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THE NATIONAL HEALTH AND MORBIDITY SURVEY 2017

NATIONAL ORAL HEALTH SURVEY OF SCHOOLCHILDREN 2017

VOLUME II : Oral Health Status of 12-year-old Schoolchildren

Institute for Public Health, National Institutes of Health (NIH)
Ministry of Health Malaysia

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VOLUME II: ORAL HEALTH STATUS OF 12-YEAR-OLD SCHOOLCHILDREN

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Disclaimer

The views expressed in this report are those of the authors and do not necessarily represent the opinions of other investigators involved in the survey, or the views or policies of the Ministry of Health Malaysia.

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The National Health and Morbidity Survey 2017: National Oral Health Survey of Schoolchildren 2017 (NHMS 2017: NOHSS 2017) is the third national oral health survey of schoolchildren in Malaysia. This cross-sectional survey involved only 12-year-olds attending government and government-assisted schools under the Ministry of Education and registered private schools in all states and Federal Territories in Malaysia. A two-stage stratified cluster sampling technique based on the stratification of primary schools by state and location (urban/rural) was used.

The targeted sample size was 12,200 and of this, 12,020 children were eligible for the survey. The final number examined was 11,511, giving a 95.8% response rate weighted to represent 444,626 schoolchildren aged 12 years. The actual enrolment of 12-year-old schoolchildren in 2017 was 444,631. Hence, the findings from this survey can be inferred as representative of the oral health status and treatment needs of 12-year-old schoolchildren at both national and state levels.

Overall, the major findings on 12-year-old schoolchildren in this survey is the drastic decline in periodontal health in the face of commendable improvement in caries status. The findings also showed a very slight decrease in the wearing of dentures and need for dentures, a slight increase in traumatic injuries to anterior teeth.

Findings from this survey showed a slight improvement in the denture status of 12-year-old children over a decade compared with findings from the national survey in 2007. A weighted population of 19 children (0.00%) were found to be wearing denture(s) and 669 children (0.16%) needed dentures compared with 0.02% and 0.20% respectively from 2007.

The prevalence of traumatised anterior teeth increased slightly from 5.4% in 2007 to 7.2% in this survey. Among children with traumatised incisors, the majority (80.2%) had only one traumatised tooth. The teeth most commonly involved were the upper central incisors. Significantly higher proportion of males (9.5%) had traumatised anterior teeth than females (4.8%). A total of 17.7% had at least one treated traumatised incisor while 84.5% had at least one untreated traumatised incisor.

This survey adopted for the first time, the Community Periodontal Index (CPI) Modified prescribed by the World Health Organisation in 2013 where all teeth present were examined. Almost all the 12-year-olds (99.8%) were found to have gingival bleeding on probing. The mean number of teeth with gingival bleeding per child was 21.16 teeth. Overall, 89.2% of teeth present per child had gingival bleeding. The teeth most commonly found to have gingival bleeding were the upper and lower first molars. Based on the

examination criteria in this survey, the children were only examined for gingival bleeding and thus, the treatment recommended would only pertain to oral hygiene instructions. Overall, commensurate with prevalence of gingival bleeding, 99.8% of 12-year-olds required reinforcement of oral hygiene instruction.

For comparison with previous national surveys, analysis based on six (6) index teeth was also undertaken. The findings showed a difference of only 0.2%, with 99.6% of 12-year-olds found with gingival bleeding. This is evidence of the drastic decline in periodontal health among 12-year-olds compared with the finding in 2007 where 19.6% of schoolchildren had healthy periodontal condition. Using the CPI, this survey also found a high mean number of sextants (5.5 sextants out of 6 sextants) with gingival bleeding per child. Analysis based on the six (6) index teeth recorded 99.6% of children requiring oral hygiene instruction, almost similar with the finding based on the analysis for all teeth examined (99.8%).

The findings show evidence of continuing improvement in the caries experience among 12-year-olds in Malaysia. Dental caries prevalence among 12-year-old schoolchildren in this survey was 33.3 %, compared with 41.5% in 2007. The mean DMFT at 0.78 was lower than the mean of 1.12 in 2007, showing a 30.4% reduction.

The filled (F) component was the highest component and accounted for about 62.8% of the mean DMFT per child in this survey, similar to the finding in 2007, where the F component was also the highest component accounting for 62.5% of the mean DMFT per child. The mean number of filled teeth (F) per child in this survey at 0.49 is a 30.0% reduction per child compared with 0.70 in 2007.

There was a 30.8% reduction in the mean decayed teeth (D) per child over the last decade, with a mean D of 0.39 in 2007 compared with 0.27 in this survey. An almost similar reduction (33.3%) was observed for the mean number of missing teeth (M) per child, where the mean of 0.02 in this survey is lower than the 0.03 in 2007.

Slightly higher percentage of children needed caries treatment (32.9%) in this survey compared with 2007 (30.9%). However, where restorative care need was highest in 2007, the current survey found the overall preventive need being higher in this survey, almost twice (22.9%) the need in 2007 (11.5%). A smaller percentage needed restorative care (14.8%) compared with 2007 (21.0%). The need for extraction had further declined over the last decade, from 2.9% in 2007 to 1.8% in this survey. Only 1.0% of children needed other complex care, unchanged over the last decade. The need for fissure sealant has been classified as part of caries treatment need in this study and about 17.4% of schoolchildren needed fissure sealant(s) compared with 10.8% in 2007.

Overall, 99.8% of schoolchildren needed oral healthcare in one form or another. The overall need for oral healthcare in this survey includes the need for dentures, treatment for traumatised anterior teeth, caries treatment (curative and preventive need) and oral hygiene instruction. The 2007[8] survey included the need for orthodontic treatment, hence, the findings between the two surveys are not directly comparable. The highest need for oral healthcare was for periodontal care, with almost all of the children (99.8%) needing oral hygiene instruction.

In cognizance of these findings, it is recommended that the Incremental Dental Care Programme consider a serious concerted emphasis on prevention and control of periodontal disease in addition to caries. Serious attention needs to be given in schools for children to maintain oral hygiene, including the possible establishment of teams dedicated to oral health promotion and to evaluating efforts on personalised oral hygiene activities.

Risk assessment and categorization for caries among schoolchildren should continue, especially with increasing application of the International Caries Detection and Assessment System (ICDAS) that now enables operators to detect the early stages of the caries process before overt cavitation. With the commendable decline in caries rates, it is also timely that dental operators be familiar with more recent caries management pathways which aim to maintain oral health and prevent progression of early lesion, shifting the paradigm away from treatment plans that emphasise the restorative cycle. School authorities should assist by strengthening their role in fluoride mouth rinsing and tooth brushing drills for schoolchildren.

The decreasing prevalence and severity of dental caries among schoolchildren also calls for a revisit on the Guidelines of the Integrated Fissure Sealant Programme, especially with the application of ICDAS codes on the early caries lesion.

To address the problem of traumatic injuries to children's incisors, it is recommended that awareness of dental trauma and its management be further enhanced in oral health promotion efforts to parents and children.

There is a need to continue the expansion of outreach program to ensure the accessibility of oral healthcare for schoolchildren particularly in the rural areas. At the same time, the dental profession must justify for continued national water fluoridation to sustain the continued improvement in caries experience among the younger generation. Without doubt, epidemiological surveillance of the oral health status of children should be continued at appropriately defined intervals. The role of the Dental Public Health Specialists/Dental Officers and Dental Therapists in oral health promotion and prevention need to be strengthened. Towards this, the development of dedicated Oral Health Promotion Teams is highly recommended in tackling oral disease at both the population and individual level.

GENERAL FINDINGS

1.0 GENERAL FINDINGS

The projected sample of 12-year-old schoolchildren for this survey was 12,200 based on the enrolment provided by the Ministry of Education (MOE) in year 2017. The total number of eligible children was 12,020 (Table 1.1). Of these eligible children, a total of 11,511 children were successfully examined, giving a response rate of 95.8% which represented an estimated population of 444,626 schoolchildren aged 12 years (Table 1.2). This weighted sample, weighted by state and location, was comparable with the actual enrolment of 12-year-old schoolchildren provided by the MOE (Table 1.2).

This survey included both Malaysian and non-Malaysian children. In terms of ethnicity, non-Malaysian children were included under the ethnic grouping of 'Others'.

1.1 RESPONDENTS

The socio-demographic profile of the respondents is shown in Table 1.3. The highest proportion of 12-year-olds was from the state of Kelantan (7.2%). There were more respondents in the urban areas (54.7%) and proportions by gender were equal.

The highest proportion was Malays (68.4%), followed by Chinese (13.9%) and Bumiputera Sabah (6.5%). Majority had parents with Level II education (62.4%) and were from households with a monthly income of RM1,000-RM1,999 (25.6%). Majority were in government schools (98.6%) and Malaysians (99.7%).

1.2 NON-RESPONDENTS

There were 689 children who were considered non-respondents (Table 1.4). A total of 180 children were found to have transferred to other schools and were not included in the survey (24.8%), some were unfit for the survey due to chronic illnesses (0.6%), some were wearing 'fixed orthodontic appliances' (0.4%), which was an exclusion criteria, and a number were no longer in schools (0.3%) (Table 1.5).

The remaining 509 children were not examined due to the following reasons – no parental consent (60.7%), absent on three repeat survey visits (12.0%), refused to be examined (0.7%), and unfit for examination due to acute illness during the survey visits (0.4%) (Table 1.5).

The highest proportion of non-respondents was in the state of Pulau Pinang (12.8%), and the majority (84.3%) was in Peninsular Malaysia.

There were slightly more male non-respondents (51.8%), about two thirds were in urban areas (63.9%), and the highest proportion were Malays (55.6%), followed by Chinese (28.4%). A substantial proportion were from households with unclassified monthly household income (37.6%) and had Level II parental education (38.9%). There was also a relatively large proportion (14.1%) from high monthly income households of ≥RM5,000 per month (14.1%). Majority were in government schools (96.5%) and Malaysians (99.1%) (**Table 1.4**).

ORAL HEALTH FINDINGS

2.0 ORAL HEALTH FINDINGS

2.1 DENTURE STATUS

Introduction

Tooth loss is known to adversely affect mastication, nutrition, dietary choices, speech, psychological well-being and social interaction.[1,2] It is also associated with oral health impact, poorer physical functioning, and lower perception in quality of life.[3] Tooth loss also occur in children due to caries, trauma and less commonly, periodontal disease. In developing countries, it has been reported that missing tooth/teeth replacement constitutes a high unmet dental need.[4] This chapter presents the findings of denture status and need for denture(s) among 12-year-old schoolchildren in Malaysia.

Findings

Denture status was based on those who were wearing denture(s), those who had a need for repair or replacement of existing denture(s) and those who required dentures. The need for denture(s) was based on normative need. A total of 396 children examined who had missing teeth were not indicated as needing denture(s) due to inadequate space for placement of a denture.

- **Prevalence of Denture Status**

Overall, very few 12-year-olds were found wearing dentures (N=19). The prostheses found were only upper partial dentures. (**Table 2.1**).

- **Need for Denture(s)**

A total of 699 children needed dentures, giving a prevalence of 0.16% (95% CI: 0.10-0.24) About 0.08% (95% CI: 0.04-0.16) needed upper partial denture only while 0.07% (95% CI: 0.04-0.13) needed lower partial denture only. Only 26 children [(0.01% (95% CI: 0.00-0.04)] needed lower and upper partial dentures (**Table 2.2**).

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[4] Akinboboye B, Azodo C, Soroye M. Partial edentulism and unmet prosthetic needs amongst young adult Nigerians. Tropical Dent J 2014;37(145):47-52.

- **Denture Status According to Socio-Demographic Characteristics**

Comparisons for differentials on wearing and needing dentures could not be made as there was less than 30 subjects within the categories for socio-demographic characteristics (**Table 2.3**).

2.2 INJURIES TO INCISORS

Introduction

Traumatic dental injury is now considered the most serious dental public health problem in children since the decline in the prevalence and severity of dental caries in many countries.[5] It is not a result of disease but a consequence of several factors that may accumulate throughout life if not properly treated.[6] The cause of injury can vary according to age, sex, climate and socio-economic status of the children.[7]

Studies show the majority of traumatic dental injury involves the anterior teeth, especially the maxillary central and lateral incisors, and most injuries involved only one tooth.[8,9] Mandibulary lateral incisors were the least likely traumatised.[10,11,12] Some studies reported teatment of traumatic injuries as severely neglected probably because the untreated traumatised incisors did not have any symptoms.[10,11]

Findings

- **Prevalence Of Traumatised Anterior Teeth**

The prevalence of traumatised permanent anterior teeth in this survey was 7.2% (95% CI: 6.50-7.99) (**Table 3.1**). The prevalence was highest in the state of Melaka [12.0% (95% CI: 8.56-16.49)] as compared to Sarawak [5.5% (95% CI: 3.94–7.68)], Kelantan [5.5% (95% CI: 3.90-7.82)], Pahang [5.4% (95% CI: 3.70-7.80)] and Terengganu [3.5% (95% CI: 2.48-4.99)]. Peninsular Malaysia [7.8% (95% CI: 7.00-8.74)] had a higher prevalence of traumatised permanent anterior teeth as compared to Sabah/Labuan [3.9% (95% CI: 2.45-6.27)] but the differential in prevalence between Peninsular Malaysia and Sarawak [5.5% (95% CI: 3.94-7.68)] was not significant (**Table 3.1**).

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The prevalence of traumatised anterior teeth was significantly higher among males [9.5% (95% CI: 8.41-10.73)] than females [4.8% (95% CI: 4.05-5.73)]. The prevalence was highest among the Indians [10.1% (95% CI: 7.46-13.52)] and this was significantly higher than that for the Chinese [5.0% (95% CI: 3.79-6.45)] and children of Bumiputera Sabah ethnicity [4.0% (95% CI: 2.24-6.91)]. Differentials in prevalence were not significant by location, parental education level, type of school and monthly household income (**Table 3.1**).

- **Number of Traumatised Anterior Teeth**

Among the schoolchildren with traumatised anterior teeth, the majority [80.2% (95% CI: 76.45-83.47] had only one tooth affected, while 16.6% (95% CI: 13.58-20.02) had two (2) affected teeth and 2.7% (95% CI: 1.60-4.43) had three (3). A very small proportion [0.2% (95% CI: 0.06-1.00)] had four (4), 0.2% (95% CI: 0.06-1.01) had five (5) and 0.1% (95% CI: 0.02-0.79)] had seven (7) traumatised anterior teeth (**Table 3.2**).

- **Type of Traumatised Anterior Teeth**

Traumatised anterior teeth were more common in the maxilla than the mandible. The most frequently traumatised anterior teeth was the right maxillary central incisor [Tooth 11, 3.8% (95% CI: 3.30-4.39)] and the left maxillary central incisor [Tooth 21, 3.5% (95% CI: 3.04-3.98)] (**Table 3.3**).

- **Treatment Status of Traumatised Anterior Teeth**

Only 17.7% (95% CI: 12.26-24.98) of children with traumatised anterior teeth has had the affected teeth treated (**Table 3.4**) and 84.5% (95% CI: 76.93-89.88) had untreated traumatised anterior teeth (**Table 3.5**). Data reported under categories for treated and untreated traumatized anterior teeth are not mutually exclusive. Children with multiple traumatised teeth, of which some are partially treated/untreated, are double-counted under both categories of children.

There was no significant difference in the prevalence of children with treated traumatised anterior teeth by location and gender. Inference on the differentials in prevalence by state, region, ethnicity, parent's education level, type of school and monthly household income could not be made due to the low number of subjects (less than 30) for related sub-variables (**Table 3.4**).

For children with untreated traumatised anterior teeth, the highest percentage was in FT Kuala Lumpur with 100% of children with traumatized anterior teeth not having had treatment for these teeth. The majority of states and Federal Territories reported percentages of children with untreated traumatized anterior teeth higher than the national

prevalence of 84.5%. Differentials in prevalence by region, location, gender, ethnicity, parental education level and monthly household income were not significant (**Table 3.5**). Among schoolchildren with treated traumatised teeth, 11.7% (95% CI: 8.13-16.44)] did not have any further problems while 6.1% (95% CI: 3.46-10.55)] had further problem(s) with their treated teeth. The differentials in prevalence of children who had been treated and had further problem(s) for all variables could not be interpreted due to the low number of subjects (less than 30) for related sub-variables (**Table 3.6**).

On the other hand, among schoolchildren with untreated traumatised teeth, 75.3% (95% CI: 69.05-80.58)] reported not having further problems while 11.6% (95% CI: 8.91-14.97)] had further problems. By state, the prevalence of children with untreated traumatised anterior teeth without problem(s) was higher in FT Kuala Lumpur [97.8% (95%CI: 86.14-99.69)] as compared to Sarawak [59.3% (95%CI: 37.06-78.34)] and Selangor [46.9% (95%CI: 28.58-66.03)]. The differentials in prevalence by other socio-demographic variables were non-significant (**Table 3.7**).

2.3 PERIODONTAL STATUS

Introduction

Periodontal diseases consist of a group of inflammatory conditions of the periodontal tissues, broadly categorized as gingivitis and periodontitis. Clinical evaluation of the periodontium typically involves a determination of the presence or absence of bleeding from the periodontal sulcus or pocket after stimulation.[13,14] Bleeding occurs because of frequent micro-ulcerations in the epithelium that lines the gingival sulcus / periodontal pocket. The gingivae of all teeth present in the mouth should be examined by carefully inserting the tip of the WHO CPI probe between the gingiva and the tooth to assess absence or presence of bleeding response. Gum bleeding is considered a very significant precursor for periodontitis.[15]

Assessment of periodontal status in this survey was conducted using the Community Periodontal Index (CPI) Modified based on WHO (2013).[16] Using this index, all teeth in the mouth were examined for absence or presence of gingival bleeding. Scores were assigned as follows - absence of condition (Score 0), presence of condition (Score 1), tooth excluded (Score 9) and tooth not present (Score 8). The worst condition (Score 1) was taken as the highest score for each child. As periodontal pockets are not recorded in individuals younger than 15 years of age, gingival bleeding was used as an indicator of periodontal status for the 12-year-old schoolchildren examined in this survey.

To allow for comparison with previous surveys[8,17] where the original CPI index[18,19] was used, analysis of the data was also done using the six (6) specified index teeth of 11, 16/17, 26/27, 31, 36/37 and 46/47 as prescribed in the original CPITN index.

Findings

2.3.1 Community Periodontal Index (CPI) modified

Using the above recommended CPI Modified index[16], all teeth in the mouth were examined for the absence or presence of gingival bleeding on probing.

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[13] Löe, H., & Silness, J. (1963). Periodontal disease in pregnancy I. Prevalence and severity. *Acta Odonto Scand* 1963;21(6):533-51.
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[17] Oral Health Division, Ministry of Health, Malaysia. National Oral Health Survey of School Children 1997 (NOHSS'97). MOH/GIG/6.98(RR),1998.
[18] World Health Organisation. Oral Health Surveys. Basic Method. 3rd edition. WHO, Geneva, 1987.
[19] World Health Organisation. Oral Health Surveys. Basic Method. 4th edition. WHO, Geneva, 1997.

- **Periodontal Status**

Almost all the children in this survey [99.80% (95% CI: 99.57–99.91)] had gingival bleeding on probing. Of sixteen (16) states and Federal Territories, ten (10) reported 100% of children examined with gingival bleeding on probing. As almost all the children were affected, with percentages ranging from 99.02% - 100% (**Table 4.1**), no further analysis by socio-demographic variables was made.

- **Severity of Bleeding on Probing per Child**

The severity of periodontal condition was reported as the mean number of teeth with gingival bleeding on probing per child. Overall, the mean number of teeth with gingival bleeding was found to be 21.16 teeth per child (**Table 4.2**).

Children in Terengganu [23.54 (95% CI: 23.11-23.96)] had the highest mean number of teeth with gingival bleeding per child while Melaka had the lowest [15.79 (95% CI: 13.86-17.73)]. Comparing regions, Sabah/Labuan [22.88 (95% CI: 22.36-23.41)] had the highest mean number of teeth with gingival bleeding per child and, this was significantly higher from that of Peninsular Malaysia [21.09 (95% CI: 20.68-21.51)] and Sarawak [19.85 (95% CI: 18.88-20.81)]. Children of Bumiputera Sabah ethnicity [22.91 (95% CI: 22.29-23.53)] were observed to have a higher mean number of teeth with gingival bleeding per child as compared to the ethnic groups of Malay [21.33 (95% CI: 20.95-21.72)], Chinese [19.82 (95% CI: 18.82-20.82)] and Bumiputera Sarawak [20.28 (95% CI: 19.44-21.12)] (**Table 4.2**).

Differentials of mean number of teeth with gingival bleeding per child were not significant for the remaining variables of location, gender, parental education level, household income and sector of schools (**Table 4.2**).

In terms of severity by proportion of teeth with gingival bleeding per child, an estimated 9 out 10 teeth examined [89.2% (95% CI: 87.88-90.61)] were found with gingival bleeding. Percentages ranged from 73.1% (95% CI: 63.58-82.60) for Pahang to 99.8% (95% CI: 99.60-99.94) for Terengganu. Seven (7) states/Federal Territories reported a higher proportion than the national average of 89.2% (**Table 4.3**).

Again, children in Sabah/Labuan had the highest proportion of teeth with gingival bleeding per child [96.8% (95% CI: 94.78-98.89)], differing significantly with Sarawak which had the lowest [81.7% (95% CI: 78.56-84.86)]. Comparison across ethnic groups also showed that children of Bumiputera Sabah ethnicity had the highest proportion of teeth with gingival bleeding per child [96.7% (95% CI: 94.53-98.85)]. Differentials were not significant by location, gender, ethnic group, parental education level, school sector or household income (**Table 4.3**).

- **Periodontal Status by Tooth**

The findings showed that the prevalence of gingival bleeding on probing in this survey was higher for the upper and lower permanent first molars compared with other teeth. The prevalence of children with gingival bleeding for the respective molars were in the following order - teeth 26 (94.8%), 46 (93.1%), 16 (92.9%) and 36 (92.4%) (**Table 4.4**).

- **Need for Oral Hygiene Instructions (OHI)**

Periodontal treatment is inferred from the scores of the Community Periodontal Index of Treatment Need (CPITN)[20] and scores for CPI-Modified obtained in this survey. Based on these findings, oral hygiene instruction is recommended for those who have gingival bleeding on probing. Almost all children [99.80% (95% CI: 99.57-99.91)] required oral hygiene instructions (**Table 4.5**). As percentages ranged from 99.02% to 100% across the states, no further analysis on differentials by the socio-demographic variables was done.

2.3.2 Community Periodontal Index (CPI)

Analysis was also carried out on the scores for the six (6) index teeth as used for CPI in previous surveys[16,18,19] and for the sake of comparisons with the results from earlier surveys.[8,17]

- **Periodontal Status Inferred from CPI**

Using only the scores for the six (6) index teeth employed for CPI in previous surveys, rather than the scores for all teeth as for the CPI-Modified of this survey, the results differed only by 0.22%. The prevalence of 12-year-olds with gingival bleeding on probing was 99.58% (95% CI: 99.29-99.75) (**Table 4.6**) as opposed to 99.80% using scores for all teeth as for the CPI-Modified. Hence, examining only the six (6) index teeth gave a good approximation of gingival bleeding present among 12-year-olds, giving results very similar to examining all teeth in the mouth.

Findings show very close approximation across all variables between scoring for six (6) index teeth as for scoring all teeth for the CPI-Modified (**Table 4.6**).

[20] Cutress TW, Ainamo J, Sardo-Infirri J. The Community Periodontal Index of Treatment Needs (CPITN) procedure for population groups and individuals. Int Dent J 1987:37:222-33

- **Severity of Periodontal Conditions**

The most profound difference in using the six (6) index teeth as in CPI of previous surveys,[8,17] is that the severity of periodontal condition was reported as the mean number of sextants with gingival bleeding on probing per child as opposed to mean number of teeth with gingival bleeding on probing per child as employed in the CPI-Modified of WHO (2013).

Overall, the mean number of sextants with gingival bleeding per child was 5.45 (95% CI: 5.38-5.52) (Table 4.7).

By state, the highest mean number of sextants affected per child was in Terengganu [5.95 (95% CI: 5.92-5.97)] and this was significantly higher than all states except for FT Kuala Lumpur [5.88 (95% CI: 5.84-5.92)].

The mean number of sextants with gingival bleeding per child differed significantly across the three regions – with Sabah/Labuan being significantly higher [5.73 (95% CI: 5.59-5.86)] than Peninsular Malaysia [5.44 (95% CI: 5.36-5.52)] and Sarawak [5.18 (95% CI: 5.03-5.34)].

Among the ethnic groups, a higher mean number of sextants with gingival bleeding per child was seen among Bumiputera Sabah [5.72 (95% CI: 5.58-5.86)] children as compared to children of Malay [5.50 (95% CI: 5.42-5.57)], Chinese [5.25 (95% CI: 5.04-5.47)] and Bumiputera Sarawak [5.21 (95% CI: 5.06-5.37)] ethnicity. Else, differentials were not significant for other variables like location, gender, parental educational level, household income and category of school sector.

- **Need for Oral Hygiene Instructions (OHI)**

For comparison with earlier surveys,[8,17] periodontal treatment need was also inferred from the scores for the six (6) index teeth.[20] Based on the examination criteria in this survey, the schoolchildren were only examined for gingival bleeding. Hence, the scope of treatment prescribed in this survey only pertains to oral hygiene instructions.

Almost all children examined [99.58% (95% CI: 99.29-99.75)] required oral hygiene instructions (Table 4.8), again differing by only 0.22% with the findings from CPI-Modified (Table 4.5).

2.4 CARIES STATUS

Introduction

Dental caries is still a major oral health problem in many industrialized countries, affecting 60-90% of schoolchildren and the vast majority of adults. Untreated dental caries is most prevalent condition worldwide.[21] However, data from the WHO has shown an overall decline in caries prevalence during the past two decades. The largest decline is seen in high- and middle-income countries as compared to low-income countries. A few exceptions have been noted where the caries prevalence has increased e.g Gambia, Saudi Arabia, Moldova, and Croatia.[22] The decline in caries prevalence is also noted in younger adults and middle-aged population groups.[22]

Dental caries is a multifactorial infectious disease involving the teeth. Interaction of acid producing bacteria and fermentable carbohydrate is the main cause of dental caries. Carious tooth leads to pain and infection, which consequently affect the quality of life. A study conducted in Thailand showed that the daily performances of about 89% of children were affected by dental problems.[23]

The mean 'DMFT' is used as a measure of the severity for caries experience. In 1981, FDI and WHO established the First Global Oral Health Goals to be achieved by 2000. The organizations envisioned global status for dental caries to be no more than DMFT 3 at 12 years of age. WHO eventually recognized that no exact blue prints for oral health plan can be set for all the countries, and hence provided a framework of oral health goals useful to health policy makers.[24]

Malaysia's National Oral Health Plan 2011-2020 has targeted as one of its key and supporting oral health goals that 70% of the 12-year-old children in this country will be caries-free, with a mean DMFT less than or equal to 1.[25]

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[21] Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of untreated caries: a systematic review and meta-regression, 2015

[22] M.D. Lagerweij, C. van Loveren. Declining Caries Trends: Are we satisfied? Curr Oral Health Rep. 2015; 2(4); 212-217. Published online 2015 Sep 23. doi: 10.1007/s40496-015-0064-9

[23] Sudaduang Gherunpong, Georgios Tsakos, Aubrey Sheiham. The prevalence and severity of oral impacts on daily performances in Thai primary school children. Health Qual Life Outcomes. 2004; 2; 57.Published online 2004 Oct 12. doi: 10.1186/1477-7525-2-57

[24] Hobdell, M., Petersen, P.E., Clarkson, J., Johnson, N. (2003). Global Goals for Oral Health 2020, 2003 edition.

[25] Oral Health Division, Ministry of Health, Malaysia. (2011). National Oral Health Plan for Malaysia 2011-2020, February 2011.

Findings

- **Caries Prevalence**

This survey found that the caries prevalence of 12-year-old schoolchildren was 33.3% (95% CI: 31.91-34.71) and conversely, 66.7% (95% CI: 65.29-68.09) of the children were caries free. Caries prevalence ranged from lowest in Johor at 17.4% (95% CI: 13.40-22.40) to the highest in the state of Sabah [63.3% (95% CI: 58.02-68.20)]. The states of Kelantan [50.5% (95% CI: 43.81-57.22)], Terengganu [45.3% (95% CI: 40.71-49.92)] and Pahang [40.1% (95% CI: 35.70-44.61)] had a higher prevalence than other states in Peninsular Malaysia (**Table 5.1**).

By region, the caries prevalence for Sabah/Labuan [62.6% (95% CI: 57.50-67.39)] was observed to be significantly higher compared with that for Sarawak [48.7% (95% CI: 43.55-53.82)] and Peninsular Malaysia [27.8% (95% CI: 26.29-29.32)]. Caries prevalence also differed significantly by location, being higher among children in the rural schools [39.5% (95% CI: 37.62-41.43)] compared with those in urban schools [26.8% (95% CI: 24.77-28.90)]. There was no significant difference in caries prevalence by gender.

By ethnicity, caries prevalence ranged from 17.9% for Indians (95% CI: 14.30-22.17) to 63.5% (95% CI: 57.99-68.59) for Bumiputera Sabah. There seems to be two (2) distinct groups of caries prevalence – with Malay [30.7% (95% CI: 28.92-32.60)], Chinese [26.7% (95% CI: 22.52-31.24)], Indian [17.9% (95% CI: 14.31-22.17)] and 'Others' children as a group with higher caries prevalence as compared another group comprising indigenous children of Bumiputera Sabah [63.5% (95% CI: 57.99-68.59)] and Bumiputera Sarawak ethnicity [54.4% (95% CI: 46.65-61.98)] who had lower prevalence. Children of Indian ethnicity had the lowest caries prevalence.

Caries prevalence was also significantly different by parental education level, with the highest among children with parents who had Level III education [43.2% (95% CI: 39.94-46.47)] compared to children with Level II [32.1% (95% CI: 30.42-33.74)] and Level I [25.7% (95% CI: 22.93-28.71)] parental education.

Differentials in caries prevalence were also significantly different by monthly household income level, ranging from 23.6% (95% CI: 21.10-26.31) among children from household with monthly income of ≥RM5,000 to 46.6% (95% CI: 43.30-49.89) among those from household with monthly income of <RM1,000. Hence, caries prevalence is inversely associated with monthly household income.

- **Mean DMFT**

The mean DMFT was 0.78 (95% CI: 0.74-0.82) for 12-year-old schoolchildren, ranging from 0.30 (95% CI: 0.21-0.40) for Johor to the highest in the state of Sabah at 2.07 (95% CI: 1.84-

2.31). The mean DMFT at 1.44 (95% CI: 1.23-1.66) for Kelantan was the highest in Peninsular Malaysia (**Table 5.2**).

By region, the mean DMFT for Sabah/Labuan [2.04 (95% CI: 1.81-2.27)] was significantly higher than that for Sarawak [1.35 (95% CI: 1.14-1.57)] and Peninsular Malaysia [0.56 (95% CI: 0.53-0.59)].

The mean DMFT was significantly different by location and gender. It was higher among children in the rural at 1.01 (95% CI: 0.94-1.08) compared with urban children [0.55 (95% CI: 0.51-0.59)]. Females had significantly higher mean DMFT [0.87 (95% CI: 0.80-0.93)] compared with males [0.71 (95% CI: 0.66-0.75)].

Differentials in the mean DMFT were significantly different by ethnicity. The mean DMFT ranged from the lowest among Indian children at 0.31 (95% CI: 0.23-0.39) to the highest among Bumiputera Sabah children at 2.15 (95% CI: 1.92-2.37). The mean DMFT among children of Indian ethnicity was significantly lower than those of other ethnic groups. Again, the mean DMFT are lower among the Malays [0.63 (95% CI: 0.59-0.68)], Chinese [0.59 (95% CI: 0.46-0.71)] and Indians [0.31 (95% CI: 0.23-0.39)] as a group compared with another group comprising Bumiputera Sabah [2.15 (95% CI: 1.92-2.37)], Bumiputera Sarawak [1.60 (95% CI: 1.29-1.92)] and 'Others' [0.83 (95% CI: 0.45-1.22)] who each had a higher mean DMFT.

As with caries prevalence, the severity of caries is seen to be inversely associated with parental education level and monthly household income. The mean DMFT was highest among children of parents with Level III education [1.17 (95% CI: 1.03-1.31)] compared to those with Level II [0.73 (95% CI: 0.68-0.78)] and Level I [0.51 (95% CI: 0.44-0.58)] parental education.

Caries severity was also highest among children from household with the lowest monthly income of <RM1,000 [1.33 (95% CI: 1.19-1.47)] compared with the lowest severity [0.48 (95% CI: 0.41-0.55)] among children from household with the highest monthly income of ≥RM 5,000.

By school sector, the mean DMFT was slightly higher among children in public sector schools [0.79 (95% CI: 0.75-0.83)] compared with those in private schools [0.51 (95% CI: 0.28-0.74)].

- **Mean Decay (D) Component**

The mean D component was 0.27 (95% CI: 0.24-0.31) and this partly indicated unmet caries treatment need. The findings indicate that unmet caries treatment need was higher in Sabah and Sarawak than Peninsular Malaysia. In Peninsular Malaysia, the highest mean D component was observed in the state of Kelantan [0.43 (95% CI: 0.31-0.55)] (**Table 5.3**).

By state, the unmet caries treatment need as in the mean D component is the highest in the state of Sabah [0.81 (95% CI: 0.53-1.10)]. By region, unmet caries treatment need was

significantly highest in Sabah/Labuan [0.80 (95% CI: 0.52-1.07)] followed by Sarawak [0.36 (95% CI: 0.22-0.51)] and Peninsular Malaysia [0.20 (95% CI: 0.18-0.22)].

Although not significantly different by gender, the mean D component is still significantly higher among rural children [0.37 (95% CI: 0.31-0.44)] than in urban children [0.17 (95% CI: 0.15-0.20)]. By ethnicity, children of Bumiputera Sabah [0.81 (95% CI: 0.53-1.09)] and Bumiputera Sarawak [0.50 (95% CI: 0.27-0.73)] ethnic groups showed significantly higher mean D compared with other ethnic groups, indicating a higher decay component in the states of Sabah and Sarawak.

The mean D values are also inversely associated with parental education level and monthly household income, indicating the inverse caries association with socio-economic status. The highest mean D was found among children of parents with Education Level III [0.44 (95% CI: 0.32-0.56)] followed by those with Level II [0.25 (95% CI: 0.22-0.28)] and Level I [0.16 (95% CI: 0.13-0.18)] parental education level.

Children from household with a monthly income < RM1,000 [0.50 (95% CI: 0.38-0.62)] had the highest mean D compared with children in the other household income range, the lowest mean D being among those children with monthly household income of >RM5000 [0.14 (95% CI: 0.11-0.16)].

- **Mean Missing (M) Component**

The mean M component was 0.02 (95% CI: 0.01-0.02), the smallest component in the mean DMFT (**Table 5.4**).

The mean M is indicative of extractions done for caries and is found to be highest in Sabah [0.09 (95% CI: 0.04-0.14)]. This also leads to highest M components among children in the Bumiputera Sabah [0.10 (95% CI: 0.04-0.17)], Bumiputera Sarawak [0.02 (95% CI: 0.00-0.03)] and 'Others' ethnic group [0.03 (95% CI: 0.00-0.06)] who are predominantly indigenous groups.

Again, mean M values are inversely associated with parental education level and monthly household income. Thus, the lower the education level, the higher the mean M component and similarly, the lower the monthly household income, the higher the mean M component.

Children in public sector schools were found to have significantly higher mean M than those in private sector schools, although the mean M values were small.

- **Mean Filled (F) Component**

The mean F component was the largest component in mean DMFT at 0.49 (95% CI: 0.46-0.52). Higher values of mean DMFT indicates higher caries experience, but with mean F being a substantial component, this also indicates that caries treatment need has been met with restorations to a certain extent (**Table 5.5**).

The highest mean F was in Sabah [1.17 (95% CI: 1.00-1.34)] and the lowest in Johor [0.14 (95% CI: 0.09-0.19)], commensurate with the pattern of mean DMFT values in the states. By region, Sabah/Labuan [1.16 (95% CI: 0.99-1.32)] and Sarawak [0.98 (95% CI: 0.78-1.18)] had significantly higher mean F values than Peninsular Malaysia [0.35 (95% CI: 0.32-0.37)], indicating that with higher mean DMFT values in Sabah and Sarawak, a substantial amount of caries treatment need has been met.

The mean F was significantly higher in rural children [0.61 (95% CI: 0.56-0.67)] than urban children [0.36 (95% CI: 0.33-0.40)], and higher among females [0.55 (95% CI: 0.50-0.60)] compared with males [0.44 (95% CI: 0.40-0.47)].

Again, mean F values can be dichotomised in one category of Malays [0.40 (95% CI: 0.36-0.43)], Chinese [0.40 (95% CI: 0.31-0.49)] and Indians [0.19 (95% CI: 0.13-0.26)] and 'Others' [0.45 (95% CI: 0.26-0.64)] versus another category of Bumiputera Sabah [1.23 (95% CI: 1.07-1.40)] and Bumiputera Sarawak [1.08 (95% CI: 0.80-1.37)] with high mean F values. Children of Indian ethnicity [0.19 (95% CI: 0.13-0.26)] had significantly lower mean F compared with all other ethnic groups.

As with other parameters of caries severity, mean F scores were inversely associated with parental education level and monthly household income. A higher mean F was observed among children of those with Level III parental education [0.69 (95% CI: 0.60-0.79)] followed by those with parental education Level II [0.46 (95% CI: 0.43-0.50)] and Level I [0.35 (95% CI: 0.30-0.40)]. Children from homes with monthly household income <RM1,000 [0.79 (95% CI: 0.69-0.88)] had the highest mean F; and the mean F decreased as monthly household income increased.

- **Mean D, M and F Components**

The mean D, M, F components and the mean DMFT are shown in **Table 5.6**. It can be seen that the highest proportion of the mean DMFT index is contributed by the F component (0.49), followed by the D component (0.27) while the M component (0.02) contributed sparingly.

2.5 CARIES TREATMENT NEED

Introduction

Valid estimation of the dental treatment need from epidemiological survey data provided at population level is important for oral healthcare planning and monitoring. Normative need can be defined as a dimension of need recorded by clinicians in epidemiological survey.[26] In contrast, perceived need reported by individuals, explains care-seeking behavior to determine their wants.[27]

The assessment of treatment need in this survey was based on normative need. Similar to NOHSS 2007[8], assessment of the overall caries treatment need was categorized into the following four groups; preventive need (caries-arresting care and/or fissure sealant), restorative need (one surface and/or two-or-more surface restoration), need for extraction and need for complex care (complex treatment and/or pulp care).

Findings from 12-year-old schoolchildren from NOHSS 2007[8] showed that the caries prevalence was 41.5% (compared with 33.3% from this survey) and the mean DMFT was 1.12 (compared with mean DMFT 0.78 from this survey) and DMFS was 1.61.

In the same study, 30.9% of the 12-year-olds needed some treatment for caries. Majority needed restorations (21.0%) followed by preventive procedures (11.5%) while the need for extraction (2.9%) and other types of complex care (1.0%) were minimal.[8]

Findings

- **Overall Caries Treatment Need**

Overall, 32.9% (95% CI: 30.96-34.96) of the 12-year-old schoolchildren in this survey needed treatment for caries (**Table 6.1**). The highest caries treatment need was for preventive care [22.9% (95% CI: 21.14-24.81)], followed by restorative treatment [14.8% (95% CI: 13.63-16.04)], extraction [1.8% (95% CI: 1.31-2.52)] and complex care [1.0% (95% CI: 0.73-1.24)] (**Table 6.2**).

The highest prevalence for overall caries treatment need among 12-year-old schoolchildren was seen in FT Labuan [74.3% (95% CI: 67.96-79.76)] followed by Kelantan [50.2% (95% CI: 43.74-56.57)]. For the remaining states/Federal Territories, caries treatment need ranged

[26] Bradshaw J. A taxonomy of social need. In Problems and Progress in Medical Care Essays on Current Research. Edited by McLachlan G. London: Oxford University Press; 1972.

[27] Andersen RM. (1995) Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? J Health Soc Behav 1995;36:1:1–10.

from the lowest in Negeri Sembilan [14.4% (95% CI: 12.01-17.20)] to 47.7% (95% CI: 39.77-55.83) in Pahang (Table 6.1).

By region, a higher need for caries treatment was observed in Sabah/Labuan [41.4% (95% CI: 34.82-48.34)] as compared to Peninsular Malaysia [31.9% (95% CI: 29.70-34.15)]. The findings also showed that children in the rural had a higher caries treatment need [38.3% (95% CI: 35.59-41.17)] than those in the urban [27.2% (95% CI: 24.48-30.20)]. No significant difference was observed between the need for caries treatment between males [31.9% (95% CI: 29.46-34.37)] and females [34.0% (95% CI: 31.76-36.38)] (Table 6.1).

Comparison by ethnic groups showed that children of 'Others' ethnicity [43.5% (95% CI: 36.55-50.68)] had a higher caries treatment need compared to children of Malay [33.3% (95% CI: 30.92-35.87)], Chinese [29.3% (95% CI: 24.23-34.94)] and Indian [20.4% (95% CI: 16.19-25.40)] ethnicity. On the other hand, there was no significant difference in the prevalence for caries treatment need between children of 'Others' ethnicity compared to children of Bumiputera Sabah [41.6% (95% CI: 34.49-49.15)] and Bumiputera Sarawak [35.5% (95% CI: 28.39-43.30)] ethnicity (Table 6.1).

Caries treatment need was found to be inversely associated with parental education level and monthly household income. As education level increased, treatment need decreased and this was substantiated by the findings that children with Level III parental education [38.1% (95% CI: 34.71-41.58)] had a higher need compared to those with Level I parental education [27.9% (95% CI: 24.51-31.48)] (Table 6.1).

Similarly as monthly household income increased, treatment need decreased. The highest need was observed among children with a monthly household income range of <RM1,000 [40.2% (95% CI: 36.44-44.03)] as compared to children from homes with income range of between RM3,000 – RM3,999 [29.1% (95% CI: 25.28-33.17)], RM4,000 – RM4,999 [28.1% (95% CI: 24.34-32.27)] and those with a monthly household income of ≥RM5,000 [26.3% (95% CI: 23.33-29.48)] (Table 6.1).

- **Need for Preventive Care**

The need for preventive care comprises preventive caries-arresting care (eg. fluoride varnish and fluoride mouth rinse) and the need for fissure sealant(s). The findings from this survey showed that the overall need for preventive care was 22.9% (95% CI: 21.14-24.81). The highest need for preventive care was in FT Labuan [73.6% (95% CI: 67.48-78.92)] while the lowest was in Negeri Sembilan [5.5% (95% CI: 4.04-7.53)] (Table 6.3).

There was a higher need for preventive care in Peninsular Malaysia [24.5% (95% CI: 22.42-26.71)] as compared to Sabah/Labuan [14.2% (95% CI: 10.73-18.52)]. The need for

preventive care was higher among children of 'Others' ethnicity [32.3% (95% CI: 25.77-39.52)] as compared to children of Indian [15.4% (95% CI: 11.27-20.70)] and Bumiputera Sabah [13.5% (95% CI: 9.86-18.12)] ethnicity. There was no significant difference in the need for preventive care by location, gender, parent's education level, school sector and monthly household income (**Table 6.3**).

Overall, the need for preventive caries-arresting care was low at 7.6% (95% CI: 6.68-8.60). Comparing between states, the highest need was observed in FT Labuan [45.1% (95% CI: 37.80-52.70)]. By ethnicity, the need was significantly higher among children in the 'Others' ethnic group [9.2% (95% CI: 5.36-15.25)] as compared to children of Bumiputera Sabah ethnicity [3.7% (95% CI: 2.66-5.10)]. A higher need was also seen among children with a monthly household income of <RM1,000 [10.2% (95% CI: 8.47-12.27)] compared to children with monthly household income range of RM3,000 – RM3,999 [6.3% (95% CI: 4.69-8.37)] and ≥RM5,000 [6.3% (95% CI: 5.13-7.64)]. There was no significant difference in the prevalence of the need for preventive caries-arresting care across region, location, gender, parent's education level and school sector (**Table 6.4**).

The need for fissure sealant in this survey refers to the need for fissure sealant in posterior molars only. About 17.4% (95% CI: 15.73-19.11) of schoolchildren in this survey needed fissure sealant(s). The need was notably higher among those in FT Labuan [57.8% (95% CI: 50.58-64.66)] as compared to other states. By region, more schoolchildren in Peninsular Malaysia [19.1% (95% CI: 17.17-21.15)] needed fissure sealant(s) as compared to Sabah/Labuan [10.1% (95% CI: 7.36-13.76)] and Sarawak [10.5% (95% CI: 6.66-16.06)]. Children of 'Others' ethnicity [25.7% (95% CI: 17.66-35.82)] showed a higher need for fissure sealant(s) than children of Indian [12.8% (95% CI: 9.68-16.66)] and Bumiputera Sabah [10.4% (95% CI: 7.43-14.43)] ethnicity. The need for fissure sealant(s) was not significantly different across location, gender, parent's education level, school sector and monthly household income (**Table 6.5**).

- **Need for Restorative Care**

Overall, 14.8% (95% CI: 13.63-16.04) of 12-year-old schoolchildren needed restorative care (**Table 6.6**). The need for one-surface filling was higher [10.9% (95% CI: 9.85-12.12)] (**Table 6.7**) than simple filling on more than one surface [0.9% (95% CI: 0.67-1.17)] (**Table 6.8**) and compound filling on two or more surfaces [5.2% (95% CI: 4.42-6.03)] (**Table 6.9**).

Restorative care need was significantly different by region - highest in Sabah/Labuan [31.8% (95% CI: 25.51-38.83)] compared with Sarawak [18.2% (95% CI: 13.50-23.99)] and Peninsular Malaysia [12.2% (95% CI: 11.19-13.36)]. By state, the highest need for restoration was seen in Sabah [32.3% (95% CI: 25.87-39.57)] while by location, rural children [18.3% (95% CI: 16.38-20.28)] had a significantly higher need than those in the urban [11.2% (95% CI: 9.85-12.64)]. Children of Bumiputera Sabah ethnicity [32.1% (95% CI: 24.87-40.37)] was observed to have a higher need for restoration when compared to children in other ethnic groups except for those of Bumiputera Sarawak ethnicity [23.2% (95% CI: 16.25-31.91)] (**Table 6.6**).

Restorative care need was also inversely associated with parental education level and monthly household income – the lower the education level, the higher the need for restorative care. Children with Level III parental education [19.6% (95% CI: 16.97-22.51)] had a higher need compared to those with Level II [14.5% (95% CI: 13.22-15.93)] and Level I [10.0% (95% CI: 8.35-11.92)] parental education. The highest need for restoration was also observed among children from homes with a monthly household income of <RM1,000 [21.5% (95% CI: 18.62-24.72)] as compared to other income groups. The need for restoration by gender was not significantly different between males [13.9% (95% CI: 12.53-15.37)] and females [15.7% (95% CI: 14.24-17.36)] (Table 6.6).

- **Need for Tooth Extraction**

The findings of this survey showed that 1.8% (95% CI: 1.31-2.52) of 12-year-old schoolchildren in Malaysia needed permanent teeth extraction. The extraction need was significantly higher in Sabah/Labuan [6.3% (95% CI: 2.61-14.24)] than Peninsular Malaysia [1.3% (95% CI: 1.06-1.64)]. There was no significant difference by location and gender (Table 6.10).

For comparison by ethnicity, no inference on the need for teeth extraction could be made for the Chinese, Indian, Bumiputera Sarawak and 'Others' ethnic groups due to the low number of subjects for groups concerned. However, it was noted that children of Bumiputera Sabah ethnicity [6.1% (95% CI: 2.48-14.19)] had a higher extraction need as compared to those of Malay ethnicity [1.6% (95% CI: 1.23-1.95)].

There seemed to be a higher need for extraction of teeth among children with parents who had Level III education [3.6% (95% CI: 2.04-6.44)] compared with those with Level II [1.4% (95% CI: 1.07-1.82)] parental education. Comparison by monthly household income could not be fully done due to the low number of subjects (less than 30) for some of the sub-groups concerned. However, there was no significant difference in the need for extraction of permanent teeth between children from homes with a monthly household income of <RM1,000 [3.7% (95% CI: 2.13-6.32)] and those with monthly household income range of RM1,000 – RM1,999 [2.0% (95% CI: 1.40-2.75)].

- **Need for Complex Care**

The need for complex care comprises pulp care and complex conservative treatment (need for crown/veneer restoration). Overall, it was found that only 1.0% (95% CI: 0.73-1.24) of 12-year-old schoolchildren needed complex care (Table 6.11). Only 0.8% (95% CI: 0.64-1.12) of the 12-year-olds needed pulp care (Table 6.12) while 0.1% (95% CI: 0.04-0.26) needed complex conservative treatment (Table 6.13).

The overall need for complex care did not differ significantly across the socio-demographic variables of location and gender. By parental education level, there was no difference in the overall need for complex care among children with Level II [0.9% (95% CI: 0.67-1.32)] and Level III parental education [1.5% (95% CI: 1.04-2.19)]. Statistical comparisons on the need for complex care across the socio-demographic variables of state, region, ethnicity, school sector and monthly household income could not be made due to the low number of subjects (less than 30) for some/all sub-groups concerned (**Table 6.11**).

The need for pulp care was higher among children in the rural [1.2% (95% CI: 0.81-1.64)] than those in the urban [0.5% (95% CI: 0.34-0.80)]. By gender, no difference was observed in the need for pulp care between males [0.9% (95% CI: 0.65-1.31)] and females [0.8% (95% CI: 0.48-1.20). There was also no difference in the overall need for pulp care among children with Level II [0.8% (95% CI: 0.56-1.17)] and Level III parental education [1.5% (95% CI: 1.03-2.17)]. Statistical comparisons on the need for pulp care across the socio-demographic variables of state, region, ethnicity, school sector and monthly household income could not be made due to the low number of subjects (less than 30) for some/all sub-groups concerned (**Table 6.12**).

Statistical comparisons on the need for complex treatment across all the socio-demographic variables of state, region, ethnicity, parent's education level, school sector and monthly household income could not be made due to the low number of subjects for some/all sub-groups concerned (**Table 6.13**).

- **Need for Other Type(s) of Oral Healthcare Not Due to Caries**

The need for other type(s) of oral healthcare not due to caries refers to the need for treatment for non-carious conditions such as dental trauma or congenital tooth defect(s). The survey findings showed that only 2.5% (95% CI: 2.10-2.95) of 12-year-olds in Malaysia needed dental treatment for non-carious conditions (**Table 6.14**).

More males [3.3% (95% CI: 2.64-4.01)] than females [1.7% (95% CI: 1.31-2.18)] needed other type(s) of oral healthcare which were not due to caries. There was no significant difference in the need for other type(s) of oral healthcare not due to caries between children in the urban [2.5% (95% CI: 1.90-3.24)] and those in the rural [2.5% (95% CI: 2.01-3.08)]. Similarly by parental education level, the need was also not significantly different between children with Level I [2.3% (95% CI: 1.61-3.29)], Level II [2.7% (95% CI: 2.25-3.34)] and Level III [2.0% (95% CI: 1.35-2.83)] parental education.

Statistical comparisons on the need for other type(s) of oral healthcare not due to caries across the socio-demographic variables of state, region, ethnicity, school sector and monthly household income could not be done due to the low number of subjects (less than 30) for some/all sub-groups concerned.

2.6 OVERALL NEED FOR ORAL HEALTHCARE

Introduction

Treatment need for dentition of 12-year-olds in this survey was based on the most appropriate treatment for the condition assessed by the examiner. The appropriateness of treatment included a consideration of the overall dentition status, age, education level and access to existing oral healthcare services. In assessing the overall need for oral healthcare, a child is deemed to need dental treatment if he/she needed any of the following types of oral healthcare: need for dental caries treatment, need for non-carious conditions (e.g. dental trauma, congenital defect of tooth), need for denture(s) and need for periodontal care. The need for orthodontic treatment was not assessed in this survey.

The need for dental caries treatment comprised need for preventive care, restorative care, extraction and complex care. Prosthetic need was assessed based on the need for partial and full dentures. Periodontal treatment was indicated for children with gingival bleeding based on modified Community Periodontal Index (CPI).[16]

Findings

Overall, 99.8% (95% CI: 99.66-99.93) of the 12-year-old schoolchildren in Malaysia needed oral healthcare (**Table 7.1**), with the majority needing periodontal care [99.8% (95% CI: 99.57-99.91)] (**Table 4.5**), followed by treatment need for dental caries [32.9% (95% CI: 30.96-34.96)] (**Table 6.1**), treatment for non-carious conditions [2.5% (95% CI: 2.10-2.95)] (**Table 6.14**) and the need for denture(s) [0.16% (95% CI: 0.10-0.24)] (**Table 2.2**).

The need for oral healthcare was very high across all states and Federal Territories (**Table 7.1**). As almost all the children were affected, with percentages ranging from 99.5%- 100.0%, no further analysis by socio-demographic variables was made.

DISCUSSION

3.0 DISCUSSION

The survey obtained a high response rate of 95.8%, which when weighted was deemed representative of 12-year-old schoolchildren in government and private schools in the country. The findings of this survey are discussed as follows:

Wearing of Denture(s) and Denture Need

The finding of 19 children in this survey who wore denture(s) was very low and is lower than the finding of the survey in 2007[8] (0.02%, N=97). The survey in 1997[17] reported the unweighted population and hence, the findings (0.01%, n=3) cannot be directly compared with this 2017 survey. A study in Nigeria[28] also reported a low prevalence (1.6%) of denture wearers among children aged 10-15 years old. The authors opine that the Incremental Dental Care programme of the Ministry of Health Malaysia and the water fluoridation programme in Malaysia have had a positive impact on prevention and control of caries rates among primary schoolchildren, thus avoiding loss of teeth that leads to need for wearing dentures. However, the authors are also mindful that other determinants of health are also contributory towards better oral health among Malaysians.

The need for dentures(s) among 12-year-old schoolchildren declined from 0.20% (N=995) in 2007[8] to 0.16% (N=669) in this survey. Similarly, the need for dentures in 1997[17] (0.72%, n=35) are not directly comparable due to analysis approach in the 1997[17] survey.

Based on normative need, none of the children needed repair or replacement of their denture(s). As no assessment of denture repair or replacement were included in past local surveys, this finding will serve as baseline data for future surveys.

Injuries to Incisors

The prevalence of 12-year-old schoolchildren with traumatised anterior teeth showed an increasing trend from 2.5% (1997)[17] to 5.4% (2007)[8] to 7.2% (2017). This current finding is comparable with the prevalence in an earlier study by Gauba[29] (7.5%), but is higher than the finding of 4.1% from a local study by Nik-Hussein (2001)[30] and is substantially lower than a studies by Baldava (2007)[31] (14.9%) and Gupta et al. (2002)[32] (13.8%). Behavioural and

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[28] Tunde J0, Olanrewaju IO. Denture care practice among patients attending the prosthetic clinic in a Nigerian teaching hospital. Niger Med J 2015;56(3):199–203.

[29] Gauba ML. A correction of fractured anterior teeth to their proclination. JIDA 1967; 12:105-12.

[30] Nik-Hussein NN. (2001). Traumatic injuries to anterior teeth among school children in Malaysia. *Dent. Traumatol* 2001; 17;149-52.

[31] Baldava PAN. (2007). Risk factors for traumatic dental injuries in an adolescent male population in India. J Contemp Dent Pract 2007; 8:35-42.

cultural diversity may likely be the factors for the differences between countries and within a country.[33]

Survey findings from NOHSS 2007[8] [7.4% (95% CI: 6.6-8.3)] and from this survey [9.5% (95% CI: 8.41-10.73)] show the propensity for males to be more prone to traumatic injuries than females - 3.2% (95% CI: 2.7-3.9) in 2007 and 4.8% (95% CI: 4.05-5.73) in 2017. A recent study has also reported this trend.[34] The higher percentage of traumatic injuries in males could be attributed to the fact that males engage in leisure activities or sports of a generally more aggressive nature or with a greater accident risk as compared to females.

The survey findings also showed that only a small proportion of children (17.7%) with traumatised anterior teeth have had treatment for their traumatic injuries, while majority of the children (84.5%) did not receive treatment. However, it is to be noted that a child may have both treated and untreated traumatised anterior teeth. The analysis of treated and untreated traumatised anterior teeth by children was not done in the same manner as the survey in 2007[18] and hence comparison of the findings between the two surveys was not possible.

The causes and types of injuries, the association of traumatised teeth with overjet, lip coverage and presence of dental injuries were also not studied in this survey.

Periodontal Status

Gingival bleeding is used as an objective sign of inflammation and has been used as a key parameter in the clinical evaluation of the periodontium because of its objectivity and ease of clinical access. The fact that the gingival tissues can be provoked to bleed just by touching the gingival margin with a blunt instrument suggests that the epithelial changes and the vascular changes are well established.[35]

Using the CPI Modified, it was found that almost all 12-year-olds in schools had unhealthy periodontal condition, with only 0.2% of the children having healthy periodontal condition. In addition to that, a high proportion of teeth present per child (89.2%) had gingival bleeding.

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[32] Gupta K, Tandon S, Prabhu D. Traumatic injuries to the incisors in children of South Kanara District. A prevalence study. J Ind Soc Pedo Prev Dent 2002;20(3):107-13.

[33] Bastone EB, Freer TJ, McNamara JR. Epidemiology of dental trauma: a review of the literature. Aust Dent J 2000;45(1):2-9.

[34] Ravishankar TL, Kumar MA, Ramesh N, Chaitra TR. Prevalence of traumatic dental injuries to permanent incisors among 12-year-old school children in Davangere, South India. Chin J Dent Res 2010;13(1):57-60.

[35] Rebelo, M. A. B., & De Queiroz, A. C. (2011). Gingival indices: state of art. INTECH Open Access Publisher, 2011.

Analysis using the CPI scores of the six (6) index teeth found a lower prevalence of children with healthy periodontium (0.4%) in this survey compared with the findings from 1997 (94.4%)[17] and 2007 survey (19.6%).[8] In terms of severity, this survey found that a higher number of sextants (5.45 sextants per child) with gingival bleeding compared with 3.09 sextants (CPI 1 or higher) in the 2007 survey.[8]

The 99.6% prevalence of gingival bleeding using CPI and six (6) index teeth is very similar to the 99.8% prevalence using CPI Modified which required examination of all teeth. Hence, where constraints of budget, time and manpower might be present, examining the six (6) index teeth, will also give a good estimation of the prevalence of gingival bleeding.

The need for oral hygiene instruction was almost universal for 12-year-old schoolchildren as almost all had gingival bleeding in this survey compared with 80.4% in the 2007 survey.[8] This finding warrants a review of the Incremental Dental care programme to ensure greater emphasis on oral hygiene and periodontal health education and monitoring from past emphasis on dental caries. Concern for rising periodontal conditions among schoolchildren had been raised in NOHSS 2007[8], and this current finding indicate that the situation has worsened over the 10 years since 2007. The finding also echoes recent data that show high prevalence of periodontal conditions among adults.[36]

The CPI-Modified[16] is used for the first time for 12-year-olds in this national oral health epidemiological survey and the findings will serve as baseline for future national surveys involving the same age group of schoolchildren in the country. The need for oral hygiene instruction was almost universal among the 12-year-old children as the vast majority of children had gingival bleeding in this survey (99.58%) as compared to 80.4% in the 2007 survey.[8]

Caries Status

This survey confirmed an improving trend of dental caries status among 12-year-old schoolchildren over the last two decades, from 60.9% (1997)[17] declining to 41.5% (2007)8 to 33.3% (2017). Conversely, the percentage of caries-free children has increased from 39.1% (1997)[17] to 58.5% (2007)[8] to 66.7% in the current survey. The findings show that Malaysia is moving steadily towards the National Oral Health Plan 2011-2020 goal of 70% caries-free 12-year-olds.[25]

In terms of caries severity, the mean DMFT of 0.78 from this survey also show an improving trend in caries experience over the last two decades, where the mean DMFT was 1.9 in

[36] Oral Health Division, Ministry of Health Malaysia. Chapter 7. National Oral Health Survey of Adults 2010 (NOHSA 2010). November 2013

1997[17] and 1.12 in 2007[8]. As in the case of caries prevalence, all states showed a reduction in the mean DMFT, with the exception of Sarawak. This finding also confirms that the country is on track for the key oral health goal of DMFT ≤ 1 targeted under the National Oral Health Plan 2011-2020[25].

The global weighted mean DMFT data of 12-year-olds from 209 countries showed an increase in the mean DFMT values in recent years, with a mean DMFT of 1.61 in 2004, 1.67 in 2011 and 1.86 in 2015.[37] By WHO Region, of which Malaysia is a member country under the Western Pacific Regional Organisation (WPRO), there has been declining mean DMFT values from 1.48 (2004), 1.39 (2011) to 1.05 (2015).[37]

Comparing with other countries, the severity of dental caries among 12-year-old in Malaysia are lower than WHO data for children of similar age in New Zealand (1.0 in 2014), Thailand (1.3 in 2012), United States of America (1.19 in 1999-2004), Australia (1.05 in 2009), Indonesia (0.9 in 2009) but higher than Singapore (0.6 in 2011), Brunei (0.6 in 2012), United Kingdom (0.6 in 2013); and Hong Kong (0.3 in 2012).[38]

In the last two decades, there has been an improvement in the number of schoolchildren with unmet treatment need (D component) and restorative care rendered (F component). The mean D has decreased by 46% over 20 years from 0.5 in 1997[17] to 0.27 in the present survey, while the mean F had decreased by 59% over the 20-year period from 1.2 in 1997[17] to 0.49 in this survey.

This improvement in caries status in Malaysia may be attributed to the comprehensive Incremental Dental Care for schoolchildren implemented since 1985. In 2015, 98.8% of enrolled primary schoolchildren received oral healthcare under this progamme.[39] The reduction in caries prevalence may also be attributed to the School-based Fissure Sealant Programme introduced in 1999, which targets schoolchildren at risk of developing occlusal caries.[40,41] In addition, the Ministry of Health is also responsible for the implementation of the national water fluoridation programme. Data has shown that states that have consistent water fluoridation programmes show lower caries prevalence and severity than those that have problematic/no water fluoridation programmes.

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[37] http://www.mah.se/CAPP/Country-Oral-Health-Profiles/According-to-Alphabetical/Global-DMFT-for-12-year-olds-2011/ (accessed on 06 June 2017).

[38] Zhang et al. (2014). Dental Caries and erosion status of 12-year-old Hong Kong Children., *BMC Public Health.*,14:7

[39] Oral Health Division. (2015). Annual Report Health Information Management System (Oral Health Sub-System). Ministry of Health Malaysia

[40] Oral Health Division, Ministry of Health Malaysia. School-based Fissure Sealant Programme. Guidelines for Implementation. First Edition: MOH/K/GIG/2.99(GU), March 1999.

[41] Oral Health Division, Ministry of Health Malaysia. Guidelines: School-based Fissure Sealant Programme. Second Edition: MOH/K/GIG/1.2003(GU), March 2003

However, in spite of the national caries prevalence decline, disparities exists, especially between states in Peninsular Malaysia and Sabah and Sarawak. This survey also showed that the caries rates remain higher among schoolchildren in the rural areas, among females and in households where parents/guardians have lower education level and lower monthly income as in the previous survey in 2007.[8] A higher caries experience was also found among children in the region of Sabah/Labuan where a large majority were of indigenous ethnicity; and among children in government schools.

Socio-economic gradient influences oral health status of young children.[42,43] The level of education and family income are among the important factors for the development and progression of dental caries.[13] The enrolment of children between public or private schools contributed to the oral health disparity in Puerto Rico.[44] While in Nevada inequalities of caries experience were found among different ethnic groups like Hispanics or Afro-Americans, and females.[45] Likewise in New Zealand, Maori Children continue to carry a disproportionate oral health burden compared with their non-Maori counterparts.[46] Apart from socio-demographic determinants or risks associated with caries among young children, levels of oral health knowledge, attitudes and related behaviour of children (and indirectly, mothers) also play a significant role. The scope of this survey, however, has not included the study of these factors.

In the wake of this commendable caries decline seen among children in Malaysia, it is timely that dental practitioners be further trained in the application of the International Caries Detection and Assessment System (ICDAS)[47] that enables operators to detect the very early stages of the caries process. The Ministry of Health has embarked on the use of ICDAS Codes of 1, 2 and 3 and this can further enhance caries detection before penetration into dentine.[48]

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[42] Golkari A, Sabokseir A, Sheiham A, Watt RGI. Socioeconomic gradients in general and oral health of primary school children in Shiraz, Iran. F (http://dx.doi.org/10.12688/f1000research.8641.1) [Pubmed (http://www.ncbi.nlm.nih.gov/pubmed/27239279)]

[43] Radic et al. Presentation of DMF Index in Croatia and Europe. Acta Stomatol Croat 2015;49:4:275-84.

[44] Elias B. Persistent oral health disparity in 12-year-old Hispanic: a cross sectional study. BMS Oral Health 2016;16:10.

[45] Ditmyer et al. Inequalities of caries experience in Nevada youth expressed by DMFT index vs Significant Caries Index (SicC) over time. BMC Oral Health 2011;11:12.

[46] Schluter PJ, Lee M. Water fluoridation and ethnic inequities in dental caries profile in New Zealand children aged 5 and 12-13 year: analysis of national cross-sectional registry database for the decade 2004-2013. BMC Oral Health 2016;16:21.

[47] International Caries Detection and Assessment System (ICDAS) Coordinating Committee. Rationale and Evidence for the International Caries Detection and Assessment System (ICDAS II). Reviewed September 2011 (unchanged from 2005)

[48] Salleh Z. Findings of Pilot Implementation of the Modified MOH ICDAS in FTKL. Presentation made at the *Mesyuarat bersama Penyelaras dan Trainers Negeri*, *BKPKKM* Putrajaya on 21 Nov 2016

With the commendable decline in caries rates, it is also timely that operators be familiarised with more recent caries management pathways[49] which aims to maintain oral health and prevent progression of early lesion in tandem with the management of the stages of early caries process. This is a shift in paradigm in caries management away from the traditional treatment which emphasised the restorative cycle.

Caries Treatment Need

The categorization of caries treatment need for the 12-year-old schoolchildren in this survey was similar to NOHSS 2007[8]. Caries treatment need estimation is of great interest for the MOH as it is a gauge of how well service delivery meets the needs of the schoolchildren. Overall, caries treatment need for the 12-year-old schoolchildren in this survey (32.9%) was slightly higher compared with findings from NOHSS 2007 (30.9%).[8] The highest need was for preventive care (22.9%) in this survey, while in NOHSS 2007, restorative need was higher (21.0%).[8] The need for extractions has also dropped from 2.9% to 1.8% of those examined. The findings of this survey showed a very high caries treatment need in FT Labuan.

- **Need for Preventive Care**

In this survey as in NOHSS 2007[8], the need for preventive care includes the need for preventive caries-arresting care and fissure sealants. The need for caries-arresting care (7.6%) was found to be higher than the 1.5% in 2007.[8] Need for fissure sealant (17.4%) is also higher than the 10.8% in 2007.[8] Overall, there has been a two-fold increase in the need for preventive care over the last decade, with about 22.9% of 12-year-old schoolchildren needing preventive care compared with 11.5% a decade ago.[8] Data across the states and by location gives an indication of the workload required for preventive care among 12-year-olds.

- **Need for Restorative Care**

The proportion of 12-year-old schoolchildren who needed restorative care was lower (14.8%) in this survey compared with the finding from NOHSS 2007 (21.0%).[8] Comparison of the need for one surface and compound filling across a decade showed that the need for one surface filling was still higher than compound filling in this survey, although the need for one surface filling has dropped by 5.4 percentage points in 2017.

[49] Amid I Ismail, Nigel B Pitts, Marisol Tellez. The International Caries Classification and Management System (ICCMS™) an example of a Caries Management Pathway. BMC Oral Health 2015; 15(Suppl 1):S9. Accessed at http://www.biomedcentral.com/1472-6831/15/S1/S9 on 15 July 2017

The findings in NOHSS 2007 and this survey showed that children in the rural, the state of Sabah and children of indigenous ethnicities in Sabah and Sarawak as well as those of lower parental education level continue to have a higher need for restorations.[8]

- **Need for Extraction**

In this survey, about 1.8% of 12 year-old schoolchildren needed extraction. This is lower compared with the need of 2.9% in NOHSS 2007.[8] This reduced need may be attributed to the general improvement of caries status partly contributed by the comprehensive incremental dental care programme which includes clinical preventive care at a younger age and the emphasis on oral health promotion among the population at large.

- **Need for Complex Care**

The need for complex care among 12-year-old schoolchildren remained low (1.0%). Only 0.1% of 12-year-old schoolchildren needed complex treatment. This finding is similar to the need of 0.2% in NOHSS 2007.[8] About 0.8% of 12-year-old schoolchildren needed pulp care, which was also very similar to the prevalence found in NOHSS 2007 (0.7%).[8]

- **Overall Need for Oral Healthcare**

Overall need for oral healthcare encompasses need for denture(s), need for treatment for traumatised anterior teeth, caries treatment need and need for oral hygiene instructions. The categorisation of need for overall oral healthcare in this survey is different from the 'No Treatment Required' criteria of NOHSS 2007.[8] In NOHSS 2007, orthodontic treatment need was taken into account while in this survey orthodontic need was not covered. Hence, comparison of the findings cannot be made with NOHSS 2007.[8]

The variation of need for oral healthcare across states and Federal Territories indicates a compelling need to analyse local conditions in relation to disease burden and workload.

CONCLUSION

4.0 CONCLUSION

The 11,511 respondents to this survey were weighted to represent 444,626 schoolchildren aged 12 years in 2017. The weighted population is comparable to the actual enrolment of 444,631 in the year 2017. The findings of this survey, therefore, is representative of 12-year-old schoolchildren in Malaysia. Overall, the major findings show a major shift in oral health burden of disease from caries to periodontal conditions among 12-year-old schoolchildren in the country. The key findings and implications of the survey are summarized as follows.

- There is a slight decrease in proportions in denture status among 12-year-old schoolchildren compared with data from NOHSS 2007[8]. The weighted population yielded 19 children (0.00%) wearing denture(s) and 669 children (0.16%) needing denture(s) compared with the weighted corresponding findings from NOHSS 2007[8] with 0.02% (N=97) and 0.20% (N=995) respectively.

- There is an increase in the prevalence of traumatic injuries to incisors from 5.4% in 2007[8] to 7.2% in this survey. Males (9.5%) were significantly more affected than females (4.8%), and upper central incisors were most commonly affected. Majority of the children (80.2%) had only one tooth affected.

- The overall situation in Malaysia for 12-year-old schoolchildren indicates a worsening trend in periodontal health alongside a commendable improvement in dental caries status. This trend had already been noted in NOHSS 2007 when the proportion of 12-year-old schoolchildren with healthy periodontium decreased drastically from NOHSS '97 data.

- Based on the use of the Community Periodontal Index (CPI) Modified, where all teeth present were examined for gingival bleeding, the prevalence of unhealthy periodontal condition as manifested by the presence of gingival bleeding on probing, was 99.8%. The severity of gingival bleeding was also found to be high, with a mean of 21.16 teeth per child found to have gingival bleeding on probing.

- Almost all the children aged 12 years (99.8%) were deemed in need of oral hygiene instruction, commensurate with the findings on presence of gingival bleeding on probing.

- Analysis using the scores of the six (6) index teeth as in the original Community Periodontal Index (CPI) found a marked decrease of 12-year-olds with healthy periodontium compared with findings from previous surveys - 94.4% (1997)[17] and 19.6% (2007)[8]. This indicates a drastic declining trend in periodontal health among 12-year-old schoolchildren.

- Dental caries prevalence declined from 41.5% in 2007[8] to 33.3% in this survey - an almost 20% reduction. This reduction in prevalence is accompanied by an almost 30% reduction in caries severity from a mean DMFT score of 1.12 in 2007 to 0.78 in this survey.

- The data on caries experience indicate that Malaysia is on track to achieving the national target of 70% caries-free 12-year-olds targeted in the National Oral Health Plan 2011-2020[25]; and that the country has already achieved the target of mean DMFT≤1 in 12-year-olds under the Plan.

- However, disparities in caries experience continue to be seen, with Sabah state and Sabah/Labuan region having the highest caries prevalence and severity. A higher caries experience is also seen among children of indigenous ethnicities in Sabah and Sarawak as well as those in rural areas and to a certain extent, among females. The findings also clearly indicate an inverse association between caries experience and socio-economic status as reported for the proxy indicators of parental education level and monthly household income – caries prevalence and severity increased with decreasing parental education level and decreasing monthly household income range.

- Overall, dental caries treatment need increased slightly by 2% over the last decade from 30.9% in 2007[8] to 32.9% in this survey. The overall need was for preventive care (preventive caries-arresting care and fissure sealants) which almost doubled over the last decade from 11.5% in 2007[8] to 22.9% in this survey. The need for fissure sealants has increased substantially from 10.8% in 2007[8] to 17.4% in this survey.

- The unmet treatment need indicated by the D component of mean DMFT has declined from 0.39 in 2007[8] to 0.27 in this survey.

- There is a corresponding decreased need for restorations, from 21.0% in 2007[8] to 14.8% in this survey. The need for extractions has also decreased – from 2.9% in 2007[8] to 1.8% in this survey.

- There was no difference in the need for complex care over the last decade - 1.0% in 2007[8] and in this survey.

- Overall, almost all 12-year-old schoolchildren (99.8%) were assessed to be in need of oral healthcare in this survey.

RECOMMENDATIONS

5.0 RECOMMENDATION

In cognizance of the findings in this survey, the following recommendations are made:

- Noting that the worsening trend in healthy periodontium among 12-year-olds had been noted ten years ago in the comparison of findings from NOHSS 2007 and NOHSS '97, the Incremental Dental Care Programme needs to make a **strong paradigm shift** towards emphasis on prevention and control of periodontal conditions alongside the continuing focus on dental caries.

- Oral hygiene instruction as the first level of intervention in the Incremental Dental Care Programme must be prioritised, and steps taken to **evaluate** efforts at personalizing oral hygiene instruction among schoolchildren to control early signs of periodontal disease.

- Risk assessment and categorization for caries among schoolchildren should continue, especially with increasing application of the International Caries Detection and Assessment System (ICDAS) that now enables operators to detect the early stages of the caries process.

- With the commendable decline in caries rates, it is also timely that dental operators be familiarised with more recent caries management pathways which aim to maintain oral health and prevent progression of early lesion, shifting the paradigm away from treatment plans that emphasise the restorative cycle.

- Hence, with the increase in numbers of dental officers, there should be strong consideration for the establishment of oral health promotion teams consisting of dental officers and dental auxiliaries to strengthen oral health promotion activities in schools.

- There must be more educational programmes aimed for parents and their children regarding the preventive and treatment aspects of traumatic injuries to anterior teeth.

- Efforts must continue to strengthen collaboration with school authorities towards empowering teachers to implement and monitor fluoride mouth rinsing activities and daily tooth brushing in schools.

- In the wake of newer caries management pathways, the existing Guideline on School-based Fissure Sealant Programme should be revisited, especially in the selection criteria of children for fissure sealant application.

- There is continuing need to expand accessibility to oral healthcare through "outreach programmes", especially with opportunities to build mobile dental clinics.

- Even with commendable caries decline among schoolchildren, the dental profession should continue to justify continuing community water fluoridation to sustain the caries decline.

- Time-series national epidemiological surveillance at the national level should continue to monitor trends in population oral health status.

NHMS 2017: NOHSS 2017
TABLES OF FINDINGS

1.0 GENERAL FINDINGS

Table 1.1: Projected Sample and Distribution of 12-year-old Schoolchildren Examined, 2017

	Projected sample					Number of eligible schoolchildren					Number of schoolchildren examined				
	Urban		Rural		Total	Urban		Rural		Total	Urban		Rural		Total
	n	%	n	%		N	%	N	%		N	%	N	%	
Malaysia	6,740	55.2	5,460	44.8	12,200	6,637	55.2	5,383	44.8	12,020	6,300	54.7	5,211	45.3	11,511
State															
FT Kuala Lumpur	420	100	0	0.0	420	414	100	0	0.0	414	360	100	0	0.0	360
Perlis	420	50.0	420	50.0	840	417	49.9	419	50.1	836	399	49.4	408	50.6	807
Kedah	420	50.0	420	50.0	840	416	50.1	415	49.9	831	399	50.3	395	49.7	794
Pulau Pinang	420	50.0	420	50.0	840	416	50.7	405	49.3	821	371	49.3	381	50.7	752
Perak	420	50.0	420	50.0	840	420	50.1	419	49.9	839	389	48.8	408	51.2	797
Selangor	420	50.0	420	50.0	840	407	49.6	413	50.4	820	388	50.4	382	49.6	770
Negeri Sembilan	420	50.0	420	50.0	840	414	49.8	417	50.2	831	399	50.1	397	49.9	796
Melaka	420	50.0	420	50.0	840	417	50.0	417	50.0	834	396	49.7	400	50.3	796
Johor	420	50.0	420	50.0	840	403	49.9	404	50.1	807	390	49.4	399	50.6	789
Pahang	420	50.0	420	50.0	840	417	50.2	413	49.8	830	400	49.8	404	50.2	804
Terengganu	420	50.0	420	50.0	840	414	49.8	418	50.2	832	408	49.8	412	50.2	820
Kelantan	420	50.0	420	50.0	840	419	50.1	418	49.9	837	414	50.0	414	50.0	828
Sabah	420	50.0	420	50.0	840	410	49.8	414	50.2	824	394	49.1	409	50.9	803
Sarawak	420	50.0	420	50.0	840	408	49.8	411	50.2	819	395	49.6	402	50.4	797
FT Labuan	420	100	0	0.0	420	412	100	0	0.0	412	392	100	0	0.0	392
FT Putrajaya	440	100	0	0.0	440	433	100	0	0.0	433	406	100	0	0.0	406

Table 1.2: Estimated Population of 12-year-old Schoolchildren, 2017

	No. examined					Estimated Population					Actual Enrolment, MOE 2017				
	Urban		Rural		Total	Urban		Rural		Total	Urban		Rural		Total
	n	%	n	%		N	%	N	%		N	%	N	%	
Malaysia	6,300	54.7	5,211	45.3	11,511	217,059	48.8	227,567	51.2	444,626	217,068	48.8	227,563	51.2	444,631
State															
FT Kuala Lumpur	360	100	0	0.0	360	21,337	100	-	-	21,337	21,341	100	0	0	21,341
Perlis	399	49.4	408	50.6	807	894	24.1	2,809	75.9	3,704	894	24.1	2,809	75.9	3,703
Kedah	399	50.3	395	49.7	794	11,801	36.8	20,281	63.2	32,082	11,803	36.8	20,285	63.2	32,088
Pulau Pinang	371	49.3	381	50.7	752	11,059	50.6	10,778	49.4	21,837	11,054	50.6	10,782	49.4	21,836
Perak	389	48.8	408	51.2	797	15,586	46.3	18,085	53.7	33,671	15,581	46.3	18,084	53.7	33,665
Selangor	388	50.4	382	49.6	770	54,233	63.1	31,693	36.9	85,927	54,241	63.1	31,695	36.9	85,936
Negeri Sembilan	399	50.1	397	49.9	796	9,321	54.8	7,686	45.2	17,007	9,322	54.8	7,685	45.2	17,007
Melaka	396	49.7	400	50.3	796	3,811	29.2	9,218	70.8	13,029	3,811	29.2	9,221	70.8	13,032
Johor	390	49.4	399	50.6	789	31,580	58.5	22,441	41.5	54,021	31,590	58.5	22,448	41.5	54,038
Pahang	400	49.8	404	50.2	804	7,817	32.7	16,110	67.3	23,927	7,816	32.7	16,111	67.3	23,927
Terengganu	408	49.8	412	50.2	820	7,750	38.9	12,187	61.1	19,937	7,754	38.9	12,189	61.1	19,943
Kelantan	414	50.0	414	50.0	828	6,381	21.9	22,699	78.1	29,080	6,380	21.9	22,690	78.1	29,070
Sabah	394	49.1	409	50.9	803	14,051	31.7	30,302	68.3	44,353	14,047	31.7	30,292	68.3	44,339
Sarawak	395	49.6	402	50.4	797	18,173	43.8	23,278	56.2	41,451	18,169	43.8	23,272	56.2	41,441
FT Labuan	392	100	0	0.0	392	1,271	100	-	-	1,271	1,270	100	0	0	1,270
FT Putrajaya	406	100	0	0.0	406	1,994	100	-	-	1,994	1,995	100	0	0	1,995

Table 1.3: Socio-demographic Characteristics of 12-year-old Schoolchildren Examined, 2017

Variable	Count	%
Malaysia	11,511	100
State		
FT Kuala Lumpur	360	3.1
Perlis	807	7.0
Kedah	794	6.9
Pulau Pinang	752	6.5
Perak	797	6.9
Selangor	770	6.7
Negeri Sembilan	796	6.9
Melaka	796	6.9
Johor	789	6.9
Pahang	804	7.0
Terengganu	820	7.1
Kelantan	828	7.2
Sabah	803	7.0
Sarawak	797	6.9
FT Labuan	392	3.4
FT Putrajaya	406	3.5
Region		
Peninsular Malaysia	9,519	82.7
Sabah/Labuan	1,195	10.4
Sarawak	797	6.9
Location		
Urban	6,300	54.7
Rural	5,211	45.3
Gender		
Male	5,750	50.0
Female	5,761	50.0
Ethnicity		
Malay	7,874	68.4
Chinese	1,604	13.9
Indian	508	4.4
Bumiputera Sabah	747	6.5
Bumiputera Sarawak	508	4.4
*Others	270	2.3
† **Parental Education Level**		
Level I	2,083	18.1
Level II	7,183	62.4
Level III	2,188	19.0
Unclassified	57	0.5

* 'Others' refers to Malaysian schoolchildren whose ethnicity is other than Malay, Chinese, Indian, Bumiputera Sabah and Bumiputera Sarawak. Non-citizens are also included in this category.

Table 1.3: Socio-demographic Characteristics of 12-year-old Schoolchildren Examined, 2017 (cont.)

Variable	Count	%
Malaysia	11,511	100
Type of School		
Government	11,347	98.6
Private	164	1.4
Citizenship		
Citizen	11,477	99.7
Non-citizen	34	0.3
Monthly Household Income		
≥RM5,000	2,181	18.9
RM4,000 – RM4,999	898	7.8
RM3,000 – RM3,999	1,251	10.9
RM2,000 – RM2,999	1,668	14.5
RM1,000 – RM1,999	2,948	25.6
<RM1,000	2,418	21.0
Unclassified	147	1.3

†Notes on Parental Education Level:

Level I *Degree or equivalent*
Level II *Diploma / Certificate / STPM / SPM or equivalent*
Level III *PMR or equivalent / Primary School / No formal education*

Table 1.4: Non-respondent 12-year-old Schoolchildren, 2017

Variable	Number of non-respondents	%
Malaysia	689	100
State		
FT Kuala Lumpur	60	8.7
Perlis	33	4.8
Kedah	46	6.7
Pulau Pinang	88	12.8
Perak	43	6.2
Selangor	70	10.2
Negeri Sembilan	44	6.4
Melaka	44	6.4
Johor	51	7.4
Pahang	36	5.2
Terengganu	20	2.9
Kelantan	12	1.7
Sabah	37	5.4
Sarawak	43	6.2
FT Labuan	28	4.1
FT Putrajaya	34	4.9
Region		
Peninsular Malaysia	581	84.3
Sabah/Labuan	65	9.4
Sarawak	43	6.2
Location		
Urban	440	63.9
Rural	249	36.1
Gender		
Male	357	51.8
Female	332	48.2
Ethnicity		
Malay	383	55.6
Chinese	196	28.4
Indian	36	5.2
Bumiputera Sabah	36	5.2
Bumiputera Sarawak	20	2.9
Others	18	2.6
Parental Education Level		
Level I	92	13.4
Level II	268	38.9
Level III	74	10.7
Unclassified	255	37.0

Table 1.4: Non-respondent 12-year-old Schoolchildren, 2017 (cont.)

Variable	Number of non-respondents	%
Malaysia	689	100
Type of School		
Government	665	96.5
Private	24	3.5
Citizenship		
Citizen	683	99.1
Non-citizen	6	0.9
Monthly Household Income		
≥RM5,000	97	14.1
RM4,000 – RM4,999	48	7.0
RM3,000 – RM3,999	49	7.1
RM2,000 – RM2,999	87	12.6
RM1,000 – RM1,999	80	11.6
<RM1,000	69	10.0
Unclassified	259	37.6

Table 1.5: Reasons for Non-response, 2017

Variable	Number of non-respondents	%
Malaysia	689	100
Non-eligible Children		
Transferred to other schools	171	24.8
Unfit for examination due to chronic illness	4	0.6
Child with 'Fixed Appliance'	3	0.4
Child has stopped schooling	2	0.3
Sub-total	180	26.1
Eligible Children but did not respond		
Parents refused to give consent to participate in survey	418	60.7
Child absent for 3 or more times	83	12.0
Unfit for examination due to acute illness	3	0.4
Child refused to be examined	5	0.7
Sub-total	509	73.9

2.0 DENTURE STATUS

Table 2.1: Denture Wearing Status of 12-year-old Schoolchildren, 2017

Denture Status	Count	Estimated Population	%	95% CI		Design Effect
				Lower	Upper	
OVERALL	1	19	0.00	0.00	0.03	0.51
UPPER						
Do not wear upper denture	11,510	444,607	100	99.97	100	0.51
Wearing upper partial denture	1	19	0.00	0.00	0.03	0.51
Wearing full upper denture	0	0	0.00	0.00	0.00	0.00
LOWER						
Do not wear lower denture	11,511	444,626	100	100	100	0.00
Wearing lower partial denture	0	0	0.00	0.00	0.00	0.00
Wearing full lower denture	0	0	0.00	0.00	0.00	0.00

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have count less than 30. Results should be interpreted with caution

Table 2.2: Need for Denture in 12-year-old Schoolchildren, 2017

Denture Need Status	Count	Estimated Population	%	95% CI		Design Effect
				Lower	Upper	
Need for Denture						
- Overall need	25	699	0.16	0.10	0.24	0.91
- Do not need denture	11,486	443,928	99.84	99.76	99.90	0.91
Need Upper Only						
- Upper partial denture	12	364	0.08	0.04	0.16	1.07
- Upper full denture	0	0	0.00	0.00	0.00	0.00
Need Lower Only						
- Lower partial denture	12	308	0.07	0.04	0.13	0.74
- Lower full denture	0	0	0.00	0.00	0.00	0.00
Need Upper and Lower Denture						
- Both upper and lower partial denture	1	26	0.01	0.00	0.04	0.70
- Both upper and lower full denture	0	0	0.00	0.00	0.00	0.00
- Upper full and lower partial denture	0	0	0.00	0.00	0.00	0.00
- Upper partial and lower full denture	0	0	0.00	0.00	0.00	0.00
Need Denture Repair/Replacement	0	0	0.00	0.00	0.00	0.00

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have count less than 30. Results should be interpreted with caution

Table 2.3: Denture Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Wearing denture						Needing denture					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	1	19	0.00	0.00	0.03	0.51	25	699	0.16	0.10	0.24	0.91
State													
FT Kuala Lumpur	21,337	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Perlis	3,704	0	0	0.00	0.00	0.00	0.00	1	1	0.04	0.01	0.27	0.04
Kedah	32,082	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Pulau Pinang	21,837	0	0	0.00	0.00	0.00	0.00	4	120	0.55	0.21	1.42	0.75
Perak	33,671	0	0	0.00	0.00	0.00	0.00	3	106	0.32	0.10	0.95	0.90
Selangor	85,927	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Negeri Sembilan	17,007	0	0	0.00	0.00	0.00	0.00	2	33	0.19	0.05	0.73	0.40
Melaka	13,029	0	0	0.00	0.00	0.00	0.00	2	46	0.35	0.09	1.34	0.57
Johor	54,021	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Pahang	23,927	0	0	0.00	0.00	0.00	0.00	4	122	0.51	0.19	1.38	0.84
Terengganu	19,937	1	19	0.10	0.01	0.68	0.51	2	43	0.22	0.05	0.88	0.59
Kelantan	29,080	0	0	0.00	0.00	0.00	0.00	1	15	0.05	0.01	0.37	0.40
Sabah	44,353	0	0	0.00	0.00	0.00	0.00	3	159	0.36	0.12	1.10	1.40
Sarawak	41,451	0	0	0.00	0.00	0.00	0.00	1	44	0.11	0.01	0.76	1.18
FT Labuan	1,271	0	0	0.00	0.00	0.00	0.00	2	8	0.61	0.09	4.27	0.21
FT Putrajaya	1,994	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Region													
Peninsular	357,552	1	19	0.01	0.00	0.04	0.51	19	487	0.14	0.09	0.22	0.74
Sabah/Labuan	45,623	0	0	0.00	0.00	0.00	0.00	5	167	0.37	0.12	1.07	1.34
Sarawak	41,451	0	0	0.00	0.00	0.00	0.00	1	44	0.11	0.01	0.76	1.17
Location													
Urban	217,059	1	19	0.01	0.00	0.06	0.51	13	310	0.14	0.08	0.27	0.82
Rural	227,567	0	0	0.00	0.00	0.00	0.00	12	388	0.17	0.09	0.31	0.98

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have count less than 30. Results should be interpreted with caution

Table 2.3: Denture Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Wearing denture						Needing denture					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	1	19	0.00	0.00	0.03	0.51	25	699	0.16	0.10	0.24	0.91
Gender													
Male	226,797	0	0	0.00	0.00	0.00	0.00	15	436	0.19	0.11	0.34	0.96
Female	217,829	1	19	0.01	0.00	0.06	0.51	10	262	0.12	0.06	0.24	0.91
Ethnicity													
Malay	277,956	1	19	0.01	0.00	0.05	0.51	14	338	0.12	0.07	0.22	0.76
Chinese	66,035	0	0	0.00	0.00	0.00	0.00	5	114	0.17	0.06	0.46	0.76
Indian	29,357	0	0	0.00	0.00	0.00	0.00	1	39	0.13	0.02	0.91	1.00
Bumiputera Sabah	23,383	0	0	0.00	0.00	0.00	0.00	1	44	0.19	0.03	1.33	1.16
Bumiputera Sarawak	46,580	0	0	0.00	0.00	0.00	0.00	4	164	0.35	0.12	1.05	1.37
Others	1,316	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
Parental Education Level													
Level I	78,115	0	0	0.00	0.00	0.00	0.00	3	21	0.03	0.01	0.12	0.32
Level II	269,949	1	19	0.01	0.00	0.05	0.51	12	331	0.12	0.06	0.23	0.96
Level III	95,001	0	0	0.00	0.00	0.00	0.00	10	347	0.37	0.19	0.69	0.96
Type of School													
Government	438,776	1	19	0.00	0.00	0.03	0.51	24	679	0.15	0.10	0.24	0.92
Private	5,851	0	0	0.00	0.00	0.00	0.00	1	20	0.34	0.05	2.38	0.53
Monthly Household Income													
≥RM5,000	82,603	0	0	0.00	0.00	0.00	0.00	5	44	0.05	0.02	0.17	0.41
RM4,000 – RM4,999	33,589	0	0	0.00	0.00	0.00	0.00	0	0	0.00	0.00	0.00	0.00
RM3,000 – RM3,999	47,480	0	0	0.00	0.00	0.00	0.00	1	16	0.03	0.00	0.25	0.43
RM2,000 – RM2,999	64,512	0	0	0.00	0.00	0.00	0.00	4	102	0.16	0.06	0.45	0.75
RM1,000 – RM1,999	109,921	1	19	0.02	0.00	0.12	0.51	10	348	0.32	0.16	0.62	1.08
<RM1,000	100,969	0	0	0.00	0.00	0.00	0.00	5	188	0.19	0.08	0.46	1.05

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have count less than 30. Results should be interpreted with caution

3.0 INJURIES TO INCISORS

Table 3.1: Prevalence of Traumatised Anterior Teeth among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Traumatised anterior tooth						
	Total Estimated Population	Estimated Population	%	95 % CI		Design Effect	Count
				Lower	Upper		
Malaysia	444,626	32,068	7.2	6.50	7.99	2.53	776
State							
FT Kuala Lumpur	21,337	2,220	10.4	7.16	14.88	2.28	38
Perlis	3,704	92	2.5	1.44	4.28	0.19	23
Kedah	32,082	2,473	7.7	6.01	9.83	1.11	64
Pulau Pinang	21,837	2,448	11.2	9.11	13.72	0.80	84
Perak	33,671	2,794	8.3	6.23	10.97	1.68	69
Selangor	85,927	7,116	8.3	6.20	10.97	4.34	59
Negeri Sembilan	17,007	455	2.7	1.64	4.34	0.76	21
Melaka	13,029	1,559	12.0	8.56	16.49	1.32	91
Johor	54,021	5,002	9.3	6.63	12.78	4.09	72
Pahang	23,927	1,291	5.4	3.70	7.80	1.31	41
Terengganu	19,937	703	3.5	2.48	4.99	0.61	30
Kelantan	29,080	1,611	5.5	3.90	7.82	1.43	41
Sabah	44,353	1,714	3.9	2.35	6.29	2.97	29
Sarawak	41,451	2,288	5.5	3.94	7.68	1.86	44
FT Labuan	1,271	82	6.5	4.18	9.89	0.11	26
FT Putrajaya	1,994	219	11.0	8.50	14.07	0.11	44
Region							
Peninsular Malaysia	357,552	27,983	7.8	7.00	8.74	2.57	677
Sabah/Labuan	45,623	1,796	3.9	2.45	6.27	2.84	55
Sarawak	41,451	2,288	5.5	3.94	7.68	1.86	44
Location							
Urban	217,059	17,341	8.0	6.89	9.25	2.82	446
Rural	227,567	14,727	6.5	5.61	7.46	2.20	330
Gender							
Male	226,797	21,568	9.5	8.41	10.73	2.43	512
Female	217,829	10,500	4.8	4.05	5.73	2.30	264

- Due to rounding, some of totals may be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 3.1: Prevalence of Traumatised Anterior Teeth among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Traumatised anterior tooth						
	Total Estimated Population	Estimated Population	%	95 % CI		Design Effect	Count
				Lower	Upper		
Malaysia	444,626	32,068	7.2	6.50	7.99	2.53	776
Ethnicity							
Malay	277,956	22,421	8.1	7.18	9.06	2.27	554
Chinese	66,035	3,270	5.0	3.79	6.45	1.68	94
Indian	29,357	2,963	10.1	7.46	13.52	2.01	45
Bumiputera Sabah	35,081	1,389	4.0	2.24	6.91	3.16	34
Bumiputera Sarawak	24,720	1,300	5.3	3.27	8.35	2.08	29
Others	11,477	725	6.3	3.12	12.35	2.54	20
Parental Education Level							
Level I	78,115	6,375	8.2	6.68	9.94	1.89	142
Level II	269,949	19,126	7.1	6.25	8.03	2.22	474
Level III	95,001	6,488	6.8	5.47	8.50	2.32	154
Type of School							
Government	438,776	31,498	7.2	6.46	7.96	2.54	759
Private	5,851	570	9.7	5.41	16.94	1.43	17
Monthly Household Income							
≥RM5,000	82,603	6,322	7.7	6.00	9.71	2.72	144
RM4,000 – RM4,999	33,589	2,797	8.3	6.37	10.82	1.48	72
RM3,000 – RM3,999	47,480	3,366	7.1	5.64	8.88	1.28	92
RM2,000 – RM2,999	64,512	4,237	6.6	5.19	8.27	1.69	107
RM1,000 – RM1,999	109,921	8,062	7.3	6.20	8.66	1.68	199
<RM1,000	100,969	6,932	6.9	5.54	8.48	2.32	151

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 3.2: Prevalence of 12-year-old Schoolchildren with Traumatised Anterior Teeth by Number of Teeth Affected, 2017

Number of Traumatised Teeth	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper	
1	597	25,717	80.2	76.45	83.47	1.59
2	149	5,308	16.6	13.58	20.02	1.54
3	25	856	2.7	1.60	4.43	1.47
4	2	75	0.2	0.06	1.00	1.01
5	2	77	0.2	0.06	1.01	1.02
7	1	35	0.1	0.02	0.79	0.88
Total	**776**	**32,068**	**100**			

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 3.3: Percentage of Traumatised Anterior Teeth by Type of Teeth among 12-year-old Schoolchildren, 2017

Tooth	No. of Teeth Present						No. of Traumatised Anterior Teeth					
	Count	Estimated Population	%	95 % CI		Design Effect	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper					Lower	Upper	
11	11,495	444,097	99.9	99.79	99.93	1.14	418	16,924	3.8	3.30	4.39	2.46
12	11,415	440,748	99.1	98.89	99.31	1.54	54	2,179	0.5	0.35	0.70	1.75
21	11,494	444,170	99.9	99.82	99.94	1.05	395	15,453	3.5	3.04	3.98	1.98
22	11,420	441,016	99.2	98.90	99.40	2.35	32	1,434	0.3	0.19	0.55	2.72
31	11,479	443,253	99.7	99.49	99.81	2.41	31	1,201	0.3	0.17	0.42	1.61
32	11,423	441,240	99.2	98.99	99.43	1.88	20	752	0.2	0.11	0.26	0.95
41	11,480	443,349	99.7	99.55	99.82	1.80	25	1,036	0.2	0.14	0.39	1.91
42	11,393	440,192	99.0	98.73	99.22	1.85	20	852	0.2	0.11	0.33	1.61

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 3.4: Prevalence of Schoolchildren with Treated Traumatised Anterior Teeth among 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Schoolchildren with Treated Traumatised Anterior Teeth					
	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper	
Malaysia	111	5,691	17.7	12.26	24.98	5.64
State						
FT Kuala Lumpur	0	0	0.0	0.00	0.00	0.00
Perlis	7	27	29.4	11.05	58.34	0.18
Kedah	7	221	8.9	4.13	18.21	0.87
Pulau Pinang	7	202	8.3	3.96	16.41	0.72
Perak	5	182	6.5	2.74	14.75	0.90
Selangor	24	2,990	42.0	21.17	66.18	10.92
Negeri Sembilan	6	104	22.9	9.39	45.87	0.57
Melaka	10	160	10.3	4.32	22.57	0.80
Johor	10	699	14.0	6.23	28.40	3.06
Pahang	2	39	3.0	0.81	10.47	0.42
Terengganu	4	105	14.9	5.99	32.55	0.58
Kelantan	7	221	13.7	6.51	26.56	0.83
Sabah	5	314	18.3	9.22	33.15	1.03
Sarawak	6	390	17.0	5.91	40.16	2.90
FT Labuan	7	17	20.6	8.16	43.11	0.10
FT Putrajaya	4	20	9.0	4.18	18.29	0.08
Region						
Peninsular Malaysia	93	4,970	17.8	11.73	25.98	6.16
Sabah/Labuan	12	331	18.4	9.60	32.47	0.98
Sarawak	6	390	17.0	5.91	40.16	2.90
Location						
Urban	73	3,915	22.6	13.56	35.15	7.45
Rural	38	1,776	12.1	8.21	17.37	1.82
Gender						
Male	66	3,314	15.4	10.24	22.42	3.87
Female	45	2,376	22.6	14.81	32.97	3.18
Ethnicity						
Malay	81	4,096	18.3	11.32	28.13	6.71
Chinese	11	347	10.6	5.28	20.20	1.13
Indian	7	671	22.6	10.11	43.23	3.03
Bumiputera Sabah	5	252	18.1	7.46	37.82	1.35
Bumiputera Sarawak	4	257	19.8	4.47	56.52	3.64
Others	3	68	9.4	1.40	42.92	1.55

- Due to rounding, some of totals may be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.4: Prevalence of Schoolchildren with Treated Traumatised Anterior Teeth among 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Schoolchildren with Treated Traumatised Anterior Teeth					
	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper	
Malaysia	111	5,691	17.7	12.26	24.98	5.64
Parental Education Level						
Level I	27	1,825	28.6	15.60	46.53	4.97
Level II	64	2,708	14.2	8.88	21.82	4.08
Level III	19	1,156	17.8	10.99	27.60	1.92
Type of School						
Government	111	5,691	18.1	12.49	25.42	5.64
Private	0	0	0.0	0.00	0.00	0.00
Monthly Household Income						
≥RM5,000	31	2,033	32.2	18.07	50.48	5.15
RM4,000 – RM4,999	8	356	12.7	5.07	28.43	1.99
RM3,000 – RM3,999	16	622	18.5	9.73	32.26	1.78
RM2,000 – RM2,999	13	511	12.1	6.11	22.46	1.60
RM1,000 – RM1,999	25	1,203	14.9	8.56	24.72	2.57
<RM1,000	17	902	13.0	7.63	21.32	1.76

- Due to rounding, some of totals may be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.5: Prevalence of Schoolchildren with Untreated Traumatised Anterior Teeth among 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Schoolchildren with Untreated Traumatised Anterior Teeth					
	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper	
Malaysia	686	27,089	84.5	76.93	89.88	6.45
State						
FT Kuala Lumpur	38	2,220	100	100	100	0.00
Perlis	18	74	80.0	43.73	95.37	0.25
Kedah	58	2,293	92.7	84.25	96.80	0.80
Pulau Pinang	79	2,303	94.1	86.27	97.58	0.75
Perak	65	2,645	94.7	87.01	97.91	0.85
Selangor	36	4,266	59.9	35.12	80.54	11.30
Negeri Sembilan	16	365	80.2	58.77	91.99	0.50
Melaka	83	1,444	92.6	80.78	97.39	0.81
Johor	62	4,303	86.0	71.60	93.77	3.06
Pahang	39	1,252	97.0	89.53	99.19	0.42
Terengganu	27	626	89.0	71.44	96.30	0.60
Kelantan	37	1,470	91.2	78.71	96.70	0.88
Sabah	27	1,612	94.0	77.02	98.67	1.47
Sarawak	39	1,942	84.9	60.15	95.44	3.24
FT Labuan	21	70	85.6	66.36	94.67	0.08
FT Putrajaya	41	204	93.2	83.01	97.47	0.09
Region						
Peninsular Malaysia	599	23,464	83.9	75.33	89.83	6.83
Sabah/Labuan	48	1,682	93.6	78.42	98.36	1.34
Sarawak	39	1,942	84.9	60.15	95.44	3.24
Location						
Urban	383	13,710	79.1	65.97	88.03	8.15
Rural	303	13,380	90.9	85.65	94.29	2.03
Gender						
Male	458	18,589	86.2	79.01	91.19	4.19
Female	228	8,500	81.0	70.18	88.48	3.62
Ethnicity						
Malay	486	18,616	83.0	72.97	89.86	7.14
Chinese	86	2,989	91.4	81.95	96.14	1.19
Indian	39	2,433	82.1	60.64	93.18	3.31
Bumiputera Sabah	32	1,349	97.1	82.14	99.60	0.99
Bumiputera Sarawak	25	1,043	80.2	43.48	95.53	3.64
Others	18	660	91.0	56.42	98.76	1.60

- Due to rounding, some of totals may be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.5: Prevalence of Schoolchildren with Untreated Traumatised Anterior Teeth among 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Schoolchildren with Untreated Traumatised Anterior Teeth					
	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper	
Malaysia	686	27,089	84.5	76.93	89.88	6.45
Parental Education Level						
Level I	117	4,569	71.7	53.69	84.67	5.01
Level II	425	16,859	88.1	80.23	93.16	4.66
Level III	139	5,584	86.1	75.87	92.38	2.25
Type of School						
Government	669	26,519	84.2	76.53	89.69	6.45
Private	17	570	100	100	100	0.00
Monthly Household Income						
≥RM5,000	116	4,341	68.7	50.19	82.67	5.23
RM4,000 – RM4,999	65	2,442	87.3	71.59	94.96	2.00
RM3,000 – RM3,999	83	2,869	85.2	70.70	93.25	2.05
RM2,000 – RM2,999	95	3,758	88.7	78.34	94.47	1.63
RM1,000 – RM1,999	178	7,084	87.9	77.82	93.72	2.87
<RM1,000	138	6,242	90.0	81.96	94.73	1.87

- Due to rounding, some of totals may be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.6: Status of Treated Traumatised Anterior Teeth in 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Treated, no problem						Treated, with problem					
	Count	Estimated Population	%	95 % CI		Design Effect	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper					Lower	Upper	
Malaysia	80	3,737	11.7	8.13	16.44	3.37	32	1,958	6.1	3.46	10.55	4.16
State												
FT Kuala Lumpur	0	0	0.0	0.00	0.00	0.00	0	0	0.0	0.00	0.00	0.00
Perlis	7	27	29.4	11.05	58.34	0.18	0	0	0.0	0.00	0.00	0.00
Kedah	4	129	5.2	1.98	13.03	0.78	3	92	3.7	0.87	14.46	1.24
Pulau Pinang	6	171	7.0	2.92	15.71	0.84	1	31	1.3	0.19	8.31	0.75
Perak	4	147	5.3	1.89	13.78	0.99	1	36	1.3	0.19	8.18	0.84
Selangor	13	1,676	23.6	12.15	40.72	5.26	11	1,314	18.5	8.42	35.83	5.57
Negeri Sembilan	4	65	14.3	4.78	35.69	0.51	2	39	8.6	2.13	28.66	0.48
Melaka	7	106	6.8	2.62	16.46	0.62	3	55	3.5	0.61	17.71	1.07
Johor	9	621	12.4	5.17	26.96	3.18	1	77	1.5	0.19	11.37	2.15
Pahang	1	19	1.5	0.19	10.63	0.51	1	19	1.5	0.22	9.44	0.45
Terengganu	2	59	8.4	2.33	26.27	0.64	2	46	6.5	1.70	21.75	0.53
Kelantan	3	47	2.9	0.70	11.24	0.61	4	174	10.8	4.41	24.11	0.92
Sabah	4	248	14.5	5.40	33.43	1.60	1	66	3.8	0.63	20.24	1.38
Sarawak	6	390	17.0	5.91	40.16	2.90	0	0	0.0	0.00	0.00	0.00
FT Labuan	7	17	20.6	8.16	43.11	0.10	1	4	5.0	0.63	29.98	0.11
FT Putrajaya	3	15	6.6	2.58	16.06	0.08	1	5	2.4	0.31	15.56	0.13
Region												
Peninsular Malaysia	63	3,082	11.0	7.28	16.32	3.62	30	1,888	6.7	3.76	11.81	4.27
Sabah/Labuan	11	265	14.8	5.85	32.55	1.52	2	70	3.9	0.71	18.81	1.31
Sarawak	6	390	17.0	5.91	40.16	2.90	0	0	0.0	0.00	0.00	0.00
Location												
Urban	52	2,477	14.3	8.76	22.43	4.12	22	1,443	8.3	3.99	16.54	5.15
Rural	28	1,261	8.6	5.41	13.30	1.79	10	515	3.5	1.86	6.48	1.34

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.6: Status of Treated Traumatised Anterior Teeth in 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Treated, no problem						Treated, with problem					
	Count	Estimated Population	%	95 % CI		Design Effect	Count	Estimated Population	%	95 % CI		Design Effect
				Lower	Upper					Lower	Upper	
Malaysia	80	3,737	11.7	8.13	16.44	3.37	32	1,958	6.1	3.46	10.55	4.16
Gender												
Male	45	2,092	9.7	6.67	13.90	2.00	21	1,222	5.7	2.59	11.95	4.89
Female	35	1,645	15.7	9.91	23.89	2.44	11	735	7.0	3.63	13.09	2.10
Ethnicity												
Malay	55	2,540	11.3	7.50	16.76	2.98	27	1,560	7.0	3.52	13.30	4.79
Chinese	9	239	7.3	3.42	14.90	0.90	2	109	3.3	0.73	13.77	1.58
Indian	5	447	15.1	4.76	38.75	3.91	2	223	7.5	1.77	26.93	3.00
Bumiputera Sabah	4	186	13.4	3.63	38.78	2.05	1	66	4.7	0.85	22.41	1.24
Bumiputera Sarawak	4	257	19.8	4.47	56.52	3.64	0	0	0	0.00	0.00	0.00
Others	3	68	9.4	1.40	42.92	1.55	0	0	0	0.00	0.00	0.00
Parental Education Level												
Level I	21	1,444	22.7	12.38	37.77	3.77	6	381	6.0	2.31	14.58	2.22
Level II	47	1,615	8.4	5.32	13.15	2.30	18	1,097	5.7	2.84	11.25	3.54
Level III	11	677	10.4	5.61	18.58	1.74	8	480	7.4	3.48	15.03	1.79
Type of School												
Government	80	3,737	11.9	8.27	16.73	3.37	32	1,958	6.2	3.52	10.73	4.16
Private	0	0	0.0	0.00	0.00	0.00	0	0	0.0	0.00	0.00	0.00
Monthly Household Income												
≥RM5,000	26	1,590	25.2	14.41	40.15	3.62	6	447	7.1	2.82	16.64	2.46
RM4,000 – RM4,999	4	169	6.1	1.22	25.18	2.77	4	186	6.7	2.27	17.98	1.39
RM3,000 – RM3,999	15	597	17.7	9.13	31.62	1.82	1	25	0.7	0.10	5.18	0.62
RM2,000 – RM2,999	10	421	9.9	4.55	20.35	1.70	3	90	2.1	0.60	7.28	0.93
RM1,000 – RM1,999	13	444	5.5	2.67	11.00	1.51	12	759	9.4	4.21	19.74	3.25
<RM1,000	11	453	6.5	3.14	13.09	1.59	6	450	6.5	2.79	14.38	2.09

- Due to rounding, some totals may not be equal to the sum of separated figures. Some cells have counts less than 30. Results should be interpreted with caution
- A child may have treated from traumatised anterior teeth as follows: (i) Treated, no problem and/or (ii) Treated, with problem

Table 3.7: Status of Untreated Traumatised Anterior Teeth in 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017

Socio-demographic Characteristic	Not treated, no problem						Not treated, with problem					
	Count	Estimated Population	%	95 % CI		Design Effect	Count	Estimated population	%	95 % CI		Design Effect
				Lower	Upper					Lower	Upper	
Malaysia	617	24,136	75.3	69.05	80.58	3.68	91	3,721	11.6	8.91	14.97	1.81
State												
FT Kuala Lumpur	37	2,171	97.8	86.14	99.69	1.18	1	49	2.2	0.31	13.86	1.18
Perlis	15	66	71.0	41.78	89.33	0.18	4	10	10.5	3.45	27.80	0.08
Kedah	55	2,140	86.5	76.81	92.55	0.81	9	424	17.1	10.86	25.95	0.63
Pulau Pinang	71	2,070	84.6	75.76	90.57	0.64	12	352	14.4	8.71	22.86	0.62
Perak	60	2,457	87.9	76.10	94.35	1.30	6	227	8.1	3.07	19.72	1.39
Selangor	28	3,335	46.9	28.58	66.03	7.07	8	931	13.1	6.07	25.97	3.70
Negeri Sembilan	14	339	74.5	49.86	89.57	0.64	2	26	5.7	1.51	19.06	0.29
Melaka	77	1,362	87.3	75.50	93.90	0.71	8	134	8.6	3.68	18.88	0.64
Johor	61	4,263	85.2	70.93	93.17	2.98	1	40	0.8	0.10	6.03	1.09
Pahang	33	1,078	83.5	69.21	91.90	0.75	8	234	18.1	7.28	38.34	1.31
Terengganu	23	540	76.7	58.34	88.58	0.59	7	166	23.6	11.00	43.57	0.68
Kelantan	30	1,223	75.9	63.73	84.98	0.64	10	394	24.5	14.57	38.06	0.78
Sabah	25	1,482	86.5	63.80	95.86	2.13	2	130	7.6	2.34	21.88	1.16
Sarawak	31	1,358	59.3	37.06	78.34	2.91	8	585	25.6	11.01	48.77	2.89
FT Labuan	18	59	72.3	46.20	88.81	0.13	3	11	13.2	3.19	41.47	0.14
FT Putrajaya	39	195	88.9	80.36	94.03	0.06	2	9	4.3	1.15	14.71	0.10
Region												
Peninsular Malaysia	543	21,236	75.9	69.00	81.65	3.92	78	2,996	10.7	8.04	14.11	1.70
Sabah/Labuan	43	1,542	85.8	64.97	95.18	1.95	5	141	7.8	2.65	20.97	1.07
Sarawak	31	1,358	59.3	37.06	78.34	2.91	8	585	25.6	11.01	48.77	2.89
Location												
Urban	348	12,422	71.6	61.21	80.17	4.98	44	1,512	8.7	5.42	13.74	2.31
Rural	269	11,714	79.5	73.88	84.23	1.55	47	2,209	15.0	11.10	19.96	1.43

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have untreated traumatised anterior teeth as follows;: (i) untreated, no problem and/or (ii) untreated, with problem

Table 3.7: Status of Untreated Traumatised Anterior Teeth in 12-year-old Schoolchildren with Traumatised Anterior Teeth by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristic	Not treated, no problem						Not treated, with problem					
	Count	Estimated Population	%	95 % CI		Design Effect	Count	Estimated population	%	95 % CI		Design Effect
				Lower	Upper					Lower	Upper	
Malaysia	617	24,136	75.3	69.05	80.58	3.68	91	3,721	11.6	8.91	14.97	1.81
Gender												
Male	407	16,283	75.5	69.05	80.97	2.66	68	2,894	13.4	9.77	18.16	2.06
Female	210	7,853	74.8	65.33	82.37	2.61	23	827	7.9	4.79	12.67	1.36
Ethnicity												
Malay	434	16,599	74.0	66.08	80.67	4.00	71	2,692	12.0	9.14	15.62	1.41
Chinese	79	2,553	78.1	63.49	87.93	1.84	8	465	14.2	5.75	31.10	2.55
Indian	39	2,433	82.1	60.64	93.18	3.31	2	63	2.1	0.28	14.27	1.63
Bumiputera Sabah	30	1,220	87.8	71.32	95.41	1.07	2	130	9.3	2.96	25.84	1.12
Bumiputera Sarawak	20	852	65.5	34.04	87.50	3.19	5	191	14.7	3.89	42.31	2.19
Others	15	480	66.2	32.48	88.86	2.04	3	180	24.8	6.05	62.86	2.31
Parental Education Level												
Level I	106	4,059	63.7	48.81	76.31	3.47	16	654	10.3	5.05	19.71	2.18
Level II	380	14,839	77.6	70.65	83.27	2.79	54	2,351	12.3	8.95	16.66	1.65
Level III	126	5,160	79.5	69.71	86.78	1.84	21	716	11.0	6.76	17.50	1.16
Type of School												
Government	603	23,657	75.1	68.78	80.51	3.72	85	3,534	11.2	8.52	14.64	1.87
Private	14	479	84.0	62.54	94.32	0.64	6	187	32.9	17.22	53.52	0.59
Monthly Household Income												
≥RM5,000	104	3,675	58.1	43.61	71.38	3.36	15	733	11.6	5.69	22.19	2.49
RM4,000 – RM4,999	61	2,109	75.4	58.68	86.91	1.96	4	333	11.9	4.04	30.25	2.54
RM3,000 – RM3,999	75	2,562	76.1	61.91	86.22	1.77	9	335	10.0	3.98	22.80	1.85
RM2,000 – RM2,999	88	3,621	85.5	75.35	91.89	1.44	8	168	4.0	1.77	8.60	0.70
RM1,000 – RM1,999	160	6,502	80.7	71.19	87.55	2.19	28	931	11.6	7.47	17.44	1.21
<RM1,000	118	5,313	76.6	66.78	84.25	1.89	27	1,221	17.6	11.13	26.72	1.83

- Due to rounding, some totals may not be equal to the sum of separated figures
- Some cells have counts less than 30. Results should be interpreted with caution
- A child may have untreated traumatised anterior teeth as follows: (i)untreated, no problem and/or (ii) untreated, with problem

4.0 PERIODONTAL STATUS

Table 4.1: Periodontal Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Percentage of schoolchildren with gingival bleeding											
		Absence of gingival bleeding						Presence of gingival bleeding					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	16	879	0.20	0.09	0.43	3.69	11,495	443,747	99.80	99.57	99.91	3.69
State													
FT Kuala Lumpur	21,337	0	0	0.00	0.00	0.00	0.00	360	21,337	100	100	100	0.00
Perlis	3,704	0	0	0.00	0.00	0.00	0.00	807	3,704	100	100	100	0.00
Kedah	32,082	0	0	0.00	0.00	0.00	0.00	794	32,082	100	100	100	0.00
Pulau Pinang	21,837	0	0	0.00	0.00	0.00	0.00	752	21,837	100	100	100	0.00
Perak	33,671	3	109	0.32	0.11	0.97	0.92	794	33,562	99.68	99.03	99.89	0.92
Selangor	85,927	1	141	0.16	0.02	1.16	3.74	769	85,786	99.84	98.84	99.98	3.74
Negeri Sembilan	17,007	0	0	0.00	0.00	0.00	0.00	796	17,007	100	100	100	0.00
Melaka	13,029	0	0	0.00	0.00	0.00	0.00	796	13,029	100	100	100	0.00
Johor	54,021	7	331	0.61	0.14	2.61	4.88	782	53,689	99.39	97.39	99.86	4.88
Pahang	23,927	4	235	0.98	0.21	4.51	3.89	800	23,692	99.02	95.49	99.79	3.89
Terengganu	19,937	0	0	0.00	0.00	0.00	0.00	820	19,937	100	100	100	0.00
Kelantan	29,080	0	0	0.00	0.00	0.00	0.00	828	29,080	100	100	100	0.00
Sabah	44,353	1	63	0.14	0.02	1.01	1.68	802	44,290	99.86	98.99	99.98	1.68
Sarawak	41,451	0	0	0.00	0.00	0.00	0.00	797	41,451	100	100	100	0.00
FT Labuan	1,271	0	0	0.00	0.00	0.00	0.00	392	1,271	100	100	100	0.00
FT Putrajaya	1,994	0	0	0.00	0.00	0.00	0.00	406	1,994	100	100	100	0.00
Region													
Peninsular Malaysia	357,552	15	816	0.23	0.10	0.52	3.85	9,504	356,736	99.77	99.48	99.90	3.85
Sabah/Labuan	45,623	1	63	0.14	0.02	0.98	1.68	1,194	45,560	99.86	99.02	99.98	1.68
Sarawak	41,451	0	0	0.00	0.00	0.00	0.00	797	41,451	100	100	100	0.00
Location													
Urban	217,059	5	279	0.13	0.04	0.40	2.51	6,295	216,780	99.87	99.60	99.96	2.51
Rural	227,567	11	600	0.26	0.10	0.72	4.24	5,200	226,967	99.74	99.28	99.90	4.24

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.1: Periodontal Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Percentage of schoolchildren with gingival bleeding											
		Absence of gingival bleeding						Presence of gingival bleeding					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	16	879	0.20	0.09	0.43	3.69	11,495	443,747	99.80	99.57	99.91	3.69
Gender													
Male	226,797	7	360	0.16	0.05	0.47	2.89	5,743	226,437	99.84	99.53	99.95	2.89
Female	217,829	9	520	0.24	0.08	0.70	4.12	5,752	217,310	99.76	99.30	99.92	4.12
Ethnicity													
Malay	277,956	10	541	0.19	0.07	0.55	4.02	7,864	277,415	99.81	99.45	99.93	4.02
Chinese	66,035	5	276	0.42	0.11	1.57	3.36	1,599	65,759	99.58	98.43	99.89	3.36
India	29,357	0	0	0.00	0.00	0.00	0.00	508	29,357	100	100	100	0.00
Bumiputera Sabah	35,081	1	63	0.18	0.03	1.28	1.68	746	35,017	99.82	98.72	99.97	1.68
Bumiputera Sarawak	24,720	0	0	0.00	0.00	0.00	0.00	508	24,720	100	100	100	0.00
Others	11,477	0	0	0.00	0.00	0.00	0.00	270	11,477	100	100	100	0.00
Parental Education Level													
Level I	78,115	3	227	0.29	0.08	1.09	2.75	2,080	77,888	99.71	98.91	99.92	2.75
Level II	269,949	11	503	0.19	0.07	0.47	2.92	7,172	269,447	99.81	99.53	99.93	2.92
Level III	95,001	2	149	0.16	0.04	0.64	2.05	2,186	94,852	99.84	99.36	99.96	2.05
Type of School													
Government	438,776	16	879	0.20	0.09	0.44	3.69	11,331	437,896	99.80	99.56	99.91	3.69
Private	5,851	0	0	0.00	0.00	0.00	0.00	164	5,851	100	100	100	0.00
Monthly Household Income													
≥RM5,000	82,603	2	181	0.22	0.04	1.08	3.18	2,179	82,422	99.78	98.92	99.96	3.18
RM4,000 – RM4,999	33,589	0	0	0.00	0.00	0.00	0.00	898	33,589	100	100	100	0.00
RM3,000 – RM3,999	47,480	2	133	0.28	0.07	1.19	1.93	1,249	47,347	99.72	98.81	99.93	1.93
RM2,000 – RM2,999	64,512	4	158	0.25	0.07	0.89	1.82	1,664	64,354	99.75	99.11	99.93	1.82
RM1,000 – RM1,999	109,921	4	200	0.18	0.06	0.53	1.57	2,944	109,721	99.82	99.47	99.94	1.57
<RM1,000	100,969	4	208	0.21	0.06	0.65	1.89	2,414	100,761	99.79	99.35	99.94	1.89

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.2: Mean Number of Teeth with Gingival Bleeding per Child in 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Count	Total Estimated Population	Mean no. of teeth with gingival bleeding per child				
			Mean	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	21.16	20.81	21.51	0.18	12.73
State							
FT Kuala Lumpur	360	21,337	23.01	22.62	23.40	0.20	4.09
Perlis	807	3,704	19.76	18.86	20.66	0.46	0.87
Kedah	794	32,082	23.11	22.84	23.38	0.14	1.98
Pulau Pinang	752	21,837	22.41	22.16	22.67	0.13	1.04
Perak	797	33,671	18.79	17.68	19.90	0.56	6.82
Selangor	770	85,927	21.69	20.46	22.91	0.62	31.84
Negeri Sembilan	796	17,007	22.30	21.82	22.79	0.25	2.86
Melaka	796	13,029	15.79	13.86	17.73	0.98	10.67
Johor	789	54,021	20.60	19.29	21.90	0.66	14.87
Pahang	804	23,927	17.73	15.51	19.94	1.12	14.28
Terengganu	820	19,937	23.54	23.11	23.96	0.22	2.52
Kelantan	828	29,080	21.32	20.65	21.99	0.34	5.09
Sabah	803	44,353	23.00	22.46	23.54	0.27	5.68
Sarawak	797	41,451	19.85	18.88	20.81	0.49	9.07
FT Labuan	392	1,271	18.78	17.89	19.67	0.45	0.26
FT Putrajaya	406	1,994	20.24	19.40	21.08	0.43	0.55
Region							
Peninsular Malaysia	9,519	357,552	21.09	20.68	21.51	0.21	13.91
Sabah/Labuan	1,195	45,623	22.88	22.36	23.41	0.27	5.27
Sarawak	797	41,451	19.85	18.88	20.81	0.49	9.07
Location							
Urban	6,300	217,059	20.94	20.38	21.50	0.28	16.22
Rural	5,211	227,567	21.37	20.95	21.79	0.21	9.47

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.2: Mean Number of Teeth with Gingival Bleeding per Child in 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean no. of teeth with gingival bleeding per child				
			Mean	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	21.16	20.81	21.51	0.18	12.73
Gender							
Male	5,750	226,797	21.00	20.63	21.37	0.19	7.68
Female	5,761	217,829	21.33	20.95	21.71	0.19	7.23
Ethnicity							
Malay	7,874	277,956	21.33	20.95	21.72	0.20	10.57
Chinese	1,604	66,035	19.82	18.82	20.82	0.51	13.46
India	508	29,357	21.23	19.72	22.74	0.77	12.41
Bumiputera Sabah	747	35,081	22.91	22.29	23.53	0.32	5.19
Bumiputera Sarawak	508	24,720	20.28	19.44	21.12	0.43	4.04
Others	270	11,477	21.03	19.06	23.01	1.00	10.20
Parental Education Level							
Level I	2,083	78,115	20.96	20.40	21.53	0.29	6.25
Level II	7,183	269,949	21.12	20.77	21.48	0.18	7.94
Level III	2,188	95,001	21.41	20.92	21.91	0.25	5.48
Type of School							
Government	11,347	438,776	21.17	20.81	21.52	0.18	12.93
Private	164	5,851	20.74	17.58	23.91	1.61	13.63
Monthly Household Income							
≥RM5,000	2,181	82,603	20.83	20.16	21.49	0.34	8.77
RM4,000 – RM4,999	898	33,589	20.96	20.42	21.50	0.27	2.46
RM3,000 – RM3,999	1,251	47,480	21.06	20.51	21.62	0.28	3.23
RM2,000 – RM2,999	1,668	64,512	20.96	20.41	21.51	0.28	4.09
RM1,000 – RM1,999	2,948	109,921	21.37	20.93	21.80	0.22	5.15
<RM1,000	2,418	100,969	21.42	20.96	21.87	0.23	5.09

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.3: Proportion of Teeth Present with Gingival Bleeding per Child in 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Count	Total Estimated Population	% of teeth present with gingival bleeding per child			
			%	95% CI		Design Effect
				Lower	Upper	
Malaysia	11,511	444,626	89.2	87.88	90.61	13.98
State						
FT Kuala Lumpur	360	21,337	98.5	98.11	98.90	1.09
Perlis	807	3,704	85.0	80.67	89.41	1.29
Kedah	794	32,082	97.6	96.92	98.31	2.04
Pulau Pinang	752	21,837	97.7	97.03	98.47	1.09
Perak	797	33,671	79.5	75.22	83.73	6.57
Selangor	770	85,927	88.8	84.49	93.18	31.82
Negeri Sembilan	796	17,007	98.1	97.33	98.95	1.92
Melaka	796	13,029	90.9	86.49	95.35	5.62
Johor	789	54,021	82.8	76.97	88.55	18.17
Pahang	804	23,927	73.1	63.58	82.60	16.69
Terengganu	820	19,937	99.8	99.60	99.94	1.04
Kelantan	828	29,080	93.0	90.72	95.34	6.19
Sabah	803	44,353	97.2	95.07	99.29	10.25
Sarawak	797	41,451	81.7	78.56	84.86	6.92
FT Labuan	392	1,271	83.9	80.65	87.21	0.23
FT Putrajaya	406	1,994	89.2	86.43	92.04	0.49
Region						
Peninsular Malaysia	9,519	357,552	89.2	87.54	90.82	15.51
Sabah/Labuan	1,195	45,623	96.8	94.78	98.89	9.24
Sarawak	797	41,451	81.7	78.56	84.86	6.92
Location						
Urban	6,300	217,059	88.3	86.16	90.52	17.17
Rural	5,211	227,567	90.1	88.44	91.78	10.92

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.3: Proportion of Teeth Present with Gingival Bleeding per Child in 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	% of teeth present with gingival bleeding per child			
			%	95% CI		Design Effect
				Lower	Upper	
Malaysia	11,511	444,626	89.2	87.88	90.61	13.98
Gender						
Male	5,750	226,797	90.0	88.58	91.40	8.01
Female	5,761	217,829	88.5	86.99	90.01	8.03
Ethnicity						
Malay	7,874	277,956	90.3	88.79	91.87	12.27
Chinese	1,604	66,035	84.7	80.31	89.12	16.32
India	508	29,357	86.9	81.68	92.13	10.70
Bumiputera Sabah	747	35,081	96.7	94.53	98.85	6.57
Bumiputera Sarawak	508	24,720	83.0	79.92	86.18	3.85
Others	270	11,477	86.2	78.25	94.14	10.23
Parental Education Level						
Level I	2,083	78,115	89.0	86.82	91.10	6.24
Level II	7,183	269,949	89.2	87.80	90.63	9.03
Level III	2,188	95,001	89.4	87.41	91.45	6.54
Type of School						
Government	11,347	438,776	89.3	87.87	90.64	14.23
Private	164	5,851	88.5	75.01	101.95	15.87
Monthly Household Income						
≥RM5,000	2,181	82,603	88.2	85.54	90.82	9.87
RM4,000 – RM4,999	898	33,589	88.7	86.58	90.91	2.74
RM3,000 – RM3,999	1,251	47,480	88.7	86.41	90.95	3.77
RM2,000 – RM2,999	1,668	64,512	88.1	85.94	90.30	4.69
RM1,000 – RM1,999	2,948	109,921	90.1	88.43	91.85	5.58
<RM1,000	2,418	100,969	90.1	88.26	91.87	5.91

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.4: Periodontal Status of 12-year-old Schoolchildren by Tooth, 2017

Tooth	Absence of gingival bleeding		Presence of gingival bleeding		Tooth not present		Tooth excluded	
	Count	%	Count	%	Count	%	Count	%
26	450	4.7	10,994	94.8	14	0.1	53	0.4
46	585	5.1	10,703	93.1	49	0.4	174	1.4
16	657	6.5	10,783	92.9	10	0.1	61	0.5
36	593	5.8	10,686	92.4	46	0.4	186	1.4
41/81	1,202	11.1	10,284	88.8	18	0.1	7	0.1
42/82	1,083	10.3	10,312	88.7	107	0.9	9	0.0
31/71	1,229	11.4	10,260	88.4	17	0.1	5	0.1
32/72	1,224	11.3	10,205	88.1	75	0.6	7	0.1
12/52	1,465	13.6	9,888	85.4	57	0.5	101	0.6
24/64	1,011	9.9	9,574	84.9	105	1.0	821	4.3
44/84	953	8.7	9,442	84.3	221	1.8	895	5.1
34/74	963	8.8	9,366	83.4	246	2.3	936	5.4
45/85	711	6.3	9,286	83.3	562	4.9	952	5.5
11/51	1,807	16.5	9,661	83.2	14	0.1	29	0.2
25/65	731	7.6	9,371	82.9	335	3.1	1,074	6.5
14/54	1,077	11.4	9,445	82.8	120	1.1	869	4.7
22/62	1,741	16.5	9,624	82.6	48	0.4	98	0.5
15/55	886	8.9	9,301	82.3	329	3.0	995	5.7
21/61	1,954	17.8	9,511	82.0	15	0.1	31	0.2
35/75	706	6.9	9,199	81.6	644	5.7	962	5.9
43/83	1,153	11.1	8,759	78.5	223	1.9	1,376	8.5
33/73	1,258	12.0	8,610	77.5	191	1.6	1,452	8.8
13/53	1,017	10.2	7,584	68.9	806	7.0	2,104	13.9
23/63	1,181	12.4	7,304	66.6	761	6.4	2,265	14.6
47	215	2.5	2,568	26.3	3,956	35.2	4,772	35.9
37	221	2.9	2,526	25.5	3,856	34.1	4,908	37.4
27	179	2.1	2,429	23.9	6,840	59.7	2,063	14.3
17	211	2.7	2,348	23.0	7,030	61.1	1,922	13.3

Table 4.5: Need for Oral Hygiene Instruction (OHI) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Need OHI						Do not need OHI					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,495	443,747	99.80	99.57	99.91	3.69	16	879	0.20	0.09	0.43	3.69
State													
FT Kuala Lumpur	21,337	360	21,337	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Perlis	3,704	807	3,704	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Kedah	32,082	794	32,082	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Pulau Pinang	21,837	752	21,837	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Perak	33,671	794	33,562	99.68	99.03	99.89	0.92	3	109	0.32	0.11	0.97	0.92
Selangor	85,927	769	85,786	99.84	98.84	99.98	3.74	1	141	0.16	0.02	1.16	3.74
Negeri Sembilan	17,007	796	17,007	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Melaka	13,029	796	13,029	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Johor	54,021	782	53,689	99.39	97.39	99.86	4.88	7	331	0.61	0.14	2.61	4.88
Pahang	23,927	800	23,692	99.02	95.49	99.79	3.89	4	235	0.98	0.21	4.51	3.89
Terengganu	19,937	820	19,937	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Kelantan	29,080	828	29,080	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Sabah	44,353	802	44,290	99.86	98.99	99.98	1.68	1	63	0.14	0.02	1.01	1.68
Sarawak	41,451	797	41,451	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
FT Labuan	1,271	392	1,271	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
FT Putrajaya	1,994	406	1,994	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Region													
Peninsular Malaysia	357,552	9,504	356,736	99.77	99.48	99.90	3.85	15	816	0.23	0.10	0.52	3.85
Sabah/Labuan	45,623	1,194	45,560	99.86	99.02	99.98	1.68	1	63	0.14	0.02	0.98	1.68
Sarawak	41,451	797	41,451	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Location													
Urban	217,059	6,295	216,780	99.87	99.60	99.96	2.51	5	279	0.13	0.04	0.40	2.51
Rural	227,567	5,200	226,967	99.74	99.28	99.90	4.24	11	600	0.26	0.10	0.72	4.24
Gender													
Male	226,797	5,743	226,437	99.84	99.53	99.95	2.89	7	360	0.16	0.05	0.47	2.89
Female	217,829	5,752	217,310	99.76	99.30	99.92	4.12	9	520	0.24	0.08	0.70	4.12

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.5: Need for Oral Hygiene Instruction (OHI) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Need OHI						Do not need OHI					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,495	443,747	99.80	99.57	99.91	3.69	16	879	0.20	0.09	0.43	3.69
Ethnicity													
Malay	277,956	7,864	277,415	99.81	99.45	99.93	4.02	10	541	0.19	0.07	0.55	4.02
Chinese	66,035	1,599	65,759	99.58	98.43	99.89	3.36	5	276	0.42	0.11	1.57	3.36
India	29,357	508	29,357	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Bumiputera Sabah	35,081	746	35,017	99.82	98.72	99.97	1.68	1	63	0.18	0.03	1.28	1.68
Bumiputera Sarawak	24,720	508	24,720	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Others	11,477	270	11,477	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Parental Education Level													
Level I	78,115	2,080	77,888	99.71	98.91	99.92	2.75	3	227	0.29	0.08	1.09	2.75
Level II	269,949	7,172	269,447	99.81	99.53	99.93	2.92	11	503	0.19	0.07	0.47	2.92
Level III	95,001	2,186	94,852	99.84	99.36	99.96	2.05	2	149	0.16	0.04	0.64	2.05
Type of School													
Government	438,776	11,331	437,896	99.80	99.56	99.91	3.69	16	879	0.20	0.09	0.44	3.69
Private	5,851	164	5,851	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Monthly Household Income													
≥RM5,000	82,603	2,179	82,422	99.78	98.92	99.96	3.18	2	181	0.22	0.04	1.08	3.18
RM4,000 – RM4,999	33,589	898	33,589	100	100	100.00	0.00	0	0	0.00	0.00	0.00	0.00
RM3,000 – RM3,999	47,480	1,249	47,347	99.72	98.81	99.93	1.93	2	133	0.28	0.07	1.19	1.93
RM2,000 – RM2,999	64,512	1,664	64,354	99.75	99.11	99.93	1.82	4	158	0.25	0.07	0.89	1.82
RM1,000 – RM1,999	109,921	2,944	109,721	99.82	99.47	99.94	1.57	4	200	0.18	0.06	0.53	1.57
<RM1,000	100,969	2,414	100,761	99.79	99.35	99.94	1.89	4	208	0.21	0.06	0.65	1.89

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.6: Periodontal Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth)

Socio-demographic Characteristics	Total Estimated Population	Absence of gingival bleeding						Presence of gingival bleeding					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	45	1,864	0.42	0.25	0.71	3.59	11,466	442,763	99.58	99.29	99.75	3.59
State													
FT Kuala Lumpur	21,337	0	0	0.00	0.00	0.00	0.00	360	21,337	100	100	100	0.00
Perlis	3,704	1	1	0.03	0.00	0.23	0.03	806	3,702	99.97	99.77	100	0.03
Kedah	32,082	0	0	0.00	0.00	0.00	0.00	794	32,082	100	100	100	0.00
Pulau Pinang	21,837	0	0	0.00	0.00	0.00	0.00	752	21,837	100	100	100	0.00
Perak	33,671	15	528	1.57	0.88	2.77	1.21	782	33,143	98.43	97.23	99.12	1.21
Selangor	85,927	1	141	0.16	0.02	1.16	3.74	769	85,786	99.84	98.84	99.98	3.74
Negeri Sembilan	17,007	0	0	0.00	0.00	0.00	0.00	796	17,007	100	100	100	0.00
Melaka	13,029	0	0	0.00	0.00	0.00	0.00	796	13,029	100	100	100	0.00
Johor	54,021	10	507	0.94	0.30	2.87	4.46	779	53,513	99.06	97.13	99.70	4.46
Pahang	23,927	12	547	2.29	0.66	7.66	5.89	792	23,380	97.71	92.34	99.34	5.89
Terengganu	19,937	0	0	0.00	0.00	0.00	0.00	820	19,937	100	100	100	0.00
Kelantan	29,080	2	31	0.10	0.03	0.40	0.38	826	29,050	99.90	99.60	99.97	0.38
Sabah	44,353	1	63	0.14	0.02	1.01	1.68	802	44,290	99.86	98.99	99.98	1.68
Sarawak	41,451	1	40	0.10	0.01	0.68	1.06	796	41,411	99.90	99.32	99.99	1.06
FT Labuan	1,271	1	1	0.10	0.01	0.69	0.03	391	1,269	99.90	99.31	99.99	0.03
FT Putrajaya	1,994	1	5	0.23	0.03	1.61	0.12	405	1,990	99.77	98.39	99.97	0.12
Region													
Peninsular	357,552	42	1,759	0.49	0.28	0.86	3.72	9,477	355,793	99.51	99.14	99.72	3.72
Sabah/Labuan	45,623	2	64	0.14	0.02	0.97	1.65	1,193	45,559	99.86	99.03	99.98	1.65
Sarawak	41,451	1	40	0.10	0.01	0.68	1.06	796	41,411	99.90	99.32	99.99	1.06
Location													
Urban	217,059	21	669	0.31	0.17	0.57	1.72	6,279	216,390	99.69	99.43	99.83	1.72
Rural	227,567	24	1,195	0.53	0.25	1.11	4.64	5,187	226,372	99.47	98.89	99.75	4.64
Gender													
Male	226,797	18	731	0.32	0.14	0.72	3.24	5,732	226,066	99.68	99.28	99.86	3.24
Female	217,829	27	1,133	0.52	0.28	0.96	2.93	5,734	216,697	99.48	99.04	99.72	2.93

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.6: Periodontal Status of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth) (cont.)

Socio-demographic Characteristics	Total Estimated Population	Absence of gingival bleeding						Presence of gingival bleeding					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	45	1,864	0.42	0.25	0.71	3.59	11,466	442,763	99.58	99.29	99.75	3.59
Ethnicity													
Malay	277,956	28	1,110	0.40	0.21	0.75	3.03	7,846	276,846	99.60	99.25	99.79	3.03
Chinese	66,035	10	474	0.72	0.23	2.21	4.22	1,594	65,561	99.28	97.79	99.77	4.22
Indian	29,357	4	143	0.49	0.19	1.22	0.83	504	29,214	99.51	98.78	99.81	0.83
Bumiputera Sabah	35,081	2	136	0.39	0.10	1.55	1.82	745	34,945	99.61	98.45	99.90	1.82
Bumiputera Sarawak	24,720	0	0	0.00	0.00	0.00	0.00	508	24,720	100	100	100	0.00
Others	11,477	1	1	0.01	0.00	0.08	0.03	269	11,476	99.99	99.92	100	0.03
Parental Education Level													
Level I	78,115	10	353	0.45	0.18	1.12	2.01	2,073	77,762	99.55	98.88	99.82	2.01
Level II	269,949	24	1,018	0.38	0.20	0.72	2.95	7,159	268,932	99.62	99.28	99.80	2.95
Level III	95,001	11	493	0.52	0.22	1.21	2.46	2,177	94,508	99.48	98.79	99.78	2.46
Type of School													
Government	438,776	45	1,864	0.42	0.25	0.72	3.59	11,302	436,912	99.58	99.28	99.75	3.59
Private	5,851	0	0	0.00	0.00	0.00	0.00	164	5,851	100	100	100	0.00
Monthly Household Income													
≥RM5,000	82,603	7	251	0.30	0.09	1.00	2.47	2,174	82,352	99.70	99.00	99.91	2.47
RM4,000 – RM4,999	33,589	3	113	0.34	0.12	0.95	0.85	895	33,475	99.66	99.05	99.88	0.85
RM3,000 – RM3,999	47,480	6	299	0.63	0.26	1.51	1.60	1,245	47,181	99.37	98.49	99.74	1.60
RM2,000 – RM2,999	64,512	9	349	0.54	0.22	1.34	1.98	1,659	64,163	99.46	98.66	99.78	1.98
RM1,000 – RM1,999	109,921	13	583	0.53	0.21	1.32	3.40	2,935	109,338	99.47	98.68	99.79	3.40
<RM1,000	100,969	7	268	0.27	0.10	0.72	1.82	2,411	100,700	99.73	99.28	99.90	1.82

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.7: Mean Number of Sextants Affected per Child by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean number of sextants affected per child with/without gingival bleeding							
			Absence of gingival bleeding				Presence of gingival bleeding			
			Mean	95% CI		Design Effect	Mean	95% CI		Design Effect
				Lower	Upper			Lower	Upper	
Malaysia	11,511	444,626	0.55	0.48	0.62	12.06	5.45	5.38	5.52	12.06
State										
FT Kuala Lumpur	360	21,337	0.12	0.08	0.16	1.72	5.88	5.84	5.92	1.72
Perlis	807	3,704	0.78	0.53	1.02	1.22	5.22	4.98	5.47	1.22
Kedah	794	32,082	0.13	0.11	0.16	0.99	5.87	5.84	5.89	0.99
Pulau Pinang	752	21,837	0.20	0.16	0.25	0.83	5.80	5.75	5.84	0.83
Perak	797	33,671	1.11	0.87	1.35	6.25	4.89	4.65	5.13	6.25
Selangor	770	85,927	0.53	0.33	0.74	24.24	5.47	5.26	5.67	24.24
Negeri Sembilan	796	17,007	0.19	0.11	0.26	2.23	5.81	5.74	5.89	2.23
Melaka	796	13,029	0.56	0.35	0.77	3.93	5.44	5.23	5.65	3.93
Johor	789	54,021	0.87	0.57	1.18	17.74	5.13	4.82	5.43	17.74
Pahang	804	23,927	1.29	0.79	1.79	15.35	4.71	4.21	5.21	15.35
Terengganu	820	19,937	0.05	0.03	0.08	0.84	5.95	5.92	5.97	0.84
Kelantan	828	29,080	0.38	0.28	0.47	3.43	5.62	5.53	5.72	3.43
Sabah	803	44,353	0.26	0.12	0.40	12.32	5.74	5.60	5.88	12.32
Sarawak	797	41,451	0.82	0.66	0.97	6.33	5.18	5.03	5.34	6.33
FT Labuan	392	1,271	0.79	0.60	0.97	0.22	5.21	5.03	5.40	0.22
FT Putrajaya	406	1,994	0.50	0.35	0.66	0.42	5.50	5.34	5.65	0.42
Region										
Peninsular Malaysia	9,519	357,552	0.56	0.48	0.64	12.86	5.44	5.36	5.52	12.86
Sabah/Labuan	1,195	45,623	0.27	0.14	0.41	11.25	5.73	5.59	5.86	11.25
Sarawak	797	41,451	0.82	0.66	0.97	6.33	5.18	5.03	5.34	6.33
Location										
Urban	6,300	217,059	0.58	0.48	0.69	13.11	5.42	5.31	5.52	13.11
Rural	5,211	227,567	0.52	0.43	0.61	10.98	5.48	5.39	5.57	10.98
Gender										
Male	5,750	226,797	0.53	0.45	0.60	7.01	5.47	5.40	5.55	7.01
Female	5,761	217,829	0.58	0.50	0.65	6.93	5.42	5.35	5.50	6.93

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.7: Mean Number of Sextants Affected per Child by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth) (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean number of sextants affected per child with/without gingival bleeding							
			Absence of gingival bleeding				Presence of gingival bleeding			
			Mean	95% CI		Design Effect	Mean	95% CI		Design Effect
				Lower	Upper			Lower	Upper	
Malaysia	11,511	444,626	0.55	0.48	0.62	12.06	5.45	5.38	5.52	12.06
Ethnicity										
Malay	7,874	277,956	0.50	0.43	0.58	10.28	5.50	5.42	5.57	10.28
Chinese	1,604	66,035	0.75	0.53	0.96	13.83	5.25	5.04	5.47	13.83
Indian	508	29,357	0.64	0.37	0.90	9.86	5.36	5.10	5.63	9.86
Bumiputera Sabah	747	35,081	0.28	0.14	0.42	8.14	5.72	5.58	5.86	8.14
Bumiputera Sarawak	508	24,720	0.79	0.63	0.94	3.82	5.21	5.06	5.37	3.82
Others	270	11,477	0.76	0.28	1.25	12.80	5.24	4.75	5.72	12.80
Parental Education Level										
Level I	2,083	78,115	0.58	0.47	0.69	5.30	5.42	5.31	5.53	5.30
Level II	7,183	269,949	0.54	0.47	0.60	7.53	5.46	5.40	5.53	7.53
Level III	2,188	95,001	0.58	0.47	0.69	6.68	5.42	5.31	5.53	6.68
Type of School										
Government	11,347	438,776	0.55	0.48	0.62	12.31	5.45	5.38	5.52	12.31
Private	164	5,851	0.57	-0.10	1.23	14.09	5.43	4.77	6.10	14.09
Monthly Household Income										
≥RM5,000	2,181	82,603	0.60	0.48	0.73	7.51	5.40	5.27	5.52	7.51
RM4,000 – RM4,999	898	33,589	0.55	0.44	0.66	2.49	5.45	5.34	5.56	2.49
RM3,000 – RM3,999	1,251	47,480	0.59	0.47	0.71	3.72	5.41	5.29	5.53	3.72
RM2,000 – RM2,999	1,668	64,512	0.59	0.48	0.70	4.13	5.41	5.30	5.52	4.13
RM1,000 – RM1,999	2,948	109,921	0.49	0.41	0.58	4.82	5.51	5.42	5.59	4.82
<RM1,000	2,418	100,969	0.54	0.44	0.63	6.03	5.46	5.37	5.56	6.03

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.8: Need for Oral Hygiene Instruction (OHI) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth)

Socio-demographic Characteristics	Total Estimated Population	Need for OHI						Do not need OHI					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,466	442,763	99.58	99.29	99.75	3.59	45	1,864	0.42	0.25	0.71	3.59
State													
FT Kuala Lumpur	21,337	360	21,337	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Perlis	3,704	806	3,702	99.97	99.77	100	0.03	1	1	0.03	0.00	0.23	0.03
Kedah	32,082	794	32,082	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Pulau Pinang	21,837	752	21,837	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Perak	33,671	782	33,143	98.43	97.23	99.12	1.21	15	528	1.57	0.88	2.77	1.21
Selangor	85,927	769	85,786	99.84	98.84	99.98	3.74	1	141	0.16	0.02	1.16	3.74
Negeri Sembilan	17,007	796	17,007	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Melaka	13,029	796	13,029	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Johor	54,021	779	53,513	99.06	97.13	99.70	4.46	10	507	0.94	0.30	2.87	4.46
Pahang	23,927	792	23,380	97.71	92.34	99.34	5.89	12	547	2.29	0.66	7.66	5.89
Terengganu	19,937	820	19,937	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Kelantan	29,080	826	29,050	99.90	99.60	99.97	0.38	2	31	0.10	0.03	0.40	0.38
Sabah	44,353	802	44,290	99.86	98.99	99.98	1.68	1	63	0.14	0.02	1.01	1.68
Sarawak	41,451	796	41,411	99.90	99.32	99.99	1.06	1	40	0.10	0.01	0.68	1.06
FT Labuan	1,271	391	1,269	99.90	99.31	99.99	0.03	1	1	0.10	0.01	0.69	0.03
FT Putrajaya	1,994	405	1,990	99.77	98.39	99.97	0.12	1	5	0.23	0.03	1.61	0.12
Region													
Peninsular Malaysia	357,552	9,477	355,793	99.51	99.14	99.72	3.72	42	1,759	0.49	0.28	0.86	3.72
Sabah/Labuan	45,623	1,193	45,559	99.86	99.03	99.98	1.65	2	64	0.14	0.02	0.97	1.65
Sarawak	41,451	796	41,411	99.90	99.32	99.99	1.06	1	40	0.10	0.01	0.68	1.06
Location													
Urban	217,059	6,279	216,390	99.69	99.43	99.83	1.72	21	669	0.31	0.17	0.57	1.72
Rural	227,567	5,187	226,372	99.47	98.89	99.75	4.64	24	1,195	0.53	0.25	1.11	4.64
Gender													
Male	226,797	5,732	226,066	99.68	99.28	99.86	3.24	18	731	0.32	0.14	0.72	3.24
Female	217,829	5,734	216,697	99.48	99.04	99.72	2.93	27	1,133	0.52	0.28	0.96	2.93

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 4.8: Need for Oral Hygiene Instruction (OHI) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (Based on Scoring of Index Teeth) (cont.)

Socio-demographic Characteristics	Total Estimated Population	Need for OHI						Do not need OHI					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,466	442,763	99.58	99.29	99.75	3.59	45	1,864	0.42	0.25	0.71	3.59
Ethnicity													
Malay	277,956	7,846	276,846	99.60	99.25	99.79	3.03	28	1,110	0.40	0.21	0.75	3.03
Chinese	66,035	1,594	65,561	99.28	97.79	99.77	4.22	10	474	0.72	0.23	2.21	4.22
Indian	29,357	504	29,214	99.51	98.78	99.81	0.83	4	143	0.49	0.19	1.22	0.83
Bumiputera Sabah	35,081	745	34,945	99.61	98.45	99.90	1.82	2	136	0.39	0.10	1.55	1.82
Bumiputera Sarawak	24,720	508	24,720	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Others	11,477	269	11,476	99.99	99.92	100	0.03	1	1	0.01	0.00	0.08	0.03
Parental Education Level													
Level I	78,115	2,073	77,762	99.55	98.88	99.82	2.01	10	353	0.45	0.18	1.12	2.01
Level II	269,949	7,159	268,932	99.62	99.28	99.80	2.95	24	1,018	0.38	0.20	0.72	2.95
Level III	95,001	2,177	94,508	99.48	98.79	99.78	2.46	11	493	0.52	0.22	1.21	2.46
Type of School													
Government	438,776	11,302	436,912	99.58	99.28	99.75	3.59	45	1,864	0.42	0.25	0.72	3.59
Private	5,851	164	5,851	100	100	100	0.00	0	0	0.00	0.00	0.00	0.00
Monthly Household Income													
≥RM5,000	82,603	2,174	82,352	99.70	99.00	99.91	2.47	7	251	0.30	0.09	1.00	2.47
RM4,000 – RM4,999	33,589	895	33,475	99.66	99.05	99.88	0.85	3	113	0.34	0.12	0.95	0.85
RM3,000 – RM3,999	47,480	1,245	47,181	99.37	98.49	99.74	1.60	6	299	0.63	0.26	1.51	1.60
RM2,000 – RM2,999	64,512	1,659	64,163	99.46	98.66	99.78	1.98	9	349	0.54	0.22	1.34	1.98
RM1,000 – RM1,999	109,921	2,935	109,338	99.47	98.68	99.79	3.40	13	583	0.53	0.21	1.32	3.40
<RM1,000	100,969	2,411	100,700	99.73	99.28	99.90	1.82	7	268	0.27	0.10	0.72	1.82

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

5.0 CARIES STATUS

Table 5.1: Caries Status of 12- year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Caries Status											
		Caries free (DMFT=0)						Caries prevalence (DMFT≠0)					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	7,610	296,583	66.7	65.29	68.09	2.71	3,901	148,043	33.3	31.91	34.71	2.71
State													
FT Kuala Lumpur	21,337	276	16,539	77.5	71.95	82.25	2.23	84	4,797	22.5	17.75	28.05	2.23
Perlis	3,704	519	2,403	64.9	60.48	69.05	0.21	288	1,300	35.1	30.95	39.52	0.21
Kedah	32,082	572	22,939	71.5	68.11	74.66	1.16	222	9,143	28.5	25.34	31.89	1.16
Pulau Pinang	21,837	527	15,288	70.0	66.78	73.05	0.70	225	6,549	30.0	26.95	33.22	0.70
Perak	33,671	616	25,594	76.0	72.57	79.15	1.38	181	8,077	24.0	20.85	27.43	1.38
Selangor	85,927	595	66,770	77.7	73.20	81.65	6.09	175	19,157	22.3	18.35	26.80	6.09
Negeri Sembilan	17,007	628	13,500	79.4	76.24	82.20	0.63	168	3,507	20.6	17.80	23.76	0.63
Melaka	13,029	580	9,399	72.1	68.62	75.41	0.52	216	3,630	27.9	24.59	31.38	0.52
Johor	54,021	652	44,594	82.6	77.60	86.60	5.20	137	9,426	17.4	13.40	22.40	5.20
Pahang	23,927	477	14,339	59.9	55.39	64.30	1.37	327	9,588	40.1	35.70	44.61	1.37
Terengganu	19,937	452	10,910	54.7	50.08	59.29	1.18	368	9,027	45.3	40.71	49.92	1.18
Kelantan	29,080	418	14,388	49.5	42.78	56.19	3.64	410	14,692	50.5	43.81	57.22	3.64
Sabah	44,353	314	16,297	36.7	31.80	41.98	3.42	489	28,056	63.3	58.02	68.20	3.42
Sarawak	41,451	426	21,276	51.3	46.18	56.45	3.02	371	20,174	48.7	43.55	53.82	3.02
FT Labuan	1,271	240	777	61.1	56.59	65.51	0.07	152	494	38.9	34.49	43.41	0.07
FT Putrajaya	1,994	318	1,569	78.7	74.38	82.46	0.13	88	425	21.3	17.54	25.62	0.13
Region													
Peninsular Malaysia	357,552	6,630	258,233	72.2	70.68	73.71	2.82	2,889	99,319	27.8	26.29	29.32	2.82
Sabah/Labuan	45,623	554	17,074	37.4	32.61	42.50	3.30	641	28,549	62.6	57.50	67.39	3.30
Sarawak	41,451	426	21,276	51.3	46.18	56.45	3.02	371	20,174	48.7	43.55	53.82	3.02
Location													
Urban	217,059	4,337	158,928	73.2	71.10	75.23	3.25	1,963	58,131	26.8	24.77	28.90	3.25
Rural	227,567	3,273	137,655	60.5	58.57	62.38	2.37	1,938	89,912	39.5	37.62	41.43	2.37

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.1: Caries Status of 12- year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Caries Status											
		Caries free (DMFT=0)						Caries prevalence (DMFT≠0)					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	7,610	296,583	66.7	65.29	68.09	2.71	3,901	148,043	33.3	31.91	34.71	2.71
Gender													
Male	226,797	3,911	154,900	68.3	66.59	69.96	2.05	1,839	71,897	31.7	30.04	33.41	2.05
Female	217,829	3,699	141,683	65.0	63.06	66.98	2.53	2,062	76,146	35.0	33.02	36.94	2.53
Ethnicity													
Malay	277,956	5,316	192,538	69.3	67.40	71.08	3.05	2,558	85,418	30.7	28.92	32.60	3.05
Chinese	66,035	1,148	48,433	73.3	68.76	77.48	4.42	456	17,602	26.7	22.52	31.24	4.42
Indian	29,357	417	24,102	82.1	77.83	85.69	2.11	91	5,255	17.9	14.31	22.17	2.11
Bumiputera Sabah	35,081	318	12,822	36.5	31.41	42.01	2.94	429	22,259	63.5	57.99	68.59	2.94
Bumiputera Sarawak	24,720	253	11,267	45.6	38.02	53.35	4.09	255	13,453	54.4	46.65	61.98	4.09
Others	11,477	158	7,422	64.7	55.58	72.80	2.60	112	4,056	35.3	27.20	44.42	2.60
Parental Education Level													
Level I	78,115	1,488	58,028	74.3	71.29	77.07	2.35	595	20,087	25.7	22.93	28.71	2.35
Level II	269,949	4,811	183,406	67.9	66.26	69.58	2.34	2,372	86,543	32.1	30.42	33.74	2.34
Level III	95,001	1,272	53,982	56.8	53.53	60.06	2.84	916	41,019	43.2	39.94	46.47	2.84
Type of School													
Government	438,776	7,500	292,283	66.6	65.18	68.02	2.73	3,847	146,492	33.4	31.98	34.82	2.73
Private	5,851	110	4,300	73.5	63.76	81.38	1.62	54	1,551	26.5	18.62	36.24	1.62
Monthly Household Income													
≥RM5,000	82,603	1,579	63,106	76.4	73.69	78.90	2.14	602	19,497	23.6	21.10	26.31	2.14
RM4,000 – RM4,999	33,589	647	24,638	73.4	69.22	77.11	1.84	251	8,951	26.6	22.89	30.78	1.84
RM3,000 – RM3,999	47,480	867	33,662	70.9	67.32	74.23	1.89	384	13,817	29.1	25.77	32.68	1.89
RM2,000 – RM2,999	64,512	1,152	45,816	71.0	68.08	73.79	1.76	516	18,696	29.0	26.21	31.92	1.76
RM1,000 – RM1,999	109,921	1,910	71,882	65.4	62.93	67.78	1.97	1,038	38,038	34.6	32.22	37.07	1.97
<RM1,000	100,969	1,360	53,934	53.4	50.11	56.70	3.04	1,058	47,034	46.6	43.30	49.89	3.04

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.2: Mean DMFT of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Count	Total Estimated Population	Mean DMFT	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.78	0.74	0.82	0.02	2.08
State							
FT Kuala Lumpur	360	21,337	0.38	0.29	0.48	0.05	1.89
Perlis	807	3,704	0.70	0.60	0.80	0.05	0.18
Kedah	794	32,082	0.56	0.47	0.66	0.05	1.51
Pulau Pinang	752	21,837	0.60	0.53	0.68	0.04	0.53
Perak	797	33,671	0.40	0.34	0.47	0.03	1.26
Selangor	770	85,927	0.36	0.29	0.43	0.03	4.35
Negeri Sembilan	796	17,007	0.34	0.28	0.41	0.03	0.71
Melaka	796	13,029	0.49	0.42	0.56	0.04	0.51
Johor	789	54,021	0.30	0.21	0.40	0.05	4.96
Pahang	804	23,927	0.89	0.77	1.01	0.06	1.18
Terengganu	820	19,937	1.01	0.91	1.10	0.05	0.56
Kelantan	828	29,080	1.44	1.23	1.66	0.11	2.21
Sabah	803	44,353	2.07	1.84	2.31	0.12	2.69
Sarawak	797	41,451	1.35	1.14	1.57	0.11	3.04
FT Labuan	392	1,271	0.89	0.70	1.09	0.10	0.14
FT Putrajaya	406	1,994	0.40	0.32	0.49	0.04	0.12
Region							
Peninsular Malaysia	9,519	357,552	0.56	0.53	0.59	0.02	1.88
Sabah/Labuan	1,195	45,623	2.04	1.81	2.27	0.12	2.64
Sarawak	797	41,451	1.35	1.14	1.57	0.11	3.04
Location							
Urban	6,300	217,059	0.55	0.51	0.59	0.02	1.99
Rural	5,211	227,567	1.01	0.94	1.08	0.03	2.18
Gender							
Male	5,750	226,797	0.71	0.66	0.75	0.02	1.59
Female	5,761	217,829	0.87	0.80	0.93	0.03	2.30
Ethnicity							
Malay	7,874	277,956	0.63	0.59	0.68	0.02	2.34
Chinese	1,604	66,035	0.59	0.46	0.71	0.06	4.02
Indian	508	29,357	0.31	0.23	0.39	0.04	2.32
Bumiputera Sabah	747	35,081	2.15	1.92	2.37	0.11	1.83
Bumiputera Sarawak	508	24,720	1.60	1.29	1.92	0.16	3.19
Others	270	11,477	0.83	0.45	1.22	0.20	5.03

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.2: Mean DMFT of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean DMFT	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.78	0.74	0.82	0.02	2.08
Parental Education Level							
Level I	2,083	78,115	0.51	0.44	0.58	0.04	2.08
Level II	7,183	269,949	0.73	0.68	0.78	0.02	1.86
Level III	2,188	95,001	1.17	1.03	1.31	0.07	3.41
Type of School							
Government	11,347	438,776	0.79	0.75	0.83	0.02	2.10
Private	164	5,851	0.51	0.28	0.74	0.12	2.04
Monthly HH Income							
≥RM5,000	2,181	82,603	0.48	0.41	0.55	0.03	2.17
RM4,000 – RM4,999	898	33,589	0.55	0.44	0.65	0.05	1.60
RM3,000 – RM3,999	1,251	47,480	0.59	0.48	0.70	0.05	2.48
RM2,000 – RM2,999	1,668	64,512	0.56	0.50	0.62	0.03	1.30
RM1,000 – RM1,999	2,948	109,921	0.79	0.72	0.86	0.03	1.61
<RM1,000	2,418	100,969	1.33	1.19	1.47	0.07	3.00

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.3 : Mean D of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-Demographic Characteristic	Count	Total Estimated Population	Mean D	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.27	0.24	0.31	0.02	5.22
State							
FT Kuala Lumpur	360	21,337	0.13	0.08	0.19	0.03	2.23
Perlis	807	3,704	0.15	0.11	0.19	0.02	0.22
Kedah	794	32,082	0.27	0.20	0.34	0.04	1.59
Pulau Pinang	752	21,837	0.22	0.17	0.26	0.02	0.59
Perak	797	33,671	0.16	0.11	0.20	0.02	1.66
Selangor	770	85,927	0.13	0.09	0.17	0.02	5.16
Negeri Sembilan	796	17,007	0.13	0.10	0.16	0.02	0.55
Melaka	796	13,029	0.17	0.12	0.22	0.03	0.90
Johor	789	54,021	0.16	0.10	0.22	0.03	4.54
Pahang	804	23,927	0.30	0.19	0.40	0.05	2.80
Terengganu	820	19,937	0.25	0.19	0.30	0.03	1.06
Kelantan	828	29,080	0.43	0.31	0.55	0.06	2.25
Sabah	803	44,353	0.81	0.53	1.10	0.14	9.08
Sarawak	797	41,451	0.36	0.22	0.51	0.07	6.64
FT Labuan	392	1,271	0.21	0.12	0.31	0.05	0.15
FT Putrajaya	406	1,994	0.14	0.10	0.18	0.02	0.11
Region							
Peninsular Malaysia	9,519	357,552	0.20	0.18	0.22	0.01	2.37
Sabah/Labuan	1,195	45,623	0.80	0.52	1.07	0.14	8.99
Sarawak	797	41,451	0.36	0.22	0.51	0.07	6.64
Location							
Urban	6,300	217,059	0.17	0.15	0.20	0.01	2.40
Rural	5,211	227,567	0.37	0.31	0.44	0.03	6.23
Gender							
Male	5,750	226,797	0.25	0.22	0.29	0.02	2.64
Female	5,761	217,829	0.30	0.25	0.35	0.03	4.60
Ethnicity							
Malay	7,874	277,956	0.22	0.20	0.25	0.01	2.33
Chinese	1,604	66,035	0.18	0.12	0.23	0.03	3.10
Indian	508	29,357	0.11	0.06	0.17	0.03	3.27
Bumiputera Sabah	747	35,081	0.81	0.53	1.09	0.14	6.85
Bumiputera Sarawak	508	24,720	0.50	0.27	0.73	0.12	6.39
Others	270	11,477	0.36	0.06	0.65	0.15	6.23

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.3: Mean D of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean D	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.27	0.24	0.31	0.02	5.22
Parental Education Level							
Level I	2,083	78,115	0.16	0.13	0.18	0.01	1.75
Level II	7,183	269,949	0.25	0.22	0.28	0.01	2.50
Level III	2,188	95,001	0.44	0.32	0.56	0.06	6.69
Type of School							
Government	11,347	438,776	0.28	0.24	0.31	0.02	5.25
Private	164	5,851	0.22	0.09	0.34	0.06	1.80
Monthly Household Income							
≥RM5,000	2,181	82,603	0.14	0.11	0.16	0.01	1.26
RM4,000 – RM4,999	898	33,589	0.20	0.14	0.26	0.03	1.48
RM3,000 – RM3,999	1,251	47,480	0.19	0.13	0.24	0.03	2.45
RM2,000 – RM2,999	1,668	64,512	0.22	0.18	0.26	0.02	1.60
RM1,000 – RM1,999	2,948	109,921	0.27	0.23	0.31	0.02	2.14
<RM1,000	2,418	100,969	0.50	0.38	0.62	0.06	6.63

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.4: Mean M of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Count	Total Estimated Population	Mean M	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.02	0.01	0.02	0.00	3.48
State							
FT Kuala Lumpur	360	21,337	0.00	0.00	0.01	0.00	1.28
Perlis	807	3,704	0.00	0.00	0.00	0.00	0.03
Kedah	794	32,082	0.01	0.00	0.02	0.00	1.65
Pulau Pinang	752	21,837	0.02	0.01	0.04	0.01	1.04
Perak	797	33,671	0.00	0.00	0.01	0.00	1.00
Selangor	770	85,927	0.00	0.00	0.01	0.00	2.59
Negeri Sembilan	796	17,007	0.01	0.00	0.01	0.00	0.50
Melaka	796	13,029	0.00	0.00	0.01	0.00	0.52
Johor	789	54,021	0.01	0.00	0.01	0.00	1.98
Pahang	804	23,927	0.01	0.00	0.02	0.00	0.95
Terengganu	820	19,937	0.04	0.02	0.05	0.01	0.71
Kelantan	828	29,080	0.02	0.01	0.04	0.01	1.50
Sabah	803	44,353	0.09	0.04	0.14	0.03	5.04
Sarawak	797	41,451	0.01	0.00	0.01	0.00	1.02
FT Labuan	392	1,271	0.01	0.00	0.03	0.01	0.12
FT Putrajaya	406	1,994	0.00	0.00	0.00	0.00	0.00
Region							
Peninsular Malaysia	9,519	357,552	0.01	0.01	0.01	0.00	1.27
Sabah/Labuan	1,195	45,623	0.09	0.04	0.14	0.03	5.02
Sarawak	797	41,451	0.01	0.00	0.01	0.00	1.02
Location							
Urban	6,300	217,059	0.01	0.01	0.01	0.00	2.16
Rural	5,211	227,567	0.03	0.01	0.04	0.01	3.87
Gender							
Male	5,750	226,797	0.02	0.01	0.02	0.00	2.51
Female	5,761	217,829	0.02	0.01	0.02	0.00	1.99
Ethnicity							
Malay	7,874	277,956	0.01	0.01	0.01	0.00	1.25
Chinese	1,604	66,035	0.01	0.00	0.01	0.00	1.39
Indian	508	29,357	0.00	0.00	0.01	0.00	0.81
Bumiputera Sabah	747	35,081	0.10	0.04	0.17	0.03	4.96
Bumiputera Sarawak	508	24,720	0.02	0.00	0.03	0.01	1.38
Others	270	11,477	0.03	0.00	0.06	0.01	1.90

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.4: Mean M of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Count	Total Estimated Population	Mean M	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.02	0.01	0.02	0.00	3.48
Parental Education Level							
Level I	2,083	78,115	0.01	0.00	0.01	0.00	1.68
Level II	7,183	269,949	0.02	0.01	0.02	0.00	1.98
Level III	2,188	95,001	0.03	0.02	0.05	0.01	3.33
Type of School							
Government	11,347	438,776	0.02	0.01	0.02	0.00	3.48
Private	164	5,851	0.00	0.00	0.00	0.00	0.00
Monthly Household Income							
≥RM5,000	2,181	82,603	0.00	0.00	0.01	0.00	1.59
RM4,000 – RM4,999	898	33,589	0.00	0.00	0.01	0.00	0.67
RM3,000 – RM3,999	1,251	47,480	0.01	0.00	0.02	0.00	1.80
RM2,000 – RM2,999	1,668	64,512	0.01	0.00	0.02	0.01	1.98
RM1,000 – RM1,999	2,948	109,921	0.02	0.01	0.02	0.00	1.27
<RM1,000	2,418	100,969	0.04	0.02	0.06	0.01	2.99

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.5: Mean F of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristic	Count	Total Estimated Population	Mean F	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.49	0.46	0.52	0.02	2.73
State							
FT Kuala Lumpur	360	21,337	0.25	0.17	0.32	0.04	2.01
Perlis	807	3,704	0.55	0.45	0.64	0.05	0.22
Kedah	794	32,082	0.28	0.21	0.35	0.04	2.31
Pulau Pinang	752	21,837	0.36	0.30	0.43	0.03	0.82
Perak	797	33,671	0.24	0.18	0.30	0.03	2.10
Selangor	770	85,927	0.23	0.17	0.28	0.03	4.93
Negeri Sembilan	796	17,007	0.20	0.16	0.25	0.02	0.86
Melaka	796	13,029	0.32	0.26	0.38	0.03	0.64
Johor	789	54,021	0.14	0.09	0.19	0.03	3.69
Pahang	804	23,927	0.59	0.48	0.69	0.05	1.68
Terengganu	820	19,937	0.72	0.62	0.83	0.05	1.02
Kelantan	828	29,080	0.99	0.82	1.16	0.09	2.62
Sabah	803	44,353	1.17	1.00	1.34	0.09	3.34
Sarawak	797	41,451	0.98	0.78	1.18	0.10	4.14
FT Labuan	392	1,271	0.67	0.52	0.81	0.07	0.13
FT Putrajaya	406	1,994	0.26	0.20	0.32	0.03	0.12
Region							
Peninsular Malaysia	9,519	357,552	0.35	0.32	0.37	0.01	2.19
Sabah/Labuan	1,195	45,623	1.16	0.99	1.32	0.09	3.29
Sarawak	797	41,451	0.98	0.78	1.18	0.10	4.14
Location							
Urban	6,300	217,059	0.36	0.33	0.40	0.02	2.13
Rural	5,211	227,567	0.61	0.56	0.67	0.03	3.10
Gender							
Male	5,750	226,797	0.44	0.40	0.47	0.02	2.08
Female	5,761	217,829	0.55	0.50	0.60	0.02	2.44
Ethnicity							
Malay	7,874	277,956	0.40	0.36	0.43	0.02	2.69
Chinese	1,604	66,035	0.40	0.31	0.49	0.05	3.58
Indian	508	29,357	0.19	0.13	0.26	0.03	2.63
Bumiputera Sabah	747	35,081	1.23	1.07	1.40	0.08	2.24
Bumiputera Sarawak	508	24,720	1.08	0.80	1.37	0.15	4.91
Others	270	11,477	0.45	0.26	0.64	0.10	2.71

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.5: Mean F of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristic	Count	Total Estimated Population	Mean F	95% CI		Std. Error	Design Effect
				Lower	Upper		
Malaysia	11,511	444,626	0.49	0.46	0.52	0.02	2.73
Parental Education Level							
Level I	2,083	78,115	0.35	0.30	0.40	0.03	1.99
Level II	7,183	269,949	0.46	0.43	0.50	0.02	2.13
Level III	2,188	95,001	0.69	0.60	0.79	0.05	3.55
Type of School							
Government	11,347	438,776	0.49	0.46	0.53	0.02	2.76
Private	164	5,851	0.29	0.07	0.52	0.11	3.15
Monthly Household Income							
≥RM5,000	2,181	82,603	0.34	0.28	0.40	0.03	2.30
RM4,000 – RM4,999	898	33,589	0.34	0.27	0.42	0.04	1.83
RM3,000 – RM3,999	1,251	47,480	0.39	0.32	0.46	0.04	1.90
RM2,000 – RM2,999	1,668	64,512	0.33	0.29	0.37	0.02	1.07
RM1,000 – RM1,999	2,948	109,921	0.51	0.46	0.56	0.03	1.65
<RM1,000	2,418	100,969	0.79	0.69	0.88	0.05	3.25

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.6: Mean D, M, F Components and mean DMFT of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Mean D	Mean M	Mean F	Mean DMFT
Malaysia	0.27	0.02	0.49	0.78
State				
FT Kuala Lumpur	0.13	0.00	0.25	0.38
Perlis	0.15	0.00	0.55	0.70
Kedah	0.27	0.01	0.28	0.56
Pulau Pinang	0.22	0.02	0.36	0.60
Perak	0.16	0.00	0.24	0.40
Selangor	0.13	0.00	0.23	0.36
Negeri Sembilan	0.13	0.01	0.20	0.34
Melaka	0.17	0.00	0.32	0.49
Johor	0.16	0.01	0.14	0.30
Pahang	0.30	0.01	0.59	0.89
Terengganu	0.25	0.04	0.72	1.01
Kelantan	0.43	0.02	0.99	1.44
Sabah	0.81	0.09	1.17	2.07
Sarawak	0.36	0.01	0.98	1.35
FT Labuan	0.21	0.01	0.67	0.89
FT Putrajaya	0.14	0.00	0.26	0.40
Region				
Peninsular Malaysia	0.20	0.01	0.35	0.56
Sabah/Labuan	0.80	0.09	1.16	2.04
Sarawak	0.36	0.01	0.98	1.35
Location				
Urban	0.17	0.01	0.36	0.55
Rural	0.37	0.03	0.61	1.01
Gender				
Male	0.25	0.02	0.44	0.71
Female	0.30	0.02	0.55	0.87
Ethnicity				
Malay	0.22	0.01	0.40	0.63
Chinese	0.18	0.01	0.40	0.59
Indian	0.11	0.00	0.19	0.31
Bumiputera Sabah	0.81	0.10	1.23	2.15
Bumiputera Sarawak	0.50	0.02	1.08	1.60
Others	0.36	0.03	0.45	0.83
Parental Education Level				
Level I	0.16	0.01	0.35	0.51
Level II	0.25	0.02	0.46	0.73
Level III	0.44	0.03	0.69	1.17

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 5.6: Mean D, M, F Components and mean DMFT of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Mean D	Mean M	Mean F	Mean DMFT
Malaysia	0.27	0.02	0.49	0.78
Type of School				
Government	0.28	0.02	0.49	0.79
Private	0.22	0.00	0.29	0.51
Monthly Household Income				
≥RM5,000	0.14	0.00	0.34	0.48
RM4,000 – RM4,999	0.20	0.00	0.34	0.55
RM3,000 – RM3,999	0.19	0.01	0.39	0.59
RM2,000 – RM2,999	0.22	0.01	0.33	0.56
RM1,000 – RM1,999	0.27	0.02	0.51	0.79
<RM1,000	0.50	0.04	0.79	1.33

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

6.0 CARIES TREATMENT NEED

Table 6.1: Overall Caries Treatment Need of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Need caries treatment						Do not need caries treatment					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	3,729	146,397	32.9	30.96	34.96	5.54	7,782	298,230	67.1	65.04	69.04	5.54
State													
FT Kuala Lumpur	21,337	156	9,287	43.5	36.05	51.31	3.53	204	12,050	56.5	48.69	63.95	3.53
Perlis	3,704	140	731	19.7	15.71	24.50	0.31	667	2,973	80.3	75.50	84.29	0.31
Kedah	32,082	227	8,987	28.0	23.61	32.88	2.36	567	23,095	72.0	67.12	76.39	2.36
Pulau Pinang	21,837	172	5,013	23.0	19.56	26.75	1.10	580	16,824	77.0	73.25	80.44	1.10
Perak	33,671	281	13,259	39.4	29.87	49.77	9.84	516	20,412	60.6	50.23	70.13	9.84
Selangor	85,927	231	23,544	27.4	21.76	33.87	10.96	539	62,383	72.6	66.13	78.24	10.96
Negeri Sembilan	17,007	119	2,451	14.4	12.01	17.20	0.64	677	14,556	85.6	82.80	87.99	0.64
Melaka	13,029	212	3,622	27.8	24.19	31.72	0.63	584	9,408	72.2	68.28	75.81	0.63
Johor	54,021	185	12,751	23.6	18.48	29.63	6.42	604	41,270	76.4	70.37	81.52	6.42
Pahang	23,927	365	11,422	47.7	39.77	55.83	4.32	439	12,505	52.3	44.17	60.23	4.32
Terengganu	19,937	317	7,728	38.8	31.53	46.53	3.29	503	12,209	61.2	53.47	68.47	3.29
Kelantan	29,080	389	14,586	50.2	43.74	56.57	3.33	439	14,495	49.8	43.43	56.26	3.33
Sabah	44,353	287	17,952	40.5	33.72	47.61	6.18	516	26,401	59.5	52.39	66.28	6.18
Sarawak	41,451	233	13,502	32.6	26.91	38.79	4.61	564	27,949	67.4	61.21	73.09	4.61
FT Labuan	1,271	289	944	74.3	67.96	79.76	0.16	103	327	25.7	20.24	32.04	0.16
FT Putrajaya	1,994	126	618	31.0	27.28	34.91	0.09	280	1,377	69.0	65.09	72.72	0.09
Region													
Peninsular Malaysia	357,552	2,920	113,999	31.9	29.70	34.15	5.62	6,599	243,554	68.1	65.85	70.30	5.62
Sabah/Labuan	45,623	576	18,896	41.4	34.82	48.34	5.98	619	26,727	58.6	51.66	65.18	5.98
Sarawak	41,451	233	13,502	32.6	26.91	38.79	4.61	564	27,949	67.4	61.21	73.09	4.61
Location													
Urban	217,059	1,909	59,141	27.2	24.48	30.20	6.17	4,391	157,918	72.8	69.80	75.52	6.17
Rural	227,567	1,820	87,255	38.3	35.59	41.17	5.17	3,391	140,312	61.7	58.83	64.41	5.17

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.1: Overall Caries Treatment Need of 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Need caries treatment						Do not need caries treatment					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	3,729	146,397	32.9	30.96	34.96	5.54	7,782	298,230	67.1	65.04	69.04	5.54
Gender													
Male	226,797	1,808	72,266	31.9	29.46	34.37	4.33	3,942	154,531	68.1	65.63	70.54	4.33
Female	217,829	1,921	74,131	34.0	31.76	36.38	3.55	3,840	143,699	66.0	63.62	68.24	3.55
Ethnicity													
Malay	277,956	2,540	92,686	33.3	30.92	35.87	5.28	5,334	185,270	66.7	64.13	69.08	5.28
Chinese	66,035	459	19,347	29.3	24.23	34.94	6.33	1,145	46,688	70.7	65.06	75.77	6.33
Indian	29,357	96	5,993	20.4	16.19	25.40	2.63	412	23,364	79.6	74.60	83.81	2.63
Bumiputera Sabah	35,081	335	14,606	41.6	34.49	49.15	5.40	412	20,475	58.4	50.85	65.51	5.40
Bumiputera Sarawak	24,720	186	8,774	35.5	28.39	43.30	4.18	322	15,947	64.5	56.70	71.61	4.18
Others	11,477	113	4,991	43.5	36.55	50.68	1.62	157	6,487	56.5	49.32	63.45	1.62
Parental Education Level													
Level I	78,115	602	21,762	27.9	24.51	31.48	3.25	1,481	56,353	72.1	68.52	75.49	3.25
Level II	269,949	2,309	88,155	32.7	30.58	34.80	3.75	4,874	181,794	67.3	65.20	69.42	3.75
Level III	95,001	800	36,179	38.1	34.71	41.58	3.27	1,388	58,821	61.9	58.42	65.29	3.27
Type of School													
Government	438,776	3,677	143,987	32.8	30.86	34.84	5.43	7,670	294,789	67.2	65.16	69.14	5.43
Private	5,851	52	2,410	41.2	19.82	66.48	10.56	112	3,441	58.8	33.52	80.18	10.56
Monthly Household Income													
≥RM5,000	82,603	600	21,718	26.3	23.33	29.48	2.77	1,581	60,885	73.7	70.52	76.67	2.77
RM4,000 – RM4,999	33,589	263	9,449	28.1	24.34	32.27	1.80	635	24,140	71.9	67.73	75.66	1.80
RM3,000 – RM3,999	47,480	386	13,801	29.1	25.28	33.17	2.48	865	33,679	70.9	66.83	74.72	2.48
RM2,000 – RM2,999	64,512	551	21,750	33.7	30.66	36.91	1.94	1,117	42,762	66.3	63.09	69.34	1.94
RM1,000 – RM1,999	109,921	979	37,272	33.9	31.06	36.88	2.86	1,969	72,649	66.1	63.12	68.94	2.86
<RM1,000	100,969	904	40,563	40.2	36.44	44.03	4.17	1,514	60,405	59.8	55.97	63.56	4.17

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.2: Overall Caries Treatment Need of 12-year-old Schoolchildren by Type of Treatment, 2017

Treatment Need	Count	Estimated Population	%*	95% CI	
				Lower	Upper
Overall Preventive Need	2,689	101,923	22.9	21.14	24.81
• Caries-arresting Care	1,030	33,726	7.6	6.68	8.60
• Fissure Sealant	1,967	77,173	17.4	15.73	19.11
Overall Restorative Need	1,569	65,779	14.8	13.63	16.04
• 1-surface Restoration	1,149	48,624	10.9	9.85	12.12
• ≥ 2-surface Restoration (simple)	108	3,935	0.9	0.67	1.17
• ≥ 2-surface Restoration (compound)	525	22,975	5.2	4.42	6.03
Extraction	194	8,086	1.8	1.31	2.52
Other Complex Care	94	4,227	1.0	0.73	1.24
• Complex Treatment (e.g. veneers, crown)	6	467	0.1	0.04	0.26
• Pulp Care	88	3,761	0.8	0.64	1.12

*One child may require more than one type of treatment

Table 6.3: Need for Preventive Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	2,689	101,923	22.9	21.14	24.81	5.81
State							
FT Kuala Lumpur	21,337	150	8,966	42.0	34.49	49.95	3.65
Perlis	3,704	83	422	11.4	7.81	16.36	0.45
Kedah	32,082	133	5,271	16.4	13.11	20.39	2.12
Pulau Pinang	21,837	98	2,917	13.4	10.01	17.61	1.86
Perak	33,671	241	11,574	34.4	24.52	45.79	11.92
Selangor	85,927	180	17,849	20.8	15.62	27.08	11.78
Negeri Sembilan	17,007	45	941	5.5	4.04	7.53	0.67
Melaka	13,029	150	2,545	19.5	15.71	24.03	0.98
Johor	54,021	140	9,565	17.7	13.67	22.62	5.08
Pahang	23,927	291	9,373	39.2	30.76	48.29	5.41
Terengganu	19,937	238	5,829	29.2	22.19	37.44	3.90
Kelantan	29,080	318	11,824	40.7	34.53	47.09	3.30
Sabah	44,353	96	5,536	12.5	9.01	17.04	4.43
Sarawak	41,451	132	7,843	18.9	14.26	24.66	5.00
FT Labuan	1,271	286	935	73.6	67.48	78.92	0.15
FT Putrajaya	1,994	108	531	26.6	22.52	31.21	0.13
Region							
Peninsular Malaysia	357,552	2,175	87,609	24.5	22.42	26.71	6.09
Sabah/Labuan	45,623	382	6,471	14.2	10.73	18.52	3.87
Sarawak	41,451	132	7,843	18.9	14.26	24.66	5.00
Location							
Urban	217,059	1,474	44,140	20.3	17.78	23.16	6.66
Rural	227,567	1,215	57,782	25.4	22.98	27.97	5.15
Gender							
Male	226,797	1,308	50,584	22.3	20.07	24.71	4.84
Female	217,829	1,381	51,339	23.6	21.55	25.71	3.59
Ethnicity							
Malay	277,956	1,879	69,055	24.8	22.56	27.27	5.68
Chinese	66,035	343	14,824	22.4	17.68	28.06	7.03
Indian	29,357	67	4,522	15.4	11.27	20.70	3.41
Bumiputera Sabah	35,081	192	4,724	13.5	9.86	18.12	3.49
Bumiputera Sarawak	24,720	122	5,095	20.6	14.76	28.02	4.56
Others	11,477	86	3,703	32.3	25.77	39.52	1.72

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.3: Need for Preventive Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	2,689	101,923	22.9	21.14	24.81	5.81
Parental Education Level							
Level I	78,115	454	15,914	20.4	17.33	23.80	3.45
Level II	269,949	1,684	62,253	23.1	21.16	25.07	3.99
Level III	95,001	537	23,562	24.8	21.94	27.91	3.12
Type of School							
Government	438,776	2,658	100,236	22.8	21.08	24.71	5.62
Private	5,851	31	1,686	28.8	8.30	64.43	18.51
Monthly Household Income							
≥RM5,000	82,603	462	16,360	19.8	16.91	23.05	3.37
RM4,000 – RM4,999	33,589	200	6,861	20.4	17.22	24.05	1.66
RM3,000 – RM3,999	47,480	274	9,532	20.1	16.91	23.66	2.31
RM2,000 – RM2,999	64,512	411	16,003	24.8	21.83	28.04	2.30
RM1,000 – RM1,999	109,921	691	25,997	23.7	21.05	26.47	3.07
<RM1,000	100,969	617	25,860	25.6	22.61	28.86	3.56

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.4: Need for Preventive Caries-arresting Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,030	33,726	7.6	6.68	8.60	4.00
State							
FT Kuala Lumpur	21,337	51	3,132	14.7	10.28	20.54	3.04
Perlis	3,704	34	167	4.5	2.44	8.19	0.44
Kedah	32,082	29	1,089	3.4	2.24	5.11	1.32
Pulau Pinang	21,837	17	492	2.3	1.21	4.16	1.33
Perak	33,671	10	598	1.8	0.59	5.18	4.94
Selangor	85,927	56	5,103	5.9	4.15	8.44	4.72
Negeri Sembilan	17,007	14	298	1.8	1.17	2.62	0.34
Melaka	13,029	45	731	5.6	3.78	8.27	0.82
Johor	54,021	44	2,870	5.3	3.39	8.24	4.12
Pahang	23,927	99	3,142	13.1	8.88	19.00	3.62
Terengganu	19,937	124	3,038	15.2	9.35	23.86	5.46
Kelantan	29,080	181	6,769	23.3	16.51	31.76	6.53
Sabah	44,353	37	1,788	4.0	2.78	5.81	1.75
Sarawak	41,451	64	3,671	8.9	5.81	13.26	4.73
FT Labuan	1,271	172	573	45.1	37.80	52.70	0.20
FT Putrajaya	1,994	53	264	13.2	11.08	15.69	0.06
Region							
Peninsular Malaysia	357,552	757	27,694	7.7	6.72	8.92	4.14
Sabah/Labuan	45,623	209	2,361	5.2	3.89	6.85	1.37
Sarawak	41,451	64	3,671	8.9	5.81	13.26	4.73
Location							
Urban	217,059	611	13,710	6.3	5.30	7.52	3.09
Rural	227,567	419	20,016	8.8	7.37	10.47	4.65
Gender							
Male	226,797	507	16,530	7.3	6.25	8.49	2.89
Female	217,829	523	17,195	7.9	6.77	9.19	2.99
Ethnicity							
Malay	277,956	732	24,536	8.8	7.56	10.28	4.38
Chinese	66,035	95	3,944	6.0	4.21	8.40	3.44
Indian	29,357	14	933	3.2	1.10	8.83	7.27
Bumiputera Sabah	35,081	91	1,294	3.7	2.66	5.10	0.98
Bumiputera Sarawak	24,720	57	1,967	8.0	4.81	12.88	3.59
Others	11,477	41	1,052	9.2	5.36	15.25	2.19

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.4: Need for Preventive Caries-arresting Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,030	33,726	7.6	6.68	8.60	4.00
Parental Education Level							
Level I	78,115	176	4,661	6.0	4.90	7.26	1.32
Level II	269,949	642	21,355	7.9	6.82	9.16	3.48
Level III	95,001	206	7,655	8.1	6.52	9.91	2.50
Type of School							
Government	438,776	1,021	33,563	7.6	6.73	8.68	4.03
Private	5,851	9	163	2.8	0.73	9.99	2.00
Monthly Household Income							
≥RM5,000	82,603	180	5,180	6.3	5.13	7.64	1.50
RM4,000 – RM4,999	33,589	82	2,559	7.6	5.43	10.59	2.13
RM3,000 – RM3,999	47,480	100	2,983	6.3	4.69	8.37	1.84
RM2,000 – RM2,999	64,512	144	4,875	7.6	5.97	9.53	1.99
RM1,000 – RM1,999	109,921	248	7,550	6.9	5.49	8.56	2.76
<RM1,000	100,969	267	10,312	10.2	8.47	12.27	2.72

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.5: Need for Fissure Sealant(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,967	77,173	17.4	15.73	19.11	6.06
State							
FT Kuala Lumpur	21,337	123	7,308	34.2	26.76	42.61	4.15
Perlis	3,704	53	274	7.4	4.49	11.96	0.49
Kedah	32,082	108	4,340	13.5	10.32	17.54	2.43
Pulau Pinang	21,837	83	2,485	11.4	8.12	15.72	2.11
Perak	33,671	236	11,404	33.9	24.05	45.31	11.98
Selangor	85,927	139	14,118	16.4	11.72	22.56	12.53
Negeri Sembilan	17,007	31	642	3.8	2.47	5.72	0.81
Melaka	13,029	111	1,886	14.5	9.77	20.93	2.22
Johor	54,021	108	7,455	13.8	10.59	17.79	4.00
Pahang	23,927	230	7,595	31.7	23.95	40.71	5.41
Terengganu	19,937	136	3,302	16.6	12.97	20.90	1.55
Kelantan	29,080	186	7,088	24.4	19.83	29.58	2.58
Sabah	44,353	62	3,884	8.8	6.00	12.61	4.05
Sarawak	41,451	70	4,337	10.5	6.66	16.06	6.48
FT Labuan	1,271	225	734	57.8	50.58	64.66	0.18
FT Putrajaya	1,994	66	321	16.1	11.57	21.99	0.27
Region							
Peninsular Malaysia	357,552	1,610	68,219	19.1	17.17	21.15	6.29
Sabah/Labuan	45,623	287	4,618	10.1	7.36	13.76	3.47
Sarawak	41,451	70	4,337	10.5	6.66	16.06	6.48
Location							
Urban	217,059	1,060	33,940	15.6	13.33	18.26	6.84
Rural	227,567	907	43,233	19.0	16.79	21.42	5.45
Gender							
Male	226,797	950	38,108	16.8	14.79	19.03	5.01
Female	217,829	1,017	39,065	17.9	16.09	19.94	3.77
Ethnicity							
Malay	277,956	1,353	52,027	18.7	16.69	20.93	5.63
Chinese	66,035	264	11,569	17.5	13.12	23.00	7.63
Indian	29,357	56	3,749	12.8	9.68	16.66	2.18
Bumiputera Sabah	35,081	148	3,657	10.4	7.43	14.43	3.10
Bumiputera Sarawak	24,720	81	3,221	13.0	8.49	19.47	4.41
Others	11,477	65	2,950	25.7	17.66	35.82	3.44

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.5: Need for Fissure Sealant(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,967	77,173	17.4	15.73	19.11	6.06
Parental Education Level							
Level I	78,115	322	12,194	15.6	12.79	18.92	3.81
Level II	269,949	1,232	46,860	17.4	15.67	19.18	3.98
Level III	95,001	401	17,930	18.9	16.20	21.87	3.41
Type of School							
Government	438,776	1,943	75,619	17.2	15.64	18.96	5.83
Private	5,851	24	1,554	26.6	6.84	64.06	19.95
Monthly Household Income							
≥RM5,000	82,603	330	12,273	14.9	12.31	17.82	3.40
RM4,000 – RM4,999	33,589	141	5,151	15.3	12.46	18.74	1.74
RM3,000 – RM3,999	47,480	193	7,185	15.1	12.37	18.39	2.29
RM2,000 – RM2,999	64,512	313	12,492	19.4	16.78	22.24	2.12
RM1,000 – RM1,999	109,921	533	20,766	18.9	16.40	21.67	3.42
<RM1,000	100,969	426	18,051	17.9	15.31	20.77	3.52

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.6: Need for Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,569	65,779	14.8	13.63	16.04	3.54
State							
FT Kuala Lumpur	21,337	37	2,037	9.5	6.20	14.42	2.77
Perlis	3,704	67	343	9.3	6.58	12.90	0.30
Kedah	32,082	116	4,605	14.4	11.48	17.80	1.78
Pulau Pinang	21,837	101	2,912	13.3	11.26	15.73	0.65
Perak	33,671	87	3,568	10.6	8.03	13.86	2.05
Selangor	85,927	78	8,611	10.0	7.77	12.84	4.17
Negeri Sembilan	17,007	76	1,577	9.3	7.42	11.53	0.58
Melaka	13,029	87	1,521	11.7	9.05	14.94	0.75
Johor	54,021	82	5,665	10.5	7.34	14.77	5.34
Pahang	23,927	137	4,008	16.8	12.67	21.82	2.45
Terengganu	19,937	121	2,953	14.8	11.69	18.59	1.28
Kelantan	29,080	153	5,751	19.8	16.03	24.15	2.08
Sabah	44,353	219	14,346	32.3	25.87	39.57	6.61
Sarawak	41,451	122	7,529	18.2	13.50	23.99	5.24
FT Labuan	1,271	47	163	12.8	8.32	19.30	0.23
FT Putrajaya	1,994	39	189	9.5	7.26	12.27	0.10
Region							
Peninsular Malaysia	357,552	1,181	43,741	12.2	11.19	13.36	2.68
Sabah/Labuan	45,623	266	14,509	31.8	25.51	38.83	6.48
Sarawak	41,451	122	7,529	18.2	13.50	23.99	5.24
Location							
Urban	217,059	727	24,246	11.2	9.85	12.64	2.93
Rural	227,567	842	41,534	18.3	16.38	20.28	3.98
Gender							
Male	226,797	729	31,499	13.9	12.53	15.37	2.61
Female	217,829	840	34,280	15.7	14.24	17.36	2.75
Ethnicity							
Malay	277,956	1,028	37,601	13.5	12.30	14.86	2.68
Chinese	66,035	177	6,985	10.6	8.31	13.37	3.05
Indian	29,357	45	2,522	8.6	6.13	11.92	2.11
Bumiputera Sabah	35,081	183	11,271	32.1	24.87	40.37	6.73
Bumiputera Sarawak	24,720	93	5,727	23.2	16.25	31.91	5.89
Others	11,477	43	1,673	14.6	8.91	22.95	3.05

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.6: Need for Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,569	65,779	14.8	13.63	16.04	3.54
Parental Education Level							
Level I	78,115	215	7,810	10.0	8.35	11.92	1.89
Level II	269,949	961	39,203	14.5	13.22	15.93	2.74
Level III	95,001	386	18,614	19.6	16.97	22.51	3.16
Type of School							
Government	438,776	1,543	65,036	14.8	13.64	16.09	3.57
Private	5,851	26	743	12.7	7.78	20.06	1.32
Monthly Household Income							
≥RM5,000	82,603	209	7,659	9.3	7.99	10.73	1.26
RM4,000 – RM4,999	33,589	95	3,861	11.5	8.75	14.96	2.16
RM3,000 – RM3,999	47,480	158	5,710	12.0	9.79	14.68	1.83
RM2,000 – RM2,999	64,512	220	9,059	14.0	11.87	16.54	1.99
RM1,000 – RM1,999	109,921	437	17,021	15.5	13.59	17.59	2.31
<RM1,000	100,969	431	21,721	21.5	18.62	24.72	3.83

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.7: Need for 1-surface Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,149	48,624	10.9	9.85	12.12	4.02
State							
FT Kuala Lumpur	21,337	31	1,719	8.1	5.30	12.07	2.19
Perlis	3,704	42	228	6.2	3.76	9.93	0.40
Kedah	32,082	78	3,079	9.6	7.19	12.69	1.89
Pulau Pinang	21,837	86	2,489	11.4	9.56	13.54	0.59
Perak	33,671	78	3,245	9.6	7.24	12.72	1.96
Selangor	85,927	57	6,119	7.1	5.49	9.19	3.00
Negeri Sembilan	17,007	54	1,140	6.7	5.13	8.72	0.59
Melaka	13,029	69	1,179	9.1	6.85	11.86	0.67
Johor	54,021	58	3,888	7.2	4.70	10.87	5.09
Pahang	23,927	84	2,545	10.6	7.67	14.57	2.02
Terengganu	19,937	87	2,107	10.6	8.14	13.60	1.07
Kelantan	29,080	106	4,026	13.8	10.70	17.73	2.06
Sabah	44,353	163	10,841	24.4	17.74	32.68	9.26
Sarawak	41,451	89	5,756	13.9	9.40	20.05	6.64
FT Labuan	1,271	46	159	12.5	8.27	18.47	0.20
FT Putrajaya	1,994	21	103	5.1	3.18	8.22	0.17
Region							
Peninsular Malaysia	357,552	851	31,867	8.9	8.08	9.82	2.28
Sabah/Labuan	45,623	209	11,000	24.1	17.59	32.11	9.09
Sarawak	41,451	89	5,756	13.9	9.40	20.05	6.64
Location							
Urban	217,059	544	18,026	8.3	7.28	9.45	2.29
Rural	227,567	605	30,598	13.4	11.60	15.53	5.16
Gender							
Male	226,797	553	24,265	10.7	9.43	12.12	2.94
Female	217,829	596	24,359	11.2	9.90	12.61	2.78
Ethnicity							
Malay	277,956	732	27,284	9.8	8.79	10.94	2.48
Chinese	66,035	143	5,483	8.3	6.58	10.43	2.18
Indian	29,357	36	1,926	6.6	4.42	9.63	2.15
Bumiputera Sabah	35,081	140	8,508	24.3	16.42	34.28	10.55
Bumiputera Sarawak	24,720	71	4,520	18.3	11.70	27.43	6.97
Others	11,477	27	903	7.9	4.19	14.30	2.56

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.7: Need for 1-surface Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	1,149	48,624	10.9	9.85	12.12	4.02
Parental Education Level							
Level I	78,115	152	5,654	7.2	5.87	8.89	1.79
Level II	269,949	705	29,356	10.9	9.68	12.20	3.02
Level III	95,001	286	13,502	14.2	11.73	17.12	3.87
Type of School							
Government	438,776	1,128	48,007	10.9	9.85	12.14	4.06
Private	5,851	21	617	10.5	5.89	18.14	1.51
Monthly Household Income							
≥RM5,000	82,603	144	5,265	6.4	5.20	7.79	1.58
RM4,000 – RM4,999	33,589	72	2,883	8.6	6.37	11.48	1.89
RM3,000 – RM3,999	47,480	120	4,401	9.3	7.36	11.61	1.74
RM2,000 – RM2,999	64,512	161	6,707	10.4	8.69	12.39	1.62
RM1,000 – RM1,999	109,921	334	12,861	11.7	9.98	13.67	2.47
<RM1,000	100,969	308	16,240	16.1	13.18	19.48	5.09

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.8: Need for Simple Restoration(s) on More Than One Surface among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	108	3,935	0.9	0.67	1.17	2.15
State							
FT Kuala Lumpur	21,337	2	115	0.5	0.14	2.04	1.42
Perlis	3,704	0	0	0.0	0.00	0.00	0.00
Kedah	32,082	5	226	0.7	0.30	1.65	1.13
Pulau Pinang	21,837	2	57	0.3	0.07	0.98	0.70
Perak	33,671	7	257	0.8	0.39	1.47	0.77
Selangor	85,927	2	162	0.2	0.05	0.72	1.99
Negeri Sembilan	17,007	2	26	0.2	0.04	0.59	0.32
Melaka	13,029	4	72	0.6	0.15	1.97	0.81
Johor	54,021	1	40	0.1	0.01	0.52	1.06
Pahang	23,927	41	1,106	4.6	2.46	8.53	3.10
Terengganu	19,937	5	92	0.5	0.13	1.57	0.97
Kelantan	29,080	14	645	2.2	1.21	4.02	1.63
Sabah	44,353	11	613	1.4	0.70	2.70	1.93
Sarawak	41,451	7	501	1.2	0.44	3.26	3.49
FT Labuan	1,271	2	8	0.6	0.17	2.39	0.10
FT Putrajaya	1,994	3	15	0.7	0.26	2.00	0.10
Region							
Peninsular Malaysia	357,552	88	2,813	0.8	0.57	1.08	1.97
Sabah/Labuan	45,623	13	621	1.4	0.70	2.63	1.90
Sarawak	41,451	7	501	1.2	0.44	3.26	3.49
Location							
Urban	217,059	48	1,097	0.5	0.33	0.77	1.37
Rural	227,567	60	2,838	1.2	0.88	1.77	2.46
Gender							
Male	226,797	45	1,666	0.7	0.50	1.07	1.65
Female	217,829	63	2,270	1.0	0.71	1.52	2.25
Ethnicity							
Malay	277,956	71	2,289	0.8	0.60	1.13	1.59
Chinese	66,035	15	494	0.7	0.37	1.51	1.69
Indian	29,357	1	18	0.1	0.01	0.44	0.48
Bumiputera Sabah	35,081	5	297	0.8	0.36	1.98	1.51
Bumiputera Sarawak	24,720	6	500	2.0	0.77	5.19	3.20
Others	11,477	10	338	2.9	0.71	11.40	4.70

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.8: Need for Simple Restoration(s) on More Than One Surface among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	108	3,935	0.9	0.67	1.17	2.15
Parental Education Level							
Level I	78,115	17	478	0.6	0.34	1.09	1.11
Level II	269,949	54	1,770	0.7	0.46	0.93	1.53
Level III	95,001	35	1,606	1.7	1.02	2.79	2.84
Type of School							
Government	438,776	105	3,838	0.9	0.66	1.17	2.20
Private	5,851	3	98	1.7	0.83	3.33	0.33
Monthly Household Income							
≥RM5,000	82,603	17	492	0.6	0.31	1.14	1.44
RM4,000 – RM4,999	33,589	6	172	0.5	0.21	1.24	0.93
RM3,000 – RM3,999	47,480	11	320	0.7	0.32	1.41	1.21
RM2,000 – RM2,999	64,512	15	510	0.8	0.43	1.47	1.36
RM1,000 – RM1,999	109,921	21	815	0.7	0.44	1.26	1.60
<RM1,000	100,969	36	1,545	1.5	0.97	2.42	2.27

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.9: Need for ≥2-surface Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	525	22,975	5.2	4.42	6.03	3.97
State							
FT Kuala Lumpur	21,337	7	378	1.8	0.90	3.48	1.22
Perlis	3,704	35	170	4.6	3.17	6.59	0.16
Kedah	32,082	50	2,005	6.2	4.72	8.23	1.14
Pulau Pinang	21,837	24	694	3.2	2.15	4.67	0.74
Perak	33,671	12	439	1.3	0.61	2.76	1.74
Selangor	85,927	23	2,719	3.2	1.94	5.11	4.53
Negeri Sembilan	17,007	25	499	2.9	1.81	4.73	0.82
Melaka	13,029	20	390	3.0	1.40	6.27	1.56
Johor	54,021	27	1,992	3.7	2.47	5.47	2.26
Pahang	23,927	37	1,121	4.7	2.44	8.81	3.35
Terengganu	19,937	42	1,049	5.3	3.59	7.65	1.09
Kelantan	29,080	59	2,118	7.3	5.16	10.18	1.81
Sabah	44,353	92	6,508	14.7	9.65	21.68	8.64
Sarawak	41,451	52	2,798	6.8	4.38	10.27	3.77
FT Labuan	1,271	0	0	0.0	0.00	0.00	0.00
FT Putrajaya	1,994	20	96	4.8	3.35	6.88	0.09
Region							
Peninsular Malaysia	357,552	381	13,669	3.8	3.28	4.45	2.24
Sabah/Labuan	45,623	92	6,508	14.3	9.39	21.08	8.59
Sarawak	41,451	52	2,798	6.8	4.38	10.27	3.77
Location							
Urban	217,059	214	7,351	3.4	2.73	4.20	2.42
Rural	227,567	311	15,624	6.9	5.59	8.40	4.77
Gender							
Male	226,797	233	10,245	4.5	3.73	5.46	2.69
Female	217,829	292	12,730	5.8	4.85	7.03	3.21
Ethnicity							
Malay	277,956	355	12,468	4.5	3.86	5.21	2.03
Chinese	66,035	41	1,873	2.8	1.72	4.63	3.24
Indian	29,357	11	755	2.6	1.15	5.64	3.37
Bumiputera Sabah	35,081	74	5,528	15.8	10.49	22.99	7.00
Bumiputera Sarawak	24,720	32	1,653	6.7	3.76	11.62	3.91
Others	11,477	12	698	6.1	2.28	15.22	4.68

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.9: Need for ≥2-surface Restoration(s) among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	525	22,975	5.2	4.42	6.03	3.97
Parental Education Level							
Level I	78,115	68	2,298	2.9	2.13	4.04	1.67
Level II	269,949	318	13,403	5.0	4.23	5.82	2.47
Level III	95,001	138	7,233	7.6	5.71	10.08	4.34
Type of School							
Government	438,776	519	22,830	5.2	4.45	6.07	3.99
Private	5,851	6	145	2.5	0.97	6.20	0.89
Monthly Household Income							
≥RM5,000	82,603	71	2,594	3.1	2.26	4.34	1.96
RM4,000 – RM4,999	33,589	31	1,280	3.8	2.39	6.03	1.96
RM3,000 – RM3,999	47,480	42	1,562	3.3	2.26	4.77	1.56
RM2,000 – RM2,999	64,512	68	2,745	4.3	3.15	5.72	1.76
RM1,000 – RM1,999	109,921	128	5,528	5.0	3.79	6.64	3.13
<RM1,000	100,969	176	8,786	8.7	6.75	11.15	4.17

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.10: Need for Extraction among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	194	8,086	1.8	1.31	2.52	6.12
State							
FT Kuala Lumpur	21,337	4	231	1.1	0.35	3.28	2.01
Perlis	3,704	4	22	0.6	0.16	2.11	0.25
Kedah	32,082	23	955	3.0	2.05	4.31	0.93
Pulau Pinang	21,837	9	260	1.2	0.62	2.25	0.74
Perak	33,671	3	103	0.3	0.10	0.92	0.87
Selangor	85,927	11	1,112	1.3	0.72	2.33	2.69
Negeri Sembilan	17,007	7	129	0.8	0.35	1.66	0.55
Melaka	13,029	3	66	0.5	0.18	1.44	0.50
Johor	54,021	5	320	0.6	0.25	1.40	1.64
Pahang	23,927	10	266	1.1	0.62	1.97	0.61
Terengganu	19,937	22	469	2.4	1.48	3.72	0.71
Kelantan	29,080	22	789	2.7	1.47	4.97	2.09
Sabah	44,353	55	2,829	6.4	2.64	14.62	15.45
Sarawak	41,451	9	506	1.2	0.63	2.35	1.53
FT Labuan	1,271	6	23	1.8	0.64	5.23	0.18
FT Putrajaya	1,994	1	5	0.3	0.04	1.84	0.14
Region							
Peninsular Malaysia	357,552	124	4,727	1.3	1.06	1.64	1.56
Sabah/Labuan	45,623	61	2,853	6.3	2.61	14.24	15.30
Sarawak	41,451	9	506	1.2	0.63	2.35	1.53
Location							
Urban	217,059	82	2,662	1.2	0.90	1.67	1.79
Rural	227,567	112	5,424	2.4	1.49	3.79	8.29
Gender							
Male	226,797	91	3,876	1.7	1.18	2.46	3.66
Female	217,829	103	4,210	1.9	1.35	2.77	3.85
Ethnicity							
Malay	277,956	113	4,309	1.6	1.23	1.95	1.61
Chinese	66,035	12	558	0.8	0.44	1.60	1.60
Indian	29,357	2	147	0.5	0.08	2.91	3.20
Bumiputera Sabah	35,081	44	2,135	6.1	2.48	14.19	12.08
Bumiputera Sarawak	24,720	9	414	1.7	0.83	3.35	1.42
Others	11,477	14	522	4.5	1.52	12.82	4.35

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.10: Need for Extraction among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	194	8,086	1.8	1.31	2.52	6.12
Parental Education Level							
Level I	78,115	23	849	1.1	0.69	1.71	1.21
Level II	269,949	97	3,770	1.4	1.07	1.82	1.82
Level III	95,001	74	3,467	3.6	2.04	6.44	8.18
Type of School							
Government	438,776	188	7,905	1.8	1.29	2.52	6.23
Private	5,851	6	182	3.1	0.86	10.57	2.06
Monthly Household Income							
≥RM5,000	82,603	20	768	0.9	0.57	1.51	1.25
RM4,000 – RM4,999	33,589	8	211	0.6	0.28	1.41	0.96
RM3,000 – RM3,999	47,480	10	310	0.7	0.31	1.37	1.18
RM2,000 – RM2,999	64,512	15	791	1.2	0.66	2.26	2.08
RM1,000 – RM1,999	109,921	55	2,161	2.0	1.40	2.75	1.73
<RM1,000	100,969	83	3,722	3.7	2.13	6.32	7.91

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.11: Need for Complex Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	94	4,227	1.0	0.73	1.24	2.03
State							
FT Kuala Lumpur	21,337	1	52	0.2	0.03	1.73	1.39
Perlis	3,704	10	58	1.6	0.80	3.03	0.18
Kedah	32,082	7	215	0.7	0.34	1.33	0.69
Pulau Pinang	21,837	6	178	0.8	0.32	2.06	1.07
Perak	33,671	3	188	0.6	0.15	2.00	2.14
Selangor	85,927	5	559	0.7	0.28	1.51	2.75
Negeri Sembilan	17,007	6	123	0.7	0.26	1.96	0.85
Melaka	13,029	2	48	0.4	0.10	1.39	0.59
Johor	54,021	9	545	1.0	0.52	1.95	1.65
Pahang	23,927	4	135	0.6	0.12	2.55	2.15
Terengganu	19,937	5	114	0.6	0.24	1.34	0.58
Kelantan	29,080	6	205	0.7	0.30	1.65	1.03
Sabah	44,353	19	1,162	2.6	1.55	4.38	2.20
Sarawak	41,451	9	636	1.5	0.65	3.60	3.29
FT Labuan	1,271	0	0	0.0	0.00	0.00	0.00
FT Putrajaya	1,994	2	10	0.5	0.13	1.83	0.12
Region							
Peninsular Malaysia	357,552	66	2,430	0.7	0.50	0.93	1.63
Sabah/Labuan	45,623	19	1,162	2.5	1.51	4.26	2.20
Sarawak	41,451	9	636	1.5	0.65	3.60	3.29
Location							
Urban	217,059	39	1,411	0.6	0.44	0.97	1.56
Rural	227,567	55	2,817	1.2	0.88	1.74	2.26
Gender							
Male	226,797	50	2,195	1.0	0.69	1.36	1.78
Female	217,829	44	2,033	0.9	0.62	1.40	2.36
Ethnicity							
Malay	277,956	54	1,927	0.7	0.49	0.99	1.68
Chinese	66,035	13	678	1.0	0.53	1.97	2.01
Indian	29,357	2	56	0.2	0.04	0.82	0.82
Bumiputera Sabah	35,081	16	946	2.7	1.52	4.73	2.15
Bumiputera Sarawak	24,720	5	443	1.8	0.63	5.02	3.39
Others	11,477	4	177	1.5	0.40	5.72	2.19

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.11: Need for Complex Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	94	4,227	1.0	0.73	1.24	2.03
Parental Education Level							
Level I	78,115	5	200	0.3	0.08	0.80	1.79
Level II	269,949	57	2,539	0.9	0.67	1.32	2.05
Level III	95,001	31	1,436	1.5	1.04	2.19	1.38
Type of School							
Government	438,776	94	4,227	1.0	0.74	1.25	2.03
Private	5,851	0	0	0.0	0.00	0.00	0.00
Monthly Household Income							
≥RM5,000	82,603	4	56	0.1	0.02	0.22	0.55
RM4,000 – RM4,999	33,589	4	156	0.5	0.15	1.45	1.41
RM3,000 – RM3,999	47,480	9	575	1.2	0.59	2.48	2.07
RM2,000 – RM2,999	64,512	15	703	1.1	0.58	2.05	1.96
RM1,000 – RM1,999	109,921	28	1,026	0.9	0.57	1.52	1.68
<RM1,000	100,969	31	1,586	1.6	1.03	2.40	1.99

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.12: Need for Pulp Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	88	3,761	0.8	0.64	1.12	2.02
State							
FT Kuala Lumpur	21,337	1	52	0.2	0.03	1.73	1.39
Perlis	3,704	10	58	1.6	0.80	3.03	0.18
Kedah	32,082	6	187	0.6	0.26	1.28	0.80
Pulau Pinang	21,837	6	178	0.8	0.32	2.06	1.07
Perak	33,671	3	188	0.6	0.15	2.00	2.14
Selangor	85,927	2	235	0.3	0.07	1.11	3.21
Negeri Sembilan	17,007	6	123	0.7	0.26	1.96	0.85
Melaka	13,029	2	48	0.4	0.10	1.39	0.59
Johor	54,021	8	446	0.8	0.40	1.69	1.60
Pahang	23,927	4	135	0.6	0.12	2.55	2.15
Terengganu	19,937	5	114	0.6	0.24	1.34	0.58
Kelantan	29,080	5	190	0.7	0.26	1.62	1.09
Sabah	44,353	19	1,162	2.6	1.55	4.38	2.20
Sarawak	41,451	9	636	1.5	0.65	3.60	3.29
FT Labuan	1,271	0	0	0.0	0.00	0.00	0.00
FT Putrajaya	1,994	2	10	0.5	0.13	1.83	0.12
Region							
Peninsular Malaysia	357,552	60	1,963	0.5	0.39	0.77	1.53
Sabah/Labuan	45,623	19	1,162	2.5	1.51	4.26	2.20
Sarawak	41,451	9	636	1.5	0.65	3.60	3.29
Location							
Urban	217,059	35	1,133	0.5	0.34	0.80	1.40
Rural	227,567	53	2,628	1.2	0.81	1.64	2.29
Gender							
Male	226,797	49	2,103	0.9	0.65	1.31	1.76
Female	217,829	39	1,658	0.8	0.48	1.20	2.36
Ethnicity							
Malay	277,956	49	1,557	0.6	0.38	0.82	1.58
Chinese	66,035	12	581	0.9	0.43	1.80	2.07
Indian	29,357	2	56	0.2	0.04	0.82	0.82
Bumiputera Sabah	35,081	16	946	2.7	1.52	4.73	2.15
Bumiputera Sarawak	24,720	5	443	1.8	0.63	5.02	3.39
Others	11,477	4	177	1.5	0.40	5.72	2.19

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.12: Need for Pulp Care among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	88	3,761	0.8	0.64	1.12	2.02
Parental Education Level							
Level I	78,115	4	101	0.1	0.04	0.42	0.97
Level II	269,949	53	2,186	0.8	0.56	1.17	2.04
Level III	95,001	30	1,421	1.5	1.03	2.17	1.39
Type of School							
Government	438,776	88	3,761	0.9	0.65	1.13	2.02
Private	5,851	0	0	0.0	0.00	0.00	0.00
Monthly Household Income							
≥RM5,000	82,603	4	56	0.1	0.02	0.22	0.55
RM4,000 – RM4,999	33,589	4	156	0.5	0.15	1.45	1.41
RM3,000 – RM3,999	47,480	7	342	0.7	0.32	1.60	1.53
RM2,000 – RM2,999	64,512	13	576	0.9	0.44	1.79	1.94
RM1,000 – RM1,999	109,921	27	934	0.8	0.52	1.39	1.59
<RM1,000	100,969	30	1,571	1.6	1.01	2.38	2.00

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.13: Need for Complex Treatment among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	6	467	0.1	0.04	0.26	2.60
State							
FT Kuala Lumpur	21,337	0	0	0.0	0.00	0.00	0.00
Perlis	3,704	0	0	0.0	0.00	0.00	0.00
Kedah	32,082	1	28	0.1	0.01	0.63	0.75
Pulau Pinang	21,837	0	0	0.0	0.00	0.00	0.00
Perak	33,671	0	0	0.0	0.00	0.00	0.00
Selangor	85,927	3	325	0.4	0.12	1.17	2.87
Negeri Sembilan	17,007	0	0	0.0	0.00	0.00	0.00
Melaka	13,029	0	0	0.0	0.00	0.00	0.00
Johor	54,021	1	99	0.2	0.03	1.29	2.61
Pahang	23,927	0	0	0.0	0.00	0.00	0.00
Terengganu	19,937	0	0	0.0	0.00	0.00	0.00
Kelantan	29,080	1	15	0.1	0.01	0.37	0.40
Sabah	44,353	0	0	0.0	0.00	0.00	0.00
Sarawak	41,451	0	0	0.0	0.00	0.00	0.00
FT Labuan	1,271	0	0	0.0	0.00	0.00	0.00
FT Putrajaya	1,994	0	0	0.0	0.00	0.00	0.00
Region							
Peninsular Malaysia	357,552	6	467	0.1	0.05	0.32	2.60
Sabah/Labuan	45,623	0	0	0.0	0.00	0.00	0.00
Sarawak	41,451	0	0	0.0	0.00	0.00	0.00
Location							
Urban	217,059	4	278	0.1	0.04	0.43	2.79
Rural	227,567	2	189	0.1	0.02	0.32	2.32
Gender							
Male	226,797	1	92	0.0	0.01	0.29	2.45
Female	217,829	5	375	0.2	0.06	0.48	2.73
Ethnicity							
Malay	277,956	5	369	0.1	0.05	0.37	2.67
Chinese	66,035	1	97	0.1	0.02	1.00	2.46
Indian	29,357	0	0	0.0	0.00	0.00	0.00
Bumiputera Sabah	35,081	0	0	0.0	0.00	0.00	0.00
Bumiputera Sarawak	24,720	0	0	0.0	0.00	0.00	0.00
Others	11,477	0	0	0.0	0.00	0.00	0.00

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- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.13: Need for Complex Treatment among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	6	467	0.1	0.04	0.26	2.60
Parental Education Level							
Level I	78,115	1	99	0.1	0.02	0.90	2.62
Level II	269,949	4	353	0.1	0.05	0.37	2.68
Level III	95,001	1	15	0.0	0.00	0.11	0.40
Type of School							
Government	438,776	6	467	0.1	0.04	0.26	2.60
Private	5,851	0	0	0.0	0.00	0.00	0.00
Monthly Household Income							
≥RM5,000	82,603	0	0	0.0	0.00	0.00	0.00
RM4,000 – RM4,999	33,589	0	0	0.0	0.00	0.00	0.00
RM3,000 – RM3,999	47,480	2	233	0.5	0.12	1.94	3.07
RM2,000 – RM2,999	64,512	2	127	0.2	0.04	0.96	2.22
RM1,000 – RM1,999	109,921	1	92	0.1	0.01	0.60	2.45
<RM1,000	100,969	1	15	0.0	0.00	0.11	0.40

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.14: Need for Other Type(s) of Oral Healthcare Not Due to Caries among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	296	11,064	2.5	2.10	2.95	2.26
State							
FT Kuala Lumpur	21,337	7	399	1.9	0.94	3.67	1.29
Perlis	3,704	10	44	1.2	0.48	2.89	0.25
Kedah	32,082	10	457	1.4	0.84	2.40	0.88
Pulau Pinang	21,837	50	1,475	6.8	4.57	9.87	1.61
Perak	33,671	27	961	2.9	1.86	4.36	1.24
Selangor	85,927	22	2,588	3.0	1.91	4.73	3.80
Negeri Sembilan	17,007	8	198	1.2	0.46	2.91	1.17
Melaka	13,029	24	421	3.2	1.74	5.93	1.13
Johor	54,021	20	1,227	2.3	1.12	4.53	4.20
Pahang	23,927	30	1,057	4.4	2.82	6.86	1.51
Terengganu	19,937	27	654	3.3	2.14	5.00	0.84
Kelantan	29,080	14	567	2.0	1.20	3.16	0.94
Sabah	44,353	7	383	0.9	0.34	2.17	2.27
Sarawak	41,451	7	478	1.2	0.45	2.90	2.88
FT Labuan	1,271	8	31	2.4	1.05	5.51	0.15
FT Putrajaya	1,994	25	125	6.2	4.16	9.26	0.15
Region							
Peninsular Malaysia	357,552	274	10,172	2.8	2.38	3.39	2.24
Sabah/Labuan	45,623	15	414	0.9	0.38	2.13	2.11
Sarawak	41,451	7	478	1.2	0.45	2.90	2.88
Location							
Urban	217,059	149	5,397	2.5	1.90	3.24	2.72
Rural	227,567	147	5,667	2.5	2.01	3.08	1.83
Gender							
Male	226,797	190	7,382	3.3	2.64	4.01	2.30
Female	217,829	106	3,682	1.7	1.31	2.18	1.67
Ethnicity							
Malay	277,956	229	7,982	2.9	2.35	3.51	2.28
Chinese	66,035	30	1,230	1.9	1.16	2.97	1.89
Indian	29,357	15	771	2.6	1.43	4.77	1.99
Bumiputera Sabah	35,081	7	350	1.0	0.37	2.68	2.41
Bumiputera Sarawak	24,720	8	337	1.4	0.57	3.21	1.75
Others	11,477	7	395	3.4	1.51	7.63	1.85

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

Table 6.14: Need for Other Type(s) of Oral Healthcare Not Due to Caries among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper	
Malaysia	444,626	296	11,064	2.5	2.10	2.95	2.26
Parental Education Level							
Level I	78,115	58	1,802	2.3	1.61	3.29	1.61
Level II	269,949	186	7,399	2.7	2.25	3.34	2.05
Level III	95,001	52	1,863	2.0	1.35	2.83	1.78
Type of School							
Government	438,776	289	10,857	2.5	2.08	2.94	2.29
Private	5,851	7	207	3.5	1.78	6.93	0.69
Monthly Household Income							
≥RM5,000	82,603	58	1,815	2.2	1.50	3.20	1.83
RM4,000 – RM4,999	33,589	22	871	2.6	1.52	4.39	1.73
RM3,000 – RM3,999	47,480	26	881	1.9	1.13	3.03	1.49
RM2,000 – RM2,999	64,512	46	1,709	2.6	1.87	3.74	1.46
RM1,000 – RM1,999	109,921	87	3,331	3.0	2.30	3.99	1.80
<RM1,000	100,969	57	2,456	2.4	1.71	3.45	2.12

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution

7.0 OVERALL NEED FOR ORAL HEALTHCARE

Table 7.1: Overall Need for Oral Healthcare among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017

Socio-demographic Characteristics	Total Estimated Population	Overall need for oral healthcare						Do not need any oral healthcare					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,499	443,943	99.8	99.66	99.93	2.98	12	683	0.2	0.07	0.34	2.98
State													
FT Kuala Lumpur	21,337	360	21,337	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Perlis	3,704	807	3,704	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Kedah	32,082	794	32,082	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Pulau Pinang	21,837	752	21,837	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Perak	33,671	794	33,562	99.7	99.03	99.89	0.92	3	109	0.3	0.11	0.97	0.92
Selangor	85,927	769	85,786	99.8	98.84	99.98	3.74	1	141	0.2	0.02	1.16	3.74
Negeri Sembilan	17,007	796	17,007	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Melaka	13,029	796	13,029	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Johor	54,021	783	53,736	99.5	97.86	99.87	3.90	6	285	0.5	0.13	2.14	3.90
Pahang	23,927	803	23,841	99.6	97.44	99.95	2.33	1	86	0.4	0.05	2.56	2.33
Terengganu	19,937	820	19,937	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Kelantan	29,080	828	29,080	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Sabah	44,353	802	44,290	99.9	98.99	99.98	1.68	1	63	0.1	0.02	1.01	1.68
Sarawak	41,451	797	41,451	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
FT Labuan	1,271	392	1,271	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
FT Putrajaya	1,994	406	1,994	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Region													
Peninsular Malaysia	357,552	9,508	356,932	99.8	99.59	99.93	3.12	11	620	0.2	0.07	0.41	3.12
Sabah/Labuan	45,623	1,194	45,560	99.9	99.02	99.98	1.68	1	63	0.1	0.02	0.98	1.68
Sarawak	41,451	797	41,451	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Location													
Urban	217,059	6,297	216,843	99.9	99.61	99.97	2.76	3	216	0.1	0.03	0.39	2.76
Rural	227,567	5,202	227,100	99.8	99.45	99.92	3.09	9	467	0.2	0.08	0.55	3.09
Gender													
Male	226,797	5,746	226,587	99.9	99.73	99.97	1.61	4	210	0.1	0.03	0.27	1.61
Female	217,829	5,753	217,356	99.8	99.39	99.92	3.44	8	473	0.2	0.08	0.61	3.44

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution
- Need for orthodontic treatment is not included

Table 7.1: Overall Need for Oral Healthcare among 12-year-old Schoolchildren by Socio-demographic Characteristics, 2017 (cont.)

Socio-demographic Characteristics	Total Estimated Population	Overall need for oral healthcare						Do not need any oral healthcare					
		Count	Estimated Population	%	95% CI		Design Effect	Count	Estimated Population	%	95% CI		Design Effect
					Lower	Upper					Lower	Upper	
Malaysia	444,626	11,499	443,943	99.8	99.66	99.93	2.98	12	683	0.2	0.07	0.34	2.98
Ethnicity													
Malay	277,956	7,865	277,462	99.8	99.52	99.93	3.39	9	494	0.2	0.07	0.48	3.39
Chinese	66,035	1,602	65,909	99.8	99.17	99.96	1.87	2	126	0.2	0.04	0.83	1.87
Indian	29,357	508	29,357	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Bumiputera Sabah	35,081	746	35,017	99.8	98.72	99.97	1.68	1	63	0.2	0.03	1.28	1.68
Bumiputera Sarawak	24,720	508	24,720	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Others	11,477	270	11,477	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Parental Education Level													
Level I	78,115	2,080	77,888	99.7	98.91	99.92	2.75	3	227	0.3	0.08	1.09	2.75
Level II	269,949	7,175	269,557	99.9	99.62	99.94	2.48	8	393	0.1	0.06	0.38	2.48
Level III	95,001	2,187	94,938	99.9	99.52	99.99	1.69	1	63	0.1	0.01	0.48	1.69
Type of School													
Government	438,776	11,335	438,092	99.8	99.65	99.93	2.98	12	683	0.2	0.07	0.35	2.98
Private	5,851	164	5,851	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
Monthly Household Income													
≥RM5,000	82,603	2,179	82,422	99.8	98.92	99.96	3.18	2	181	0.2	0.04	1.08	3.18
RM4,000 – RM4,999	33,589	898	33,589	100	100	100	0.00	0	0	0.0	0.00	0.00	0.00
RM3,000 – RM3,999	47,480	1,249	47,347	99.7	98.81	99.93	1.93	2	133	0.3	0.07	1.19	1.93
RM2,000 – RM2,999	64,512	1,665	64,385	99.8	99.09	99.96	2.06	3	127	0.2	0.04	0.91	2.06
RM1,000 – RM1,999	109,921	2,946	109,839	99.9	99.70	99.98	1.12	2	82	0.1	0.02	0.30	1.12
<RM1,000	100,969	2,415	100,808	99.8	99.51	99.95	1.41	3	161	0.2	0.05	0.49	1.41

- Due to rounding, some totals may not be equal to the sum of separate figures
- Some cells have counts less than 30. Results should be interpreted with caution
- Need for orthodontic treatment is not included

APPENDICES

APPENDIX 1
OPERATIONAL DEFINITION OF VARIABLES

OPERATIONAL DEFINITION OF VARIABLES - DENTURE STATUS

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
B_R_TotalWear	B_R_TotalWear	Final_Weight	Number of denture(s) worn by the subject	COMPUTE B_R_TotalWear = B_DentUpper + B_DentLower. EXECUTE.
B_R_TotalWearGrp	B_R_TotalWearGrp	Final_Weight	Whether the subject wore denture(s)	RECODE B_R_TotalWear (2=1) (1=1) (0=0) INTO B_R_TotalWearGrp. EXECUTE. **Value Labels.** 0 Not wearing denture 1 Wearing denture(s)
B_R_TotalNeed	B_R_TotalNeed	Final_Weight	Number of denture(s) needed by the subject	COMPUTE B_R_TotalNeed = B_DentNeedUp + B_DentNeedLow. EXECUTE.
B_R_TotalNeedGrp	B_R_TotalNeedGrp	Final_Weight	Whether the subject needed denture(s)	RECODE B_R_TotalNeed (1=1) (0=0) (2=1) INTO B_R_TotalNeedGrp. EXECUTE. **Value Labels.** 0 Does not need denture 1 Need denture(s)

B_R_UpperLowerDentNeed	B_R_UpperLowerDentNeed	Final_Weight	Overall denture need	COMPUTE B_R_UpperLowerDentNeed = 0.
				IF (ANY(B_DentNeedUp, 1, 2) AND ANY(B_DentNeedLow, 1, 2)) B_R_UpperLowerDentNeed = 1.
				IF (ANY(B_DentNeedUp, 1, 2) AND ANY(B_DentNeedLow, 0, 3)) B_R_UpperLowerDentNeed = 2.
				IF (ANY(B_DentNeedUp, 0, 3) AND ANY(B_DentNeedLow, 1, 2)) B_R_UpperLowerDentNeed = 3.
				IF (ANY(B_DentNeedUp, 0) AND ANY(B_DentNeedLow, 0)) B_R_UpperLowerDentNeed = 4.
				IF (ANY(B_DentNeedUp, 3) OR ANY(B_DentNeedLow, 3)) B_R_UpperLowerDentNeed = 5.
				EXECUTE.

APPENDIX 1

OPERATIONAL DEFINITION OF VARIABLES - DENTURE STATUS (cont.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable Definition
B_R_UpperLowerDentNeed (cont.)	B_R_UpperLowerDentNeed	Final_Weight	Overall denture need	**Value Labels.** 1 Need both 2 Need upper only 3 Need lower only 4 Does not need denture 5 Need denture repair/replacement
B_R_DentNeedDetail	B_R_DentNeedDetail	Final_Weight	Details on denture need	COMPUTE B_R_DentNeedDetail = 0. DO IF B_R_UpperLowerDentNeed = 1. IF B_DentNeedUp = 1 AND B_DentNeedLow = 1 B_R_DentNeedDetail = 111. IF B_DentNeedUp = 1 AND B_DentNeedLow = 2 B_R_DentNeedDetail = 112. IF B_DentNeedUp = 2 AND B_DentNeedLow = 1 B_R_DentNeedDetail = 121. IF B_DentNeedUp = 2 AND B_DentNeedLow = 2 B_R_DentNeedDetail = 122. ELSE IF B_R_UpperLowerDentNeed = 2. IF B_DentNeedUp = 1 B_R_DentNeedDetail = 21. IF B_DentNeedUp = 2 B_R_DentNeedDetail = 22. ELSE IF B_R_UpperLowerDentNeed = 3. IF B_DentNeedUp = 1 B_R_DentNeedDetail = 31. IF B_DentNeedUp = 2 B_R_DentNeedDetail = 32. END IF. EXECUTE. **Value Labels.** 0 Does not need denture 111 Need both - partial/partial 112 Need both - partial/full 121 Need both - full/partial 122 Need both - full/full 21 Need upper only - partial 22 Need upper only - full 31 Need lower only - partial 32 Need lower only - full

OPERATIONAL DEFINITION OF VARIABLES - INJURIES TO INCISORS

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
C_R_InjuredTeethCount	C_R_InjuredTeethCount	Final_Weight	Number of traumatised anterior teeth	COUNT C_R_InjuredTeethCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (1, 2, 3, 4).
C_R_InjuredTeeth	C_R_InjuredTeeth	Final_Weight	Whether the subject had traumatised anterior teeth	COMPUTE C_R_InjuredTeeth = 0. IF C_R_InjuredTeethCount > 0. C_R_InjuredTeeth = 1. EXECUTE. **Value Labels.** 0 No traumatised anterior tooth 1 Traumatised anterior tooth
C_R_TreatedTeethCount	C_R_TreatedTeethCount	Final_Weight	Number of treated traumatised anterior teeth	COUNT C_R_TreatedTeethCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (1,2).
C_R_TreatedTeeth	C_R_TreatedTeeth	Final_Weight	Whether the subject had treated traumatised anterior teeth	COMPUTE C_R_TreatedTeeth = 0. IF C_R_TreatedTeethCount > 0. C_R_TreatedTeeth = 1. EXECUTE. **Value Labels.** 0 No treated traumatised anterior teeth 1 Has treated traumatised anterior teeth
C_R_UntreatedTeethCount	C_R_UntreatedTeethCount	Final_Weight	Number of untreated traumatised anterior teeth	COUNT C_R_UntreatedTeethCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (3, 4).

APPENDIX 1

OPERATIONAL DEFINITION OF VARIABLES - INJURIES TO INCISORS (cont.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
C_R_UntreatedTeeth	C_R_UntreatedTeeth	Final_Weight	Whether the subject had untreated traumatised anterior teeth	COMPUTE C_R_UntreatedTeeth = 0. IF C_R_UntreatedTeethCount > 0. C_R_UntreatedTeeth = 1. EXECUTE. **Value Labels.** 0 No treated traumatised anterior teeth 1 Has treated traumatised anterior teeth
C_R_TreatedNoProblemCount	C_R_TreatedNoProblemCount	Final_Weight	Number of treated traumatised anterior teeth with no problem	COUNT C_R_TreatedNoProblemCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (1).
C_R_TreatedNoProblem	C_R_TreatedNoProblem	Final_Weight	Whether the subject had treated traumatised anterior teeth with no problem	COMPUTE C_R_TreatedNoProblem = 0. IF C_R_TreatedNoProblemCount > 0. C_R_TreatedNoProblem = 1. EXECUTE. **Value Labels.** 0 No treated traumatised anterior teeth with no problem 1 Has treated traumatised anterior teeth with no problem
C_R_TreatedWithProblemCount	C_R_TreatedWithProblemCount	Final_Weight	Number of treated traumatised anterior teeth with problem	COUNT C_R_TreatedWithProblemCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (2).

OPERATIONAL DEFINITION OF VARIABLES - INJURIES TO INCISORS (cont.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
C_R_TreatedWithProblem	C_R_TreatedWithProblem	Final_Weight	Whether the subject had treated traumatised anterior teeth with problem	COMPUTE C_R_TreatedWithProblem = 0. IF C_R_TreatedWithProblemCount > 0. C_R_TreatedWithProblem = 1. EXECUTE. **Value Labels.** 0 No treated traumatised anterior teeth with problem 1 Has treated traumatised anterior teeth with problem
C_R_UntreatedNoProblemCount	C_R_UntreatedNoProblemCount	Final_Weight	Number of untreated traumatised anterior teeth with no problem	COUNT C_R_UntreatedNoProblemCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (3).
C_R_UntreatedNoProblem	C_R_UntreatedNoProblem	Final_Weight	Whether the subject had untreated traumatised anterior teeth with no problem	COMPUTE C_R_UntreatedNoProblem = 0. IF C_R_UntreatedNoProblemCount > 0. C_R_UntreatedNoProblem = 1. EXECUTE. **Value Labels.** 0 No treated untraumatised anterior teeth with no problem 1 Has untreated traumatised anterior teeth with no problem
C_R_UntreatedWithProblemCount	C_R_UntreatedWithProblemCount	Final_Weight	Number of untreated traumatised anterior teeth with problem	COUNT C_R_UntreatedWithProblemCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (4).
C_R_UntreatedWithProblem	C_R_UntreatedWithProblem	Final_Weight	Whether the subject had untreated traumatised anterior teeth with problem	COMPUTE C_R_UntreatedWithProblem = 0. IF C_R_UntreatedWithProblemCount > 0. C_R_UntreatedWithProblem = 1. EXECUTE. **Value Labels.** 0 No untreated traumatised anterior teeth with problem 1 Has untreated traumatised anterior teeth with problem

APPENDIX 1

OPERATIONAL DEFINITION OF VARIABLES – PERIODONTAL CONDITION

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
D_R_BleedingCount	D_R_BleedingCount	Final_Weight	Number of teeth with gingival bleeding in the subject	COUNT D_R_BleedingCount = D_Perio_11_51 D_Perio_12_52 D_Perio_13_53 D_Perio_14_54 D_Perio_15_55 D_Perio_16 D_Perio_17 D_Perio_21_61 D_Perio_22_62 D_Perio_23_63 D_Perio_24_64 D_Perio_25_65 D_Perio_26 D_Perio_27 D_Perio_31_71 D_Perio_32_72 D_Perio_33_73 D_Perio_34_74 D_Perio_35_75 D_Perio_36 D_Perio_37 D_Perio_41_81 D_Perio_42_82 D_Perio_43_83 D_Perio_44_84 D_Perio_45_85 D_Perio_46 D_Perio_47 (1).
D_R_TotalExamined	D_R_TotalExamined	Final_Weight	Total number of teeth examined	COUNT D_R_TotalExamined = D_Perio_11_51 D_Perio_12_52 D_Perio_13_53 D_Perio_14_54 D_Perio_15_55 D_Perio_16 D_Perio_17 D_Perio_21_61 D_Perio_22_62 D_Perio_23_63 D_Perio_24_64 D_Perio_25_65 D_Perio_26 D_Perio_27 D_Perio_31_71 D_Perio_32_72 D_Perio_33_73 D_Perio_34_74 D_Perio_35_75 D_Perio_36 D_Perio_37 D_Perio_41_81 D_Perio_42_82 D_Perio_43_83 D_Perio_44_84 D_Perio_45_85 D_Perio_46 D_Perio_47 (1, 0).
D_R_Index_BleedingCount	D_R_Index_BleedingCount	Final_Weight	Number of index teeth with gingival bleeding in the subject	COUNT D_R_Index_BleedingCount = D_Perio_16 D_Perio_11_51 D_Perio_26 D_Perio_31_71 D_Perio_36 D_Perio_46 (1).
D_R_Index_HealthyCount	D_R_Index_HealthyCount	Final_Weight	Number of index teeth without gingival bleeding in the subject	COMPUTE D_R_Index_HealthyCount = 6 - D_R_Index_BleedingCount. EXECUTE.
D_R_Index_Bleeding	D_R_Index_Bleeding	Final_Weight	Whether subject had gingival bleeding in any of the index teeth	COMPUTE D_R_Index_Bleeding = 0. IF D_R_Index_BleedingCount > 0. D_R_Index_Bleeding = 1. EXECUTE. **Value Labels.** 0 No gingival bleeding 1 Gingival bleeding present

OPERATIONAL DEFINITION OF VARIABLES - CARIES STATUS FOR PERMANENT TEETH & CARIES FREE STATUS

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_D	E_R_D	Final_Weight	Number of decayed permanent teeth, D (Section E: CS-1, CS-2)	COUNT E_R_D = E_18_CS E_17_CS E_16_CS E_15_CS E_14_CS E_13_CS E_12_CS E_11_CS E_21_CS E_22_CS E_23_CS E_24_CS E_25_CS E_26_CS E_27_CS E_28_CS E_48_CS E_47_CS E_46_CS E_45_CS E_44_CS E_43_CS E_42_CS E_41_CS E_31_CS E_32_CS E_33_CS E_34_CS E_35_CS E_36_CS E_37_CS E_38_CS (1, 2).
E_R_M	E_R_M	Final_Weight	Number of missing permanent teeth due to caries, M (Section E: CS-4)	COUNT E_R_M = E_18_CS E_17_CS E_16_CS E_15_CS E_14_CS E_13_CS E_12_CS E_11_CS E_21_CS E_22_CS E_23_CS E_24_CS E_25_CS E_26_CS E_27_CS E_28_CS E_48_CS E_47_CS E_46_CS E_45_CS E_44_CS E_43_CS E_42_CS E_41_CS E_31_CS E_32_CS E_33_CS E_34_CS E_35_CS E_36_CS E_37_CS E_38_CS (4).
E_R_F	E_R_F	Final_Weight	Number of filled permanent teeth without caries, F (Section E: CS-3)	COUNT E_R_F = E_18_CS E_17_CS E_16_CS E_15_CS E_14_CS E_13_CS E_12_CS E_11_CS E_21_CS E_22_CS E_23_CS E_24_CS E_25_CS E_26_CS E_27_CS E_28_CS E_48_CS E_47_CS E_46_CS E_45_CS E_44_CS E_43_CS E_42_CS E_41_CS E_31_CS E_32_CS E_33_CS E_34_CS E_35_CS E_36_CS E_37_CS E_38_CS (3).
E_R_DMFT	E_R_DMFT	Final_Weight	Total caries experience (DMFT)	COMPUTE E_R_DMFT = E_R_D + E_R_F + E_R_M. EXECUTE.

APPENDIX 1

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_CariesTreatment	E_R_CariesTreatment	Final_Weight	Whether the subject needed any treatment due to caries (Section E: TN-1, TN-2, TN-3, TN-4, TN-5, TN-6, TN-11, TN-12, TN-13)	COUNT E_R_CariesTreatmentCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (1, 2, 3, 4, 5, 6, 11, 12, 13). COMPUTE E_R_CariesTreatment = 0. IF E_R_CariesTreatmentCount > 0. E_R_CariesTreatment = 1. EXECUTE. DELETE VARIABLES E_R_CariesTreatmentCount. **Value Labels.** 0 Does not need treatment for caries 1 Need caries treatment
E_R_PrevCare	E_R_PrevCare	Final_Weight	Whether the subject needed preventive care (caries arresting care, fissure sealant) (Section E: TN-12, TN-13)	COUNT E_R_PrevCareCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (12, 13). COMPUTE E_R_PrevCare = 0. IF E_R_PrevCareCount > 0. E_R_PrevCare = 1. EXECUTE. DELETE VARIABLES E_R_PrevCareCount. **Value Labels.** 0 Does not need preventive care 1 Need preventive care

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_FS	E_R_FS	Final_Weight	Whether the subject needed fissure sealant in 1st and 2nd permanent molar (Section E: TN-13)	COUNT E_R_FSCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (13). COMPUTE E_R_FS = 0. IF E_R_FSCount > 0. E_R_FS = 1. EXECUTE. DELETE VARIABLES E_R_FSCount. **Value Labels.** 0 Does not need fissure sealant (molars) 1 Need fissure sealant (molars)
E_R_CariesArresting	E_R_CariesArresting	Final_Weight	Whether the subject needed preventive, caries-arresting care (Section E: TN-12)	COUNT E_R_CariesArrestingCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (12). COMPUTE E_R_CariesArresting = 0. IF E_R_CariesArrestingCount > 0. E_R_CariesArresting = 1. EXECUTE. DELETE VARIABLES E_R_CariesArrestingCount. **Value Labels.** 0 Does not need caries-arresting care 1 Need caries-arresting care

APPENDIX 1

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_FillingAll	E_R_FillingAll	Final_Weight	Whether the subject needed any type of filling (simple filling, compound filling) (Section E: TN-1, TN-2, TN-11)	COUNT E_R_FillingAllCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (1, 2, 11). COMPUTE E_R_FillingAll = 0. IF E_R_FillingAllCount > 0. E_R_FillingAll = 1. EXECUTE. DELETE VARIABLES E_R_FillingAllCount. **Value Labels.** 0 Does not need any type of filling 1 Need any type of filling
E_R_Filling1Surf	E_R_Filling1Surf	Final_Weight	Whether the subject needed one-surface filling (Section E: TN-1)	COUNT E_R_Filling1SurfCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (1). COMPUTE E_R_Filling1Surf = 0. IF E_R_Filling1SurfCount > 0. E_R_Filling1Surf = 1. EXECUTE. DELETE VARIABLES E_R_Filling1SurfCount. **Value Labels.** 0 Does not need 1-surface filling 1 Need 1-surface filling

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_FillingMulti1Surf	E_R_FillingMulti1Surf	Final_Weight	Whether the subject needed simple fillings on more than one surface (Section E: TN-11)	COUNT E_R_FillingMulti1SurfCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (11). COMPUTE E_R_FillingMulti1Surf = 0. IF E_R_FillingMulti1SurfCount > 0. E_R_FillingMulti1Surf = 1. EXECUTE. DELETE VARIABLES E_R_FillingMulti1SurfCount. **Value Labels.** 0 Does not need multiple 1-surface fillings on one tooth 1 Need multiple 1-surface fillings on at least one tooth
E_R_FillingComp	E_R_FillingComp	Final_Weight	Whether the subject needed compound filling (Section E: TN-2)	COUNT E_R_FillingCompCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (2). COMPUTE E_R_FillingComp = 0. IF E_R_FillingCompCount > 0. E_R_FillingComp = 1. EXECUTE. DELETE VARIABLES E_R_FillingCompCount. **Value Labels.** 0 Does not need compound filling 1 Need compound filling

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OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_Extraction	E_R_Extraction	Final_Weight	Whether the subject needed extraction (Section E: TN-3)	COUNT E_R_ExtractionCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (3). COMPUTE E_R_Extraction = 0. IF E_R_ExtractionCount > 0. E_R_Extraction = 1. EXECUTE. DELETE VARIABLES E_R_ExtractionCount. **Value Labels.** 0 Does not need extraction 1 Need extraction
E_R_ComplexCare	E_R_ComplexCare	Final_Weight	Whether the subject needed complex care (Section E: TN-4, TN-5)	COUNT E_R_ComplexCareCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (4, 5). COMPUTE E_R_ComplexCare = 0. IF E_R_ComplexCareCount > 0. E_R_ComplexCare = 1. EXECUTE. DELETE VARIABLES E_R_ComplexCareCount. **Value Labels.** E_R_ComplexCare 0 Does not need complex care 1 Need complex care

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_PulpCare	E_R_PulpCare	Final_Weight	Whether the subject needed pulp care (Section E: TN-4)	COUNT E_R_PulpCareCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (4). COMPUTE E_R_PulpCare = 0. IF E_R_PulpCareCount > 0. E_R_PulpCare = 1. EXECUTE. DELETE VARIABLES E_R_PulpCareCount. **Value Labels.** 0 Does not need pulp care 1 Need pulp care
E_R_ComplexTx	E_R_ComplexTx	Final_Weight	Whether the subject needed complex treatment (Section E: TN-5)	COUNT E_R_ComplexTxCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (5). COMPUTE E_R_ComplexTx = 0. IF E_R_ComplexTxCount > 0. E_R_ComplexTx = 1. EXECUTE. DELETE VARIABLES E_R_ComplexTxCount. **Value Labels.** 0 Does not need complex treatment 1 Need complex treatment

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OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_TNTraumaAnterior	E_R_TNTraumaAnterior	Final_Weight	Whether the subject needed treatment for traumatised anterior teeth (Section C: 2, 4)	COUNT E_R_TNTraumaAnteriorCount = C_Injuries_11 C_Injuries_12 C_Injuries_21 C_Injuries_22 C_Injuries_31 C_Injuries_32 C_Injuries_41 C_Injuries_42 (2, 4). COMPUTE E_R_TNTraumaAnterior = 0. IF E_R_TNTraumaAnteriorCount > 0. E_R_TNTraumaAnterior = 1. EXECUTE. DELETE VARIABLES E_R_TNTraumaAnteriorCount. **Value Labels.** 0 Does not need treatment for traumatised anterior tooth 1 Need treatment for traumatised anterior tooth
E_R_TNPerio	E_R_TNPerio	Final_Weight	Whether the subject needed Oral Hygiene Instruction (OHI) (Section D: 1)	COMPUTE E_R_TNPerio = 0. IF D_Perio_Overall = 1. E_R_TNPerio = 1. EXECUTE. **Value Labels.** 0 Does not need OHI 1 Need OHI
E_R_TNDenture	E_R_TNDenture	Final_Weight	Whether the subject needed denture(s)	COMPUTE E_R_TNDenture = 0. IF B_R_TotalNeedGrp = 1. E_R_TNDenture = 1. EXECUTE. **Value Labels.** 0 Does not need denture 1 Need denture(s)

OPERATIONAL DEFINITION OF VARIABLES - CARIES TREATMENT NEED FOR PERMANENT TEETH (CONT.)

Variable Name	Variable in SPSS	Weight	Definition	SPSS Variable definition
E_R_TNNotCaries	E_R_TNNotCaries	Final_Weight	Whether the subject needed treatment not due to caries (Section E: TN-7)	COUNT E_R_TNNotCariesCount = E_11_TN E_12_TN E_13_TN E_14_TN E_15_TN E_16_TN E_17_TN E_18_TN E_21_TN E_22_TN E_23_TN E_24_TN E_25_TN E_26_TN E_27_TN E_28_TN E_31_TN E_32_TN E_33_TN E_34_TN E_35_TN E_36_TN E_37_TN E_38_TN E_41_TN E_42_TN E_43_TN E_44_TN E_45_TN E_46_TN E_47_TN E_48_TN (7) COMPUTE E_R_TNNotCaries = 0. IF E_R_TNNotCariesCount > 0. E_R_TNNotCaries = 1. EXECUTE. DELETE VARIABLES E_R_TNNotCariesCount. **Value Labels.** 0 Does not need treatment not due to caries 1 Need treatment not due to caries
E_R_TNOverall	E_R_TNOverall	Final_Weight	Whether the subject needed any type of oral healthcare	COMPUTE E_R_TNOverall = 0. IF ANY(1, E_R_TNTraumaAnterior, E_R_TNPerio, E_R_CariesTreatment, E_R_TNDenture, E_R_TNNotCaries) E_R_TNOverall = 1. EXECUTE. **Value Labels.** 0 Does not need any oral healthcare 1 Need oral healthcare

APPENDIX 2

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