



GOVERNMENT OF
WESTERN AUSTRALIA



Move and Munch

Key findings from the Western Australian
Child and Adolescent Physical Activity
and Nutrition Survey 2008

be active wa
Physical Activity Taskforce

Suggested Citation

Martin, K., Rosenberg, M., Miller, French, S., M., McCormack, G., Bull, F., Giles-Corti, B., Pratt, S. Child and Adolescent Physical Activity and Nutrition Survey 2008: Key Findings. Perth, Western Australia: Western Australian Government, 2009.

Any enquiries regarding this publication should be directed to Physical Activity Taskforce Secretariat, Department of Sport and Recreation, PO Box 329, Leederville, Western Australia, 6903.

Contribution and Acknowledgements

| | |
|--|---|
| Project management team | Karen Martin (Project Manager), Michael Rosenberg, Margaret Miller |
| Project consultants | Fiona Bull, Billie Giles-Corti, Amanda Devine, Anthea Magarey, Gavin McCormack, Steve Pratt |
| Project coordinators | Stephanie McFaull and Jennifer Tartaglia |
| Child consent coordinator | Bree Shields |
| Team leaders | Dane Waters, Mark Mirauda, Natasha Hale, Claire South |
| Field team | Gill Ashton, Lisa Bennett, Nancy Lee Boulton, Fabienne Byrne, Michael Clow, Laura Drummy, Amy Ekin, Lynda Enright, Amy Fairburn, Natalie Harold, Sun Leong, Daniela Miloskeski, Melanie Oddy, Hannah Pierce, Jenny Paul, Sian Pulham, Hayley Saunders, Lisa Shuttleton, Sharon Slater, Catie Stephenson, Nao Suzuki, Claire Thomson, Jessica Truong, Karyn West, Carole Holywel, Gemma Whitman. |
| Staff training manual | Karen Martin, Stephanie McFaull |
| Food coding manual | Margaret Miller, Stephanie McFaull |
| Physical activity data coders | Bree Shields (Coordinator), Natasha Hale, Dane Waters, Claire South, Laura Drummy, Nancy Lee Boulton, Hannah Pierce |
| Food data coders | Stephanie McFaull (Coordinator), Mark Mirauda, Karen West, Nicole Steele, Dionne Marshall |
| Data entry | Axis Data Entry |
| Data merging | Jonathon Kur |
| Statistics consultant | Professor Max Bulsara |
| Data analysis | Sarah French, Karen Martin, Gavin McCormack |
| PATF Evaluation and Monitoring Working Group | Rex Milligan, Steve Pratt, Geoffrey Jalleh |
| PATF Secretariat Manager: | Jo Davies |
| PATF Project Manager | Jo Davies |
| Funding Providers | Healthway, Department of Education and Training, Department of Health, Department of Planning and Infrastructure, Department of Sport and Recreation. |

CONTENTS

| | |
|---|-----------|
| BACKGROUND | 4 |
| METHOD | 4 |
| Sampling framework 2003 and 2008..... | 4 |
| Selection of schools..... | 4 |
| School response rates..... | 4 |
| Participant response rates..... | 4 |
| Ethics approval..... | 5 |
| Instruments..... | 5 |
| Data treatment and analysis..... | 3 |
| Further details..... | 4 |
| SAMPLE DEMOGRAPHICS | 5 |
| KEY FINDINGS | 7 |
| PHYSICAL ACTIVITY | 7 |
| Self-report overall physical activity..... | 7 |
| Pedometer determined daily steps taken by children and adolescents..... | 8 |
| Physical activities reported by children and adolescents..... | 9 |
| Participation in physical activity domains..... | 14 |
| Active commuting..... | 15 |
| Independent mobility..... | 17 |
| Screen-based recreation activity..... | 19 |
| NUTRITION | 20 |
| Energy and macronutrient intakes..... | 20 |
| Consumption of main food groups..... | 21 |
| Usual vegetable and fruit intake..... | 23 |
| Breakfast habits..... | 25 |
| School canteen food purchasing habits..... | 26 |
| Evening meal habits..... | 27 |
| Fast food..... | 29 |
| LIMITATIONS | 30 |
| REFERENCES | 31 |

LIST OF TABLES

| | | |
|----------|---|----|
| Table 1: | Sample Characteristics..... | 6 |
| Table 2: | Average daily step counts & proportion of children meeting recommended step counts: primary school children | 9 |
| Table 3: | Average daily step counts & proportion of children meeting recommended step counts: secondary school children | 9 |
| Table 4: | Total time per day spent in physical activity domains: secondary school children..... | 15 |
| Table 5: | Mean 24 hour energy intake & proportion of energy from macronutrients..... | 20 |
| Table 6: | Proportion consuming food from main food groups | 22 |

LIST OF FIGURES

| | | |
|------------|--|----|
| Figure 1: | Self-reported number of days participating in 60 minutes or more of physical activity in the last week: primary school children..... | 7 |
| Figure 2: | Self-reported number of days participating in 60 minutes or more of physical activity in the last seven days: secondary school children..... | 8 |
| Figure 3: | Prevalence of physical activities undertaken in the past seven days: primary school boys..... | 10 |
| Figure 4: | Prevalence of physical activities undertaken in the past seven days: primary school girls | 11 |
| Figure 5: | Prevalence of physical activities undertaken in the past seven days: secondary school boys | 12 |
| Figure 6: | Prevalence of physical activities undertaken in the past seven days: secondary school girls..... | 13 |
| Figure 7: | Proportion of children participating in physical activity domains | 14 |
| Figure 8: | Prevalence (%) of active commuting to school on the previous school day | 16 |
| Figure 9: | Prevalence (%) of active commuting home from school on the previous school day | 16 |
| Figure 10: | Proportion of children reporting actively commuting to local destinations in the last seven days: primary school children | 17 |
| Figure 11: | Proportion of children reporting actively commuting to local destinations in the last seven days: secondary school children | 18 |
| Figure 12: | Proportion of children meeting guidelines for electronic media use on each of the last seven days..... | 19 |
| Figure 13: | Proportion of children usually meeting recommend daily vegetable intake | 23 |
| Figure 14: | Proportion of children usually meeting recommend daily fruit intake..... | 24 |
| Figure 15: | Proportion of children who consume breakfast daily..... | 25 |
| Figure 16: | Frequency purchase food or drinks from the school canteen: primary school children ... | 26 |
| Figure 17: | Frequency purchase food or drinks from the school canteen: secondary school children..... | 27 |
| Figure 18: | Proportion of children eating evening meal with family five to seven days per week | 28 |
| Figure 19: | Proportion of children watching TV while eating evening meal five to seven evenings per week..... | 28 |
| Figure 20: | Proportion of children consuming food or snacks from fast food chain at least once a week..... | 29 |

BACKGROUND

Decreasing levels of physical activity participation, the quality of dietary intake and increasing levels of overweight and obesity of Australian youth are of increasing concern and require concerted efforts to improve. Both National¹ and State^{2,3} surveys have, in recent years, examined the proportion of children who meet recommended physical activity and nutrient intake guidelines and who are of a healthy weight. However, little trend data is available exploring these health measures. In Western Australia, the first Child and Adolescent Physical Activity and Nutrition Survey (CAPANS)⁴, commissioned by the Premier's Physical Activity Taskforce, was completed in 2003 by Notre Dame University. A repeat study was commissioned by the Physical Activity Taskforce and data collected by Edith Cowan University in 2008.

This report details the key findings of the CAPANS 2008 survey and provides 2008 data compared with 2003 for physical activity and nutrition where possible.

METHOD

This section describes the study methods in brief. Additional methodological details and results will be presented in the CAPANS 2008 Full Report.

Sampling framework 2003 and 2008

The target population was Western Australian children and adolescents in the primary school years 3, 5, and 7, and secondary school years 8, 10 and 11. No year 7 children were included in the secondary school sample. The sample was structured to obtain proportional representation according to the State's general population figures.

Selection of schools

A two-stage stratified sample design was used. The sampling frame was divided into four strata: Primary Metropolitan; Primary Non-metropolitan; Secondary Metropolitan; and Secondary Non-metropolitan. The 2003 and 2008 samples were selected by the Australian Centre for Education Research, through systematic random sampling from the total Western Australian school population, inclusive of government and non-government schools.

School response rates

In 2003, 36 primary and secondary schools agreed to participate from a total of 60 schools approached. The response rate was 60%. In 2008, contact was made with 74 schools. In total 34 schools participated in the study, a response rate of 45.9%.

Participant response rates

Data were collected during terms three and four from school years 3, 5, 7, 8, 10 and 11 during the Western Australian school year (i.e. from July to November) in both the 2003 and 2008 surveys.

Based on the total number of consent forms distributed per school, in 2003, the overall response rate was 55.8%, with primary and secondary school response rates of 58.8% and 52.1% respectively. In 2008, an overall response rate of 58.8% was achieved, with response rates of 79.5% for primary school children and 46.2% for secondary school children.

Ethics approval

In 2003, The University of Notre Dame Australia Ethics Committee approved the protocol for the study and in 2008, approval was provided by Edith Cowan University's Human Research Ethics Committee.

Instruments

In both 2003 and 2008, children could participate in one or more of the following five survey components:

- 1) physical activity questionnaire;
- 2) pedometer record;
- 3) 24-hour food record;
- 4) food frequency questionnaire; and/or
- 5) anthropometric measurements including height, weight, waist, umbilicus and hip measures.

Some items within the physical activity questionnaire and food frequency questionnaire differed between 2003 and 2008 and in such instances comparisons of responses were not made.

Three versions of the physical activity questionnaire and pedometer diary were produced, one each for year three children; years five and seven children and; years eight to eleven children. The food frequency questionnaire differed slightly for primary and secondary school children, with parents of primary school children completing the questionnaire on behalf of their child.

Data treatment and analysis

Missing data on age were replaced with school-specific year group mean age. Missing home neighbourhood SEIFA was replaced with school SEIFA. Unless otherwise stated, all results presented in this report have been weighted to the Western Australian population by gender, age and home neighbourhood socio-economic status (SES) derived from the Australian Socio-Economic Index For Areas (SEIFA). Population data were derived from 2006 Australian Census data⁵. Due to small numbers children aged seven and 17 were removed from the 2003 and 2008 samples.

All statistical analyses have been adjusted for gender, age, home neighbourhood socio-economic status (SES) and school level clustering. Statistical significance was determined at the level of 0.05 for all analysis.

Further details

This key findings report provides a summary of key outcome measures. The CAPANS 2008 Full Report contains further results, analysis and details of methods and instruments.

SAMPLE DEMOGRAPHICS

Table 1 presents the unweighted 2003 and 2008 sample characteristics.

- The 2003 and 2008 samples contained similar proportions of boys and girls (50%) (Table 1).
- A significantly higher proportion of year three children participated in the 2008 survey (22.9%) compared with the 2003 survey (16.5%) (Table 1).
- The proportion of children attending a metropolitan school was significantly higher in 2008 (76.4%) compared with 2003 (72.6%) (Table 1).
- A significantly higher proportion of children surveyed in 2008 resided in middle SES areas compared with the 2003 sample (Table 1). Conversely, a significantly lower proportion of children surveyed resided in low SES areas in the 2008 sample (27.7%) compared with the 2003 sample (39.8%)
- A significantly lower proportion of children in the 2008 survey were born in Australia (80.8%) compared with children in 2003 (88.5%) (Table 1).
- The proportion of children who were Aboriginal and/or a Torres Strait Islander in the 2008 survey sample (4.4%) was significantly higher than in 2003 (4.1%) (Table 1).

Table 1: Sample characteristics

| Variable | 2003 N=2227 | | 2008 N=1827 | |
|---|----------------|------|----------------|------|
| | n | % | n | % |
| Gender | | | | |
| Boys | 1109 | 49.8 | 897 | 49.1 |
| Girls | 1118 | 50.2 | 930 | 50.1 |
| School year group#* | | | | |
| Year 3 | 367 | 16.5 | 416 | 22.9 |
| Years 5 & 7 | 926 | 41.6 | 708 | 38.8 |
| Years 8 , 10 & 11 | 934 | 41.9 | 703 | 38.5 |
| School Location* | | | | |
| Metropolitan | 1616 | 72.6 | 1396 | 76.4 |
| Non-metropolitan | 611 | 27.4 | 431 | 23.6 |
| Home neighbourhood socio-economic status^* | | | | |
| Low | 887 | 39.8 | 506 | 27.7 |
| Medium | 637 | 28.6 | 797 | 43.6 |
| High | 703 | 31.6 | 524 | 28.7 |
| Country of birth* | | | | |
| Australia | 1977 | 88.5 | 1469 | 80.8 |
| UK | 72 | 3.4 | 46 | 2.5 |
| New Zealand | 33 | 1.5 | 32 | 1.8 |
| Other | 121 | 5.4 | 178 | 8.4 |
| Aboriginality* | | | | |
| Aboriginal or Torres Strait Islander | 90 | 4.1 | 76 | 4.4 |

Raw data presented

Year groups were survey specific

^ Tertiles created from sample distribution of SEIFA for home postcode

* statistically significant difference between 2003 and 2008; p<0.05

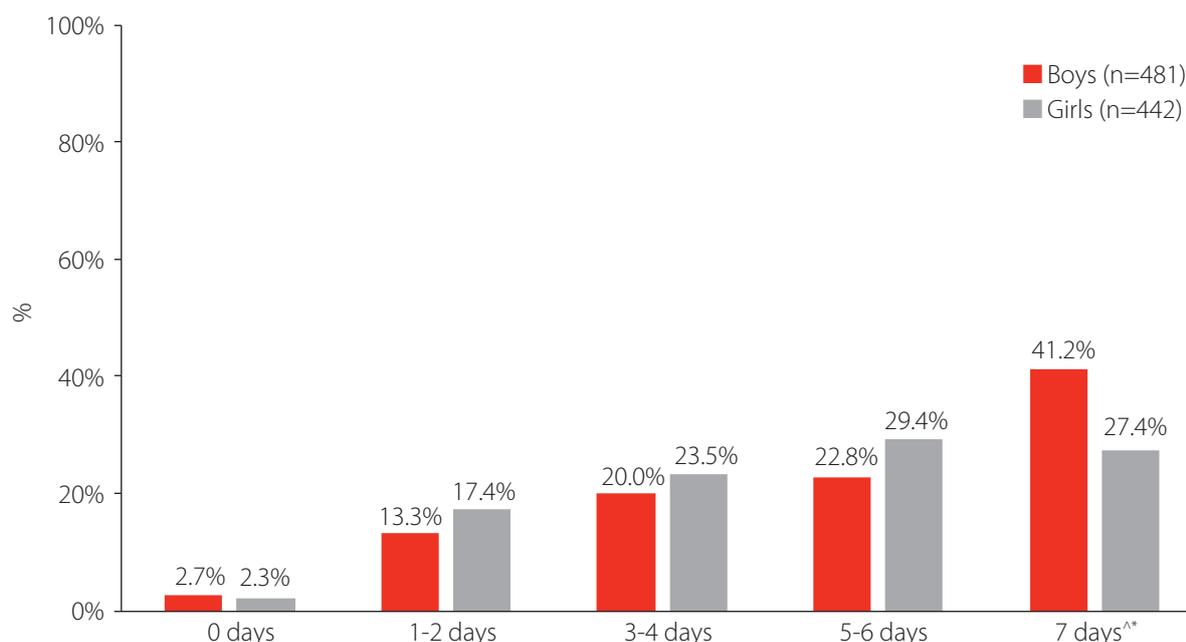
KEY FINDINGS

PHYSICAL ACTIVITY

Self-report overall physical activity

In 2008, 95.8% of the children in the study completed the physical activity questionnaire. Children were asked to report their physical activity participation in the previous seven days. Note that no comparable data from 2003 is available for this section as the question was not in the 2003 survey. Results are presented in Figure 1.

- Australia’s physical activity guidelines for children recommend 60 minutes or more of daily physical activity⁶. Amongst primary school children, boys were significantly more likely to meet the recommendations (41.2%) compared with girls (27.4%) (Figure 1).
- Two thirds of primary school boys (64.0%) and just over one half of primary school girls (56.8%) reported participating in 60 minutes or more of physical activity on at least five of the previous seven days (Figure 1).
- Notably, a very small proportion of primary school boys (2.7%) and girls (2.3%) reported not participating in 60 minutes or more of physical activity on any of the last seven days (Figure 1).



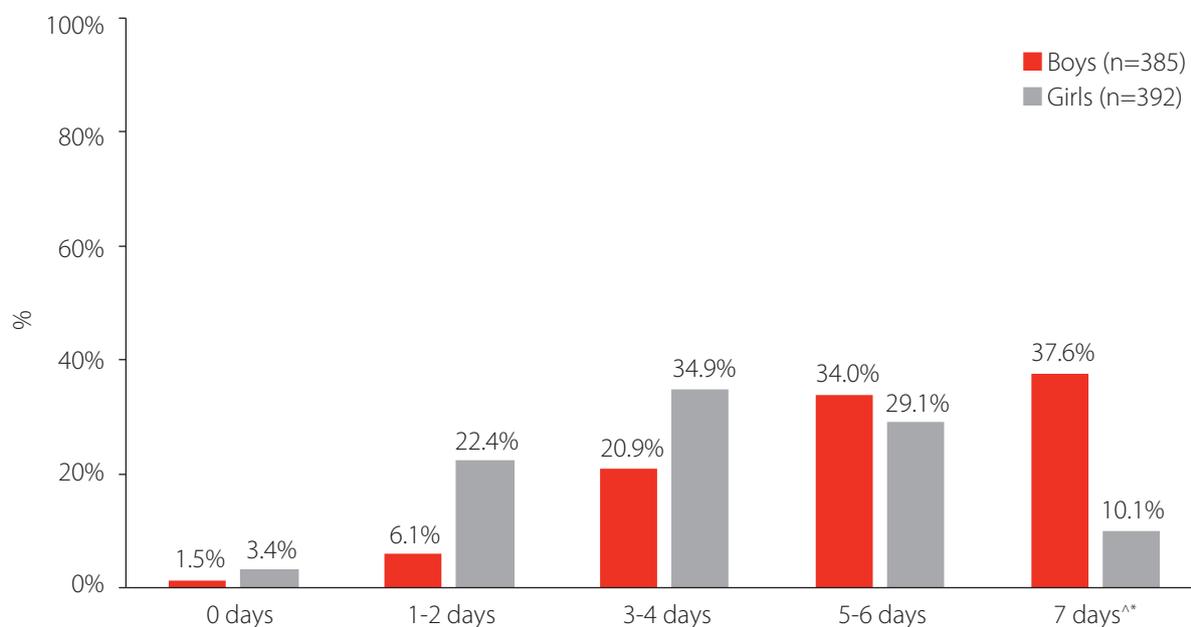
[^] recommended physical activity for 5-12 year olds⁶

^{*} significant difference between boys and girls after adjusting for age, SES and school clustering

Figure 1: Self-reported number of days participating in 60 minutes or more of physical activity in the last week: primary school children

- Australia’s physical activity guidelines for 12-18 year olds recommend 60 minutes or more of daily physical activity⁷. After adjustment a significantly greater proportion of secondary school boys (37.6%) compared with girls (10.1%) achieved the recommendation on all of the previous seven days (Figure 2).
- Almost three-quarters of secondary school boys (71.6%) reported participating in at least 60 minutes of physical activity on at least five of the previous seven days (Figure 2).

- More than one-third (39.2%) of secondary school girls reported participating in 60 minutes of physical activity on at least five of the previous seven days (Figure 2).
- A very small proportion of secondary boys (1.5%) and girls (3.4%) reported not participating in at least 60 minutes of physical activity on any of the previous seven days (Figure 2).



[^] recommended physical activity for 12-18 year olds⁷

^{*} statistically significant difference between boys and girls after adjusting for age, SES and school clustering

Figure 2: Self-reported number of days participating in 60 minutes or more of physical activity in the last seven days: secondary school children

Pedometer determined daily steps taken by children and adolescents

Three-quarters (76.9%) of children in 2008 participated in the pedometer study. Only data from children who wore pedometers for four or more days and recorded daily step counts between 1,000 and 40,000 were included in these analyses⁴. Table 2 and Table 3 present average daily steps and the proportion of children and adolescents achieving pedometer-determined step recommendations⁸ among the 2003 and 2008 study participants.

- There were a significantly greater number of average daily steps for primary school boys in 2008, compared with 2003 (Table 2).
- Slightly more than one-third of primary school children were at or above the recommended step counts⁸ in both 2003 (36.6%) and 2008 (37.7%) (Table 2).
- No differences in the proportion of primary school children above the recommended step counts⁸ were identified between 2003 and 2008 (Table 2).

Table 2: Average daily step counts & proportion of children meeting recommended step counts: primary school children

| | | 2003 | | 2008 | |
|---|-------|------|--------------|------|--------------|
| | | n | mean (SD) | n | mean (SD) |
| Average daily steps | Boys* | 551 | 13202(±4925) | 398 | 13844(±4182) |
| | Girls | 505 | 11681(±4564) | 414 | 12015(±3521) |
| | All | 1056 | 12502(±4820) | 812 | 12943(±3975) |
| | | n | % | n | % |
| Proportion (%) at or above recommended step counts [#] | Boys | 551 | 34.8 | 398 | 31.7 |
| | Girls | 505 | 38.8 | 414 | 43.9 |
| | All | 1056 | 36.6 | 812 | 37.7 |

[#] recommended pedometer steps⁸

* statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering

- There were no significant differences between 2003 and 2008 in average daily steps or the proportion meeting recommended daily step counts⁸ amongst secondary school children (Table 3).
- In total, 38.8% of secondary school children met the recommended number of daily steps⁸ in 2008, compared with 41.1% in 2003. No significant differences between the samples were identified (Table 3).

Table 3: Average daily step counts & proportion of children meeting recommended step counts: secondary school children

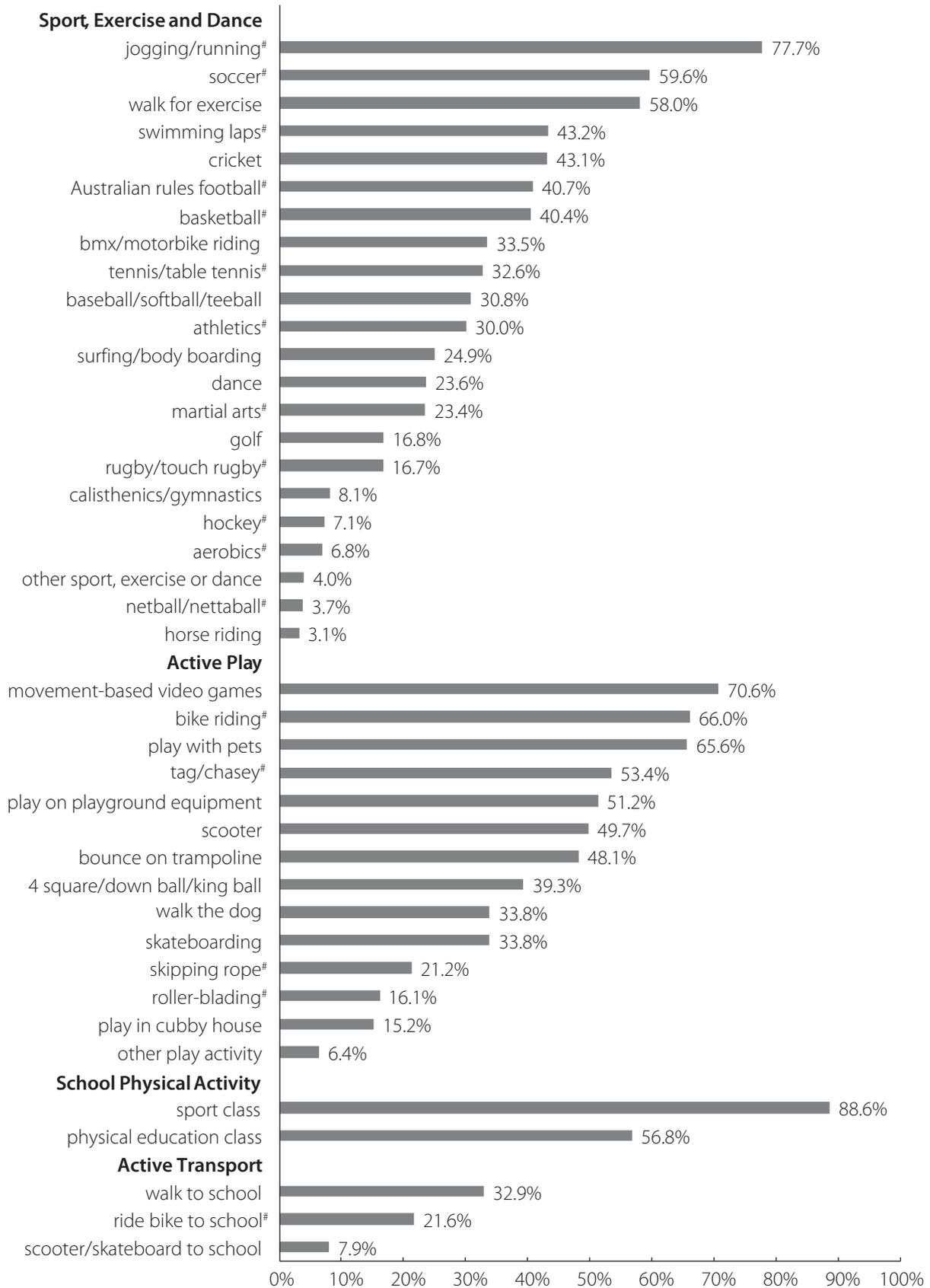
| Variable | | 2003 | | 2008 | |
|---|-------|------|--------------|------|--------------|
| | | n | mean (SD) | n | mean (SD) |
| Average daily steps | Boys | 338 | 14319(±4352) | 188 | 14433(±4134) |
| | Girls | 428 | 11709(±4060) | 310 | 11368(±3541) |
| | All | 766 | 13052(±4409) | 498 | 12764(±4113) |
| | | n | % | n | % |
| Proportion (%) at or above recommended step counts [#] | Boys | 338 | 39.9 | 188 | 41.2 |
| | Girls | 428 | 42.3 | 310 | 36.8 |
| | All | 766 | 41.1 | 498 | 38.8 |

[#] recommended pedometer steps⁸

No statistically significant differences between 2003 and 2008 after adjusting for age, gender, SES

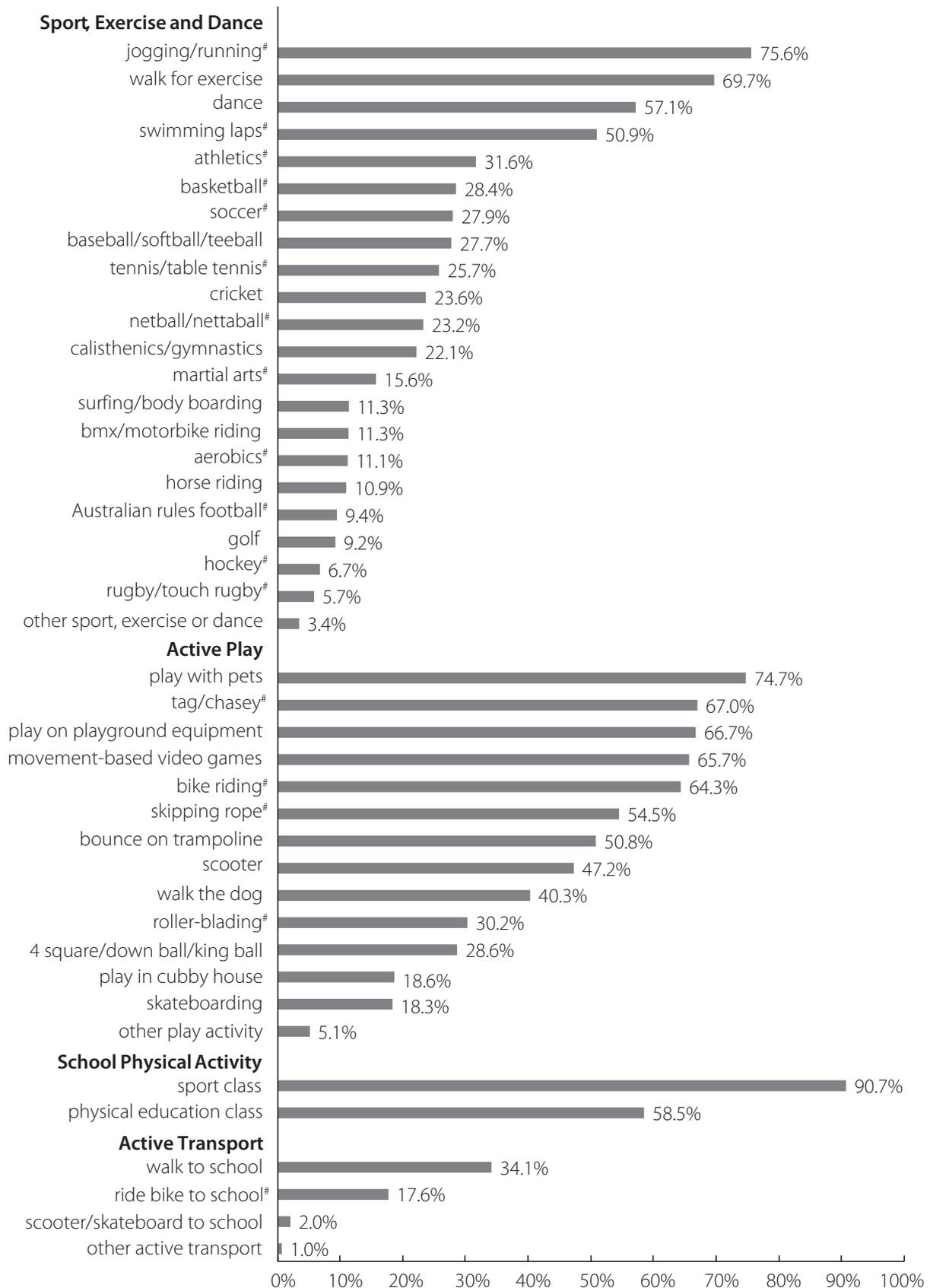
Physical activities reported by children and adolescents

Figure 3 through Figure 6 present the most commonly reported physical activities undertaken in the past seven days by boys and girls attending primary and secondary school. Activities were classified as being usually undertaken at light to moderate-intensity, except those marked with a hash (#) which indicates a vigorous intensity activity. The physical activities were categorised into the following domains “sport, exercise and dance”, “active play”, “school physical activity” and “active transport”. Note that there is no comparison of the 2008 with the 2003 data as the question was not phrased the same in both surveys.



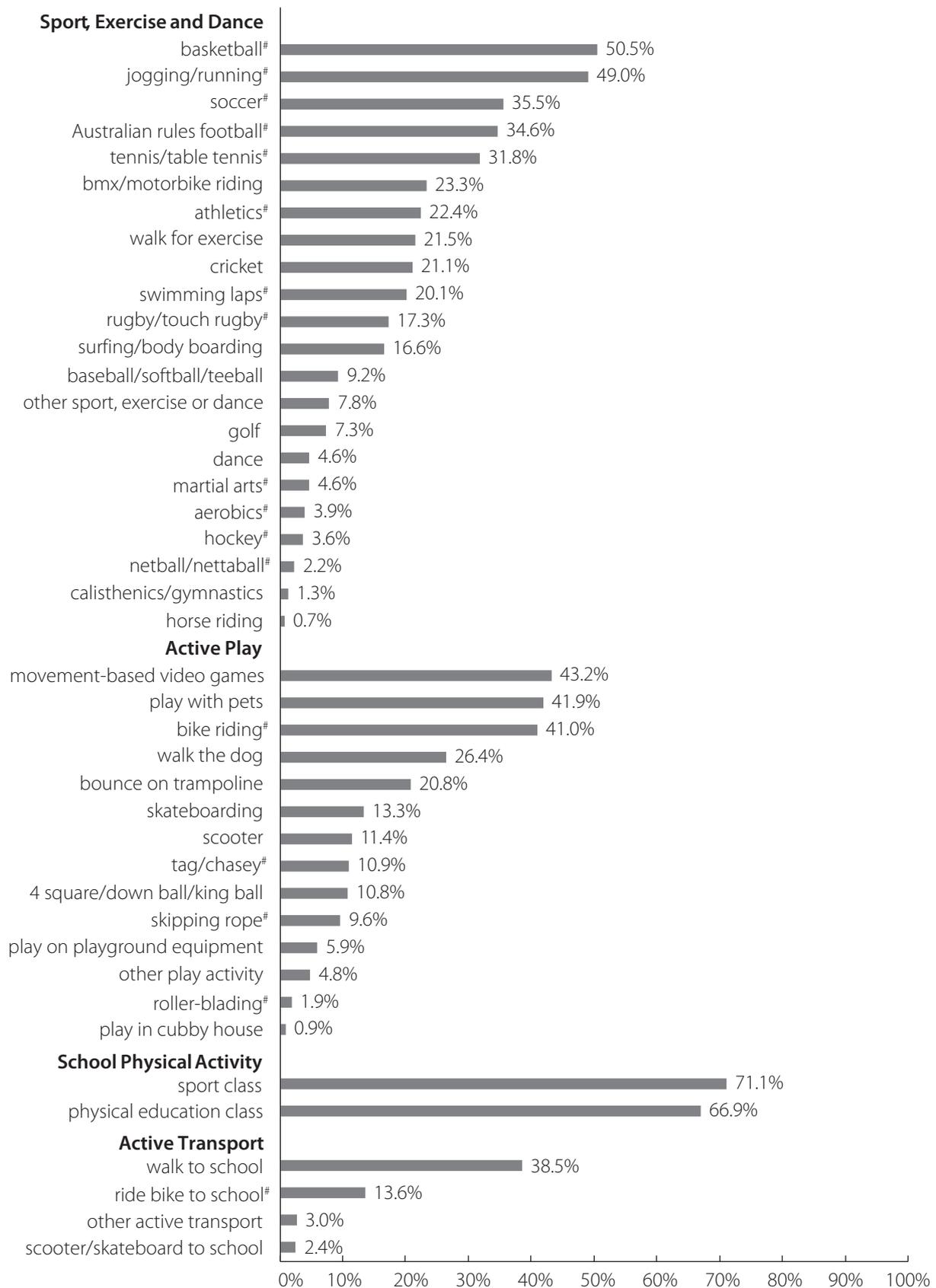
[#] vigorous intensity physical activity^o

Figure 3: Prevalence of physical activities undertaken in the past seven days: primary school boys



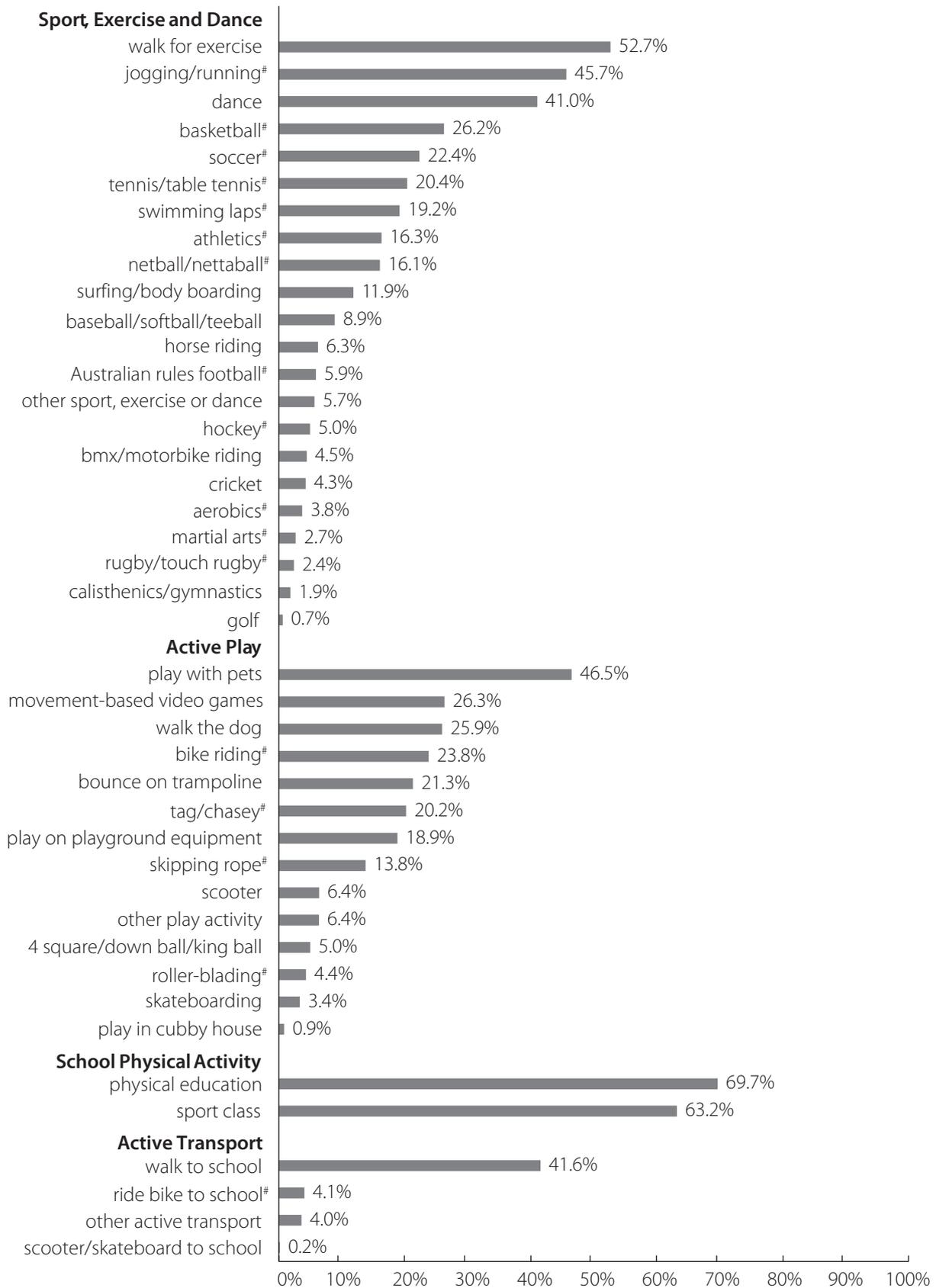
[#] vigorous intensity physical activity^o

Figure 4: Prevalence of physical activities undertaken in the past seven days: primary school girls



vigorous intensity physical activity⁹

Figure 5: Prevalence of physical activities undertaken in the past seven days: secondary school boys



vigorous intensity physical activity⁹

Figure 6: Prevalence of physical activities undertaken in the past seven days: secondary school girls

Participation in physical activity domains

Figure 7 presents the proportion of children participating in each of the four physical activity domains; “sport, exercise and dance”; “play activities”; “school sport or physical education (PE)”; and “active transport”.

- The majority of children participated in at least one session of sport/exercise/dance in the last seven days (Figure 7).
- Most primary school boys and girls participated in at least one session of active play in the last seven days. A large majority of secondary school boys and girls also participated in at least one session of active play in the last seven days (Figure 7).
- In the past seven days, 46.5% of primary school boys and 43.1% of primary school girls reported one session of active transport. In the past seven days, 50.9% of secondary school boys and 43.2% of secondary school girls engaged in at least one session of active transport (Figure 8).
- The majority of primary and secondary school children participated in at least one session of school sport or PE in the last seven days (Figure 7).

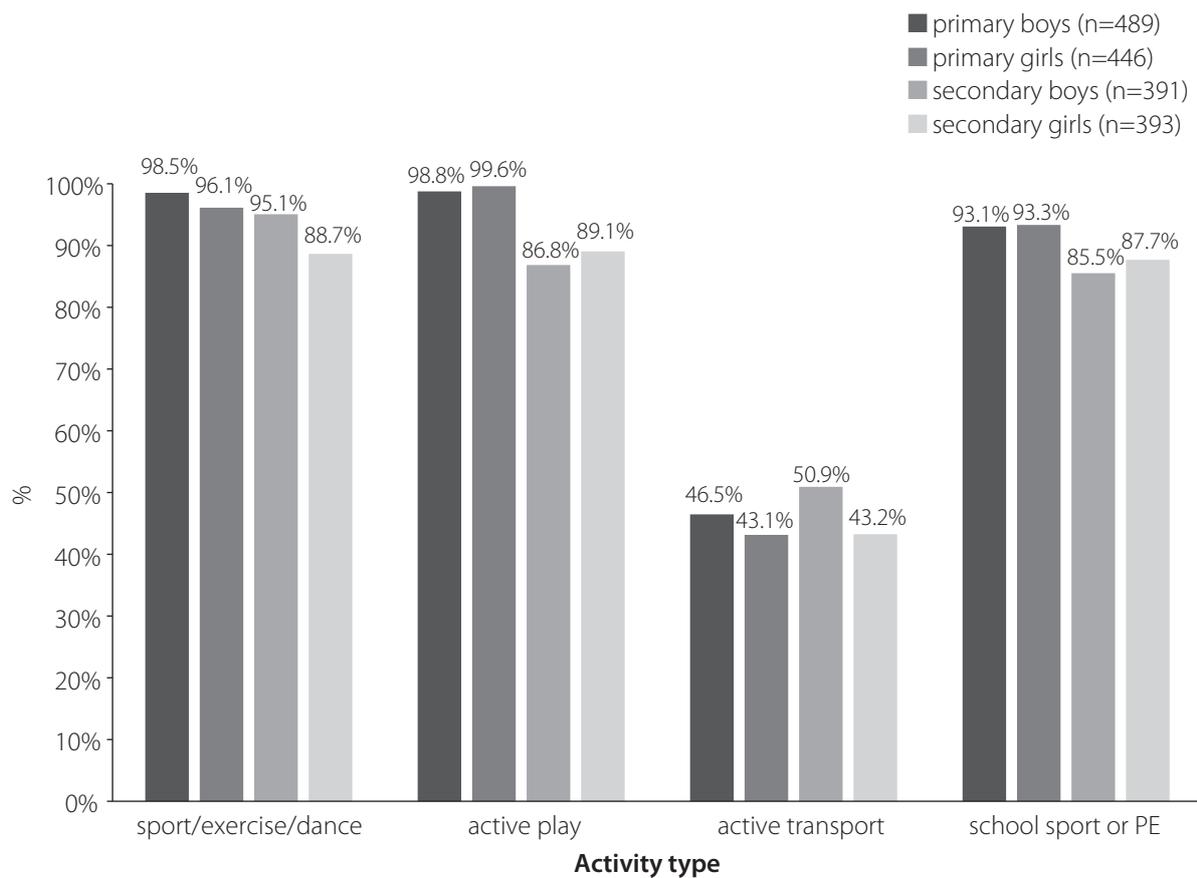


Figure 7: Proportion of children participating in physical activity domains

Table 4 presents the average daily minutes of moderate-vigorous physical activity for secondary school girls and boys across four domains. These questions were not included in the primary school children’s questionnaire.

- Secondary school boys and girls spent most time undertaking sport/exercise/dance activities (68.3 (±36.3) and 50.1 (±33.4) minutes respectively), followed by active play (49.5 (±33.1) and 35.8 (±30.4) minutes respectively) (Table 4).
- Participation in school sport and PE averaged just over 30 minutes per school day for both secondary school boys (37.6 (±18.1) minutes) and girls (34.1 (±16.8) minutes) (Table 4).
- Secondary school boys and girls reported, on average, approximately 10 minutes of active transport each day (Table 4).

Table 4: Total time per day spent in physical activity domains: secondary school children

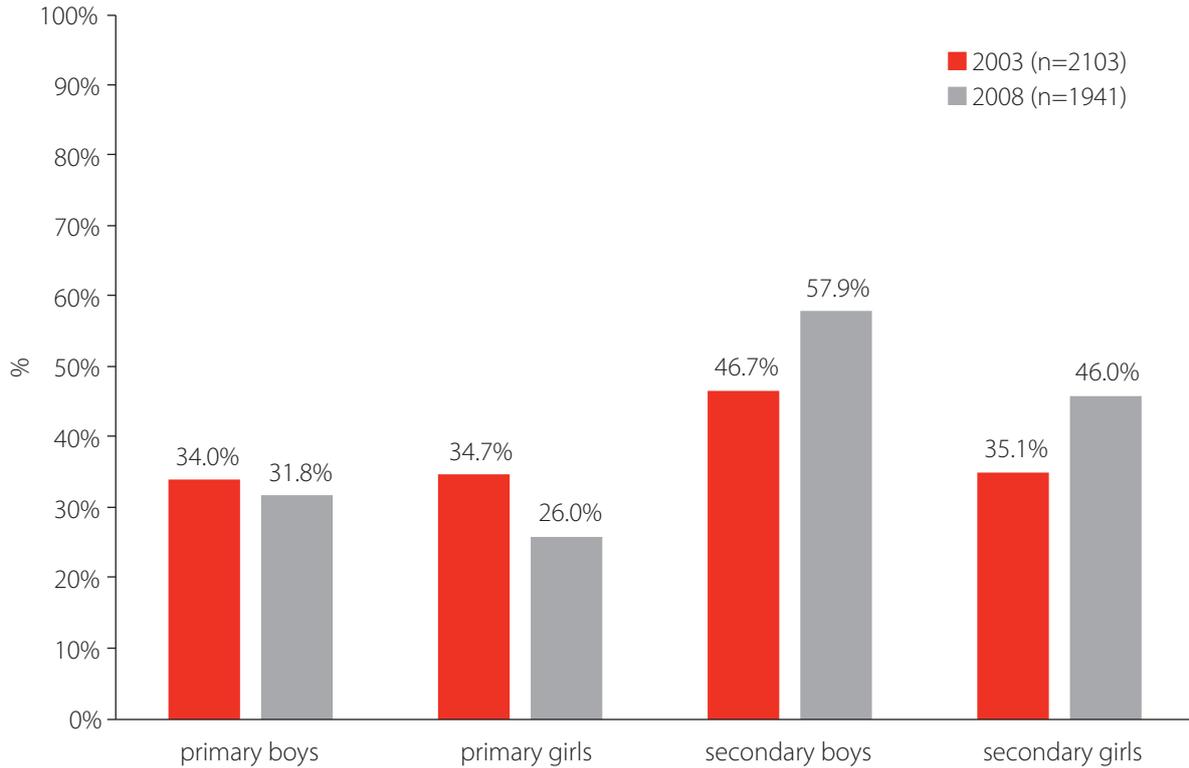
| Physical activity domains | Mins/day Mean (SD) | |
|----------------------------------|-----------------------|------------------|
| | Boys (n=388) | Girls (n=393) |
| Sport, exercise and dance | 68.3 (±36.3) | 50.1 (±33.4) |
| Active play | 49.5 (±33.1) | 35.8 (±30.4) |
| School sport and PE [^] | 37.6 (±18.1) | 34.1 (±16.8) |
| Active transport | 9.1 (±7.4) | 9.1 (±7.5) |

[^] mins/day based on 5 day school week

Active commuting

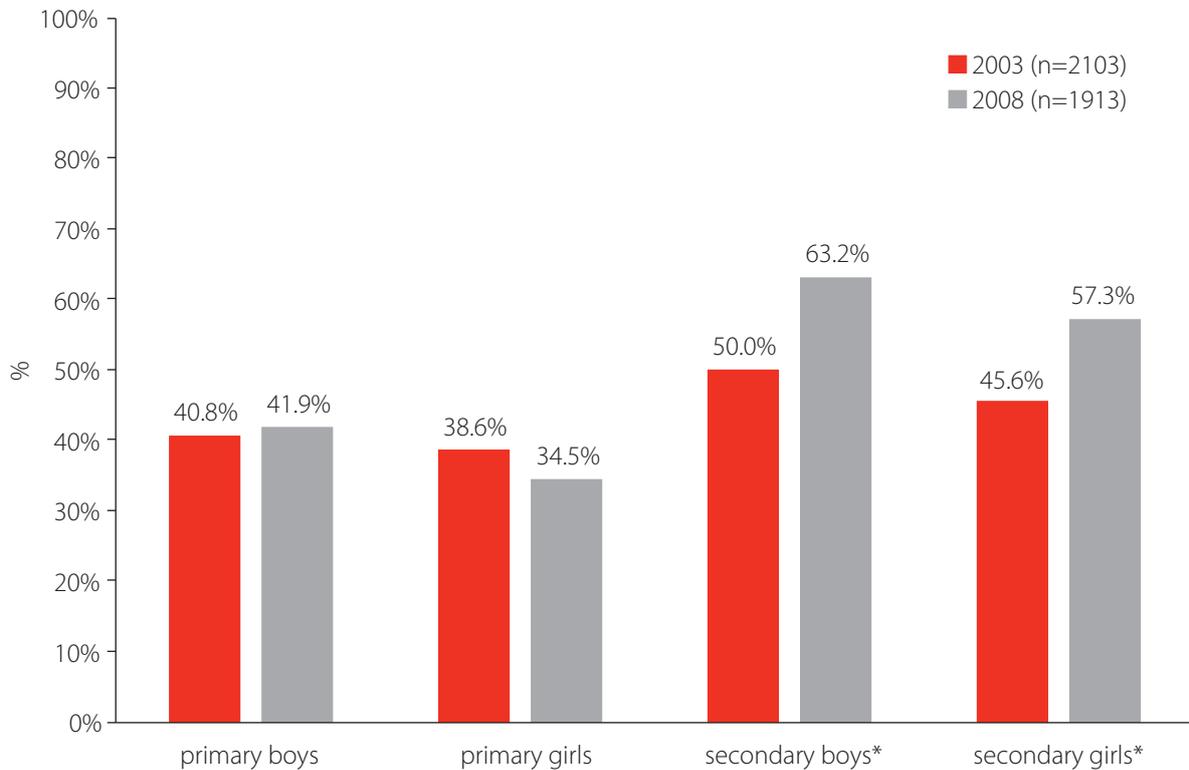
Active commuting refers to walking, cycling, skateboarding or scootering to get from place to place. This was assessed for both primary and secondary school children via questions on method of transport to school and home from school. The proportion of primary and secondary school boys and girls reporting the use of active transport are presented in Figure 8 and Figure 9.

- There were no significant differences in the proportions of children who actively commuted to school between 2003 and 2008, after adjusting for sample differences (Figure 8).
- A significantly higher proportion of secondary school boys and girls actively commuted home from school in 2008 compared with 2003, after adjusting for sample differences (Figure 9).
- There were no significant differences in the proportions of primary school children who actively commuted home from school between 2003 and 2008, after adjustment (Figure 9).



No statistically significant differences between 2003 and 2008 after adjusting for age, SES and school clustering
 Primary Boys 2003 n=544, 2008 n=525. Primary Girls 2003 n=489, 2008 n=496. Secondary Boys 2003 n=533, 2008 n=355. Secondary Girls 2003 n=538, 2008 n=379.

Figure 8: Prevalence (%) of active commuting to school on the previous school day



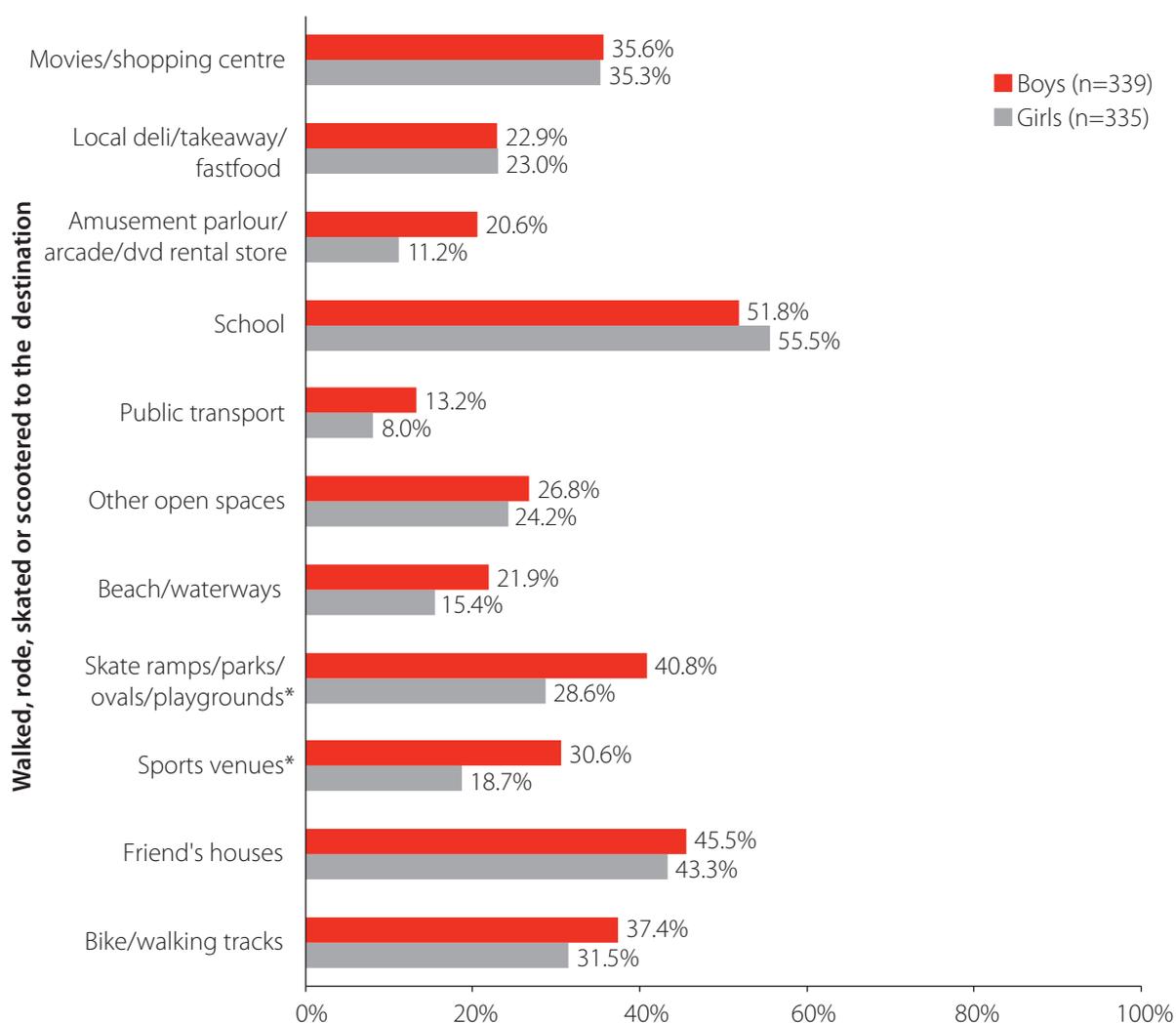
* statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering
 Primary Boys 2003 n=544, 2008 n=525. Primary Girls 2003 n=489, 2008 n=496. Secondary Boys 2003 n=533, 2008 n=355. Secondary Girls 2003 n=538, 2008 n=379.

Figure 9: Prevalence (%) of active commuting home from school on the previous school day

Independent mobility

Figure 10 and Figure 11 present the proportion of primary (years 5 and 7 only) and secondary school children reporting the local destinations to which they actively commuted (walked, cycled, skateboarded or scootered) in the last seven days.

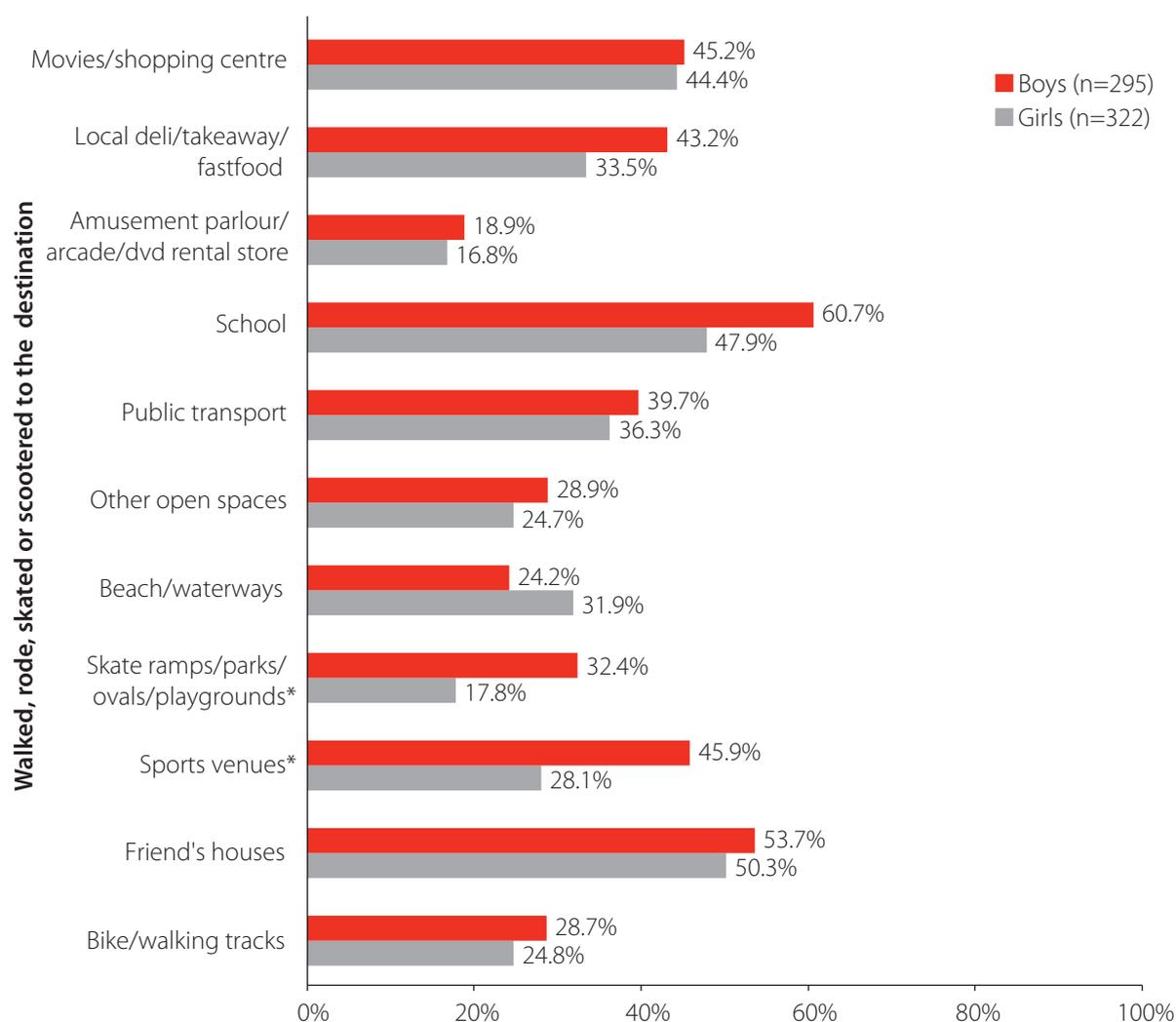
- Slightly more than one half of primary school girls (55.5%) and boys (51.8%) actively commuted to school at least once in the last seven days (Figure 10).
- Less than one half of primary school boys (45.5%) and girls (43.3%) reported actively commuting to friend’s houses in the last seven days (Figure 10).
- A significantly larger proportion of primary school boys (40.8%) actively commuted to amusement parlour/arcade/DVD rental store skate ramps/ parks/ovals/playgrounds at least once in the last seven days, compared with primary school girls (28.6%) (Figure 10).
- A significantly larger proportion of primary school boys (30.6%) actively commuted to sports venues at least once in the last seven days, compared with primary school girls (18.7%) (Figure 10).



* significant difference between boys and girls after adjusting for age, SES and school clustering

Figure 10: Proportion of children reporting actively commuting to local destinations in the last seven days: years five and seven

- Nearly two-thirds of secondary school boys (60.7%) actively commuted to school at least once in the last seven days, compared with just less than one half (47.9%) of secondary school girls (Figure 11).
- A significantly greater proportion of secondary school boys (45.9%) actively commuted to sport venues at least once in the past seven days, compared with secondary school girls (28.1%) (Figure 11).
- Almost one-half of secondary school boys (45.2%) and girls (44.4%) actively commuted to the movies/shopping centre in the past seven days (Figure 11).
- Just over one-half of secondary school boys (53.7%) and girls (50.3%) actively commuted to a friend's house in the past seven days (Figure 11).
- A significantly greater proportion of secondary school boys (32.4%) actively commuted to skate ramps/parks/ovals/playgrounds compared with secondary school girls (17.8%) at least once in the past seven days (Figure 11).



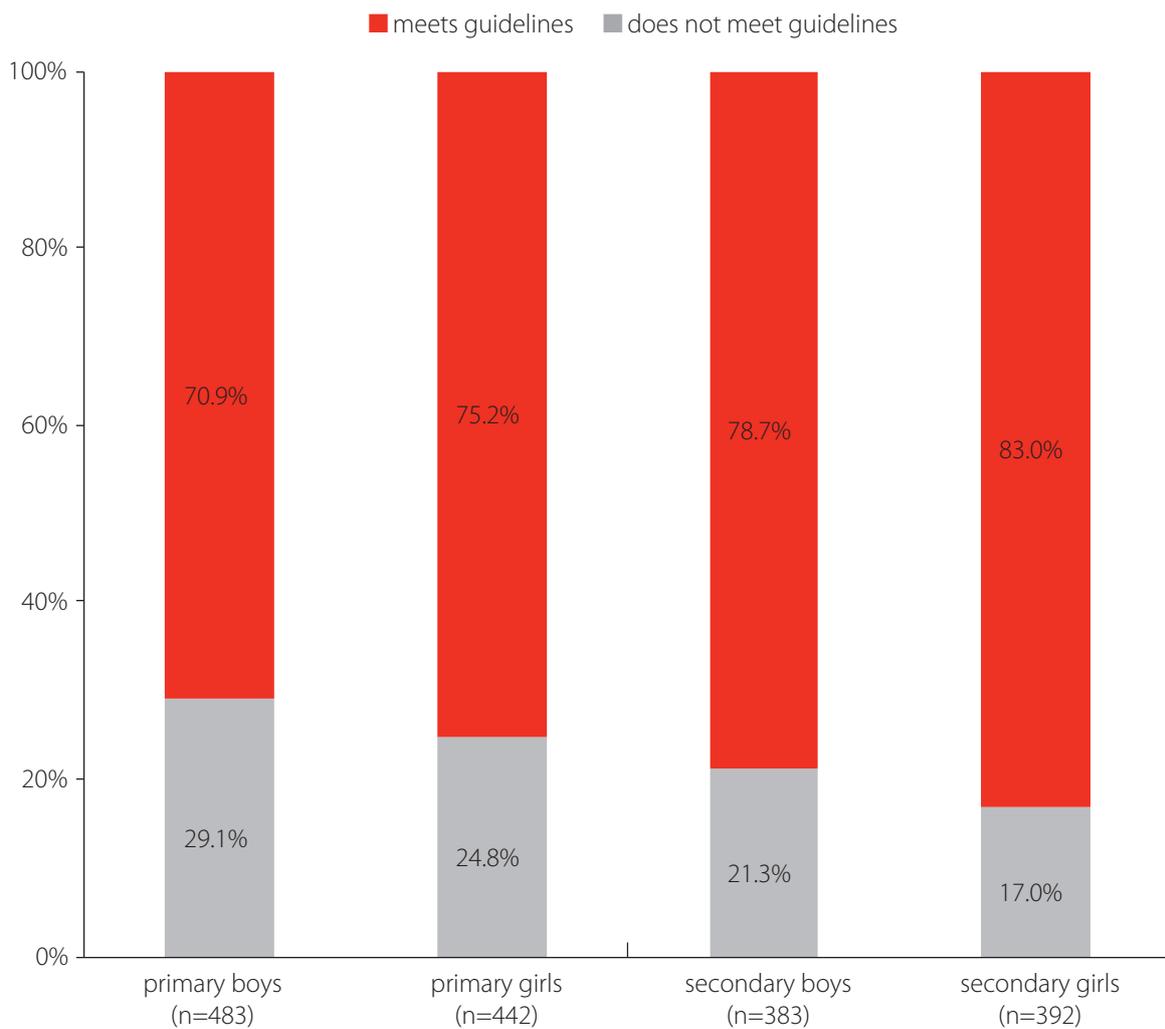
* significant difference between boys and girls after adjusting for age, SES and school clustering

Figure 11: Proportion of children reporting actively commuting to local destinations in the last seven days: secondary school children

Screen-based recreation activity

Participation in screen based recreation was assessed in both primary and secondary school children. Australian guidelines recommend that children aged 5-18 years should not spend more than two hours a day using electronic media for entertainment, particularly during daylight hours^{6,7}. The proportions of children meeting guidelines for screen-based recreation are presented in Figure 12.

- Most primary school boys (70.9%) and girls (75.2%) reported participating in more than two hours of screen-based recreation on at least one of the past seven days (Figure 12).
- Amongst secondary school children, four out of five secondary schools boys (78.7%) and girls (83.0%) participated in screen-based recreation for more than two hours on at least one of the past seven days (Figure 12).
- There were no statistically significant differences in proportions meeting screen-based recreation guidelines between boys and girls, after adjusting for age and socio-economic status.



No statistically significant difference between boys and girls after adjusting for age and SES

Figure 12: Proportion of children meeting guidelines for screen-based recreation^{6,7} on each of the last seven days

NUTRITION

Dietary Recall

Energy and macronutrient intakes

Energy and macronutrient intakes were derived from 24 hour food diaries. In 2008, 89.8% of the participants completed a 24 hour food diary. Twenty-four hour energy intake and mean percent energy from macronutrients for children in 2003 and 2008 are presented in Table 5.

- The mean 24 hour energy intake (kJ) amongst secondary school girls was significantly lower in 2008 (7826 kJ) compared with 2003 (8658kJ), after adjusting for differences in the samples. There were no other statistically significant changes in energy intake between 2003 and 2008 (Table 5).
- The mean proportion of energy derived from carbohydrates was significantly lower in 2003 compared with 2008 amongst primary and secondary school children (Table 5).
- The mean proportion of energy derived from protein was significantly higher amongst primary and secondary school children in 2008 compared with 2003. (Table 5).
- Amongst girls the mean proportion of energy derived from sugars was lower in 2008 compared with 2003 (22.5% and 20.3% respectively for primary school girls and 23.5% and 22.2% respectively for secondary school girls) (Table 5).

Table 5: Mean 24 hour energy intake & proportion of energy from macronutrients

| | Primary | | Secondary | |
|--------------------------|---------|-------|-----------|-------|
| | 2003 | 2008 | 2003 | 2008 |
| Boys | n=507 | n=434 | n=181 | n=119 |
| Energy (kJ) [#] | 9049 | 9041 | 11203 | 11186 |
| Mean % of energy from | | | | |
| Total Fats | 32.9 | 33.7 | 33.2 | 33.9 |
| Saturated Fats | 14.4 | 14.6 | 14.4 | 14.1 |
| Total Carbohydrates | 49.9 | 48.7* | 49.8 | 48.1* |
| Sugars | 20.9 | 20.5 | 21.4 | 20.9 |
| Total Protein | 17.2 | 17.5 | 17.0 | 18.0* |
| Mean % of energy from | | | | |
| Girls | n=487 | n=492 | n=200 | n=176 |
| Energy (kJ) [#] | 7885 | 8401 | 8658 | 7826* |
| Total Fats | 33.3 | 33.5 | 33.3 | 32.7 |
| Saturated Fats | 14.9 | 14.7 | 14.4 | 14.0 |
| Total Carbohydrates | 50.1 | 49.0 | 51.3 | 49.6* |
| Sugars | 22.5 | 20.3* | 23.5 | 22.2* |
| Total Protein | 16.6 | 17.4* | 15.4 | 17.6* |
| Mean % of energy from | | | | |
| All | n=994 | n=926 | n=381 | n=295 |
| Energy (kJ) [#] | 8494 | 8732 | 10011 | 9359 |
| Total Fats | 33.1 | 33.6 | 33.2 | 33.3 |
| Saturated Fats | 14.6 | 14.7 | 14.4 | 14.0 |
| Total Carbohydrates | 50.0 | 48.9* | 50.5 | 49.0* |
| Sugars | 21.7 | 20.4* | 22.4 | 21.6* |
| Total Protein | 16.9 | 17.5* | 16.2 | 17.8* |

Note - Alcohol contribution was less than 0.1% for all categories therefore not presented

[#]Energy total excludes fermentable fibre

* statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, gender, SES and school clustering

Consumption of main food groups

After adjustment for differences in the samples, statistically significant changes in the proportion of children consuming some of the main categories of food were observed between 2003 and 2008 (Table 6). Details are as follows:

- The proportion of primary and secondary school children consuming fruit products and dishes was significantly higher in 2008 compared with 2003 (Table 6).
- In 2008, 68.6% of primary school children consumed fruit products and dishes compared with 56.7% in 2003. Similarly, the proportion of secondary school children consuming fruit products and dishes was 62.7% in 2008 compared with 54.0% in 2003 (Table 6).
- The proportions of primary and secondary school boys consuming meat, poultry and game products and dishes were significantly higher in 2008 (82.8% and 88.6% respectively) compared with 2003 (78.3% and 83.8% respectively) (Table 6).
- The proportion of primary school girls consuming fish and seafood was significantly higher in 2008 (15.4%) compared with 2003 (10.5%) (Figure 6).
- The proportion of primary school children consuming confectionery and cereal bars was significantly lower in 2008 (35.6%) compared with 2003 (48.3%) (Table 6).
- The proportion of secondary school girls consuming sugar products and dishes was also significantly lower in 2008 (33.2%) than 2003 (56.1%) (Table 6).
- The proportion of children consuming fats and oils was lower in 2008 compared with 2003. The proportion of primary school children consuming fats and oils was 49.0% in 2003 and 42.2% in 2008, similarly for secondary school children (49.2% in 2003 and 41.0% in 2008) (Table 6).
- Milk products and dishes were consumed by a significantly smaller proportion of primary and secondary school girls in 2008 (91.5% and 84.1% respectively) compared with 2003 (92.8% and 84.1% respectively) (Figure 6).

Table 6: Proportion consuming food from main food groups

| | Primary | | Secondary | |
|--|--------------|--------------|--------------|--------------|
| | 2003 | 2008 | 2003 | 2008 |
| Boys | n=506 | n=431 | n=308 | n=222 |
| Cereals & cereal products (e.g. breads, pasta, breakfast cereal) | 97.2 | 98.1 | 93.8 | 97.6 |
| Cereal-based products & dishes (e.g. biscuits, pastries, cakes) | 71.0 | 71.1 | 71.7 | 72.1 |
| Fruit products & dishes | 51.4 | 63.0* | 47.3 | 57.2* |
| Vegetable products & dishes | 73.4 | 75.2 | 72.7 | 77.6 |
| Fats & oils (e.g. butter, margarine, vegetable oils) | 49.1 | 43.9* | 46.8 | 42.8 |
| Fish & seafood products & dishes | 8.9 | 14.8 | 4.5 | 11.0 |
| Egg products & dishes | 8.2 | 9.1 | 7.8 | 11.0 |
| Meat, poultry & game products & dishes | 78.3 | 82.8* | 83.8 | 88.6* |
| Milk products & dishes | 93.2 | 90.7 | 89.3 | 89.3 |
| Seed & nut products & dishes | 16.4 | 14.3 | 8.8 | 14.8 |
| Legume & pulse products & dishes | 3.3 | 3.3 | 4.8 | 4.1 |
| Snack foods (e.g. potato chips, corn chips, pretzels) | 28.0 | 26.7 | 31.5 | 30.0 |
| Sugar products & dishes (e.g. sugar, sweet spreads) | 41.6 | 41.5 | 40.5 | 36.9 |
| Confectionary & cereal bars (e.g. chocolate, fruit/cereal bars) | 46.5 | 32.7* | 43.5 | 41.4 |
| Girls | n=492 | n=429 | n=319 | n=331 |
| Cereals & cereal products (e.g. breads, pasta, breakfast cereal) | 97.4 | 96.7 | 90.9 | 91.0 |
| Cereal-based products & dishes (e.g. biscuits, pastries, cakes) | 76.7 | 76.7 | 75.9 | 69.9 |
| Fruit products & dishes | 62.6 | 74.6* | 61.9 | 67.3 |
| Vegetable products & dishes | 74.6 | 76.4* | 84.1 | 78.6 |
| Fats & oils (e.g. butter, margarine, vegetable oils) | 49.0 | 40.3* | 52.1 | 39.6* |
| Fish & seafood products & dishes | 10.5 | 15.4* | 12.2 | 11.9 |
| Egg products & dishes | 8.2 | 9.5 | 6.8 | 12.2* |
| Meat, poultry & game products & dishes | 78.7 | 79.0 | 75.6 | 72.2 |
| Milk products & dishes | 92.8 | 91.5* | 88.9 | 84.1* |
| Seed & nut products & dishes | 12.1 | 12.3 | 15.1 | 15.1 |
| Legume & pulse products & dishes | 3.8 | 5.1 | 1.1 | 8.1* |
| Snack foods (e.g. potato chips, corn chips, pretzels) | 32.1 | 27.8 | 26.7 | 21.7 |
| Sugar products & dishes (e.g. sugar, sweet spreads) | 43.1 | 42.4 | 56.1 | 33.2* |
| Confectionary & cereal bars (e.g. chocolate, fruit/cereal bars) | 50.3 | 38.8* | 54.5 | 46.5 |
| All children | n=998 | n=860 | n=627 | n=553 |
| Cereals & cereal products (e.g. breads, pasta, breakfast cereal) | 97.3 | 97.5 | 92.4 | 94.0 |
| Cereal-based products & dishes (e.g. biscuits, pastries, cakes) | 73.7 | 73.8 | 73.7 | 70.9 |
| Fruit products & dishes | 56.7 | 68.6* | 54.0 | 62.7* |
| Vegetable products & dishes | 74.0 | 75.9 | 78.1 | 78.1 |
| Fats & oils (e.g. butter, margarine, vegetable oils) | 49.0 | 42.2* | 49.2 | 41.0* |
| Fish & seafood products & dishes | 9.7 | 15.1* | 8.0 | 11.5 |
| Egg products & dishes | 8.1 | 9.2 | 7.4 | 11.7 |
| Meat, poultry & game products & dishes | 78.5 | 81.0 | 79.8 | 79.7 |
| Milk products & dishes | 93.2 | 91.1* | 89.1 | 86.5 |
| Seed & nut products & dishes | 14.3 | 13.4 | 11.7 | 14.9 |
| Legume & pulse products & dishes | 3.5 | 4.2 | 3.2 | 6.3 |
| Snack foods (e.g. potato chips, corn chips, pretzels) | 29.9 | 27.3 | 29.3 | 25.5 |
| Sugar products & dishes (e.g. sugar, sweet spreads) | 42.3 | 42.0 | 47.9 | 34.9* |
| Confectionary & cereal bars (e.g. chocolate, fruit/cereal bars) | 48.3 | 35.6* | 48.7 | 44.2 |

* statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, gender, SES and school clustering

Food Habits

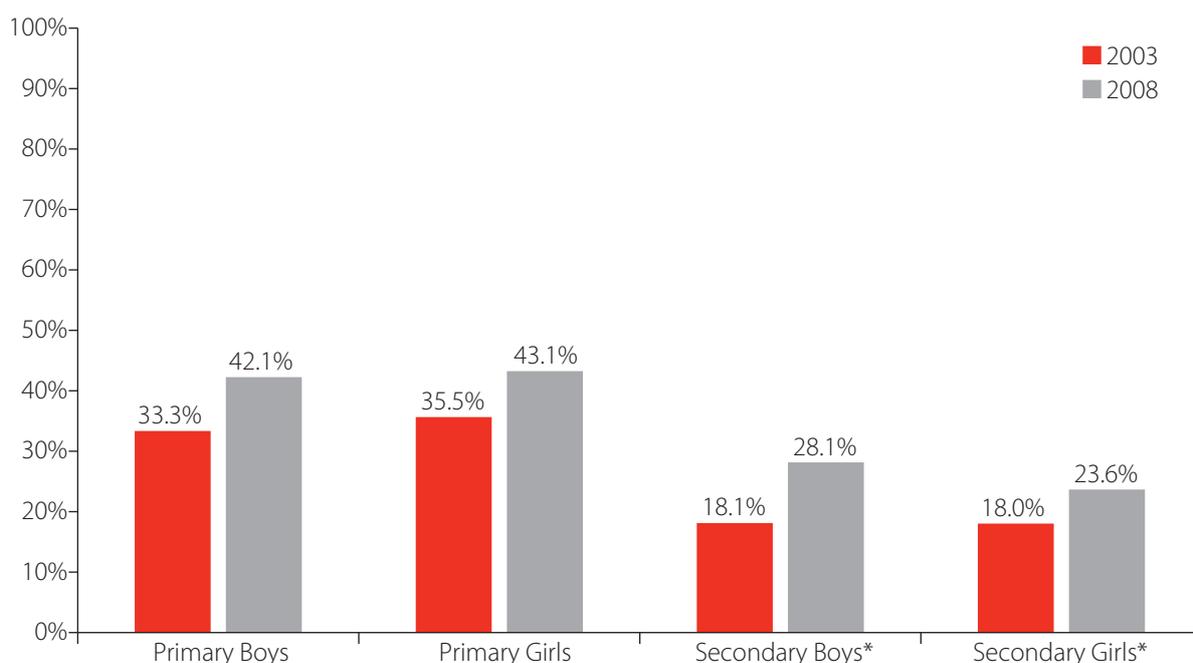
A series of questions on food habits was asked in the 12-month food frequency questionnaire (completed by 82.7% of participants in 2008). These included usual food consumption, breakfast and dinner habits, and frequency of purchase at school canteens and fast food outlets. Results comparing 2003 and 2008 are presented in the section to follow.

Usual vegetable and fruit intake

Patterns of vegetable and fruit consumption are presented in Figure 13 and Figure 14. Minimum recommended vegetable and fruit intakes are derived from the Dietary Guidelines for Children and Adolescents in Australia.¹⁰

Vegetables

- Primary school children were significantly more likely to usually meet minimum recommended vegetable intake than secondary school children.
- The proportion of secondary school children meeting minimum recommendations was significantly higher in 2008 compared with 2003.
- In 2008, 42.1% of primary school boys and 43.1% of primary school girls met dietary guidelines for vegetable consumption. This proportion did not differ significantly from 2003 (33.3% for boys and 35.5% for girls) (Figure 13).
- In 2008, 23.6% of secondary school girls were meeting dietary guidelines for vegetable consumption. This was significantly higher than 2003 (18.0%) (Figure 13).
- While the proportion of secondary school boys meeting dietary guidelines for vegetable consumption was 18.1% in 2003 and 28.1% in 2008, this difference was not significant (Figure 13).



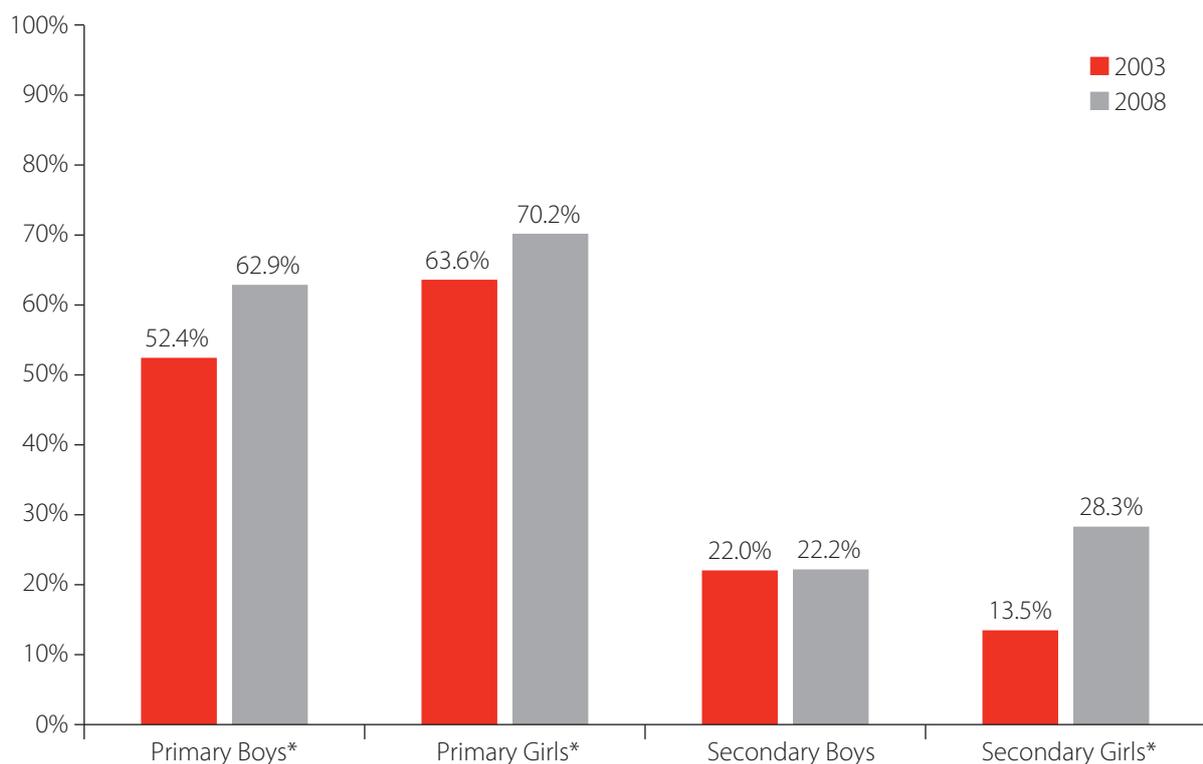
Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354. Australian dietary guidelines for children and adolescents 10 (3 serves for 8-11 yo, 4 serves for 12-18 yo)

* statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 13: Proportion of children usually meeting recommend daily vegetable intake

Fruit

- Primary school children were more likely to meet minimum recommended fruit intake compared with secondary school children (Figure 14).
- The proportion of primary school boys and girls and secondary school girls usually meeting minimum recommended fruit intake⁸ was significantly higher in 2008 compared with 2003, after adjustment (Figure 14).
- In 2008, 62.9% of primary school boys and 70.2% of primary school girls were meeting dietary guidelines for fruit consumption. These proportions were significantly higher than in 2003 (52.4% for boys and 63.6% for girls) (Figure 14).
- The proportion of secondary school girls usually meeting dietary guidelines for fruit consumption was significantly greater in 2008 compared with 2003 (28.3% and 13.5% respectively) (Figure 14).
- Secondary school boys meeting dietary guidelines for fruit did not differ between 2003 and 2008 (22.0% and 22.2% respectively) (Figure 14).

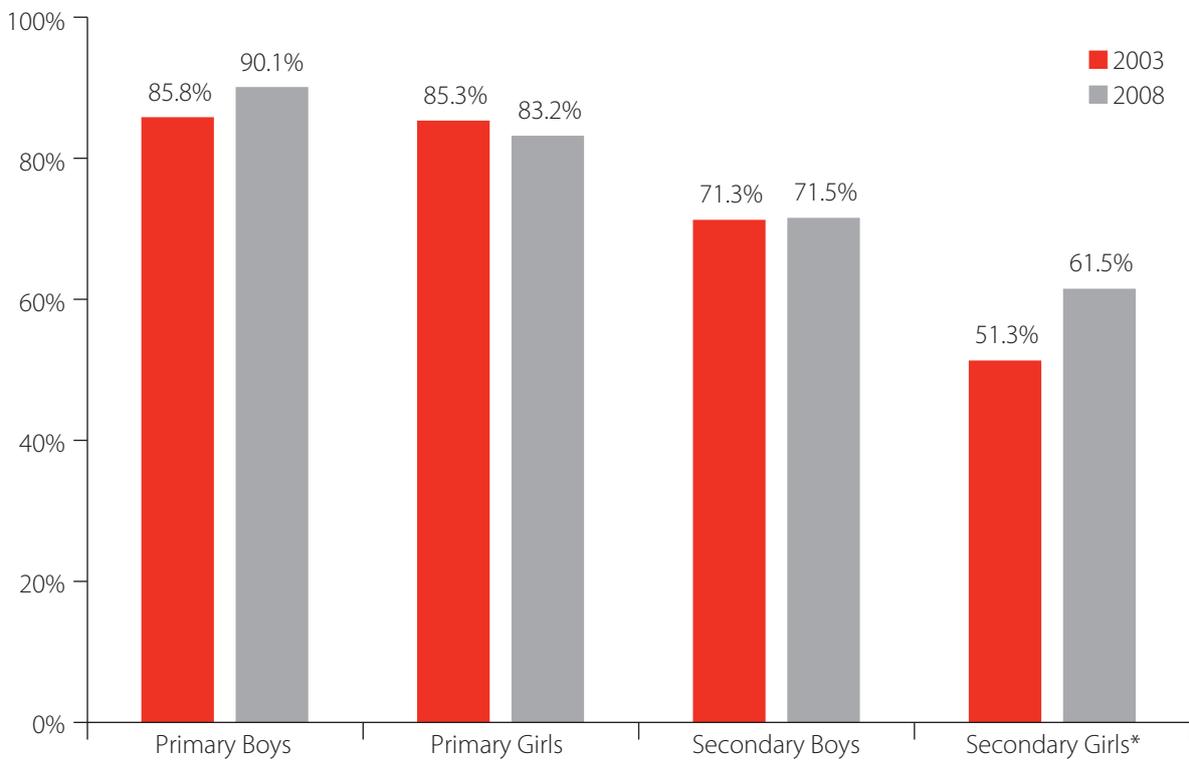


Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354. Recommendations: Australian dietary guidelines for children and adolescents 10 (1 serves for 8-11 yo, 3 serves for 12-18 yo)
 * statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 14: Proportion of children usually meeting recommend daily fruit intake

Breakfast habits

- The majority of children consumed breakfast daily.
- The proportion of secondary school girls who consumed breakfast daily was lower than secondary boys and primary school children.
- The proportion of secondary school girls who consumed breakfast daily was significantly higher in 2008 (61.5%) than in 2003 (51.3%) (Figure 15).
- There were no other statistically significant differences between years after adjusting for age and SES.



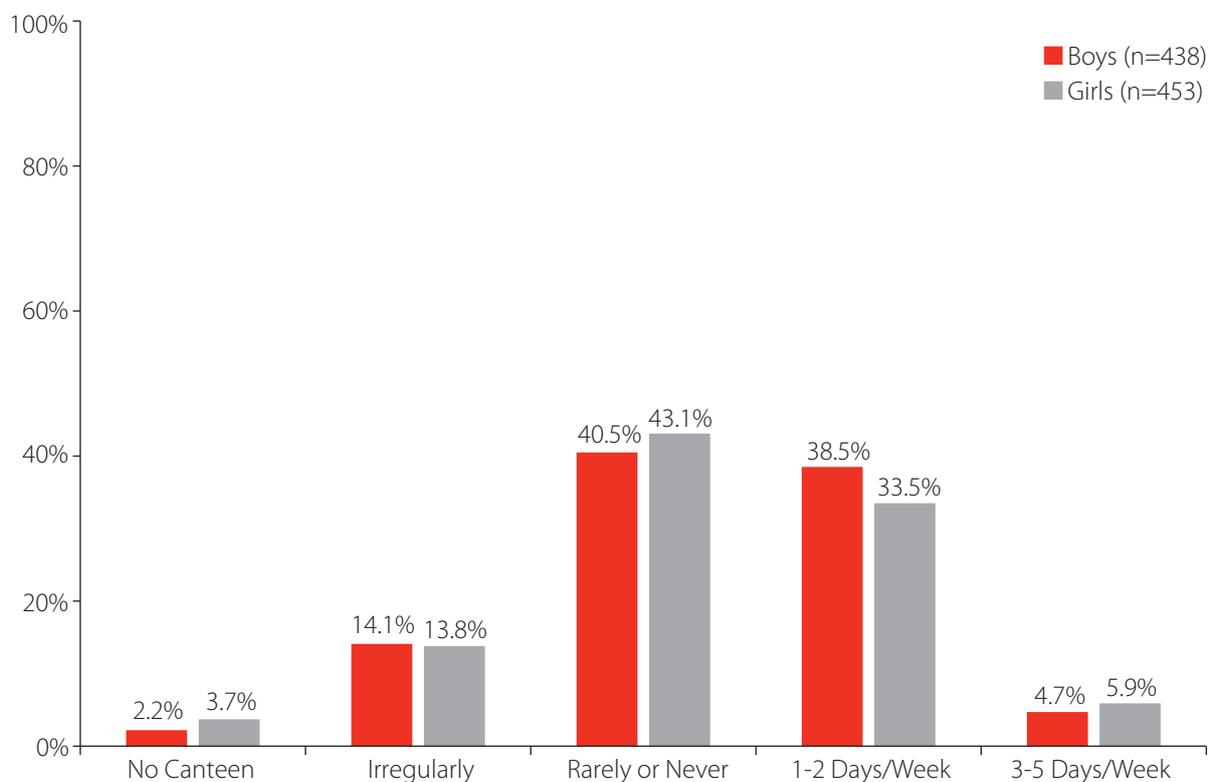
Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354.
 * statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 15: Proportion of children who consume breakfast daily

School canteen food purchasing habits

Frequency of purchasing food and drinks from school canteen/kiosk was collected in 2008 only. The frequency of purchasing food and drink from school for primary and secondary school children are presented in Figure 16 and Figure 17.

- In 2008, approximately four in ten primary school children and five in ten secondary school children purchased food or drinks from the school canteen at least once per week.
- Secondary school children were more likely to purchase from the school canteen on most days of the week than primary school children.
- There were no significant gender differences at the primary school level after adjustment (Figure 16).

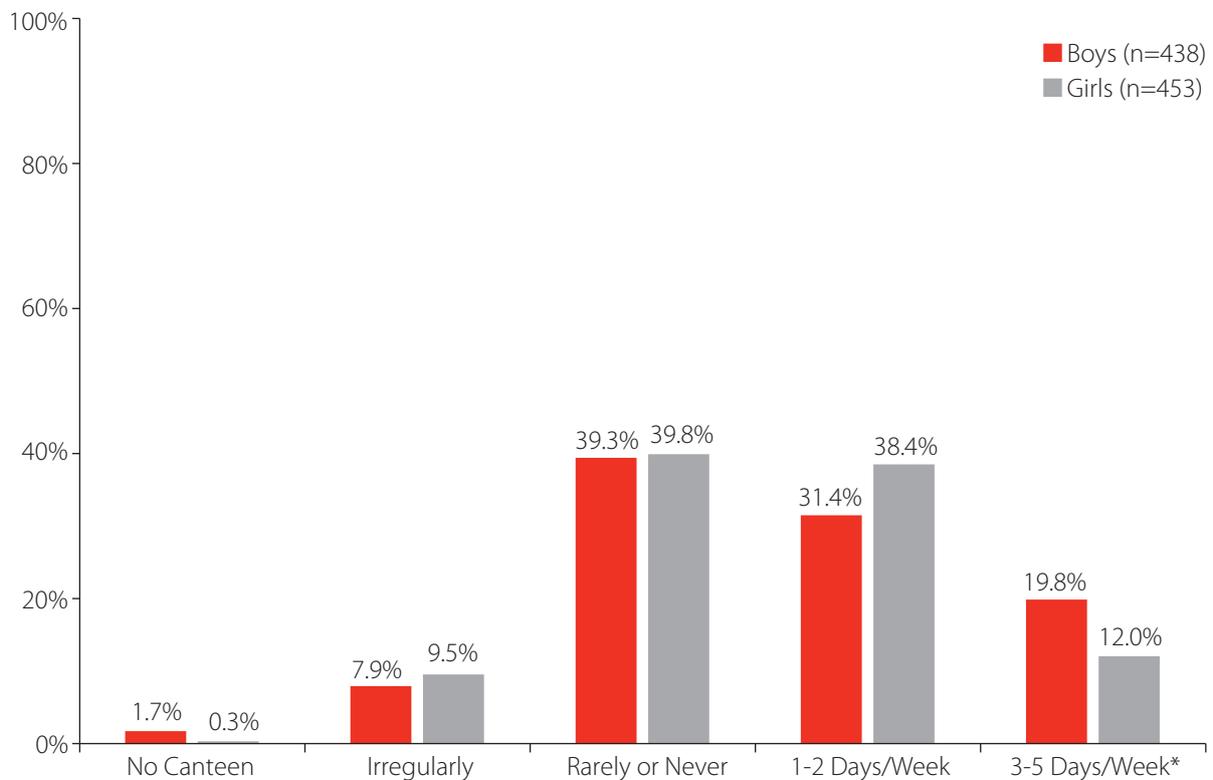


2008 data: Question not included in 2003

No statistically significant differences between boys and girls after adjusting for age, SES and school clustering

Figure 16: Frequency purchase food or drinks from the school canteen: primary school children

- Significantly more secondary school boys purchased food or drink from the school canteen on most days of the week (19.8%) than secondary school girls (12.0%) (Figure 17).



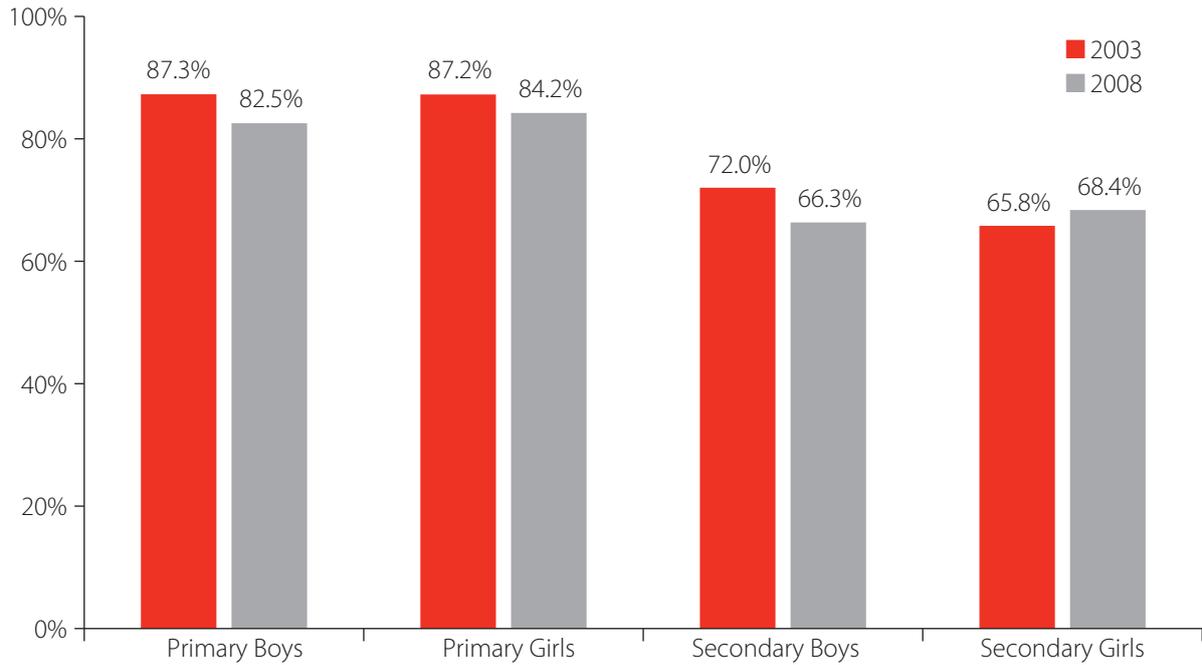
2008 data: Question not included in 2003

*statistically significant difference between boys and girls after adjusting for age, SES and school clustering

Figure 17: Frequency purchase food or drinks from the school canteen: secondary school children

Evening meal habits

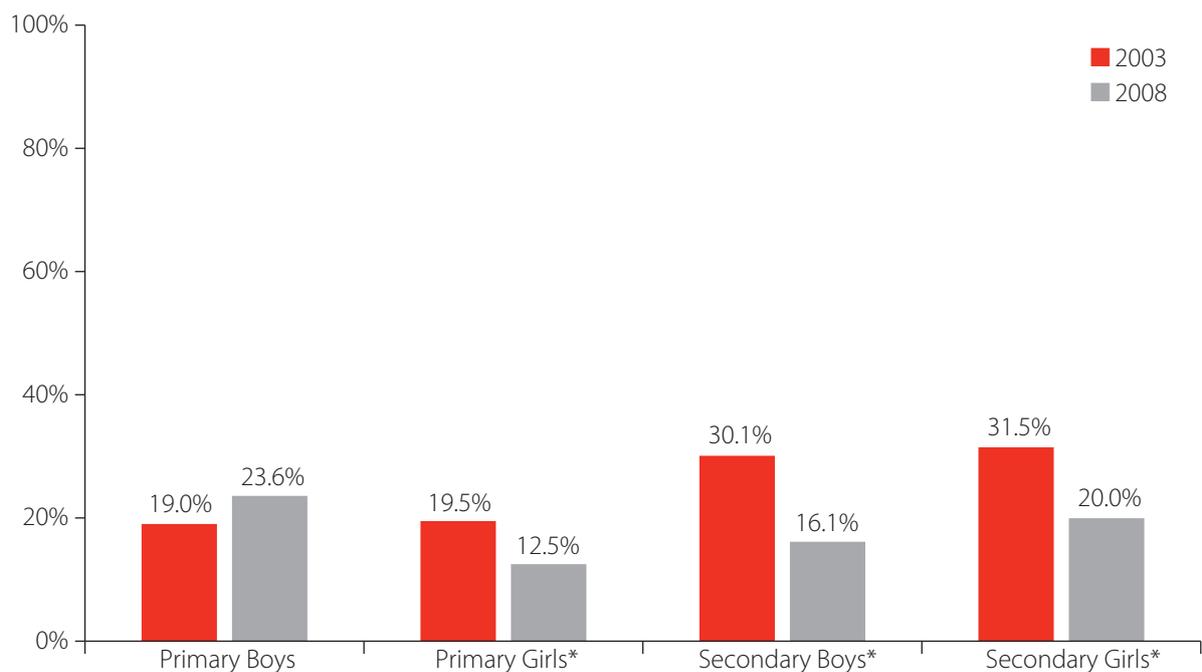
- The majority of children eat their evening meal with family on most days of the week, although the proportion decreases from primary to secondary school children (Figure 18).
- There were no statistically significant differences in the proportion eating their evening meal with family on most days of the week between 2003 and 2008 after adjusting for difference between the samples.



Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354. No statistically significant differences between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 18: Proportion of children eating evening meal with family five to seven days per week

- Fewer than one fifth of children in 2008 watched TV whilst eating dinner on most days of the week (Figure 19).
- With the exception of primary school boys, the proportion of children watching TV while eating the evening meal on most days of the week was significantly lower in 2008 compared with 2003 (Figure 19).

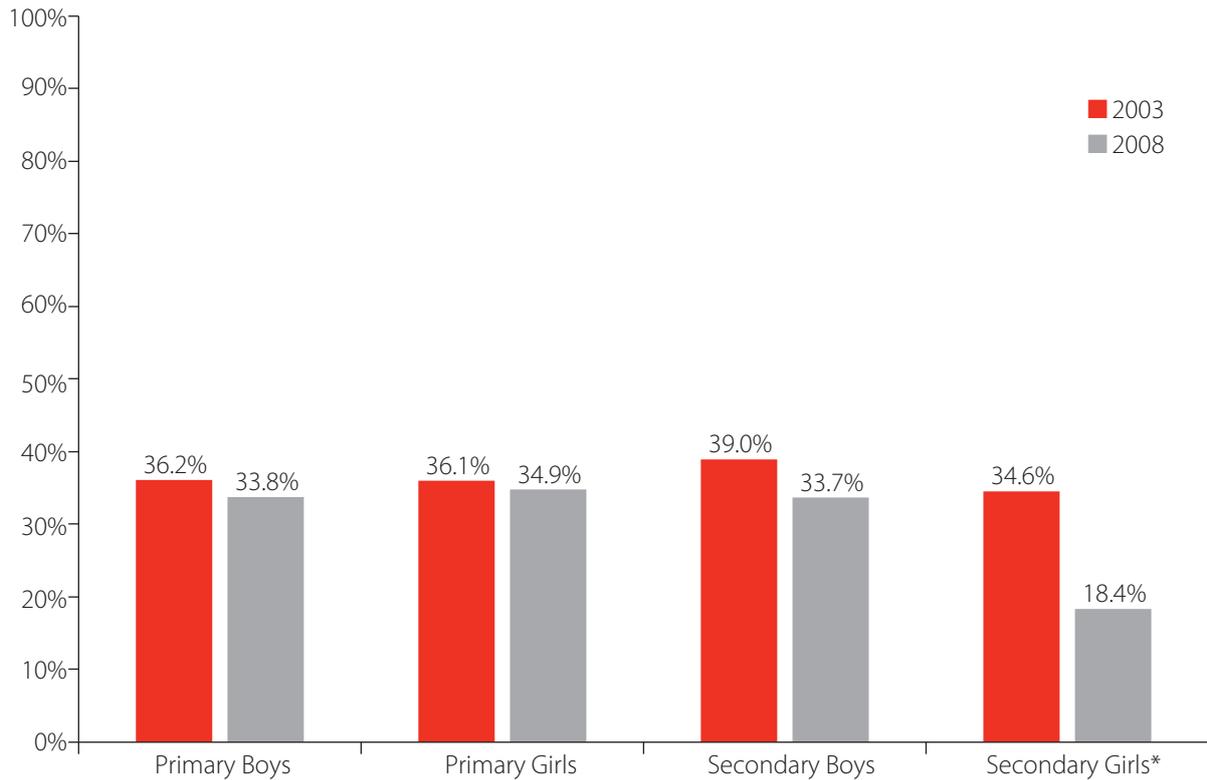


Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354. *statistically significant difference (p < 0.05) between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 19: Proportion of children watching TV while eating evening meal five to seven evenings per week

Fast food

- Similar to 2003, in 2008 approximately one third of primary school children consumed meals or snacks from fast food chains at least once a week (Figure 20).
- The proportion of secondary school girls consuming fast food at least once a week was significantly lower in 2008 compared with 2003 (18.4% and 34.6% respectively) (Figure 20). There were no other statistically significant differences in frequency of fast food purchase between 2003 and 2008.



Primary Boys 2003 n=583, 2008 n=444. Primary Girls 2003 n=549, 2008 n=459. Secondary Boys 2003 n=287, 2008 n=255. Secondary Girls 2003 n=299, 2008 n=354.
 * statistically significant difference ($p < 0.05$) between 2003 and 2008 after adjusting for age, SES and school clustering

Figure 20: Proportion of children consuming food or snacks from fast food chain at least once a week

LIMITATIONS

- Self-reported physical activity and nutrition behaviours were captured, the accuracy of which may be limited by the child's ability to recall over the time period and social desirability bias.
- Pedometers provide an objective measure of physical activity, however; they primarily capture activities involving walking or running and do not record intensity. Although estimates of non-ambulatory steps (i.e., swimming) were imputed, pedometer-determined physical activity may nevertheless underestimate actual physical activity levels.
- The protocol used for 2008 data collection closely followed the methods reported in the 2003 CAPANS survey; however some differences in child self-selection and data collection may have occurred.
- Although the analysis results include an adjustment for school-level clustering, age, home neighbourhood SES and gender, other factors were not included in the adjustment (such as metropolitan versus non-metropolitan school location).
- Data on 'school type' (i.e. government/private funding) and school year group were not available and thus could not be included in the analyses for 2003. It is possible that the response rates by school type may have differed in 2003 compared with 2008, however this could not be established due to the missing information for the 2003 data.
- The "home neighbourhood" SEIFA (based on postcode) was used as this was the only SES variable collected from the children and may not provide the most accurate representation of home SES.
- Comparative descriptive statistics are weighted to population standardised age, home neighbourhood SES and gender, however do not take into account sample differences.

REFERENCES

1. Australian Government Department of Health and Ageing. *Australian National Children's Nutrition and Physical Activity Survey- Main Findings*. Barton: ACT; 2008.
2. Booth M, Okely A, Denney-Wilson E, et al. *NSW Schools Physical Activity and Nutrition Survey (SPANS) 2004: Full Report*. Sydney: NSW Department of Health; 2006.
3. Abbott R, Macdonald D, Mackinnon L, et al. *Healthy Kids Queensland Survey 2006: Summary Report*. Brisbane, Queensland Health; 2007.
4. Hands B, Parker H, Glasson C, et al. *Physical Activity and Nutrition Levels in Western Australian Children and Adolescents: Report*. Perth: Western Australian Government; 2004.
5. Australian Bureau of Statistics. 2006 Census CDATA Online. [http://www.abs.gov.au/CDATA Online](http://www.abs.gov.au/CDATAOnline); Accessed 10 June 2009.
6. Australian Government Department of Health and Ageing. *Australia's physical activity recommendations for 5-12 year olds*. Canberra; 2004.
7. Australian Government Department of Health and Ageing. *Australia's physical activity recommendations for 12-18year olds*. Canberra; 2004.
8. Cuddihy T, Tudor-Locke C, Pangrazi, R, et al. BMI-referenced standards for recommended pedometer-determined steps/day in children. *Prev Med* 2004; 38(6): 857-864.
9. Ainsworth B, Haskell W, Leon A, et al. Compendium of physical activities: classification of energy costs of human physical activities. *Med Sci Sports Exerc* 1993; 25(1): 71-80.
10. National Health & Medical Research Council. *Dietary Guidelines for Children and Adolescents in Australia*. Canberra; 2003.

Physical Activity Taskforce

The Physical Activity Taskforce was established in 2001 to oversee the development and delivery of a whole of government and whole of community approach to increasing physical activity levels in Western Australians. It comprises government, non-government, academic and local government agencies.

Contact us for more information:

The logo for 'be active wa' features the words 'be active wa' in a lowercase, sans-serif font. Above the word 'active' is a stylized black arch with a red dot at its peak. The 'a' in 'wa' is also lowercase.

Physical Activity Taskforce

Physical Activity Taskforce Secretariat

PO Box 329, Leederville WA 6903

T 08 9492 9630 **F** 08 9492 9711

W www.beactive.wa.gov.au

No single agency or organisation will be able to increase physical activity levels on its own.



Government of Western Australia

Department of Education
Department of Health
Department of Planning
Department of Sport and Recreation
Department of Transport

