected by tooth decay 30 years down the road, when only 37.8% of the 12-year old students had experienced tooth decay in 2001.

Table 8.7
Oral health indices in 2001 according to age groups

	5	12	35-44	NOP	IOP
% With no teeth	N/A	N/A	0	8.6	27.2
% With ≥ 20 teeth	N/A	N/A	99.2	49.7	24.1
dmft / DMFT	2.3	0.8	7.4	17.6	24.5
% dmft / DMFT	51.0	37.8	97.5	99.4	99.8
dt / DT	2.1	0.1	0.7	1.3	2.6
% dt / DT	49.4	6.9	32.0	52.9	55.2
Mean number of teeth with untreated root decay	N/A	N/A	<0.05	0.3	0.4
% Untreated root decay	N/A	N/A	3.4	21.5	22.7
% with bleeding gum	N/A	35.0	3.4	1.7	0
% with calculus	N/A	59.5	49.9	43.0	49.8
% with gum pockets	N/A	N/A	46.0	55.3	49.9

N/A=not applicable

However, there is no room for complacency nor false sense of security either. From Table 8.7, it can be observed that as a whole, the level of tooth decay and gum disease had continued to increase with age. The presence of gum inflammation and calculus deposits found at age 12, was an early indication of risk detection in the development of gum disease, while tooth decay on the other hand, was of a lesser problem from age 12 to adulthood, judging from the low level of tooth decay at age 12 in 2001. There were also early warning signs on the emerging problem of root surface decay, as seen in the adult and older persons age groups. With the increasing trend of having teeth retained in the mouth for a longer span in the lifetime, such exposure of root surfaces due to loss of gum attachment, and its risks to tooth decay, make root surface decay a threat and problem to watch out for in the future adults and older persons groups. The fact remains that oral health problems detected early on in life would gradually progress and build-up, unless preventive efforts are enhanced, early intervention provided and maintenance care is sustained.

Although the oral health of the Hong Kong population compared with those of other countries was relatively good, **both tooth decay and gum disease are still imminent threats to the oral health of the local population**. To reduce the undesirable consequence of tooth loss, it is essential to prevent the onset of new diseases, and to prevent the deterioration of existing diseases. **Prevention is the key to better oral health**.

How did the Hong Kong population fare in terms of oral health care maintenance?

Simple, safe and proven measures to prevent tooth decay and gum disease and improve oral health, are available for everyone to adopt. Conscious and repeated efforts and partnership of the dental profession and the community are required. At the individual level, it has been accepted by the dental profession worldwide that optimal oral health may be achieved by adopting an appropriate life-style.

Life-style conducive to optimal oral health

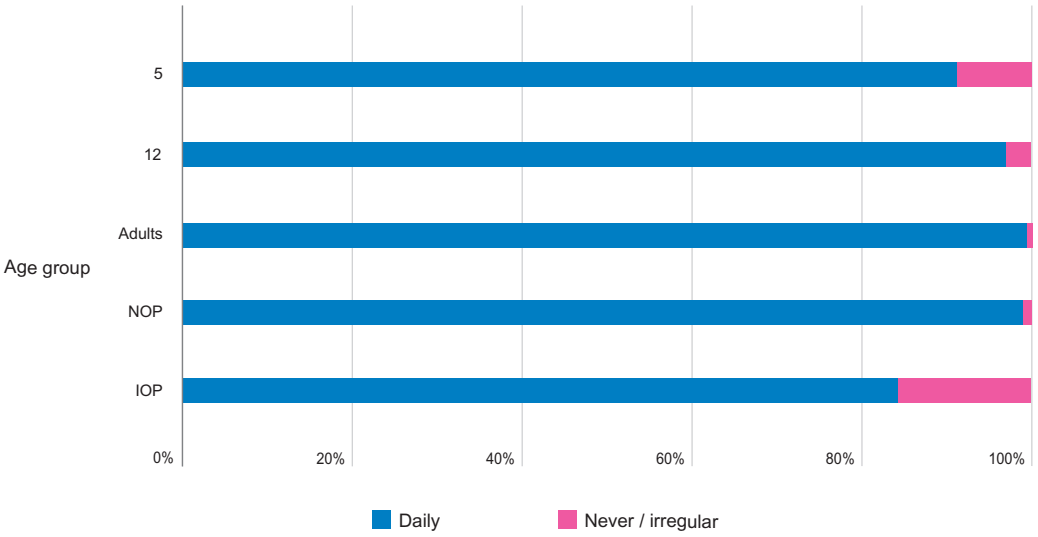
- **Perform teeth cleaning preferably twice everyday, by proper toothbrushing with fluoride-containing toothpaste and by appropriate interdental cleaning.**
- **Make use of oral health care services, by seeking regular dental checkup for prevention, early detection and management of oral health problems.**
- **Adopt a good dietary habit by reducing snacking frequency, especially sugar-containing snacks, and by seeking medical advice for special dietary requirement, one which also compliments oral health needs.**
- **Refrain from smoking, or quit smoking if you are a smoker, and reduce the consumption of alcohol.**

Teeth cleaning - toothbrushing

Toothbrushing was found to be a social norm. The habit of daily toothbrushing had been established at a young age. It can be observed from Figure 8.1 that except for the IOP group, over 90% of individuals of all the age groups reported the habit of daily brushing.

The regular use of toothpastes was common in both the 5-year old children (83.9%) and 12-year old students (94.5%) groups. Toothbrushing with toothpaste was almost universally reported among those with daily toothbrushing habit.

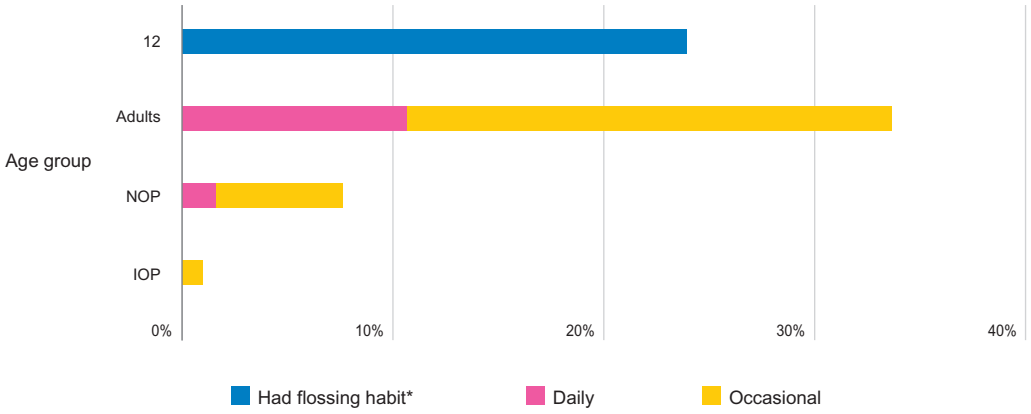
Figure 8.1
Reported toothbrushing habit of all age groups



Interdental cleaning - flossing

The reported flossing habit in all age groups (not applicable to the 5-year old children) are shown in Figure 8.2. The habit of flossing was still far from common for Hong Kong's population as a whole.

Figure 8.2
Reported flossing habit of all age groups@



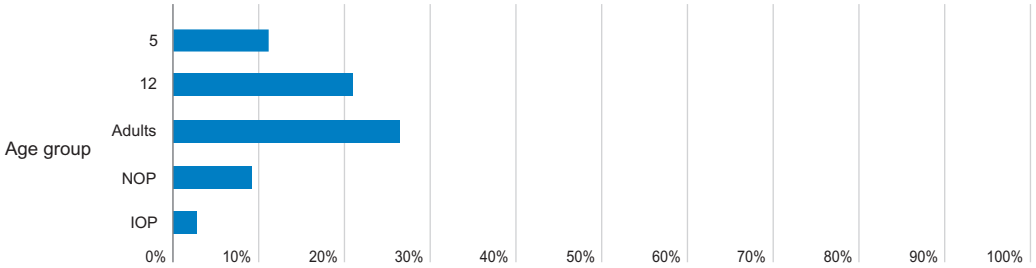
* Frequeucy of flossing unknown
@ Not applicable to 5-year old children

The purpose of proper teeth cleaning is to remove the dental plaque daily, and prevent its build up for it to cause damage to the teeth and gums. Mechanical cleaning is the only effective means to remove dental plaque. For toothbrushing to be effective in young children, parental assistance has to be provided. Toothbrushing, if properly performed, is effective for removing dental plaque on most tooth surfaces except the tight areas between adjacent teeth (interdental). Hence, toothbrushing is best complemented with proper interdental cleaning.

Usage of oral health care services - regular dental checkup

The proportion of people who claimed to have the habit of regular dental checkup is shown in Figure 8.3. Regular checkup was not at all a common practice. Although adults had the highest proportion with reported checkup habit, there were almost three out of four adults who still did not seek regular dental checkup.

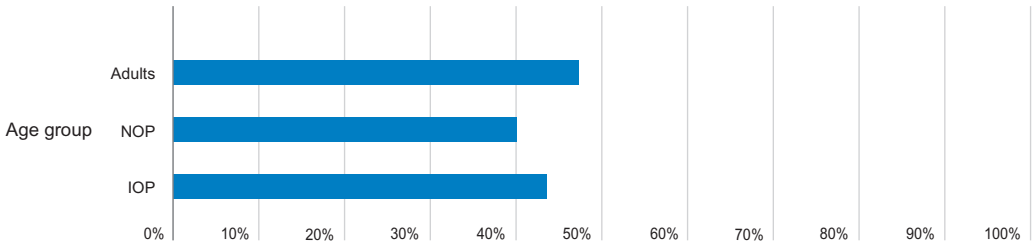
Figure 8.3
Reported habit of regular dental checkup of all age groups



Usage of oral health care services when there were perceived severe oral health problems

It was found that less than half of the adults and older persons with perceived severe oral health problems visited the dentist. (Figure 8.4) The proportion of people who did not seek attention was even higher for other "milder" perceived oral health problems.

Figure 8.4
Reported behaviour in seeking oral health care services when there were perceived severe oral health problems



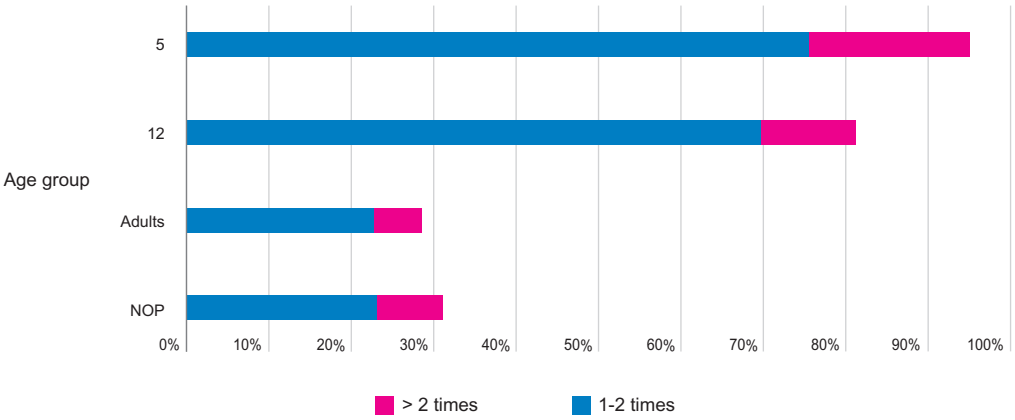
Regular dental checkup is not just about screening to detect the presence of disease. Its primary aim is to fortify the preventive aspects of care to prevent the onset of oral diseases. During regular checkup, family dentists can make appropriate personal advice on individual life-style and behaviour, give personal and individual instructions on the skill of teeth cleaning, and monitor the effectiveness of such home care behaviour, all in the name of improving oral health. It is evidence-based that one of the most effective ways to ensure proper dental plaque removal was for people to receive simple but individualized advice from dental personnel on a regular and repetitive basis[11]. It has also been shown in a local exploratory study that the usage rate of dental floss was significantly higher among regular dental visit attenders than among the irregular counterparts[12].

During dental checkup, family dentists can also provide preventive treatment such as fluoride application and fissure sealants. The diagnosis of diseases and the provision of curative treatment should not be the main thrust of the overall aim of regular dental checkup.

Dietary habit in relation to oral health - snacking

The reported snacking habit in all age groups are shown in Figure 8.5. Snacking habit was found to be more common among the younger population, and the proportion of the 5 and 12-year olds who snacked more than twice a day, was comparatively higher than the adult and older persons groups.

Figure 8.5
Reported snacking habit of all age groups

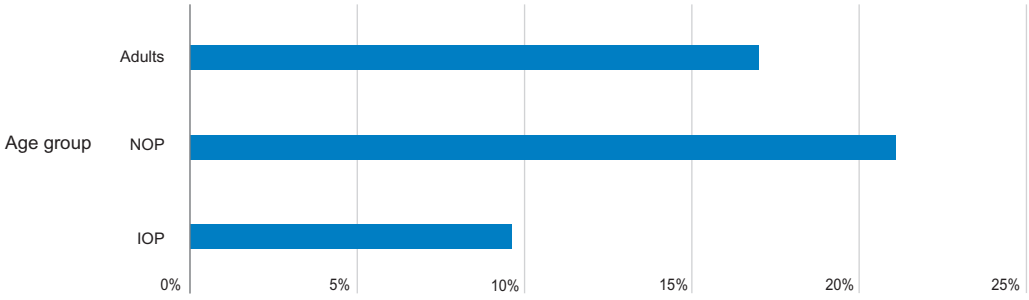


Diet is a complex issue with various considerations such as nutrition, content and frequency of food intake, which are important to both oral health and general health. In the context of oral health, the significant aspects of diet are the sugar content of food and the snacking frequency. Any food substances containing sugar, either artificially added or naturally occurring (such as lactose in milk and other sugar in fruits) can cause tooth decay. It is thus important to reduce the frequency of such food intake (including snacks, milk and fruits) as far as possible. Promotion of a healthy eating habit can be carried out on a community basis as well as individually. Dentist, ancillary dental personnel, doctor, and other health care workers, have roles to play in motivating their clients to adopt healthy eating habits.

Smoking habit

The reported smoking habit in the adult and older persons groups are shown in Figure 8.6. Smoking habit was relatively more common among NOP compared with the adults and the IOP.

Figure 8.6
Reported smoking habit
of the adult and older persons groups



Smoking is associated with a higher risk of developing destructive gum disease and oral cancer. Smoking is also a contributory factor to bad breath, not to mention the unsightly extrinsic stains on tooth surfaces from tobacco. The avoidance of tobacco use is an important factor in promoting general health and oral health.

There is room for improvement in the current life-style and behaviour conducive to optimal oral health.

Toothbrushing was the only oral health habit that was mostly practised, while interdental cleaning by flossing was not commonly practised. Effective teeth cleaning practices needs to be reinforced. Dental plaque was commonly found among the 5-year old children and 12-year old students. Calculus was present in nearly 60% of the 12-year old students. These were indications that the toothbrushing practice was not adequate in removing dental plaque. Only a small number of parents regularly helped their 5-year old children when they brushed their teeth.

The habit of seeking regular dental checkup was not common in the population. Of all the groups surveyed, the adults had a relatively higher percentage who had the regular dental checkup habit. Still, almost three out of four adults did not seek regular dental checkup. Short of this prescribed habit, the opportunities for professionally applied prevention therapy, as well as early diagnosis and early intervention would not be possible. Furthermore, the delay in seeking professional care in case of oral health problems may lead to the progressive deterioration of existent tooth decay and gum disease.

Frequent snacking and smoking are also risk factors. Of all age groups surveyed, snacking habit was more common among the 5 and 12-year olds. Smoking habit was reported by 17% of adults and 20% of NOP.

What were the perceived methods to prevent tooth decay and gum disease ?

Data from the children and student groups were collected by self-completed questionnaires where multiple choice answers had been provided. Data from the adults and older persons groups were collected through structured interviews and no choice in answers had been provided. Hence, attempts at directly comparing the knowledge level of these groups ought to be guarded at best.

Except for the 5-year old children themselves, the students, their parents, adults and older persons, were asked about their perceived methods of preventing tooth decay and gum disease, and the results are summarized in Table 8.8 and Table 8.9.

Table 8.8
Three most commonly perceived methods to prevent tooth decay as reported by different age groups

12-year old students	Parents of 5-year olds	Parents of 12-year olds	Adults	NOP
Toothbrushing in morning & night	Toothbrushing in morning & night	Toothbrushing in morning & night	Proper cleaning of teeth	Proper cleaning of teeth
Use fluoride toothpaste	Proper toothbrushing	Proper toothbrushing	Rinsing with water / salt water	Rinsing with water / salt water
Reduce consumption of candies	Reduce consumption of candies	Reduce consumption of candies	Reduce consumption of candies	Reduce consumption of candies

Table 8.9
Two most commonly perceived methods to prevent gum disease as reported by different age groups

12-year old students	Parents of 5-year olds	Parents of 12-year olds	Adults	NOP
Toothbrushing in morning & night	Toothbrushing in morning & night	Toothbrushing in morning & night	Proper cleaning of teeth	Proper cleaning of teeth
Avoid smoking	Proper toothbrushing	Proper toothbrushing	Avoidance of certain food	Avoidance of certain food

The commonly given responses for all age groups regarding the prevention of tooth decay were *toothbrushing in the morning and at night*, and the *reduction of consumption of candies*. It was encouraging to note that the knowledge of the 12-year old students were better than the adults, as more of them pinpointed the *use of fluoride toothpaste* as an effective means to prevent tooth decay.

For gum disease, the knowledge was found to be lacking, as a substantial proportion of the adults and older persons replied *don't know* (noting that they were not provided with any choice in answers). For those who responded, the commonly reported methods for prevention of gum disease were *toothbrushing* and *avoidance of certain food* (related to traditional Chinese medicine beliefs). Of all the age groups surveyed, it was encouraging to note that the 12-year old students cited *avoid smoking* as one of the other most commonly perceived methods to prevent gum disease.

Factors related to traditional Chinese medicine beliefs had been mentioned in relation to tooth decay and gum disease. Problems such as loosening of teeth were considered to be an expression of the imbalance between "yin" and "yang" (regarded as the two vital forces in the universe in traditional Chinese medicine) in the kidneys, and the remedy was to take nutritious food to strengthen and balance kidney function. Gum bleeding or swelling, and bad breath were believed to be caused by intense heat or "flaring fire" in the stomach, and the cure was to take herbal tea to "cool down the fire"[13]. The traditional Chinese medicine beliefs may have explained why the *avoidance of certain food* had been reported by adults and older persons in the prevention of gum disease.

The knowledge on ways to prevent tooth decay and gum disease were mostly mainstream ones. Other relevant factors in the prevention of these diseases, such as *reduce frequency of intake of food or drinks* (snacking), *avoid smoking*, and *seek regular checkup*, were not among the most commonly perceived methods cited. Except for the 12-year old students, where the *use of fluoride toothpaste* and *avoid smoking* were the commonly cited methods to prevent tooth decay and gum disease, respectively.

How did the people perceive the seeking of oral health care services ?

In the evaluation of people's attitudes towards oral health care services, it was observed that a relatively large proportion (52.9% adults, 64.9% NOP & 42.3% IOP) of respondents chose the response that *dentists are more concerned on treatment than to teach people how to prevent dental disease*.

In general, the adult and older persons groups had a high confidence on the dental profession, in terms of *their competence at solving oral health problems*. However, there were still concerns among these two groups on issues like the *worry of contracting contagious disease* and *pain* and *discomfort in dental treatment*. Furthermore, 27.9% adults and 17.1% NOP worried that *dentist may perform treatment that was unnecessary*.

The *uncertainty of cost* / *worry of high cost* had always been mentioned as one of the reasons for not visiting the dentist. There was an apparent lack of knowledge on the cost of oral health care, especially among the NOP. 6.5% of adults and 29.5% of NOP could not give an estimate of the cost of a dental checkup and professional cleaning (scaling). Among those who could give an estimate, the median estimate cost in both the adult and NOP groups was $300.

There was an expression of doubt on the value of oral health care services compared with the cost as shown by 51.7% adults and 37.6% NOP. The problem of cost of oral health care services might be the lack of price information, or the affordability of services, or it might well be the lack of appreciation and value placed on the cost of care. More in-depth evaluation is required in this respect.

Dental schemes might be a consideration to remove the cost barrier by removing the uncertainty of cost or actually reducing the cost, as the coverage by dental schemes was found to be associated with better usage of oral health care services in all age groups. It should be noted that even with dental schemes coverage, around one-third of people in all age groups still did not seek oral health care services.

Many respondents did not perceive dentists as being associated with prevention.

Coverage by dental schemes was found to be associated with better usage of oral health care services. Whether the coverage by dental schemes was the cause of the more favourable usage of oral health care services could not be ascertained by this survey. Even with coverage, other barriers might still deter some people from seeking oral health care services.

Pain was found to be an important determining factor in the oral health care seeking behavior in all age groups. The absence of pain was often interpreted by students, parents, adults and older persons as a sign of good oral health and hence, did not warrant dental checkup. When their perceived dental treatment need was compared with the assessed need based on the survey criteria, it was found in all age groups that most of the preventive and curative treatment needs had not been perceived.

There was the expected disparity between the perceived oral health care need and the assessed need. It was generally observed that the assessed oral health care need was higher than what was perceived. In other words, in the absence of pain or discomfort, people did not perceive that they had any oral health care needs, when in fact they needed preventive and/or curative treatment.

Even in the presence of discomfort, it was found that the seeking of care was often delayed. It was generally perceived that the discomfort would relieve by itself. People tended to ignore pain and discomfort, or attempted to manage the discomfort by themselves. Similar results were obtained from another study, where majority of the people who experienced various types of dental pain still did not visit the dentist. A lot of them had tried to use various alternative methods, including Chinese herbs, over-the-counter medication, acupuncture, homeotherapy, and aromatherapy, to control their pain, and these methods were reported to be effective by the majority[14].

Tooth decay and gum disease are usually described as **silent epidemics**, since they are progressively destructive without obvious symptoms during its early stages of development, nor are the conditions perceptible by the affected person. When oral health problem is perceived, the condition is usually in the moderate or advanced stage of tissue destruction. Thus, it has been advocated by the dental profession that individuals should seek regular dental checkup, to detect disease early, and to initiate intervention early, in order to minimize the extent of the damage.

Minor but perceptible signs are usually tell-tale signs of underlying problems. Tooth sensitivity may be a sign of tooth decay, or exposed root surfaces. Bleeding gums may be a sign of gum inflammation. More apparent signs and symptoms such as mobile teeth, abscess and severe pain are already an indication of advanced stages of tooth decay or gum destruction. When an individual has perceived oral health problems, professional care is already urgently required.

There were barriers to the demand for oral health care services. The problem of cost of oral health care services may be the lack of price information, or the affordability of services, or it may well be the lack of appreciation and value placed on the cost of care. More in-depth evaluation is required in this respect. Among adults and NOP, there were some who worried about issues like *contracting contagious disease and pain* and *discomfort in dental treatment.* It was not conclusive as to whether the problem of cost was the affordability factor or its perceived value.

What was the people's attitude towards tooth loss ?

More than one-third of the parents had opined either to leave any decayed teeth in their children's mouth untreated, or have them removed. The removal of the offending tooth appeared to be an expedient solution to oral health problems, as observed among some of the adults and more so among the NOP.

It was observed among the NOP where the level of tooth loss was associated with more negative impact on daily life, that the aspect affected was on the eating function. Where the problem of tooth loss was more prominent among the IOP, disturbance in speech and psychological discomfort due to dissatisfaction to appearance were also raised.

The removal of teeth was a common solution to teeth-related oral health problems especially among the adults and older persons groups.

Tooth loss was considered by most as a natural eventuality in life. To 41.2% adults, 62.7% NOP, and 70% IOP, tooth loss was considered as a part of aging.

Tooth loss at old age can be avoided, and actions to achieve this must start as early as possible. The pan-population view of the survey findings suggested that tooth loss at old age was most probably the result of years of lack in appropriate oral health care during their younger stages of life. The historical comparisons showed that the degree of tooth loss in Hong Kong has been decreasing. Looking into the future, funther reduction in tooth loss and better improvement in oral health are still possible. Individuals in our community may still improve their oral health by adoption of a life-style conducive to optimal oral health.

Tooth loss at old age is not a natural eventuality in life. Attaining optimal level of oral health requires conscious efforts by each individual, along with the concerted efforts of the Government, the dental profession, the dental school, and the community as a whole. **Prevention holds the key to good oral health, which is essential to everyone's personal health and well-being**.