



Changes in child toothbrushing over time

The first section of this report provides information on the toothbrushing behaviour of 1–2 year old children, while the second section provides information about 5 year olds.

In the early 1990s, the dental profession and oral health care product manufacturers began introducing low-fluoride children’s toothpastes and advice for parents on children’s toothbrushing. The measures were aimed at reducing the ingestion of fluoride from toothpaste and preventing dental fluorosis (discolouration or pitting of the dental enamel caused by exposure to excessive amounts of fluoride during enamel formation). This is the first report on how child toothbrushing behaviour has changed since then.

The findings of this report can be viewed in the context of recommendations affirmed at a Consensus Conference on the Appropriate Fluoride Exposure for Infants and Children in 1993 (Health Department of Western Australia 1993). Recommended behaviour included using children’s toothpaste (400–550 ppm fluoride) for children 6 years or under, using a smear of toothpaste, and encouraging children to spit out, rather than swallow, during and after brushing. It was recommended that parents supervise all use of toothpaste by children aged 6 years or under. Such advice was incorporated into the labelling of toothpastes in Australia. Three years later, the Colgate Education Program at The University of Adelaide gave additional advice in Fluoride Information Sheet No. 3 ‘Fluoride and dental fluorosis’ that brushing with toothpaste should begin at around 2 years of age (Dental Practice Education Research Unit 1996).

These recommendations have been superseded by The Use of Fluorides in Australia: Guidelines, published in 2006, which modified the age for beginning the use of low-fluoride children’s toothpaste to 18 months (Australian Research Centre for Population Oral Health 2006). These guidelines retained the recommended use of low fluoride children’s toothpaste through to 6 years old.

Contents

Summary	2
Data collection methods and response	2
Toothbrushing among Australian children.....	3
Toothbrushing behaviour when child started brushing with toothpaste, 1993–2000	3
Toothbrushing behaviour at age 5 years, 1993–2003	6
References	10
Acknowledgments	10

Summary

Although toothbrushing is almost universally practised in Australia, there has been a decline in toothbrushing frequency. The proportion of children brushing their teeth less than once a day, among children when they start brushing with toothpaste, has almost doubled between 1993 and 2000. Although reducing the risk of very mild or mild dental fluorosis, this would have also reduced exposure to the protective effects of fluoridated toothpaste.

The proportion of children brushing with low-fluoride children's toothpaste, as is recommended for children aged 6 years or under, has increased. Most young children now use low-fluoride toothpaste.

The inappropriate eating or licking of toothpaste has increased, both when children start brushing and at 5 years of age. This is an established risk factor for dental fluorosis with no benefit in preventing dental caries.

Data collection methods and response

Findings presented in this publication are based on the *Child Oral Health Study 2002–2004*, which surveyed the parents of a random sample of children from South Australia, Victoria, Tasmania and Queensland. The collection was coordinated by the Australian Research Centre for Population Oral Health (ARCPOH) at the University of Adelaide.

Results are based on retrospective reporting by parents of children aged between 5 and 15 at the time of participation in the survey. There is therefore variation in the length of the time over which toothbrushing behaviour was recalled by parents. The longer the period for recall, the greater the potential for recall bias.

Analysis of toothbrushing behaviour at the time brushing began with toothpaste is restricted to children who were reported to have started brushing at age 1 or 2 years. These were used as anchor ages for analysing behaviour at the commencement of brushing with toothpaste and include the age at which toothbrushing was recommended to begin. The minority who began brushing with toothpaste later had substantially different toothbrushing behaviour, supporting their exclusion.

The unweighted numbers of children from metropolitan and non-metropolitan areas by state are presented in Table 1. The findings presented here are based on data that have been weighted to take into account varying probabilities of selection across strata formed by metropolitan and non-metropolitan area in each state, and by the water fluoridation status of the child's residence, and to adjust for the age and sex distribution of children within each stratum.

Table 1: Number and proportion of children by state/territory and residential location (unweighted)

State/territory	Metropolitan		Non-metropolitan		All	
	n	%	n	%	n	%
Vic	2,227	20.3	1,836	31.3	4,063	24.1
Qld	4,878	44.4	0	0.0	4,878	28.9
SA	3,674	33.4	2,753	47.0	6,427	38.1
Tas	216	2.0	1,273	21.7	1,489	8.8
Total	10,995	100.0	5,862	100.0	16,857	100.0

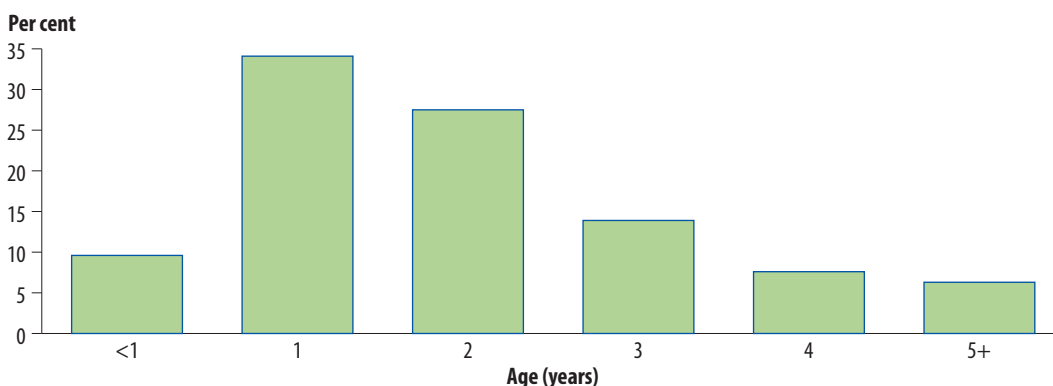
Toothbrushing among Australian children

Recent Australian research has demonstrated that toothbrushing with fluoridated toothpaste is widely practised among children. In 2002–2005, about 99% of children aged 5 to 15 were currently using or had previously used fluoridated toothpaste when brushing their teeth (Armfield & Spencer 2011). The almost universal adoption of fluoridated toothpaste is consistent with recommendations from dental organisations such as the Australian Dental Association. It is supported by several decades of research showing that brushing teeth with fluoridated toothpaste helps prevent tooth decay.

Toothbrushing behaviour when child started brushing with toothpaste, 1993–2000

Parents were asked to recall the toothbrushing behaviour of their child at the time when their child first started brushing with toothpaste.

Most children (61.6%) began brushing their teeth at 1 or 2 years of age (Figure 1). Just under 10% started brushing under 12 months of age, while a high proportion (28.1%) started brushing their teeth at age 3 or later.



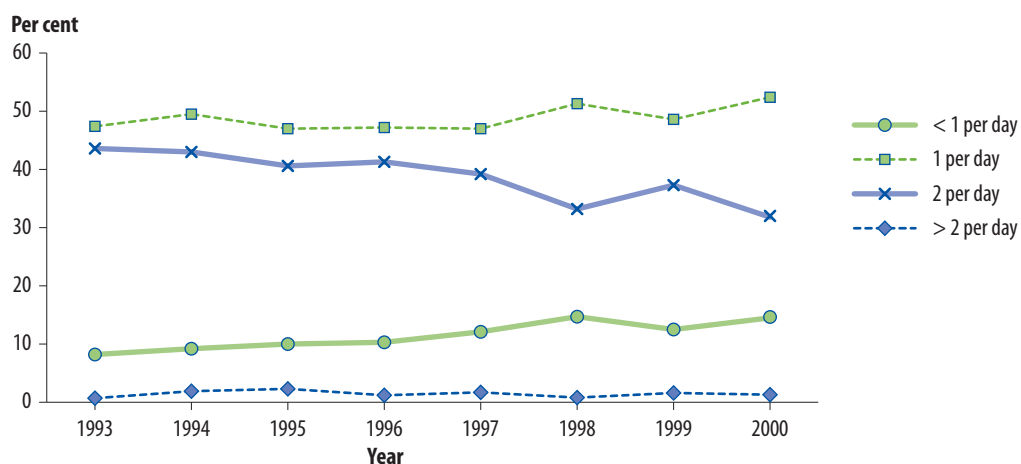
Source: Child Oral Health Study.

Figure 1: Age when children began brushing their teeth

For subsequent results, only data for 1 and 2 year old children were used for reported behaviour when children began brushing their teeth.

Differences in toothbrushing frequency

Across the period 1993–2000, the proportion of children brushing less than once a day when they began almost doubled from 8% to 15% (Figure 2). The proportion brushing twice a day reduced from a high of 44% in 1993 to 32% in 2000.

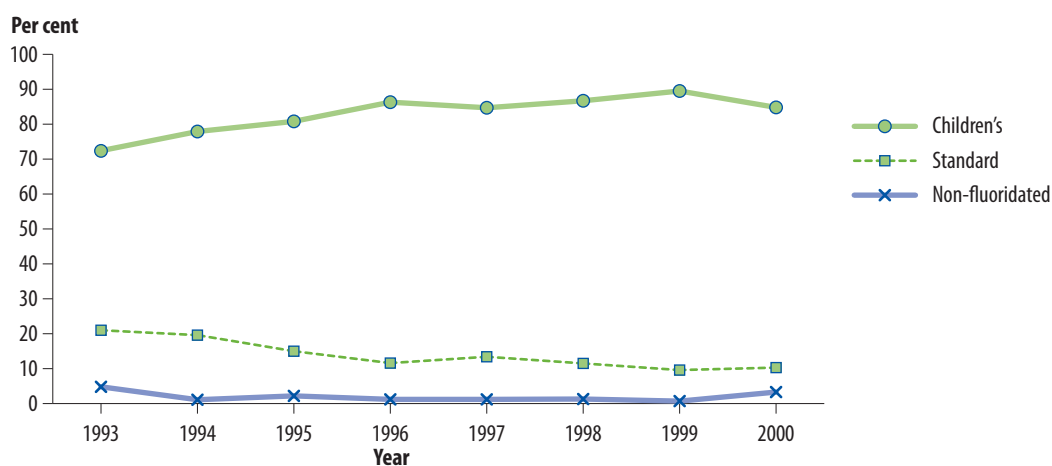


Source: Child Oral Health Study.

Figure 2: Frequency of toothbrushing when brushing began, 1993–2000

Differences in type of toothpaste used

The proportion of children who began brushing with low-fluoride children’s toothpaste (400–550 ppm fluoride) increased from 72% in 1993 to a high of 90% in 1999, while the proportion who began brushing with standard fluoridated toothpaste (1,000 ppm fluoride) decreased from 21% to 10% across the period 1993–2000 (Figure 3).

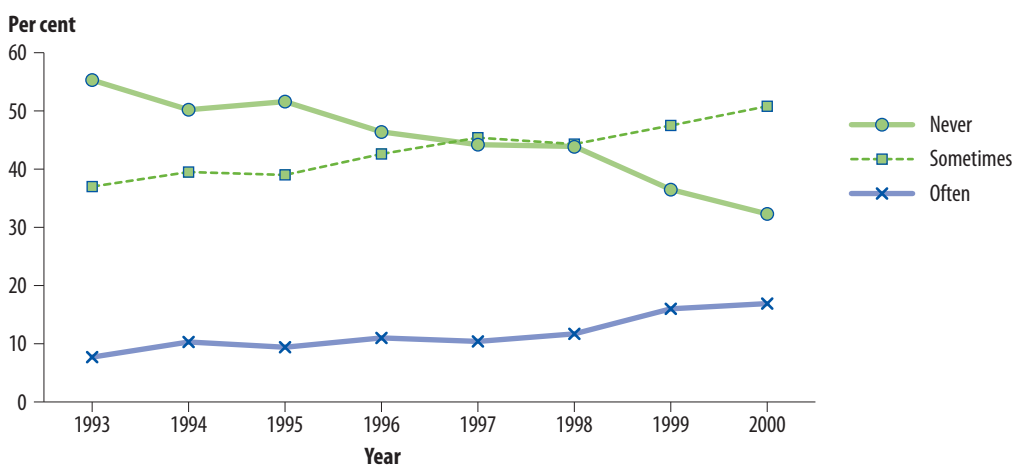


Source: Child Oral Health Study.

Figure 3: Type of toothpaste used when brushing began, 1993–2000

Differences in eating or licking of toothpaste

There were considerable changes over time in the eating or licking of toothpaste when brushing began (Figure 4). The proportion of children who were judged to never eat or lick toothpaste declined from 55% in 1993 to about 32% in 2000. During the same period, the proportion of children believed to be sometimes eating or licking toothpaste increased from 37% to 51% while those believed to be often eating or licking toothpaste more than doubled, from 8% to 17%.

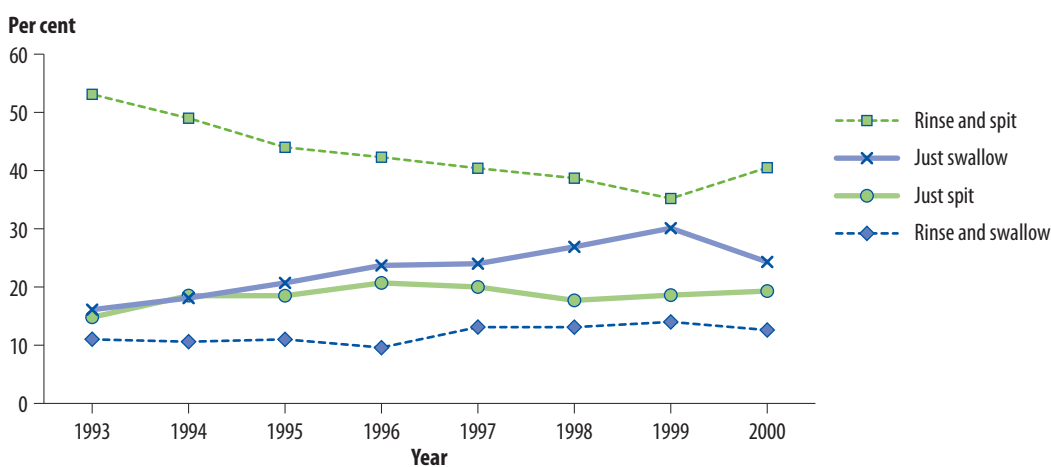


Source: Child Oral Health Study.

Figure 4: Eating or licking toothpaste when brushing began, 1993–2000

Differences in post-toothbrushing behaviour

The proportion of children rinsing and spitting out their toothpaste decreased from 1993 to 1999, but increased between 1999 and 2000 (Figure 5). In contrast, the proportion of children who just swallowed toothpaste rose steadily from 16% in 1993 to 30% in 1999, but decreased between 1999 and 2000. The proportion of children undertaking the recommended behaviour of just spitting remained low at between 15% and 20% across the period between 1993 and 2000.



Source: Child Oral Health Study.

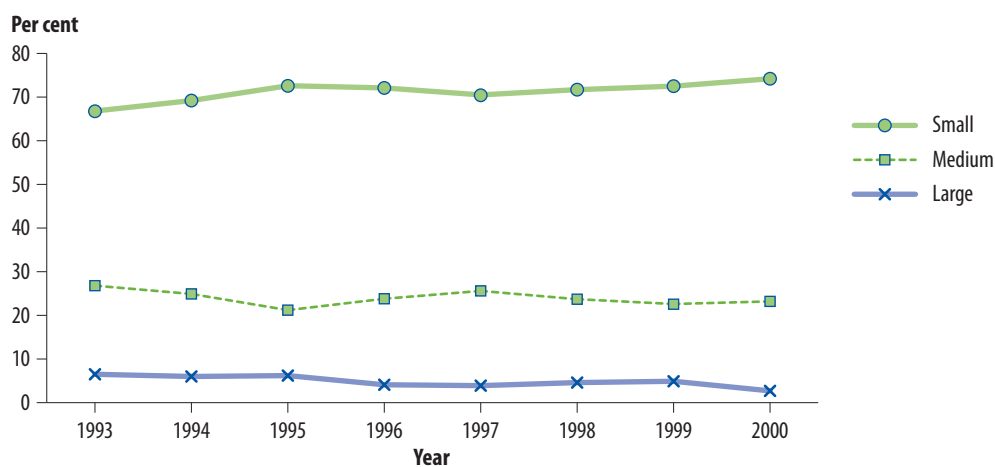
Figure 5: Behaviour after toothbrushing when brushing began, 1993–2000

Differences in amount of toothpaste used

Parents used visual images of a small amount of toothpaste (a smear), a medium or pea-sized amount, or a large amount of toothpaste to indicate the amount placed on their child's toothbrush.

Between 1993 and 2000, there was a small increase in the proportion of 1–2 year old children using a small amount of toothpaste when they began brushing and a small decrease in the proportion of 1–2 year old children using a large amount (Figure 6).

The Use of Fluorides in Australia: Guidelines (Australian Research Centre for Population Oral Health 2006), recommends that children use a pea-sized amount of fluoride toothpaste, as using a large amount is a risk factor for dental fluorosis.



Source: Child Oral Health Study.

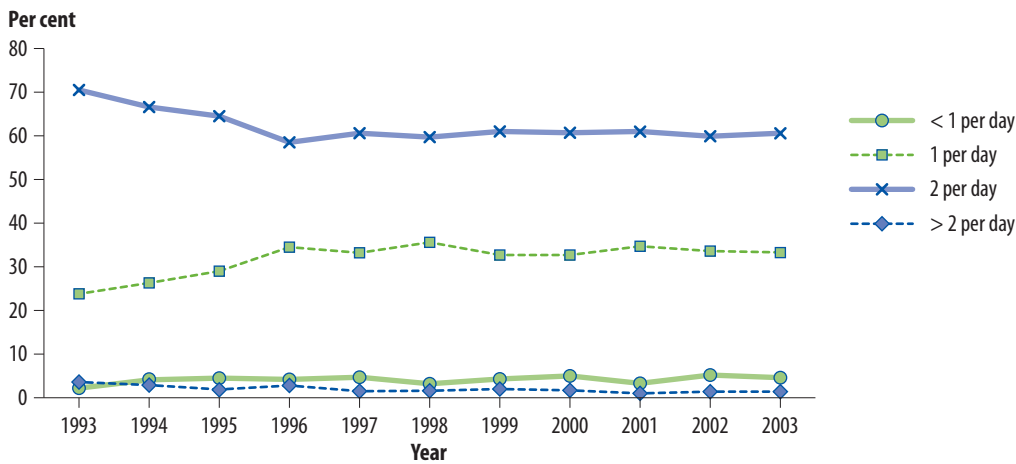
Figure 6: Amount of toothpaste used when brushing began, 1993–2000

Toothbrushing behaviour at age 5 years, 1993–2003

Parents of children aged from 5 to 15 were asked several questions about their child's toothbrushing behaviour at the age of 5.

Differences in toothbrushing frequency

Between 1993 and 1996, there was a decrease in the proportion of children brushing twice a day and a corresponding increase in the proportion of children brushing only once a day (Figure 7). Since 1996, however, the proportion of children brushing their teeth twice a day has remained consistently at about 60%.

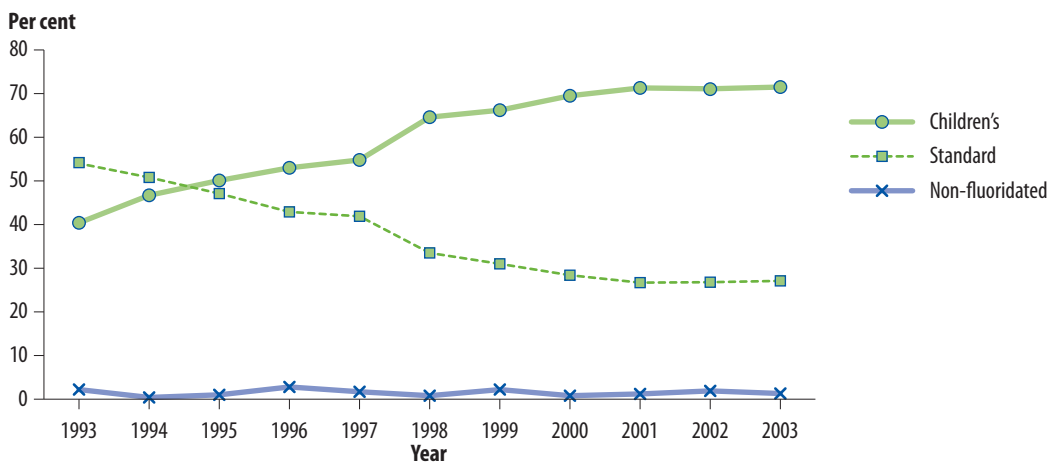


Source: Child Oral Health Study.

Figure 7: Frequency of toothbrushing at age 5 years, 1993–2003

Differences in type of toothpaste used

Between 1993 and 2001, there was a substantial decline in the proportion of 5 year old children brushing their teeth with full-strength fluoridated toothpaste (about 1,000 ppm fluoride) and a corresponding increase in the proportion brushing their teeth with children's toothpaste (about 400–550 ppm fluoride). The proportions remain steady thereafter (Figure 8).

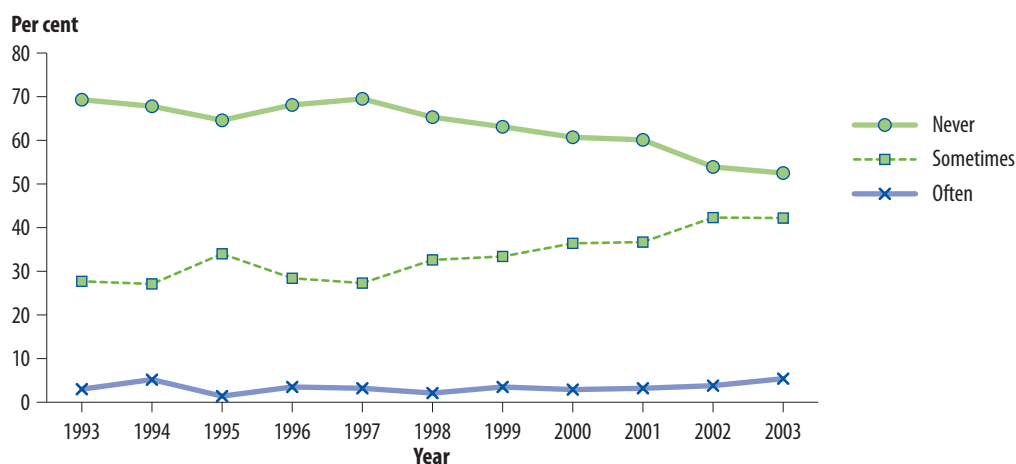


Source: Child Oral Health Study.

Figure 8: Type of toothpaste used at age 5 years, 1993–2003

Differences in eating or licking of toothpaste

Between 1997 and 2003, the proportion of children reported to be 'sometimes' eating or licking toothpaste increased from about 30% to about 40%, while those who did not eat or lick toothpaste declined from about 70% to about 50% (Figure 9).



Source: Child Oral Health Study.

Figure 9: Eating and licking of toothpaste at age 5 years, 1993–2003

Differences in size of toothbrush used

From 1993 to 2003, there was little difference in the proportions of children using either a small or regular sized toothbrush (Figure 10).

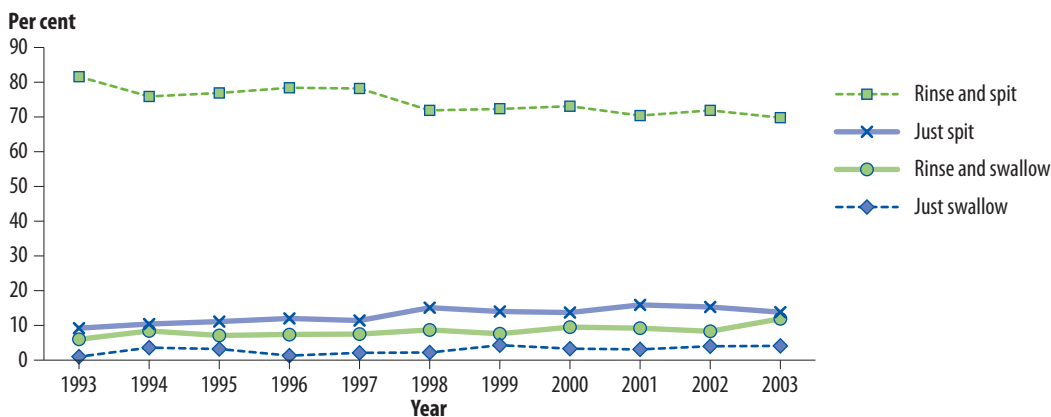


Source: Child Oral Health Study.

Figure 10: Size of toothbrush used at age 5 years, 1993–2003

Differences in post-toothbrushing behaviour

After toothbrushing, most children rinse and spit out any remaining toothpaste (Figure 11). However, the proportion of children rinsing and spitting decreased from 82% in 1993 to just under 70% in 2003. The proportion of children just spitting increased from 9% to about 15% during the same period. Just spitting is the currently recommended behaviour (Australian Research Centre for Population Oral Health 2006).



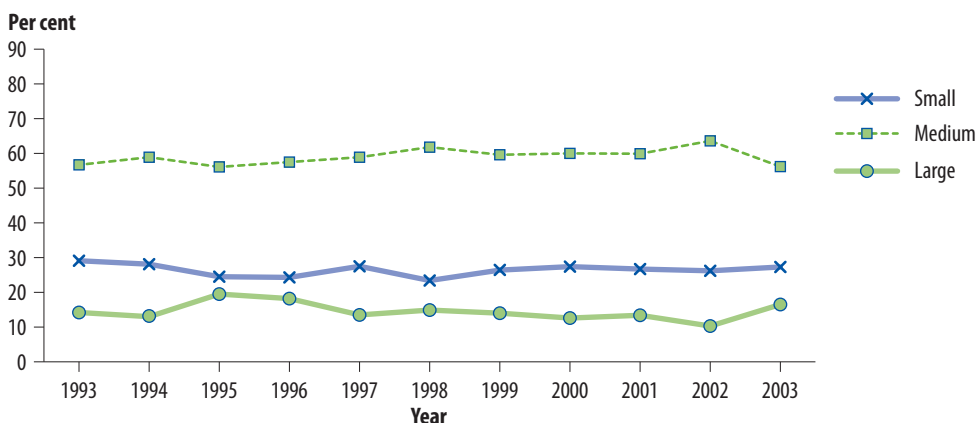
Source: Child Oral Health Study.

Figure 11: Behaviour after toothbrushing at age 5 years, 1993–2003

Differences in amount of toothpaste used

As noted earlier, parents used visual images of a small amount of toothpaste (a smear), a medium or pea-sized amount, or a large amount of toothpaste to indicate the amount placed on their child's toothbrush.

From 1993 to 2002, there was a small but steady increase in the proportion of children using a medium amount of toothpaste and a decrease in the proportion of children using a large amount (Figure 12). Between 2002 and 2003, however, there was an increase in the proportion of children reported to be using a large amount.



Source: Child Oral Health Study.

Figure 12: Amount of toothpaste used at age 5 years, 1993–2003

References

AIHW: Armfield JM & Spencer AJ 2011 (forthcoming). Dental health behaviours among children. Dental statistics and research series. Canberra: AIHW.

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

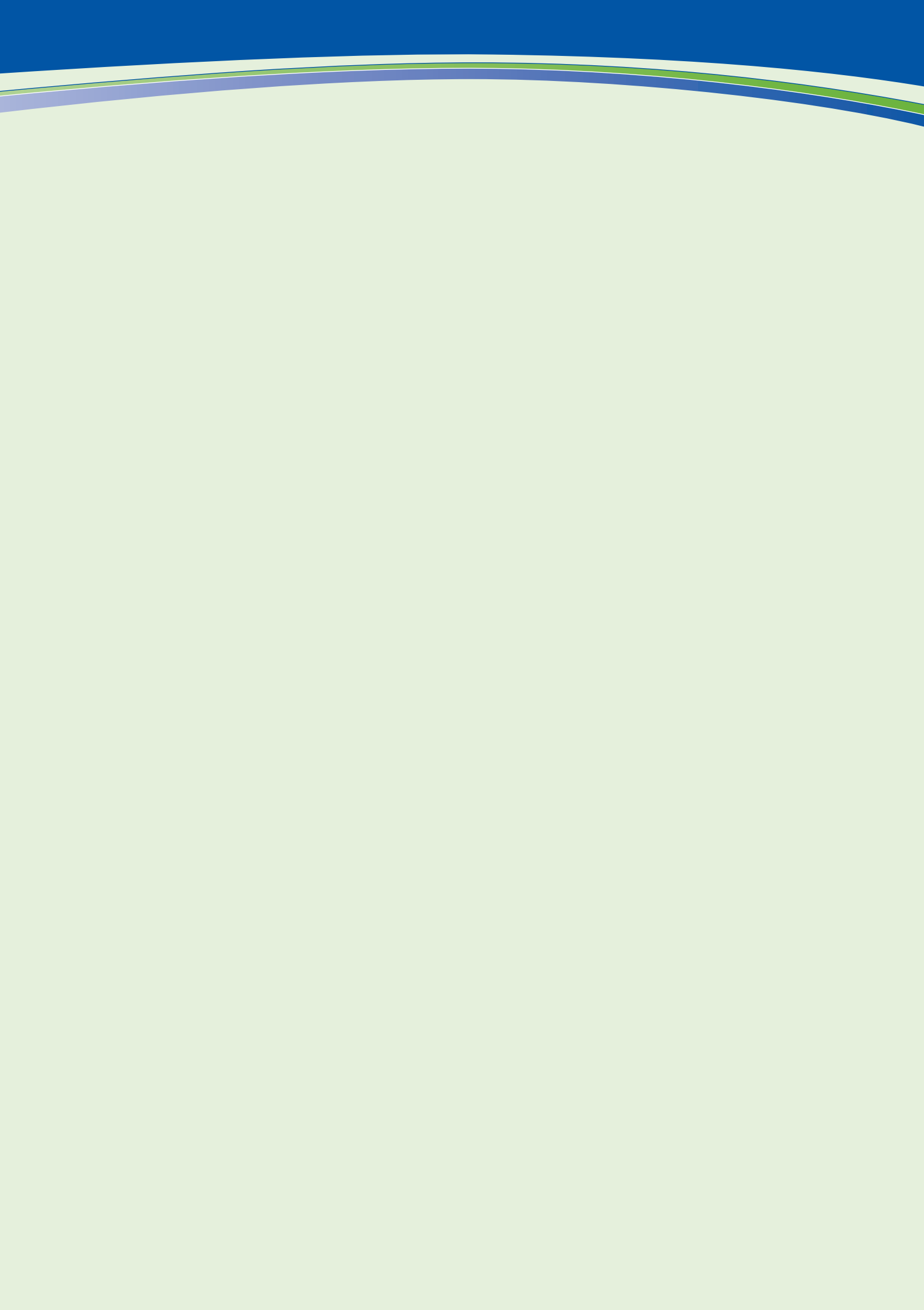
Dental Practice Education Research Unit 1996. Colgate Information Program. Fluoride and dental fluorosis. Fluoride Information Sheet No. 3. Adelaide: The University of Adelaide.

Health Department of Western Australia & The University of Western Australia 1993. Consensus Conference on Appropriate Exposure for Infants and Children. Perth, 2–3 December.

Acknowledgments

The author of this report was Dr Jason Armfield.

This study was funded by project grant #207806 from the National Health and Medical Research Council.





The AIHW Dental Statistics and Research Unit (DSRU) is a collaborating unit of the Australian Institute of Health and Welfare, established in 1988 at The University of Adelaide and located in the Australian Research Centre for Population Oral Health (ARCPHO), School of Dentistry, The University of Adelaide. DSRU aims to improve the oral health of Australians through the collection, analysis and reporting of information on oral health and access to dental care, the practice of dentistry and the dental labour force in Australia.

© Australian Institute of Health and Welfare 2011

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without prior written permission from the Australian Institute of Health and Welfare. Requests and enquiries concerning reproduction and rights should be directed to the Head of the Communications, Media and Marketing Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601.

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

ISSN 1445-775X
ISBN 978-1-74249-185-1

Suggested citation

Australian Institute of Health and Welfare 2011. Changes in child toothbrushing over time. Research report series no. 54. Cat. no. DEN 211. Canberra: AIHW.

Australian Institute of Health and Welfare

Board Chair
Hon. Peter Collins, AM, QC

Director
David Kalisch

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
Phone: (02) 6244 1032
Email: info@aihw.gov.au

Published by the Australian Institute of Health and Welfare