NATIONAL ORAL HEALTH SURVEY

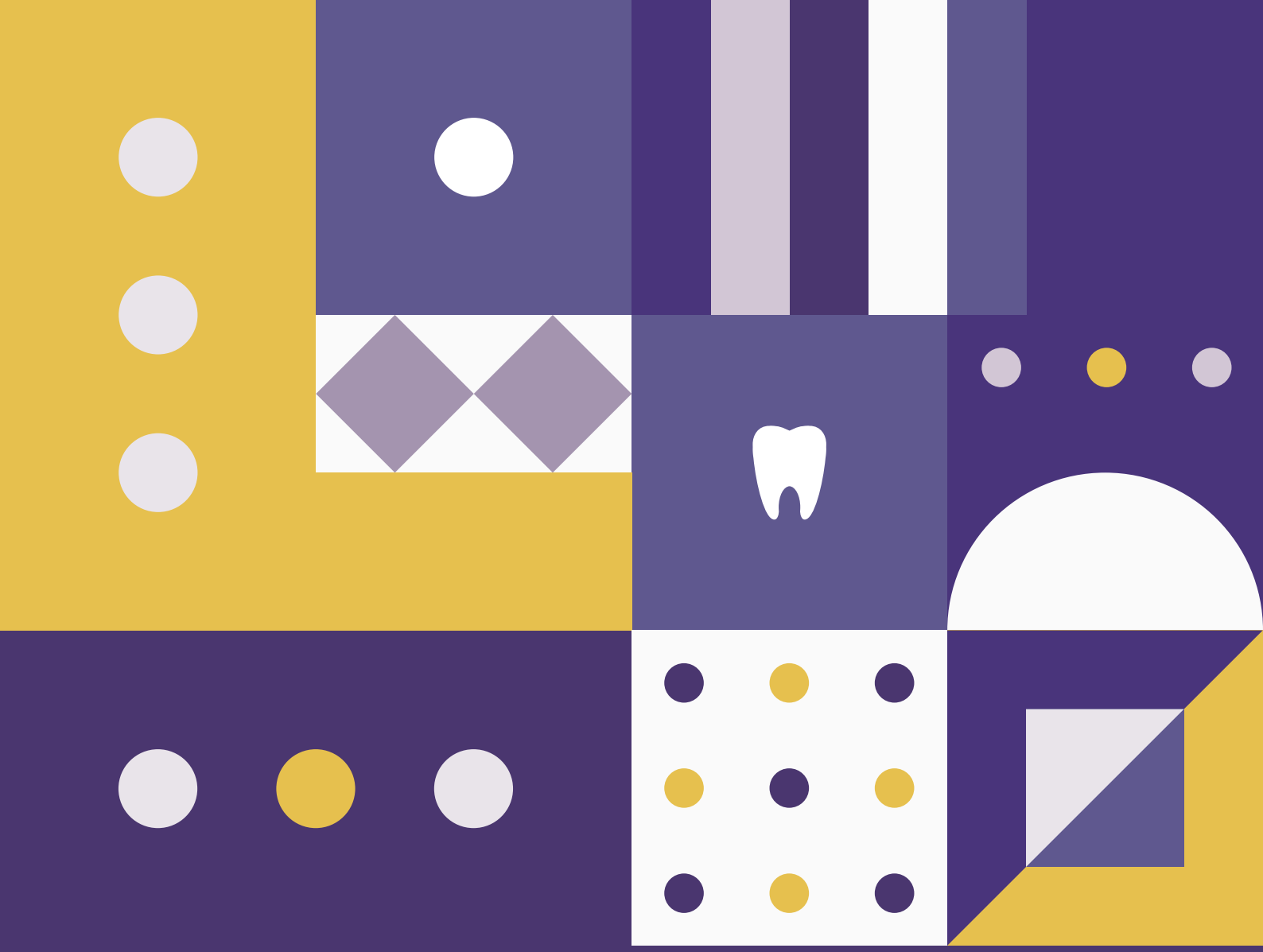
BRUNEI DARUSSALAM 2014 - 2017

A joint effort between the Ministry of Health, Brunei Darussalam and the Australian Research Centre for Population Oral Health at the University of Adelaide, Australia.

كمنترين كصيحتن
KEMENTERIAN KESIHATAN
MINISTRY OF HEALTH

ARCPOH
Australian Research Centre for POPULATION ORAL HEALTH

ADULT PHASE



Brunei Darussalam National Oral Health Survey 2014-2017

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Executive Summary

The 2014–17 National Oral Health Survey of Brunei Darussalam of adults was a collaborative project between the Ministry of Health, Brunei Darussalam and the Australian Research Centre for Population Oral Health at The University of Adelaide, Australia. The Survey was a cross-sectional stratified study of adults in Brunei Darussalam and comprised a questionnaire about sociodemographic and socio-economic factors, health behaviours and dental attendance as well as a dental examination which assessed oral mucosal lesions, missing teeth, denture wearing, prevalence and severity of dental caries (decay), various measures of periodontal disease and tooth wear. A total of 907 adults completed all components of the Survey ranging in age from 17 to 87 years. The data was cleaned and weighted to represent the adult population of Brunei Darussalam.

Dental caries (decay)

Less than 10% of adults had no experience of dental caries. This percentage was higher in the 16–24 years age group (16.1%) and the oldest age group (13.5%). Nearly two-thirds of the adult population had untreated dental caries with an average of over four tooth surfaces or two teeth affected. One in eight adults aged over 55 years had untreated root decay. On average, adults had three filled teeth and three teeth missing because of disease. Caries was related to age, with increasing numbers of tooth surfaces and teeth affected with increasing years. There were also some gender differences with females having more filled surfaces and fewer coronal and root tooth surfaces with untreated caries. There were a few differences by educational attainment with those with less education having more untreated caries and more missing teeth than those in the highest education group. There were few differences by ethnicity, but Chinese adults had more missing teeth in the older age groups.

Periodontal disease

Nearly 30% of Brunei adults had periodontal disease according to the US Centre for Disease Control and the American Periodontal Association criteria. Over half of adults had 4+mm of clinical attachment loss. The percentage of people affected increased with increasing age.

Dental attendance

Over 37% of all adults had made a dental visit in the previous 12 months with no differences between population groups. Among those who had not made a dental visit for two or more years, over half had no perceived need; difficulty in taking time off work was the second most common reason. About 15% reported that they experience moderate to extreme fear or distress when going to the dentist.

Perception of oral health

Over 40% of all age groups rated their oral health as fair or poor, however there were no differences by age, educational level, family income or ethnicity.

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Foreword

A word from the Minister of Health

Assalamualaikum Warahmatullahi Wabarakatuh

بسم الله الرحمن الرحيم

Praise to Allah Subhanahu Wata'ala, blessings be upon our Prophet Muhammad Sallalahu Alaihi Wasallam and his relatives, friends and loyal followers. We are grateful to Allah Subhanahu Wata'ala that the Department of Health Services, Ministry of Health, has published a report on the National Oral Health Survey carried out from 2014-2017.

The Department of Dental Services, Ministry of Health, Brunei Darussalam produced the Oral Health Agenda 2008 – 2012 (PEARL) that aimed at improving and maintaining oral health of the population of Brunei Darussalam, by adopting strategies towards meeting their oral health needs.

Oral Health is an essential part of general health that affects overall well-being and quality of life. Oral diseases are among the most common non-communicable diseases in the world, and they not only impact systemic health, but also become a financial burden to both the individual and to the Health Services. It should be emphasized, however, that most oral diseases can be prevented and successfully treated. Hence, the Ministry of Health recognises the importance of reducing the burden of oral diseases through oral health promotion and by improving the oral health of the population of Brunei Darussalam. With the goal of enhancing general health, the Dental Services strives to achieve its mission to provide effective, equitable, affordable, accessible and sustainable oral health care services. This is very much in line with the Ministry of Health's Vision 2035: "Together Towards a Healthy Nation,"

The National Oral Health Survey was one of the recommendations of the Oral Health Agenda as part of the Dental Strategic Plan. The aim of the survey was, among other things, to provide vital, valid and reliable data on the oral health status of children and adults in our population. The survey was also to serve as a scientific tool to evaluate the Oral Health Agenda (PEARL 2012) and to assess the effectiveness of its strategies in improving the oral health of children and adults in the country.

This report will provide valuable insight into the Oral Health status in Brunei Darussalam and, therefore, be a useful reference for planning future strategies and programmes to enhance the efforts in improving Oral Health of the country.

Lastly, I would like to take this opportunity to congratulate the Department of Dental Services for producing this report, especially the committee members who have put in great time and effort towards this publication.

وبا الله التوفيق والهدايه
والسلام عليكم ورحمة الله وبركاته

Dato Seri Setia Dr Haji Md Isham bin Haji Jaafar
Minister of Health
Brunei Darussalam

A word from the Director of Dental Services

The National Oral Health Survey (2014-2017) was conducted by the Department of Dental Services in collaboration with Australian Research Centre for Population Oral Health (ARCPOH), University of Adelaide in order to serve as a scientific tool to evaluate the Oral Health Agenda 2008-2012. The nationwide study of oral health covered a nationally representative sample of the population, assessing their oral health behaviours (including dental visits) and examining oral diseases especially dental caries and periodontal disease.

The wealth of findings from the NOHS are invaluable to the Department of Dental Services particularly in identifying areas for priority action, in evaluating the effectiveness of current programmes, and to help plan and guide strategies for future programmes and policy, in alignment with the current situation and oral health needs of the population. Data from the Survey will also provide useful insight on the trends of oral diseases amongst children and adults in Brunei Darussalam, which will be vital in providing a better understanding in oral health issues and guiding preventive measures in order to reduce the oral disease burden. Additionally, the information collected from this survey will also contribute significantly to the existing body of population data gathered from other surveys to date, allowing cross comparisons over time and for different target groups. Furthermore, beyond this Report, the data gathered will also offer invaluable opportunities for research and analysis allowing us to gain a better understanding with regards to oral diseases in Brunei Darussalam and refine our management approaches.

On behalf of the Department of Dental Services, I would like to convey our gratitude and appreciation to the Honourable Minister of Health for his continuous support and also wish to thank the Permanent Secretary and the Director General of Medical Services for their invaluable advice and expert guidance throughout the Survey. My heartiest congratulations and thank you to the NOHS taskforce and all involved for their hard work, time and dedication from the planning of the Survey to the final publication of this Report. Lastly, I would also like to sincerely thank each and everyone of the survey participants and their parents, for whom without them this Survey would not have been a success.

Dr Kok Ei Chuen
Acting Director of Dental Services
Brunei Darussalam

Acknowledgements

The Ministry of Health, Brunei Darussalam would like to thank the following staff of the Australian Research Centre for Population Oral Health at the University of Adelaide for their contribution in the preparation of the Brunei Darussalam National Oral Health Survey report 2014-2017:

Professor Kaye Roberts-Thomson, Associate Professor Karen Peres, Sergio Chrisopoulos, Anne Ellershaw, Carmen Koster, Dr Xiangqun Ju, Ms Ali White

Funding source

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Introduction

Oral health is a significant aspect of overall health which can have a major impact on quality of life. Poor oral health can cause pain, difficulty in sleeping, delayed speech development in children, dental and facial anomalies, difficulty eating certain foods, and embarrassment. Much of this impact is preventable with appropriate public health policies for the community, positive health behaviours by individuals and timely (early) and relevant treatment interventions.

The Oral Health Agenda 2008–2012 of Brunei Darussalam recognises the fact that oral health is fundamental to overall health, well-being and quality of life. Oral disease has a multifaceted impact on an individual's health and well-being with wide-ranging effects that result in high use of Health Services and personal costs. These financial impacts from these oral diseases are considerable. Hence, the Ministry of Health of Brunei Darussalam recognises the importance of reducing the burden of oral diseases and promoting and improving the oral health of the population of Brunei Darussalam. This will not only enhance their general health but will allow the Department of Dental Services to continue providing a sustainable, accessible and acceptable level of care to the people.

Various goals, objectives, rationale and expected outcomes and benefits of the above in addition to other strategies to improve the oral health status of the population, were documented in the Oral Health Agenda 2008–2012. This Agenda also recommended that an Oral Health Survey should be undertaken. It is therefore very timely to conduct such a survey which will, among other things, provide vital, valid and reliable data on the oral health status of children and adults. The survey will also serve as a scientific tool to evaluate the Oral Health Agenda of Brunei Darussalam.

The Ministry of Health, Brunei Darussalam in collaboration with the Australian Research Centre for Population Oral Health (ARCPOH) at the University of Adelaide, conducted a nationwide study of oral health. This study aims to describe the oral health status of the child population in Brunei Darussalam and to address a number of core questions of potential impact on children's oral health.

Aim

To provide accurate and up-to-date information on the oral health of adults in Brunei Darussalam.

Methodology

Methodology

Study population

The target population for the Adult National Oral Health Survey comprised of adults aged from 16 years or older of both genders registered in the Brunei Darussalam Healthcare Information Management System (BruHIMS) and living in the four districts of the country: Brunei Muara, Tutong, Belait, and Temburong.

Sample size and sampling process

The sample was estimated by maximising the sample size required for different oral conditions to be examined and taking into account a representative sample size of adults aged 16 years or older as well as a representative sample for those aged 35–44 years. The following parameters were considered: prevalences from 6% (periodontal pocket and adults aged 15–34 years) to 98.0% (dental caries in adults 45 years or older), confidence interval of 95%, sampling error of 4.0 percentage points, a design effect of 1.34 (due to proportional sample distribution according to districts and age groups) and the account for 50% non- response. The total minimum sample size was estimated equal to 4,000 adults (n = 3,000 for adults aged 18–34 years plus 45 years or older and n = 1,000 for adults aged 35–44 years).

To draw a national representative sample of adults from Brunei, a simple random sample design was undertaken. All subjects registered with BruHIMS, approximately 160,000, were eligible to participate in this study with the probability proportional to size of each district and age group. Foreign residents and adults living in areas without access by land were excluded from the sampling frame. A list of adults from every district was obtained and participants were selected by giving an equal probability to be selected for each subject of the frame. A separate list of adults aged 35–44 years was also provided in order to run a similar sample selection and oversample this specific age group (sample frame stratified by age group 35– 44 years). A systematic sampling was used to select the potential participant. All adults received a number and the first adult was selected at random. The other adult was selected through the range k (k = N/ n) where N equals the total number of adults in each district and n equals the sample size obtained. Due to a low response rate, adults from the same household as selected participants who accompanied participants to the dental clinic were invited to participate.

Weighting Brunei data

The BruHIMS database was used as the sampling frame to select a sample of persons aged 16 years or older. The database was stratified by district and age group and a simple random sample of persons was selected from each strata. Different sampling fractions were applied across strata to achieve specified sample sizes at the district and age group level.

Weighting of the Brunei examination data consisted of two phases. The first phase calculated an initial weight which was defined as the inverse of the stratum sampling fraction. As examination participation rates varied by Brunei district, gender and age group, the second phase of weighting adjusted the initial weights to ensure the final weighted sample distribution was consistent with the Brunei population distribution. Population counts for persons aged 16 years or older were sourced from the 2011 Population and Housing Census. Persons were assigned to a district by gender by age group weighting cell, which was then linked to the corresponding population count to derive the final weight. The age groups were defined as 16–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years and 65 years or older.

The formulae used to calculate the weight for each person is provided below:

$$w_i = \frac{N_{d,g,a}}{\sum_{i \in d,g,a} h_i} * h_i$$

where:
i = person
d = district (Tutong, Temburong, Brunei Muara, Belait)
g = gender (male, female)
a = age group (16–24, 25–34, 35–44, 45–54, 55–64, 65+)
h_i = initial weight for person i
$N_{d,g,a}$ = population count for district (d), gender (g), age group (a)

Where there was an insufficient sample in a district by gender by age group weighting cell, two consecutive age groups were combined to derive the weights.

Population estimates and corresponding standard errors were derived using weighted data. District level stratification with replacement estimation was used to calculate the standard errors.

Socio-demographic questionnaire

The questionnaire consisted of questions that were primarily based on questions that had been tried and tested in the National Dental Telephone Interview Survey of Australia, which was conducted by the Australian Research Centre for Population Oral Health (ARCPOH).
The questionnaire was finalised in discussions with the Survey Team in Brunei Darussalam and translated into Brunei Malay.

The main aim of the questionnaire was to determine patterns of service use and to identify factors contributing to the oral health status of the children including use of oral health services and general health behaviours. Questions were therefore designed to measure patterns of service use, perceptions of oral health, oral health knowledge, health behaviours and socio-economic information.

Questionnaires were distributed to selected participants by mail accompanied by a consent form, an information sheet and appointment for an oral examination. A copy of the questionnaire can be seen in the Appendix.

Oral epidemiological examination

Detailed oral examinations were carried out by dental practitioners who undertook training in Survey procedures. Examinations were conducted onsite in regional health centres using portable dental equipment. The examiners followed a standardised protocol. The extent and severity of the following oral diseases and conditions were investigated:

- Oral mucosal conditions
- Denture wearing
- Dental caries at tooth surface level (dmfs/DMFS)
- Simplified Dental Debris Index
- Periodontal disease (gingival recession, periodontal pocketing and bleeding) at three sites per tooth
- Tooth wear on lower incisors

During the data collection, replicate examinations were conducted to evaluate the consistency of the findings relative to a Gold Standard examiner. Each examination team comprised a dental examiner and a data recorder. The selected teams undertook a three-day training program conducted by Professor Kaye Roberts- Thomson and Associate Professor Karen Peres, oral epidemiologists from the ARCPOH. The examination team received manuals outlining the protocol. The training consisted of didactic teaching using power point slides, a DVD and group discussions. This was followed by practising the procedures on volunteers under supervision. Difficult decisions were discussed at the end of each session. This facilitated calibration of the examiners.

The participants were examined in a standard supine position on portable dental chairs with an overhead light. Examiners used an intra-oral mirror which has its own light source. A periodontal probe was used to remove plaque and debris for the caries examination. Sharp explorers were not used and assessment of carious lesions was visual. A periodontal probe with 2mm markings was used to measure gingival recession and periodontal pocketing for the periodontal examination. No radiographs were taken.

Data recording was undertaken directly onto a laptop computer using a Microsoft Access program designed for the purpose. Recorders were trained in the use of the program during the examination training sessions.

Data analysis

The data was collected and directly entered into a computer using the access data base. Analyses were performed using the SAS/SPSS statistical package. The data were cleaned and managed for the missing values. Oral health status data were analysed to determine the association with socioeconomic factors, habits, diet and oral hygiene behaviours. Univariate and bivariate analyses were used to report and compare oral health by demographic and visiting values. Percentages of the population with particular conditions and mean values were reported.

Ethics approval

Ethics approval was obtained for the Survey from the University of Adelaide Human Research Ethics Committee (RM: 000002080L, Project number: H-2015-168) and the Medical and Health Research and Ethics Commitee (MHREC), Brunei Darussalam.

Results

Results

Table 1 presents the characteristics of the sample (after weighting) compared to the Brunei population and the BruHIMS data.

Table 1: Sample characteristics

Characteristics	Sample		Brunei population 2011		Patient (BruHIMS)	
	n	Weighted % (95% CI)(a)	n	%	n	%
Age						
16–24	145	22.5 (19.0;26.4)	66,036	23.0	20,441	12.7
25–34	169	27.1 (23.4;31.1)	76,081	26.5	45,870	28.6
35–44	254	22.3 (19.5;25.3)	63,918	22.3	39,998	24.3
45–54	162	15.5 (13.0;18.3)	44,391	15.5	26,747	16.7
55–64	96	8.3 (6.6;10.4)	22,562	7.9	17,317	10.8
65+	81	4.4 (3.5;5.6)	13,868	4.8	11,241	7.0
Sex						
Male	391	51.7 (47.7;55.6)	148,166	51.7	–	–
Female	516	48.3 (44.4;52.4)	138,690	48.3	–	–
District						
Brunei-Muara	435	70.7 (69.2;72.3)	202,802	70.7	81,059	72.5
Belait	164	16.1 (14.7;17.6)	46,145	16.1	17,903	16.0
Tutong	154	11.0 (10.3;11.7)	31,563	11.0	8,418	7.5
Temburong	154	2.2 (2.1;2.4)	6,346	2.2	4,435	4.0
Total	**907**	**100.0**	**286,856**	**100.0**	**111,815**	**100**

(a) 95% CI = 95% confidence interval for estimated percentage

Additional details of the sample are shown in Tables 2 and 2a.

Table 2: Additional sample characteristics

Measures	Age (years)	Sex (% Male)	Diabetes	Smoking	No. Cigarettes per day*
Min	17	–	–		1
Max	87	–	–		25
Mean	37.2	–	–		7.9
(95% CI)	36.1;38.2				6.6;9.1
Proportion	–	51.7 47.7;55.6	10.1 8.0;12.6	16.4 13.6;19.7	

*Among current smokers

Table 2a: Other additional sample characteristics

Characteristics	Sample	
	n	% (95% CI)
Ethnicity		
Brunei Malay	598	71.6 (67.9;74.9)
Other Brunei Malay	136	13.1 (10.7;15.9)
Other Indigenous	76	7.1 (5.4;9.4)
Chinese	70	6.4 (4.9;8.4)
Others	20	1.9 (1.1;3.1)
Monthly family income		
≥ 3,000 (High)	264	34.7 (30.8;38.9)
1,000 – 2,999 (Medium)	331	43.1 (38.9;47.4)
< 1,000 (low)	167	22.2 (18.8;26.0)
Education		
Degree up to PhD or above	135	16.1 (13.3;19.3)
Technical or Vocational/'A' level/HND	331	25.6 (22.2;29.4)
Secondary or below	167	58.3 (54.2;62.2)

(a) 95% CI = 95% confidence interval for estimated percentage

Reliability of adult survey examination

Replicate pairs of examinations were conducted in order to assess reliability. A total of 145 survey participants of four examiners was analysed (Table 3). Median reliability among examiners was high, ranging from 0.85 (number of decay teeth per person) to 0.99 (number of teeth present per person). The overall reliability was also high (from 0.78 to 0.97). Only one examiner had intra-correlation coefficient less than 0.3 in one single outcome (number of filled teeth per person).

Table 3: Reliability of adult survey examinations

Index	Number of examiners evaluated	Number of replicated pairs evaluated	Median reliability*	Number of examiners with reliability ≤ 0.6	Overall reliability (95% CI)
Number of teeth present per person	4	145	0.99	-	0.97 (0.95;0.98)
Number of missing teeth missing per person	4	145	0.98	-	0.98 (0.97;0.99)
Number of decay teeth per person	4	145	0.85	-	0.78 (0.70;0.84)
Number of filled teeth per person	4	145	0.98	1	0.95 (0.93;0.97)
Number of decay, missing or filled teeth per person	4	145	0.96	-	0.95 (0.94;0.97)

*Intraclass correlation coefficient

Experience of dental caries

Dental caries (dental decay) is a disease in which hard mineral structures of the teeth are dissolved by acid producing bacteria. In early stages, the process can be reversed with the use of fluoride. However, in the late stages, a cavity is formed which needs to be restored with a filling. In severe stages, with more extensive infection, a tooth may need to be removed.

Dental caries was measured in this study visually and required cavitation or shadowing for a diagnosis of caries to be recorded.

Percentage of people with no experience of dental caries

The percentage of people with no experience of dental caries is shown in Table 4 and Figure 1. Nearly 9% of adults over 16 years of age had no experience of dental caries. The percentage was related to age group with more of the youngest adults having had no caries experience (19.1%) compared to those in the 35–44 year and 45–54 year age group (0.9% and 1.4%, respectively). A higher proportion of the oldest age group also had no experience of dental caries (13.5%) compared to those aged 35–44 and 45–54 years.

Amongst all adults, a higher percentage of those with technical or vocational education (15.6%) were caries free compared to those whose highest level of education was at secondary level or lower (6.5%).

Figure 1: Percentage of people with no experience of coronal dental decay (DMFT = 0)

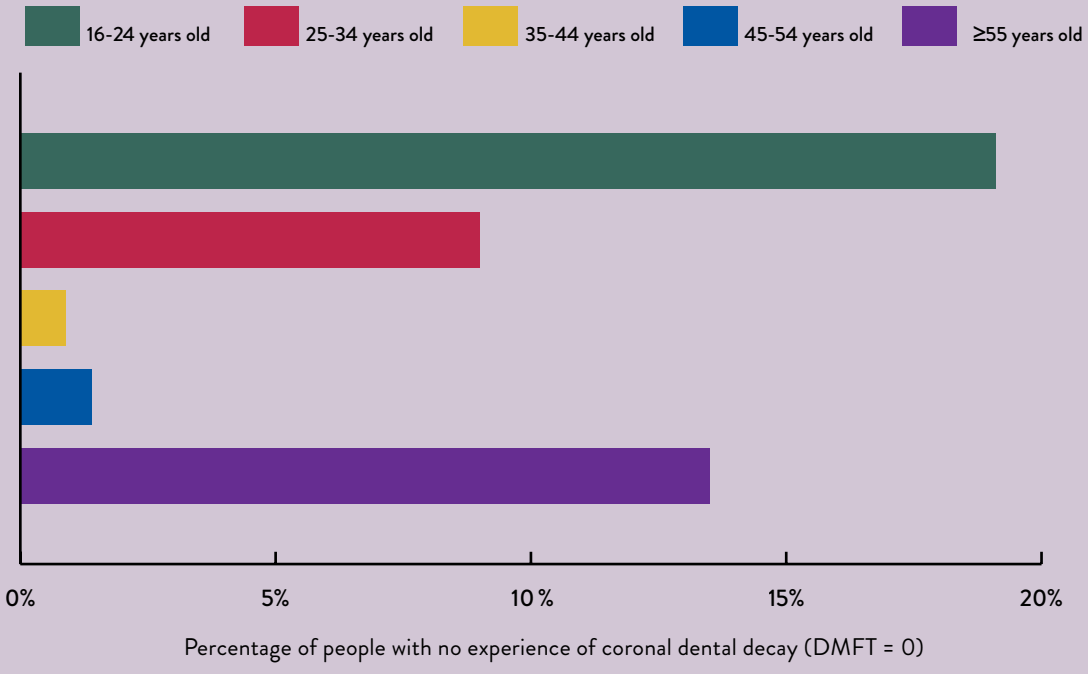


Table 4: Percentage of people with no experience of coronal dental decay (DMFT = 0)

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**%**	**8.9**	**19.1**	**9.0**	**0.9**	**1.4**	**13.5**
	95% CI	**6.7;11.6**	**12.5;28.1**	**5.0;15.9**	**0.2;3.7**	**0.2;8.8**	**8.8;19.9**
Sex							
Male	%	9.1	20.0	10.9	1.7	2.6	6.8
	95% CI	5.9;13.7	10.2;35.7	4.8;22.7	0.3;7.2	0.3;17.1	2.7;16.2
Female	%	8.6	18.1	6.9	–	0.1	20.0
	95% CI	6.1;12.1	10.5;29.4	2.8;15.9	–	0.0;0.9	12.4;30.6
Last dental visit							
< 12 months	%	10.3	26.1	7.0	–	–	24.3
	95% CI	6.6;15.7	14.3;42.7	2.3;19.4	–	–	11.4;44.5
1 to 2 years	%	10.8	13.7	16.5	1.5	–	14.8
	95% CI	6.3;18.2	4.4;35.3	6.8;34.8	0.2;10.7	–	6.4;30.9
2 to 5 years	%	3.0	2.6	3.4	–	8.4	2.5
	95% CI	1.0;8.2	0.4;13.6	0.4;22.5	–	1.1;42.9	0.6;8.9
5 years/never	%	9.8	20.5	9.2	2.7	–	14.2
	95% CI	5.5;16.7	7.7;44.5	1.5;39.5	0.3;17.7	–	6.5;28.3
Level of education							
Degree up to PhD or above	%	6.6	15.7	3.7	–	–	33.8
	95% CI	2.9;14.3	3.7;34.5	0.5;22.7	–	–	9.0;72.5
Technical or Vocational/'A' level/HND	%	15.6	30.7	11.4	–	–	10.2
	95% CI	10.0;23.5	18.6;46.2	4.2;27.3	–	–	0.7;37.2
Secondary or below	%	6.5	10.3	9.8	1.4	1.9	11.1
	95% CI	4.3;9.5	4.0;24.0	4.2;20.9	0.3;5.7	0.2;12.0	6.7;17.8
Family Income (monthly)							
High	%	9.7	23.1	6.7	2.5	–	14.4
	95% CI	6.0;15.3	11.4;41.2	1.6;25.3	0.6;10.5	–	7.1;27.0
Medium	%	7.3	22.0	4.0	–	3.2	11.4
	95% CI	4.3;12.1	9.9;42.0	1.0;14.6	–	0.4;20.5	5.0;24.1
Low	%	10.0	14.1	18.6	–	0.3	16.5
	95% CI	5.3;18.1	4.6;42.2	6.8;41.7	–	0.0;2.1	7.1;33.9
Ethnicity							
Brunei Malay	%	10.8	20.5	10.7	0.8	2.4	20.4
	95% CI	8.0;14.5	12.8;31.2	5.7;19.2	0.1;5.5	0.4;14.7	13.1;30.3
Other Brunei Malay	%	4.7	23.7	0.4	–	–	1.6
	95% CI	1.6;13.3	6.3;59.1	0.1;3.4	–	–	0.2;11.8
Other Indigenous	%	4.8	1.4	10.3	4.2	–	6.6
	95% CI	1.4;15.8	0.9;68.0	0.8;46.9	0.5;25.4	–	0.6;47.0
Chinese	%	2.6	6.6	–	–	–	5.9
	95% CI	0.6;10.4	1.0;74.3	–	–		0.7;35.7

Prevalence of untreated coronal caries

The prevalence of untreated coronal caries is shown in Table 5 as the percentage of people with one or more decayed surface(s) on the crowns of their teeth. Untreated coronal caries reflects both the prevalence of the disease in the population and access to dental care for treatment.

Untreated caries was found in almost two-thirds of the adult population with 63.4% experiencing it. Prevalence of untreated caries was related to age. Those aged 35–44 years had the highest prevalence (74.7%) which was 1.4 times that of those aged 16–24 years (53.1%) and 1.3 times that of those aged 55 years and older (58.1%).
Adults whose last dental visit was 2–5 years previously had 1.4 times the prevalence of untreated dental caries (74.2%) than those who made a dental visit between one and two years previously (53.3%).

Amongst all adults, those with the least education had 1.3 times the prevalence of untreated caries (67.7%) compared to those with the highest education (52.9%).
In summary, age, time since last dental visit and education were related to the prevalence of untreated caries.

Figure 2 : Percentage of people with untreated coronal decay

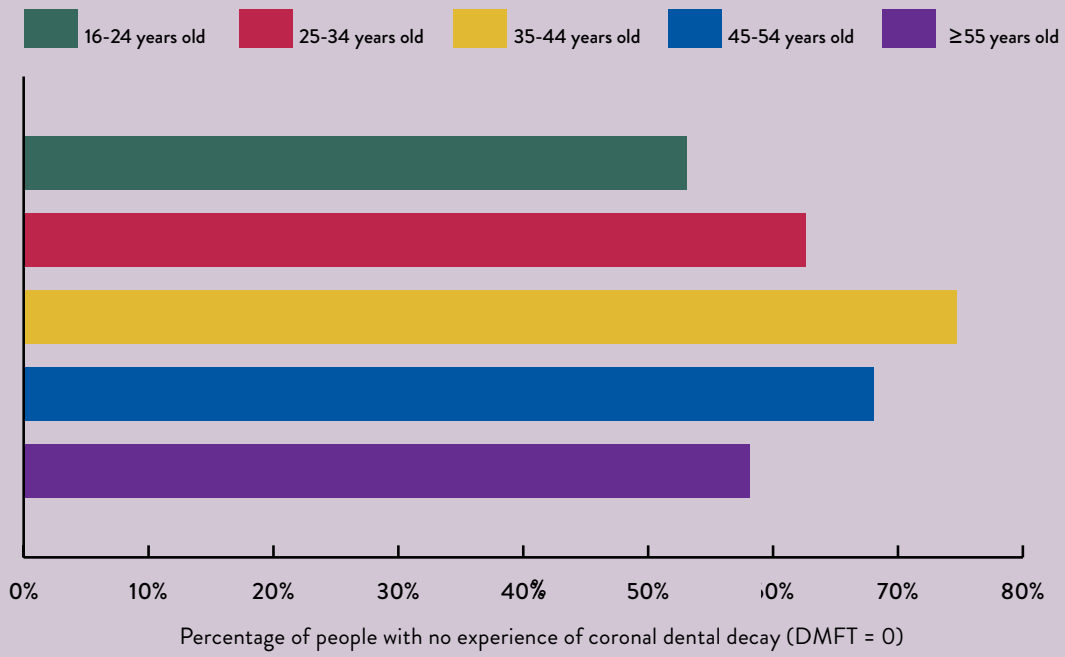


Table 5: Percentage of people with untreated coronal decay (D component of DMFS index)

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**%** **95% CI**	**63.4** **59.4;67.2**	**53.1** **43.2;62.8**	**62.6** **53.6;70.7**	**74.7** **68.1;80.3**	**68.1** **58.8;76.1**	**58.1** **49.7;66.1**
Sex							
Male	% 95% CI	66.4 60.3;72.0	54.4 39.0;69.0	61.6 47.8;73.7	81.4 75.1;88.1	71.3 56.7;83.1	65.5 53.4;75.8
Female	% 95% CI	60.2 55.0;65.2	51.8 39.2;64.2	63.7 51.9;74.0	67.6 57.9;76.1	64.1 52.3;74.4	50.9 39.0;62.8
Last dental visit							
< 12 months	% 95% CI	65.5 58.7;71.7	62.5 45.4;77.0	65.1 49.4;78.0	73.0 61.9;81.8	62.9 48.3;75.4	61.6 42.7;77.5
1 to 2 years	% 95% CI	53.3 44.9;61.6	36.6 20.8;55.9	54.1 37.0;70.2	65.9 49.2;79.3	72.7 48.0;88.5	47.8 30.3;66.0
2 to 5 years	% 95% CI	74.2 65.5;81.3	78.3 46.3;93.8	85.8 65.3;95.1	78.5 60.7;89.6	58.7 35.9;78.3	60.1 41.8;76.0
5 years/never	% 95% CI	61.3 52.0;69.9	40.5 19.8;65.3	45.4 22.7;70.1	81.3 65.7;90.8	79.5 50.2;86.8	64.9 47.9;78.8
Level of education							
Degree up to PhD or above	% 95% CI	52.9 42.7;62.8	41.1 33.2;73.7	55.5 35.8;73.7	61.3 42.1;77.6	66.1 39.7;85.2	11.5 2.3;41.9
Technical or Vocational/'A' level/HND	% 95% CI	60.8 52.3;68.8	48.0 33.2;63.2	63.5 47.4;77.0	81.8 65.6;91.4	75.3 43.5;92.4	44.3 23.5;72.0
Secondary or below	% 95% CI	67.7 62.8;72.4	63.2 47.0;76.8	64.4 50.5;76.2	76.6 68.4;83.2	67.3 56.2;76.8	64.1 54.7;72.4
Family Income (monthly)							
High	% 95% CI	57.8 50.5;64.9	52.4 34.8;69.4	55.9 38.2;72.2	63.6 51.3;74.3	66.0 46.7;81.1	51.4 36.7;65.8
Medium	% 95% CI	65.9 59.3;72.0	47.9 31.5;64.8	62.3 47.0;75.3	83.5 73.3;90.3	65.8 51.0;78.1	68.9 54.2;80.6
Low	% 95% CI	67.2 57.8;75.4	60.3 21.1;66.5	65.8 43.7;82.6	76.0 58.9;87.5	76.8 54.0;90.4	50.0 30.0;69.9
Ethnicity							
Brunei Malay	% 95% CI	63.3 58.5;67.9	54.5 43.3;65.3	59.6 49.2;69.2	79.7 72.3;85.6	71.4 59.3;81.1	48.9 38.1;60.0
Other Brunei Malay	% 95% CI	63.9 53.0;73.6	43.7 15.1;77.1	86.1 59.7;96.3	52.4 32.5;71.7	61.5 38.2;80.5	77.6 52.3;91.6
Other Indigenous	% 95% CI	68.1 52.9;80.2	81.3 27.6;95.9	63.2 30.5;85.4	77.5 51.7;87.3	66.5 33.2;88.8	49.5 17.3;82.2
Chinese	% 95% CI	60.5 45.4;73.9	31.7 9.1;85.0	66.9 2.8;99.3	66.2 48.2;91.9	58.4 39.9;90.4	68.7 44.0;86.0

Severity of untreated caries

The average number of tooth surfaces per person reflects the burden of untreated caries. In this survey, each tooth crown was divided into five tooth surfaces and each was assessed for untreated caries. Caries was defined as a cavity that had broken through enamel or had undermined the enamel. Higher average numbers of untreated tooth surfaces with caries reflect both rates of new disease and lack of dental treatment.

Table 6 outlines the average number of untreated carious coronal surfaces per person with an average of 4.6 surfaces per adult.

There were few differences by population groups although females had somewhat fewer affected tooth surfaces than males (3.8 surfaces and 5.4 surfaces, respectively).

Dental caries is a bacterial infection that affects the hard tissue of the teeth, caused by acid-producing bacteria, primarily Streptococcus mutans and Lactobacilli.

These bacteria colonize the surface of teeth, where they ferment carbohydrates to produce acid. Left untreated, the bacteria can continue to break down the tooth, causing pain and potentially leading to tooth loss.

The bacteria can spread from the affected tooth to surrounding tissues and potentially lead to a painful abscess or spread to other parts of the body, affecting overall health. Moreover, advanced cavities can impair one's ability to chew and speak properly, which can affect one's quality of life.

Untreated dental caries can have a significant impact on the economy. When left untreated, cavities can progress and lead to more severe oral health problems. This can result in increased dental costs, lost workdays due to oral health problems, decreased productivity, and decreased overall quality of life.

Table 6: Average number of decayed tooth surfaces per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean** **95% CI**	**4.6** **4.0;5.2**	**4.2** **2.7;5.6**	**3.7** **2.4;5.0**	**5.7** **4.4;7.0**	**5.2** **3.8;6.6**	**4.4** **3.2;5.6**
Sex							
Male	mean 95% CI	5.4 4.4;6.3	4.3 2.3;6.2	4.0 1.7;6.3	7.5 5.3;9.7	5.7 3.4;8.0	5.9 3.8;8.1
Female	mean 95% CI	3.8 3.1;4.4	4.1 1.9;6.3	3.3 2.4;4.2	3.8 2.6;5.1	4.7 3.1;6.3	2.9 1.9;3.9
Last dental visit							
< 12 months	mean 95% CI	5.5 3.9;6.0	5.9 2.8;9.1	3.2 2.1;4.3	5.9 3.8;8.1	5.7 3.4;8.0	3.3 1.6;5.1
1 to 2 years	mean 95% CI	3.8 2.4;5.3	2.6 0.7;4.5	4.5 0.6;8.5	4.3 1.4;7.2	4.0 2.3;5.7	3.6 1.12;6.2
2 to 5 years	mean 95% CI	4.7 3.5;6.0	4.8 1.8;7.7	3.3 1.7;4.9	6.6 2.8;10.3	5.1 1.3;8.9	4.0 1.8;6.2
5 years/never	mean 95% CI	4.7 3.4;6.0	2.5 0.4;4.7	3.9 0.3;7.6	5.9 3.6;8.2	6.4 2.2;9.6	5.6 3.0;8.1
Level of education							
Degree up to PhD or above	mean 95% CI	3.6 2.4;4.8	3.2 1.0;4.9	2.6 1.2;3.9	6.0 2.1;9.9	4.1 2.1;6.1	0.4 0.0;1.1
Technical or Vocational/'A' level/HND	mean 95% CI	4.5 3.2;5.9	4.3 1.4;7.3	4.6 2.5;6.7	5.2 2.7;7.9	4.7 2.2;7.3	3.2 0.8;6.4
Secondary or below	mean 95% CI	4.8 4.0;5.6	4.1 2.5;5.8	3.5 1.1;5.8	5.8 4.2;7.4	5.5 3.7;7.4	4.9 3.5;6.3
Family Income (monthly)							
High	mean 95% CI	4.3 3.3;5.4	4.8 1.2;8.3	3.7 1.6;5.8	4.6 2.9;6.3	4.6 2.6;6.7	3.8 1.7;5.9
Medium	mean 95% CI	4.3 3.4;5.1	3.2 1.5;4.8	3.3 1.8;4.8	6.2 3.9;8.5	4.2 2.4;6.0	4.5 2.7;6.3
Low	mean 95% CI	5.4 3.5;7.3	3.9 1.1;6.1	4.9 0.0;9.9	7.2 3.4;11.0	6.8 2.5;11.2	3.5 0.8;6.2
Ethnicity							
Brunei Malay	mean 95% CI	4.4 3.7;5.1	4.4 2.7;6.1	3.2 2.2;4.2	5.8 4.4;7.2	5.1 3.4;6.9	3.8 2.3;5.3
Other Brunei Malay	mean 95% CI	6.3 3.8;8.8	4.4 0.0;9.6	9.2 0.0;19.7	4.9 0.3;9.4	6.5 3.1;9.9	6.4 2.5;10.4
Other Indigenous	mean 95% CI	3.0 2.0;4.1	3.2 0.4;4.1	2.3 0.5;3.6	5.0 1.8;5.5	2.1 0.6;3.7	2.6 0.0.;5.4
Chinese	mean 95% CI	4.9 2.6;7.2	2.2 0.0;7.8	2.7 0.0;7.6	8.7 2.1;18.0	3.6 0.9;9.0	5.6 2.2;9.0

Severity of untreated caries

Each of the five coronal tooth surfaces was assessed for the presence of untreated caries. The average number of carious teeth per person is shown in Table 7. The average number of teeth with untreated dental caries per adult was 2.1. There were no differences by population group.

Table 7: Average number of decayed teeth per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean** **95% CI**	**2.1** **1.9;2.3**	**2.0** **1.5;2.5**	**1.9** **1.5;2.3**	**2.5** **2.1;2.9**	**2.3** **1.8;2.8**	**1.8** **1.4;2.2**
Sex							
Male	mean 95% CI	2.2 1.9;2.6	2.0 1.2;2.7	1.7 1.1;2.4	3.0 2.4;3.7	2.5 1.7;3.3	2.2 1.5;2.8
Female	mean 95% CI	1.9 1.7;2.2	2.0 1.2;2.8	2.1 1.6;2.6	1.9 1.4;2.3	2.2 1.6;2.7	1.4 1.0;1.9
Last dental visit							
< 12 months	mean 95% CI	2.3 1.9;2.7	2.5 1.5;3.5	2.0 1.4;2.7	2.6 1.9;3.3	2.4 1.6;3.2	1.3 0.8;1.9
1 to 2 years	mean 95% CI	1.7 1.3;2.1	1.6 0.5;2.6	1.7 0.7;2.7	1.8 1.0;2.6	2.1 1.4;2.8	1.5 0.7;2.3
2 to 5 years	mean 95% CI	2.3 1.8;2.7	2.6 1.3;3.9	2.3 1.4;3.2	2.6 1.6;3.7	2.2 0.9;3.5	1.6 0.9;2.3
5 years/never	mean 95% CI	2.0 1.6;2.5	1.2 0.3;2.0	1.7 0.3;3.0	2.5 1.7;3.2	2.7 1.3;3.5	2.4 1.5;3.3
Level of education							
Degree up to PhD or above	mean 95% CI	1.7 1.3;2.2	1.3 0.7;2.5	1.5 0.7;2.4	2.5 1.2;3.8	2.1 1.3;3.0	0.2 0.0;0.6
Technical or Vocational/'A' level/HND	mean 95% CI	2.1 1.6;2.6	1.9 0.9;2.9	2.2 1.4;2.9	2.3 1.4;3.7	2.6 1.4;3.7	1.6 0.5;2.8
Secondary or below	mean 95% CI	2.2 1.9;2.5	2.3 1.5;3.1	1.8 1.1;2.5	2.5 2.0;3.0	2.3 1.7;3.0	1.9 1.5;2.4
Family Income (monthly)							
High	mean 95% CI	2.0 1.6;2.4	2.2 0.9;3.4	2.0 1.1;2.9	2.1 1.5;2.7	2.2 1.3;3.0	1.6 0.9;2.3
Medium	mean 95% CI	2.1 1.7;2.4	1.8 1.0;2.6	1.7 1.1;2.3	2.6 1.9;3.3	2.3 1.5;3.0	1.9 1.3;2.5
Low	mean 95% CI	2.2 1.7;2.8	1.8 0.7;2.9	2.1 0.7;3.4	2.9 1.8;4.0	2.5 1.3;3.7	1.5 0.5;2.4
Ethnicity							
Brunei Malay	mean 95% CI	2.1 1.8;2.3	2.0 1.4;2.6	1.7 1.3;2.1	2.5 2.1;3.0	2.5 1.8;3.1	1.5 1.0;2.0
Other Brunei Malay	mean 95% CI	2.6 1.8;3.3	2.2 0.0;4.7	3.6 0.9;6.3	1.8 0.6;3.0	2.6 1.4;3.7	2.7 1.5;4.0
Other Indigenous	mean 95% CI	1.6 1.1;2.1	1.6 0.5;2.3	1.7 0.4;2.9	2.4 1.3;2.6	1.0 0.5;1.6	1.1 0.0;2.2
Chinese	mean 95% CI	2.1 1.3;2.9	1.3 0.0;4.5	1.6 0.0;4.3	3.6 1.6;6.6	1.5 0.8;3.2	2.0 1.0;3.1

Untreated root caries

Decay on the root surface of the tooth is possible when the root surface is exposed to the risk factors for dental caries and therefore is associated with gingival (gum) recession. As recession is more common in older people, root caries is therefore associated with age.
Presence of untreated root caries is also associated with access to dental care as those with less access are more likely to have more untreated disease.

Table 8 shows the percentage of adults in Brunei Darussalam with untreated root caries. Amongst adults of all ages, 3.6% had untreated root caries. However, adults aged 55 years and older had 3.4 times the prevalence of all adults with 12.1% experiencing root caries.
Among all adults, more Chinese adults had root caries (11.8%) compared to Brunei Malays (2.3%).

Table 8: Percentage of people with untreated root decay

Variables		All ages	Age group ≥ 55
All	**%** **95% CI**	**3.6** **2.3;4.9**	**12.1** **7.8;18.3**
Sex			
Male	% 95% CI	4.0 2.4;6.7	13.4 7.5;22.7
Female	% 95% CI	2.7 1.6;4.5	10.8 5.3;20.5
Last dental visit			
< 12 months	% 95% CI	5.3 3.0;9.0	25.6 12.8;44.6
1 to 2 years	% 95% CI	1.2 0.4;3.0	7.0 2.2;19.8
2 to 5 years	% 95% CI	3.3 1.5;7.0	10.7 3.6;27.8
5 years/never	% 95% CI	1.6 0.6;4.5	5.7 1.9;16.1
Level of education			
Degree up to PhD or above	% 95% CI	2.1 0.7;6.2	– –
Technical or Vocational/'A' level/HND	% 95% CI	1.8 0.4;7.0	– –
Secondary or below	% 95% CI	4.4 2.9;6.7	14.3 9.2;21.7
Family Income (monthly)			
High	% 95% CI	3.4 1.7;6.4	12.1 5.6;24.5
Medium	% 95% CI	2.6 1.4;4.9	11.4 5.0;24.1
Low	% 95% CI	4.4 2.0;9.5	12.1 4.4;29.3
Ethnicity			
Brunei Malay	% 95% CI	2.3 1.3;4.1	12.5 7.2;21.2
Other Brunei Malay	% 95% CI	4.1 1.5;11.0	6.0 0.7;36.2
Other Indigenous	% 95% CI	5.1 1.3;17.9	14.0 1.6;61.4
Chinese	% 95% CI	11.8 6.1;21.8	17.3 6.4;39.0

Prevalence of filled teeth

Fillings for the treatment of dental caries leave a permanent mark on the tooth and are one measure of people's experience of caries. Filled teeth also indicate patterns of dental treatment and access to dental care.

Among adults in Brunei Darussalam, 70.8% of adults had at least one filled tooth (Table 9). There was a difference amongst age groups with 81.8% of 45–54 year olds having a filled tooth, compared to 61.6% of 16–24 year olds and those aged 55 years and older.

There was also a difference between the proportion of females (76.8%) with a filling compared to that of males (65.2%). No differences were seen between other population groups.

Table 9: Percentage of people with one or more filled teeth

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**% 95% CI**	**70.8 67.0;74.4**	**61.6 51.7;70.6**	**71.5 62.2;79.0**	**77.0 70.6;82.3**	**81.8 73.0;88.2**	**61.6 53.4;69.3**
Sex							
Male	% 95% CI	65.2 59.2;70.8	57.0 41.8;71.0	63.7 50.0;75.5	68.4 58.3;76.8	74.5 59.5;85.3	66.4 54.4;76.5
Female	% 95% CI	76.8 72.2;80.9	66.3 53.8;76.9	80.6 69.6;88.3	86.0 78.3;91.3	89.8 81.4;94.7	57.0 45.1;68.1
Last dental visit							
< 12 months	% 95% CI	70.5 63.7;76.4	52.8 37.0;68.0	76.3 61.1;86.8	83.7 73.4;90.5	80.7 65.5;90.2	45.9 28.0;64.9
1 to 2 years	% 95% CI	66.7 58.1;74.3	72.2 51.6;86.4	57.1 39.8;72.8	72.6 55.9;84.7	84.2 60.1;95.0	54.4 36.2;71.5
2 to 5 years	% 95% CI	75.2 66.1;82.5	76.1 50.0;91.1	70.8 45.9;87.4	75.8 58.7;87.3	74.6 47.9;90.4	80.0 65.1;90.5
5 years/never	% 95% CI	71.4 62.8;78.7	56.9 36.4;75.2	83.6 53.6;95.7	72.3 56.2;84.2	91.8 58.3;92.0	59.5 42.9;74.2
Level of education							
Degree up to PhD or above	% 95% CI	76.5 66.4;84.2	79.7 56.8;91.7	70.3 48.7;85.5	81.7 64.3;91.7	89.5 71.8;96.6	44.3 13.6;80.1
Technical or Vocational/'A' level/HND	% 95% CI	67.7 59.1;75.3	46.1 31.6;61.4	75.3 59.0;86.6	82.9 65.8;92.5	93.6 80.1;98.1	80.9 53.7;94.9
Secondary or below	% 95% CI	70.8 66.0;75.3	69.6 53.9;81.8	68.8 54.8;80.0	74.3 66.0;81.1	8.2 66.8;86.5	61.6 52.3;70.1
Family Income (monthly)							
High	% 95% CI	69.3 62.0;75.7	54.0 35.8;71.2	70.8 54.4;83.2	81.3 70.1;89.0	80.0 60.4;91.3	9.1 44.2;72.5
Medium	% 95% CI	74.7 68.4;80.1	65.0 45.5;80.5	78.1 63.2;88.2	76.8 65.9;85.0	82.4 67.0;91.6	67.5 53.2;79.2
Low	% 95% CI	68.1 58.8;76.2	68.4 33.5;78.9	57.4 37.2;75.5	72.9 56.5;84.8	85.2 58.8;95.9	60.4 39.6;78.1
Ethnicity							
Brunei Malay	% 95% CI	69.0 64.2;73.3	60.9 49.6;71.2	68.9 58.4;77.7	76.8 69.0;83.1	79.4 67.2;87.9	58.6 47.4;68.9
Other Brunei Malay	% 95% CI	73.6 62.8;82.1	47.7 17.5;80.0	82.3 45.2;96.3	86.5 69.9;94.6	74.7 50.0;90.0	73.4 48.1;89.1
Other Indigenous	% 95% CI	80.1 66.5;89.1	91.6 20.8;91.3	79.0 42.8;93.7	77.5 51.7;87.3	85.0 34.1;98.4	66.3 28.4;90.6

Average number of filled tooth surfaces

In this survey, all five coronal tooth surfaces were assessed for presence of a filling placed for decay. The assessment was made for up to 160 tooth surfaces. The average number of filled tooth surfaces was 5.6 (Table 10).

The average number of filled tooth surfaces was related to age group. Adults aged 16–24 years had the lowest number of filled surfaces with 2.8. This was lower than the average for those aged 25–34 years (5.1 surfaces), those aged 35–44 years (7.4 surfaces), those aged 45–54 years (7.8 surfaces) and those aged 55 years and older (6.1 surfaces).

There was also a difference in the average number of filled tooth surfaces between males and females with females having 1.5 times the number of filled surfaces (6.8) compared to males (4.6 surfaces).

There were no other differences between population groups.

Table 10: Average number of filled tooth surfaces per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean** **95% CI**	**5.6** **5.1;6.2**	**2.8** **2.0;3.5**	**5.1** **3.8;6.4**	**7.4** **6.2;8.7**	**7.8** **6.2;9.5**	**6.1** **4.4;7.8**
Sex							
Male	mean 95% CI	4.6 3.7;5.4	2.0 1.2;2.9	3.6 1.8;5.4	6.4 4.4;8.4	3.5 2.3;4.7	5.7 3.2;8.2
Female	mean 95% CI	6.8 6.0;7.6	3.5 2.3;4.7	6.8 5.1;8.5	8.5 7.0;10.0	9.5 7.1;11.8	6.5 4.0;8.9
Last dental visit							
< 12 months	mean 95% CI	5.5 4.5;6.4	2.6 1.2;3.9	5.7 3.2;8.2	7.6 6.0;9.2	6.5 4.8;8.2	5.2 1.4;9.1
1 to 2 years	mean 95% CI	4.7 3.6;5.8	2.9 1.7;4,1	3.8 1.9;5.8	5.7 3.5;8.0	8.7 4.4;13.1	5.0 0.7;9.2
2 to 5 years	mean 95% CI	5.9 4.6;7.2	3.5 2.2;4.8	4.5 1.5;7.6	6.2 3.8;8.6	7.3 3.4;11.3	8.4 4.9;11.9
5 years/never	mean 95% CI	6.3 4.8;7.9	2.6 0.6;4.5	6.5 2.7;10.2	8.6 4.7;12.6	9.3 4.0;10.0	5.5 2.4;8.7
Level of education							
Degree up to PhD or above	mean 95% CI	5.3 4.2;6.4	3.3 2.0;4.8	5.0 2.8;7.2	7.0 4.6;9.5	5.9 3.0;8.7	6.5 0.8;12.1
Technical or Vocational/'A' level/HND	mean 95% CI	4.9 3.6;6.2	1.8 0.9;2.8	6.1 3.1;9.2	6.1 4.3;7.9	9.1 4.5;13.7	7.8 0.1;15.8
Secondary or below	mean 95% CI	6.1 5.3;6.8	3.5 2.1;4.8	4.0 2.8;5.3	8.0 6.2;9.7	8.1 6.0;10.1	6.0 4.1;7.9
Family Income (monthly)							
High	mean 95% CI	5.4 4.3;6.5	2.3 1.3;3.3	5.7 2.3;9.2	7.4 5.5;9.3	6.7 3.8;9.7	5.4 2.6;8.1
Medium	mean 95% CI	6.4 5.4;7.5	3.2 1.6;4.8	5.6 3.7;7.5	7.9 5.6;10.2	8.6 5.7;11.6	7.0 3.6;10.4
Low	mean 95% CI	5.6 4.3;7.0	2.9 0.6;5.1	3.5 1.3;5.8	7.8 4.9;10.6	8.6 4.9;12.2	6.4 2.4;10.5
Ethnicity							
Brunei Malay	mean 95% CI	5.3 4.6;6.0	2.8 2.0;3.6	4.9 3.4;6.4	7.4 5.9;8.9	6.7 4.9;8.6	6.4 3.7;9.2
Other Brunei Malay	mean 95% CI	6.4 4.8;8.0	3.1 0.0;6.7	6.6 2.3;10.8	7.7 4.6;10.8	8.8 5.1;12.6	4.8 2.7;6.9
Other Indigenous	mean 95% CI	7,7 4.9;10.5	2.8 0.3;4.0	5.5 2.1;8.7	7.2 3.2;8.6	13.1 1.7;24.4	11.0 3.7;18.4
Chinese	mean 95% CI	5.3 3.7;6.9	1.6 0.0;3.1	1.7 0.0;3.9	9.7 3.7;13.3	6.8 4.7;11.9	4.2 1.8;6.8

Average number of filled teeth per person

The average number of filled teeth in the adult population of Brunei Darussalam was 3.1 teeth as shown in Table 11. The youngest age group had the lowest number of filled teeth (1.9 teeth) which was lower than the oldest age group (2.7 teeth). Both of these groups had a lower average number of filled teeth compared to the 25–34 year age group (3.0 teeth), the 35–44 year age group (3.9 teeth) and the 45–54 year age group (4.0 teeth).

Females had, on average, more filled teeth than males (3.8 compared to 2.4 teeth). No other differences between population groups were noted.

Figure 3: Average number of filled teeth per person

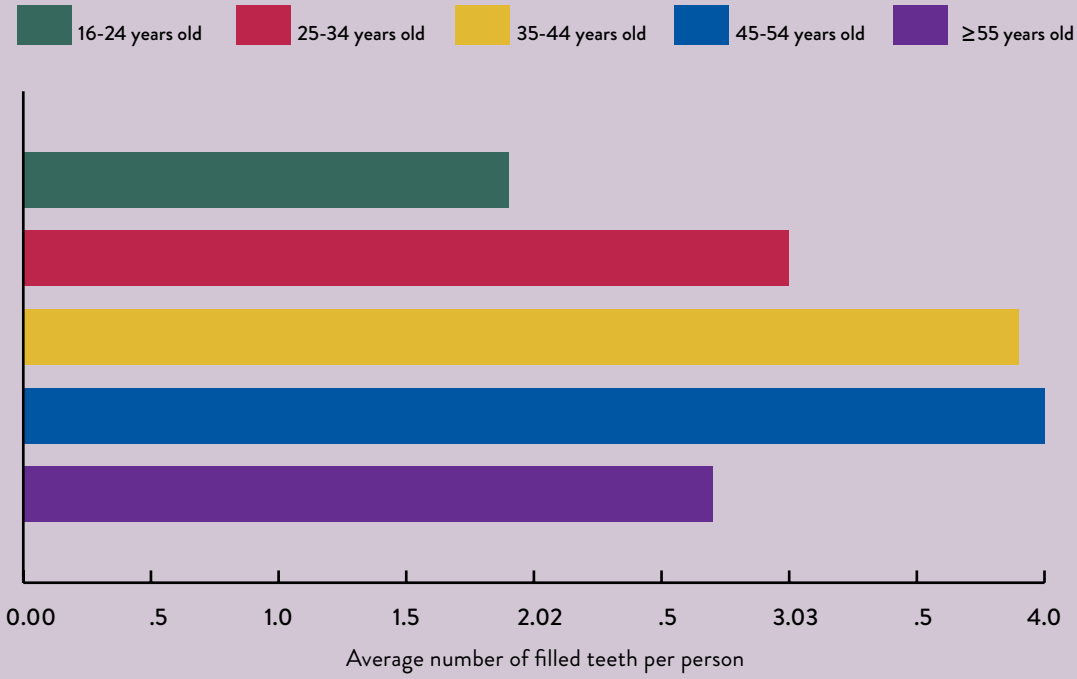


Table 11: Average number of filled teeth per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean** **95% CI**	**3.1** **2.8;3.4**	**1.9** **1,4;2.3**	**3.0** **2.4;3.6**	**3.9** **3.4;4.5**	**4.0** **3.4;4.7**	**2.7** **2.1;3.4**
Sex							
Male	mean 95% CI	2.4 2.1;2.8	1.3 0.8;1.8	2.2 1.4;3.1	3.2 2.4;4.0	3.3 2.3;4.2	2.7 1.8;3.6
Female	mean 95% CI	3.8 3.4;4.1	2.5 1.7;3.2	3.9 3.0;4.7	4.8 4.0;5.5	4.9 4.0;5.8	2.8 1.9;3.7
Last dental visit							
< 12 months	mean 95% CI	3.1 2.7;3.6	1.8 0.9;2.7	3.3 2.2;4.4	4.3 3.5;5.1	3.7 2.8;4.5	2.4 0.9;3.9
1 to 2 years	mean 95% CI	2.5 2.0;3.0	1.9 1.2;2.6	2.3 1.2;3.3	3.3 2.1;4,5	4.0 2.2;5.9	1.9 0.6;3.3
2 to 5 years	mean 95% CI	3.1 2.5;3.7	2.2 1.4;3.1	2.7 1.1;4.2	3.2 2.1;4.2	3.7 2.0;5.4	4.0 2.7;5.3
5 years/never	mean 95% CI	3.4 2.7;4.1	1.8 0.7;2.8	3.8 1.8;5.7	4.4 2.8;5.9	5.2 2.4;5.6	2.4 1.3;3.5
Level of education							
Degree up to PhD or above	mean 95% CI	3.1 2.5;3.7	2.4 1.4;3.2	3.1 1.8;4.3	3.9 2.6;5.2	2.9 1.7;4.1	3.2 0.4;6.0
Technical or Vocational/'A' level/HND	mean 95% CI	2.7 2.1;3.3	1.3 0.7;2.0	3.3 1.9;4.7	3.4 2.5;4.3	4.7 3.0;6.5	2.8 0.8;4.8
Secondary or below	mean 95% CI	3.2 2.9;3.6	2.3 1.5;3.0	2.5 1.8;3.3	4.1 3.4;4.9	4.2 3.3;5.0	2.7 2.0;3.4
Family Income (monthly)							
High	mean 95% CI	3.0 2.5;3.5	1.6 0.9;2.3	3.2 1.7;4.7	4.0 3.1;4.9	3.5 2.2;4.7	2.4 1.4;3.4
Medium	mean 95% CI	3.4 2.9;3.9	2.1 1.2;2.9	3.3 2.3;4.3	4.1 3.2;5.0	4.3 3.1;5.4	3.2 2.0;4.54
Low	mean 95% CI	3.0 2.4;3.6	2.3 1.5;3.0	2.5 1.8;3.3	4.1 3.4;4.9	4.2 3.3;5.0	2.7 2.0;3.4
Ethnicity							
Brunei Malay	mean 95% CI	3.0 2.6;3.3	1.9 1.4;2.4	3.0 2.2;3.7	3.9 3.3;4.6	3.7 2.8;4.5	2.7 .8;3.6
Other Brunei Malay	mean 95% CI	3.4 2.7;4.1	2.0 0.1;3.8	3.4 1.4;5.4	4.2 2.8;5.6	4.3 2.8;5.8	2.8 1.6;3.9
Other Indigenous	mean 95% CI	3.6 2.6;4.6	1.9 0.1;2.6	2.9 1.4;4.1	3.6 1.8;4.4	5.5 1.9;9.1	4.3 1.5;7.0
Chinese	mean 95% CI	2.9 2.1;3.7	1.4 0.0;2.7	1.5 0.0;3.5	5.2 2.1;6.6	3.9 3.0;5.8	1.9 1.0;2.7

Prevalence of missing teeth

Teeth are extracted when severe caries, pain or infection mean that the affected tooth cannot be treated with a filling. Both the patient and the dentist are involved in the decision to extract a tooth.

The percentage of people with at least one missing tooth due to pathology is shown in Table 12. Across the Brunei Darussalam adult population, 64.2% of people had a missing tooth due to pathology. This proportion was strongly related to age. The highest percentage with a missing tooth was seen in the 45–54 year age group where almost all adults were missing a tooth (96.9%). This was 3.8 times the proportion in the youngest age group where approximately one-quarter of the group had a missing tooth (25.3%); 1.7 times higher than those in the 25–34 year group (57.9%) which was more than twice that in the youngest group; and 1.3 times the percentage in the 35–44 year age group (75.7%).

Level of education was also related to the percentage of adults with a missing tooth. Nearly 1.5 times more adults whose highest level of education was secondary or below had a missing tooth (70.8%) relative to adults with vocational of technical education (50.3%).

Figure 4: Percentage of people with one or more missing teeth due to pathology

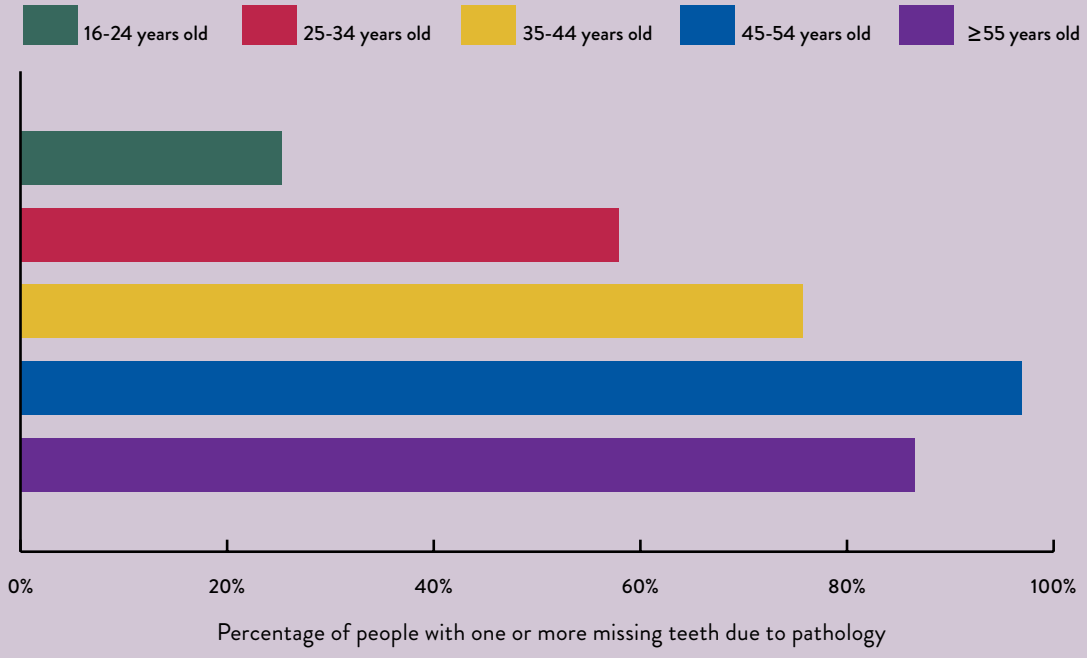


Table 12: Percentage of people with one or more missing teeth due to pathology

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**%** **95% CI**	**64.2** **60.1**	**25.3** **17.7;38.8**	**57.9** **48.9;66.3**	**75.7** **69.2;81.3**	**96.9** **90.0;99.1**	**86.6** **80.1;91.2**
Sex							
Male	% 95% CI	62.7 56.5;68.6	21.0 10.9;36.5	54.2 40.9;67.1	76.2 66.9;83.6	94.2 81.1;98.4	93.2 83.8;97.3
Female	% 95% CI	65.8 60.5;70.7	30.0 19.5;42.9	62.1 50.4;72.3	75.2 65.6;82.8	99.8 99.1;99.9	80.0 69.4;87.6
Last dental visit							
< 12 months	% 95% CI	63.1 56.1;69.6	18.4 9.2;33.5	68.7 53.7;80.7	75.3 63.7;84.1	96.0 81.3;99.3	81.2 49.6;95.0
1 to 2 years	% 95% CI	59.8 51.1;68.0	20.0 8.3;40.7	59.4 41.5;75.2	70.2 53.3;82.9	99.7 97.7;100.0	94.6 65.8;99.4
2 to 5 years	% 95% CI	71.3 61.2;79.7	41.9 16.3;72.7	46.8 25.5;69.4	86.1 69.2;94.5	91.6 57.1;99.0	100.0 –
5 years/never	% 95% CI	65.7 56.3;74.0	34.9 16.8;58.7	48.3 24.4;73.0	76.1 60.0;87.1	100.0 –	92.9 57.1;99.2
Level of education							
Degree up to PhD or above	% 95% CI	62.2 51.6;71.8	8.9 –	74.5 54.7;87.7	70.7 52.7;84.0	97.6 86.5;99.6	66.2 27.5;91.0
Technical or Vocational/'A' level/HND	% 95% CI	50.3 42.0;58.6	21.5 11.3;37.0	53.1 37.6;68.0	3.9 56.5;86.1	100.0 –	94.1 62.7;99.3
Secondary or below	% 95% CI	70.8 65.5;75.5	33.4 20.2;47.8	53.4 39.9;66.4	77.1 68.9;83.7	96.2 86.2;99.0	88.9 82.2;93.3
Family Income (monthly)							
High	% 95% CI	66.1 58.6;72.9	18.8 8.2;37.5	75.6 58.5;87.2	73.7 61.5;83.1	98.6 92.1;99.7	85.6 73.0;92.9
Medium	% 95% CI	66.0 59.2;72.2	21.1 9.7;39.8	60.1 44.9;73.6	75.1 63.8;83.8	93.6 77.2;98.4	88.6 75.9;95.0
Low	% 95% CI	63.3 53.5;72.1	24.5 7.3;47.5	46.7 27.2;67.3	75.6 58.8;87.0	99.7 97.9;100.0	83.5 66.1;92.9
Ethnicity							
Brunei Malay	% 95% CI	60.8 55.9;65.5	27.5 18.7;38.5	57.0 46.6;66.8	75.2 67.3;81.2	94.7 83.2;98.5	79.6 70.0;86.9
Other Brunei Malay	% 95% CI	73.7 62.6;82.4	10.6 1.6;46.9	84.6 59.5;95.4	70.3 48.4;85.6	100.0 –	98.4 88.2;99.8
Other Indigenous	% 95% CI	65.9 48.9;79.7	– –	48.6 24.8;80.5	87.8 71.9;98.3	100.0 –	93.4 53.0;99.4
Chinese	% 95% CI	73.4 57.1;85.2	30.6 4.2;48.5	29.7 4.0;81.1	70.5 48.2;92.0	99.4 55.9;99.3	94.1 64.3;99.3

Average number of missing teeth due to pathology per person

To make an estimation of the average number of teeth missing due to dental decay and periodontal disease, an assessment was made as to the reason for the extraction in people less than 45 years of age at the time of examination. This meant that teeth missing for other reasons could be excluded from the analysis. In older adults, it was assumed that missing teeth had been extracted for dental disease.

In the adult population of Brunei Darussalam, the average number of missing teeth due to pathology was 3.5 teeth (Table 13). The average number of missing teeth was strongly related to age. The average number among 16–24 year olds was 0.5, in those 25–34 years 1.5 teeth, in 35–44 year olds 3.3 teeth, in 45–54 year olds 7.0 teeth, and in those 55 years and older an average of 9.3 teeth were missing.

The average number of missing teeth was related to education attainment level. Adults with only secondary education or lower had, on average, 4.3 missing teeth which was 1.9 times higher than those with technical or vocational education (2.2 teeth) and 1.5 times higher than adults with degrees (2.8 teeth).

The average number of missing teeth was also related to ethnicity with those of Brunei Malay origin having 2.9 missing teeth which was fewer than Other Brunei Malays (4.8 teeth), other Indigenous adults (3.4 missing teeth) and adults of Chinese ethnicity (6.9 missing teeth).
In summary, the average number of missing teeth due to pathology was related to age, education and ethnicity.

Figure 5: Level of education and average number of missing teeth due to pathology per person

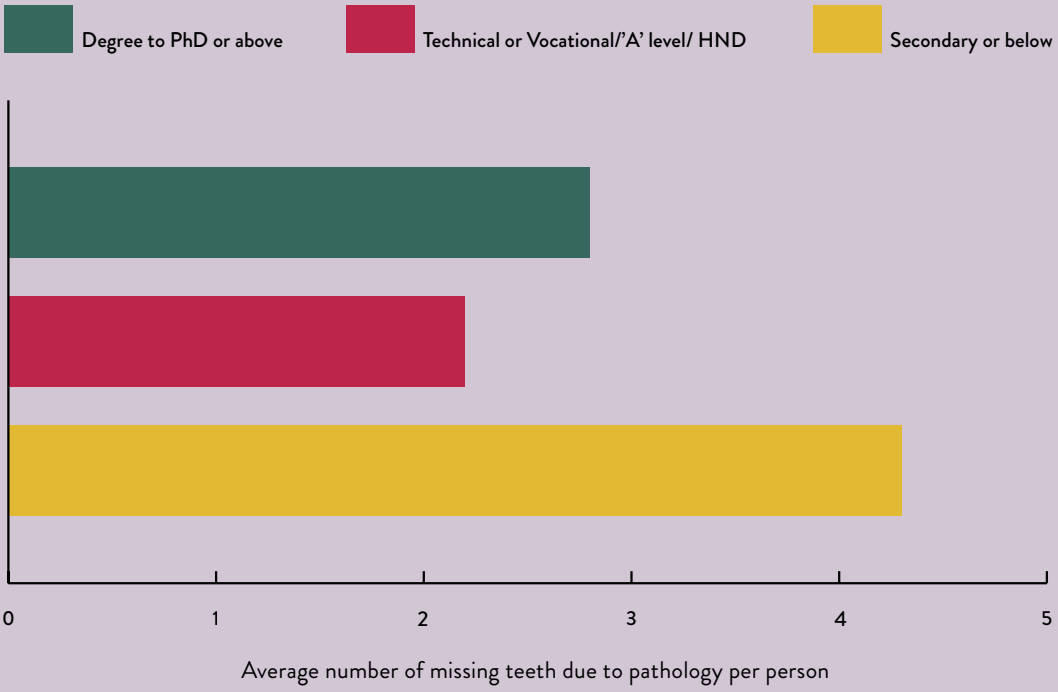


Table 13: Average number of missing teeth due to pathology per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean** **95% CI**	**3.5** **3.2;3.8**	**0.5** **0.3;0.7**	**1.5** **1.1;1.8**	**3.3** **2.8;3.8**	**7.0** **6.2;7.8**	**9.3** **8.1;10.5**
Sex							
Male	mean 95% CI	3.5 3.0;4.0	0.4 0.1;0.7	1.5 1.0;2.0	3.6 2.8;4.4	6.5 5.1;7.8	9.7 8.1;11.3
Female	mean 95% CI	3.5 3.1;4.0	0.6 0.3;0.9	1.5 1.1;1.8	3.0 2.4;3.6	7.5 6.6;8.5	8.9 7.1;10.6
Last dental visit							
< 12 months	mean 95% CI	3.2 2.7;3.8	0.3 0.1;0.5	1.7 1.2;2.2	3.3 2.5;4.1	7.3 5.7;8.8	8.3 5.2;11.4
1 to 2 years	mean 95% CI	3.3 2.6;4.0	0.3 0.1;0.6	1.6 0.8;2.4	2.6 1.8;3.4	6.8 5.6;8.3	10.5 7.9;13.2
2 to 5 years	mean 95% CI	3.9 3.2;4.7	1.1 0.2;2.1	1.3 0.4;2.3	4.1 2.5;5.7	5.9 4.1;7.7	8.8 6.7;10.9
5 years/never	mean 95% CI	3.7 2.9;4.4	0.7 0.2;1.1	1.0 0.3;1.8	3.2 2.2;4.1	7.1 5.4;8.2	8.8 7.0;10.6
Level of education							
Degree up to PhD or above	mean 95% CI	2.8 2.0;3.5	0.2 0.0;2.5	1.6 1.0;2.2	2.9 1.8;4.1	6.8 4.7;8.8	8.6 0.3;16.9
Technical or Vocational/'A' level/HND	mean 95% CI	2.2 1.7;2.6	0.4 0.1;0.7	1.3 0.8;1.9	3.8 2.4;5.1	7.5 5.8;9.1	8.5 5.9;12.0
Secondary or below	mean 95% CI	4.3 3.8;4.8	0.7 0.3;1.1	1.5 1.0;2.1	3.3 2.7;3.9	7.0 5.9;8.0	9.5 8.3;10.8
Family Income (monthly)							
High	mean 95% CI	3.7 3.1;4.3	0.4 0.1;0.7	1.8 1.2;2.5	3.0 2.3;3.7	8.8 6.8;10.9	9.1 7.1;11.0
Medium	mean 95% CI	3.4 2.9;3.9	0.5 0.1;0.9	1.5 1.0;1.9	3.3 2.4;4.1	5.3 4.4;6.2	9.0 7.0;10.9
Low	mean 95% CI	3.8 3.0;4.7	0.4 0.0;0.7	1.4 0.4;2.4	3.9 2.5;5.3	7.3 6.0;8.7	9.7 6.9;12.5
Ethnicity							
Brunei Malay	mean 95% CI	2.9 2.6;3.3	0.6 0.3;0.8	1.3 1.0;1.6	3.2 2.7;3.8	6.6 5.3;7.8	8.4 7.0;9.9
Other Brunei Malay	mean 95% CI	4.8 3.8;5.8	0.3 0.0;0.7	3.4 1.7;5.1	3.7 2.0;5.4	7.4 5.9;9.0	9.5 6.3;12.8
Other Indigenous	mean 95% CI	3.4 2.3;4.5	– –	1.0 0.4;1.8	3.5 1.8;4.6	5.5 4.0;6.2	8.6 6.8;10.5
Chinese	mean 95% CI	6.9 4.9;8.8	0.4 0.0;1.2	0.7 0.0;2.0	3.3 2.0;7.0	9.5 5.8;11.5	13.0 9.0;17.1

Severity of dental caries experience DMFT

The number of decayed, missing and filled teeth (DMFT) reflects a person's lifetime experience of dental caries. This is because cavities cannot 'heal' and because treatment of dental caries leaves a permanent mark, either through a filling or through loss of a tooth through dental extraction. The total number of teeth with untreated decay (D), missing because of pathology (M) and filled teeth (F) is a measure widely referred to as the DMFT index. In this survey, in people under 45 years of age, missing teeth were only counted as 'M' if the examiner was sure the tooth was extracted because of pathology.

Table 14 shows the average DMFT for the adult population of Brunei Darussalam at 8.7. The index strongly increased with age up to the age of 45–54 years. DMFT for 16–24 year olds was 4.4, in 25–34 year olds it was 6.3, in 35–44 year olds it was 9.7,in 45–54 year olds it was 13.4 and among those aged 55 years and older it was 13.8.

Educational level was found to be related to DMFT score with an average score among those with only secondary education or less (DMFT 9.8) which was higher than those with technical or vocational education (6.9) and those with degrees or higher education (7.6).

Differences were also seen relative to ethnicity. Chinese people had the highest DMFT score of 11.9, which was more than twice that of Brunei Malays (8.0) and other Brunei Malays (10.8).
In summary, average DMFT was related to age, education and ethnicity.

The DMFT (Decayed, Missing, Filled Teeth) index is a commonly used measure to assess the oral health status of a population or individual. It provides a numerical value that represents the number of teeth that have been affected by caries (decay) and the number of teeth that have been restored with fillings or other restorations.

The DMFT index is calculated by summing the number of teeth that have been decayed (D), the number of teeth that are missing (M), and the number of teeth that have been restored with fillings or other restorations (F). The DMFT index is usually expressed as a single numerical value, such as "DMFT = 2", which would indicate that two teeth have been affected by decay, missing or restored.

The DMFT index is used to assess the oral health status of a population or individual, and to monitor changes in oral health over time. It is also used to compare the oral health of different populations or groups, and to identify areas where oral health interventions are needed.

It's important to note that the DMFT index is just one of the many indicators used to assess oral health. Other indexes like the Community Periodontal Index of Treatment Needs (CPITN) which assesses the periodontal health and the Simplified Oral Hygiene Index (OHI-S) are also used to evaluate a person's oral health.

Table 14: Average number of decayed, missing or filled teeth due to caries per person

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**mean**	**8.7**	**4.4**	**6.3**	**9.7**	**13.4**	**13.8**
	95% CI	**8.2;9.2**	**3.6;5.2**	**5.4;7.3**	**8.9;10.5**	**12.2;14.5**	**12.4;15.2**
Sex							
Male	mean	8.2	3.7	5.4	9.8	12.3	14.6
	95% CI	7.4;9.0	2.7;4.7	4.4;6.9	8.5;11.1	10.4;14,1	12.7;16.4
Female	mean	9.2	5.1	7.4	9.6	14.6	13.1
	95% CI	8.6;9.9	3.9;6.3	6.3;8.5	8.6;10.7	13.3;15.8	11.0;15.1
Last dental visit							
< 12 months	mean	8.6	4.6	7.0	10.2	13.3	12.0
	95% CI	7.8;9.5	3.1;6.0	5.5;8.6	8.8;11.5	11.6;15.1	8.3;15.8
1 to 2 years	mean	7.5	3.8	5.6	7.7	13.1	13.9
	95% CI	6.5;8.6	2.5;5.2	3.5;7.6	6.1;9.3	11.1;15.0	11.0;16.9
2 to 5 years	mean	9.3	5.9	6.3	9.9	11.8	14.4
	95% CI	8.2;10.5	4.0;7.9	4.1;8.5	7.8;12.0	8.6;14.9	12.0;16.7
5 years/never	mean	9.1	3.6	6.5	10.0	14.9	13.6
	95% CI	7.8;10.3	2.1;5.1	3.8;9.1	8.1;11.9	10.7;15.7	11.2;15.9
Level of education							
Degree up to PhD or above	mean	7.6	3.9	6.2	9.4	11.8	12.0
	95% CI	6.5;8.7	3.1;6.8	4.7;7.9	7.1;11.6	9.5;14.1	3.6;20.4
Technical or Vocational/'A' level/HND	mean	6.9	3.6	6.8	9.5	14.7	12.8
	95% CI	5.9;8.0	2.2;5.0	5.0;8.5	7.7;11.3	12.2;17.2	9.8;17.0
Secondary or below	mean	9.8	5.3	5.9	9.9	13.5	14.2
	95% CI	9.1;10.5	4.1;6.4	4.5;7.3	8.9;11.0	12.1;14.9	12.7;15.7
Family Income (monthly)							
High	mean	8.7	4.2	7.1	9.1	14.5	13.1
	95% CI	7.7;9.7	2.6;5.7	5.0;9.1	7.7;10.4	12.3;16.7	10.7;15.4
Medium	mean	8.9	4.3	6.5	10.0	11.9	14.1
	95% CI	8.1;9.6	3.0;5.7	5.2;7.7	8.6;11.4	10.3;13.4	11.8;16.4
Low	mean	9.1	4.3	5.3	10.9	14.4	13.8
	95% CI	7.7;10.5	1.9;6.6	2.7;7.9	8.9;13.0	11.7;17.1	10.5;17.0
Ethnicity							
Brunei Malay	mean	8.0	4.5	6.0	9.7	12.7	12.7
	95% CI	7.4;8.6	3.6;5.4	5.0;7.0	8.5;10.7	11.3;14.1	10.7;14.6
Other Brunei Malay	mean	10.8	4.5	10.4	9.7	14.3	15.0
	95% CI	9.4;12.3	1.8;7.2	6.2;14.6	7.3;12.0	11.9;16.7	11.8;18.3
Other Indigenous	mean	8.6	3.5	5.5	9.5	12.0	14.0
	95% CI	6.9;10.3	1.4;4.1	3.5;7.4	6.3;10.2	8.0;16.0	10.7;17.3
Chinese	mean	11.9	3.1	3.9	12.1	14.9	16.9
	95% CI	9.5;14.3	0.6;5.9	1.7;6.1	8.9;17.0	11.2;18.9	12.8;21.0

Gum diseases

Periodontitis, inflammation of the gum tissue, was assessed by measuring gingival recession (distance from the cemento-enamel junction to the free gingival margin), periodontal pocket depth (distance from the free gingival margin to the base of the pocket) and gingival bleeding. Measurements were undertaken at three sites per tooth on up to 28 teeth (not including wisdom teeth) with a periodontal probe which had 2mm markings.

Prevalence of moderate or severe periodontitis

A case definition was developed by the US Centres for Disease Control and Prevention (CDC) and the American Academy of Periodontology (AAP) to describe the prevalence of moderate and severe periodontitis. The definition describes moderate periodontitis as the presence of either two sites between adjacent teeth with attachment loss of 4 mm or more, or at least two such sites that have pockets of 5mm or more. Severe periodontitis is defined as at least two sites with clinical attachment loss of 6mm or more and at least one pocket of 5mm or more.
The prevalence of moderate or severe periodontitis among adults in Brunei Darussalam is 29% (Table 15). The prevalence increased across the age groups with the oldest age group (60.7%) having 3.9 times the prevalence of the youngest age group (15.4%). 34.6% of adults with secondary education had moderate ot severe periodontitis compared to 17.4% with a degree of higher education. The highest prevalence was seen in adults aged 65+ years with technical education (78.3%) and the lowest prevalence in those aged 16–34 years with a bachelor degree or higher (5.9%).

Gum disease, also known as periodontal disease, is an infection of the tissues surrounding the teeth. It is most often caused by bacteria that form plaque on the teeth and gums, which, if not removed through daily brushing and flossing, can cause the gums to become inflamed and infected.

Gingivitis is a common and mild form of gum disease that is characterized by inflammation of the gums. It is caused by plaque buildup along the gum line, which can irritate the gums and lead to redness, swelling, and bleeding during brushing or flossing. If left untreated, gingivitis can progress to a more severe form of gum disease called periodontitis.

Periodontitis is characterized by loss of the bone and connective tissue that support the teeth. This can lead to loose or shifting teeth, or even tooth loss.

Risk factors for gum disease include poor oral hygiene, smoking, stress, hormonal changes, certain medical conditions, and certain medications.

Treatment for gum disease typically involves removing the plaque and tartar buildup, and controlling the infection through scaling and root planing, antibiotics, and/or surgery. Maintaining good oral hygiene, quitting smoking, and seeing a dentist regularly can also help prevent gum disease.

Table 15: Percentage of people with moderate or severe periodontitis in Brunei

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**%** **95% CI**	**29.0** **25.6;32.8**	**15.4** **11.2;20.8**	**40.0** **34.6;45.7**	**56.4** **44.0;68.0**	**60.7** **45.6;74.0**
Sex						
Male	% 95% CI	31.1 25.9;36.9	16.8 10.5;25.6	44.2 35.9;52.7	60.9 42.5;76.6	49.7 31.2;68.8
Female	% 95% CI	26.9 22.5;31.7	13.9 9.0;21.0	35.6 28.8;43.1	52.3 35.0;69.0	74.0 50.9;88.6
Last dental visit						
< 12 months	% 95% CI	31.4 25.5;38.0	17.8 10.9;27.6	45.8 37.0;54.9	57.8 25.7;84.4	58.5 22.6;83.2
1 to 2 years	% 95% CI	25.8 19.1;33.8	15.5 8.2;27.5	37.8 26.0;51.2	50.0 26.4;73.6	54.0 15.0;90.9
2 to 5 years	% 95% CI	29.5 21.8;38.5	12.5 4.9;28.2	38.5 26.0;52.9	58.5 34.8;78.8	42.7 15.7;73.3
>5 years/never	% 95% CI	27.4 20.1;36.2	15.9 6.7;33.2	28.0 18.0;40.9	54.6 25.7;80.7	78.9 53.7;94.9
Level of education						
Degree up to PhD or above	% 95% CI	17.4 11.2;26.2	5.9 1.5;19.9	34.3 22.0;49.2	29.0 2.2;88.3	– –
Technical or Vocational/'A' level/HND	% 95% CI	23.8 22.2;34.7	14.3 8.2;23.6	45.3 33.3;57.8	64.0 26.2;91.9	78.3 18.6;99.1
Secondary or below	% 95% CI	34.6 29.7;39.7	19.7 12.8;29.2	39.8 33.1;47.0	58.8 44.6;71.6	58.4 42.2;72.9
Family Income (monthly)						
High	% 95% CI	28.2 22.3;34.9	10.4 5.1;20.2	44.0 34.4;54.0	46.2 25.3;68.5	63.5 29.3;85.1
Medium	% 95% CI	31.7 25.9;38.2	16.7 9.7;27.4	41.6 32.9;50.9	62.0 4.2;79.2	60.0 31.8;82.9
Low	% 95% CI	31.9 23.7;41.4	23.3 12.2;40.0	32.5 21.3;46.0	67.3 34.0;86.3	75.4 37.8;96.3
Ethnicity						
Brunei Malay	% 95% CI	27.2 23.1;31.6	15.6 10.1;21.9	38.9 32.3;45.8	60.6 43.5;75.5	52.6 33.1;69.9
Other Brunei Malay	% 95% CI	30.0 21.3;40.4	10.3 3.0;30.1	38.3 25.0;53.6	58.4 31.8;82.9	58.2 15.0;90.9
Other Indigenous	% 95% CI	33.5 20.6;49.5	23.3 9.4;48.3	45.5 22.6;53.8	24.0 4.2;78.5	– –
Chinese	% 95% CI	33.4 21.3;48.2	3.2 0.8;50.1	36.1 18.1;59.2	60.0 15.2;92.6	69.3 30.9;91.9

Prevalence of deep periodontal pockets

Deep periodontal pockets are defined as 4mm or more. The depth of the pocket measured in millimetres using a periodontal probe, is an indication of the severity of the disease process. Table 16 shows the percentage of adults in Brunei Darussalam with at least one site with a pocket of 4mm or more. Over one-third of all adults (35.4%) had at least one deep periodontal pocket. There was a tendency for severe pocketing to be found in fewer females (29.9%) than males (40.6%). There were only small differences among other population groups.

Gingival and periodontal indices are used to assess the health of the gingiva and the periodontium.

The Plaque Index is a quantitative scoring system used to assess the amount of dental plaque present on the teeth. The index assigns scores based on the amount of plaque present on a scale of 0 to 3, with 0 being no plaque and 3 being a heavy accumulation of plaque. This index is commonly used in dental research and clinical practice as a measure of oral hygiene and as a tool for monitoring changes in plaque accumulation over time.

Bleeding on probing is a common sign of periodontal disease and inflammation in the gums. It occurs when a dental instrument (periodontal probe) is used to gently press on the gum tissue and blood is present in the area. It is often used as a diagnostic tool to assess the health of the gums.

The gingival recession index is a measure of the extent of gingival recession, which is a loss of gum tissue resulting in exposure of the root surface of a tooth. This index is used to quantify the severity of gum recession, which is commonly caused by periodontal disease, aggressive tooth brushing, or other factors. The measurement can be taken on a scale from 0 to 3, with higher values indicating a greater extent of gingival recession.

Clinical Attachment Level measures the distance from the gum line to the bottom of a periodontal pocket, and can indicate the severity of periodontal disease. These indices help to diagnose and monitor the progression of periodontal disease and track the success of treatment.

Table 16: Percentage of people with 4+mm periodontal pockets

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**%** **95% CI**	**35.4** **31.6;39.5**	**32.0** **26.2;38.5**	**39.6** **34.2;45.3**	**36.2** **25.5;48.6**	**40.1** **25.7;56.5**
Sex						
Male	% 95% CI	40.6 34.7;46.9	36.5 27.5;46.6	44.5 36.2;53.2	48.1 31.0;65.6	46.8 22.4;59.2
Female	% 95% CI	29.9 25.2;35.0	27.1 20.2;35.4	34.4 27.7;41.7	25.5 13.1;43.6	32.2 20.6;61.4
Last dental visit						
< 12 months	% 95% CI	41.7 35.0;48.8	40.6 30.3;51.7	42.5 33.8;51.8	35.8 11.5;70.4	71.9 28.8;88.3
1 to 2 years	% 95% CI	38.3 30.2;47.1	34.9 23.6;48.1	45.8 33.2;58.9	31.0 12.6;58.4	59.9 9.1;85.0
2 to 5 years	% 95% CI	30.2 22.1;39.7	25.5 13.2;43.6	31.4 20.0;45.6	42.4 22.6;64.9	33.5 6.7;60.7
>5 years/never	% 95% CI	28.5 21.0;37.4	21.3 10.8;37.8	36.5 25.1;49.8	36.8 13.3;68.9	18.8 11.5;57.1
Level of education						
Degree up to PhD or above	% 95% CI	28.4 20.0;38.7	27.7 15.9;43.8	28.4 17.7;42.4	41.1 4.5;91.3	– –
Technical or Vocational/'A' level/HND	% 95% CI	36.0 28.4;44.4	32.9 23.6;43.9	43.7 31.1;57.2	43.3 13.4;80.5	53.7 9.1;90.9
Secondary or below	% 95% CI	37.3 32.3 ;42.7	33.1 24.2;43.3	41.5 34.7;48.7	35.4 23.4;49.5	37.8 22.5;56.0
Family Income (monthly)						
High	% 95% CI	38.0 31.0;45.4	34.9 24.0;47.6	40.7 31.3;50.8	41.6 21.9;64.4	41.2 16.5;71.3
Medium	% 95% CI	34.2 28.1;41.0	32.3 22.5;44.0	37.3 29.1;46.2	29.1 14.7;49.5	39.9 17.1;68.2
Low	% 95% CI	39.4 30.4;49.2	31.6 18.4;48.7	46.6 33.6;60.1	44.4 18.3;71.6	53.6 18.1;81.9
Ethnicity						
Brunei Malay	% 95% CI	36.7 32.0;41.6	34.5 27.7;42.0	39.9 33.3;46.8	40.0 25.2;56.8	34.0 18.9;54.3
Other Brunei Malay	% 95% CI	36.6 26.9;47.7	25.8 12.0;47.0	44.2 29.8;59.7	41.8 17.1;68.2	58.2 15.0;90.9
Other Indigenous	% 95% CI	31.1 18.3;47.6	33.1 15.7;57.4	31.2 18.4;48.6	24.0 4.2;78.5	– –
Chinese	% 95% CI	25.3 15.0;39.3	4.2 3.3;54.3	33.4 15.8;57.2	24.2 3.8;72.2	45.4 15.4;79.1

Prevalence of gingival recession

Gingival recession or receding gums may be caused by a number of factors including incorrect toothbrushing technique. It exposes the root surface to decay causing factors and thus may result in disease, pain, or in severe cases tooth loss. Gingival recession was measured at three sites on each tooth.

The prevalence of a least one site with 2+ mm of exposed root surface was 40.6% (Table 17). Recession was strongly related to age, increasing prevalence with increasing years. Prevalence was 18.0% among 16–34 year olds, 60.4% among 35–54 year olds, 73.4% among 55–64 year olds and 85.9% among those aged 65 years and older. There were no other differences between population groups.

Figure 6: Percentage of adults with gingival recession 2+mm

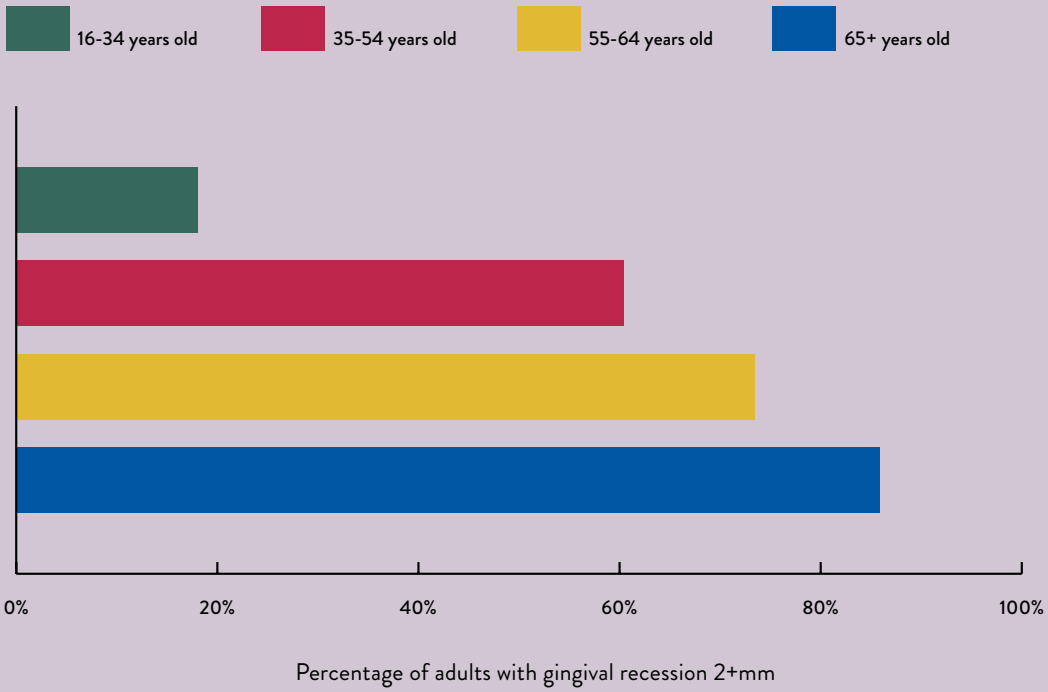


Table 17: Percentage of adults with gingival recession 2+mm

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**%** **95% CI**	**40.6** **36.6;44.8**	**18.0** **13.3;23.9**	**60.4** **54.6;65.9**	**73.4** **60.3;83.2**	**85.9** **72.4;93.4**
Sex						
Male	% 95% CI	38.1 32.2;44.3	15.5 9.2;24.9	58.9 50.4;66.9	69.7 49.5;84.4	81.4 62.3;92.0
Female	% 95% CI	43.4 38.0;48.9	20.7 14.3;28.9	62.0 54.2;69.3	76.3 56.9;88.6	90.1 75.3;98.5
Last dental visit						
< 12 months	% 95% CI	38.1 31.7;45.0	17.5 10.5;27.7	57.2 48.0;66.0	88.2 42.9;98.7	84.0 51.4;94.7
1 to 2 years	% 95% CI	35.5 27.5;44.4	21.0 11.9;34.5	50.2 36.8;63.5	69.3 39.3;88.7	88.2 46.3;99.1
2 to 5 years	% 95% CI	47.0 37.2;57.2	19.1 8.7;37.0	67.1 53.0;78.6	74.8 45.3;91.4	92.2 37.4;99.1
>5 years/never	% 95% CI	45.9 36.4;55.7	16.6 6.8;35.1	67.3 52.9;79.0	68.4 34.1;90.0	82.1 56.4;93.3
Level of education						
Degree up to PhD or above	% 95% CI	36.0 26.8;46.4	16.7 8.0;31.6	58.6 43.7;72.1	91.3 90.5;92.1	100.0 –
Technical or Vocational/'A' level/HND	% 95% CI	26.2 19.3;34.5	17.0 9.8;28.0	43.8 30.6;58.1	100.0 –	80.2 25.7;99.0
Secondary or below	% 95% CI	48.5 43.0;54.0	19.0 12.1;28.7	64.9 57.8;71.4	69.4 54.5;81.1	85.3 69.7;93.6
Family Income (monthly)						
High	% 95% CI	37.4 30.6;44.8	12.2 5.8;24.1	54.5 42.2;62.6	90.2 69.4;97.4	87.4 52.3;97.8
Medium	% 95% CI	45.6 38.7;52.6	19.9 12.0;31.1	67.8 58.9;75.6	63.9 41.9;81.4	88.7 49.6;98.4
Low	% 95% CI	44.3 34.8;54.2	21.2 10.5;38.3	62.8 48.6;75.1	67.0 35.4;92.8	91.4 54.6;97.2
Ethnicity						
Brunei Malay	% 95% CI	39.4 34.6;44.4	16.9 11.7;23.7	63.6 56.5;70.0	82.1 65.2;91.8	2.4 76.1;97.4
Other Brunei Malay	% 95% CI	44.7 33.7;56.3	26.0 11.7;48.1	58.3 43.1;72.1	54.0 19.5;86.6	86.4 18.6;99.1
Other Indigenous	% 95% CI	37.4 24.5;52.4	13.9 4.4;40.4	51.3 31.2;71.0	69.4 20.9;95.1	66.8 –
Chinese	% 95% CI	51.4 36.0;66.5	26.6 4.7;72.6	51.2 29.3;72.7	72.5 27.6;95.9	73.9 35.6;93.6

Prevalence of periodontal clinical attachment loss

Clinical attachment loss is the loss of the supporting structure around the tooth. It can comprise gingival recession and/or periodontal pocketing. In this survey, clinical attachment loss was measured using a combination of recession and periodontal probing depth.

The percentage of the Brunei population with at least one site with 4mm or more attachment loss was 51.6% (Table 18). There were significant differences in clinical attachment loss between age groups. Those aged 65 years or older had a prevalence of 88.3%, 2.5 times higher than the 16–34 years group (34.9%). Those aged 55–64 years had 2.2 times the prevalence of those aged 16–34 years (77.6% compared with 34.9%) and those aged 35–54 years had 1.9 times the prevalence (66.4%) of the youngest age group.

More of those whose highest education was secondary education or less had clinical attachment loss (56.7%) than people with technical or vocational education (42.9%). There were no other differences between population groups.

The impact of periodontal disease can be significant, affecting not only oral health but also overall health and well-being.

One can experience pain, discomfort, and sensitivity in the affected teeth and surrounding tissues from periodontal disease. This can interfere with daily activities such as eating, talking, and sleeping, leading to decreased quality of life.

Periodontal disease can cause the destruction of the supporting structures of the teeth, leading to tooth loss. Again, this can impact an individual's self-esteem, confidence, and overall quality of life.

Furthermore, periodontal disease has been linked to a number of systemic health problems, including cardiovascular disease, diabetes, respiratory disease, and rheumatoid arthritis.

Treating periodontal disease can be costly, especially if the disease has advanced to the point of requiring extensive surgical interventions. Therefore, prevention and early treatment of periodontal disease are important in mitigating its impact. Good oral hygiene practices, regular dental check-ups and cleanings, and managing underlying medical conditions can help prevent and manage periodontal disease.

Table 18: Percentage of people with 4+mm periodontal clinical attachment loss

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**%** **95% CI**	**51.6** **47.4;55.7**	**34.9** **29.0;41.4**	**66.4** **61.0;71.5**	**77.6** **65.9;86.1**	**88.3** **75.2;94.9**
Sex						
Male	% 95% CI	54.3 48.0;60.5	35.9 26.9;46.0	71.7 63.6;78.5	85.7 68.7;94.3	86.5 62.1;92.8
Female	% 95% CI	48.6 43.3;54.0	33.9 26.5;42.3	61.0 53.5;68.0	70.1 52.1;83.5	90.4 64.2;96.1
Last dental visit						
< 12 months	% 95% CI	56.0 48.9;62.9	42.1 31.8;53.2	70.0 61.4;77.4	90.4 73.0;97.1	83.9 42.0;96.5
1 to 2 years	% 95% CI	50.1 41.5;58.8	36.5 25.2;49.5	69.1 56.5;79.4	73.6 45.7;90.2	74.6 21.5;95.8
2 to 5 years	% 95% CI	49.1 39.5;58.7	23.3 11.8;40.7	64.6 50.7;76.4	80.6 55.2;93.3	91.8 45.7;96.7
>5 years/never	% 95% CI	46.6 37.5;56.0	29.6 16.8;46.7	56.1 43.0;68.5	64.6 31.9;87.7	93.2 62.7;99.3
Level of education						
Degree up to PhD or above	% 95% CI	48.3 37.9;58.9	33.9 20.7;50.2	68.1 53.6;79.9	77.0 10.6;99.0	– –
Technical or Vocational/'A' level/HND	% 95% CI	42.9 34.9;51.2	33.7 24.5;44.4	65.4 52.1;76.7	64.0 26.2;91.9	100.0 –
Secondary or below	% 95% CI	56.7 51.3;62.0	36.6 17.5;46.9	66.3 59.4;72.5	80.0 66.8;88.8	87.8 72.9;95.0
Family Income (monthly)						
High	% 95% CI	54.3 46.7;61.7	33.9 23.1;46.6	73.7 64.7;81.2	74.2 50.3;89.1	74.5 41.2;92.4
Medium	% 95% CI	51.8 45.0;58.6	37.7 27.4;49.3	60.5 51.3;69.1	78.3 58.2;90.3	98.1 58.4;99.3
Low	% 95% CI	52.1 42.5;61.5	33.5 20.4;49.9	64.4 51.2;75.8	85.1 46.0;94.0	100.0 –
Ethnicity						
Brunei Malay	% 95% CI	50.4 45.4;55.3	36.8 29.9;44.3	64.8 58.1;71.1	81.3 65.0;91.1	86.9 63.3;93.0
Other Brunei Malay	% 95% CI	52.0 41.3;62.6	28.3 14.7;47.4	66.3 52.4;77.9	73.4 42.9;91.0	82.9 21.5;95.8
Other Indigenous	% 95% CI	51.0 35.7;66.0	33.2 15.7;57.4	67.5 46.2;77.4	60.8 15.0;90.9	100.0 –
Chinese	% 95% CI	66.3 46.8;77.2	17.9 10.9;67.1	77.7 56.7;90.3	90.1 37.4;99.3	90.4 43.3;99.2

Extent of deep periodontal pocketing

Table 19 shows the percentage of all measured tooth sites with a periodontal pocket depth (PPD) of 4 mm or more. Of all the tooth sites measured, 3.3% had deep periodontal pockets of 4 mm or more. There were fewer sites among those aged 16–34 years (2.2%) compared with 4.1% among those aged 35–44 years and 55–64 years (4.7%), and 9.3% among those aged 65 years and older.

The highest percentage was 20.3% among adults 65 years and older who had last made a dental visit 1–2 years ago. The lowest percentage was among the 16–34 years age group who had a degree or higher education (1.2%), who were in the other Brunei Malay (1.1%) and Chinese (1.2%) population groups.

There was a tendency for those with secondary education or less to have a higher percentage of sites (3.6%) compared to those with a degree (2.1%).

Table 19: Percentage of tooth sites with 4mm+ deep periodontal pockets (mean %)

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**% of sites** **95% CI**	**3.3** **2.8;3.9**	**2.2** **1.5;2.9**	**4.1** **3.2;5.0**	**4.7** **2.5;7.0**	**9.3** **4.2;14.5**
Sex						
Male	% of sites 95% CI	3.6 2.8;4.4	2.1 1.2;3.1	4.6 3.2;6.0	6.1 2.4;9.8	11.9 2.9;15.4
Female	% of sites 95% CI	3.0 2.2;3.7	2.2 1.3;3.2	3.6 2.4;4.8	3.5 0.7;6.2	6.3 1.9;13.4
Last dental visit						
< 12 months	% of sites 95% CI	4.0 3.0;5.0	3.3 1.8;4.7	4.1 2.7;5.4	6.7 0.0;14.9	20.0 1.0;29.4
1 to 2 years	% of sites 95% CI	3.5 2.3;4.8	1.9 0.7;3.1	5.7 2.6;8.5	4.4 0.0;9.5	20.3 0.0;32.4
2 to 5 years	% of sites 95% CI	2.5 1.6;3.4	1.6 0.4;2.8	3.1 1.4;4.8	3.7 1.1;6.4	3.6 0.0;6.1
>5 years/never	% of sites 95% CI	2.9 1.8;4.1	1.3 0.2;2.3	4.3 2.0;6.7	5.7 0.0;11.7	2.4 0.0;8.8
Level of education						
Degree up to PhD or above	% of sites 95% CI	2.1 1.2;3.0	1.2 0.4;1.9	3.1 1.2;5.1	5.9 0.0;15.6	– –
Technical or Vocational/'A' level/HND	% of sites 95% CI	3.4 2.2;4.5	1.7 0.9;2.6	7.2 3.5;10.8	10.1 0.0;19.1	10.5 0.0;22.7
Secondary or below	% of sites 95% CI	3.6 2.9;4.3	2.8 1.6;4.0	3.7 2.7;4.6	4.0 1.8;6.2	9.1 3.1;15.0
Family Income (monthly)						
High	% of sites 95% CI	4.1 3.0;5.2	2.0 1.1;2.8	5.5 3.4;7.7	7.7 1.9;13.5	10.8 0.1;21.5
Medium	% of sites 95% CI	2.8 2.1;3.6	2.1 1.0;3.3	3.4 2.3;4.6	2.3 0.6;4.0	7.3 0.6;13.5
Low	% of sites 95% CI	3.8 2.4;5.1	2.1 0.7;3.5	4.3 2.1;6.5	6.4 0.9;11.2	18.3 0.0;29.9
Ethnicity						
Brunei Malay	% of sites 95% CI	3.4 2.7;4.0	2.4 1.6;3.2	4.3 3.1;5.5	5.9 2.3;9.4	7.2 2.3;11.7
Other Brunei Malay	% of sites 95% CI	3.4 2.1;4.8	1.1 0.2;2.0	4.7 2.3;7.2	5.0 0.2;9.7	10.9 0.0;22.1
Other Indigenous	% of sites 95% CI	1.7 0.5;2.8	2.0 0.0;5.0	1.4 0.7;2.9	0.9 0.0;3.8	– –
Chinese	% of sites 95% CI	3.3 0.9;5.6	1.2 0.0;9.7	2.0 0.5;3.5	3.5 0.0;10.4	13.1 0.0;30.0

Extent of clinical attachment loss

Clinical attachment loss (CAL) is a measure of the loss of supporting structures attached to the tooth. CAL is measured by adding the measured gingival recession to the probing pocket depth. This was measured in millimetres using a periodontal probe at three sites per tooth.

Of all the tooth sites measured, 8.7% had CAL of 4 mm or more (Table 20). This percentage was highly related to age group. Adults aged 16–34 years had an average of 3.0% of sites affected, 35–44 year olds 11.0% of sites, 55–64 year olds 23.9% of sites, and the oldest age group of 65 years or older had an average of 42.1% of sites with 4 mm or more of CAL.

Brunei Malay adults (7.7%) and other Indigenous adults (6.4%) had a lower average percentage of sites with CAL compared with the Chinese population (18.5%). There was a tendency for adults with secondary education or less (10.3%) to have a higher percentage of sites with CAL than those with a degree or higher (6.2%).

The highest average percentage of sites was found among other Indigenous adults aged 65 years or older. The lowest average percentage was seen in Chinese adults aged 16–34 years (1.5%).

Table 20: Percentage of tooth sites with 4mm+ periodontal clinical attachment loss (mean%)

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**% of sites** **95% CI**	**8.7** **7.5;9.9**	**3.0** **2.1;3.9**	**11.0** **9.0;13.0**	**23.9** **17.1;30.7**	**42.1** **30.9;53.3**
Sex						
Male	% of sites 95% CI	9.8 7.8;11.7	3.3 1.8;4.9	12.7 9.4;16.1	26.7 15.9;37.9	46.1 28.5;56.6
Female	% of sites 95% CI	7.5 6.1;9.0	2.6 1.6;3.8	9.1 7.0;11.2	21.2 12.5;29.9	37.3 22.1;49.4
Last dental visit						
< 12 months	% of sites 95% CI	8.8 6.7;10.9	3.6 2.0;5.2	12.1 8.5;15.7	35.3 11.9;58.7	37.4 12.3;56.4
1 to 2 years	% of sites 95% CI	9.6 6.7;12.5	3.6 10.3;6.0	13.1 8.1;18.2	29.1 11.1;47.1	64.5 9.8;96.6
2 to 5 years	% of sites 95% CI	8.3 5.8;10.8	1.5 1.0;2.9	8.6 5.1;12.2	18.3 9.8;26.8	48.3 20.2;65.8
>5 years/never	% of sites 95% CI	8.0 5.6;10.5	2.5 0.7;4.2	8.9 4.7;13.0	17.0 5.1;29.0	35.1 21.7;53.5
Level of education						
Degree up to PhD or above	% of sites 95% CI	6.2 3.7;8.8	1.8 0.6;3.0	9.6 5.6;13.6	42.0 0.0;100.0	– –
Technical or Vocational/'A' level/HND	% of sites 95% CI	6.7 4.5;8.9	3.0 1.3;4.7	13.8 7.9;19.8	26.1 8.4;46.4	38.1 3.5;76.4
Secondary or below	% of sites 95% CI	10.3 8.6;12.0	3.3 1.9;4.8	10.6 8.2;13.1	22.2 15.1;29.3	43.6 31.4;55.8
Family Income (monthly)						
High	% of sites 95% CI	9.3 7.0;11.5	2.5 1.3;3.6	11.7 8.4;15.0	29.3 13.9;44.7	38.0 16.3;59.7
Medium	% of sites 95% CI	8.5 6.6;10.5	3.3 1.4;5.2	10.2 7.4;13.0	18.6 9.9;27.4	49.1 20.9;67.6
Low	% of sites 95% CI	8.9 6.3;11.5	3.0 0.9;5.1	10.8 6.4;15.2	22.6 9.7;31.2	49.3 28.7;67.4
Ethnicity						
Brunei Malay	% of sites 95% CI	7.7 6.4;9.0	3.1 2.0;4.2	10.2 8.0;12.4	27.1 17.6;36.6	35.0 21.6;46.5
Other Brunei Malay	% of sites 95% CI	9.5 6.1;12.9	2.2 0.0;4.8	11.6 6.3;16.8	21.1 8.1;37.1	31.9 0.0;55.2
Other Indigenous	% of sites 95% CI	6.4 3.5;9.4	3.1 0.1;6.3	7.9 3.5;9.5	8.9 0.0;48.5	74.7 –
Chinese	% of sites 95% CI	18.5 9.8;27.2	1.5 0.0;9.7	16.4 2.6;30.1	33.3 0.0;72.4	53.5 28.1;78.9

Prevalence of gingival inflammation

The gingival index is a measure of gingivitis, or inflammation of the gums. In this survey, gingivitis was assessed on six index teeth. A gingival index of two or more indicated either bleeding on probing or spontaneous bleeding, and this finding was classified as gingivitis.
Table 21 shows that almost three-quarters of adults in Brunei Darussalam (74.8%) had a gingival index score of two or more. More adults aged 16–34 years (79.3%) had gingivitis than those in the 65 years or older age group (53.0%). The lowest percentage of people with gingivitis was seen among those aged 65 years or older who had not made a dental visit in the previous five years (42.4%). The highest prevalence was seen in other Brunei Malay people aged 65 years or older (85.7%).

Figure 7: Percentage of adults with gingival inflammation

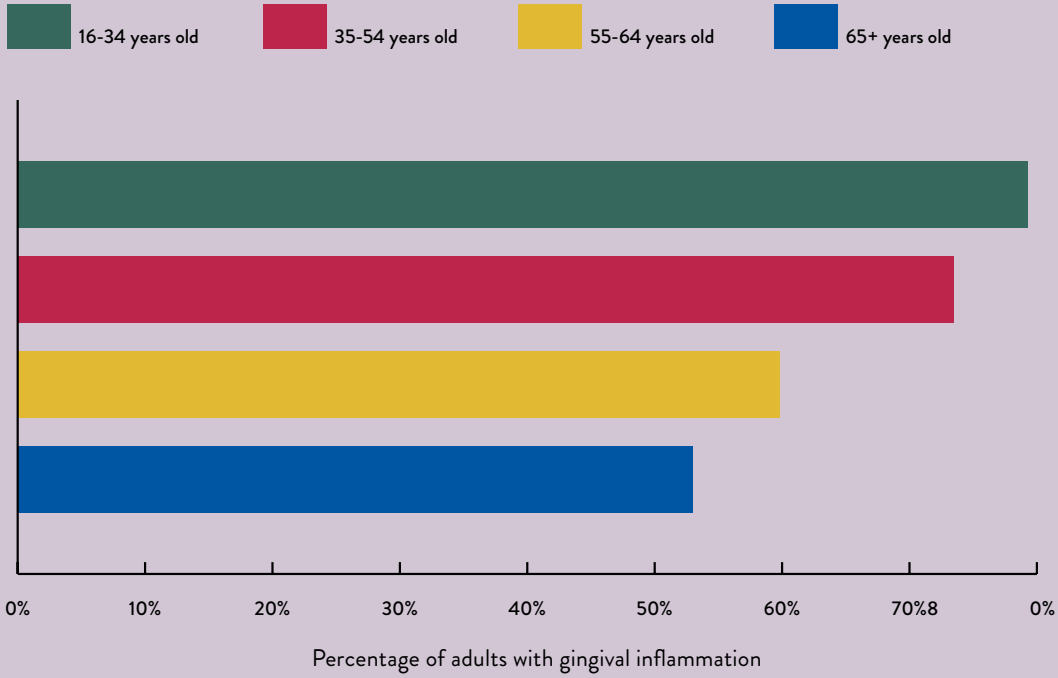


Table 21: Percentage of adults with gingival inflammation (%, 95% CI)

Age at time of survey (years)		All ages	16–34	35–54	55–64	65+
All people	**%** **95% CI**	**74.8** **71.1;78.2**	**79.3** **73.4;84.1**	**73.5** **68.1;78.2**	**59.8** **46.5;70.2**	**53.0** **38.4;67.2**
Sex						
Male	% 95% CI	77.9 72.4;82.5	82.5 73.4;88.9	75.9 67.7;82.5	62.4 44.8;77.2	58.6 37.5;74.8
Female	% 95% CI	71.5 66.5;76.1	75.8 67.7;82.3	71.0 63.6;77.3	55.7 38.6;71.6	46.3 27.4;69.0
Last dental visit						
< 12 months	% 95% CI	81.5 75.7;86.2	83.8 74.2;90.3	79.5 71.1;85.8	76.0 38.3;94.2	74.7 35.4;92.8
1 to 2 years	% 95% CI	76.1 68.4;82.4	83.3 71.8;90.7	70.5 57.5;80.9	51.0 26.0;75.5	44.1 9.1;85.0
2 to 5 years	% 95% CI	67.0 57.2;75.5	70.9 52.6;84.3	65.7 51.1;77.8	64.2 39.6;83.1	43.8 15.7;73.3
>5 years/never	% 95% CI	69.1 59.6;77.1	71.7 53.9;84.5	71.5 58.3;81.8	60.7 29.9;84.8	42.4 19.3;67.3
Level of education						
Degree up to PhD or above	% 95% CI	77.0 67.3;84.5	78.8 63.8;88.7	77.9 63.8;87.6	44.6 5.3;92.1	– –
Technical or Vocational/'A' level/HND	% 95% CI	78.3 70.4;84.5	78.2 67.8;86.0	81.1 69.2;89.1	58.9 26.2;91.9	78.3 18.6;99.1
Secondary or below	% 95% CI	72.4 67.5;76.8	79.6 70.2;86.6	70.8 63.8;76.8	61.1 47.0;73.5	49.4 33.9;64.9
Family Income (monthly)						
High	% 95% CI	76.6 69.9;82.2	79.5 67.6;87.8	75.8 66.3;83.2	65.9 44.0;82.6	68.8 36.8;89.3
Medium	% 95% CI	75.3 69.1;80.6	78.2 68.4;86.9	75.7 66.8;82.7	58.8 38.3;76.6	49.3 26.6;78.3
Low	% 95% CI	73.6 64.2;81.2	80.3 63.4;90.5	69.7 55.8;80.7	59.3 34.0;86.3	56.0 18.1;81.9
Ethnicity						
Brunei Malay	% 95% CI	76.4 72.1;80.3	80.4 73.8;85.7	74.6 68.0;80.2	57.3 40.5;72.6	53.2 33.1;70.0
Other Brunei Malay	% 95% CI	68.9 57.6;78.3	74.4 58.8;85.6	72.3 59.9;82.0	66.7 37.2;87.1	85.7 25.7;99.0
Other Indigenous	% 95% CI	73.1 56.6;85.0	85.7 61.3;95.8	68.4 51.4;81.6	71.4 21.5;95.8	– –
Chinese	% 95% CI	70.2 55.0;81.9	83.3 45.7;96.7	70.0 50.5;84.2	80.0 37.8;96.3	45.5 16.8;77.4

Other dental conditions

Prevalence of moderate or abundant dental plaque

The plaque index includes the presence of a moderate or abundant soft deposit within the gingival pocket, or tooth and gingival margin visible to the naked eye (score of 2 or more, Loe and Silness plaque index, 1963). Dental plaque is necessary for dental caries and periodontal diseases.

Prevalence of visible plaque is shown in Table 22. Moderate or abundant accumulation of dental plaque visible on at least one tooth was found in over one-quarter of Brunei adults. There were no differences by age group. There were also no differences among all adults by any of the listed explanatory variables.

There was a slight tendency for more of the youngest age group to have visible plaque. The highest proportion of people with visible plaque was found among those aged 55 years or older who visited in 1-2 years (63.5%) and older Chinese people (63.9%) with the lowest among other Indigenous people aged 16–24 years.

Dental plaque is a thin, sticky film of bacteria that forms on the surface of teeth. It is a major cause of tooth decay and gum disease, as the bacteria in plaque produce acids that can erode tooth enamel and irritate the gums.

Plaque forms from the combination of food particles, saliva, and bacteria in the mouth. If not removed through regular brushing and flossing, plaque can harden into calculus (tartar), which can only be removed by a dentist or dental hygienist. Plaque can also lead to the development of gum disease, as the bacteria in plaque can cause inflammation and infection in the gums.

The Loe and Silness Plaque Index (LSPI) is a commonly used tool in dentistry for assessing the amount of plaque on teeth surfaces. It was developed by H. Loe and J. Silness in 1963 and is considered one of the earliest and most widely used plaque indices.

The LSPI evaluates the amount of plaque on both tooth surfaces and gum margins by assigning a score of 0 to 3 to each surface, with 0 being no plaque and 3 being heavy plaque. The scores are then used to calculate an overall plaque score for each tooth, which can be expressed as a percentage of the total tooth surfaces scored.

The LSPI is considered a simple and effective method for evaluating plaque accumulation, and is commonly used to monitor the effectiveness of oral hygiene practices and track the progression of plaque over time. Regular dental check-ups and cleanings are important in preventing and removing plaque buildup, reducing the risk of tooth decay and gum disease.

Table 22: Percentage of adults with moderate or abundant accumulation of dental plaque

Variables		Age groups (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All people	**%** **95% CI**	**25.5** **21.6;29.8**	**35.3** **6.5;45.1**	**22.5** **15.9;30.8**	**21.3** **15.6;28.5**	**22.4** **14.0;33.9**	**16.1** **7.3;31.9**
Sex							
Male	% 95% CI	26.9 21.1;33.6	35.9 22.8;51.5	25.7 15.8;39.0	22.6 14.1;34.0	21.6 9.9;41.2	18.0 7.0;36.7
Female	% 95% CI	24.0 19.1;29.6	34.9 5.4;45.7	19.1 12.3;28.9	20.5 14.1;28.9	24.1 14.6;37.2	10.5 2.3;37.1
Last dental visit							
< 12 months	% 95% CI	28.0 21.5;35.5	30.0 17.3;46.8	31.0 18.9;46.3	25.1 15.6;38.0	25.4 11.9;46.3	4.6 0.3;40.7
1 to 2 years	% 95% CI	31.5 23.1;41.4	44.7 26.2;64.9	23.6 11.5;42.5	17.6 7.3;36.5	29.0 11.9;51.0	63.5 20.8;91.3
2 to 5 years	% 95% CI	19.3 11.7;30.0	43.7 21.7;68.4	14.2 3.8;40.9	18.2 7.5;38.0	11.5 2.9;36.6	100.0 -
5 years/never	% 95% CI	20.5 13.2;30.3	29.0 14.2;50.2	12.4 3.5;35.4	20.5 9.6;38.7	23.6 7.0;55.9	9.1 0.7;59.0
Level of education							
Degree up to PhD or above	% 95% CI	21.0 13.5;31.2	16.8 11.4;49.1	19.0 7.7;39.8	24.0 11.1;44.4	34.2 11.3;67.9	100.0 –
Technical or Vocational/'A' level/HND	% 95% CI	28.9 21.4;37.8	42.0 28.0;57.5	16.8 8.2;31.6	28.8 14.7;48.7	16.8 8.6;30.1	30.0 0.8;88.9
Secondary or below	% 95% CI	25.0 19.8;31.0	34.2 21.0;50.5	28.8 18.0;42.6	18.7 12.1;27.7	20.4 10.8;35.2	15.9 7.0;31.9
Family Income (monthly)							
High	% 95% CI	23.8 17.3;31.8	29.2 15.4;48.2	16.4 7.0;33.9	22.7 13.3;36.0	30.9 12.2;59.0	24.9 6.6;61.0
Medium	% 95% CI	27.7 21.3;35.2	41.7 25.0;60.5	30.5 18.3;45.5	22.4 13.3;35.2	16.8 7.5;33.7	12.2 2.1;34.0
Low	% 95% CI	25.2 16.6;36.3	42.7 25.0;70.8	16.6 5.8;39.0	21.6 9.7;41.3	32.2 12.2;59.8	100.0 –
Ethnicity							
Brunei Malay	% 95% CI	26.9 22.0;31.2	37.0 27.8;48.3	25.2 17.3;33.1	22.5 15.2;29.8	22.2 11.7;32.8	7.7 0.0;18.7
Other Brunei Malay	% 95% CI	17.3 7.9;26.8	30.0 8.0;52.0	15.8 0.0;33.8	13.8 0.0;27.1	27.8 4.1;50.7	10.0 0.0;32.6
Other Indigenous	% 95% CI	22.7 8.4;37.0	4.7 0.0;42.0	22.5 0.0;49.6	40.2 0.9;43.5	12.4 0.0;38.5	44.4 0.0;100.0
Chinese	% 95% CI	27.3 9.0;45.6	50.3 0.0;92.3	100.0 –	33.0 1.5;55.6	7.7 0.0;59.5	63.9 0.0;100.0

Prevalence of severe tooth wear of lower incisors

Severe tooth wear was defined as complete loss of enamel from the incisal surface of at least one lower incisor. Tooth wear was measured on the lower incisor teeth by visually assessing the amount of enamel in the biting surface. Teeth that had an incisal filling on the biting surface were excluded from the assessment.

Severe tooth wear was seen in 9.0% of the Brunei adult population (Table 23). It was strongly related to age with 5.8 times more people aged 55 years or older (22.7%) having severe tooth wear than those aged 16–24 years (3.9%). There were no significant differences between other groups. The highest proportion of people with severe tooth wear was seen in Chinese adults aged 25–34 years (40.0%) and the lowest proportion was seen among adults aged 16–24 years who last made a dental visit less than 12 months ago (0.2%).

Toothwear is a general term used to describe the loss of tooth structure due to various causes, such as abrasion, erosion, attrition, and abfraction.

Abrasion is the loss of tooth structure due to mechanical forces, such as brushing too hard or using a toothbrush with stiff bristles. Erosion is the loss of tooth structure due to chemical dissolution, typically caused by acidic foods and drinks or by acid reflux. Attrition is the loss of tooth structure due to tooth-to-tooth contact, such as grinding or clenching of the teeth. Abfraction is the loss of tooth structure due to bending forces on the teeth, often caused by bruxism (tooth grinding) or occlusal (bite) problems.

Toothwear can lead to sensitivity, pain, and aesthetic issues, as well as increasing the risk of tooth fracture and decay. Preventive measures, such as avoiding acidic foods and drinks, using a soft-bristled toothbrush, and treating bruxism, can help reduce the risk of toothwear. Early diagnosis and treatment of toothwear can help prevent further tooth loss and maintain oral health.

Table 23: Percentage of people with severe incisal tooth wear

Variables		Age groups (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All people	**%** **95% CI**	**9.0** **6.9;11.6**	**3.9** **1.3;10.8**	**7.2** **3.7;13.5**	**7.8** **4.7;12.8**	**14.3** **8.9;22.2**	**22.7** **15.0;32.8**
Sex							
Male	% 95% CI	11.2 7.4;15.0	7.3 0.0;15.2	10.3 2.2;18.4	8.7 2.6;14.9	15.4 5.2;25.6	23.1 11.4;34.9
Female	% 95% CI	6.5 4.1;9.0	0.2 0.0;0.1	3.6 0.0;7.8	6.9 1.8;12.0	13.2 4.7;21.6	22.5 7.7;36.8
Last dental visit							
< 12 months	% 95% CI	7.7 4.1;11.0	0.2 0.0;0.1	8.0 0.7;15.4	8.0 1.2;14.8	14.5 3.6;25.3	18.9 10.4;52.4
1 to 2 years	% 95% CI	11.3 5.9;16.6	1.8 0.0;5.5	9.5 0.0;20.6	13.2 1.2;25.0	15.3 0.0;32.3	39.9 18.6;63.2
2 to 5 years	% 95% CI	7.3 2.9;11.7	5.6 0.0;17.3	3.8 0.0;11.8	2.6 0.0;7.8	16.7 0.6;32.7	10.0 0.0;21.4
5 years/never	% 95% CI	12.5 7.0;18.0	6.9 0.0;16.7	4.3 0.0;13.4	11.4 1.6;21.1	9.5 0.0;23.2	29.6 11.2;48.0
Level of education							
Degree up to PhD or above	% 95% CI	8.9 4.4;17.3	0.4 0.0;27.4	18.3 7.0;40.0	– –	15.3 5.0;38.4	– –
Technical or Vocational/'A' level/HND	% 95% CI	4.3 2.1;8.7	– –	2.7 0.0;17.8	7.7 2.1;24.0	17.1 4.9;44.8	26.7 7.2;64.6
Secondary or below	% 95% CI	11.3 8.4;15.2	9.0 3.0;24.2	5.9 1.8;17.6	10.0 5.6;17.1	13.6 7.3;24.0	23.8 15.3;35.1
Family Income (monthly)							
High	% 95% CI	10.0 6.1;15.8	4.8 0.7;27.3	13.4 4.8;32.3	8.2 3.3;18.9	11.9 4.7;27.0	16.2 6.6;34.4
Medium	% 95% CI	11.1 7.6;16.0	6.3 1.2;26.2	6.1 1.8;18.4	8.7 3.9;18.6	16.1 7.7;30.8	33.3 18.5;52.4
Low	% 95% CI	8.3 4.5;15.0	3.2 0.6;33.8	7.4 1.5;29.5	4.8 1.2;17.0	18.6 5.6;36.3	25.0 8.6;54.3
Ethnicity							
Brunei Malay	% 95% CI	9.2 6.7;12.4	4.9 1.8;13.6	6.7 3.0;14.2	9.7 5.6;16.1	16.9 9.5;28.3	22.0 12.5;35.6
Other Brunei Malay	% 95% CI	9.5 4.4;19.4	– –	11.2 1.2;55.3	5.5 0.7;33.7	11.2 2.54;39.5	23.9 5.3;4.6
Other Indigenous	% 95% CI	3.1 0.8;11.0	– –	– –	3.8 0.5;25.4	14.3 2.9;48.0	14.3 1.0;74.3
Chinese	% 95% CI	16.4 8.2;30.0	– –	40.0 3.8;91.9	– –	16.7 3.3;54.3	37.5 16.1;65.2

Prevalence of use of full dentures

Table 24 shows the proportion of adults who wore a full denture in the upper or lower arch or both. The loss of all teeth in one or both arches and the replacement with full dentures is a measure of past dental disease. Denture wearing in either the upper or lower arch or both was strongly related to age.

Figure 8: Percentage of use of full dentures

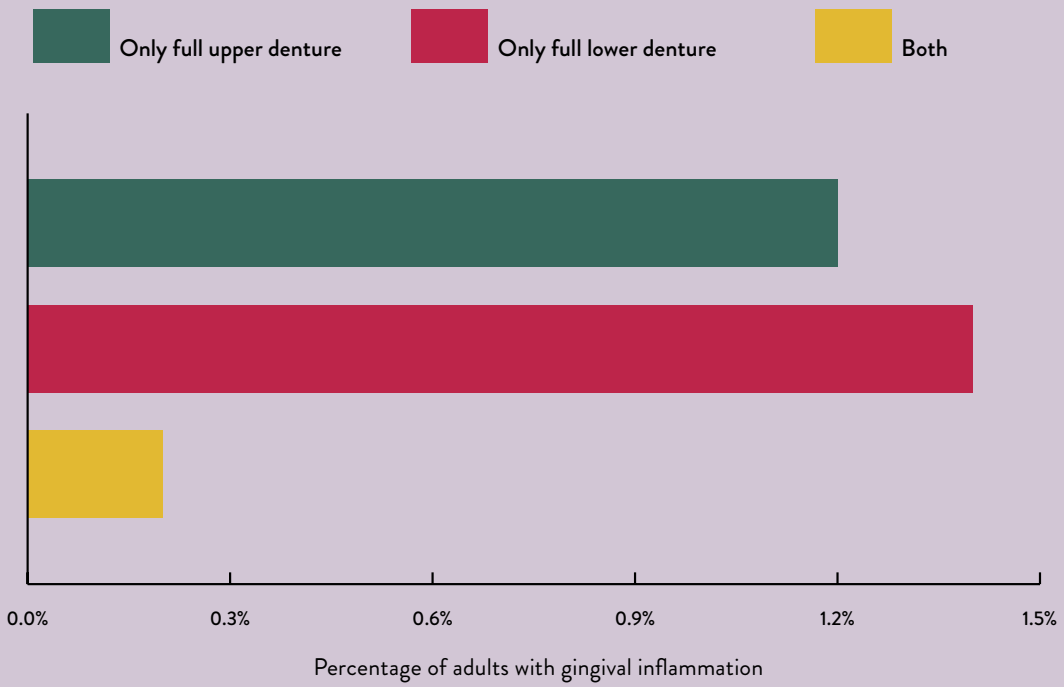


Table 24: Percentage of people with full dentures

Use of dentures		Both		Only full upper denture[1]		Only full lower denture[2]	
All	**%** **95% CI**	**1.2%** **(0.7;1.9)**		**1.4%** **(0.9;2.4)**		**0.2%** **(0.0;0.8)**	
Age group		**55–64 years**	**≥ 65 years**	**55–64 years**	**≥ 65 years**	**55–64 years**	**≥ 65 years**
All	**%** **95% CI**	**4.0%** **(1.3;11.9)**	**19.1%** **(11.0;31.1)**	**7.2%** **(3.0;16.0)**	**14.4%** **(6.9;27.9)**	**1.7%** **(0.3;9.7)**	**2.9%** **(0.4;19.1)**
Sex							
Male	% 95% CI	– –	6.9% (2.4;22.2)	7.8% (2.32;23.8)	5.3% (1.5;23.9)	– –	4.6% (0.4;21.6)
Female	% 95% CI	8.1% (2.5;23.1)	29.9% (15.8;49.2)	6.5% (1.9;20.4)	26.9% (11.0;47.4)	3.6% (0.6;19.2)	– –
Last dental visit							
< 12 months	% 95% CI	11.4% (2.1;43.2)	32.9% (11..5;65.1)	– –	– –	– –	– –
1 to 2 years	% 95% CI	– –	33.3% (11.2;66.5)	21.8% (7.5;49.1)	18.9% (4.2;78.5)*	6.2% (0.7;38.3)	17.1% (0.9;68.1)*
2 to 5 years	% 95% CI	7.3% (0.1;5.6)	4.2% (0.7;41.6)	4.0 (0.7;19.9)	– 29.0 (6.3;57.2)	0.8% (0.1;6.2)	– –
5 years/never	% 95% CI	7.1% (0.8;42.9)	9.3% (3.3;31.1)	– –	12.7% (2.3;37.1)	– –	– –
Level of education							
Degree up to PhD or above	% 95% CI	18.7% (1.1;82.4)*	82.7% (2.5;99.9)*	28.7% (0.4;6.0)*	– –	– –	– –
Technical or Vocational/'A' level/HND	% 95% CI	– –*	–* –	26.5% (0.5;4.5)*	– –	– –	– –
Secondary or below	% 95% CI	3.1% (0.8;11.7)	16.3% (8.3;29.6)	3.3% (0.9;11.8)	16.9% (8.0;32.1)	2.1% (0.4;11.4)	3.5% (0.4;22.9)

Family Income (monthly)							
High	% 95% CI	4.7% (0.6;29.8)	26.2% (10.9;50.6)	16.4% (5.7;39.0)	8.4% (0.9;50.0)	5.4% (0.7;33.2)	– –
Medium	% 95% CI	2.0% (0.3;13.6)	15.7% (3.8;46.8)	0.5% (0.12;3.7)	29.6% (15.2;62.3)	– –	9.8% (0.8;46.9)
Low	% 95% CI	1.1% (0.1;9.3)	23.8% (7.7;49.5)	1.1% (0.1;9.3)	– –	1.2% (0.1;10.4)	– –
Ethnicity							
Brunei Malay	% 95% CI	6.9% (2.1;20.7)	22.7% (11.3;35.2)	6.7% (2.2;20.1)	12.1% (4.9;33.0)	3.0% (0.4;19.5)	5.3% (0.5;25.4)
Other Brunei Malay	% 95% CI	– –	10.0% (0.9;68.1)*	7.0% (0.7;39.3)	– –	– –	– –
Other Indigenous	% 95% CI	1.9% (0.2;17.6)*	39.6% (0.5;95.9)*	1.9% (0.1;17.6)*	– –	2.2% (0.2;21.7)	– –
Chinese	% 95% CI	– –	10.5% (0.7;41.6)	19.8% (1.7;77.7)	24.5% (6.6;59.7)	– –	– –

[1]no full lower denture

[2]no full upper denture

*maximum sample size in the category as a whole (absence or presence of both full dentures): n = 10

Table 25 Shows the percentage of people wearing particular types of dentures by age group. Full upper denture was the most common denture in the oldest age group, whereas a partial upper denture was the most common in the 55-64 year age group.

Table 25: Percentage of people wearing dentures

Variables		Age group (years)						
		All ages	16–24	25–34	35–44	45–54	55–64	≥ 65
Full upper denture	%	2.9	–	0.7	0.6	1.8	10.4	32.1
	95% CI	2.0;4.1	–	0.1;5.0	0.1;4.0	0.4;8.2	5.3;19.6	21.7;44.8
Partial upper denture	%	6.3	–	1.4	4.8	14.6	22.8	15.5
	95% CI	4.8;8.1	–	0.3;5.7	2.6;8.7	9.2;22.2	14.8;33.5	8.5;26.6
Fixed upper denture	%	0.6	–	–	0.8	1.2	1.5	3.4
	95% CI	0.1;1.3	–	–	0.2;3.5	0.2;4.9	0.2;10.4	1.0;10.9
Full lower denture	%	1.4	–	–	–	–	5.3	21.6
	95% CI	0.1;2.2	–	–	–	–	2.0;13.6	13.0;33.8
Partial lower denture	%	0.9	–	–	0.6	0.4	5.3	5.2
	95% CI	0.5;1.6	–	–	0.1;4.0	0.1;3.0	2.1;12.5	2.0;13.4
Fixed lower denture	%	0.3	–	–	–	0.4	1.5	1.6
	95% CI	0.1;0.8	–	–	–	0.1;2.8	0.1;10.4	0.2;11.1

Table 26 presents the percentage of adults who perceive the need for dentures by age group. More people perceived the need for upper dentures than lower dentures and substantially more adults reported the need for dentures in the 55 year and older age group compared to the younger age groups.

Table 26: Self-perceived need for dentures by age group

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
Upper denture	%	**10.8**	1.0	2.9	12.7	14.5	37.3
	95% CI	**8.9;13.1**	0.2;5.9	1.1;7.4	8.7;18.3	9.4;21.7	29.6;45.7
Lower denture	%	**7.0**	–	2.1	5.6	8.7	30.6
	95% CI	**5.5;8.9**	–	0.6;7.0	3.1;9.8	5.0;14.8	23.5;38.8

Dental visiting

Percentage of people visiting a dentist within the last 12 months

Time since last visit is a key indicator of access to dental care. Visiting within a 12 month period for a check-up is widely recommended by the dental profession. Such visits provide an opportunity for provision of preventive services, early diagnosis and timely treatment of any dental disease.

In this survey, adults were asked in a questionnaire when they last made a dental visit. The categories of response were 'Less than 12 months', '1–2 years', '2–5 years', '5 years or longer', and never visited.

Table 27 shows the percentage of people who made a dental visit in the previous 12 months. Among all adults in Brunei Darussalam, 37.4% had made a dental visit within the last 12 months. There were no differences by population groups.

Figure 9: Percentage of people visiting dentist within last 12 months

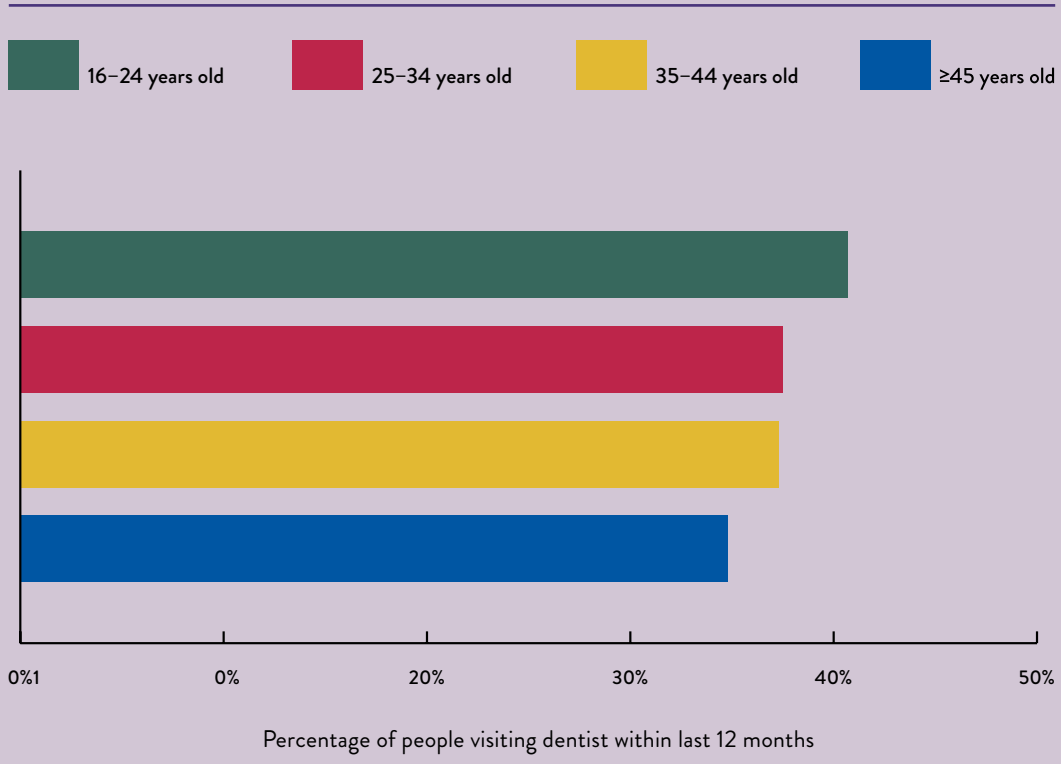


Table 27: Percentage of people visiting dentist within last 12 months

Variables		Age group (years)				
		All ages	16–24	25–34	35–44	≥ 45
All	**%** **95% CI**	**37.4** **33.5;41.5**	**40.7** **31.4;50.8**	**37.5** **29.3;46.6**	**37.3** **30.7;44.4**	**34.8** **28.8;41.2**
Sex						
Male	% 95% CI	35.9 30.1;42.1	43.8 30.2;58.5	35.5 23.7;49.2	27.3 19.2;37.4	36.4 27.3;46.6
Female	% 95% CI	39.1 34.0;44.4	37.3 25.6;50.7	40.0 29.0;52.0	47.6 37.9;57.5	33.1 25.7;41.5
Level of education						
Degree up to PhD or above	% 95% CI	46.2 36.1;56.6	50.6 26.3;66.8	50.8 31.9;69.5	43.4 26.7;61.7	36.8 19.8;57.8
Technical or Vocational/'A' level/HND	% 95% CI	37.5 28.7;45.2	47.7 32.5;63.4	29.6 17.1;46.2	34.9 21.1;51.7	26.8 14.4;44.3
Secondary or below	% 95% CI	35.5 30.6;40.7	30.5 17.7;47.4	37.9 25.4;52.2	36.8 28.6;45.9	35.5 28.6;43.1
Family Income						
High	% 95% CI	38.5 31.6;45.9	38.2 23.2;55.8	33.2 18.3;50.8	42.5 31.1;54.7	39.5 28.6;51.6
Medium	% 95% CI	37.9 31.5;44.7	41.2 24.3;60.4	41.2 27.1;57.7	34.2 24.2;45.9	35.8 26.5;46.3
Low	% 95% CI	34.8 26.1;44.6	44.0 –	36.7 –	37.6 23.2;54.6	24.8 14.1;40.1
Ethnicity						
Brunei Malay	% 95% CI	38.7 33.9;43.6	41.6 30.9;53.1	40.2 30.7;50.5	35.4 27.8;43.9	36.6 28.8;45.3
Other Brunei Malay	% 95% CI	29.2 20.4;39.9	37.3 13.3;69.9	12.7 2.9;41.3	43.4 24.2;64.9	26.2 14.9;41.7
Other Indigenous	% 95% CI	43.8 29.0;58.1	56.5 47.9;64.6	36.8 14.6;69.5	38.2 21.1;59.3	44.9 24.1;67.7
Chinese	% 95% CI	42.4 29.0;57.0	25.7 –	66.7 –	57.2 37.7;84.8	37.8 21.3;57.7

Some cells do not have confidence intervals due to small numbers

Barriers to dental visiting

There are a number of potential barriers which make dental visiting more difficult. Adults in Brunei Darussalam who had not made a dental visit in the last two years were asked what were the main barriers to visiting. Almost 38% of respondents had not made a dental visit for 2 or more years. People were able to mark more than one reason.

Table 28 shows the percentage of people who nominated the listed barriers. The most common reason was that there was no perceived need for a dental visit, reported by 50.7%.
The next most frequent response was the difficulty in taking time off work or in getting permission to take time off work. This was reported by 32.7% of respondents who had not visited in the previous two years. Over one-fifth of adults reported waiting time as a barrier.

Table 28: Percentage of people who had barriers/difficulties visiting a dentist in the last 2 years

Barriers/ difficulties	Age group (years)									
	All ages		25–34		35–44		45–54		55+ years	
	n	% 95% CI	n	% 95% CI	n	% 95% CI	n	% 95% CI	n	% 95% CI
There is no need	178	50.7 44.2;57.2	22	48.1 39.5;56.9	21	48.5 39.7;57.3	50	9.5 41.5;57.6	85	49.8 42.0;57.6
Time/ permission off work	106	32.7 26.9;39.1	15	39.0 30.7;47.9	18	39.7 31.5;48.6	37	38.4 30.8;46.6	36	36.1 28.9;44.0
Waiting time	74	20.5 15.8;26.0	13	23.1 16.7;30.9	7	20.2 14.3;27.6	30	22.8 17.0;29.9	24	19.4 14.2;25.9
Family commitments	57	17.8 13.4;23.3	8	18.5 12.6;26.3	6	16.5 10.9;24.2	20	18.4 12.9;25.6	23	17.9 12.7;24.8
Opening hours of clinic	57	16.4 12.2;21.6	10	18.3 12.8;25.6	17	20.1 14.1;27.8	24	19.0 13.7;25.9	16	16.8 11.9;23.2
Transport problem	59	15.7 11.7;20.9	15	17.3 11.7;24.8	4	15.3 10.1;22.5	20	15.4 10.5;22.1	20	15.2 10.4;21.5
Previous bad experience	50	13.6 9.8;18.6	7	14.2 9.2;21.4	5	14.3 9.2;21.4	17	13.9 9.2;20.4	21	16.1 11.2;22.6
Anxiety	51	12.6 9.2;17.1	9	13.0 8.4;19.6	3	11.7 7.5;17.9	19	14.0 9.5;20.1	20	14.1 9.8;19.9
Distance to the clinic	44	11.3 7.9;15.9	6	11.8 7.3;18.5	5	11.6 7.2;18.1	16	11.9 7.6;18.0	17	12.5 8.3;18.4
Cost	32	8.3 5.5;12.4	4	9.0 5.2;15.2	3	8.3 4.8;13.9	11	8.4 5.0;13.7	14	9.2 5.8;14.4

n = 538

Percentage of people who usually visit a dentist for a check-up

Intention behind visiting a dentist whether for a check-up or a dental problem is a defining characteristic of people's dental care. People who visit for a check-up are more likely to receive timely interventions to any dental disease and approaches to prevent future disease.

Table 29 shows that 46.2% of adults in Brunei Darussalam usually visit the dentist for a check-up.

There were no differences by population group.

Table 29: Percentage of people who usually visit a dentist for a check-up

Variables		Age group (years)				
		All ages	16–24	25–34	35–44	≥ 45
All	**%** **95% CI**	**46.2** **42.3;50.3**	**36.8** **27.9;46.7**	**45.7** **36.9;54.8**	**49.3** **42.3;56.4**	**52.0** **45.7;58.4**
Sex						
Male	% 95% CI	48.7 42.7;54.9	35.5 22.2;51.5	50.6 37.1;64.0	54.3 44.0;64.2	53.3 43.5;62.8
Female	% 95% CI	43.6 38.5;48.9	38.1 26.9;50.9	40.2 29.3;52.1	44.1 34.7;54.1	50.8 42.5;59.0
Level of education						
Degree up to PhD or above	% 95% CI	41.4 31.7;51.9	33.4 13.7;51.1	49.5 31.1;68.0	33.9 19.5;52.1	44.9 26.9;64.3
Technical or Vocational/'A' level/HND	% 95% CI	44.3 36.2;52.8	34.0 21.1;49.7	48.6 33.2;64.3	51.0 35.8;66.2	53.0 34.6;70.7
Secondary or below	% 95% CI	48.2 43.1;53.4	39.6 25.5;55.6	40.9 28.5;54.6	53.5 44.6;62.2	52.7 45.3;60.0
Family Income (monthly)						
High	% 95% CI	43.3 36.2;50.7	42.4 26.2;60.3	46.4 29.8;63.8	42.5 30.9;55.0	22.5 13.0;36.2
Medium	% 95% CI	48.5 42.0;55.1	39.1 23.0;58.0	47.1 32.8;61.8	53.5 42.0;64.5	46.6 32.5;61.3
Low	% 95% CI	50.3 40.8;59.7	35.7 17.2;62.0	43.4 21.3;54.7	52.4 35.4;68.8	65.1 42.6;82.4
Ethnicity						
Brunei Malay	% 95% CI	45.7 40.9;50.6	34.3 24.7;45.5	45.4 35.3;55.8	51.3 43.0;59.6	53.0 44.8;61.1
Other Brunei Malay	% 95% CI	50.32 39.4;61.0	53.6 22.7;82.0	53.7 28.1;77.6	39.0 21.4;60.1	52.9 36.7;68.6
Other Indigenous	% 95% CI	46.5 31.6;62.0	52.6 –	64.9 –	64.9 –	43.5 22.6;67.0
Chinese	% 95% CI	40.0 26.8;54.3	– –	29.7 4.0;81.1	25.8 –	46.9 29.3;65.3

Some cells do not have confidence intervals due to small numbers.

Table 30 shows the percentage of adults who attended a private clinic for their last dental visit by ethnicity. More Chinese adults attended a private clinic than other ethnic groups.

Table 30: Percentage of people who have attended private dental clinic at last dental visit

Variables		Age group (years)						
		All ages	16–24	25–34	35–44	45–54	55–64	≥65
All	**%**	**10.3**	**8.5**	**8.0**	**12.1**	**12.7**	**12.6**	**11.2**
	95% CI	**8.1;13.0**	**4.0;16.9**	**4.3;14.4**	**8.1;17.6**	**7.7;20.3**	**7.0;21.7**	**5.3;22.1**
Ethnicity								
Brunei Malay	%	8.2	6.7	5.1	11.9	9.8	13.5	5.5
	95% CI	6.0;11.2	2.7;16.0	2.2;11.3	7.3;18.8	5.2;17.7	6.0;27.6	2.2;20.7
Other Brunei Malay	%	10.5	17.0	20.2	5.0	9.7	1.6	–*
	95% CI	4.7;21.5	2.4;63.4	3.6;63.4	0.1;28.7	1.8;38.0	0.1;41.6	–
Other Indigenous	%	5.8	–*	0.1	2.8	–	39.9*	24.9*
	95% CI	2.5;13.0	–	–		–	3.047.3	–
Chinese	%	39.3	14.3*	60.0*	41.2	42.9	9.1	25.0
	95% CI	5.9;54.5	0.1;74.3	8.1;96.2	9.3;67.3	8.3;71.6	0.1;53.7	8.6;54.3

*less than 10 participants in this category

Percentage of adults who are moderately to extremely afraid making a dental visit

The proportion of Bruneian adults who feel moderate to extremely afraid or distressed when making a dental visit is shown in Table 31. Overall, 15% of adults reported feeling fear or distress, with little difference between age groups. There was a gradient between the proportion of the adult population feeling fear or distress by time since last visit starting at 11% among those who had visited a dental provider in the previous 12 months, increasing to 19.2% among those who had not made a visit in the last five years.

In the younger age groups, fewer of those with the lowest educational attainment reported fear or distress than those with higher levels. Fewer Chinese adults were afraid or distressed than Brunei Malay and other Brunei Malay adults.

Dental anxiety is a common condition characterized by fear or nervousness about visiting the dentist or undergoing dental procedures. This fear can range from mild to severe and can prevent individuals from seeking necessary dental care, leading to further dental problems and decreased oral health.

The causes of dental anxiety can be complex and can include past negative experiences, fear of pain or injury, fear of losing control, or embarrassment about the appearance of their teeth or mouth.

Dental professionals can help manage dental anxiety by establishing a positive and supportive relationship with patients, providing clear and detailed information about the procedures. In some cases, cognitive-behavioral therapy or exposure therapy may also be helpful in reducing dental anxiety.

It is important for individuals with dental anxiety to seek dental care and maintain good oral health, as untreated dental problems can lead to more serious health issues.

Table 31: Percentage of people who feel moderate to extremely afraid or distressed when going to the dentist

Variables		Age groups					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**%** **95% CI**	**15.0** **12.3;18.1**	**18.6** **12.1;27.4**	**13.5** **8.5;20.7**	**12.7** **8.7;18.3**	**15.0** **9.2;23.7**	**15.8** **10.3;23.3**
Sex							
Male	% 95% CI	15.6 11.7;20.6	15.1 6.9;30.0	13.0 6.1;25.5	14.1 8.3;22.9	20.2 10.6;35.0	19.5 11.2;31.6
Female	% 95% CI	14.3 11.0;18.4	22.0 13.3;34.3	14.0 7.9;23.6	11.3 6.3;19.3	9.3 4.6;18.1	12.3 6.1;23.1
Last dental visit							
< 12 months	% 95% CI	11.0 7.5;15.8	13.0 5.6;27.3	5.7 1.8;16.7	12.1 6.2;22.4	13.0 5.4;28.0	14.2 4.9;34.6
1 to 2 years	% 95% CI	16.1 10.8;23.4	16.6 6.8;35.2	20.0 9.4;38.2	18.3 8.7;34.6	8.1 2.2;25.7	9.7 2.8;28.7
2 to 5 years	% 95% CI	17.6 11.3;26.2	21.6 5.6;56.1	18.9 6.3;44.7	13.5 5.5;29.4	15.4 4.2;42.9	19.4 8.6;38.2
5 years/never	% 95% CI	19.2 12.6;28.2	32.0 14.2;57.1	17.8 7.2;37.7	10.8 4.2;25.1	16.7 3.9;35.8	17.9 8.2;34.8
Level of education							
Degree up to PhD or above	% 95% CI	17.0 10.3;26.8	23.3 8.3;43.2	16.8 6.0;38.8	15.6 6.1;34.4	14.0 3.2;44.4	7.7 0.6;51.7
Technical or Vocational/'A' level/HND	% 95% CI	17.2 11.7;24.7	27.0 15.6;42.7	12.6 5.2;27.5	9.3 3.2;24.1	17.0 5.3;42.7	8.1 0.9;57.8
Secondary or below	% 95% CI	13.7 10.5;17.6	9.8 3.5;24.5	12.8 6.7;23.1	13.1 8.1;20.5	14.8 8.2;25.8	18.0 11.6;26.8
Family Income (monthly)							
High	% 95% CI	17.5 12.4;24.2	22.9 10.9;42.0	25.0 12.5;43.8	15.3 8.2;26.7	11.2 3.7;28.9	5.8 2.2;14.9
Medium	% 95% CI	11.6 8.0;16.4	8.6 2.3;26.9	11.3 5.1;23.0	8.0 3.5;17.3	13.0 5.6;27.2	20.6 11.1;35.2
Low	% 95% CI	18.5 12.5;26.5	18.2 4.6;42.2	6.1 1.4;22.5	19.0 9.0;35.7	30.8 13.5;55.9	30.6 14.5;53.5
Ethnicity							
Brunei Malay	% 95% CI	16.1 12.8;20.0	18.2 11.3;28.1	13.7 8.1;22.2	15.7 10.4;23.0	17.5 9.5;29.9	16.8 9.7;27.6
Other Brunei Malay	% 95% CI	15.0 8.4;25.3	17.9 3.2;59.6	21.8 6.0;55.1	2.4 0.6;9.3	17.2 5.2;44.2	16.8 5.1;43.0
Other Indigenous	% 95% CI	12.7 5.6;26.4	17.3 0.9;68.1	10.6 3.1;51.0	9.2 1.7;28.1	8.4 0.8;50.4	22.8 3.9;68.5
Chinese	% 95% CI	8.0 2.3;24.5	35.8 1.0;74.3	–	7.0 2.5;40.9	–	6.3 1.5;22.7

Oral health perceptions

Perception of oral health as fair or poor

Self-reported global measures of oral health reflect an individual's experience of their own oral health. Such measures reflect the impact of oral health on daily living and are associated with discomfort, functional limitation, as well as clinical measures. In a single question, participants were asked to rate their oral health on a five point scale from excellent to poor.

Over 40% of Brunei Darussalam adults rated their oral health as fair or poor (Table 32). There were no differences by age group, educational level, family income or ethnicity.

Table 32: Percentage of people rating their oral health fair or poor

Variables		Age group (years)				
		All ages	16–24	25–34	35–44	≥ 45
All	**%** **95% CI**	**42.0** **38.1;46.0**	**40.2** **31.1;50.1**	**42.8** **34.9;51.7**	**42.6** **35.9;49.6**	**42.2** **36.1;48.7**
Sex						
Male	% 95% CI	40.1 34.4;46.2	29.7 17.8;45.1	42.8 30.3;53.3	43.5 33.8;53.7	43.1 33.9;52.9
Female	% 95% CI	44.0 38.8;49.3	51.3 38.5;63.9	42.7 31.8;54.3	41.7 32.4;51.5	41.3 33.4;49.7
Level of education						
Degree up to PhD or above	% 95% CI	45.1 35.1;55.5	39.3 26.3;66.8	52.6 32.5;71.3	37.2 21.3;56.5	48.3 29.7;67.3
Technical or Vocational/'A' level/HND	% 95% CI	37.8 30.1;46.1	35.1 22.4;50.2	0.5 26.6;56.1	39.2 24.8;55.9	35.8 21.7;53.1
Secondary or below	% 95% CI	43.0 38.0;48.2	46.7 31.6;62.5	40.9 28.6;54.4	44.0 35.6;52.9	41.8 34.8;49.3
Family Income (monthly)						
High	% 95% CI	40.3 33.4;47.7	43.4 26.5;62.0	38.3 22.3;57.4	44.1 32.6;54.3	35.6 25.5;47.1
Medium	% 95% CI	36.7 30.6;46.2	29.8 15.7;49.2	37.4 24.4;52.4	36.3 26.1;47.9	40.4 30.8;50.8
Low	% 95% CI	49.3 40.0;58.6	34.3 21.1;66.5	55.3 36.3;72.8	46.5 30.7;63.0	54.3 39.0;68.8
Ethnicity						
Brunei Malay	% 95% CI	42.4 37.7;47.3	43.6 33.1;54.9	43.0 33.2;53.3	42.2 34.3;50.6	40.7 32.9;49.0
Other Brunei Malay	% 95% CI	35.6 26.2;46.3	20.9 6.7;49.3	34.0 14.6;60.7	5.6 18.9;56.9	43.3 28.1;59.8
Other Indigenous	% 95% CI	42.5 27.9;58.6	49.2 14.3;85.7	35.9 10.2;63.5	38.3 19.0;57.5	47.8 25.2;71.3
Chinese	% 95% CI	47.3 33.5;61.5	25.9 4.2;78.5	55.4 40.0;69.8	47.5 23.5;72.0	50.5 32.3;68.5

Experience of toothache

Toothache is usually caused by dental diseases including dental caries and gum diseases. Other causes include trauma and gingival recession. Toothache may be transitory or persistent. In this survey, participants were asked how often they had experienced toothache in the previous 12 months. Response categories were 'very often, often, occasionally, hardly ever and never'.

Table 33 shows that 46.7% of adults reported experiencing toothache occasionally, often or very often. Experience of toothache was not related to age group, sex, educational attainment, family income or ethnicity.

Table 33: Percentage of people with toothache (occasionally/often/very often) in the last 12 months

Variables		Age group (years)				
		All ages	16–24	25–34	35–44	≥ 45
All	**%** **95% CI**	**46.7** **42.7;50.7**	**45.7** **36.2;56.1**	**51.1** **42.1;59.9**	**50.4** **43.4;57.3**	**40.1** **34.0;46.5**
Sex						
Male	% 95% CI	45.7 39.7;51.9	37.7 23.9;53.9	53.5 39.9;66.6	47.6 37.6;57.9	42.4 33.0;52.4
Female	% 95% CI	47.8 42.5;53.0	54.3 41.2;66.9	48.3 36.8;59.9	53.3 43.8;65.6	37.8 30.1;46.1
Level of education						
Degree up to PhD or above	% 95% CI	42.5 32.5;53.1	33.9 25.1;67.5	49.1 29.5;68.9	45.7 28.3;64.2	35.9 20.1;55.6
Technical or Vocational/'A' level/HND	% 95% CI	48.8 40.4;57.2	42.7 28.8;57.9	52.6 37.1;67.6	55.5 38.9;71.0	45.6 28.1;64.2
Secondary or below	% 95% CI	47.3 42.1;52.5	55.2 38.6;70.7	51.6 38.1;64.9	49.8 41.1;58.4	39.9 32.8;47.4
Family Income (monthly)						
High	% 95% CI	44.7 37.5;52.2	42.1 24.8;61.6	53.2 35.1;70.5	50.4 38.4;62.3	34.2 24.1;46.0
Medium	% 95% CI	47.3 40.7;53.9	51.7 32.9;69.9	54.4 39.2;68.9	44.5 33.6;56.0	0.7 31.1;51.0
Low	% 95% CI	46.8 37.6;56.2	42.1 21.1;66.5	54.3 37.1;70.5	57.1 42.6;70.6	45.1 30.2;60.9
Ethnicity						
Brunei Malay	% 95% CI	47.4 2.5;52.3	44.1 33.3;55.6	53.3 42.9;63.4	48.0 39.7;56.4	2.5 34.6;50.9
Other Brunei Malay	% 95% CI	49.5 38.6;60.5	53.2 27.1;77.6	50.4 26.3;74.4	63.3 42.4;80.2	39.3 24.6;56.2
Other Indigenous	% 95% CI	48.9 34.2;63.8	70.6 20.8;91.3	53.5 24.8;80.4	40.5 27.3;66.2	40.1 20.2;64.0
Chinese	% 95% CI	34.6 22.2;49.6	45.1 15.0;90.9	– –	51.6 25.0;75.0	34.6 18.4;55.4

Current smokers

The percentage of adults in Brunei who reported being current smokers was 16.4%. The proportion was highest among adults aged 35–44 years and lowest in the 45–54 years age group (Table 34).

Somewhat fewer adults who had made a dental visit in the previous 12 months were current smokers (11.8%) than people with other visiting patterns.

About 10% of adults smoked e-cigarettes or vape (Table 33). This figure was highest among the youngest age group but none of those aged 45 years or older reported smoking this form of tobacco.

The use of tobacco products can have a negative impact on nearly every aspect of oral health, including the teeth, gums, tongue, and other oral tissues.

Smoking is a significant risk factor for periodontal (gum) disease. Studies have shown that smokers are more likely to develop gum disease compared to non-smokers. Smoking decreases the blood flow to the gums, making it harder for the tissues to heal. It also weakens the immune system's ability to fight off bacteria that cause gum disease. Smoking also increases inflammation in the body, including the gums, making it more likely for gum disease to develop.

The tar and nicotine in cigarette smoke can cause teeth and tongue to stain. The tobacco smoke can dry out the mouth and cause a buildup of bacteria, leading to an unpleasant odor.

Smoking is a major risk factor for oral cancer, which is cancer that occurs in the mouth, including the lips, tongue, cheeks, and throat. The use of tobacco products, including cigarettes, cigars, and smokeless tobacco, increases the risk of developing oral cancer.

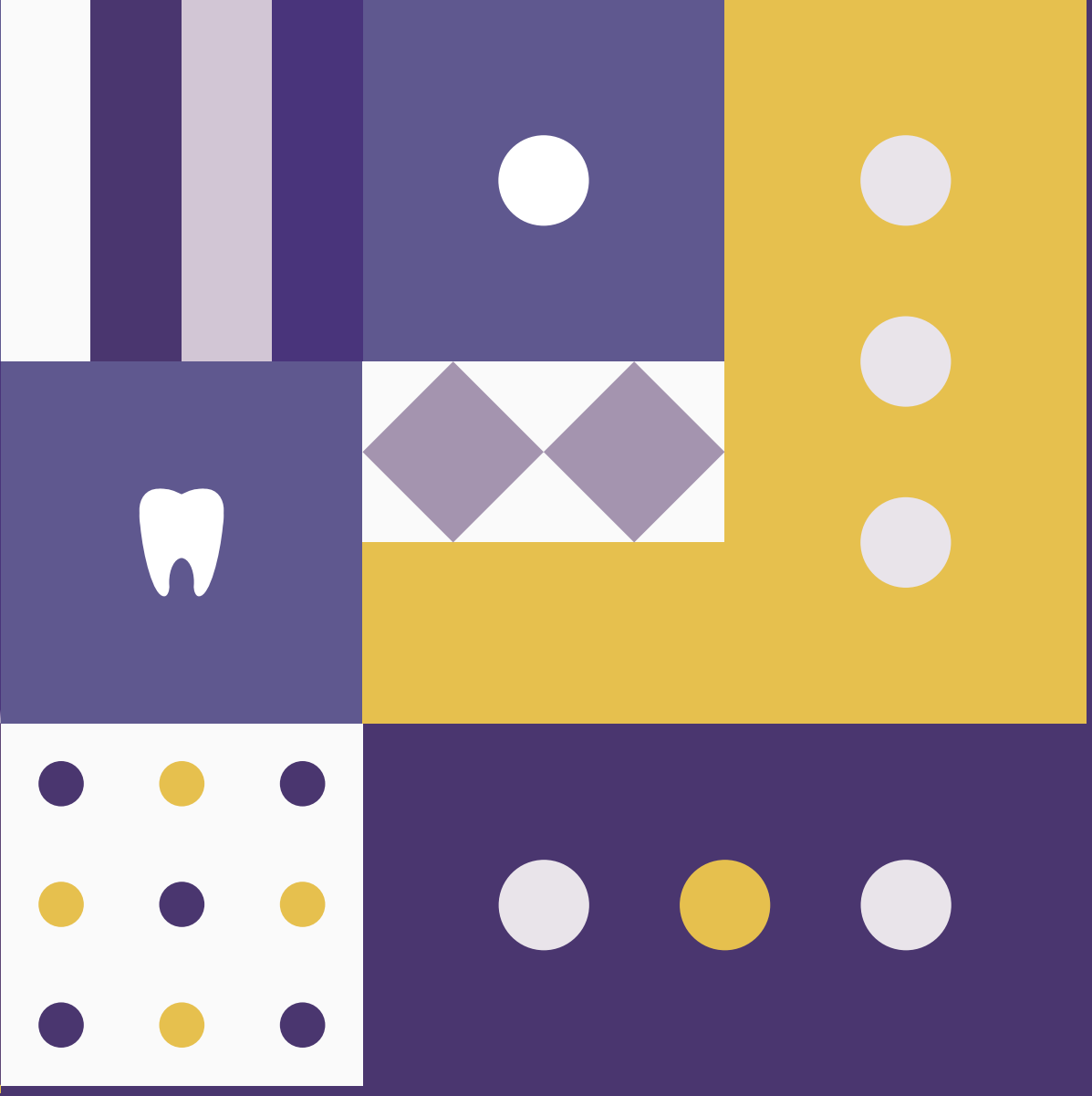
Quitting smoking can have significant benefits for oral health, including reducing the risk of gum disease, tooth loss, bad breath, and oral cancer.

Table 34: Prevalence of current smokers

Variables		Age group (years)					
		All ages	16–24	25–34	35–44	45–54	≥ 55
All	**%** **95% CI**	**16.4** **13.6;19.7**	**17.3** **10.9;26.4**	**18.6** **12.5;26.8**	**20.9** **15.8;27.2**	**9.3** **5.0;16.7**	**10.7** **6.4;17.4**
Sex							
Male	% 95% CI	17.8 13.5;23.0	16.9 8.1;32.1	22.5 13.1;35.8	22.0 14.7;31.7	11.7 5.0;25.0	8.3 3.7;17.9
Female	% 95% CI	15.0 11.5;19.2	17.8 9.8;30.0	14.2 7.8;24.5	19.7 13.1;28.5	6.6 2.7;15.5	12..9 6.5;23.9
Last dental visit							
< 12 months	% 95% CI	11.8 8.1;16.9	9.8 3.2;26.0	10.5 4.1;24.4	19.3 11.7;30.1	10.3 4.1;23.6	4.9 1.3;17.0
1 to 2 years	% 95% CI	19.6 13.5;27.7	30.6 15.4;51.8	18.4 8.0;36.6	19.5 9.6;35.6	11.1 2.6;36.5	9.6 2.8;28.3
2 to 5 years	% 95% CI	16.3 10.0;25.4	12.8 1.9;52.7	27.6 11.1;53.9	20.9 9.9;38.8	4.1 0.5;26.5	6.5 1.4;25.1
5 years/never	% 95% CI	20.5 14.0;28.9	19.5 7.3;42.9	30.3 12.6;56.9	23.0 12.2;39.0	–	17.6 7.7;35.4
Level of education						**–**	
Degree up to PhD or above	% 95% CI	12.8 7.2;21.7	25.3 –	8.8 2.0;31.1	10.4 3.3;28.4	9.2 1.9;34.0	7.7 0.6;51.7
Technical or Vocational/'A' level/HND	% 95% CI	11.5 6.9;18.5	3.9 0.7;19.5	19.2 9.3;35.2	15.8 6.9;32.1	– –	12.3 –
Secondary or below	% 95% CI	19.3 15.5;23.8	24.7 13.5;41.0	22.9 13.6;36.0	25.2 18.4;33.6	10.8 5.4;20.6	10.9 6.2;18.6
Family Income (monthly)							
High	% 95% CI	11.8 7.8;17.5	15.8 6.3;34.3	8.6 2.7;24.0	13.2 7.0;23.5	12.1 4.0;31.4	7.5 2.5;20.3
Medium	% 95% CI	17.4 12.4;23.3	22.2 10.3;41.5	19.3 9.8;34.5	26.1 17.2;37.5	3.7 0.9;13.6	9.9 4.1;21.9
Low	% 95% CI	19.4 13.0;28.0	7.0 –	24.8 10.7;47.5	19.4 9.6;35.3	21.5 7.9;46.4	21.0 8.3;44.0
Ethnicity							
Brunei Malay	% 95% CI	16.0 12.8;20.0	14.9 8.4;24.9	17.0 10.5;26.3	24.0 17.6;31.8	7.3 3.1;16.4	9.1 4.3;18.2
Other Brunei Malay	% 95% CI	20.8 12.9;31.7	30.9 10.6;62.7	26.8 7.6;62.0	14.3 5.2;33.7	17.8 5.3;45.5	14.6 4.1;40.3
Other Indigenous	% 95% CI	18.2 8.6;34.5	– –	39.9 –	16.2 –	9.3 –	12.3 1.1;63.2
Chinese	% 95% CI	11.1 4.9;23.4	25.9 –	– –	8.7 –	7.6 –	14.3 4.0;40.3

Table 35: Percentage of current smoking using e-cigarettes/ vape

Variables		Age groups (years)						
		All ages	16–24	25–34	35–44	45–54	55–64	≥ 65
e-cigarette/ vape	%	9.6	16.8	13.3	5.3	–	–	–
	95% CI	5.0;17.5	4.9;43.8	4.1;35.2	1.5;16.6	–	–	–



Oral Health in Brunei Darussalam

Interpretation of Findings and Discussion of Oral Health in Brunei Darussalam

Oral health diseases and disorders are common in the Brunei population. The burden of these diseases can significantly affect people's quality of life as a result of infections, pain, inability to chew, difficulty in speaking and loss of sleep. This can result not only in suffering for the individual, but economic cost in terms of loss of time or reduced performance at work or school, and costs in provision of dental services.

Dental caries

The previous National Oral Health Survey of Brunei was held in 1999. The methodology used was somewhat different to the random sampling of the population used in the Survey reported here. However, comparisons are instructive.

In the adult population, among those aged 35–44 years, the caries prevalence is static at 98.3% in 1999 and 99.1% in 2016. However, the severity has fallen from a DMFT score of 14.4 in 1999 to 9.7 in 2016.

These declines can be ascribed to the widespread implementation of water fluoridation in 1987 in Bukit Barun and Layong, and the commencement of water fluoridation in Mengkubau, Seria, Sg Liang, Batang Duri, Sumbiling and Tasek Lama in the 2000s. Greater declines in caries would be expected in children than adults as they have had exposure to fluoride for a greater proportion of their lifetime. Water fluoridation is known to provide an additional benefit to fluoride in toothpaste.

A large proportion of the caries experience in all age groups remains untreated. The percentage of adults with untreated caries is high (63.4%) as is the proportion of adults with missing teeth (64.2%). Both a reduction in caries experience and more timely dental treatment would improve the oral health of both children and adults.

Periodontal disease

Although the measurements of periodontal disease differed in 1999 from that used in 2016, some comparisons can be made.

In adults aged 35–44 years, prevalence of bleeding was 43.4% in 1999 but 73.5% in 2016. Prevalence of 4mm pocketing or more was 67.7% in 1999 and 39.6% in 2016 among those aged 35–44 years. The comparisons for adults are less reliable as the 2016 Survey measured different teeth and a different sample.

Periodontal disease is associated with smoking, diabetes and a few other less common illnesses and oral hygiene.

International comparisons in oral health

Among adults in the 35–44 year age group, both the prevalence of dental caries and the severity are similar. Prevalence of caries in Brunei is 99.1% and in Australia 95.8%. The DMFT for adults aged 35–44 year in Brunei is 9.7, compared to 10.6 in Australia. The proportion with missing teeth due to pathology also differs with 75.7% of adults aged 35–44 years in Brunei compared to 49.3% in Australia (Roberts-Thomson & Do, 2007).

The prevalence of moderate to severe periodontitis in the 35–44 years age group also differed between Australia and Brunei. Forty percent of adults aged 35–44 years had moderate to severe periodontitis in Brunei compared to 24.5 % in Australia.

Dental visiting

Among adults, better oral health outcomes are usually seen in those who visit regularly and who visit for a check-up. Less than 40% of adults had not made a dental visit in the previous 12 months, and 46.2% reported that they usually visit for a check-up. The somewhat high proportion of the population with untreated caries indicates substantial need for dental care for adults.

Timely dental visits are needed for early intervention in the disease process. The relatively high proportion of the population with missing teeth in the Brunei population indicates that many people seek dental care late in the disease process. Ready access to care may be one factor due to distance, insufficient dental staff or opening hours of clinics, but lack of awareness and fear and anxiety may also contribute to this timeliness issue.

Differences between population groups

The other age group with better oral health than its younger compatriots is the 55+ age group. Lower levels of untreated decay, filled teeth and similar DMFT to the 45–54 years age group is notable. This may be related to fewer teeth but that does not explain the DMFT score. Indeed, 13.5% of adults aged 55 years and older had a DMFT score of zero.

There were few differences between males and females. Among both adults and children, more females had fillings than males and more adult females had a denture than males.

There were some differences by ethnicity in the adult population. Brunei Malay adults had fewer missing teeth than other ethnic groups. Chinese adults had a higher DMFT score than the other ethnic groups, and more of them visited a private practice for dental care.

Lower levels of education was associated with a number of poorer oral health outcomes. A higher proportion of adults with the least education, secondary school or less, had untreated decay, at least one missing tooth due to pathology and moderate or severe periodontal disease than adults with higher levels of education. They also had higher DMFT scores.

Many of these differences between population groups are difficult to minimise although some targeted programs may be helpful.

Strategies to improve oral health

The most effective means of improving and maintaining oral health in terms of dental caries is the use of fluorides, particularly water fluoridation and use of fluoride toothpaste. Water fluoridation provides a public health benefit of between 25% and 40%, in addition to the 25% benefit from fluoride toothpaste.

Maintenance of water fluoridation which has brought significant reduction in caries in recent years, is very important. Water fluoridation is cost effective to the health system and effective in reducing caries.

Twice daily brushing of teeth with a fluoridated toothpaste is recommended for caries prevention.

A second method for reducing caries is the reduction in sugar intake. It is pleasing to note the introduction of a sugar tax in Brunei Darussalam, however, additional methods could be considered. WHO recommendations to reduce sugar intake as a proportion of daily energy are likely to bring about encouragement to drink water. (World Health Organization 2015).

High percentage of the population with untreated dental caries and the relatively high numbers of missing teeth in middle aged and older adults suggests that more accessible and responsive dental care to facilitate early intervention and secondary preventive measure are desirable.

Periodontal disease in adults is related to smoking and diabetes as well as less than adequate oral hygiene. Periodontal disease is also minimised with regular dental visits with appropriate interventions. Programmes using 'a common risk approach' coordinated with general health programmes to reduce smoking and control diabetes would reduce the prevalence of periodontal disease.

It is therefore, timely, that the second Oral Health Agenda is produced to document the Department of Dental Services' strategic plans in the short, medium and long term. The ultimate aim is to achieve sustained long term improvements

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Appendix

كمنترين كصيحتن

MINISTRY OF HEALTH

BRUNEI DARUSSALAM

KAJISELIDIK KESIHATAN MULUT KEBANGSAAN 2015-2017

NEGARA BRUNEI DARUSSALAM

(KAJISELIDIK DEWASA)

BRUNEI DARUSSALAM NATIONAL ORAL HEALTH SURVEY 2015-2017

(ADULT SURVEY)

Dengan hormat sukacita kami memohon kerjasama awda. Sepertimana yang telah diterangkan di dalam surat, kami berharap untuk mengumpulkan maklumat tentang kesihatan mulut biskita sebagai sebahagian dari Kajiselidik Kesihatan Mulut Kebangsaan, Negara Brunei Darussalam 2015-2017. Jika awda setuju untuk menyertai Kajiselidik ini, sila isikan borang kajiselidik berikutnya. Semua maklumat yang awda berikan adalah SULIT.

We would like your help. As explained in the letter, we hope to collect information about your oral health as part of the Brunei Darussalam National Oral Health Survey 2015-2017. If you agree to participate, please fill in the following questionnaire. All information you provide will be STRICTLY CONFIDENTIAL.

BORANG KEBENARAN *CONSENT FORM*

NAMA *NAME*: .....

ALAMAT *ADDRESS*:.....

KAMPONG:.....

POSKOD *POSTCODE*: __ __ __ __ __ __

DAERAH *DISTRICT*:.....

ALAMAT E-MEL *E-MAIL ADDRESS*:.....

NOMBOR TELEFON RUMAH/BIMBIT *HOME/ MOBILE PHONE NUMBER*: __ __ __ __ __ __ __

PEKERJAAN *OCCUPATION*:.....

TARIKH LAHIR *DATE OF BIRTH*__ __ /__ __ /__ __ __ __ (DD/MM/YYYY)

FOR OFFICE USE All details must be complete

Return date _____ *ID* _____

Saya telah membaca lampiran maklumat, dan bersetuju untuk memberikan maklumat bagi Kajiselidik Kesihatan Mulut Kebangsaan 2015-2017 (Kajiselidik Dewasa).

Dengan memberi kebenaran ini, saya memahami bahawa:

a. **Saya boleh menarik balik kebenaran saya ini pada bila-bila masa, dan ianya tidak akan menjejaskan pengurusan penjagaan kesihatan mulut saya pada masa ini atau di masa akan datang;**
b. **Kajiselidik ini adalah untuk tujuan penyelidikan yang direka bagi meningkatkan kesihatan mulut di kalangan dewasa di Negara Brunei Darussalam, dan tidak semestinya memberi manfaat kepada saya secara langsung;**
c. **Maklumat sulit yang saya berikan untuk kajian ini akan terpelihara; dan**
d. **Maklumat yang dikumpul akan digunakan untuk penyelidikan dan terbitan pada MASA AKAN DATANG.**
e. **Saya faham bahawa penyertaan termasuk melengkapkan borang kajiselidik ini dan juga pemeriksaan pergigian oleh doktor pergigian yang terlatih.**
f. **Saya faham bahawa saya akan menerima nasihat umum mengenai kesihatan mulut saya selepas pemeriksaan pergigian dan akan dimaklumkan jika ada isu-isu utama yang menjejaskan kesihatan mulut saya yang memerlukan penilaian atau penjagaan selanjutnya.**
g. **Saya faham bahawa saya mungkin akan dihubungi lagi oleh Pasukan Petugas Kajiselidik, jika perlu, untuk maksud menjelaskan apa-apa maklumat, ataupun respons yang diberikan di dalam borang kajiselidik.**
h. **Saya memberi kebenaran secara SUKARELA.**
i. **Saya tahu bahawa saya perlu menyimpan salinan Borang Persetujuan ini, setelah diisi, dan juga lampiran maklumat yang diberikan.**

I have read the attached information sheet and consent to provide information for the National Oral Health Survey 2015-2017 (Adult Survey).

In giving my consent, I understand that:

a. *I am free to withdraw my consent at any time, and this will not affect the management of my oral health care, now or in the future;*
b. *The study is for the purpose of research which, although designed to improve the oral health of adults in Brunei Darussalam, may not directly benefit me;*
c. *The confidentiality of information that I provide for the study will be safeguarded; and*
d. *The information collected will be used for FUTURE research and publications.*
e. *I understand that participation includes the completion of this questionnaire and a dental examination by a trained dentist.*
f. *I understand that I will receive general advice about my oral health following the dental examination and will be advised if any significant issues affecting my oral health need further assessment or care.*
g. *I understand that I may be contacted by the Survey Taskforce again, if needed, for the purpose of clarifying any details or responses provided in the questionnaire.*
h. *My consent is given VOLUNTARILY.*
i. *I am aware that I should keep a copy of this Consent form, when completed, and the attached Information sheet.*

Tandatangan *Signature*: ……..…… **Tarikh** *Date*: ……

Nama *Name*: ……...

Untuk diisikan oleh Petugas penyelidik(Saksi): *Survey member/ (Witness) to complete:*

Saya telah menerangkan sifat penyelidikan kepada peserta ini dan pada pendapat saya dia memahami penjelasan tersebut.
I have described the nature of the survey to the participant and in my opinion, she/he understood the explanation.

Tandatangan *Signature*: _____ **Tarikh** *Date*: _____

Nama *Name*: _____ **Jawatan** *Position*: _____

كمنترين كصيحتن

MINISTRY OF HEALTH

BRUNEI DARUSSALAM

THE UNIVERSITY of ADELAIDE

KAJISELIDIK KESIHATAN MULUT KEBANGSAAN 2015-2017

NEGARA BRUNEI DARUSSALAM

(KAJISELIDIK DEWASA)

BRUNEI DARUSSALAM NATIONAL ORAL HEALTH SURVEY 2015-2017

(ADULT SURVEY)

Dengan hormat sukacita kami memohon kerjasama awda. Sepertimana yang telah diterangkan di dalam surat, kami berharap untuk mengumpulkan maklumat tentang kesihatan mulut awda sebagai sebahagian dari Kajiselidik Kesihatan Mulut Kebangsaan, Negara Brunei Darussalam 2015-2017. Jika awda setuju untuk menyertai Kajiselidik ini, sila isikan borang kajiselidik berikutnya. Semua maklumat yang awda berikan adalah SULIT.

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BORANG KEBENARAN *CONSENT FORM*

NAMA *NAME*: .....

ALAMAT *ADDRESS*:.....

KAMPONG:.....

POSKOD *POSTCODE*: __ __ __ __ __ __

DAERAH *DISTRICT*:.....

ALAMAT E-MEL *E-MAIL ADDRESS*:.....

NOMBOR TELEFON RUMAH/BIMBIT *HOME/ MOBILE PHONE NUMBER*: __ __ __ __ __ __ __ __

PEKERJAAN *OCCUPATION*:.....

TARIKH LAHIR *DATE OF BIRTH*__ __ /__ __ /__ __ __ __ (DD/MM/YYYY)

FOR OFFICE USE All details must be complete

Return date _____ *ID* _____

Saya telah membaca lampiran maklumat, dan bersetuju untuk memberikan maklumat bagi Kajiselidik Kesihatan Mulut Kebangsaan 2015-2017 (Kajiselidik Dewasa).

Dengan memberi kebenaran ini, saya memahami bahawa:

a. Saya boleh menarik balik kebenaran saya ini pada bila-bila masa, dan ianya tidak akan menjejaskan pengurusan penjagaan kesihatan mulut saya pada masa ini atau di masa akan datang;
b. Kajiselidik ini adalah untuk tujuan penyelidikan yang direka bagi meningkatkan kesihatan mulut di kalangan dewasa di Negara Brunei Darussalam, dan tidak semestinya memberi manfaat kepada saya secara langsung;
c. Maklumat sulit yang saya berikan untuk kajian ini akan terpelihara; dan
d. Maklumat yang dikumpul akan digunakan untuk penyelidikan dan terbitan pada MASA AKAN DATANG.
e. Saya faham bahawa penyertaan termasuk melengkapkan borang kajiselidik ini dan juga pemeriksaan pergigian oleh doktor pergigian yang terlatih.
f. Saya faham bahawa saya akan menerima nasihat umum mengenai kesihatan mulut saya selepas pemeriksaan pergigian dan akan dimaklumkan jika ada isu-isu utama yang menjejaskan kesihatan mulut saya yang memerlukan penilaian atau penjagaan selanjutnya.
g. Saya faham bahawa saya mungkin akan dihubungi lagi oleh Pasukan Petugas Kajiselidik, jika perlu, untuk maksud menjelaskan apa-apa maklumat, ataupun respons yang diberikan di dalam borang kajiselidik.
h. Saya memberi kebenaran secara SUKARELA.
i. Saya tahu bahawa saya perlu menyimpan salinan Borang Persetujuan ini, setelah diisi, dan juga lampiran maklumat yang diberikan.

I have read the attached information sheet and consent to provide information for the National Oral Health Survey 2015-2017 (Adult Survey).

In giving my consent, I understand that:

a. I am free to withdraw my consent at any time, and this will not affect the management of my oral health care, now or in the future;
b. The study is for the purpose of research which, although designed to improve the oral health of adults in Brunei Darussalam, may not directly benefit me;
c. The confidentiality of information that I provide for the study will be safeguarded; and
d. The information collected will be used for FUTURE research and publications.
e. I understand that participation includes the completion of this questionnaire and a dental examination by a trained dentist.
f. I understand that I will receive general advice about my oral health following the dental examination and will be advised if any significant issues affecting my oral health need further assessment or care.
g. I understand that I may be contacted by the Survey Taskforce again, if needed, for the purpose of clarifying any details or responses provided in the questionnaire.
h. My consent is given VOLUNTARILY.
i. I am aware that I should keep a copy of this Consent form, when completed, and the attached Information sheet.

Tandatangan *Signature*: ..... **Tarikh** *Date*: .....

Nama *Name*: .....

Untuk diisikan oleh Petugas penyelidik(Saksi): *Survey member/ (Witness) to complete:*

Saya telah menerangkan sifat penyelidikan kepada peserta ini dan pada pendapat saya dia memahami penjelasan tersebut.
I have described the nature of the survey to the participant and in my opinion, she/he understood the explanation.

Tandatangan *Signature*: _____ **Tarikh** *Date*: _____

Nama *Name*: _____ **Jawatan** *Position*: _____

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

A. SEJARAH PERGIGIAN *DENTAL HISTORY*

(Sila tandakan **SATU PETAK SAHAJA** melainkan dinyatakan sebaliknya)
*(Please tick **ONE BOX ONLY** unless otherwise specified)*

1 **Bilakah perjumpaan pergigian terakhir awda (tidak termasuk perjumpaan ortodontik)?**
When was your last dental visit (excluding orthodontic visits)?

- ☐1 **Kurang dari 12 bulan yang lalu** *Less than 12 months ago* } Terus ke soalan 3 *Go to question 3*
- ☐2 **1 ke 2 tahun yang lalu** *1 to 2 years ago*
- ☐3 **2 ke 5 tahun yang lalu** *2 to 5 years ago*
- ☐4 **Lebih daripada 5 tahun yang lalu** *More than 5 years ago*
- ☐5 **Tidak pernah** *Never*

2 **Jika perjumpaan pergigian kali <u>TERAKHIR</u> awda adalah 2 tahun atau lebih, apakah penghalang/ kesukaran yang awda hadapi untuk perjumpaan?**
If your <u>LAST</u> dental visit was 2 or more years ago, what barriers/ difficulties did you experience in visiting?

	Sebab utama (Tandakan **SATU PETAK SAHAJA**) *Main reason (Tick **ONE BOX ONLY**)*	**Sebab lain** (Tandakan **SEBANYAK PETAK** yang berkenaan) *Other reasons (Tick **AS MANY BOXES AS APPLICABLE**)*
Sukar bagi saya mendapat masa/ kebenaran untuk keluar dari kerja *I have difficulty getting time/ permission off work*	☐1	☐1
Masalah kenderaan *Transport problem*	☐2	☐2
Tiada keperluan *There is no need*	☐3	☐3
Jarak ke klinik *Distance to the clinic*	☐4	☐4
Komitmen keluarga *Family commitments*	☐5	☐5
Saya pernah mengalami pengalaman yang tidak baik *I had a previous bad experience*	☐6	☐6
Waktu klinik beroperasi *Opening hours of clinic*	☐7	☐7
Masa menunggu *Waiting time*	☐8	☐8
Kos (Kewangan) *Cost (Finance)*	☐9	☐9
Saya bimbang tentang perjumpaan *I am anxious about visiting*	☐10	☐10

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

3 **Siapakah yang awda jumpai pada perjumpaan terakhir mengenai gigi atau gusi awda?**
Who did you see at your last visit concerning your teeth or gums?

- ☐1 **Klinik Pergigian Kerajaan** *Government Dental Clinic*
- ☐2 **Klinik Pergigian Swasta** *Private Dental clinic*
- ☐3 **Doktor Perubatan** *Medical doctor*
- ☐4 **Perawat Tradisional** *Traditional healer*
- ☐5 **Lain-lain (sila nyatakan)** *Others (please specify)* .....

4 **Apakah sebab perjumpaan pergigian yang terakhir? (Awda boleh tandakan lebih dari satu petak)**
What was the reason for the last dental visit? (You may tick more than one box)

- ☐1 **Sakit** *Pain*
- ☐2 **Gusi berdarah** *Bleeding gum*
- ☐3 **Kerosakan gigi** *Tooth decay*
- ☐4 **Tampalan hilang / pecah** *Loss of filling / broken filling*
- ☐5 **Trauma / kecederaan gigi** *Trauma / tooth injury*
- ☐6 **Gigi longgar** *Loose tooth*
- ☐7 **Gigi palsu** *Denture / False teeth*
- ☐8 **Pemeriksaan** *Check-up*
- ☐9 **Lain-lain (sila nyatakan)** *Others (please specify)* .....

5 **Apakah rawatan yang awda terima pada perjumpaan pergigian yang terakhir?**
What treatment did you receive at your last dental visit?

- ☐1 **Ubat** *Medicine*
- ☐2 **Tampalan** *Fillings*
- ☐3 **Pembersihan dan penskaleran** *Cleaning and scaling*
- ☐4 **Gigi palsu** *False teeth*
- ☐5 **Cabut gigi** *Tooth removal*
- ☐6 **Lain-lain (sila nyatakan)** *Others (please specify)* .....

6 **Mengapakah awda biasanya berjumpa doktor gigi?**
Why do you usually visit a dentist?

- ☐1 **Pemeriksaan** *Check-up*
- ☐2 **Melegakan kesakitan** *Pain relief*
- ☐3 **Sebab lain (sila nyatakan)** *Other reasons(please specify):* .....

7 **Bagaimanakah awda menilai kesihatan umum awda?**
How would you rate your general health?

- ☐1 **Kurang baik** *Poor*
- ☐2 **Sederhana** *Fair*
- ☐3 **Baik** *Good*
- ☐4 **Sangat baik** *Very good*
- ☐5 **Cemerlang** *Excellent*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

8 **Bagaimanakah awda menilai kesihatan mulut awda?**
How would you rate your oral health?

☐1 **Kurang baik** *Poor*
☐2 **Sederhana** *Fair*
☐3 **Baik** *Good*
☐4 **Sangat baik** *Very good*
☐5 **Cemerlang** *Excellent*

9 a. **Adakah awda membersihkan gigi awda kelmarin?**
Did you clean your teeth yesterday?

☐1 **Ya** *Yes*
☐2 **Tidak** *No* (**Terus ke soalan 11** *Go to question 11*)

b. **Berapa kali awda membersihkannya kelmarin?**
How many times did you clean them yesterday?
___ **kali** *times*

10 **Apakah yang awda gunakan untuk membersihkan gigi?** *What did you use to clean your teeth?*
(**Tandakan sebanyak mana petak yang berkenaan** *Tick as many boxes as applicable*)

☐1 **Berus gigi** *Tooth brush*
☐2 **Kayu siwak** *Miswak stick*
☐3 **Berus interdental** *Interdental brushes*
☐4 **Ubat kumur-kumur** *Mouthwash*
☐5 **Flos gigi** *Dental floss*
☐6 **Pencungkil gigi** *Toothpick*
☐7 **Jari** *Finger*
☐8 **Lain-lain (sila nyatakan)** *Others (please specify)*_____

11 **Adakah awda menggunakan ubat gigi kelmarin?**
Did you use toothpaste yesterday?

☐1 **Ya** *Yes*

Jenama *Brand* _____

Berapa kali? *How many times?* ___

☐2 **Tidak** *No*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

12 **Adakah awda pernah mengalami masalah-masalah ini dalam tempoh 12 bulan kebelakangan?**
(Tandakan satu petak sahaja bagi setiap jenis masalah)
Have you ever had any of these problems in the last 12 months?
(Tick one box only for each type of problem)

	tidak pernah *never*	**kadang-kadang** *occasionally*	**sering** *often*	**selalu** *very often*	**tidak tahu** *don't know*
a. **Sakit gigi** *Toothache*	☐1	☐2	☐3	☐4	☐99
b. **Bengkak di muka dan/atau leher** *Swelling in face and/or neck*	☐1	☐2	☐3	☐4	☐99
c. **Nafas berbau** *Bad breath*	☐1	☐2	☐3	☐4	☐99
d. **Gusi berdarah** *Bleeding gum*	☐1	☐2	☐3	☐4	☐99
e. **Gigi bergoyang** *Loose teeth*	☐1	☐2	☐3	☐4	☐99
f. **Kesakitan akibat masalah gusi dan/atau gusi *bengkak*** *Pain due to gum problem and/or swollen gum*	☐1	☐2	☐3	☐4	☐99
g. **Kesukaran mengunyah beberapa makanan** *Difficulty chewing some foods*	☐1	☐2	☐3	☐4	☐99
h. **Mulut kering** *Dry mouth*	☐1	☐2	☐3	☐4	☐99
i. **Gigi menguning** *Stained teeth*	☐1	☐2	☐3	☐4	☐99

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

B. PROFIL KESAN KESIHATAN MULUT *ORAL HEALTH IMPACT PROFILE*

13 **Adakah awda pernah mengalami masalah-masalah ini dalam tempoh 12 bulan kebelakangan?**
(Tandakan satu petak sahaja bagi setiap jenis masalah)
Have you ever had any of these problems in the last 12 months? (Tick one box only for each type of problem)

	tidak pernah *never*	**jarang** *hardly ever*	**kadang-kadang** *occasionally*	**agak kerap** *fairly often*	**selalu** *very often*
a. **Pernahkah awda mengalami kesukaran mengunyah sebarang makanan disebabkan masalah gigi, mulut atau gigi palsu awda?** *Have you experienced difficulty chewing any food because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
b. **Pernahkah awda merasakan yang masalah gigi, mulut atau gigi palsu awda menyebabkan nafas awda berbau?** *Have you felt problems related to your teeth, mouth or dentures cause bad breath?*	☐1	☐2	☐3	☐4	☐5
c. **Pernahkah awda mengalami rasa tidak selesa untuk makan sebarang makanan disebabkan masalah gigi, mulut atau gigi palsu awda?** *Have you experienced discomfort eating any food because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
d. **Pernahkah awda mengalami tompok-tompok putih yang pedih (ulser) di dalam mulut?** *Have you experienced ulcers in your mouth?*	☐1	☐2	☐3	☐4	☐5

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

	tidak pernah never	jarang *hardly ever*	kadang-kadang *occasionally*	agak kerap *fairly often*	selalu *very often*
e. Pernahkah awda merasa tidak selesa disebabkan makanan terlekat di celah gigi atau gigi palsu awda? *Have you felt discomfort due to food getting stuck in between your teeth or dentures?*	☐1	☐2	☐3	☐4	☐5
f. Pernahkah awda merasa malu disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you felt shy because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
g. Pernahkah awda mengelak daripada memakan makanan tertentu disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you avoided eating certain foods because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
h. Pernahkah awda mengelak daripada senyum disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you avoided smiling because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
i. Pernahkah tidur awda terganggu disebabkan masalah gigi, mulut atau gigi palsu awda? *Has your sleep been disturbed because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

	tidak pernah never	jarang *hardly ever*	kadang-kadang *occasionally*	agak kerap *fairly often*	selalu *very often*
j. Pernahkah tumpuan awda terganggu disebabkan masalah gigi, mulut atau gigi palsu awda? *Has your concentration been disturbed by problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
k. Pernahkah awda mengelak daripada keluar berjalan-jalan disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you avoided going out because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
l. Pernahkah awda mengalami masalah untuk menjalankan kerja-kerja harian awda disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you experienced problems in carrying out your daily activities because of problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
m. Pernahkah awda terpaksa mengeluarkan perbelanjaan yang tinggi disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you had to spend a lot of money due to problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5
n. Pernahkah awda merasa kurang yakin dengan diri awda disebabkan masalah gigi, mulut atau gigi palsu awda? *Have you felt less confident of yourself due to problems with your teeth, mouth or dentures?*	☐1	☐2	☐3	☐4	☐5

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

C. SEJARAH MEROKOK *SMOKING HISTORY*

14

a. **Adakah awda merokok?** *Do you smoke?*

☐1 **Ya** *Yes*
☐2 **Tidak** *No* (**Terus ke soalan 15** *Go to question 15*).

b.

Jenis tembakau *Type of tobacco* (Tandakan **SEBANYAK PETAK** yang berkenaan *Tick **AS MANY BOXES** AS APPLICABLE*)	**Jumlah dalam sehari** *Amount per day*
☐1 **Rokok** *Cigarette*	**batang**/*sticks*
☐2 **E-rokok/vape** *E-cigarette/vape*	ml
☐3 **Cerut/paip** *Cigar/pipe*	
☐4 **Shisha** *Shisha*	
☐5 **Mengunyah tembakau** *Chewing tobacco*	
☐6 **Lain-lain (sila nyatakan)** *Others (Please state)*	

c. **Berapa lama sudahkah awda merokok?**
How long have you been smoking?
_____**tahun** *years*_____**bulan** *months*

15

a. **Adakah awda pernah merokok?** *Did you use to smoke?*

☐1 **Ya** *Yes*
☐2 **Tidak** *No* (**Terus ke soalan 16** *Go to question 16*).

b.

Jenis tembakau *Type of tobacco* (Tandakan **SEBANYAK PETAK** yang berkenaan *Tick **AS MANY BOXES** AS APPLICABLE*)	**Jumlah dalam sehari** *Amount per day*
☐1 **Rokok** *Cigarette*	**batang**/*sticks*
☐2 **E-rokok/vape** *E-cigarette/vape*	ml
☐3 **Cerut/paip** *Cigar/pipe*	
☐4 **Shisha** *Shisha*	
☐5 **Mengunyah tembakau** *Chewing tobacco*	
☐6 **Lain-lain (sila nyatakan)** *Others (Please state)*	

c. **Berapa lamakah awda merokok sebelum ini?**
How long did you smoke for in the past?
_____ **tahun** *years* _____ **bulan** *months*

d. **Sudah berapa lamakah awda berhenti merokok?**
How long has it been since you stopped smoking?
_____ **tahun** *years* _____ **bulan** *months*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

16

a. **Adakah awda mengunyah buah pinang atau daun sirih?**
Do you chew areca nut or betel leaf?
☐$_1$**Ya** *Yes* ☐$_2$**No** *Tidak* (**Terus ke soalan 17** *Go to question 17*)

b. **Yang manakah antara berikut yang awda biasanya kunyah?**
Which of the following do you usually chew?
☐$_1$ **Buah pinang** *Areca nut*
☐$_2$ **Daun sirih** *Betel leaf*
☐$_3$ **Buah pinang & daun sirih** *Areca nut & betel leaf*
☐$_4$ **Buah pinang, daun sirih & kapur** *Areca nut, betel leaf & lime*

c. **Pada umur berapakah awda mula mengunyah buah pinang atau daun sirih?**
At what age did you start chewing areca nut or betel leaf?
_____ **tahun** *years old*

d. **Sudah berapa lamakah awda mengunyah buah pinang atau daun sirih?**
How long have you been chewing areca nut or betel leaf?
_____**tahun** *years*_____**bulan** *months*

e. **Berapa lamakah awda mengunyah buah pinang dan/atau daun sirih pada hari biasa?**
How long do you chew on an areca nut &/or betel leaf on a usual day? _____ **jam** *hours*

f. **Apakah awda lakukan selepas mengunyah?** *What do you do after chewing?*
☐$_1$**Menelan** *Swallow* ☐$_2$ **Meludah** *Spit*

17

a. **Pernahkah awda mengunyah buah pinang atau daun sirih sebelum ini?**
Did you chew areca nut or betel leaf in the past?
☐$_1$**Ya** *Yes* ☐$_2$ **No** *Tidak* (**Terus ke soalan 18** *Go to question 18*)

b. **Yang manakah antara berikut yang awda biasanya kunyah?**
Which of the following do you usually chew?
☐$_1$ **Buah pinang** *Areca nut*
☐$_2$ **Daun sirih** *Betel leaf*
☐$_3$ **Buah pinang & daun sirih** *Areca nut & betel leaf*
☐$_4$ **Buah pinang, daun sirih & kapur** *Areca nut, betel leaf & lime*

c. **Pada umur berapakah awda mula mengunyah buah pinang atau daun sirih??**
At what age did you start chewing areca nut or betel leaf?
_____ **tahun** *years old*

d. **Berapa lamakah awda mengunyah buah pinang atau daun sirih sebelum ini?**
How long did you chew areca nut or betel leaf in the past?
_____**tahun** *years*_____**bulan** *months*

e. **Berapa lamakah awda mengunyah buah pinang dan/atau daun sirih pada hari biasa?**
How long do you chew on an areca nut &/or betel leaf on a usual day? _____ **jam** *hours*

f. **Apakah awda lakukan selepas mengunyah?** *What do you do after chewing?*
☐$_1$**Menelan** *Swallow* ☐$_2$ **Meludah** *Spit*

g. **Berapa lama sudahkah awda berhenti?** *How long has it been since you stopped?*
_____**tahun** *years*_____**bulan** *months*

13

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

D. KEBIMBANGAN PERGIGIAN *DENTAL ANXIETY*

18 **Adakah awda merasa takut atau susah hati bila hendak berjumpa dengan doktor gigi?**
Do you feel afraid or distressed when going to the dentist?

- ☐1 **Tidak sama sekali** *Not at all*
- ☐2 **Sedikit takut atau susah hati** *A little afraid or distressed*
- ☐3 **Sederhana takut atau susah hati** *Moderately afraid or distressed*
- ☐4 **Sangat takut atau susah hati** *Very afraid or distressed*
- ☐5 **Amat takut atau susah hati** *Extremely afraid or distressed*
- ☐99 **Don't know** *Tidak tahu*

E. KESIHATAN UMUM *GENERAL HEALTH*

Untuk memastikan pemeriksa pergigian mengetahui sebarang masalah kesihatan atau masalah lain sewaktu menjalankan permeriksaan pergigian, adalah diharapkan agar awda dapat menjawab beberapa soalan mengenai kesihatan awda.

To ensure the dental examiner will be aware of any medical or other conditions at the time of the dental examination, it would be appreciated if you could answer a few questions regarding your medical history.

a. **Ketinggian** */Height* _____ **cm**

b. **Berat badan** /Weight _____ **kg**

19 **Adakah awda sedang atau pernah menghidap masalah perubatan yang tersenarai di bawah?**
Do you have or have ever had any of the medical problems listed below?
(Tandakan sebanyak mana petak yang berkenaan *Tick as many boxes as applicable*)

☐1	a. **Masalah jantung, penyakit injap seperti 'murmur'** *Heart problems, valve disorder e.g. murmur*
☐2	b. **Penyakit jantung 'Rheumatic'** *Rheumatic heart disease*
☐3	c. **Tuberkulosis (Tibi/ Batuk Kering)** *Tuberculosis (TB/dry cough)*
☐4	d. **Tekanan darah tinggi** *Hypertension (high blood pressure)*
☐5	e. **Anemia(kurang darah) atau penyakit darah yang lain** *Anaemia, or other blood diseases*
☐6	f. **Sawan** *Epilepsy/Seizure*
☐7	g. **Asma (Ampus), sesak nafas** *Asthma, breathlessness*
☐8	h. **Kencing manis** *Diabetes*
☐9	i. **Kecelaruan mental** *Mental disorders*
☐10	j. **Masalah buah pinggang** *Kidney problems*
☐11	k. **Masalah paru-paru** *Lung problems*
☐12	l. **Arthritis** *Arthritis*
☐13	m. **Kemoterapi/Radioterapi kepala dan leher** *Chemotherapy/ Head & neck radiotherapy*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

Sila senaraikan sebarang masalah kesihatan/penyakit lain:
Please list any other health problems/ disease:

Adakah awda sedang menjalani rawatan dan/atau mengambil ubat untuk mana-mana masalah kesihatan?
Are you currently undergoing treatment and/or taking medication any of these medical problems?
☐$_1$ **Ya** *Yes* ☐$_2$ **Tidak** *No*

Sila senaraikan, ubat-ubatan preskripsi yang diberi oleh doktor yang awda ambil pada masa ini:
Please list any prescribed medicines given by a doctor that you are taking or using at present:

Sila senaraikan ubat-ubatan yang memberi alahan kepada awda:
Please list any medications you are allergic to:

Sila senaraikan alahan lain (termasuk getah lateks)
Please list any other allergies (including rubber latex):

Pernahkah awda ditahan di hospital melebihi 2 minggu dalam masa 6 bulan kebelakangan?
Have you ever been hospitalised for more than two weeks during last 6 months?
☐$_1$ **Ya** *Yes* ☐$_2$ **Tidak** *No*

Adakah awda mengandung? *Are you pregnant?*
☐$_1$ **Ya** *Yes* ☐$_2$ **Tidak** *No*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

F. PENGETAHUAN KESIHATAN MULUT *ORAL HEALTH KNOWLEDGE*

20 **Cara manakah yang paling berkesan dalam mencegah kerosakan gigi?**
(Tandakan satu petak sahaja)
Which of the following is the most effective way in preventing tooth decay?
(Tick one box only)

- ☐1 **Memberus gigi** *Tooth brushing*
- ☐2 **Fluorida di dalam air** *Fluoride in the water*
- ☐3 **Memakan makanan berserat** *Eating fibrous foods*
- ☐4 **Memflos** *Flossing*
- ☐5 **Menggunakan ubat gigi yang mengandungi fluorida** *Using toothpaste with fluoride*
- ☐6 **Pemeriksaan pergigian secara tetap** *Regular dental check-up*
- ☐7 **Varnis fluorida** *Fluoride varnish*
- ☐8 **Lain-lain *(Sila nyatakan)*** *Others (Please specify)* .....

21 **Cara manakah yang paling berkesan dalam mencegah penyakit gusi?**
(Tandakan satu petak sahaja)
Which of the following is the most effective way in preventing gum disease? (Tick one box only)

- ☐1 **Memberus gigi** *Tooth brushing*
- ☐2 **Fluorida di dalam air** *Fluoride in the water*
- ☐3 **Memakan makanan berserat** *Eating fibrous foods*
- ☐4 **Memflos** *Flossing*
- ☐5 **Menggunakan ubat gigi yang mengandungi fluorida** *Using toothpaste with fluoride*
- ☐6 **Pemeriksaan pergigian secara tetap** *Regular dental check-up*
- ☐7 **Tidak merokok** *Not smoking*
- ☐8 **Lain-lain *(Sila nyatakan)*** *Others (Please specify)* .....

22 **Apakah sumber maklumat utama awda mengenai penjagaan gigi awda?**
(Tandakan satu petak sahaja)
What is your main source of information about your dental care?
(Tick one box only)

- ☐1 **Televisyen** *Television*
- ☐2 **Radio** *Radio*
- ☐3 **Surat khabar** *Newspaper*
- ☐4 **Klinik pergigian** *Dental clinic*
- ☐5 **Klinik perubatan** *Medical clinic*
- ☐6 **Keluarga** *Family*
- ☐7 **Kawan-kawan** *Friends*
- ☐8 **Internet** *Internet*
- ☐9 **Lain-lain *(Sila nyatakan)*** *Others (Please specify)* .....

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

H. MAKLUMAT PERIBADI *PERSONAL INFORMATION*

23 **Awda termasuk dalam kumpulan etnik mana?**
To which ethnic group do you belong?

- ☐1 **Melayu Brunei** *Brunei Malay* (Brunei, Tutong, Belait, Temburong)
- ☐2 **Melayu Brunei yang lain** *Other Brunei Malay* (Dusun, Bisaya, Murut, Kedayan)
- ☐3 **Puak Asli yang lain** *Other Indigenous* (Iban, Punan, Kelabit)
- ☐4 **Cina** *Chinese*
- ☐5 **Lain-lain** *Others* _____

24 **Apakah jenis isi rumah tempat tinggal awda?**
What type of household do you live in?

- ☐1 **Tinggal sendiri** *Living alone*
- ☐2 **Dengan keluarga** *With family*
- ☐3 **Dengan bukan ahli keluarga** *With non-family members (not relatives)*

25 **Apakah jantina awda?** *What is your gender?*

☐1 **Lelaki** *Male* ☐2 **Perempuan** *Female*

26 **Apakah tahap tertinggi pendidikan awda?** *What is your highest level of education?*

- ☐1 **Tiada pendidikan formal** *No formal education*
- ☐2 **Sekolah Rendah (Dr 1-6)** *Primary (Primary 1-6)*
- ☐3 **Sekolah Menengah (Tkt 1-5)** *Secondary (Form 1-5)*
- ☐4 **Teknikal atau Vokasional / OND** *Technical or Vocational / OND*
- ☐5 **Peringkat 'A' / HND** *'A' level / HND*
- ☐6 **Sarjana Muda hingga PhD** *Degree up to PhD*
- ☐7 **Kelayakan professional** *Professional qualification*
- ☐99 **Tidak Tahu** *Don't know*

27 **Kategori manakah jumlah pendapatan bulanan dari <u>kesemua ahli</u> rumah awda? Termasuk gaji, pencen, elaun, faedah dan lain-lain.**
Which category does your total monthly household income fall into? Include any salaries, pensions, allowances, benefits, etc. from <u>all members</u> in the household.

Jumlah pendapatan bulanan keseluruhan isi rumah *Total household income per month*

- ☐1 **Kurang dari $1000** *Less than $1000*
- ☐2 **$1000-$1999**
- ☐3 **$2000-$2999**
- ☐4 **$3000-$3999**
- ☐5 **$4000 ke atas** *$4000 and above*
- ☐99 **Tidak tahu** *Don't know*
- ☐66 **Tidak berkenaan** *Not applicable*

UNTUK KEGUNAAN PEJABAT *FOR OFFICE USE*

28 **Berapa ramaikah orang yang bergantung kepada pendapatan ini termasuk diri awda?**
How many people are dependent on this income including yourself?

Dewasa lain (18 tahun dan ke atas) ..... **Kanak-kanak (0-17 tahun)** .....
Other adult (18 years old and above) *Child (0-17 years old)*

29 **Bagaimanakah taraf hidup awda sekarang, berbanding dengan zaman kanak-kanak awda?**
How would you compare your current standard of living to that of your childhood?

☐1 **Lebih baik** *Better*
☐2 **Sama** *Same*
☐3 **Lebih teruk** *Worse*

Komen awda

Terima kasih. Sumbangan awda untuk kajian ini amatlah dihargai. Sila luangkan masa memeriksa semula untuk memastikan awda telah menjawab setiap soalan dan menandatangani borang kebenaran. Setelah itu, kembalikan borang kajiselidik kepada salah seorang ahli Kajiselidik, dan seterusnya menjalani pemeriksaan pergigian.

Jika awda mempunyai sebarang komen, sila tulis dalam ruang di bawah.

Your comments

Thank you. Your contribution to this survey is greatly appreciated. Please take a moment to check that you have answered each question and have signed the consent form. Then return the completed questionnaire to a member of the Survey team and proceed to take part in the dental examination.

If you have any comments, please feel free to write them in the space below.

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Glossary

95% confidence interval	Defines the uncertainty around an estimated value. There is a 95% probability that the true value falls within the range of the upper and lower limits.
Absolute difference	The difference between two values calculated by subtracting one value from the other.
Calibration	A procedure to promote standardisation between examiners performing the oral examinations.
Canine	One of four 'eye teeth' positioned next to the incisors and used for tearing food.
Cemento-enamel junction	Point on a tooth surface where the tooth crown joins the tooth root.
Census	The Census of Population and Housing conducted every 5 years by the Australian Bureau of Statistics.
Clinical attachment loss	A measure of the loss of supporting structures attached to the tooth. The distance in millimetres measured from the edge of the enamel to the gum tissue that is adherent to the root.
Coronal	Pertaining to the crown of a tooth.
Crown	The portion of tooth covered by white enamel that usually is visible in the mouth.
Dental attendance	Behaviour related to the use of dental services.
Dental caries	The process in which tooth structure is destroyed by acid produced by bacteria in the mouth. See Dental decay.
Dental caries experience	The cumulative effect of the caries process through a person's lifetime, manifesting as teeth that are decayed, missing or filled.
Dental decay	Cavity resulting from dental caries
Dentition	The set of teeth. A complete primary dentition comprises of 20 primary/deciduous teeth. A complete permanent dentition comprises 32 adult teeth.
Denture	A removable dental prosthesis that substitutes for missing natural teeth and adjacent tissues.
dmfs/DMFS	An index of dental caries experience measured by counting the number of decayed (d/D), missing (m/M), and filled (f/F) surfaces (s/S).
dmft/DMFT	An index of dental caries experience measured by counting the number of decayed (d/D), missing (m/M), and filled (f/F) teeth (t/T).

Enamel	Hard white mineralised tissue covering the crown of a tooth.
Epidemiology	The study of the distribution and causes of health and disease in populations.
Erupted tooth	A tooth that has emerged through the gums into the mouth.
Examination protocol	Methods and guidelines for conducting standardised oral examinations conducted in a survey.
Extraction	Removal of a natural tooth.
Fluoride	A naturally occurring trace mineral that helps to prevent tooth decay.
Fluorosis	Discolouration or pitting of the dental enamel caused by exposure to excessive amounts of fluoride during enamel formation.
Gingiva	Gum tissue.
Gingivitis	Redness, swelling or bleeding of the gums caused by inflammation.
Incisor	One of eight front teeth used during eating for cutting food.
Interproximal	Between the teeth.
Intra-class correlation coefficient	A statistical term referring to a measure of agreement between two or more examiners.
Mandible	Lower jaw.
Maxilla	Upper jaw.
Mean	The arithmetic average of a set of values.
Molar	One of 8 primary or 12 permanent back teeth used in grinding food.
Natural teeth	Refers to a person's own teeth as opposed to artificial teeth.
Participation rate	The proportion of people from whom survey information is collected from among the total number of people selected as intended study participants.
Periodontal disease	Disease of the gums and other tissues that attach to and anchor the teeth to the jaws
Periodontal pocket	A space below the gum line that exists between the root of the tooth and the gum surrounding that tooth.
Periodontal recession	The shrinkage of gum tissue away from the tooth resulting in exposure of dental roots and creating the appearance of being 'long in the tooth'.
Periodontitis	Disease of the gums caused by bacteria, characterised by swelling and bleeding of the gums and loss of tissue that attaches the tooth to the jaw.
Permanent teeth	Adult teeth (secondary teeth).
Plaque	A film composed of bacteria and food debris that adheres to the tooth surface.

Prevalence	The proportion of people with a defined disease within a defined population.
Primary teeth	Deciduous/baby teeth.
Probing pocket depth	The measured depth of the periodontal pocket.
Recorder	A person, usually a dental assistant, who recorded the results of an oral examination onto a laptop computer.
Relative difference	The difference between two values calculated as a ratio of one value divided by another.
Restoration	A filling to repair a tooth damaged by decay or injury.
Root	The part of the tooth below the crown which is anchored to the jaw.
Sampling bias	A flaw in either the study design or selection of participants that leads to an erroneous interpretation.
Socioeconomic position	Descriptive term for a position in society and usually measured by attributes such as income, education, occupation or characteristics of residential area.
Statistical significance	An indication from a statistical test that an observed association is unlikely (usually less than 5% probability) to be due to chance created when a random sample of people is selected from a population.
Trend	The general direction in which change over time is observed.
Unerupted tooth	A tooth that has failed to emerge through the gums into the mouth.
Weights	Numbers applied to groups of study participants to correct for differences in probability of selection and in participation.

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Brunei Darussalam National Oral Health Survey 2014-2017

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