Australian Government
Australian Institute of Health and Welfare

*Authoritative information and statistics to promote better health and wellbeing*

DENTAL STATISTICS AND RESEARCH SERIES
Number 56

# Dental health behaviours among children 2002–2004

## The use of fluoride toothpaste, fluoride tablets and drops, and fluoride mouthrinse

**JM Armfield**
Senior Research Fellow

**AJ Spencer**
Professor of Social and Preventive Dentistry

Australian Research Centre for Population Oral Health
The University of Adelaide

**2012**

Australian Institute of Health and Welfare
Canberra
DEN 215

**The Australian Institute of Health and Welfare is a major national agency which provides reliable, regular and relevant information and statistics on Australia's health and welfare. The Institute's mission is *authoritative information and statistics to promote better health and wellbeing*.**



This publication is part of the Australian Institute of Health and Welfare's Dental statistics and research series. A complete list of the Institute's publications is available from the Institute's website <www.aihw.gov.au>.

ISSN 1321-0254
ISBN 978-1-74249-271-1

**Suggested citation**
Armfield JM and Spencer AJ 2012. Dental health behaviours among children 2002–2004: The use of fluoride toothpaste, fluoride tablets and drops, and fluoride mouthrinse. Dental statistics and research series no. 56. Cat. no. DEN 215.Canberra: Australian Institute of Health and Welfare.



Any enquiries about or comments on this publication should be directed to:
Communications, Media and Marketing Unit
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601
Tel: (02) 6244 1032
Email: info@aihw.gov.au

Published by the Australian Institute of Health and Welfare
Printed by Bluestar Print

**Please note that there is the potential for minor revisions of data in this report. Please check the online version at <www.aihw.gov.au> for any amendments.**

# Contents

# Acknowledgments

**Contributors**

We would like to thank the staff of the school dental services in South Australia, Victoria, Tasmania and Queensland for their time and extensive assistance with this survey. Thanks also to Carmen Koster, Lachlan Spencer and Kiran Singh for their assistance with data preparation, entry and cleaning.

We would also like to thank the dental health authorities in each state for giving support to their school dental service's participation in the project. In particular, we thank:
Dr David Burrow, Director of State-wide Dental Services, South Australia; Dr David Butler, State Manager, Tasmania; Ms Meredith Kefford and Dr John Rogers, Principal and Senior Dental Advisers, Victoria and Dr Martin Dooland, Chief Executive, Dental Health Services Victoria; and Dr Paul Wood, Oral Health Branch, Queensland Health.

**Funding**

A grant from the National Health and Medical Research Council funded this study. The Australian Government Department of Health and Ageing supported the preparation of this report.

# Abbreviations

| | |
|---|---|
| AIHW | Australian Institute of Health and Welfare |
| ARCPOH | Australian Research Centre for Population Oral Health |
| DSRU | Dental Statistics and Research Unit |
| ppm | parts per million |

## Abbreviations of places

| | |
|---|---|
| Qld | Queensland |
| SA | South Australia |
| Tas | Tasmania |
| Vic | Victoria |

# Summary

The majority of Australian children engage in oral health behaviours that are in line with current Australian guidelines on the use of fluoride products.

Brushing with fluoride toothpaste is the most common oral health behaviour of Australian children. Less than 5% of children brushed less than once a day and nearly all children brushed their teeth with fluoride toothpaste.

A number of small but important differences in toothbrushing practices, use of fluoride tablets and drops, and use of fluoride mouthrinse, were seen across family income, parental education and residential remoteness groups.

A study of almost 17,500 children from four Australian states (Queensland, Victoria, South Australia and Tasmania) conducted across 2002–2004 provided comprehensive information on the dental health behaviours of Australian children. These data were collected from children using the school dental service across the years 2002–2004. Children were aged from 5 to 15 and data were weighted to the age, sex and state estimated resident populations. Due to the importance of fluoride to improved oral health, information was collected on the use of fluoride toothpaste, fluoride tablets and drops, and fluoride mouthrinse. The reported behaviours have been compared to the recommendations in *The use of fluorides in Australia: guidelines* (ARCPOH 2006).

This study expanded upon the existing Child Dental Health Survey, a surveillance survey that the Australian Institute of Health and Welfare's Dental Statistics and Research Unit (DSRU) conducted (Armfield, Roberts-Thomson & Spencer 2003).

Over 99% of children brushed their teeth with toothpaste, with more than two-thirds of children brushing their teeth the recommended 2 times per day. Children from higher income families brushed their teeth more often, were more likely to be using children's toothpaste at younger ages, were more likely to use a small toothbrush at a younger age and were less likely to use a large amount of toothpaste when brushing in comparison to children from lower income families. Differences in toothbrushing behaviours were also apparent across parental education, family income and residence remoteness groups.

About 10% of children had ever used fluoride tablets or drops and the majority of children used them for less than 3 years. Children from higher income families were more likely to have used fluoride tablets or drops and, on average, used them for longer compared with children from lower income families. However, children from lower income families who used fluoride tablets or drops consumed them more frequently than did children from higher income families.

As most urban centres in Australia have fluoridated tap water, the use of fluoride tablets and drops was more common in rural than urban areas. A higher proportion of children residing in rural areas chewed and swallowed fluoride tablets than did children from urban areas.

The use of a fluoride mouthrinse was more common among older children. However, a low percentage of children at any age used a fluoride mouthrinse. Less than a quarter of children using a fluoride mouthrinse used it every day. Almost two-thirds of children who used a fluoride mouthrinse did so only a few times a week or infrequently.

# 1 Introduction

## 1.1 Dental decay and its prevalence in children

Dental decay (caries) is the most common type of dental disease in Australia (AIHW 2000). Dental decay occurs when bacteria in dental plaque use sugars in our diet and create acids at the tooth surface that cause the breakdown of the hard materials of the tooth. This is also termed demineralisation because tooth decay is effectively the loss of the mineral structure of the tooth. Tooth decay can cause considerable pain; difficulties with eating, sleeping and concentrating; and various other social, psychological and behavioural issues. The cost of dental disease is high and the prevention and treatment of dental decay in Australia entails considerable spending by both individuals and governments. Between 1991–92 and 2000–02 the cost of dental care to governments increased from $164 to $702 million (Spencer 2004). In 2008–09, total expenditure on dental care was $6.7 billion, of which the government funded 22.8% (AIHW 2010).

Among children, dental decay is one of the most prevalent health conditions in Australia. In younger children in 2003–2004, the prevalence of dental decay at any point in the child's life ranged from 38% of 4 year olds to 58.5% of 9 year olds. Australian children aged 8 had, on average, 2.25 decayed, missing or filled teeth because of dental caries.

The prevalence of having ever had dental decay in permanent teeth was approximately 50% for children aged between 12 and 15 (Armfield & Brennan 2009). The average number of decayed teeth ranged from 0.53 for 12 year olds to 0.85 for 14 year olds.

## 1.2 Prevention and preventive behaviours

Although dental decay is a naturally occurring process, there are several individual behaviours that can either slow down the decay (demineralisation) process or encourage the remineralisation of the tooth surface (WHO 2006). Some of these behaviours involve choices in food and drink consumption. Acid-producing bacteria in the mouth can cause damage to the tooth structure when exposed to fermentable carbohydrates such as sucrose, fructose and glucose. High levels of fermentable carbohydrates are found in some foods and drinks.

Important preventive behaviours relate to exposure to various fluoride products, including toothpaste, mouthrinse and various tablets and drops. Fluoride is known to be effective at reducing dental decay and enhancing remineralisation when teeth are exposed to it (WHO 2006). The application of fluoride to the teeth is therefore one important way to help improve dental health.

## 1.3 Existing research

There is evidence that more than 90% of children in Australia brush their teeth at least once a day (McLellan et al. 1999) and that almost all children who brush their teeth do so with fluoride toothpaste (Slade et al. 1995). Research also shows that most children commence brushing their teeth with low-fluoride children's toothpaste, although there is a substantial minority who commence toothbrushing using standard fluoride toothpaste (Do & Spencer 2007a). Despite the importance of preventive behaviours to oral health and the widespread

availability of fluoride products for sale in Australia, there is surprisingly little broad population research detailing the use of these products.

# 1.4 Study description

## Basic research design

A study was undertaken in order to collect extensive data on exposures to fluoridated water and other fluorides, dental history, dietary pattern, socioeconomic and lifestyle factors, and oral health data. The study expanded upon the existing Child Dental Health Survey, a surveillance survey that the Australian Institute of Health and Welfare's Dental Statistics and Research Unit (DSRU) conducted (Armfield, Roberts-Thomson & Spencer 2003).

The research strategy included the establishment of a cohort of children aged 5–15 in four states—South Australia, Victoria (5–12 year olds due to client targeting), Tasmania and Queensland. Participants were monitored over a 3-year (+/– 12 month) period with collection of subsequent oral health data at each course of care within the school dental services. Only the baseline questionnaire data concerning dental health behaviours are presented here; oral health data and results from longitudinal analyses will be presented in other publications.

## Source of participants

Children were randomly selected from existing patients enrolled in selected strata of dental clinics in the school dental services of South Australia, Victoria, Tasmania and Queensland. Dental health authorities in each state provided support for their school dental service's participation in the project.

During the study enrolment period, clinic staff identified children presenting to school dental clinics for routine dental examinations and treatment whose date of birth matched one of those pre-selected for that area. The children and their parents were invited to participate by completing a registration package that was sent home with the selected child. The package contained:

- an information sheet on the study
- a parental consent form for the child and parent to participate in the study
- a parental questionnaire
- a pre-paid return addressed envelope.

Lists of invited and consenting children and parents were maintained, allowing follow-up of non-respondents by school dental staff.

## Sampling ratios

In each state, school dental service clinics were stratified into those in fluoridated (more than 0.6 parts per million (ppm) fluoride) and those in non-fluoridated (less than 0.3 ppm fluoride) regions. Within these areas children were further stratified into those coming from a metropolitan area (that is a population size more than 100,000 people) and those from a rural area. Sampling ratios to achieve a specific target of children in each fluoridated and non-fluoridated stratum were calculated using the number of children enrolled in the selected cluster of clinics in the school dental service of each state as a denominator. Sampling ratios were determined so that the required number of children from each state would be selected. Random selection was achieved based on date of birth, a process that school dental services around Australia currently employ for selecting children for the Child Dental Health Survey.

## Inclusion/exclusion criteria

The inclusion criteria related to school dental service enrolment age (5–15 in South Australia, Tasmania and Queensland, 5–12 in Victoria) and parental consent. Exclusion from the survey occurred if a child had fixed orthodontic bands because the bands complicate the measurement of the oral health status of teeth and may be associated with different patterns of dental behaviour.

## Data collection procedures

Participating children and parents returned a consent form and completed questionnaire, which contained a unique identification code, to the researchers. Data from the parental questionnaire were coded and entered into a database. Multiple mailouts, including the provision of additional questionnaires and reminder notices, were undertaken to parents who did not return the questionnaire within a specific period.

## Data items

The questionnaire obtained information on several areas (see the Appendix for details of questions). These included:

- residential history
  - location of residencies and periods of residency
  - residential remoteness
- toothpaste use (when the child started brushing, at age 5 and currently)
  - use of toothpaste
  - age of commencement of brushing with toothpaste
  - frequency of toothbrushing
  - type of toothpaste used
  - eating or licking of toothpaste
  - size of toothbrush
  - post-brushing routine
  - amount of toothpaste used when brushing

- fluoride supplement use
  - use of fluoride tablets or drops
  - age started and stopped taking fluoride tablets or drops
  - frequency of use of fluoride tablets or drops (for the periods: birth to 6 months, 6 months to 4 years, and over 4 years)
  - method of taking fluoride tablets or drops (for the periods: birth to 6 months, 6 months to 4 years, and over 4 years)
- fluoride mouthrinse use
  - use of a fluoride mouthrinse
  - age started and stopped using a fluoride mouthrinse
  - frequency of use of mouthrinse (when started using and now or when stopped using)
- socioeconomic status
  - income (derived from both paid employment and government benefits and entitlements)
  - highest educational attainment of any parent.

## Reporting of results

Analyses are reported for three main areas of oral health behaviours: toothbrushing, the use of fluoride tablets and drops, and the use of fluoride mouthrinses.

For toothbrushing, parents provided information relating to the child's behaviours at both the time of the survey and when the child first started brushing. Results are presented for children by each age group from 5 through to age 15. However, because parents also provided information on the age of the child when he or she commenced brushing, results are also reported for the behaviours of children at ages 1–4 when they commenced brushing. Results for each of these ages represent the retrospective reporting of parents of children aged between 5 and 15 at the time of the survey. The number of children in each group aged 1–4 constitutes those who started brushing at each of these ages.

Results for toothbrushing are also broken down further by income, education and residence groups. Income groups used are less than or equal to $40,000 per year, between $40,001 and $80,000 per year and more than $80,000 per year based on family income. The education groups used are based on parental education, where at least one parent has not finished high school, has finished high school or has attended a university to undertake a bachelor or postgraduate degree. Residence groups are based on whether children reside in an urban location or a rural/remote location, as defined by the Rural, Remote and Metropolitan Areas Index (DPIE & DHSH 1994).

Fluoride supplement use includes the consumption of either fluoride tablets or drops, both of which have been recommended as alternatives to fluoride sources in areas where fluoridated water has not been available. Results are presented for each age group for children who had ever used fluoride tablets or drops. In addition, information on whether children were currently using fluoride tablets or drops—either obtained from parents who recorded their child as still taking fluoride supplements; or derived from instances where parents had recorded an age at which their child had commenced taking fluoride tablets or drops but had left blank the age at which fluoride supplement use had ceased. Additional

results are presented that break down fluoride tablet and drop use by family income and residence location.

Results for mouthrinse use follow a similar pattern to that for fluoride tablets and drops. Information is presented for children who had ever used a fluoride mouthrinse, with selected information on children who were currently using a fluoride mouthrinse. Results are also presented for further analysis by family income and residence location groups.

While the Indigenous status of the respondent was collected during the survey, the quality of these data was not sufficient to enable their analysis and reporting in a way which would contribute to our understanding of the dental health of Indigenous Australians.

## Sample size achieved

Overall, questionnaire data were obtained between 2002 and 2004 on 17,446 children with a known state of residence and stratum. Table 1.1 shows that the largest number of children were sampled from South Australia ($n$ = 6,042), followed by Queensland ($n$ = 5,663), Victoria ($n$ = 4,235) and Tasmania ($n$ = 1,506). There was a good representation of children from each of the four strata, although there were reduced numbers of children from some strata within particular states. In Tasmania, children were intentionally not sampled from metropolitan non-fluoridated areas, while in Queensland, only Brisbane and Townsville were sampled as metropolitan non-fluoridated and fluoridated areas respectively. In Queensland, children were intentionally not sampled from non-metropolitan areas, that is populations of less than 100,000 people, in either fluoridated or non-fluoridated areas.

All data were weighted to the 2002 estimated resident population by age, sex, strata and state available from the Australian Bureau of Statistics, so that the samples were representative of the distribution of children from the sampled areas in the four states. Weighting the data increased the number of children from Victoria and decreased the number of children from the other three states (Table 1.1). The weighted data also increased the proportion of children coming from metropolitan fluoridated areas.

**Table 1.1: Unweighted and weighted number of children from participating states by sampling stratum, 2002–2004**

| | Unweighted data | | | | Weighted data | | | |
|---|---|---|---|---|---|---|---|---|
| **Stratum** | **SA** | **Vic** | **Tas** | **Qld** | **SA** | **Vic** | **Tas** | **Qld** |
| Metropolitan fluoridated | 1,479 | 1,408 | 203 | 2,690 | 3,031 | 7,383 | 202 | 338 |
| Metropolitan non-fluoridated | 1,926 | 920 | . . | 2,973 | 78 | 607 | . . | 2,006 |
| Non-metropolitan fluoridated | 1,505 | 569 | 712 | . . | 925 | 357 | 274 | . . |
| Non-metropolitan non-fluoridated | 1,132 | 1,338 | 591 | . . | 295 | 2,175 | 17 | . . |
| **Total** | **6,042** | **4,235** | **1,506** | **5,663** | **4,329** | **10,522** | **493** | **2,344** |

. . = not applicable

*Notes*

1. Sampling from some strata from Tasmania and Queensland was either not feasible or not possible.
2. New South Wales, Western Australia, Australian Capital Territory & Northern Territory not included in sample.

Table 1.2 further breaks down each sample by age of the child. Overall, fewer children from older age groups participated in the study. Few older children from Victoria participated due to the limited age range of children which the school dental service covered in that state.

**Table 1.2: Unweighted and weighted number of children from participating states by age, 2002–2004**

| Age (years) | Unweighted data | | | | | Weighted data | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | SA | Vic | Tas | Qld | *Total* | SA | Vic | Tas | Qld | *Total* |
| 5 | 586 | 349 | 121 | 489 | *1,545* | 337 | 930 | 43 | 214 | *1,524* |
| 6 | 601 | 608 | 142 | 678 | *2,029* | 444 | 1,626 | 50 | 300 | *2,420* |
| 7 | 664 | 629 | 165 | 689 | *2,147* | 499 | 1,491 | 51 | 286 | *2,327* |
| 8 | 624 | 611 | 139 | 657 | *2,031* | 480 | 1,429 | 44 | 270 | *2,223* |
| 9 | 641 | 585 | 172 | 579 | *1,977* | 450 | 1,435 | 52 | 236 | *2,173* |
| 10 | 637 | 580 | 153 | 631 | *2,001* | 453 | 1,436 | 51 | 256 | *2,196* |
| 11 | 557 | 494 | 139 | 579 | *1,769* | 397 | 1,240 | 48 | 228 | *1,913* |
| 12 | 554 | 281 | 138 | 482 | *1,455* | 402 | 692 | 41 | 185 | *1,320* |
| 13 | 483 | 66 | 127 | 389 | *1,065* | 364 | 147 | 43 | 156 | *710* |
| 14 | 393 | 27 | 125 | 297 | *842* | 280 | 84 | 45 | 125 | *534* |
| 15 | 302 | 5 | 85 | 193 | *585* | 222 | 12 | 25 | 88 | *347* |
| **Total** | **6,042** | **4,235** | **1,506** | **5,663** | ***17,446*** | **4,328** | **10,522** | **493** | **2,344** | ***17,687*** |

*Notes*
1. New South Wales, Western Australia, Australian Capital Territory & Northern Territory not included in sample.
2. Column totals may not sum due to rounding.

# 2 Toothbrushing

Brushing teeth with fluoride toothpaste is a widely adopted oral health behaviour in Australia (Slade et al. 2006). Toothbrushes and fluoride toothpaste are readily available throughout the country and a number of dental and other health authorities recommend brushing. A great deal of evidence over a number of decades has found that regularly brushing children's teeth with fluoridated toothpaste reduces the risk of dental decay (Marinho et al. 2003a; Walsh et al. 2010). Toothbrushing not only removes plaque, which consists mostly of bacteria and is a risk factor for oral disease, but can be used to apply fluoride to the teeth via the application of toothpaste.

Just over 99% of children in this study had previously, and/or were currently, brushing their teeth with toothpaste. Most children (57.8%) commenced their toothbrushing between the age of 7 months and 2 years, while an additional 16.6% commenced brushing their teeth between the ages of 2 and 3 (Figure 2.1). However, 10.3% of children commenced toothbrushing in their first 6 months of life and 16.1% after the age of 3.

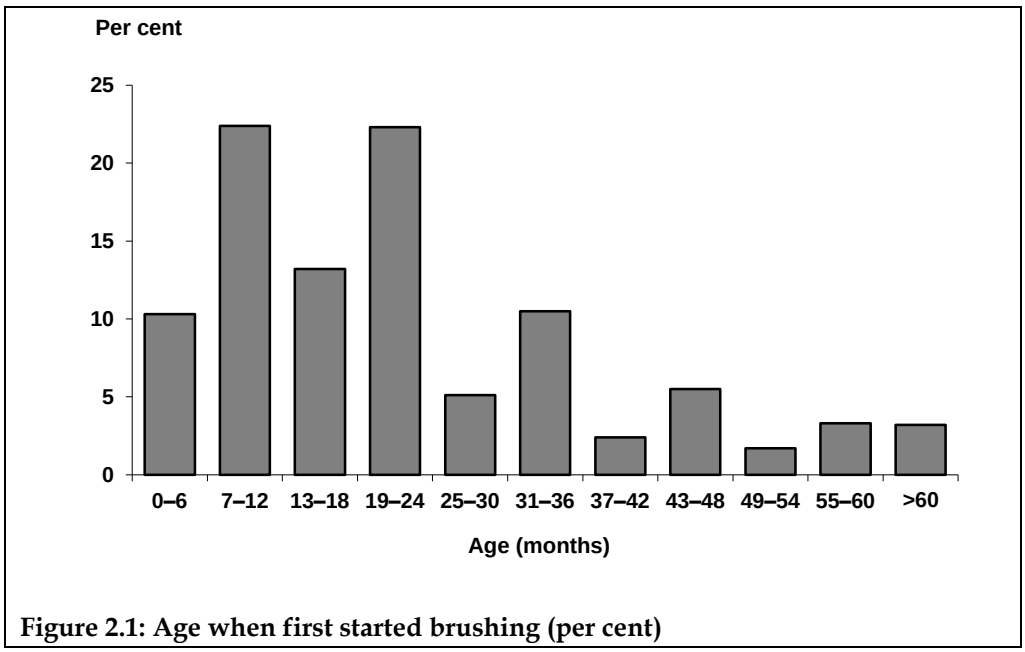



**Figure 2.1: Age when first started brushing (per cent)**

Between 64.8% and 72.5% of children between the ages of 5 and 15 brushed their teeth twice a day on average (Table 2.1). In addition, approximately one-quarter of children brushed their teeth once a day on average. Relatively few children (4.3%) brushed their teeth less than once a day and fewer still (2.2%) 3 or more times a day.

**Table 2.1: Children with different toothbrushing frequency, by age (per cent)**

| Age (years) | < Once a day | Once a day | Twice a day | > Twice a day |
|---|---|---|---|---|
| 5 | 4.7 | 23.1 | 71.0 | 1.2 |
| 6 | 4.0 | 28.9 | 65.3 | 1.7 |
| 7 | 3.6 | 27.2 | 67.9 | 1.3 |
| 8 | 3.8 | 25.9 | 68.2 | 2.1 |
| 9 | 4.4 | 25.9 | 68.2 | 1.4 |
| 10 | 4.1 | 28.7 | 64.9 | 2.3 |
| 11 | 4.4 | 27.7 | 64.8 | 3.0 |
| 12 | 6.1 | 21.1 | 70.6 | 2.2 |
| 13 | 4.1 | 22.5 | 68.9 | 4.5 |
| 14 | 4.4 | 17.0 | 72.5 | 6.0 |
| 15 | 4.8 | 25.4 | 66.5 | 3.3 |
| **All** | **4.3** | **26.1** | **67.5** | **2.2** |

When children commenced brushing their teeth, brushing only once a day was the most common frequency indicated (Table 2.2). Children who started brushing their teeth at a later age were more likely to brush less frequently. Nine per cent of children who commenced brushing their teeth at 1 year of age brushed less than once a day, while 21.4% of children who commenced brushing at age 4 brushed less than once a day on average. The percentage of children brushing their teeth twice a day at the time they commenced brushing was relatively low, varying between only 33.4% and 37.7%.

**Table 2.2: Children with different toothbrushing frequency, at the age when first started brushing (per cent)**

| Age (years) | < Once a day | Once a day | Twice a day | > Twice a day |
|---|---|---|---|---|
| 1 | 9.1 | 51.7 | 37.7 | 1.6 |
| 2 | 13.7 | 46.2 | 38.5 | 1.7 |
| 3 | 19.2 | 43.5 | 35.8 | 1.5 |
| 4 | 21.4 | 43.6 | 33.4 | 1.6 |
| **All** | **13.5** | **47.7** | **37.3** | **1.6** |

*Note:* Age when children started brushing based on recollection of parents.

Current recommendations for toothpaste use in Australia are for children to use low-fluoride toothpaste up to the age of 6, and thereafter standard-strength fluoride toothpaste (ARCPOH 2006). This study found a general trend away from the use of low-fluoride children's toothpaste and towards standard fluoride toothpaste with increasing child age (Table 2.3). Rather than a large shift at the age of 6, the percentage of children using low-fluoride children's toothpaste declined steadily from 66.9% at age 5 to 18.8% at age 9, before continuing a more gradual decline. At age 5, 32.0% of children used standard fluoride toothpaste and this increased to at least 90.2% by age 11. The use of non-fluoridated toothpaste was very low across all ages.

**Table 2.3: Children using different types of toothpaste, by age (per cent)**

| Age (years) | Standard fluoride toothpaste | Children's toothpaste | Non-fluoridated toothpaste | Don't know/not sure |
|---|---|---|---|---|
| 5 | 32.0 | 66.9 | 1.0 | 0.1 |
| 6 | 41.3 | 57.0 | 1.1 | 0.5 |
| 7 | 56.2 | 41.1 | 2.1 | 0.6 |
| 8 | 70.0 | 27.5 | 1.9 | 0.5 |
| 9 | 79.5 | 18.8 | 1.1 | 0.7 |
| 10 | 81.8 | 14.9 | 2.9 | 0.3 |
| 11 | 90.2 | 7.8 | 1.9 | 0.1 |
| 12 | 95.6 | 3.1 | 1.0 | 0.3 |
| 13 | 96.3 | 1.6 | 0.7 | 1.3 |
| 14 | 97.5 | 0.2 | 1.4 | 1.0 |
| 15 | 94.2 | 3.3 | 1.5 | 0.9 |
| **All** | **70.4** | **27.5** | **1.6** | **0.5** |

Although the majority of children commenced brushing with children's low-fluoride toothpaste, a substantial minority commenced brushing with adult-strength fluoride toothpaste (Table 2.4). Even with children as young as one year of age, 15.2% were using standard fluoride toothpaste when toothbrushing commenced. Young children using standard-strength fluoride toothpaste are at an increased risk of developing dental fluorosis (Do & Spencer 2007b), which is principally an aesthetic problem presenting as a mottling of the permanent teeth which are developing across the early years of life. At low severity, fluorosis consists of white chalky patches on the teeth, while at moderate severity it is characterised by brown stains on the teeth.

**Table 2.4: Children using different types of toothpaste, at the age when first started brushing (per cent)**

| Age (years) | Standard fluoride toothpaste | Children's toothpaste | Non-fluoridated toothpaste | Don't know/not sure |
|---|---|---|---|---|
| 1 | 15.2 | 82.6 | 1.3 | 1.0 |
| 2 | 16.3 | 79.3 | 2.4 | 2.0 |
| 3 | 20.4 | 75.6 | 1.7 | 2.2 |
| 4 | 19.0 | 77.8 | 0.6 | 2.7 |
| **All** | **16.8** | **79.9** | **1.7** | **1.7** |

*Note:* Age when children started brushing based on recollection of parents.

Another risk factor for dental fluorosis is the eating or licking of toothpaste (Do & Spencer 2007b). Children who eat fluoride toothpaste may be exposing themselves to more than the recommended intake of fluoride, increasing the likelihood of developing dental fluorosis. Some toothpastes are more flavoursome and have increased appeal with younger children, and this might be encouraging children to consume more toothpaste than is required for toothbrushing. However, very few children (1.3%) were believed to be eating or licking toothpaste often (Table 2.5). While 35.5% of 5 year olds were believed to be sometimes eating or licking toothpaste, this percentage declined with increasing age. By the time children were aged 11, no more than 8.5% were believed to be eating or licking toothpaste sometimes.

**Table 2.5: Children believed to be eating or licking toothpaste, by age (per cent)**

| Age (years) | Often | Sometimes | Never |
|---|---|---|---|
| 5 | 3.1 | 35.5 | 61.5 |
| 6 | 1.9 | 25.2 | 72.9 |
| 7 | 1.6 | 20.4 | 78.1 |
| 8 | 1.7 | 14.2 | 84.0 |
| 9 | 0.8 | 13.3 | 85.9 |
| 10 | 0.1 | 10.8 | 89.0 |
| 11 | 0.9 | 8.5 | 90.6 |
| 12 | 1.2 | 7.3 | 91.5 |
| 13 | 0.3 | 6.6 | 93.1 |
| 14 | 0.4 | 4.1 | 95.6 |
| 15 | 0.3 | 2.1 | 97.6 |
| **All** | **1.3** | **15.7** | **83.1** |

Eating or licking toothpaste was much more prevalent when children were commencing to brush their teeth (Table 2.6). A total of 11.6% of 1 year old children often ate or licked toothpaste, while 41.7% sometimes engaged in this behaviour. Children who were older at the time they commenced brushing were slightly less likely to eat or lick toothpaste than were younger children. However, the behaviour was relatively common among all children when they commenced brushing their teeth, regardless of their age.

**Table 2.6: Children believed to be eating or licking toothpaste, at the age when first started brushing (per cent)**

| Age (years) | Often | Sometimes | Never |
|---|---|---|---|
| 1 | 11.6 | 41.7 | 46.7 |
| 2 | 9.3 | 42.2 | 48.5 |
| 3 | 9.4 | 37.8 | 52.8 |
| 4 | 8.1 | 34.4 | 57.5 |
| **All** | **10.1** | **40.5** | **49.3** |

*Note:* Age when children started brushing based on recollection of parents.

The Australian guidelines on the use of fluoride recommend that those children up to and including the age of 5 use a child-sized (small) soft toothbrush. This study found that 81.0% of children were using a small toothbrush at age 5, and this percentage declined with increasing age of the child (Table 2.7). At age 11, 20.5% of children were still using a small toothbrush rather than the regular size.

**Table 2.7: Children using different-sized toothbrushes, by age (per cent)**

| Age (years) | Small size | Regular size |
|---|---|---|
| 5 | 81.0 | 19.0 |
| 6 | 73.1 | 26.9 |
| 7 | 62.2 | 37.8 |
| 8 | 47.9 | 52.1 |
| 9 | 36.5 | 63.5 |
| 10 | 28.5 | 71.5 |
| 11 | 20.5 | 79.5 |
| 12 | 17.2 | 82.8 |
| 13 | 15.7 | 84.3 |
| 14 | 12.2 | 87.8 |
| 15 | 13.8 | 86.2 |
| **All** | **43.7** | **56.3** |

Overwhelmingly, children use small toothbrushes when they commence toothbrushing (Table 2.8). Some 97.1% of children were found to be using a small toothbrush when they started brushing across the ages 1–4.

**Table 2.8: Children using different-sized toothbrushes, at the age when first started brushing (per cent)**

| Age (years) | Small size | Regular size |
|---|---|---|
| 1 | 98.0 | 2.0 |
| 2 | 97.2 | 2.8 |
| 3 | 95.8 | 4.2 |
| 4 | 95.0 | 5.0 |
| **All** | **97.1** | **2.9** |

*Note:* Age when children started brushing based on recollection of parents.

Several options are available after toothbrushing in relation to the slurry of toothpaste and saliva left in the mouth. Children can swallow the toothpaste mix, rinse their mouth with water and then swallow, rinse their mouth with water and spit out the mix of water and toothpaste, spit out the toothpaste without rinsing, or various other combinations of these behaviours. The guidelines on the use of fluorides in Australia (ARCPOH 2006) recommend that toothpaste be spat out, not swallowed, and not rinsed out with water. Not rinsing toothpaste may allow it greater time to remain in contact with the tooth surface, where fluoride ions can be incorporated into the tooth, thereby strengthening the enamel or outer layer of the tooth. Rinsing may also encourage involuntary swallowing in younger children.

An overwhelming majority of children across all ages rinse and then spit out any toothpaste remaining in their mouth after brushing (Table 2.9). This varies from 78.7% of 5 year olds to 92.0% of 15 year olds. The next most common behaviour is to just spit, with percentages ranging from 4.8% to 13.6%. Rinsing and swallowing, or just swallowing, are uncommon, ranging from a 10.7% of children at age 5 to 1.8% of children at age 14. Swallowing, or rinsing and swallowing, are much more common for children when they commence brushing their teeth, ranging from 35.5% of 1 year olds to 21.4% of 4 year olds (Table 2.10).

**Table 2.9: Children with different behaviours following toothbrushing, by age (per cent)**

| Age (years) | Just swallow | Rinse and swallow | Rinse and spit | Just spit | Other | Don't know |
|---|---|---|---|---|---|---|
| 5 | 4.7 | 6.0 | 78.7 | 9.9 | 0.1 | 0.6 |
| 6 | 2.5 | 3.8 | 79.6 | 13.6 | 0.0 | 0.5 |
| 7 | 1.2 | 4.2 | 83.1 | 10.9 | 0.3 | 0.4 |
| 8 | 0.9 | 2.1 | 86.9 | 9.7 | 0.0 | 0.3 |
| 9 | 0.4 | 3.1 | 83.7 | 11.9 | 0.0 | 0.9 |
| 10 | 0.6 | 3.0 | 86.5 | 9.1 | 0.7 | 0.1 |
| 11 | 0.9 | 2.4 | 87.0 | 7.3 | 0.2 | 2.1 |
| 12 | 0.9 | 3.2 | 86.8 | 8.2 | 0.1 | 0.8 |
| 13 | 0.1 | 1.9 | 88.7 | 8.2 | 0.0 | 1.0 |
| 14 | 0.2 | 1.6 | 84.7 | 13.2 | 0.0 | 0.4 |
| 15 | 0.3 | 1.8 | 92.0 | 4.8 | 0.0 | 1.2 |
| **All** | **1.3** | **3.2** | **84.4** | **10.2** | **0.2** | **0.7** |

**Table 2.10: Children with different behaviours following toothbrushing, at the age when first started brushing (per cent)**

| Age (years) | Just swallow | Rinse and swallow | Rinse and spit | Just spit | Other | Don't know |
|---|---|---|---|---|---|---|
| 1 | 24.7 | 10.8 | 42.7 | 17.5 | 0.8 | 3.5 |
| 2 | 19.2 | 11.3 | 46.9 | 19.0 | 0.5 | 3.1 |
| 3 | 11.7 | 14.7 | 51.8 | 16.7 | 0.3 | 4.9 |
| 4 | 11.0 | 10.3 | 57.1 | 17.9 | 0.2 | 3.3 |
| **All** | **19.4** | **11.5** | **47.0** | **17.9** | **0.6** | **3.6** |

*Note:* Age when children started brushing based on recollection of parents.

The recommendation for the amount of toothpaste to be used for brushing is for a small pea-sized amount to be applied to the toothbrush (ARCPOH 2006). In response to a question regarding the amount of toothpaste that children used, parents indicated that, for the most part, their children used either a medium or a large amount of toothpaste. Size was defined as a smear (small amount), a pea (medium amount), or a ribbon (large amount). The highest proportion of children using a large amount of toothpaste was for the oldest children (Table 2.11). The proportion of children using a medium amount declined from a high of 60.4% for 6 year olds to 33.7% for 15 year olds. The proportion of children using a small amount of toothpaste was highest for younger children and decreased to no more than 8.7% for children aged 11 or older.

**Table 2.11: Children using different amounts of toothpaste, by age (per cent)**

| Age (years) | Large amount | Medium amount | Small amount |
|---|---|---|---|
| 5 | 22.6 | 55.5 | 21.9 |
| 6 | 20.9 | 60.4 | 18.7 |
| 7 | 29.9 | 54.0 | 16.1 |
| 8 | 34.0 | 53.7 | 12.2 |
| 9 | 38.3 | 52.7 | 9.0 |
| 10 | 42.5 | 46.6 | 10.8 |
| 11 | 51.2 | 41.9 | 6.9 |
| 12 | 49.7 | 43.4 | 6.9 |
| 13 | 54.5 | 38.9 | 6.6 |
| 14 | 53.7 | 42.0 | 4.3 |
| 15 | 57.6 | 33.7 | 8.7 |
| **All** | **37.3** | **50.4** | **12.3** |

A majority of children used a small amount of toothpaste when they commenced brushing (Table 2.12). At age one year, 73.5% of children used a small amount, while only 3.8% used a large amount.

**Table 2.12: Children using different amounts of toothpaste, at the age when first started brushing (per cent)**

| Age (years) | Large amount | Medium amount | Small amount |
|---|---|---|---|
| 1 | 3.8 | 22.7 | 73.5 |
| 2 | 5.9 | 26.4 | 67.7 |
| 3 | 8.3 | 32.6 | 59.1 |
| 4 | 11.5 | 34.1 | 54.4 |
| **All** | **6.0** | **26.6** | **67.4** |

*Note:* Age when children started brushing based on recollection of parents.

## 2.1 Dental health behaviours in children by parental income

Differences were explored in toothbrushing behaviours by family income. Family income was based on three categories: less than or equal to $40,000 per year, between $40,001 and $80,000 per year, and more than $80,000 per year. Table 2.13 indicates that there were noticeable differences in the brushing frequency of children from lower income families compared with children from higher income families. There was a socioeconomic gradient in the percentages of children brushing their teeth less than once a day, with lower proportions of children from higher income families brushing their teeth less than once a day. In contrast, the proportion of children who brushed their teeth twice a day was lowest for children from lower income families across all the age groups and highest for children from the highest income category, especially among the older age groups. The difference in the proportion of children brushing their teeth twice a day by family income was greatest for 11 year olds, with 55.8% of children from the lowest income group brushing their teeth twice a day compared with 87.0% of children from the highest income group.

**Table 2.13: Children with different toothbrushing frequency by age and family income (per cent)**

| | < Once a day | | | Once a day | | | Twice a day | | | > Twice a day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K– $80K | >$80K | ≤$40K | >$40K– $80K | >$80K | ≤$40K | >$40K –$80K | >$80K |
| 5 | 9.0 | 1.1 | 2.1 | 23.8 | 19.2 | 31.6 | 65.1 | 78.8 | 66.3 | 2.0 | 0.9 | 0.0 |
| 6 | 6.6 | 1.2 | 2.6 | 33.2 | 25.5 | 30.5 | 58.7 | 70.8 | 66.3 | 1.4 | 2.5 | 0.6 |
| 7 | 5.3 | 1.5 | 3.5 | 30.1 | 28.0 | 19.2 | 63.0 | 69.4 | 76.3 | 1.6 | 1.1 | 1.1 |
| 8 | 5.6 | 2.8 | 0.6 | 30.8 | 18.0 | 27.2 | 60.6 | 77.7 | 70.9 | 3.0 | 1.5 | 1.2 |
| 9 | 5.3 | 2.4 | 2.4 | 29.9 | 24.0 | 22.4 | 63.4 | 72.6 | 73.6 | 1.5 | 1.0 | 1.7 |
| 10 | 4.7 | 3.5 | 0.7 | 31.3 | 27.7 | 25.5 | 60.7 | 67.2 | 71.8 | 3.3 | 1.6 | 2.0 |
| 11 | 6.4 | 2.8 | 3.0 | 34.0 | 23.8 | 9.0 | 55.8 | 70.1 | 87.0 | 3.8 | 3.3 | 1.0 |
| 12 | 7.7 | 5.6 | 3.1 | 23.0 | 20.2 | 16.0 | 67.8 | 71.4 | 79.0 | 1.6 | 2.8 | 1.9 |
| 13 | 5.9 | 3.3 | 0.0 | 26.1 | 23.4 | 12.8 | 63.2 | 70.3 | 81.4 | 4.7 | 2.9 | 5.8 |
| 14 | 5.5 | 3.3 | 1.3 | 14.7 | 22.4 | 11.8 | 73.9 | 67.2 | 81.6 | 6.0 | 7.1 | 5.3 |
| 15 | 7.4 | 3.0 | 3.0 | 26.8 | 25.9 | 9.1 | 61.1 | 68.9 | 84.8 | 4.7 | 2.2 | 3.0 |
| **All** | **6.1** | **2.5** | **2.1** | **29.4** | **23.8** | **21.9** | **62.0** | **71.6** | **74.5** | **2.6** | **2.0** | **1.5** |

In relation to brushing frequency when children commenced brushing their teeth, it was evident that children from higher income families were more likely to brush their teeth twice a day compared with children from lower income families (Table 2.14). Absolute differences between the highest and lowest income groups with regard to brushing teeth twice a day were greater than 12% across all ages except for 3 year olds, with the average being 12.2%.

**Table 2.14: Children with different toothbrushing frequency by family income, at the age when first started brushing (per cent)**

| | < Once a day | | | Once a day | | | Twice a day | | | > Twice a day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 1 | 10.0 | 9.4 | 7.2 | 55.9 | 52.1 | 42.6 | 31.9 | 37.4 | 48.7 | 2.2 | 1.1 | 1.5 |
| 2 | 15.5 | 12.4 | 9.1 | 45.7 | 50.5 | 41.1 | 36.1 | 36.2 | 49.4 | 2.7 | 0.9 | 0.3 |
| 3 | 17.7 | 22.7 | 19.7 | 45.2 | 42.0 | 38.4 | 36.1 | 33.3 | 41.0 | 1.0 | 2.0 | 1.0 |
| 4 | 21.5 | 24.0 | 15.6 | 46.0 | 45.8 | 41.9 | 30.4 | 29.7 | 42.5 | 2.1 | 0.5 | 0.0 |
| **All** | **14.4** | **13.6** | **10.4** | **49.4** | **49.5** | **41.4** | **33.9** | **35.8** | **47.3** | **2.2** | **1.2** | **0.9** |

*Note:* Age when children started brushing based on recollection of parents.

Children aged between 5 and 8 from higher income families were more likely to be using children's toothpaste and less likely to be using standard fluoride toothpaste than were children from lower income families (Table 2.15). Given the recommendation that children use low-fluoride children's toothpaste up to and including the age of 5 (ARCPOH 2006), the results indicate that the type of toothpaste used by children from higher income families is more in line with the Australian guidelines on fluoride use. Although the use of non-fluoridated toothpaste was low for both lower and higher income families, a slightly higher percentage of children from lower income families were using non-fluoridated toothpaste compared with children from higher income families.

**Table 2.15: Children using different types of toothpaste, by age and family income (per cent)**

| | Standard fluoride toothpaste | | | Children's toothpaste | | | Non-fluoridated toothpaste | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 5 | 35.1 | 33.5 | 23.2 | 63.7 | 65.1 | 76.3 | 0.9 | 1.4 | 0.5 |
| 6 | 46.3 | 38.1 | 33.2 | 51.7 | 60.8 | 66.2 | 1.2 | 0.8 | 0.6 |
| 7 | 59.0 | 57.2 | 46.1 | 37.3 | 40.9 | 53.3 | 2.9 | 1.8 | 0.3 |
| 8 | 73.6 | 70.2 | 60.4 | 22.8 | 28.5 | 36.8 | 2.7 | 1.1 | 2.2 |
| 9 | 77.8 | 82.9 | 78.0 | 19.1 | 16.1 | 21.7 | 1.9 | 0.7 | 0.0 |
| 10 | 78.0 | 87.5 | 77.8 | 18.3 | 9.9 | 17.7 | 3.4 | 2.5 | 4.1 |
| 11 | 88.1 | 92.5 | 87.4 | 8.7 | 5.8 | 12.0 | 3.2 | 1.6 | 0.3 |
| 12 | 95.0 | 96.0 | 97.5 | 4.1 | 2.6 | 1.9 | 0.4 | 1.4 | 0.6 |
| 13 | 97.3 | 94.7 | 98.9 | 0.3 | 3.4 | 0.0 | 0.9 | 0.5 | 0.0 |
| 14 | 95.4 | 99.5 | 98.7 | 0.5 | 0.0 | 1.3 | 2.7 | 0.5 | 0.0 |
| 15 | 91.2 | 100.0 | 87.9 | 5.4 | 0.0 | 9.1 | 2.0 | 0.0 | 0.0 |
| **All** | **71.7** | **71.6** | **64.4** | **25.5** | **26.8** | **34.3** | **2.1** | **1.3** | **1.0** |

The results for type of toothpaste used when children commenced brushing their teeth were consistent with the results for current use. Generally, a lower percentage of children from higher income families commenced brushing with standard fluoride toothpaste and a higher percentage commenced brushing with children's toothpaste (Table 2.16). Differences were not large, but were consistent across age groups.

**Table 2.16: Children using different types of toothpaste by family income, at the age when first started brushing (per cent)**

| | Standard fluoride toothpaste | | | Children's toothpaste | | | Non-fluoridated toothpaste | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 1 | 17.4 | 13.4 | 13.4 | 80.4 | 84.0 | 85.5 | 1.2 | 1.6 | 0.8 |
| 2 | 18.3 | 16.4 | 10.9 | 77.1 | 82.1 | 80.6 | 2.7 | 1.1 | 5.0 |
| 3 | 23.9 | 19.1 | 13.3 | 72.2 | 76.1 | 84.7 | 0.9 | 3.2 | 1.7 |
| 4 | 20.0 | 18.6 | 17.2 | 77.3 | 80.0 | 80.0 | 0.5 | 0.8 | 0.0 |
| **All** | **19.1** | **15.7** | **12.9** | **77.5** | **81.8** | **83.3** | **1.6** | **1.6** | **2.3** |

*Note:* Age when children started brushing based on recollection of parents.

There were few and inconsistent differences in relation to the eating or licking of toothpaste across children from different family income groups (Table 2.17).

**Table 2.17: Children believed to be eating or licking toothpaste, by age and family income (per cent)**

| | Often | | | Sometimes | | | Never | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 5 | 3.8 | 3.6 | 1.1 | 35.2 | 35.3 | 44.2 | 61.1 | 61.1 | 54.7 |
| 6 | 1.5 | 3.1 | 0.6 | 25.0 | 27.4 | 25.9 | 73.5 | 69.5 | 73.5 |
| 7 | 3.0 | 0.7 | 0.3 | 20.1 | 22.3 | 16.5 | 76.9 | 77.0 | 83.2 |
| 8 | 1.7 | 2.3 | 0.6 | 15.9 | 23.8 | 12.4 | 82.4 | 83.9 | 87.0 |
| 9 | 1.2 | 0.6 | 0.3 | 15.8 | 9.9 | 14.6 | 83.1 | 89.5 | 85.1 |
| 10 | 0.1 | 0.0 | 0.3 | 10.0 | 12.4 | 6.8 | 89.8 | 87.6 | 92.9 |
| 11 | 0.9 | 1.3 | 0.0 | 11.1 | 6.4 | 7.3 | 88.0 | 92.3 | 92.7 |
| 12 | 1.8 | 0.2 | 0.0 | 11.4 | 4.7 | 1.9 | 86.8 | 95.0 | 98.1 |
| 13 | 0.6 | 0.0 | 0.0 | 6.0 | 6.7 | 12.6 | 93.5 | 93.3 | 87.4 |
| 14 | 0.5 | 0.5 | 0.0 | 5.5 | 4.4 | 0.0 | 94.0 | 95.1 | 100.0 |
| 15 | 0.7 | 0.0 | 0.0 | 2.0 | 2.3 | 0.0 | 97.3 | 97.7 | 100.0 |
| **All** | **1.5** | **1.3** | **0.4** | **16.4** | **15.6** | **15.1** | **82.0** | **83.0** | **84.6** |

Differences in the eating and licking of toothpaste across income groups were also minimal in terms of behaviours when children commenced brushing their teeth (Table 2.18).

**Table 2.18: Children believed to be eating or licking toothpaste by family income, at the age when first started brushing (per cent)**

| | Often | | | Sometimes | | | Never | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 1 | 14.0 | 10.4 | 10.4 | 44.1 | 39.6 | 41.4 | 41.9 | 50.0 | 48.1 |
| 2 | 9.9 | 10.4 | 7.3 | 42.4 | 42.0 | 42.3 | 47.8 | 47.6 | 50.4 |
| 3 | 9.5 | 8.6 | 9.5 | 37.3 | 33.4 | 42.0 | 53.2 | 58.0 | 48.5 |
| 4 | 11.0 | 4.4 | 1.7 | 31.5 | 39.0 | 39.7 | 57.5 | 56.6 | 58.7 |
| **All** | **11.5** | **9.7** | **8.5** | **41.0** | **39.3** | **41.7** | **47.5** | **51.0** | **49.8** |

*Note:* Age when children started brushing based on recollection of parents.

Generally, a greater percentage of children from higher income families used child-sized small toothbrushes than did children from lower income families, although these differences were more pronounced for children aged 5–8 (Table 2.19). Regardless of family income, there was a gradual trend across increasing age groups for the proportion of children using a small toothbrush to decrease and for the proportion using a regular-sized toothbrush to increase.

**Table 2.19: Children using different-sized toothbrushes, by age and family income (per cent)**

| | Small size | | | Regular size | | |
|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 5 | 75.2 | 85.1 | 93.6 | 24.8 | 14.9 | 6.4 |
| 6 | 70.0 | 74.7 | 76.5 | 30.0 | 25.3 | 23.5 |
| 7 | 59.1 | 66.1 | 67.5 | 40.9 | 33.9 | 32.5 |
| 8 | 42.7 | 48.7 | 61.1 | 57.3 | 51.3 | 38.9 |
| 9 | 36.2 | 32.7 | 42.5 | 63.8 | 67.3 | 57.5 |
| 10 | 29.8 | 27.1 | 31.4 | 70.2 | 72.9 | 68.6 |
| 11 | 21.9 | 17.4 | 19.9 | 78.1 | 82.6 | 80.1 |
| 12 | 11.6 | 23.7 | 19.1 | 88.4 | 76.3 | 80.9 |
| 13 | 16.0 | 16.8 | 16.1 | 84.0 | 83.2 | 83.9 |
| 14 | 11.5 | 15.9 | 9.3 | 88.5 | 84.1 | 90.7 |
| 15 | 12.8 | 15.7 | 11.4 | 87.2 | 84.3 | 88.6 |
| **All** | **41.1** | **44.7** | **49.3** | **58.9** | **55.3** | **50.7** |

Small differences were evident across family income groups in relation to the size of toothbrush being used when children commenced brushing their teeth (Table 2.20). Children from higher income families were slightly more likely to commence brushing their teeth using a smaller toothbrush than were children from lower income families.

**Table 2.20: Children using different-sized toothbrushes by family income, at the age when first started brushing (per cent)**

| | Small size | | | Regular size | | |
|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 1 | 97.6 | 98.3 | 99.6 | 2.4 | 1.7 | 0.4 |
| 2 | 96.9 | 97.8 | 98.4 | 3.1 | 2.2 | 1.6 |
| 3 | 93.3 | 97.8 | 99.7 | 6.7 | 2.2 | 0.3 |
| 4 | 93.9 | 95.9 | 99.4 | 6.1 | 4.1 | 0.6 |
| **All** | **96.2** | **97.9** | **99.2** | **3.8** | **2.1** | **0.8** |

*Note:* Age when children started brushing based on recollection of parents.

There were few differences in post-brushing behaviours by family income (Table 2.21). Rinsing and spitting was the most prevalent behaviour, adopted by between 72.5% and 94.8% of any child age group. There were also few consistent differences between lower and higher family income groups in terms of brushing behaviours when children first started brushing (Table 2.22).

**Table 2.21: Children with different behaviours following toothbrushing, by age and family income (per cent)**

| | Just swallow | | | Rinse and swallow | | | Rinse and spit | | | Just spit | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K |
| 5 | 6.2 | 5.0 | 2.1 | 3.2 | 9.3 | 6.4 | 81.4 | 72.5 | 81.9 | 9.0 | 13.1 | 9.6 |
| 6 | 2.7 | 2.7 | 1.5 | 3.2 | 3.4 | 3.8 | 81.4 | 80.7 | 80.3 | 11.7 | 13.1 | 14.4 |
| 7 | 0.4 | 2.1 | 1.3 | 4.2 | 2.7 | 5.1 | 83.9 | 83.3 | 80.6 | 9.8 | 11.8 | 13.0 |
| 8 | 0.9 | 0.4 | 1.5 | 2.1 | 1.3 | 1.2 | 88.4 | 85.9 | 91.3 | 8.5 | 12.0 | 5.9 |
| 9 | 0.4 | 0.4 | 0.3 | 3.9 | 2.3 | 1.4 | 83.1 | 83.6 | 89.2 | 11.2 | 13.3 | 8.4 |
| 10 | 0.4 | 0.8 | 1.4 | 2.1 | 3.2 | 4.1 | 88.1 | 86.2 | 83.2 | 9.3 | 9.5 | 8.9 |
| 11 | 1.2 | 0.6 | 0.7 | 3.1 | 2.0 | 1.0 | 86.4 | 90.3 | 87.7 | 7.1 | 7.0 | 9.6 |
| 12 | 0.9 | 1.4 | 0.0 | 4.1 | 2.8 | 1.3 | 86.5 | 86.0 | 93.8 | 7.7 | 9.6 | 2.5 |
| 13 | 0.0 | 0.0 | 0.0 | 3.0 | 0.5 | 2.3 | 86.9 | 89.4 | 91.9 | 9.8 | 8.2 | 5.8 |
| 14 | 0.5 | 0.0 | 0.0 | 1.4 | 1.1 | 1.3 | 91.7 | 87.4 | 94.8 | 6.0 | 10.9 | 3.9 |
| 15 | 0.7 | 0.0 | 0.0 | 0.7 | 3.0 | 2.9 | 93.3 | 91.9 | 88.6 | 4.0 | 4.4 | 5.7 |
| **All** | **1.3** | **1.4** | **1.1** | **3.1** | **2.9** | **3.0** | **85.4** | **84.4** | **85.2** | **9.3** | **11.0** | **10.1** |

**Table 2.22: Children with different behaviours following toothbrushing by family income, at the age when first started brushing (per cent)**

| Age (years) | Just swallow | | | Rinse and swallow | | | Rinse and spit | | | Just spit | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K | ≤$40K | >$40K –$80K | >$80K |
| 1 | 25.5 | 25.4 | 23.7 | 11.5 | 9.8 | 11.2 | 43.5 | 41.2 | 41.6 | 16.0 | 18.2 | 19.5 |
| 2 | 18.4 | 19.8 | 17.6 | 11.2 | 10.5 | 14.2 | 47.6 | 47.3 | 46.8 | 19.0 | 18.8 | 20.5 |
| 3 | 12.1 | 10.6 | 8.2 | 9.8 | 18.6 | 22.9 | 58.0 | 48.8 | 45.1 | 16.0 | 16.2 | 18.0 |
| 4 | 14.0 | 9.5 | 6.1 | 6.8 | 18.5 | 6.7 | 54.6 | 55.9 | 60.6 | 19.4 | 14.7 | 24.4 |
| **All** | **19.5** | **20.0** | **17.8** | **10.6** | **12.1** | **13.5** | **48.6** | **45.5** | **45.5** | **17.4** | **17.8** | **20.0** |

*Note:* Age when children started brushing based on recollection of parents.

There was a socioeconomic gradient in amounts of toothpaste used, with children from lower income families more likely to use a large amount of toothpaste when toothbrushing than were children from higher income families (Table 2.23). This finding was consistent across all age groups other than for 15 year olds. The largest difference was for 8 year olds, with 41.8% of children from the lowest income category using a large amount of toothpaste when brushing compared with 24.8% of children from the highest income category. In contrast, children from higher income families were somewhat more likely to use either a small or medium amount of toothpaste than were children from lower income families.

**Table 2.23: Children using different amounts of toothpaste, by age and family income (per cent)**

| Age (years) | Large amount | | | Medium amount | | | Small amount | | |
|---|---|---|---|---|---|---|---|---|---|
| | ≤$40K | >$40K– $80K | >$80K | ≤$40K | >$40K– $80K | >$80K | ≤$40K | >$40K– $80K | >$80K |
| 5 | 28.1 | 16.5 | 21.7 | 56.3 | 60.2 | 46.6 | 15.6 | 23.3 | 31.7 |
| 6 | 22.3 | 22.3 | 14.7 | 58.9 | 62.5 | 68.6 | 18.8 | 15.2 | 16.7 |
| 7 | 34.4 | 27.5 | 23.8 | 52.0 | 55.5 | 57.2 | 13.6 | 17.0 | 19.0 |
| 8 | 41.8 | 27.1 | 24.8 | 48.5 | 59.9 | 55.8 | 9.8 | 13.1 | 19.4 |
| 9 | 40.5 | 36.7 | 35.1 | 51.4 | 55.2 | 52.4 | 8.2 | 8.1 | 12.5 |
| 10 | 48.6 | 39.5 | 32.3 | 41.2 | 50.5 | 51.0 | 10.2 | 10.0 | 16.7 |
| 11 | 53.0 | 48.8 | 50.2 | 41.8 | 43.2 | 41.5 | 5.2 | 8.0 | 8.3 |
| 12 | 50.9 | 48.8 | 37.1 | 42.9 | 42.2 | 56.0 | 6.2 | 9.0 | 6.9 |
| 13 | 56.1 | 53.4 | 51.2 | 37.7 | 40.4 | 44.2 | 6.2 | 6.3 | 4.7 |
| 14 | 57.8 | 49.7 | 48.0 | 36.2 | 48.6 | 48.0 | 6.0 | 1.7 | 4.0 |
| 15 | 54.0 | 64.0 | 52.9 | 37.3 | 27.9 | 35.3 | 8.7 | 8.1 | 11.8 |
| **All** | **41.2** | **34.8** | **31.0** | **48.1** | **53.0** | **53.4** | **10.7** | **12.1** | **15.5** |

By family income, differences in the amount of toothpaste used when children started brushing were smaller and less consistent than those observed for current practice (Table 2.24). However, there were consistent, although reasonably small, differences in the percentages of children using a small amount of toothpaste. Children from higher income families were slightly more likely to use a small amount of toothpaste when they first started brushing than were children from lower income families.

**Table 2.24: Children using different amounts of toothpaste by family income, at the age when first started brushing (per cent)**

| | Large amount | | | Medium amount | | | Small amount | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 1 | 4.1 | 3.4 | 2.6 | 23.4 | 22.0 | 21.8 | 72.5 | 74.6 | 75.5 |
| 2 | 6.4 | 5.9 | 3.0 | 28.7 | 24.4 | 25.2 | 64.9 | 69.7 | 71.8 |
| 3 | 7.5 | 7.8 | 11.7 | 35.3 | 30.5 | 33.4 | 57.2 | 61.8 | 54.8 |
| 4 | 12.5 | 6.8 | 7.8 | 34.6 | 38.1 | 30.7 | 52.8 | 55.1 | 61.5 |
| **All** | **6.3** | **5.2** | **4.5** | **28.5** | **25.4** | **25.4** | **65.2** | **69.5** | **70.1** |

*Note:* Age when children started brushing based on recollection of parents.

## 2.2 Dental health behaviours in children by parental education level

Table 2.25 shows the frequency of toothbrushing by age group and parental education. Parental education groups were based on three categories: where either of a child's parents had not ever finished high school, had completed high school or had ever attended a university. There was a consistent pattern for children who had at least one parent who had attended a university to be more likely to brush twice a day than children with a parent who had not finished high school. When the highest and lowest educational categories were compared, differences in the percentage who brushed twice a day ranged from only 7.7 percentage points for 6 year olds up to 37.3 percentage points for 15 year olds. Conversely, a higher proportion of children with parents with some high school education brushed their teeth once a day or less (7.0%) compared with children with a parent who had attended university (3.6%). Brushing less than once a day on average was more than twice as prevalent for children aged 5, 11, 12, 14 and 15 whose parents had not completed high school than for children with a parent who had attended university.

**Table 2.25: Children with different toothbrushing frequency, by age and parental education (per cent)**

| | < Once a day | | | Once a day | | | Twice a day | | | > Twice a day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 7.9 | 5.2 | 2.8 | 28.6 | 23.9 | 20.0 | 63.5 | 69.4 | 75.9 | 0.0 | 1.5 | 1.3 |
| 6 | 6.0 | 3.7 | 3.9 | 32.6 | 27.4 | 27.9 | 59.1 | 67.0 | 66.8 | 2.3 | 1.9 | 1.4 |
| 7 | 4.7 | 3.3 | 3.3 | 33.8 | 32.5 | 20.7 | 59.0 | 63.9 | 74.5 | 2.5 | 0.4 | 1.5 |
| 8 | 6.1 | 1.2 | 4.5 | 35.0 | 27.2 | 20.9 | 53.8 | 69.7 | 73.6 | 5.0 | 1.9 | 1.0 |
| 9 | 5.8 | 3.8 | 4.2 | 32.3 | 26.9 | 21.0 | 60.2 | 68.4 | 72.8 | 1.7 | 0.9 | 2.0 |
| 10 | 5.3 | 3.3 | 3.5 | 34.9 | 29.9 | 25.1 | 58.4 | 63.3 | 69.5 | 1.4 | 3.4 | 1.9 |
| 11 | 12.5 | 3.3 | 2.1 | 36.2 | 28.8 | 20.1 | 48.0 | 64.5 | 75.5 | 3.1 | 3.5 | 2.3 |
| 12 | 11.2 | 4.7 | 4.8 | 21.7 | 24.2 | 17.7 | 64.7 | 68.2 | 75.8 | 2.3 | 2.9 | 1.7 |
| 13 | 5.0 | 4.1 | 3.3 | 22.9 | 24.7 | 20.0 | 71.4 | 64.6 | 73.3 | 0.7 | 6.5 | 3.3 |
| 14 | 7.3 | 5.3 | 2.8 | 24.4 | 18.0 | 12.4 | 63.4 | 69.9 | 78.9 | 4.9 | 6.8 | 6.0 |
| 15 | 5.9 | 6.8 | 2.3 | 48.5 | 25.6 | 13.2 | 44.1 | 63.2 | 81.4 | 1.5 | 4.5 | 3.1 |
| **All** | **7.0** | **3.6** | **3.6** | **32.2** | **27.5** | **21.5** | **58.4** | **66.6** | **73.1** | **2.4** | **2.4** | **1.9** |

Children with a parent who had attended university were also more likely to brush twice a day when they commenced brushing (41.5%) than were children of parents with some high school education (32.2%) or who had completed high school (34.8%), and were generally less likely to brush their teeth once a day or less (Table 2.26).

**Table 2.26: Children with different toothbrushing frequency by parental education, at the age when first started brushing (per cent)**

| | < Once a day | | | Once a day | | | Twice a day | | | > Twice a day | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 10.7 | 8.5 | 9.1 | 54.8 | 53.9 | 48.7 | 32.4 | 36.3 | 40.6 | 2.1 | 1.4 | 1.6 |
| 2 | 14.0 | 17.7 | 10.4 | 47.5 | 47.8 | 43.8 | 36.3 | 33.0 | 44.5 | 2.2 | 1.5 | 1.3 |
| 3 | 20.0 | 20.1 | 18.1 | 54.0 | 43.1 | 38.8 | 25.4 | 35.8 | 41.1 | 0.7 | 1.0 | 2.1 |
| 4 | 22.9 | 21.6 | 19.5 | 44.7 | 42.3 | 45.1 | 30.7 | 33.8 | 34.7 | 1.7 | 2.3 | 0.7 |
| **All** | **14.9** | **14.9** | **11.7** | **51.0** | **48.8** | **45.3** | **32.2** | **34.8** | **41.5** | **1.9** | **1.4** | **1.5** |

*Note:* Age when children started brushing based on recollection of parents.

There were few differences overall between parental education categories across most child age groups in relation to the type of toothpaste used (Table 2.27). However, in the 6 and 7 year old age groups, at which time it is recommended that children switch from low-fluoride children's toothpaste to standard fluoride toothpaste (ARCPOH 2006), children of parents who had attended university were less likely to be using standard fluoride toothpaste and more likely to be using children's toothpaste than were children of parents with lower educational attainment. Although the absolute differences are small, the average percentage across all age groups of children of parents who had completed high school or attended university who were using non-fluoridated toothpaste was about 2 to 3 times higher than that of children with a parent who had not finished high school.

**Table 2.27: Children using different types of toothpaste, by age and parental education (per cent)**

| | Standard fluoride toothpaste | | | Children's toothpaste | | | Non-fluoridated toothpaste | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 31.3 | 31.2 | 33.1 | 68.2 | 67.8 | 65.6 | 0.5 | 0.8 | 1.3 |
| 6 | 50.3 | 45.8 | 33.8 | 48.5 | 53.4 | 63.4 | 0.2 | 0.6 | 2.2 |
| 7 | 59.2 | 61.2 | 51.1 | 39.7 | 36.5 | 45.8 | 0.0 | 2.1 | 2.7 |
| 8 | 74.5 | 69.2 | 69.2 | 22.8 | 29.9 | 27.0 | 1.3 | 0.4 | 3.6 |
| 9 | 79.5 | 81.0 | 78.2 | 18.6 | 16.8 | 20.8 | 0.2 | 1.9 | 0.8 |
| 10 | 75.5 | 86.4 | 81.7 | 21.5 | 10.6 | 15.4 | 2.5 | 2.8 | 2.8 |
| 11 | 91.4 | 90.3 | 89.0 | 8.3 | 6.5 | 9.3 | 0.3 | 3.2 | 1.5 |
| 12 | 94.9 | 94.6 | 96.6 | 4.3 | 4.7 | 1.3 | 0.0 | 0.4 | 1.9 |
| 13 | 97.9 | 97.9 | 94.6 | 0.7 | 0.3 | 2.9 | 0.7 | 0.3 | 1.2 |
| 14 | 95.2 | 96.1 | 98.6 | 0.0 | 0.5 | 0.5 | 1.2 | 2.4 | 0.5 |
| 15 | 89.7 | 97.7 | 93.0 | 2.9 | 0.0 | 7.0 | 5.9 | 0.8 | 0.0 |
| **All** | **72.8** | **72.4** | **67.8** | **25.4** | **25.8** | **29.8** | **0.8** | **1.5** | **2.1** |

Children with a parent who had not finished high school were more likely to commence brushing their teeth with standard fluoride toothpaste and less likely to commence brushing their teeth with children's toothpaste than were children of parents with higher educational attainment (Table 2.28).

**Table 2.28: Children using different types of toothpaste by parental education, at the age when first started brushing (per cent)**

| | Standard fluoride toothpaste | | | Children's toothpaste | | | Non-fluoridated toothpaste | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 17.6 | 16.6 | 13.1 | 80.9 | 81.3 | 84.3 | 0.3 | 1.4 | 1.5 |
| 2 | 20.7 | 16.8 | 14.3 | 77.1 | 79.9 | 80.4 | 0.7 | 1.7 | 3.8 |
| 3 | 29.0 | 18.4 | 18.2 | 62.8 | 78.5 | 79.1 | 5.2 | 0.5 | 1.4 |
| 4 | 18.8 | 21.6 | 16.8 | 75.0 | 77.0 | 81.2 | 0.3 | 1.2 | 0.9 |
| **All** | **20.9** | **17.4** | **14.6** | **75.6** | **80.0** | **81.9** | **1.3** | **1.5** | **2.2** |

*Note*: Age when children started brushing based on recollection of parents.

From the age of 7 onwards, children with a parent who did not finish high school were more likely to eat or lick toothpaste sometimes than were children with at least one parent who had undertaken university education (Table 2.29). Conversely, from the age of 7 onwards, a higher percentage of children with a parent who attended university never ate or licked toothpaste in comparison with children with a parent who did not finish high school.

**Table 2.29: Children believed to be eating or licking toothpaste, by age and parental education (per cent)**

| | Often | | | Sometimes | | | Never | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 1.5 | 3.1 | 3.7 | 34.0 | 36.0 | 35.4 | 64.5 | 60.7 | 60.9 |
| 6 | 1.4 | 1.6 | 2.4 | 21.2 | 25.6 | 26.6 | 77.4 | 72.9 | 71.0 |
| 7 | 2.5 | 2.3 | 0.7 | 24.0 | 20.7 | 18.9 | 73.5 | 77.0 | 80.4 |
| 8 | 3.5 | 0.9 | 1.8 | 13.6 | 16.6 | 12.0 | 82.9 | 82.5 | 86.2 |
| 9 | 0.7 | 0.6 | 1.0 | 18.0 | 12.8 | 11.9 | 81.2 | 86.7 | 87.1 |
| 10 | 0.2 | 0.1 | 0.1 | 14.3 | 11.3 | 7.9 | 85.5 | 88.6 | 92.0 |
| 11 | 0.3 | 1.7 | 0.1 | 11.5 | 9.1 | 6.6 | 88.2 | 89.2 | 93.3 |
| 12 | 0.0 | 2.5 | 0.2 | 14.8 | 6.8 | 4.3 | 85.2 | 90.7 | 95.5 |
| 13 | 0.7 | 0.0 | 0.4 | 9.3 | 6.6 | 5.4 | 90.0 | 93.4 | 94.2 |
| 14 | 0.0 | 0.5 | 0.5 | 8.5 | 3.9 | 2.7 | 91.5 | 95.6 | 96.8 |
| 15 | 1.5 | 0.0 | 0.0 | 0.0 | 3.0 | 2.3 | 98.5 | 97.0 | 97.7 |
| **All** | **1.2** | **1.3** | **1.1** | **17.2** | **16.1** | **14.5** | **81.6** | **82.5** | **84.4** |

There were no consistent differences in children's eating or licking of toothpaste at the time brushing commenced across categories of parental level of educational attainment (Table 2.30).

**Table 2.30: Children believed to be eating or licking toothpaste by parental education, at the age when first started brushing (per cent)**

| | Often | | | Sometimes | | | Never | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 11.7 | 10.9 | 12.4 | 40.9 | 42.5 | 41.0 | 47.5 | 46.6 | 46.6 |
| 2 | 12.1 | 9.1 | 8.6 | 39.0 | 44.8 | 41.9 | 48.9 | 46.2 | 49.6 |
| 3 | 8.0 | 10.4 | 8.8 | 35.5 | 36.8 | 39.4 | 56.5 | 52.8 | 51.8 |
| 4 | 8.4 | 9.2 | 6.3 | 36.9 | 28.8 | 38.7 | 54.7 | 62.0 | 55.0 |
| **All** | **10.8** | **10.0** | **10.1** | **38.8** | **41.0** | **40.9** | **50.4** | **49.0** | **49.1** |

*Note*: Age when children started brushing based on recollection of parents.

Across every age group, children who had a parent attend university were more likely to use a child-sized (small) rather than a regular-sized, toothbrush than were children whose parents had not completed high school (Table 2.31). At age 8 52.6% of children whose parents had university education still used a small toothbrush. In all, 17.1% of 15 year old children with a parent who had attended university still used a small toothbrush while all 15 year old children with a parent who had not completed high school used a regular-sized toothbrush. Absolute differences between the highest and lowest parental education groups ranged from 0.8 percentage points for 13 year olds to 15.4 percentage points for 7 year olds with the average difference across all age groups being 11.2 percentage points.

**Table 2.31: Children using different-sized toothbrushes, by age and parental education (per cent)**

| | Small size | | | Regular size | | |
|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 70.9 | 83.2 | 83.0 | 29.1 | 16.8 | 17.0 |
| 6 | 72.3 | 68.0 | 77.7 | 27.7 | 32.0 | 22.3 |
| 7 | 53.9 | 57.4 | 69.3 | 46.1 | 42.6 | 30.7 |
| 8 | 41.3 | 45.2 | 52.6 | 58.7 | 54.8 | 47.4 |
| 9 | 29.2 | 32.9 | 43.6 | 70.8 | 67.1 | 56.4 |
| 10 | 31.3 | 23.2 | 32.9 | 68.8 | 76.8 | 67.1 |
| 11 | 17.0 | 16.0 | 26.0 | 83.0 | 84.0 | 74.0 |
| 12 | 9.5 | 17.1 | 22.0 | 90.5 | 82.9 | 78.0 |
| 13 | 15.7 | 14.9 | 16.5 | 84.3 | 85.1 | 83.5 |
| 14 | 9.9 | 12.2 | 13.7 | 90.1 | 87.8 | 86.3 |
| 15 | 0.0 | 18.0 | 17.1 | 100.0 | 82.0 | 82.9 |
| **All** | **38.0** | **40.6** | **49.2** | **62.0** | **59.4** | **50.8** |

A higher proportion of children from all three parental education groups used a small toothbrush when commencing brushing their teeth than indicated for children's current use (Table 2.32). Although the percentage differences across parental education groups in relation to the size of toothbrush used when children started toothbrushing were small, children with a parent who had attended university were slightly more likely to use a small toothbrush and were slightly less likely to use a regular-sized brush than children with a parent who had not finished high school.

**Table 2.32: Children using different-sized toothbrushes by parental education, at the age when first started brushing (per cent)**

| | Small size | | | Regular size | | |
|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 96.6 | 98.1 | 98.9 | 3.4 | 1.9 | 1.1 |
| 2 | 96.3 | 97.1 | 98.3 | 3.7 | 2.9 | 1.7 |
| 3 | 94.8 | 94.9 | 97.2 | 5.2 | 5.1 | 2.8 |
| 4 | 94.6 | 95.5 | 95.0 | 5.4 | 4.5 | 5.0 |
| **All** | **95.9** | **97.0** | **98.1** | **4.1** | **3.0** | **1.9** |

*Note*: Age when children started brushing based on recollection of parents.

There were no consistent trends or differences in what children did with the toothpaste left in their mouth after brushing with regard to educational attainments of their parents (Table 2.33).

**Table 2.33: Children with different behaviours following toothbrushing, by age and parental education (per cent)**

| | Just swallow | | | Rinse and swallow | | | Rinse and spit | | | Just spit | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Complete high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 4.5 | 1.4 | 8.2 | 2.5 | 6.3 | 6.7 | 83.9 | 80.4 | 75.7 | 8.5 | 11.8 | 9.2 |
| 6 | 2.1 | 2.3 | 3.0 | 2.6 | 5.5 | 2.1 | 76.3 | 78.7 | 85.9 | 17.8 | 13.1 | 9.0 |
| 7 | 0.6 | 1.2 | 1.4 | 4.4 | 4.8 | 3.7 | 84.2 | 81.4 | 84.1 | 8.9 | 12.3 | 10.1 |
| 8 | 0.0 | 1.3 | 0.9 | 2.9 | 2.7 | 1.2 | 85.9 | 84.3 | 90.5 | 9.9 | 11.4 | 7.4 |
| 9 | 0.5 | 0.5 | 0.4 | 5.1 | 3.4 | 1.8 | 79.3 | 86.3 | 82.8 | 13.5 | 9.1 | 14.5 |
| 10 | 0.5 | 0.4 | 1.0 | 2.5 | 2.8 | 3.3 | 90.3 | 87.5 | 83.5 | 6.3 | 8.6 | 11.3 |
| 11 | 0.3 | 1.3 | 0.8 | 1.8 | 3.5 | 1.2 | 88.3 | 87.2 | 89.0 | 6.1 | 7.1 | 8.6 |
| 12 | 04 | 0.9 | 1.0 | 1.9 | 5.0 | 1.3 | 84.9 | 87.5 | 87.7 | 12.0 | 4.8 | 9.8 |
| 13 | 0.0 | 0.0 | 0.0 | 1.4 | 2.1 | 1.7 | 90.0 | 90.3 | 87.1 | 8.6 | 7.2 | 9.5 |
| 14 | 0.0 | 0.5 | 0.0 | 0.0 | 1.5 | 2.3 | 90.2 | 88.2 | 78.5 | 8.5 | 9.3 | 19.2 |
| 15 | 1.5 | 0.0 | 0.0 | 0.0 | 0.7 | 3.1 | 95.5 | 89.6 | 93.8 | 3.0 | 8.2 | 2.3 |
| **All** | **0.9** | **1.1** | **1.7** | **2.9** | **3.9** | **2.5** | **84.7** | **84.5** | **85.2** | **10.3** | **9.9** | **10.1** |

There were also no differences in post-brushing behaviours between children of parents of differing educational attainment at the time brushing commenced (Table 2.34).

**Table 2.34: Children with different behaviours following toothbrushing by parental education, at the age when first started brushing (per cent)**

| | Just swallow | | | Rinse and swallow | | | Rinse and spit | | | Just spit | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 24.4 | 21.4 | 27.3 | 8.8 | 11.5 | 10.9 | 48.7 | 43.3 | 40.2 | 15.9 | 18.5 | 17.2 |
| 2 | 21.1 | 18.5 | 18.1 | 7.2 | 12.4 | 11.9 | 45.5 | 45.5 | 50.5 | 22.1 | 20.7 | 16.4 |
| 3 | 14.7 | 10.6 | 11.6 | 8.3 | 20.2 | 12.8 | 49.9 | 51.3 | 52.7 | 18.6 | 14.4 | 18.3 |
| 4 | 14.5 | 9.4 | 9.8 | 11.0 | 9.4 | 11.6 | 44.5 | 68.2 | 53.3 | 25.9 | 9.4 | 23.4 |
| **All** | **20.4** | **17.4** | **20.4** | **8.4** | **13.0** | **11.6** | **47.3** | **47.9** | **46.6** | **19.6** | **17.7** | **17.6** |

*Note*: Age when children started brushing based on recollection of parents.

There was a consistent trend for children from lower education families to use a large amount of toothpaste when brushing their teeth compared with children of parents with higher educational attainment (Table 2.35). Differences by parental educational attainment (some high school vs attended university) in the percentage of children using a large amount of toothpaste varied from 2.6 percentage points for 6 year olds up to 27.0 percentage points for 14 year olds, with the average difference across all age groups being 13.3 percentage points. Up to the age of 8 the proportion of children using a small amount of toothpaste was higher for children with a parent who had attended university (18.1% to 27.4%) than for children whose parents had some high school education (6.1% to 20.6%). From the age of 9 onwards children whose parents had a higher educational attainment were more likely to use a medium amount of toothpaste than were children of parents with lower educational attainment.

**Table 2.35: Percentage of children using different amounts of toothpaste, by age and parental education**

| | Large amount | | | Medium amount | | | Small amount | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 5 | 29.1 | 22.9 | 20.0 | 50.3 | 60.0 | 52.6 | 20.6 | 17.2 | 27.4 |
| 6 | 22.1 | 22.8 | 19.5 | 63.6 | 58.9 | 61.1 | 14.2 | 18.3 | 19.5 |
| 7 | 41.1 | 29.7 | 25.5 | 47.0 | 54.2 | 56.4 | 11.8 | 16.1 | 18.1 |
| 8 | 41.0 | 37.6 | 27.6 | 52.9 | 54.7 | 53.8 | 6.1 | 7.7 | 18.7 |
| 9 | 46.0 | 36.0 | 36.4 | 42.1 | 55.0 | 55.9 | 11.9 | 9.0 | 7.6 |
| 10 | 52.6 | 42.9 | 36.4 | 35.5 | 45.9 | 53.2 | 11.9 | 11.2 | 10.3 |
| 11 | 51.8 | 56.5 | 44.7 | 42.6 | 36.9 | 47.5 | 5.5 | 6.6 | 7.8 |
| 12 | 61.6 | 53.9 | 38.9 | 33.7 | 38.2 | 53.2 | 4.7 | 7.9 | 7.9 |
| 13 | 64.3 | 53.3 | 51.0 | 29.3 | 39.9 | 43.1 | 6.4 | 6.9 | 5.9 |
| 14 | 65.9 | 62.0 | 38.9 | 34.1 | 33.2 | 55.6 | 0.0 | 4.9 | 5.6 |
| 15 | 73.5 | 58.6 | 49.2 | 17.6 | 30.1 | 44.6 | 8.8 | 11.3 | 6.2 |
| **All** | **45.2** | **38.9** | **31.9** | **44.6** | **49.6** | **54.1** | **10.1** | **11.4** | **14.1** |

In spite of the differences in current amounts of toothpaste used, there were few differences by educational attainment in relation to the amount of toothpaste used when brushing commenced (Table 2.36). More than 70.6% of 1 year old children from any of the three parental education groups used a small amount of toothpaste when brushing started. There were slightly lower proportions of children who started brushing later using a small amount of toothpaste, and a higher proportion of older children using medium or large amounts compared with younger children.

**Table 2.36: Children using different amounts of toothpaste by parental education, at the age when first started brushing (per cent)**

| | Large amount | | | Medium amount | | | Small amount | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university | Some high school | Completed high school | Attended university |
| 1 | 4.8 | 4.0 | 3.2 | 24.6 | 22.0 | 22.2 | 70.6 | 74.0 | 74.7 |
| 2 | 7.2 | 5.8 | 5.5 | 30.2 | 24.4 | 26.6 | 62.6 | 69.8 | 67.9 |
| 3 | 9.7 | 6.0 | 9.7 | 34.6 | 32.3 | 32.1 | 55.7 | 61.8 | 58.3 |
| 4 | 11.2 | 12.8 | 10.4 | 30.5 | 38.1 | 32.0 | 58.2 | 49.0 | 57.6 |
| **All** | **7.2** | **5.8** | **5.5** | **29.0** | **26.1** | **25.9** | **63.8** | **68.1** | **68.6** |

*Note*: Age when children started brushing based on recollection of parents.

# 2.3 Dental health behaviours in children by location

Differences in toothbrushing frequency between children residing in urban and rural locations are shown in Table 2.37. No consistent or large differences were apparent.

**Table 2.37: Children with different toothbrushing frequency, by age and residence remoteness (per cent)**

| | < Once a day | | Once a day | | Twice a day | | > Twice a day | |
|---|---|---|---|---|---|---|---|---|
| Age (years) | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 5 | 4.9 | 2.7 | 21.1 | 27.3 | 72.8 | 68.9 | 1.2 | 1.0 |
| 6 | 3.9 | 4.7 | 28.3 | 27.7 | 66.3 | 65.5 | 1.4 | 2.2 |
| 7 | 3.9 | 2.6 | 27.0 | 28.2 | 67.7 | 68.4 | 1.4 | 0.9 |
| 8 | 4.0 | 3.5 | 24.2 | 30.5 | 69.6 | 64.1 | 2.2 | 2.0 |
| 9 | 5.0 | 2.9 | 25.4 | 29.0 | 68.1 | 67.1 | 1.5 | 1.0 |
| 10 | 4.3 | 3.6 | 28.8 | 28.7 | 64.6 | 65.2 | 2.3 | 2.5 |
| 11 | 3.8 | 5.8 | 27.8 | 27.6 | 65.4 | 63.5 | 3.0 | 3.1 |
| 12 | 5.0 | 8.8 | 21.2 | 21.6 | 72.3 | 66.2 | 1.6 | 3.4 |
| 13 | 2.3 | 8.3 | 21.9 | 24.5 | 70.5 | 65.1 | 5.3 | 2.1 |
| 14 | 3.2 | 7.7 | 15.2 | 21.8 | 74.6 | 66.9 | 7.0 | 3.5 |
| 15 | 5.0 | 5.7 | 24.1 | 28.7 | 68.0 | 60.9 | 2.9 | 4.6 |
| **All** | **4.2** | **4.5** | **25.4** | **27.6** | **68.2** | **65.8** | **2.2** | **2.1** |

When children commenced brushing their teeth, children from rural areas were more likely to brush once a day compared with children from urban areas (Table 2.38). A higher proportion of children from urban areas were brushing twice a day when they commenced toothbrushing than were children from rural areas.

**Table 2.38: Children with different toothbrushing frequency by residence remoteness, at the age when first started brushing (per cent)**

| | < Once a day | | Once a day | | Twice a day | | > Twice a day | |
|---|---|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 1 | 9.1 | 9.1 | 50.3 | 55.6 | 39.1 | 33.4 | 1.5 | 1.9 |
| 2 | 13.1 | 15.9 | 44.8 | 49.4 | 40.2 | 33.5 | 1.8 | 1.3 |
| 3 | 18.6 | 17.5 | 42.9 | 48.7 | 37.2 | 31.7 | 1.3 | 2.2 |
| 4 | 22.1 | 18.1 | 43.1 | 47.2 | 33.2 | 33.6 | 1.6 | 1.1 |
| **All** | **13.4** | **13.2** | **46.4** | **51.9** | **38.6** | **33.2** | **1.6** | **1.7** |

*Note:* Age when children started brushing based on recollection of parents.

Children residing in urban areas were more likely to use children's toothpaste than were children from rural areas (Table 2.39). This was the case for both young children (aged 5), who are recommended to use low-fluoride children's toothpaste, and for older children (aged 6–11), who are recommended to use standard-strength fluoride toothpaste (ARCPOH 2006).

**Table 2.39: Children using different types of toothpaste, by age and residence remoteness (per cent)**

| | Standard fluoride toothpaste | | Children's toothpaste | | Non-fluoridated toothpaste | | Don't know/not sure | |
|---|---|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 30.4 | 37.3 | 68.9 | 60.3 | 0.7 | 2.1 | 0.0 | 0.3 |
| 6 | 38.7 | 47.0 | 59.9 | 51.4 | 0.9 | 1.3 | 0.6 | 0.4 |
| 7 | 54.8 | 60.5 | 42.2 | 37.9 | 2.4 | 1.3 | 0.7 | 0.4 |
| 8 | 69.3 | 72.2 | 28.2 | 25.8 | 2.4 | 0.7 | 0.2 | 1.3 |
| 9 | 79.1 | 81.2 | 19.4 | 16.4 | 0.7 | 2.1 | 0.8 | 0.3 |
| 10 | 79.6 | 87.0 | 16.9 | 10.0 | 3.1 | 2.5 | 0.3 | 0.5 |
| 11 | 88.8 | 93.8 | 8.7 | 5.4 | 2.3 | 0.8 | 0.1 | 0.0 |
| 12 | 96.1 | 94.6 | 2.7 | 4.0 | 1.0 | 0.9 | 0.2 | 0.6 |
| 13 | 96.3 | 96.9 | 2.0 | 0.5 | 0.6 | 1.0 | 1.0 | 1.6 |
| 14 | 97.1 | 98.6 | 0.3 | 0.0 | 1.3 | 1.4 | 1.3 | 0.0 |
| 15 | 93.7 | 95.3 | 4.6 | 0.0 | 0.8 | 3.5 | 0.8 | 1.2 |
| **All** | **68.8** | **75.1** | **29.1** | **22.9** | **1.7** | **1.5** | **0.5** | **0.5** |

Children were more likely to use standard-strength fluoride toothpaste when they commenced brushing if they came from rural rather than urban areas (Table 2.40).

**Table 2.40: Children using different types of toothpaste by residence remoteness, at the age when first started brushing (per cent)**

| | Standard fluoride toothpaste | | Children's toothpaste | | Non-fluoridated toothpaste | | Don't know/not sure | |
|---|---|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 1 | 14.7 | 16.4 | 83.0 | 81.8 | 1.4 | 1.0 | 1.0 | 0.9 |
| 2 | 14.8 | 20.2 | 79.9 | 77.7 | 3.0 | 0.8 | 2.3 | 1.3 |
| 3 | 19.8 | 23.9 | 75.9 | 73.7 | 2.0 | 0.9 | 2.3 | 1.5 |
| 4 | 15.8 | 30.5 | 81.7 | 65.1 | 0.3 | 1.5 | 2.1 | 3.0 |
| **All** | **15.7** | **19.8** | **80.6** | **78.0** | **1.9** | **0.9** | **1.8** | **1.3** |

*Note:* Age when children started brushing based on recollection of parents.

Table 2.41 shows the percentages of children by age and area of residence who their parents believed to currently be often, sometimes or never eating or licking toothpaste. Parents believed very few children from either urban or rural areas were often eating or licking toothpaste. Overall, there were few differences in eating or licking toothpaste between children from rural areas and children from urban areas.

**Table 2.41: Children believed to be eating or licking toothpaste, by age and residence remoteness (per cent)**

| | Often | | Sometimes | | Never | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 3.1 | 2.8 | 34.1 | 38.7 | 62.7 | 58.5 |
| 6 | 2.0 | 1.4 | 25.0 | 26.3 | 73.0 | 72.3 |
| 7 | 1.5 | 2.0 | 18.4 | 26.2 | 80.1 | 71.8 |
| 8 | 1.3 | 2.9 | 12.9 | 18.5 | 85.8 | 78.6 |
| 9 | 1.0 | 0.3 | 12.8 | 15.1 | 86.3 | 84.5 |
| 10 | 0.1 | 0.0 | 11.5 | 9.2 | 88.4 | 90.8 |
| 11 | 1.0 | 0.6 | 7.6 | 11.2 | 91.4 | 88.2 |
| 12 | 1.5 | 0.8 | 6.8 | 8.5 | 91.7 | 90.7 |
| 13 | 0.4 | 0.0 | 5.9 | 8.4 | 93.6 | 91.6 |
| 14 | 0.0 | 1.4 | 3.2 | 7.1 | 96.8 | 91.5 |
| 15 | 0.0 | 1.2 | 1.7 | 3.5 | 98.3 | 95.3 |
| **All** | **1.3** | **1.2** | **15.1** | **17.3** | **83.7** | **81.5** |

There were few consistent results for toothpaste consumption when brushing first started by child location of residence (Table 2.42). A slightly higher proportion of children aged 1–3 from urban areas were believed to never eat or lick toothpaste compared with children from rural areas, but this relationship was reversed for children who first started brushing at age 4.

**Table 2.42: Children believed to be eating or licking toothpaste by residence remoteness, at the age when first started brushing (per cent)**

| | Often | | Sometimes | | Never | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 1 | 10.6 | 14.1 | 42.1 | 41.3 | 47.3 | 44.5 |
| 2 | 8.9 | 10.7 | 41.2 | 43.8 | 49.9 | 45.5 |
| 3 | 9.9 | 8.2 | 36.7 | 41.7 | 53.3 | 50.1 |
| 4 | 9.0 | 5.3 | 34.3 | 33.8 | 56.7 | 60.9 |
| **All** | **9.7** | **11.5** | **40.1** | **41.7** | **50.2** | **46.8** |

*Note:* Age when children started brushing based on recollection of parents.

Across most age groups, a higher proportion of children from urban areas were reported as using a child-sized (small) toothbrush in comparison with children residing in rural areas (Table 2.43). However, these differences were generally small.

**Table 2.43: Children using different-sized toothbrushes, by age and residence remoteness (per cent)**

| | Small size | | Regular size | |
|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 81.9 | 79.2 | 18.1 | 20.8 |
| 6 | 73.6 | 70.1 | 26.4 | 29.9 |
| 7 | 64.8 | 55.3 | 35.2 | 44.7 |
| 8 | 49.2 | 45.1 | 50.8 | 54.9 |
| 9 | 38.8 | 32.1 | 61.2 | 67.9 |
| 10 | 31.0 | 22.9 | 69.0 | 77.1 |
| 11 | 21.3 | 18.8 | 78.7 | 81.2 |
| 12 | 18.7 | 13.9 | 81.3 | 86.1 |
| 13 | 17.5 | 11.5 | 82.5 | 88.5 |
| 14 | 11.3 | 14.9 | 88.7 | 85.1 |
| 15 | 15.0 | 11.5 | 85.0 | 88.5 |
| **All** | **45.7** | **38.5** | **54.3** | **61.5** |

There were few differences between children residing in urban or rural areas in terms of the size of the toothbrush they used when they commenced brushing (Table 2.44). At least 92.7% of children from both urban and rural areas commenced brushing with a small toothbrush.

**Table 2.44: Children using different-sized toothbrushes by residence remoteness, at the age when first started brushing (per cent)**

| | Small size | | Regular size | |
|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** |
| 1 | 97.9 | 98.3 | 2.1 | 1.7 |
| 2 | 97.5 | 97.3 | 2.5 | 2.7 |
| 3 | 96.3 | 93.9 | 3.7 | 6.1 |
| 4 | 95.6 | 92.7 | 4.4 | 7.3 |
| **All** | **97.3** | **96.9** | **2.7** | **3.1** |

*Note:* Age when children started brushing based on recollection of parents.

The majority of children from both rural and urban areas rinsed and spat out the toothpaste remaining after brushing (Table 2.45). The prevalence of swallowing was very low for all children, and rinsing and swallowing was also uncommon. Across almost all age groups children from rural areas were somewhat less likely to rinse and spit and more likely to just spit than were children from urban areas. Overall, 9.0% of children from urban areas just spat out the toothpaste after brushing compared with 13.8%, on average, of children from rural areas.

**Table 2.45: Children with different behaviours following toothbrushing, by age and residence remoteness (per cent)**

| | Just swallow | | Rinse and swallow | | Rinse and spit | | Just spit | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 5 | 5.5 | 2.4 | 6.4 | 4.2 | 79.9 | 75.0 | 7.6 | 18.4 | 0.1 | 0.0 |
| 6 | 2.4 | 2.4 | 3.6 | 4.0 | 80.3 | 74.5 | 12.3 | 18.8 | 0.0 | 0.0 |
| 7 | 1.2 | 1.1 | 4.3 | 2.8 | 83.4 | 82.4 | 10.3 | 13.0 | 0.2 | 0.4 |
| 8 | 0.8 | 1.1 | 1.9 | 2.9 | 88.8 | 81.9 | 8.1 | 13.7 | 0.1 | 0.0 |
| 9 | 0.3 | 0.7 | 3.0 | 3.4 | 84.5 | 80.6 | 11.1 | 14.6 | 0.0 | 0.0 |
| 10 | 0.7 | 0.5 | 2.8 | 3.3 | 88.6 | 81.3 | 7.1 | 14.1 | 0.8 | 0.5 |
| 11 | 1.0 | 0.8 | 2.3 | 2.1 | 87.6 | 85.6 | 6.3 | 10.5 | 0.3 | 0.0 |
| 12 | 1.1 | 0.3 | 2.6 | 4.8 | 87.6 | 84.1 | 8.2 | 8.5 | 0.1 | 0.3 |
| 13 | 0.0 | 0.0 | 1.6 | 2.1 | 91.0 | 83.8 | 5.9 | 14.1 | 0.0 | 0.0 |
| 14 | 0.3 | 0.7 | 1.3 | 2.1 | 84.1 | 85.1 | 14.2 | 10.6 | 0.0 | 0.0 |
| 15 | 0.0 | 1.2 | 1.7 | 2.3 | 93.8 | 87.2 | 3.7 | 8.1 | 0.0 | 0.0 |
| **All** | **1.4** | **1.1** | **3.1** | **3.2** | **85.6** | **81.2** | **9.0** | **13.8** | **0.2** | **0.1** |

Children aged 1 or 2, when brushing commenced, from rural areas were also more likely to just spit rather than rinse and spit compared with same-aged children from urban areas (Table 2.46). However, differences for children who started brushing at the ages of 3 or 4 were less apparent.

**Table 2.46: Children with different behaviours following toothbrushing by residence remoteness, at the age when first started brushing (per cent)**

| | Just swallow | | Rinse and swallow | | Rinse and spit | | Just spit | | Other | |
|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural | Urban | Rural |
| 1 | 24.0 | 26.2 | 10.8 | 10.8 | 44.7 | 37.7 | 16.5 | 20.0 | 0.9 | 0.4 |
| 2 | 18.1 | 20.9 | 11.8 | 10.0 | 48.3 | 43.6 | 18.3 | 21.3 | 0.6 | 0.3 |
| 3 | 11.4 | 13.6 | 16.0 | 9.3 | 50.8 | 52.9 | 16.4 | 19.4 | 0.4 | 0.2 |
| 4 | 10.3 | 14.1 | 11.0 | 8.6 | 56.6 | 58.0 | 18.3 | 17.8 | 0.3 | 0.0 |
| **All** | **18.5** | **21.8** | **12.1** | **10.1** | **48.1** | **43.3** | **17.3** | **20.2** | **0.7** | **0.3** |

*Note:* Age when children started brushing based on recollection of parents.

There was a tendency across several of the age groups for children from rural areas to use a large amount of toothpaste more often when brushing in comparison with children from urban areas (Table 2.47). This was most apparent for children aged 6–8 and 12–15. Overall, a higher proportion of children from urban areas used a medium amount of toothpaste. However, results for some age groups were not consistent with the overall trend.

**Table 2.47: Children using different amounts of toothpaste by age and residence remoteness (per cent)**

| | Large amount | | Medium amount | | Small amount | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 22.4 | 21.1 | 55.2 | 59.3 | 22.4 | 19.6 |
| 6 | 19.5 | 25.6 | 62.6 | 56.6 | 18.0 | 17.8 |
| 7 | 28.1 | 34.5 | 54.6 | 52.7 | 17.3 | 12.8 |
| 8 | 31.9 | 40.2 | 55.9 | 47.9 | 12.2 | 11.9 |
| 9 | 39.5 | 37.7 | 52.2 | 51.6 | 8.4 | 10.6 |
| 10 | 42.8 | 41.7 | 45.4 | 49.5 | 11.7 | 8.8 |
| 11 | 50.9 | 51.0 | 42.3 | 41.7 | 6.8 | 7.2 |
| 12 | 46.3 | 58.6 | 46.6 | 34.6 | 7.1 | 6.9 |
| 13 | 53.7 | 56.8 | 39.6 | 37.0 | 6.7 | 6.3 |
| 14 | 51.8 | 58.9 | 43.9 | 36.9 | 4.3 | 4.3 |
| 15 | 57.4 | 62.1 | 33.9 | 29.9 | 8.7 | 8.0 |
| **All** | **36.2** | **40.7** | **51.3** | **48.1** | **12.5** | **11.2** |

There were few differences between children from urban and rural locations in relation to the amount of toothpaste used when they commenced brushing (Table 2.48).

**Table 2.48: Children using different amounts of toothpaste by residence remoteness, at the age when first started brushing (per cent)**

| | Large amount | | Medium amount | | Small amount | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 1 | 3.8 | 3.8 | 22.7 | 22.3 | 73.5 | 73.9 |
| 2 | 5.8 | 6.3 | 26.9 | 25.0 | 67.4 | 68.7 |
| 3 | 7.9 | 9.6 | 32.6 | 33.9 | 59.5 | 56.5 |
| 4 | 11.4 | 11.1 | 34.6 | 33.7 | 54.0 | 55.2 |
| **All** | **5.9** | **6.0** | **27.0** | **25.6** | **67.1** | **68.4** |

*Note:* Age when children started brushing based on recollection of parents.

# 3 Fluoride tablet and drop use

A high percentage of Australian children live in areas where the tap-water contains an amount of fluoride that is beneficial for oral health. The process of adding fluoride compounds to public water supplies, termed water fluoridation, has long been hailed as an extremely important and effective public health measure for improving the oral health of both children and adults. In 2001, almost 70% of children were believed to have access to optimally fluoridated public drinking water (Armfield 2006).

Every Australian capital city had introduced fluoridated tap-water by the 1970s with the exception of Brisbane, which commenced water fluoridation in late 2008. However, large areas of rural and remote Australia have not historically had fluoridated water. Throughout Queensland and elsewhere in rural Australia, children who could not obtain the benefits of consuming fluoridated water were recommended for many years to use fluoride tablets or drops as a substitute for fluoridated water. However, the evidence for the effectiveness of fluoride supplements in the form of tablets or drops is quite limited, and there are studies showing that their consumption is associated with an increased risk of dental fluorosis (ARCPOH 2006). The 2006 Australian guidelines on the use of fluorides therefore recommended that tablets or drops that are chewed or swallowed, rather than mixed into drinking water at an optimum concentration, should not be consumed (ARCPOH 2006). The following tables in this section present data on the use of fluoride tablets and drops by Australian children prior to this recommendation.

The overall use of fluoride tablets and drops in the four areas surveyed in this study (Queensland, Victoria, South Australia and Tasmania) was low. The percentage of children who had used fluoride tablets or drops at any point in their life ranged from 6.2% for 5 year olds to 11.0% for 14 year olds (Table 3.1). Fluoride tablets were more commonly used than were fluoride drops and 1.2% of children had used both tablets and drops at some point during their life. A small number of parents could not remember whether or not their child had ever consumed fluoride tablets or drops, and the percentage who could not remember increased slightly for older children.

**Table 3.1: Children having ever used fluoride tablets or drops by age (per cent)**

| Age (years) | Fluoride tablets | Fluoride drops | Tablets and drops | Never used | Don't know |
|---|---|---|---|---|---|
| 5 | 1.5 | 3.8 | 0.9 | 93.2 | 0.6 |
| 6 | 2.4 | 3.6 | 1.2 | 91.6 | 1.2 |
| 7 | 2.9 | 2.9 | 1.1 | 92.5 | 0.6 |
| 8 | 3.6 | 2.8 | 1.2 | 91.6 | 0.9 |
| 9 | 2.8 | 2.1 | 1.2 | 92.3 | 1.5 |
| 10 | 4.1 | 2.0 | 1.4 | 91.1 | 1.4 |
| 11 | 4.1 | 2.0 | 1.2 | 91.0 | 1.7 |
| 12 | 4.8 | 2.2 | 1.3 | 89.5 | 2.2 |
| 13 | 5.1 | 3.3 | 1.1 | 88.3 | 2.3 |
| 14 | 7.1 | 2.4 | 1.5 | 86.3 | 2.6 |
| 15 | 4.4 | 2.6 | 1.8 | 88.3 | 2.9 |
| **All** | **3.4** | **2.7** | **1.2** | **91.3** | **1.4** |

Figure 3.1 shows the proportion of children who were recorded as using fluoride tablets or drops at the time of the survey. Percentages were low, ranging from 0.7% for 13 year olds to 3.1% of 8 year olds. The discrepancy between the proportions of children who had ever consumed fluoride tablets or drops and the percentages currently consuming fluoride tablets or drops indicated that a substantial number of children who had at one point taken fluoride tablets or drops had since ceased this behaviour.

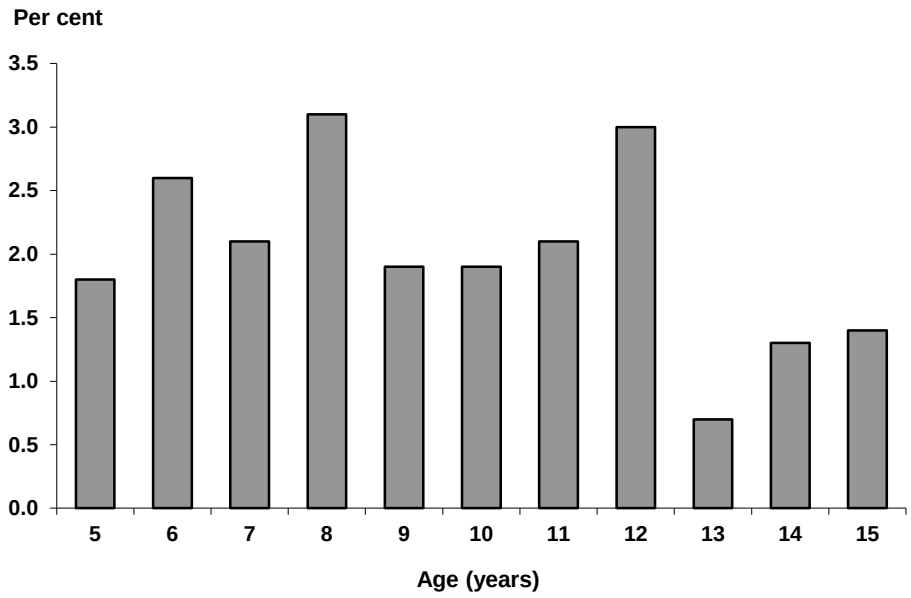



**Figure 3.1: Children using fluoride tablets or drops by age (per cent)**

Approximately 61% of the 7.3% of children who had ever consumed tablets or drops, were aged under 3 at the time they commenced using fluoride tablets or drops (Figure 3.2). Just over one-quarter of children who took tablets or drops commenced doing so during their first year of life. The high percentage of children commencing taking fluoride tablets or drops at an early age is of concern given other reported findings (ARCPOH 2006) showing that use of fluoride supplements in pre-school years is associated with an increased risk of dental fluorosis.

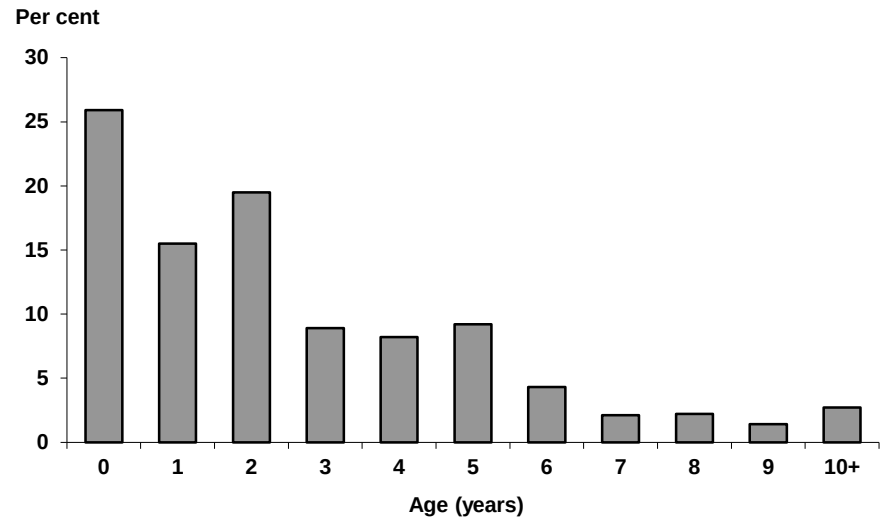



**Figure 3.2: Age when first started using fluoride tablets or drops (per cent)**

About 70% of all children who had at one point consumed fluoride tablets or drops had ceased taking them at the time of participation in the survey (Figure 3.3). Of those children who had ceased consuming fluoride tablets or drops, approximately 30% stopped taking them between the ages of 4 and 6. Just under 50% had ceased consuming fluoride supplements by the age of 5.

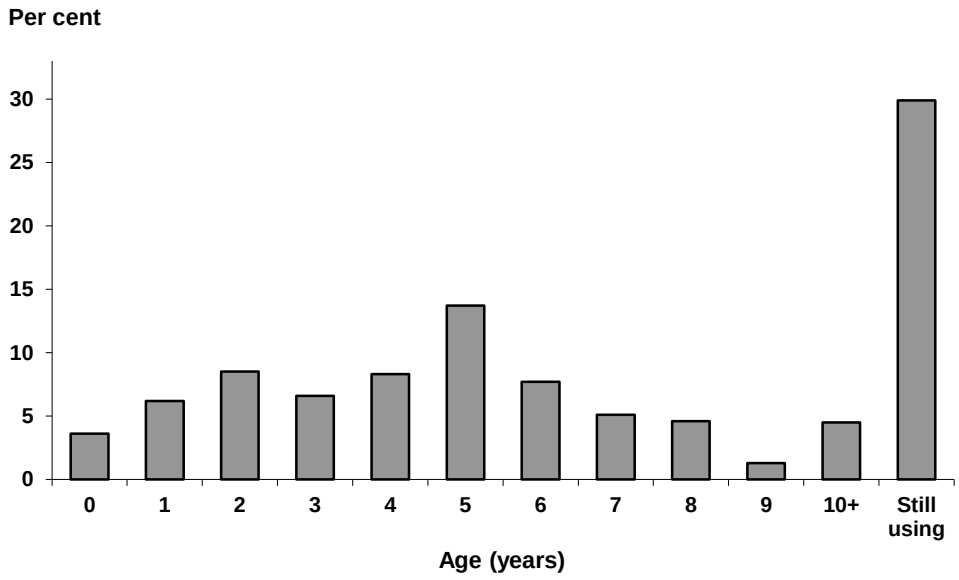



**Figure 3.3: Age when stopped using fluoride tablets or drops (per cent)**

Most children who started using fluoride tablets or drops ceased using them within a reasonably short period of time (Table 3.2). Children who were younger when they commenced using fluoride supplements were more likely than older children to stop using them sooner. Between 55.8% and 58.0% of 5 and 6 year olds ceased consuming fluoride supplements within 3 years of commencement. However, only 24.6–48.4% of children aged 7 or over ceased using fluoride tablets or drops within 3 years of commencing taking them. Children aged between 5 and 8 when they commenced taking fluoride supplements were more likely to still be taking them (30.1–44.1%) than were children aged 9 or older (6.5–34.8%).

**Table 3.2: Children using fluoride tablets or drops, by average length of time (in years) using by age (per cent)**

| Age (years) | 0–<1 year | 1–<2 years | 2–<3 years | 3–<4 years | 4–<5 years | 5–<6 years | 6–<7 years | 7–<8 years | 8+ years | Still using |
|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 24.7 | 20.4 | 12.9 | 9.7 | 1.1 | 1.1 | . . | . . | . . | 30.1 |
| 6 | 25.5 | 20.0 | 10.3 | 4.2 | 3.0 | 1.8 | 0.0 | . . | . . | 35.2 |
| 7 | 15.0 | 21.8 | 11.6 | 8.8 | 2.0 | 6.8 | 0.7 | 0.7 | . . | 32.7 |
| 8 | 10.3 | 18.6 | 13.1 | 5.5 | 2.8 | 4.1 | 0.7 | 0.7 | 0.0 | 44.1 |
| 9 | 12.7 | 19.1 | 8.2 | 7.3 | 8.2 | 3.6 | 4.5 | 9.1 | 0.9 | 26.4 |
| 10 | 17.7 | 18.4 | 10.2 | 7.5 | 8.8 | 4.1 | 2.7 | 5.4 | 3.4 | 21.8 |
| 11 | 9.4 | 18.9 | 18.1 | 4.7 | 3.1 | 5.5 | 4.7 | 3.1 | 3.9 | 28.3 |
| 12 | 4.3 | 8.7 | 22.8 | 8.7 | 4.3 | 1.1 | 4.3 | 4.3 | 6.5 | 34.8 |
| 13 | 6.5 | 29.0 | 12.9 | 12.9 | 9.7 | 4.8 | 4.8 | 0.0 | 12.9 | 6.5 |
| 14 | 5.3 | 14.0 | 5.3 | 45.6 | 7.0 | 3.5 | 1.8 | 3.5 | 5.3 | 8.8 |
| 15 | 10.3 | 6.9 | 10.3 | 10.3 | 13.8 | 3.4 | 3.4 | 10.3 | 20.7 | 10.3 |
| **All** | **14.3** | **18.7** | **12.5** | **9.1** | **4.9** | **3.7** | **2.2** | **2.8** | **2.9** | **28.9** |

. . = not applicable

The most common frequency of consumption of fluoride tablets or drops was once a day, which was adopted by more than 50% of the children using the supplements (Table 3.3). Of the 1% of children who use fluoride tablets or drops once a day, use was more common among children aged 0–6 months (75.3%) than among children aged 4 and older (53.5%). Just over one-quarter of children aged 4 and older only used fluoride supplements infrequently or once a week, compared with only 8.9% of children aged up to 6 months.

**Table 3.3: Frequency of taking fluoride tablets or drops, by age group (per cent)**

| | Age | | |
|---|---|---|---|
| **Frequency of use** | **0–6 months** | **6 months – 4 years** | **4+ years** |
| >1 per day | 1.5 | 1.7 | 2.7 |
| 1 per day | 75.3 | 66.5 | 53.5 |
| 5–6 per week | 3.5 | 2.9 | 3.8 |
| 2–4 per week | 10.9 | 12.3 | 12.2 |
| 1 per week | 2.1 | 7.0 | 11.4 |
| Infrequent | 6.8 | 9.5 | 16.5 |

How children consumed fluoride tablets or drops is an important determinant of the outcome of using these products. When parents were asked how their child normally took their fluoride tablets or drops, 43.0% responded that their child would chew the tablets and then swallow. A further 27.6% responded that their child just swallowed them. Only 21.4% dissolved the tablets or drops in a glass of water before consuming them, and a very small proportion (1.8%) dissolved the supplements in a litre of water and then drank them. The remaining 9.9% of children took their fluoride tablets or drops in some other way.

Of the children who use fluoride tablets or drops, dissolving supplements in a glass of water was the most common way for 5 year old children to take fluoride tablets or drops (Table 3.4). However, only 8.6–17.7% of children aged between 7 and 11 who used supplements took the supplements this way—the most common usage for children within this age range was to chew and swallow (45.2–55.8%). The percentage of children just swallowing fluoride supplements did not change consistently across the age range.

**Table 3.4: Method of taking fluoride tablets/drops, by child age (per cent)**

| Age (years) | Swallowing | Chewing and swallowing | Dissolving in a glass of water | Dissolving in a litre of water | Taken in another way |
|---|---|---|---|---|---|
| 5 | 26.6 | 28.7 | 34.0 | 2.1 | 13.8 |
| 6 | 31.2 | 37.0 | 26.6 | 2.9 | 6.9 |
| 7 | 27.8 | 45.6 | 17.7 | 1.9 | 13.9 |
| 8 | 27.5 | 45.2 | 15.0 | 3.6 | 8.4 |
| 9 | 27.1 | 46.6 | 17.3 | 1.5 | 10.6 |
| 10 | 28.8 | 55.8 | 16.0 | 0.6 | 3.7 |
| 11 | 33.1 | 46.4 | 8.6 | 1.4 | 15.8 |
| 12 | 22.0 | 35.2 | 32.4 | 1.8 | 12.0 |
| 13 | 19.4 | 43.3 | 28.4 | 0.0 | 10.4 |
| 14 | 18.6 | 31.7 | 47.5 | 0.0 | 3.3 |
| 15 | 33.3 | 45.2 | 10.0 | 0.0 | 9.7 |
| **All** | **27.6** | **43.0** | **21.4** | **1.8** | **9.9** |

*Note:* Parents allowed to indicate more than one response. Row totals may exceed 100%.

# 4 Mouthrinse use

Mouthrinses are liquid solutions, sometimes containing fluoride, that are promoted as contributing to better oral health. There is evidence that mouthrinses can be effective at killing oral bacteria involved in diseases of the gums and teeth. In particular, mouthrinses with added fluoride are beneficial in reducing dental decay (Marinho et al. 2003b). In this survey parents were specifically asked whether or not their child used a fluoride mouthrinse.

The proportion of children who had ever used a fluoride mouthrinse was reasonably low, but increased relatively consistently across increasing age groups (Table 4.1). Only 4.1–5.6% of children aged 5–7 had ever used a fluoride mouthrinse, but 15.3% of 15 year olds had done so at some time.

**Table 4.1: Children having ever used a fluoride mouthrinse, by age (per cent)**

| Age (years) | Yes | No | Don't know |
|---|---|---|---|
| 5 | 5.1 | 93.2 | 1.7 |
| 6 | 4.1 | 93.5 | 2.4 |
| 7 | 5.6 | 92.1 | 2.3 |
| 8 | 6.8 | 90.0 | 3.2 |
| 9 | 8.4 | 89.7 | 1.9 |
| 10 | 10.5 | 86.8 | 2.7 |
| 11 | 12.2 | 84.1 | 3.7 |
| 12 | 12.5 | 83.8 | 3.7 |
| 13 | 13.3 | 81.7 | 5.1 |
| 14 | 11.8 | 84.6 | 3.6 |
| 15 | 15.3 | 81.2 | 3.5 |
| **All** | **8.4** | **88.8** | **2.8** |

The proportion of children who were using a fluoride mouthrinse at the time of the survey followed the same general trend as demonstrated by the percentage of children who had ever used a mouthrinse. Only 2.6% of 5 year olds were using a fluoride mouthrinse, but at least 9.8% of 12–15 year olds were currently using a fluoride mouthrinse (Figure 4.1).

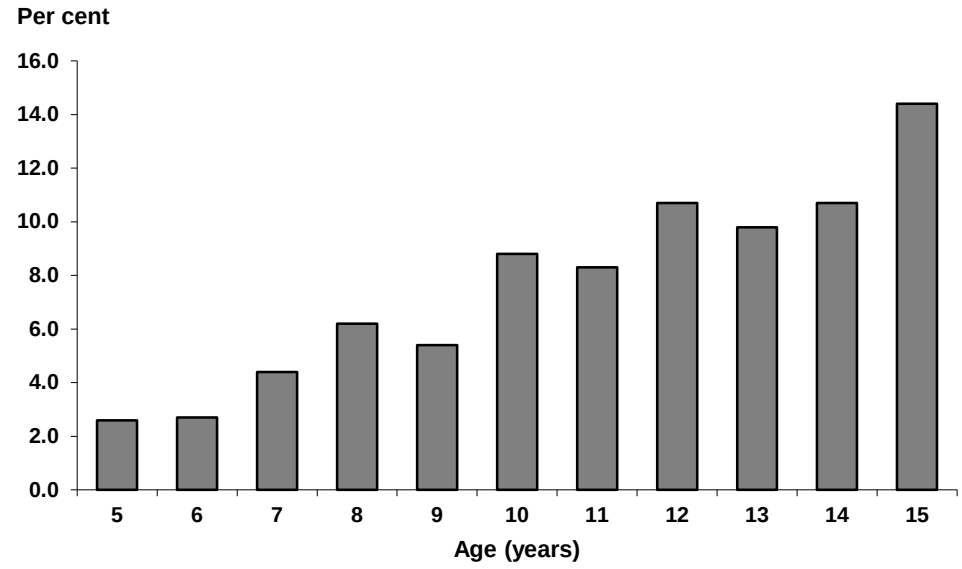



**Figure 4.1: Children currently using a fluoride mouthrinse by age (per cent)**

Very few children started using fluoride mouthrinses before the age of 4 (Figure 4.2). However, 27.4% of children started using a fluoride mouthrinse before the age of 6. This is contrary to the Australian guidelines on fluoride use which state that children below the age of 6 should not use a fluoride mouthrinse (ARCPOH 2006). Almost one-third (30.1%) of children did not start using a fluoride mouthrinse until at least the age of 10.

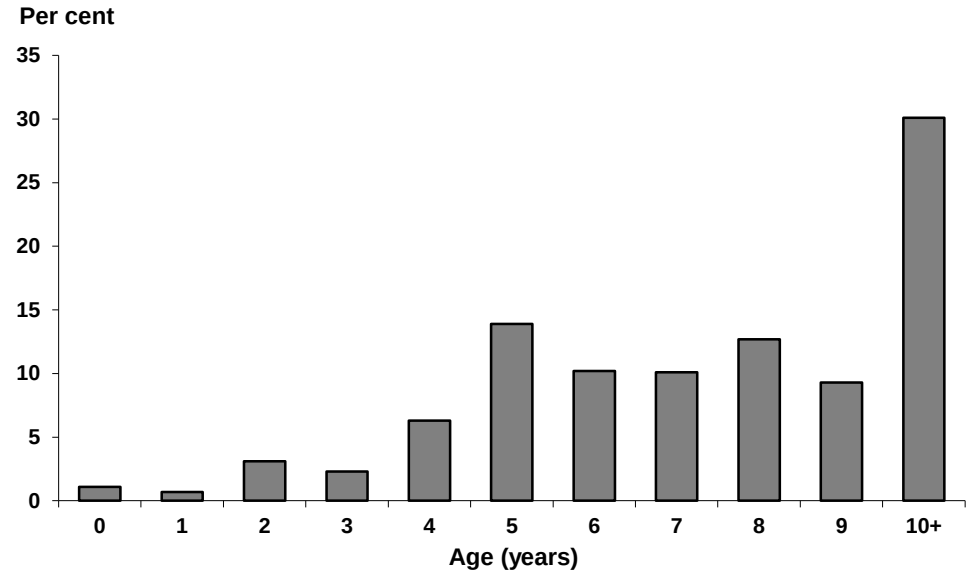



**Figure 4.2: Age when first started using a fluoride mouthrinse (per cent)**

Of those children surveyed, who had started using a fluoride mouthrinse, approximately three-quarters (76.6%) were still using it at the time of the study (Figure 4.3). A total of 9.9% of children had ceased using a fluoride mouthrinse between the ages of 4 and 6.

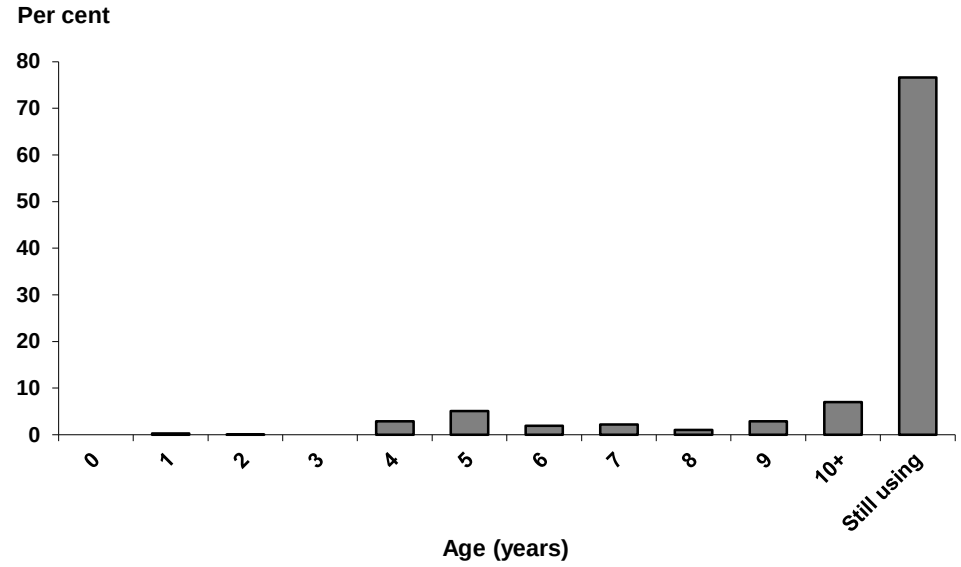



**Figure 4.3: Age when stopped using a fluoride mouthrinse (per cent)**

The most common frequency of fluoride mouthrinse use at the time children started using it was once a day for young children, whereas the most common frequency for children aged 4–5 was a few times a week (Table 4.2). For children aged 6 and older the most common usage pattern was infrequently.

**Table 4.2: Children with different mouth-rinsing frequencies, by age when commenced using (per cent)**

| Age (years) | Every day | A few times a week | Once a week | Infrequently |
|---|---|---|---|---|
| 0 | 12.5 | 12.5 | 12.5 | 62.5 |
| 1 | 57.1 | 14.3 | 14.3 | 14.3 |
| 2 | 58.1 | 16.3 | 2.3 | 23.3 |
| 3 | 53.1 | 28.1 | 9.4 | 9.4 |
| 4 | 18.2 | 45.5 | 19.7 | 16.7 |
| 5 | 24.8 | 32.7 | 16.4 | 26.1 |
| 6 | 25.0 | 25.7 | 20.0 | 29.3 |
| 7 | 11.5 | 36.7 | 12.9 | 38.8 |
| 8 | 24.9 | 30.2 | 10.1 | 34.9 |
| 9 | 18.2 | 21.2 | 10.6 | 50.0 |
| 10+ years | 23.5 | 36.5 | 11.0 | 28.9 |
| **All** | **23.9** | **31.9** | **12.8** | **31.4** |

Parents were asked how often their child used a fluoride mouthrinse 'now or when he/she stopped using it'. The most commonly reported usage frequencies were a few times a week (32.2%), followed by infrequently (31.6%) and every day (23.0%), while use once a week was reported by less than 14% of parents (Table 4.3). There were few differences in fluoride mouthrinse use by age, except that reported use once a week decreased for older children.

**Table 4.3: Children with different mouth-rinsing frequencies, by age, currently or when finished using (per cent)**

| Age (years) | Every day | A few times a week | Once a week | Infrequently |
|---|---|---|---|---|
| 5 | 20.3 | 39.1 | 28.1 | 12.5 |
| 6 | 28.9 | 21.1 | 22.2 | 27.8 |
| 7 | 19.5 | 30.9 | 16.3 | 33.3 |
| 8 | 21.2 | 31.4 | 16.8 | 30.7 |
| 9 | 19.5 | 31.8 | 11.7 | 37.0 |
| 10 | 13.4 | 39.7 | 9.5 | 37.5 |
| 11 | 28.8 | 22.8 | 15.8 | 32.6 |
| 12 | 14.2 | 45.9 | 8.8 | 31.1 |
| 13 | 25.0 | 32.4 | 5.9 | 36.8 |
| 14 | 20.7 | 31.0 | 10.3 | 37.9 |
| 15 | 36.2 | 31.9 | 8.5 | 23.4 |
| **All** | **23.0** | **32.2** | **13.2** | **31.6** |

Table 4.4 shows the average age when children started and stopped using a fluoride mouthrinse by the age of the child at the time they participated in the study. The actual age of children results in an increase in the starting and stopping ages across older age groups. There was no consistent pattern in differences between lower and higher income families in relation to when children started or stopped using a fluoride mouthrinse. Overall, children from lower income families commenced using a fluoride mouthrinse approximately 8 months earlier than did children from higher income families. However, the age of those children who ceased using a fluoride mouthrinse was somewhat younger for children from lower income families (average = 9.6 years) than for children from higher income families (average = 10.2 years). Across most age groups, there were higher proportions of children from lower income families using a fluoride mouthrinse at the time of the survey compared with children from higher income families, although many of these differences were not large.

**Table 4.4: Average age of children (years) when started and stopped using a fluoride mouthrinse and percentage of children using a fluoride mouthrinse, by age and household income**

| | Started using mouthrinse (average in months) | | | Stopped using mouthrinse (average in months) | | | Currently using mouthrinse (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 5 | 3.1 | 5.0 | 5.1 | 4.8 | 5.6 | 5.5 | 3.5 | 2.2 | 0.9 |
| 6 | 4.8 | 5.3 | 4.6 | 5.6 | 6.4 | 6.7 | 1.7 | 3.9 | 2.9 |
| 7 | 5.5 | 5.5 | 5.7 | 7.3 | 7.2 | 7.2 | 5.9 | 3.8 | 3.4 |
| 8 | 5.9 | 7.1 | 6.8 | 8.4 | 8.5 | 8.4 | 6.1 | 5.9 | 5.5 |
| 9 | 6.3 | 6.9 | 7.0 | 8.2 | 9.1 | 9.4 | 6.8 | 3.4 | 4.4 |
| 10 | 8.6 | 8.1 | 8.2 | 10.2 | 10.2 | 10.2 | 10.1 | 7.6 | 6.0 |
| 11 | 7.7 | 9.1 | 9.8 | 10.2 | 11.2 | 10.9 | 7.5 | 8.4 | 9.6 |
| 12 | 10.1 | 10.0 | 11.1 | 12.2 | 12.1 | 12.5 | 10.5 | 11.0 | 6.1 |
| 13 | 10.0 | 9.3 | 11.0 | 12.8 | 13.0 | 13.3 | 9.9 | 8.4 | 12.4 |
| 14 | 11.2 | 9.5 | 7.2 | 14.3 | 14.2 | 14.7 | 15.1 | 7.5 | 7.5 |
| 15 | 10.1 | 11.5 | 13.1 | 15.3 | 15.3 | 15.5 | 12.6 | 17.5 | 11.4 |
| **All** | **7.3** | **8.0** | **8.2** | **9.6** | **10.1** | **10.1** | **6.9** | **6.0** | **5.3** |

There were few differences in mouthrinsing frequency by household income (Table 4.5).

**Table 4.5: Percentage of children with different mouth-rinsing frequencies, by age and household income**

| | Every day | | | A few times a week | | | Once a week | | | Infrequently | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age (years) | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K | ≤$40K | >$40K–$80K | >$80K |
| 5 | 20.0 | 24.0 | 33.3 | 13.3 | 28.0 | 33.3 | 3.3 | 32.0 | 0.0 | 63.3 | 16.0 | 33.3 |
| 6 | 20.6 | 26.5 | 60.0 | 14.7 | 14.7 | 10.0 | 11.8 | 35.3 | 0.0 | 52.9 | 23.5 | 30.0 |
| 7 | 24.6 | 38.7 | 10.0 | 18.5 | 16.1 | 30.0 | 9.2 | 9.7 | 0.0 | 47.7 | 35.5 | 60.0 |
| 8 | 18.6 | 29.2 | 35.0 | 23.7 | 27.1 | 10.0 | 6.8 | 14.6 | 5.0 | 50.8 | 29.2 | 50.0 |
| 9 | 18.4 | 19.2 | 9.5 | 20.7 | 23.1 | 23.8 | 10.3 | 7.7 | 9.5 | 50.6 | 50.0 | 57.1 |
| 10 | 18.7 | 20.5 | 36.8 | 29.7 | 21.9 | 15.8 | 16.5 | 12.3 | 0.0 | 35.2 | 45.2 | 47.4 |
| 11 | 25.0 | 18.5 | 55.6 | 31.7 | 33.8 | 22.2 | 13.3 | 10.8 | 7.4 | 30.0 | 36.9 | 14.8 |
| 12 | 37.0 | 14.3 | 0.0 | 24.1 | 53.1 | 72.7 | 3.7 | 4.1 | 18.2 | 35.2 | 28.6 | 9.1 |
| 13 | 18.8 | 23.5 | 7.7 | 46.9 | 17.6 | 0.0 | 0.0 | 11.8 | 7.7 | 34.4 | 47.1 | 84.6 |
| 14 | 28.6 | 12.5 | 20.0 | 28.6 | 43.8 | 0.0 | 10.7 | 12.5 | 0.0 | 32.1 | 31.3 | 80.0 |
| 15 | 44.4 | 31.8 | 25.0 | 27.8 | 45.5 | 75.0 | 11.1 | 9.1 | 0.0 | 16.7 | 13.6 | 0.0 |
| **All** | **26.7** | **22.7** | **28.0** | **23.7** | **29.5** | **22.3** | **9.4** | **13.8** | **5.1** | **40.3** | **34.1** | **44.6** |

Other than for children aged 6–8, the percentage of children using a fluoride mouthrinse was higher among those from urban areas than from rural areas (Table 4.6).

**Table 4.6: Children having ever used a fluoride mouthrinse, by age and residence remoteness (per cent)**

| | Yes | | No | | Don't know | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 5.6 | 3.9 | 92.9 | 94.5 | 1.5 | 1.7 |
| 6 | 3.0 | 4.1 | 94.7 | 94.5 | 2.3 | 1.4 |
| 7 | 5.1 | 7.5 | 92.5 | 90.4 | 2.4 | 2.1 |
| 8 | 6.7 | 6.9 | 90.5 | 89.4 | 2.8 | 3.6 |
| 9 | 9.6 | 5.6 | 88.6 | 92.0 | 1.7 | 2.4 |
| 10 | 10.7 | 9.0 | 87.0 | 87.0 | 2.3 | 4.0 |
| 11 | 13.1 | 9.6 | 83.5 | 86.1 | 3.5 | 4.4 |
| 12 | 13.1 | 11.3 | 83.6 | 84.1 | 3.3 | 4.6 |
| 13 | 13.6 | 12.1 | 80.9 | 83.3 | 5.5 | 4.5 |
| 14 | 11.8 | 11.6 | 84.8 | 85.0 | 3.4 | 3.4 |
| 15 | 16.0 | 13.6 | 81.2 | 80.7 | 2.8 | 5.7 |
| **All** | **8.5** | **7.7** | **88.9** | **89.2** | **2.6** | **3.1** |

Differences between urban and rural-dwelling children in the age they started and stopped using a fluoride mouthrinse were inconsistent, with no clear pattern or trend across age groups (Table 4.7). Children residing in urban areas were more likely to be currently using a fluoride mouthrinse than were children residing in rural areas.

**Table 4.7: Average age of children (years) when they started and stopped using a fluoride mouthrinse and percentage of children using a fluoride mouthrinse, by age and residence remoteness**

| | Started using mouthrinse (average age in years) | | Stopped using mouthrinse (average age in years) | | Currently using mouthrinse (%) | |
|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 3.6 | 4.3 | 5.1 | 5.3 | 2.6 | 2.5 |
| 6 | 5.3 | 4.8 | 6.4 | 6.3 | 2.5 | 3.7 |
| 7 | 5.5 | 5.5 | 7.3 | 7.1 | 4.1 | 5.7 |
| 8 | 6.6 | 6.6 | 8.4 | 8.4 | 6.1 | 6.2 |
| 9 | 6.5 | 6.9 | 8.5 | 8.7 | 6.1 | 4.0 |
| 10 | 8.3 | 8.1 | 10.1 | 9.9 | 9.3 | 6.9 |
| 11 | 8.5 | 8.8 | 10.6 | 11.0 | 8.7 | 6.9 |
| 12 | 10.4 | 9.2 | 12.3 | 12.0 | 11.1 | 9.7 |
| 13 | 10.3 | 9.3 | 13.1 | 12.2 | 10.6 | 8.0 |
| 14 | 10.2 | 10.8 | 14.4 | 14.2 | 10.9 | 9.5 |
| 15 | 11.3 | 10.2 | 15.3 | 15.2 | 15.1 | 12.4 |
| **All** | **7.8** | **7.6** | **9.9** | **9.8** | **6.6** | **6.0** |

There were no consistent differences between children residing in rural or urban locations in relation to frequency of mouth-rinsing for those who were currently using or had stopped using a fluoride mouthrinse (Table 4.8).

**Table 4.8: Children with different mouth-rinsing frequencies, by age and residence remoteness (per cent)**

| | Every day | | A few times a week | | Once a week | | Infrequently | |
|---|---|---|---|---|---|---|---|---|
| **Age (years)** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| 5 | 20.8 | 21.4 | 20.8 | 21.4 | 16.7 | 21.4 | 41.7 | 35.7 |
| 6 | 32.7 | 17.9 | 9.1 | 17.9 | 14.5 | 32.1 | 43.6 | 32.1 |
| 7 | 28.6 | 16.7 | 16.7 | 30.6 | 3.6 | 19.4 | 51.2 | 33.3 |
| 8 | 28.3 | 11.8 | 22.6 | 38.2 | 6.6 | 11.8 | 42.5 | 38.2 |
| 9 | 16.5 | 17.1 | 22.9 | 22.9 | 9.2 | 8.6 | 51.4 | 51.4 |
| 10 | 19.0 | 21.3 | 30.6 | 19.1 | 12.9 | 12.8 | 37.4 | 46.8 |
| 11 | 30.4 | 16.2 | 26.4 | 43.2 | 12.0 | 5.4 | 31.2 | 35.1 |
| 12 | 18.6 | 37.0 | 46.1 | 14.8 | 5.9 | 14.8 | 29.4 | 33.3 |
| 13 | 18.0 | 25.0 | 28.0 | 31.3 | 4.0 | 6.3 | 50.0 | 37.5 |
| 14 | 21.1 | 16.7 | 34.2 | 16.7 | 7.9 | 16.7 | 36.8 | 50.0 |
| 15 | 35.1 | 30.0 | 40.5 | 40.0 | 10.8 | 10.0 | 13.5 | 20.0 |
| **All** | **26.3** | **19.2** | **26.1** | **26.3** | **9.1** | **14.6** | **38.4** | **39.9** |

# Appendix: Questionnaire items used to collect information on dental health behaviours of children

Has your child ever brushed his/her teeth with toothpaste (with or without help from an adult)? *(Tick one box only)*

☐$_1$ Yes ☐$_2$ No

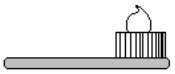
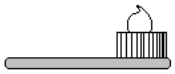
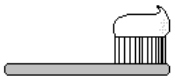
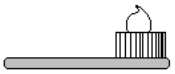
**At what age did he/she start brushing with toothpaste (with or without help from an adult)?**

*(Write age)* …… ……

Years Months

***For the following questions, please tick one box only for each time period in your child's life.***

| | WHEN YOUR CHILD STARTED BRUSHING | AT AGE 5 | NOW |
|---|---|---|---|
| a) **How often did/does your child brush his/her teeth with toothpaste?** | ☐$_1$ Less than once a day<br>☐$_2$ Once a day<br>☐$_3$ Twice a day<br>☐$_4$ More than twice a day | ☐$_1$ Less than once a day<br>☐$_2$ Once a day<br>☐$_3$ Twice a day<br>☐$_4$ More than twice a day | ☐$_1$ Less than once a day<br>☐$_2$ Once a day<br>☐$_3$ Twice a day<br>☐$_4$ More than twice a day |
| b) **What type of toothpaste did/does your child use?** | ☐$_1$ Standard fluoride toothpaste<br>☐$_2$ Children's toothpaste<br>☐$_3$ Non-fluoridated paste<br>☐$_4$ Don't know/not sure | ☐$_1$ Standard fluoride toothpaste<br>☐$_2$ Children's toothpaste<br>☐$_3$ Non-fluoridated paste<br>☐$_4$ Don't know/not sure | ☐$_1$ Standard fluoride toothpaste<br>☐$_2$ Children's toothpaste<br>☐$_3$ Non-fluoridated paste<br>☐$_4$ Don't know/not sure |
| c) **Have you noticed your child eating or licking toothpaste?** | ☐$_1$ Often<br>☐$_2$ Sometimes<br>☐$_3$ Never | ☐$_1$ Often<br>☐$_2$ Sometimes<br>☐$_3$ Never | ☐$_1$ Often<br>☐$_2$ Sometimes<br>☐$_3$ Never |
| d) **What size of toothbrush did/does your child use?** | *(If your child uses an electric toothbrush, please tick 'Small size')*<br>☐$_1$ Small size<br>☐$_2$ Regular size | ☐$_1$ Small size<br>☐$_2$ Regular size | ☐$_1$ Small size<br>☐$_2$ Regular size |

| | | | |
|---|---|---|---|
| e) **After toothbrushing did/does your child usually…** | ☐1 just swallow<br>☐2 rinse and swallow<br>☐3 rinse and spit<br>☐4 just spit<br>☐5 other<br>☐6 don't know | ☐1 just swallow<br>☐2 rinse and swallow<br>☐3 rinse and spit<br>☐4 just spit<br>☐5 other<br>☐6 don't know | ☐1 just swallow<br>☐2 rinse and swallow<br>☐3 rinse and spit<br>☐4 just spit<br>☐5 other<br>☐6 don't know |
| f) **How much toothpaste did/does your child (or do you) use on his/her toothbrush?** | ☐1  <br>☐2  <br>☐3  | ☐1  <br>☐2  <br>☐3  | ☐1  <br>☐2  <br>☐3  |

**Has your child ever taken fluoride tablets or drops?** *(Tick one box only)*

☐1 Yes, fluoride tablets only

☐2 Yes, fluoride drops only

☐3 Yes, fluoride tablets and fluoride drops

☐4 No

☐5 Don't know

**At what age did your child …**

| | | |
|---|---|---|
| **start taking fluoride tablets or drops?** | …… | …… |
| *(Write age or '0' if used since birth)* | Years | Months |
| **stop taking fluoride tablets or drops?** | …… | …… |
| *(Write age or 'still taking')* | Years | Months |

**How often did /does your child take tablets or drops?**

*(Tick one box only for each age group)*

| BIRTH – 6 MONTHS | 6 MONTHS – 4 YEARS | OVER 4 YEARS |
|---|---|---|
| ☐1 More than once a day | ☐1 More than once a day | ☐1 More than once a day |
| ☐2 Once a day | ☐2 Once a day | ☐2 Once a day |
| ☐3 5 to 6 times a week | ☐3 5 to 6 times a week | ☐3 5 to 6 times a week |
| ☐4 2 to 4 times a week | ☐4 2 to 4 times a week | ☐4 2 to 4 times a week |
| ☐5 Once a week | ☐5 Once a week | ☐5 Once a week |
| ☐6 Infrequently/varied | ☐6 Infrequently/varied | ☐6 Infrequently/varied |
| ☐7 Did not take at this age | ☐7 Did not take at this age | ☐7 Did not take at this age |

**How did/does your child usually take fluoride tablets or drops?** *(Tick as many boxes as applicable)*

☐1 Swallowing
☐2 Chewing and swallowing
☐3 Dissolved in a glass of water
☐4 Dissolved in a litre of water
☐5 Taken in another way

**Has your child ever used <u>fluoride</u> mouthrinse?** *(Tick one box only)*

Please note that not all mouthrinses contain fluoride. If possible, check the ingredients on the bottle.

☐1 Yes
☐2 No
☐3 Don't know

**At what age did your child …**

| | | |
|---|---|---|
| **start using fluoride mouthrinse?** | …… | …… |
| *(Write age or '0' if used since birth)* | Years | Months |
| **stop using fluoride mouthrinse?** | …… | …… |
| *(Write age or 'still taking')* | Years | Months |

**How often did/does your child use fluoride mouthrinse at the following times?**

*(Tick one box only for each time period)*

| When he/she started using it | Now or when he/she stopped using it |
|---|---|
| ☐1 Every day | ☐1 Every day |
| ☐2 A few times a week | ☐2 A few times a week |
| ☐3 Once a week | ☐3 Once a week |
| ☐4 Infrequently | ☐4 Infrequently |

# References


Armfield JM 2006. The extent of water fluoridation coverage in Australia. Australian and New Zealand Journal of Public Health 30:581–2.

Armfield JM & Brennan DS 2009. Dental health of Australia's teenagers and pre-teen children: the Child Dental Health Survey, Australia 2003–04. Dental Statistics and Research Series no. 52. Cat. no. DEN 199. Canberra: AIHW.

Armfield JM, Roberts-Thomson KF & Spencer AJ 2003. The Child Dental Health Survey, Australia 1999: Trends across the 1990s. Dental Statistics and Research Series no. 27. Cat. no. DEN 95. Canberra: AIHW.

AIHW (Australian Institute of Health and Welfare) 2000. Australia's health 2000: the seventh biennial health report of the Australian Institute of Health and Welfare. Canberra: AIHW.

AIHW 2010. Health expenditure Australia 2008–09. Health and Welfare Expenditure Series no. 42. Cat. no. HWE 51. Canberra: AIHW.

ARCPOH (Australian Research Centre for Population Oral Health) 2006. The use of fluorides in Australia: guidelines. Australian Dental Journal 51:195–9.

DPIE & DHSH (Department of Primary Industries and Energy and Department of Human Services and Health) 1994. Rural, remote and metropolitan areas classification 1991 Census edition. Canberra: Australian Government Publishing Service.

Do LG & Spencer AJ 2007a. Decline in the prevalence of dental fluorosis among South Australian children. Community Dentistry and Oral Epidemiology 35:282–91.

Do LG & Spencer AJ 2007b. Risk-benefit balance in the use of fluoride among young children. Journal of Dental Research 86:723–8.

Marinho VC, Higgins JP, Sheiham A & Logan S 2003a. Fluoride toothpastes for preventing dental caries in children and adolescents. Cochrane Database of Systematic Reviews Issue 1: Art. No. CD002278.

Marinho VC, Higgins JP, Logan S & Sheiham AF 2003b. Fluoride mouthrinses for preventing dental caries in children and adolescents. Cochrane Database of Systematic Reviews Issue 3: Art. No. CD002284.

McLellan L, Rissel C, Donnelly N & Bauman A 1999. Health behaviour and the school environment in New South Wales, Australia. Social Science & Medicine 49:611–9.

Slade GD, Davies MJ, Spencer AJ & Stewart JF 1995. Associations between exposure to fluoridated drinking water and dental caries experience among children in two Australian states. Journal of Public Health Dentistry 55:218–28.

Slade GD, Sanders AE, Bill CJ & Do LG 2006. Risk factors for dental caries in the five-year-old South Australian population. Australian Dental Journal 51:130–9.

Spencer AJ 2004. Narrowing the inequality gap in oral health and dental care in Australia. Australian Health Policy Institute, Commissioned Paper Series 2004. The University of Sydney.

Walsh T, Worthington HV, Glenny AM, Appelbe P, Marinho VC & Shi X 2010. Fluoride toothpastes of different concentrations for preventing dental caries in children and adolescents. Cochrane Database of Systematic Reviews Issue 1: Art. No. CD007868.

WHO (World Health Organization) 2006. Fluoride in drinking-water by Fawell J, Bailey K, Chilton E, Dahi L, Fewtrell L and Magara Y. Iwa Publishing: London, UK.

# List of tables

# List of figures