



Comparability of dietary measures among NSW children and adolescents



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Author:

Lana Hebden was responsible for the preparation of this report.

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For further information contact us at sph.panorg@sydney.edu.au or phone 02 9036 3271.



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Table of Contents

ABBREVIATIONS	5
LIST OF TABLES	6
INTRODUCTION	9
METHODS	10
1 EATING BEHAVIOURS	15
1.1 EATING BREAKFAST	17
1.2 EATING TOGETHER AS A FAMILY	21
1.3 EATING IN FRONT OF THE TELEVISION.....	23
1.4 OFFERING WATER WITH MEALS OR SNACKS	27
1.5 OFFERING SWEETS AS A REWARD	29
2 NON-ALCOHOLIC BEVERAGES	31
2.1 MILK TYPE	33
2.2 MILK AMOUNT.....	38
2.3 FRUIT JUICE FREQUENCY	44
2.4 FRUIT JUICE AMOUNT.....	47
2.5 WATER AMOUNT.....	51
2.6 SUGAR SWEETENED DRINKS (SOFT DRINKS, CORDIALS AND SPORTS DRINKS).....	53
3 FRUIT AND VEGETABLES	60
3.1 FRUIT	61
3.2 VEGETABLES	67
4 FAST FOODS	73
4.1 FAST FOOD FREQUENCY.....	74
5 EXTRA FOODS	79
5.1 HOT FRIED POTATO PRODUCTS.....	80
5.2 POTATO CRISPS AND SALTY SNACKS.....	85
5.3 CONFECTIONERY	90
5.4 OTHER SNACKS.....	94
CONCLUSIONS	95

RELATED CITATIONS.....	97
REFERENCES	98
APPENDICES	100
Appendix 1 General description of surveys.....	100
Appendix 2 Age groups covered by the selected surveys and survey years.....	102

ABBREVIATIONS

24HR recall	24-hour recall method of dietary assessment. This method involves recording all foods and drinks consumed within one 24 hour reference period, to estimate an individual's daily nutrient intake.
ANCS	Australian National Children's Nutrition and Physical Activity Survey
C	Child reported data
CATI	Computer assisted telephone interview
FFQ	Food Frequency Questionnaire
NDS	National Dietary Survey
NHS	National Health Survey
NNS	National Nutrition Survey
NNS (NSW)	NSW respondents to the National Nutrition Survey
P	Parent reported data
PHS	Population Health Survey, e.g. NSW Child PHS and NSW Adult PHS
SDQ	Short Dietary Question
SPANS	NSW Schools Physical Activity and Nutrition Survey
SSHBS	NSW School Students Health Behaviours Survey

LIST OF TABLES

Table 1.0.1	Selected dietary indicators used in assessing comparability of measures, by survey and survey year	13
Table 1.1.1	Comparability of measures for the frequency of eating breakfast, across surveys, age groups and respondents.....	17
Table 1.1.2	Estimates of common response categories for the frequency of eating breakfast, by age group, survey and respondent	18
Table 1.2.1	Comparability of measures for the frequency of eating together as a family, across surveys, age groups and respondents	21
Table 1.2.2	Estimates of common response categories for the frequency of eating together as a family, by age group, survey and respondent	21
Table 1.3.1	Comparability of measures for the frequency of eating in front of the television, across surveys, age groups and respondents	23
Table 1.3.2	Estimates of common response categories for the frequency of eating in front of the television, by age group, survey and respondent.....	24
Table 1.3.3	Estimates of common response categories for the frequency of eating in front of the television, by survey and respondent.....	24
Table 1.4.1	Comparability of measures for the frequency of offering water with meals or snacks, across surveys, age groups and respondents	27
Table 1.4.2	Estimates of common response categories for the frequency of offering water with meals or snacks, by age group, survey and respondent.....	27
Table 1.5.1	Comparability of measures for the frequency of offering sweets as a reward, across surveys, age groups and respondents	29
Table 1.5.2	Estimates of common response categories for the frequency of offering sweets as a reward, by age group, survey and respondent.....	29
Table 2.1.1	Comparability of measures for the type of milk consumed, across surveys, age groups and respondents.....	33
Table 2.1.2	Estimates of common response categories for the type of milk consumed, by age group, survey, and respondent, using SDQ and FFQ methods	35
Table 2.2.1	Comparability of measures for the amount of milk consumed, across surveys, age groups and respondents.....	38
Table 2.2.2	Estimates of common response categories (drinks cow’s milk vs. doesn’t drink cow’s milk) by age group, survey, and respondent	39

Table 2.2.3	Estimates of common response categories for the amount of cow’s milk consumed, by age group, survey, and respondent	40
Table 2.2.4	Estimates of common response categories for the amount of cow’s milk consumed, by age group, national dietary survey (NNS vs. ANCS), and respondent, using 24HR recall methods.....	41
Table 2.3.1	Comparability of measures for the frequency of consuming fruit juice, across surveys, age groups and respondents	44
Table 2.3.2	Estimates of common response categories for the frequency of consuming fruit juice, by age group, survey, and respondent	45
Table 2.4.1	Comparability of measures for the amount of fruit juice consumed, across surveys, age groups and respondents.....	47
Table 2.4.2	Estimates of common response categories for the amount of fruit juice consumed, by age group, survey, and respondent, using SDQ and 24HR recall methods	48
Table 2.5.1	Comparability of measures for the amount of water consumed, across surveys, age groups and respondents.....	51
Table 2.5.2	Estimates of common response categories for the amount of water consumed, by age group, survey, and respondent.....	51
Table 2.6.1	Comparability of measures for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed, across surveys, age groups and respondents	53
Table 2.6.2	Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed, by age group, survey, and respondent	54
Table 2.6.3	Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed per day, by age group, survey, and respondent, using SDQ and 24HR recall methods.....	55
Table 3.1.1	Comparability of measures for the amount of fruit consumed, across surveys, age groups and respondents.....	61
Table 3.1.2	Estimates of common response categories for the amount of fruit consumed, by age group, survey, and respondent.....	63
Table 3.2.1	Comparability of measures for the amount of vegetables consumed, across surveys, age groups and respondents.....	67
Table 3.2.2	Estimates of common response categories for the amount of vegetables consumed, by age group, survey, and respondent	69
Table 4.1.1	Comparability of measures for the frequency of consuming fast food, across surveys, age	

groups and respondents.....	74
Table 4.1.2 Estimates of common response categories for fast food frequency in the SSHBS, by age group and survey year (2002 vs. 2008)	75
Table 4.1.3 Estimates of common response categories for fast food frequency, by age group, survey and year of survey	76
Table 4.1.4 Estimates of common response categories for fast food frequency, by age group, survey and year of survey	77
Table 5.1.1 Comparability of measures for the frequency of consuming hot fried potato products, across surveys, age groups and respondents	80
Table 5.1.2 Estimates of common response categories for the frequency of consuming hot fried potato products, by age group, survey and respondent	81
Table 5.1.3 Estimates of common response categories for the frequency of consuming hot fried potato products, by age group, survey and respondent	83
Table 5.2.1 Comparability of measures for the frequency of consuming potato crisps and salty snacks, across surveys, age groups and respondents.....	85
Table 5.2.2 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group (12 to 15 years), survey, and respondent	86
Table 5.2.3 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group, survey and respondent	87
Table 5.2.4 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group, survey and respondent	88
Table 5.3.1 Comparability of measures for the frequency of consuming confectionery, across surveys, age groups and respondents	90
Table 5.3.2 Estimates of common response categories for the frequency of consuming confectionery, by age group, survey and respondent	91
Table 5.3.3 Estimates of common response categories for the frequency of consuming confectionery, by age group, survey and respondent	92
Table 5.4.1 Comparability of measures for the frequency of consuming other snacks, across surveys, age groups and respondents	94

INTRODUCTION

Context

The measurement of lifestyle behaviours among child and adolescent populations is challenging. Over the past two decades, there have been at least six population-based surveys that have measured lifestyle and anthropometric factors among 13 population-based samples of children and adolescents in New South Wales (NSW) (Appendix 1). While these surveys have used different instruments and modes of administration, all have to some extent collected data on the same types of indicators (or variables) for assessing dietary intake and food related behaviours.

Findings from these surveys have been published independently (Table 1.0.1). However, in order to fully understand trends in these indicators and explain the different estimates that potentially result from these surveys, an in-depth analysis of the comparability of selected dietary measures which are common across these surveys is required. The results of this analysis will provide valuable information to guide the interpretation of population dietary surveillance data, and future decisions around population nutrition monitoring, in NSW.

Purpose

The first purpose of this report was to collate the estimates of dietary indicators for young people across different population-based surveys conducted in NSW between 1995 and 2010. The second purpose was to compare these estimates according to age group, survey methods, the different population survey questions, by age group and respondent (child versus parent).

Scope:

- Eating behaviours
- Non-alcoholic Beverages
- Fruit and vegetables
- Fast foods
- Extra foods

METHODS

PHASE 1

Phase 1 comprised sourcing the user guides and reports from all national- and state-based health and nutrition surveys. The dietary indicators measured across surveys were then collated and tabulated according to the surveys in which they were measured, the age groups surveyed, the respondent (parent versus child), and the question formats used and available response options.

The complete set of available dietary indicators comprised: frequency of eating breakfast, eating together as a family and eating in front of the television, frequency of parents offering water with meals or snacks or offering sweets as a reward for good behaviour, amount and type of milk consumed, amount and frequency of fruit juice consumption, amount of water and the amount of sugar sweetened drinks consumed, servings of fruit and vegetables consumed, frequency of consuming fast foods and the frequency of consuming fried potato, potato crisps or salty snacks, confectionery and other snacks.

Common response categories were then defined for each dietary indicator based on the available response options. For example, response options from questions assessing 'offering treats or snacks as a reward' were *usually*, *sometimes* and *rarely/never* in the 2007-08 NSW Child Population Health Survey (PHS) and the 2010 Schools Physical Activity and Nutrition Survey (SPANS). Hence, the common response categories were *usually*, *sometimes* and *rarely/never*.

An assessment of the comparability of the different questions used for each dietary indicator was then conducted, to infer whether estimates could be accurately compared. This assessment was based on:

- the respondent to the survey question (e.g. child or parent),
- age group,
- question format, and
- survey method used

PHASE 2

For Phase 2, the datasets for each national- and state-based health and nutrition survey of interest were obtained, along with the accompanying data dictionaries. The estimates (counts) for each dietary indicator were then calculated with weighted population proportions, across all datasets within which they were measured. All analyses were conducted in SPSS version 19.0 (IBM Corporation, Chicago, IL, USA).

Where required, dietary indicator variables were transformed to provide estimates in the same format as the common response categories. For example, the NSW Child PHS measures the amount of milk consumed on a continuous scale of cups per day or cups per week, and this was transformed into the common response categories: doesn't drink cow's milk, drinks cow's milk (less than 1 cup/day, 1 cup/day, 2 cups/day, 3 cups/day, 4 cups/day, 5 or more cups/day), to allow comparability with other surveys that use these response categories. Relevant details of how response categories were transformed are provided as footnotes to estimate tables throughout the results. To enable a comparison of the survey methods, where relevant, all possible responses including 'don't know', 'not stated' or 'missing' responses were included in the reported prevalence estimates. However, it should be noted that when reporting on the prevalence of health behaviours, such responses are usually excluded from reporting, and for this reason the prevalence estimates presented in this report will vary from those reported in published population health survey data (Table 1.0.1). Further, in some surveys, 'N/A' (not applicable) is stated in the estimate tables where there were no data available for that response category.

RESULTS

The results section of this report presents, for each dietary indicator:

- a summary table illustrating the comparability of a selected dietary indicator across surveys, survey years, age groups and respondents (parent versus child);
- tables presenting the estimates for each selected dietary indicator according to age group, survey, and year of survey.

Brief comments are then provided for each dietary indicator in terms of patterns in the estimates across age groups, years, survey methods and between respondents (parents vs. children), in terms of how this may have influenced the estimates. Methods of measurement used for the dietary indicators presented in this report have included short dietary questions (SDQ) or food frequency questionnaires (FFQ) to assess usual intake, and more detailed twenty-four hour dietary recall (24HR recall) to assess an individual's daily nutrient intake within a 24HR reference period.

Table 1.0.1 on the following page summarises the dietary indicators selected for assessing comparability of measures in this report, according to survey and survey year.

Table 1.0.1 Selected dietary indicators used in assessing comparability of measures, by survey and survey year

Survey	Year	Dietary indicators
NSW School Students Health Behaviours Survey (SSHBS)	2002 ^a	Eating breakfast, Milk type, Fruit, Vegetables, Fast food
	2005 ^b	Water amount, Milk type, Fruit, Vegetables
	2008 ^c	Water amount, Milk type, Fruit, Vegetables, Fast food
NSW Schools Physical Activity and Nutrition Survey (SPANS)	2004 ^d	Eating together as a family, Juice frequency, Eating breakfast, Eating in front of the television, Milk type, Fruit, Vegetables, Fast food, Hot fried potato products, Potato crisps and salty snacks, Confectionery
	2010 ^e	Offering water with meals or snacks, Offering sweets as a reward, Milk amount, Juice amount, Water, Sugar sweetened drinks, Eating breakfast, Eating in front of the television, Milk type, Fruit, Vegetables, Fast food, Hot fried potato products, Potato crisps and salty snacks, Confectionery
National Nutrition Survey (NNS)	1995 ^f	Food related questions: Eating breakfast, Milk type, Fruit, Vegetables 24HR recall: Milk amount, Juice amount, Sugar sweetened drinks FFQ: Juice frequency, Potato crisps and salty snacks
Australian National Children's Nutrition and Physical Activity Survey (ANCNPAS)	2007 ^g	Food habits: Milk type 24HR recall: Milk amount, Juice amount, Sugar sweetened drinks
NSW Population Child Health Survey	2001 ^h	Milk amount, Juice amount, Sugar sweetened drinks, Fruit, Vegetables, Hot fried potato products
	2003-04 ⁱ	Fruit, Vegetables
	2005-06 ^j	Milk amount, Juice amount, Sugar sweetened drinks, Fruit, Vegetables, Fast food, Hot fried potato products, Potato crisps and salty snacks
	2007-08 ^k	Milk amount, Milk type, Juice amount, Sugar sweetened drinks, Eating breakfast, Eating together as a family, Eating in front of the television, Offering water with meals or snacks, Offering sweets as a reward, Fruit, Vegetables, Fast food, Hot fried potato products, Potato crisps and salty snacks, Confectionery
NSW Population Adult Health Survey	2004 ^l	Fruit, Vegetables
	2006 ^m	Fruit, Vegetables
	2008 ⁿ	Fruit, Vegetables

- ^a Centre for Epidemiology and Research, NSW Department of Health. The health behaviours of secondary school students in New South Wales 2002. *N S W Public Health Bull* 2004; 15(S-2).
- ^b Centre for Epidemiology and Research. *New South Wales School Students Health Behaviours Survey: 2005 Report*. Sydney: NSW Department of Health, 2007.
- ^c Centre for Epidemiology and Research. *New South Wales School Students Health Behaviours Survey: 2008 Report*. Sydney: NSW Department of Health, 2009.
- ^d Booth M, Okely AD, Denney-Wilson E, Hardy L, Yang B, Dobbins T (2006). *NSW School Physical Activity and Nutrition Survey (SPANS) 2004: Full Report*. Sydney: NSW Department of Health.
- ^e Hardy LL, King L, Espinel P, Cosgrove C, Bauman A. *NSW Schools Physical Activity and Nutrition Survey (SPANS) 2010: Full Report*. Sydney: NSW Ministry of Health.
- ^f McLennan W, Podger A. Australian Bureau of Statistics, 1998, National Nutrition Survey Users' Guide 1995, cat no. 4801.0, viewed 12 November 2012, <[http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/CA25687100069892CA256889002102FD/\\$File/48010_1995.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/CA25687100069892CA256889002102FD/$File/48010_1995.pdf)>
- ^g Commonwealth Scientific Industrial Research Organisation (CSIRO), Preventative Health National Research Flagship, and the University of South Australia. 2007 Australian National Children's Nutrition and Physical Activity Survey – User Guide. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/AC3F256C715674D5CA2574D60000237D/\\$File/user-guide-v2.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/AC3F256C715674D5CA2574D60000237D/$File/user-guide-v2.pdf). Accessed November 12, 2012.
- ^h Centre for Epidemiology and Research, NSW Department of Health. New South Wales Child Health Survey 2001. *N S W Public Health Bull* 2002; 13(S-4).
- ⁱ Centre for Epidemiology and Research. *2003–2004 Report on Child Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2006.
- ^j Centre for Epidemiology and Research. *2005–2006 Report on Child Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2008.
- ^k Centre for Epidemiology and Research. *2007–2008 Report on Child Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2010.
- ^l Centre for Epidemiology and Research, NSW Department of Health. 2004 Report on Adult Health from the New South Wales Population Health Survey. *N S W Public Health Bull* 2005; 16(S-1).
- ^m Centre for Epidemiology and Research. *2006 Report on Adult Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2007.
- ⁿ Centre for Epidemiology and Research. *2008 Report on Adult Health from the New South Wales Population Health Survey*. Sydney: NSW Department of Health, 2009.

1 EATING BEHAVIOURS

What, when, where, and why children eat is not simply based on hunger. There are many factors that influence children's food intake including social norms such as eating as a family or in front of the television, as well as the types of foods and drinks offered by parents, such as offering water with meals and snacks or offering sweets as a reward.

Scope:

- Eating behaviours
- Non-alcoholic Beverages
- Fruit and vegetables
- Fast foods
- Extra foods

There is good evidence that children and adolescents who eat breakfast daily have a healthier diet pattern (1, 2), lower body mass index and a reduced risk of becoming overweight or obese (1, 3). Children and adolescents who frequently watch television during the family evening meal (dinner) tend to have a less healthy diet (4, 5); an association which increases with each night that dinner is consumed in front of the television (5, 6). Consuming one or more dinners in front of the television each week has also been shown to lead to weight gain in Australian children aged 10-12 years (3).

Offering water with meals is one strategy to promote water consumption among children over other sugar sweetened drinks, such as soft drinks, cordials and juices, and has been associated with a better quality diet in children (7). The provision of sweets (i.e. confectionery) as a reward for good behaviour can lead to poorer dietary habits, for example if sweets are given as a reward to children for eating fruit or vegetables, children may learn to place less value on these healthier foods (8).

National and state-based nutrition and health surveys have asked about the frequency of eating breakfast, eating together as a family or in front of the television, and offering water with meals or snacks or offering sweets as a reward.

A limitation to use of these questions however is the lack of validation studies assessing their accuracy. The only question to be validated has been: *"How many days per week (do you/does...) usually have something to eat for breakfast?"* used in the 1995 National Nutrition Survey. This question was found to under-estimate the frequency of eating breakfast when compared with the 24HR recall method (9), although when compared to a longer reference period (three-day weighed food records) the reported frequency was shown to increase with the frequency reported in the weighed food records (10). Under-reporting one's frequency of eating breakfast was most common

in the lower frequency response categories (i.e. rarely or never, and 1-4 times per week), and among those of lower socio-economic status (10).

While there has been no validation of questions used for assessing the frequency of other food related behaviours, the frequency of eating dinner in front of the television has been shown to be reliable when reported by parents (3), although the consistency between what parents report compared with their children (6-9 years of age), is likely to be poor (11).

1.1 EATING BREAKFAST

Table 1.1.1 Comparability of measures for the frequency of eating breakfast, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-15 yrs 16-17 yrs	P ^a C	How many days per week (do you/does...) usually have something to eat for breakfast?	Rarely or never 1-2 days 3-4 days 5 or more days		
SSHBS	2002	12-15 yrs 16-17 yrs	C C	How many days per week do you usually have something to eat for breakfast?	Rarely or never 1-2 days 3-4 days 5 or more days		
SPANS	2004	12-15 yrs	C	How often do you usually do the following... Have something to eat for breakfast? ^b	Never or rarely <1 time per week 1-3 times per week 4-6 times per week Everyday	<1 time a week 1-2 times a week 3-4 times a week ≥ 5 times a week	Limited by differences in respondents (P vs. C) and the definition of 'breakfast' (i.e. most ask about having 'something to eat' for breakfast, while SPANS 2010 asks about having 'something' for breakfast)
NSW Child PHS	2007-08	2-4 yrs 5-10 yrs 12-15 yrs	P P P	How often does child usually have something to eat for breakfast?	0-1 times per week 2-4 times per week 5-6 times per wk Every day	(Categories common to most but not all)	
SPANS	2010	5-10 yrs 12-15 yrs	P C	How often do you usually have something for breakfast?	Never or rarely <1 week 1-2 times a week 3-4 times a week 5-6 times a week Every day		

^a Children aged 15 years were interviewed with their own consent and the permission of a parent or responsible adult. Parents or guardians who did not consent were interviewed on their child's behalf.

^b Survey also asks 'How often do you usually do the following... Have something to drink for breakfast?' This was excluded for comparability purposes as most surveys specifically ask frequency of having something to 'eat' for breakfast.

Table 1.1.2 Estimates of common response categories for the frequency of eating breakfast, by age group, survey and respondent

Age Group	Survey	Year	R	Sample Size	N (weighted %)					
					<1 a week	1-2 times a week	3-4 times a week	≥ 5 times a week	Don't know	Missing
2-4 yrs	NSW Child PHS	2007-08	P	789	21 (2.6)			767 (97.4)	1 (0.1)	0 (0.0)
5-10 yrs	NSW Child PHS	2007-08	P	1, 511	40 (2.7)			1, 471 (97.3)	0 (0.0)	0 (0.0)
	SPANS	2010	P	3, 914	80 (2.0)	82 (2.1)	139 (3.8)	3, 386 (86.3)	N/A	227 (5.7)
12-15 yrs	NNS (NSW) ^a	1995	P	111	5 (5.6)	15 (13.1)	8 (8.2)	82 (71.2)	1 (2.0)	0 (0.0)
	SSHBS	2002	C	2, 086 ^b	217 (10.7)	194 (9.3)	216 (10.2)	1, 353 (64.3)	106 (5.5) ^c	0 (0.0)
	SPANS	2004	C	1, 763	197 (12.3)	1, 554 (87.0)			N/A	12 (0.8)
	NSW Child PHS	2007-08	P	1, 197	130 (11.0)			1, 063 (88.7)	3 (0.3)	1 (0.0) ^d
	SPANS	2010	C	3, 003	235 (9.1)	199 (7.2)	230 (7.9)	2, 316 (75.0)	N/A	23 (0.8)
16-17 yrs	NNS (NSW)	1995	C	48	5 (10.0)	5 (8.2)	6 (10.7)	31 (70.0)	0 (0.0)	1 (0.0)
	SSHBS	2002	C	553 ^e	70 (13.3)	52 (9.5)	59 (11.1)	357 (63.8)	15 (2.3)	0 (0.0)

^a Data were from NSW respondents

^b Excludes n = 16 cases with missing weight data

^c Includes those that did not respond to this question on the survey

^d One respondent refused the question

^e Excludes n = 6 cases with missing weight data

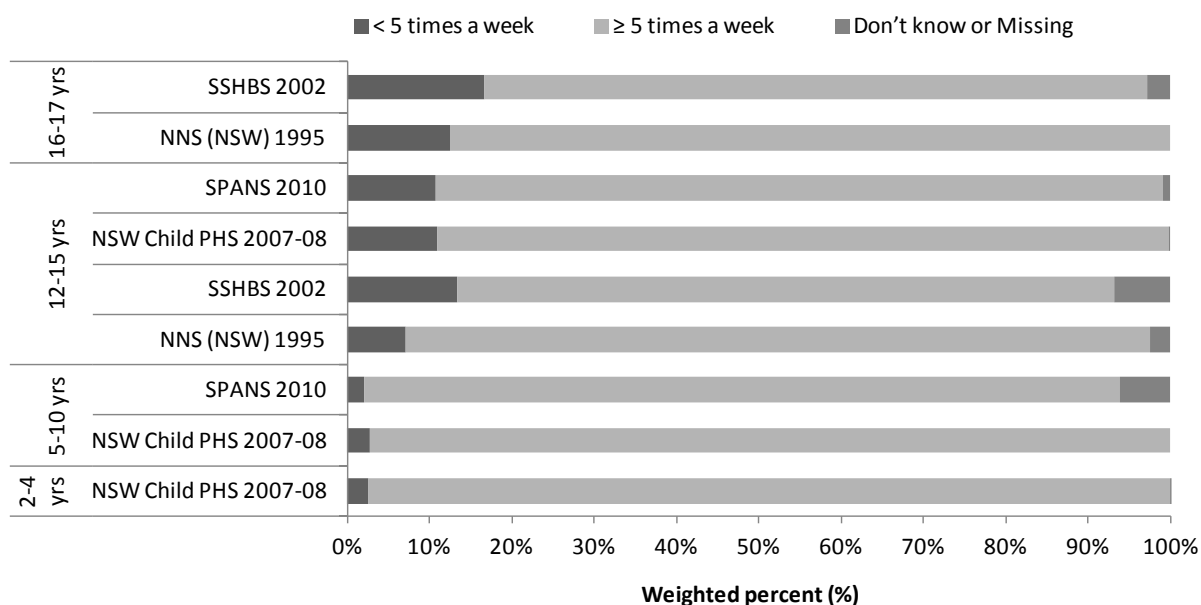


Figure 1.1.1 Estimates of common response categories for the frequency of eating breakfast, by age group, survey and respondent

FINDINGS – Estimates for ‘eating breakfast’

- Across surveys, sample years and age groups, the majority of children (or parents on behalf of their children) reported consuming breakfast five or more times per week (Figure 1.1.1). This was more common among younger children (aged ≤ 10 years), compared with older children.
- Comparing SPANS 2010 with SPANS 2004, while a lower proportion of 12-15 year olds reported consuming breakfast once or fewer times per week (9.1% in 2010 vs. 12.3% in 2004), it is unclear whether this reflects an increase in breakfast consumption as the question format differed slightly between these years (Table 1.1.1).
- A lower proportion of respondents to the NSW Child PHS 2007-08 reported breakfast consumption ≤ 4 times a week, compared to other surveys conducted with the same age groups (Table 1.1.2). For example, 11% of parents of 12-15 year olds reported their child consumed breakfast ≤ 4 times a week, compared with 24% of school children responding to the SPANS 2010, 27% of NSW parents responding to the NNS 1995, and 30% of school children responding to the SSHBS 2002.

FINDINGS – *Measurement of 'eating breakfast'*

- The lower proportion of respondents to the NSW Child PHS 2007-08 reporting their children's breakfast consumption as ≤ 4 times a week, may be due to differences between parent and child responses, but may also be illustrative of an increase in the frequency of breakfast consumption over time as SPANS 2010 and NSW Child PHS 2007-08 had the lowest proportions of respondents 12-15 years (or parents of 12-15 year olds) reporting a breakfast consumption ≤ 4 times a week, compared with earlier surveys (SSHBS 2002 and NNS (NSW) 1995).
- It is unclear whether including 'something to eat' for breakfast or having 'something' for breakfast in the survey question influenced the estimates. Regardless, it may be more pertinent to ask about whether anything (foods or drinks) were consumed rather than foods alone, given the expanding market of liquid breakfast products.
- Table 1.1.1 shows different reference measures are used in the NNS 1995 and the SSHBS 2002, compared with other surveys (i.e. 'how many days per week' vs. 'how many times per week'). However, this is unlikely to limit comparability under the assumption that breakfast is generally consumed once a day.

1.2 EATING TOGETHER AS A FAMILY

Table 1.2.1 Comparability of measures for the frequency of eating together as a family, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
SPANS	2004	11-15 yrs	C	How many days each week do you usually do the following... Eat dinner with most of your family?	Never or rarely <1 times per week 1-3 times per week 4-6 times per week Everyday	<1 times per week 1-3 times per week 4-6 times per week Everyday	Limited by differences in reference meals, i.e. SPANS 2004 asked about the dinner meal specifically, whereas NSW PHS 2007-08 asked about any meal; Respondents (P vs. C) and year of survey (2004 vs. 2007-08).
NSW Child PHS	2007-08	11-15 yrs	P	How often does your family eat together at the table?	Times per day Times per week Never Don't know Refused		

Table 1.2.2 Estimates of common response categories for the frequency of eating together as a family, by age group, survey and respondent

Age Group	Survey	Year	R	Sample Size	N (weighted %)				
					Everyday ^a	4-6 times per week	1-3 times per week	< 1 time per week ^b	Missing
11-15 yrs	SPANS	2004	C	2, 524	1, 422 (56.1)	535 (21.5)	284 (12.5)	215 (8.3)	68 (1.6)
	NSW Child PHS	2007-08	P	750 ^c	74 (9.3)	307 (41.6)	248 (34.0)	117 (14.5)	4 (0.6) ^d

^a For the NSW Child PHS 2007-08, the category 'Everyday' was computed from continuous variables, with seven or more times per week considered as being 'Everyday'

^b Includes those who responded zero, never or rarely

^c Of the 1, 731 children aged 11-15 years, data were missing for the n = 975 parents who responded in times per day, a further six parents were not asked this question, leaving n = 750 in the sample

^d Responded 'Don't know' or refused the question

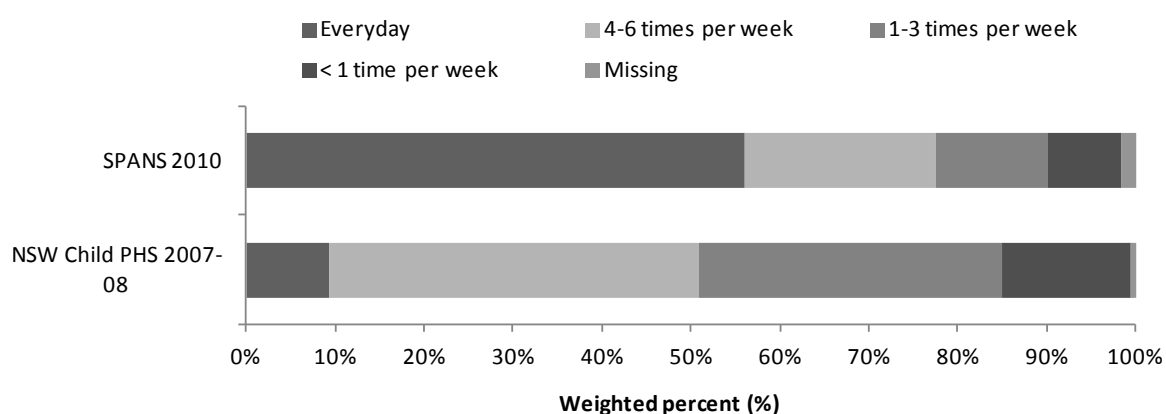


Figure 1.2.1 Estimates of common response categories for the frequency of eating together as a family among 11-15 year olds, by survey and respondent

FINDINGS – Estimates for ‘eating together as a family’

- A higher proportion of children responded that they ate dinner with their family everyday in SPANS 2004 (56.1%); compared with parent responses to the NSW Child PHS 2007-08 on how frequently their family eats together at the table (9.3%) (Figure 1.2.1 and Table 1.2.2).
- Similarly, a higher proportion of parents (NSW Child PHS 2007-08) reported their family ate together at the table six times per week or less (91%), compared with children’s responses that they ate dinner with their family six times per week or less in SPANS 2004 (44%).

FINDINGS – Measurement of ‘eating together as a family’

There are two main methodological issues in comparing surveys on this indicator:

- The lower estimate for eating together as a family ‘everyday’ in the 2007-08 NSW Child PHS may be a result of missing continuous data for those who responded in times per day, as those who eat together daily may be more likely to report the frequency of this indicator in terms of the times per day.
- The NSW Child PHS 2007-08 asks parents the frequency at which the family eats together, while SPANS 2004 asked specifically about the frequency of the family eating the evening meal (dinner) together.

1.3 EATING IN FRONT OF THE TELEVISION

Table 1.3.1 Comparability of measures for the frequency of eating in front of the television, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
SPANS	2004	11-15 yrs	C	How many days each week do you usually eat dinner in front of the television?	Never or rarely Less than once per week About 1-3 times per week About 4-6 times per week Every day	SPANS 2004 vs. NSW PHS 2007-8: Less than once/week About 1-3 times/week About 4-6/week Every day	Yes for specific surveys (P vs. C for the 11-15 year age group)
NSW Child PHS	2007-08	4-10 yrs 11-15 yrs	P P	How often does child usually have dinner in front of the television?	Number of times per week Never Don't know Refused	SPANS 2010 vs. NSW PHS 2007-8: Less than once/week About 1-2 times/week About 3-4 times/week About 5-6 times/week Everyday	
SPANS	2010	4-10 yrs 11-15 yrs	P C	How often do you (does your child) usually eat dinner in front of the television?	Never or rarely Less than once per week About 1-2 times per week About 3-4 times per week About 5-6 times per week Everyday		

Table 1.3.2 Estimates of common response categories for the frequency of eating in front of the television, by age group, survey and respondent

Age Groups	Survey	Year	R	Sample Size	N (weighted %)					
					Everyday	5-6 times/ week	3-4 times/ week	1-2 times/ week	<1 time/ week	Missing
4-10 yrs	NSW Child PHS	2007-08	P	1, 757	301 (16.9)	62 (3.4)	134 (7.4)	361 (20.2)	888 (51.4)	11 (0.7) ^a
	SPANS	2010	P	4, 192	514 (12.5)	225 (5.3)	524 (12.8)	607 (14.9)	2, 095 (49.2) ^b	227 (5.3)
11-15 yrs	NSW Child PHS	2007-08	P	1, 503	318 (20.8)	79 (4.9)	149 (9.2)	296 (18.9)	643 (44.9)	18 (1.3) ^a
	SPANS	2010	C	3, 921	547 (14.9)	323 (7.8)	545 (14.3)	619 (16.0)	1, 842 (46.2) ^b	45 (0.9)

Table 1.3.3 Estimates of common response categories for the frequency of eating in front of the television, by survey and respondent

Age Groups	Survey	Years	R	Sample Size	N (weighted %)				
					Everyday	4-6 times/ week	1-3 times/ week	<1 time/ week	Missing
11-15 yrs	NSW Child PHS	2007-08	P	1, 503	318 (20.8)	141 (8.9)	383 (24.1)	643 (44.9)	18 (1.3) ^a
	SPANS	2004	C	1, 737	262 (15.5)	201 (11.5)	336 (18.3)	876 (52.0) ^b	62 (2.7)

^a Represents those who responded 'Don't know' or refused the question as these were unable to be separated from available data

^b Includes those who responded 'Rarely or Never'

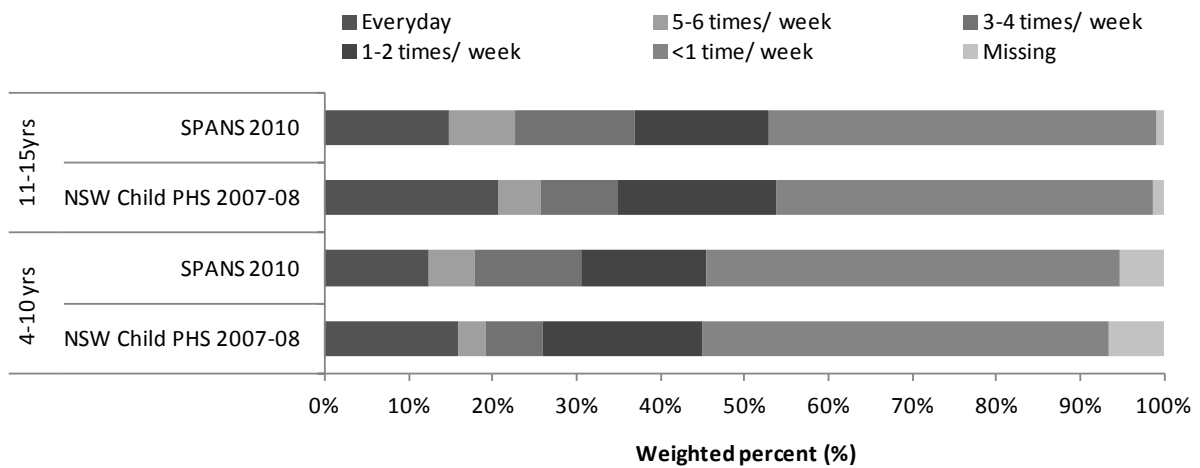


Figure 1.3.1 Estimates of common response categories for the frequency of eating in front of the television, by age group, survey and respondent

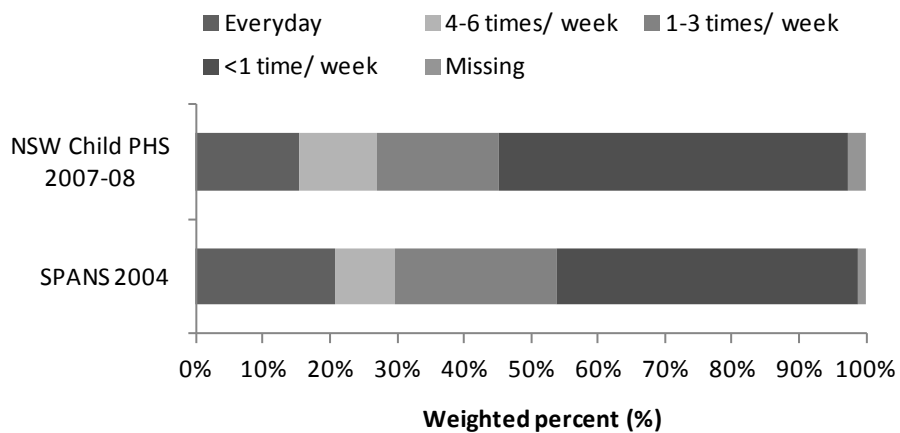


Figure 1.3.2 Estimates of common response categories for the frequency of eating in front of the television among 11-15 year olds, by survey and respondent

FINDINGS – *Estimates for 'eating in front of the television'*

- Within each age group, the proportions responding under each outcome category were similar across surveys, with slightly higher proportions of older children (aged 11-15 years) eating dinner in front of the television one or more times per week, compared with younger children (aged 4-10 years) (Figure 1.3.1 and Table 1.3.2).
- Around 50% of children (or parents on behalf of their children) reported eating dinner in front of the television once or more times per week.

FINDINGS – *Measurement of 'eating in front of the television'*

- There are consistently lower proportions of missing data in the 2007-08 NSW Child PHS compared with SPANS. Missing data appears more likely to occur when respondents are required to answer questions in a written survey (SPANS), compared with responding to verbal questions from an interviewer over the telephone (NSW Child PHS).
- Table 1.3.1 shows different reference measures are used in the SPANS 2004, compared with other surveys (i.e. 'how many days per week' vs. 'how often'). However, this is unlikely to limit comparability under the assumption that dinner is generally only consumed once a day.

1.4 OFFERING WATER WITH MEALS OR SNACKS

Table 1.4.1 Comparability of measures for the frequency of offering water with meals or snacks, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW Child PHS	2007-08	4-10 yrs	P	How often do you offer [child] water to drink with meals or snacks?	Usually Sometimes Rarely / Never	Usually Sometimes	Yes
SPANS	2010	4-10 yrs	P	How often do you offer your child water to drink with meals or snacks?	Usually Sometimes Rarely / Never	Rarely / Never	

Table 1.4.2 Estimates of common response categories for the frequency of offering water with meals or snacks, by age group, survey and respondent

Age Groups	Survey	Year	R	Sample Size	N (weighted %)				
					Usually	Sometimes	Rarely / Never	Don't know	Missing
4-10 yrs	NSW Child PHS	2007-08	P	1, 757	1, 376 (78.7)	195 (11.9)	174 (8.8)	12 (0.6)	0 (0.0)
	SPANS	2010	P	4, 100	2, 954 (72.2)	425 (10.3)	144 (3.7)	N/A	577 (13.8)

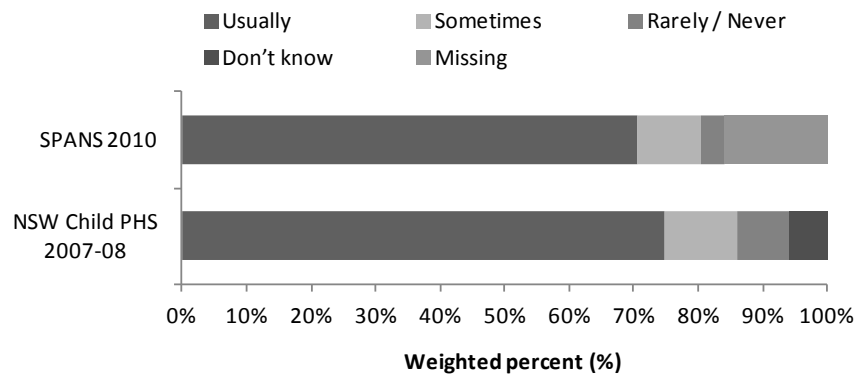


Figure 1.4.1 Estimates of common response categories for the frequency of offering water with meals or snacks among 4-10 year olds, by survey and respondent

FINDINGS – *Estimates* for ‘offering water with meals or snacks’

- Parents of young children (aged 4-10 years) responded similarly to the 2007-08 NSW Child PHS and the 2010 SPANS; estimates from both surveys indicated that approximately 75% of parents usually offered water with meals or snacks.

FINDINGS – *Measurement* of ‘offering water with meals or snacks’

- Estimates are slightly influenced by the higher proportion of missing data in SPANS 2010, compared with the 2007-08 NSW Child PHS. It appears more likely for missing data to occur when respondents are required to answer questions in a written survey (SPANS), compared with responding to verbal questions from an interviewer over the telephone (NSW Child PHS).

1.5 OFFERING SWEETS AS A REWARD

Table 1.5.1 Comparability of measures for the frequency of offering sweets as a reward, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW Child PHS	2007-08	4-10 yrs 11-15 yrs	P P	How often do you offer sweets such as lollies, ice cream, cake or biscuits to child as a reward for good behaviour?	Usually Sometimes Rarely / Never	Usually Sometimes Rarely / Never	Yes (P vs. C)
SPANS	2010	4-10 yrs 11-15 yrs	P C	How often do you/does your family offer sweets (lollies, ice cream, cake, biscuits) to you as a reward for good behaviour?	Usually Sometimes Rarely / Never		

Table 1.5.2 Estimates of common response categories for the frequency of offering sweets as a reward, by age group, survey and respondent

Age Groups	Survey	Year	R	Sample Size	N (weighted %)			
					Usually	Sometimes	Rarely / Never	Missing
4-10 yrs	NSW Child PHS	2007-08	P	1, 594	129 (8.7)	588 (37.3)	871 (53.6)	6 (0.4) ^a
	SPANS	2010	P	4, 192	379 (9.4)	1, 974 (47.3)	1, 572 (37.2)	267 (6.1)
11-15 yrs	NSW Child PHS	2007-08	P	1, 321	56 (4.4)	238 (18.6)	1, 018 (76.3)	9 (0.7) ^a
	SPANS	2010	C	3, 921	251 (6.8)	1, 423 (35.9)	2, 206 (56.5)	41 (0.8)

^a Responded don't know or refused the question

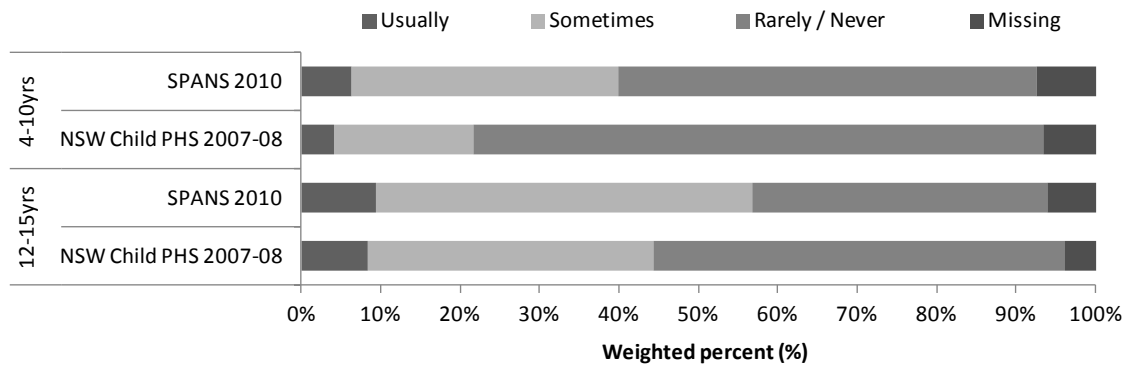


Figure 1.5.1 Estimates of common response categories for the frequency of offering sweets as a reward, by age group, survey and respondent

FINDINGS – *Estimates for ‘offering sweets as a reward’*

- Less than 10% of children (or their parents) reported they were usually offered sweets as a reward (Figure 1.5.1 and Table 1.5.2).
- In both surveys, older children aged 11-15 years (or their parents), were more likely to report rarely or never being offered sweets as a reward than younger children aged 4-10 years. This may be due to parents being less likely to use this as a parenting strategy for early teenagers than for young children.

FINDINGS – *Measurement of ‘offering sweets as a reward’*

- For both age groups, parents and children responding to SPANS 2010 were less likely to report ‘rarely/never’ rather than ‘sometimes’ offering (or being offered) sweets as a reward, compared with the 2007-08 NSW Child PHS. This may be due to social desirability bias, as parents responded to an interviewer in the NSW Child PHS, while parents or the child themselves responded to a written survey in SPANS 2010.
- Comparing parents’ responses to the NSW Child PHS for children aged 11-15 years, to those of children the same age responding to SPANS 2010, parents were 20% more likely to report their children are never/rarely offered sweets as a reward for good behaviour. This might be influenced by social desirability bias due to parents viewing this behaviour as negative, however a similar difference was observed in the responses from parents of 4-10 year olds between these surveys, and hence may instead be due to differences in the survey methods or differences over time.

2 NON-ALCOHOLIC BEVERAGES

The *Australian Guide to Healthy Eating* recommends drinking plenty of water, particularly to quench thirst, but has no quantitative recommendations on water intake for children (12). The National Health and Medical Research Council however recommends that the average child requires a total fluid intake (water and other non-alcoholic beverages) of four cups a day for children aged 1-3 years, five cups for children aged 4-8 years, five to six cups for girls aged 9-13 years, six cups for boys aged 9-13 years and girls ages 14-18 years, and seven to eight cups for boys 14-18 years (13).

In recent years, there have been a number of campaigns to promote water as a beverage, rather than sugar-sweetened drinks, such as soft drinks, cordial and sports drinks. This is because, while some non-alcoholic beverages such as fruit juice and milk provide valuable nutrients, other sugar sweetened beverages such as soft drinks, cordials, and sports drinks provide little nutritional value apart from sugar, kilojoules and fluid, and may increase the risk of obesity, type 2 diabetes, dental caries, and bone fractures (14). The *Australian Guide to Healthy Eating* recommends that soft drinks and other sugary drinks be consumed only occasionally, in small amounts, or not at all (12).

The *Dietary Guidelines for Children and Adolescents in Australia* suggest that one serve of fruit can be substituted for a small glass of 100% fruit juice (125 ml), but fruit juice should not be considered a substitute for fresh fruit due to the lack of dietary fibre (15). Young children aged 4-11 years require two serves of dairy foods a day with one household cup of milk equivalent to one serve, while older children aged 12-18 years require three serves daily (12). While milk is frequently used as a dietary indicator for monitoring population calcium intakes, it is important to recognise other calcium rich dairy foods such as cheeses and yoghurts. The *Dietary Guidelines for Children and Adolescents Australia* also suggest that reduced-fat milk should be encouraged among children aged two years and older (15).

National and state-based nutrition and health surveys have asked about the frequency, type or amount (in household cups) of which a variety of non-alcoholic beverages including milk, juice, water and sugar sweetened drinks (soft drinks, cordials and sports drinks) are consumed.

Scope:

- Eating behaviours
- **Non-alcoholic Beverages**
- Fruit and vegetables
- Fast foods
- Extra foods

There are limited validity data for short questions asking about non-alcoholic beverages. However, questions on milk quantity may be used to differentiate between respondents with higher and lower calcium intakes (16), for example the question *'about how much milk (in total) do you usually have in a day?'* has been shown to accurately estimate categories of milk intake in adults, although those responding in the highest intake category (301 to 600mLs per day) may actually consume less than this amount (10). Short questions used to assess the type of milk consumed may be used to differentiate between respondents of higher and lower saturate fat intakes (16), and have been shown to have good direct validity to milk intake reported in 24HR recall (9).

In addition, short dietary questions about the frequency of fruit juice may provide an over-estimate of the actual frequency of fruit juice (from three-day weighed food records), by around one extra occasion every eight days (10).

2.1 MILK TYPE

Table 2.1.1 Comparability of measures for the type of milk consumed, across surveys, age groups and respondents

Survey	Year(s)	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-15 yrs 16-17 yrs	P ^a C	What type of milk do you usually consume?	Whole Low / reduced fat Skim Evaporated or sweetened condensed None of the above Don't know		
SSHBS	2002 2005 2008	12-15 yrs 16-17 yrs	C C	What type of milk do you usually have?	Whole milk (including flavoured & soy full-cream milks) Reduced fat milk Skim milk Evaporated or sweetened condensed milk None of the above I don't know	Whole Low / reduced fat Skim	
SPANS	2004	12-15 yrs	C	What type of milk do you usually drink?	Whole Low/reduced fat Skim Evaporated or sweetened condensed Soy None of the above	Evaporated or sweetened condensed None of the above Don't know	Yes (P vs. C for some)
NSW Child PHS	2007-08	2-4 yrs 5-8 yrs 9-11 yrs 12-15 yrs	P P P P	What type of milk does child usually have?	Whole or full cream Low / reduced fat milk Skim milk Evaporated/sweetened milk Other Don't have milk Don't know		
ANCS	2007	2-4 yrs 5-8 yrs	P P	What is the main type of	Whole/full cream Low/reduced fat		

^a Children aged 15 years were interviewed with their own consent and the permission of a parent or responsible adult. Parents or guardians who did not consent were interviewed on their child's behalf

Survey	Year(s)	Age Groups	Respondent (R)	Question	Response	Common	Comparability
		9-11 yrs 12-15 yrs	C C	milk that you usually use?	Skim Evaporated or sweetened condensed Soy milk None of the above Does not drink milk Don't know		
SPANS	2010	5-8 yrs 9-11 yrs 12-15 yrs	P C P / C ^a	What type of milk do you (does your child) usually drink?	Don't have milk Whole Low / reduced fat Skim Evaporated or sweetened condensed Soy (full fat) Soy (reduced fat) Other type of milk (rice, goat) Don't know		

^a Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 2.1.2 Estimates of common response categories for the type of milk consumed, by age group, survey, and respondent, using SDQ and FFQ methods

Age group	Survey ^a	Years	M	R	N	N (weighted %)								
						Whole	Low / reduced fat	Skim	Evaporated /sweetened condensed	Doesn't drink or other milk	Don't know	More than one type reported	Refused	Missing
2-4 yrs	NSW Child PHS	2007-08	SDQ	P	928	743 (80.2)	129 (14.5)	16 (1.5)	1 (0.1)	39 (3.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	ANCS	2007	FFQ	P	935	675 (72.2)	159 (16.9)	31 (3.3)	N/A	71 (6.6)	0 (0.0)	N/A	N/A	0 (0.0)
5-8 yrs	NSW Child PHS	2007-08	SDQ	P	1, 162	882 (76.7)	220 (18.3)	41 (3.7)	0 (0.0)	18 (1.2)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)
	ANCS	2007	FFQ	P	1148	714 (62.2)	316 (27.6)	51 (4.4)	N/A	67 (5.9)	0 (0.0)	N/A	N/A	0 (0.0)
	SPANS	2010	SDQ	P	2, 158	1, 364 (63.7)	392 (17.5)	71 (3.5)	2 (0.1)	175 (8.2)	9 (0.4)	N/A	N/A	145 (6.8)
9-11 yrs	NSW Child PHS	2007-08	SDQ	P	967	696 (72.2)	196 (20.4)	50 (5.0)	0 (0.0)	25 (2.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	ANCS	2007	FFQ	P	881	527 (59.8)	264 (30.0)	44 (5.0)	N/A	46 (5.1)	0 (0.0)	N/A	N/A	0 (0.0)
	SPANS	2010	SDQ	P/C	1, 529	821 (54.0)	309 (20.9)	92 (6.8)	3 (0.2)	136 (8.0)	73 (4.7)	N/A	N/A	95 (5.4)
12-15 yrs	NNS	1995	FFQ	C	698	327 (46.8)	121 (17.3)	38 (5.4)	1 (0.1)	18 (2.5)	10 (1.5)	163 (23.3)	21 (3.0)	0 (0.0)
	SSHBS	2002	SDQ	C	2, 086	1, 043 (48.9)	467 (22.3)	160 (7.6)	12 (0.6)	95 (4.8)	309 (15.8)	0 (0.0)	0 (0.0)	0 (0.0)
	SPANS	2004	SDQ	C	976	543 (57.2)	170 (17.4)	63 (6.0)	2 (0.2)	40 (3.5)	88 (7.7)	N/A	N/A	70 (8.0)
	SSHBS	2005	SDQ	C	1, 941	946 (48.3)	454 (23.2)	153 (7.5)	2 (0.1)	113 (5.9)	250 (13.6)	6 (0.3)	0 (0.0)	17 (1.0)
	ANCS	2007	FFQ	C	1199	735 (61.4)	341 (28.5)	72 (6.0)	N/A	32 (2.6)	0 (0.0)	N/A	N/A	0 (0.0)
	NSW Child PHS	2007-08	SDQ	P	1, 370	930 (67.9)	336 (24.5)	60 (4.2)	3 (0.1)	40 (3.4)	0 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)
	SSHBS	2008	SDQ	C	4, 834	2, 125 (44.1)	1, 154 (23.1)	436 (8.6)	19 (0.4)	280 (5.8)	759 (16.5)	18 (0.3)	0 (0.0)	43 (1.0)
	SPANS	2010	SDQ	C	2, 018	990 (50.9)	401 (19.3)	196 (8.4)	6 (0.3)	188 (8.5)	199 (10.8)	N/A	N/A	38 (1.7)
16-17 yrs	NNS ^a	1995	FFQ	C	349	165 (47.2)	51 (14.6)	20 (5.7)	0 (0.0)	4 (1.2)	3 (0.8)	105 (29.8)	2 (0.7)	0 (0.0)
	SSHBS	2002	SDQ	C	553	296 (55.1)	128 (21.8)	59 (11.1)	2 (0.3)	29 (5.3)	39 (6.5)	0 (0.0)	0 (0.0)	0 (0.0)
	SSHBS	2005	SDQ	C	824	460 (56.2)	210 (24.8)	78 (10.2)	0 (0.0)	38 (4.5)	32 (3.7)	1 (0.1)	0 (0.0)	5 (0.4)
	SSHBS	2008	SDQ	C	2, 719	1, 434 (54.0)	662 (23.8)	254 (8.8)	12 (0.4)	117 (4.2)	181 (6.5)	25 (1.0)	0 (0.0)	34 (1.3)

M = Survey Method

^a Data presented in this table for the NNS and ANCS are from all respondents (national), not only NSW

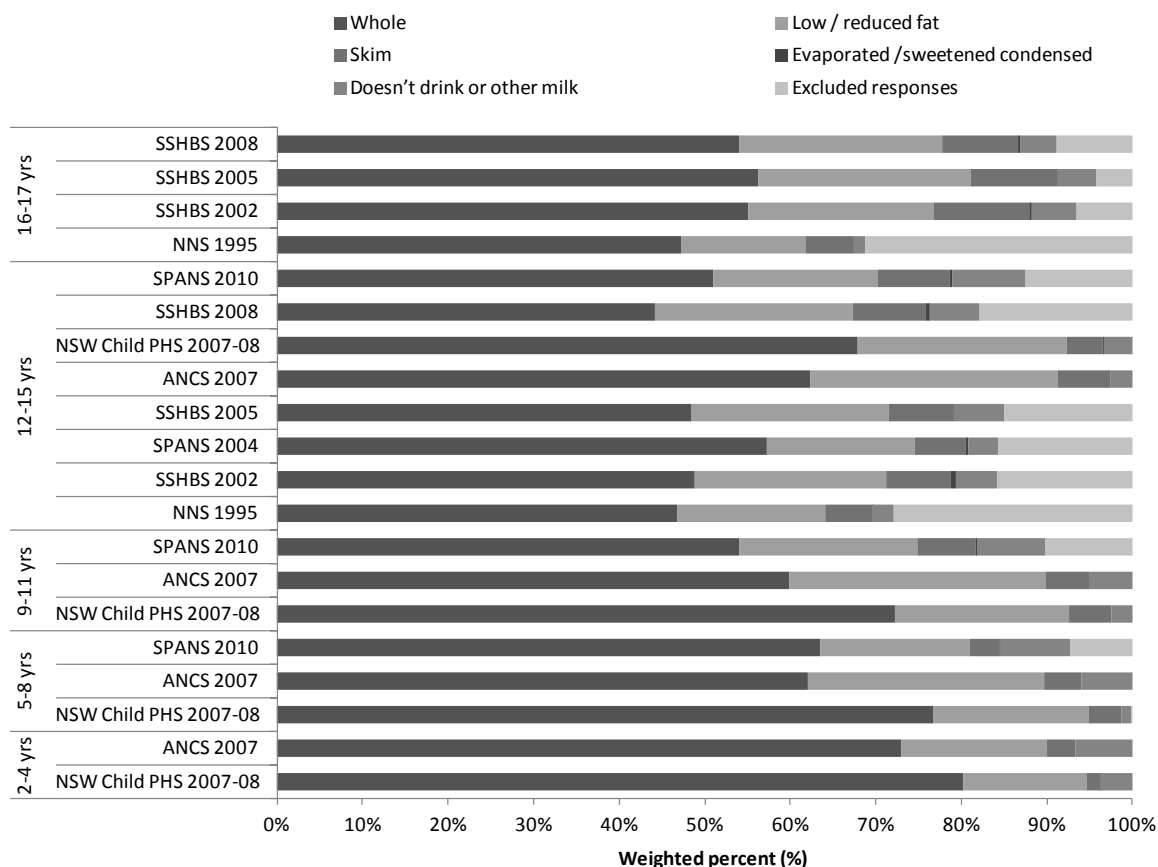


Figure 2.1.1 Estimates of common response categories for the type of milk consumed, by age group, survey, and respondent, using SDQ and FFQ

NB: Excluded responses include those who responded don't know, reported more than one type, refused the question or were missing (Figure 2.1.1)

FINDINGS – Estimates for 'milk type'

- Across all surveys, age groups and respondents, whole (or 'full cream') milk was the dominant type of milk reported to be consumed, with around 50-80% of children aged 4-11 years and 40-70% of children 12 to 17 years consuming whole milk (Figure 2.1.1 and Table 2.1.2).
- There do not appear to be any notable changes in the type of milk consumed over time.
- Figure 2.1.1 illustrates the tendency for older children (aged 12-17 years) to be less likely than younger children (aged 2-11 years) to consume whole (or 'full cream') milk, (53% versus 68%, across surveys).

FINDINGS – *Measurement of 'milk type'*

- Comparing the method of response, responding to a written survey question rather than a telephone interview (i.e. ANCS, NSW Child PHS) may result in a higher proportion of respondents reporting they don't know, providing no answer ('missing'), or reporting more than one type of milk usually consumed.
- SPANS 2010 had a higher proportion reporting 'don't drink milk or drink other milk'. This may have been due to the provision of more response options regarding other types of milk (e.g. full fat soy milk, reduced fat soy milk, and other milks such as rice or goat), thereby reducing possible confusion in recording. For example, if someone drank reduced fat soy milk they may have responded as drinking 'Low / reduced fat' [cow's] milk – or more likely they would have not reported drinking milk if low fat soy milk was not an option.

2.2 MILK AMOUNT

Table 2.2.1 Comparability of measures for the amount of milk consumed, across surveys, age groups and respondents

Survey	Year(s)	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW Child PHS	2001	2-4 yrs	P	How many cups of milk does [child] usually drink in a day? (1 cup=250ml, a household tea cup) ^a	Number of cups per day		
	2003-04	5-8 yrs	P		Number of cups per week		
	2005-06	9-11 yrs	P		Doesn't drink cow's milk, drinks other milk		
	2007-08	12-15 yrs	P		Doesn't drink cow's milk or other milk Don't know		
SPANS	2010	5-8 yrs	P	How many cups of milk do you (does your child) usually consume? (1 cup = 250ml, a household tea cup)	None	Doesn't drink cow's milk Drinks cow's milk Less than 1 cup/ day 1 cup/ day 2 cups/ day 3 cups/ day 4 cups/ day 5 or more cups/ day	Yes, only for cow's milk consumption (P vs. C for some)
		9-11 yrs	P / C ^b		Less than 1 cup per week 1 cup per week; 2 cups per week 3 cups per week; 4 cups per week 5 cups per week; 6 cups per week		
		12-15 yrs	C		1 cup per day; 2 cups per day 3 cups per day; 4 cups per day 5 or more cups per day		
ANCS	2007	2-4 yrs	P	Time, frequency, amount	24-hour Dietary Recall		
		5-8 yrs	P				
		9-11 yrs	C				
		12-15 yrs	C				
NNS	1995	2-4 yrs	P	Time, frequency, amount	24-hour Dietary Recall. Parent/carer assistance for children 5-11 years if required.		
		5-8 yrs	C				
		9-11 yrs	C				
		12-15 yrs	C				

^a Note: Milk = Cow's milk

^b Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 2.2.2 Estimates of common response categories (drinks cow's milk vs. doesn't drink cow's milk) by age group, survey, and respondent

Age Group	Survey	Year	R	Sample Size	N (weighted %)			
					Drinks cow's milk	Does not drink cow's milk ^a	Don't know	Missing
2-4yrs	NSW	2001	P	2, 029	1, 906 (93.9)	123 (6.1)	0 (0.0)	0 (0.0)
	Child PHS	2005-06	P	820	783 (95.6)	33 (3.9)	4 (0.5)	0 (0.0)
		2007-08	P	923	868 (94.9)	49 (4.5)	6 (0.6)	0 (0.0)
5-8 yrs	NSW	2001	P	2, 705	2, 537 (94.2)	166 (5.8)	2 (0.0)	0 (0.0)
	Child PHS	2005-06	P	1, 068	1, 013 (94.8)	49 (4.5)	6 (0.6)	0 (0.0)
		2007-08	P	1, 151	1, 099 (95.3)	45 (4.1)	7 (0.6)	0 (0.0)
	SPANS	2010	P	2, 158	1, 827 (84.6)	177 (8.3)	9 (0.4)	145 (6.8)
9-11 yrs	NSW	2001	P	2, 457	2, 301 (93.1)	153 (6.7)	3 (0.2)	0 (0.0)
	Child PHS	2005-06	P	853	823 (96.2)	28 (3.6)	2 (0.2)	0 (0.0)
		2007-08	P	951	895 (94.1)	47 (4.7)	9 (1.2)	0 (0.0)
	SPANS	2010	P/C	1, 529	1, 222 (81.7)	139 (8.2)	73 (4.7)	95 (5.4)
12-15 yrs	NSW	2005-06	P	1, 207	1, 153 (95.3)	48 (4.3)	6 (0.4)	0 (0.0)
	Child PHS	2007-08	P	1, 350	1, 240 (91.1)	88 (6.8)	21 (2.1)	1 (0.0) ^b
	SPANS	2010	C	2, 018	1, 587 (78.7)	194 (8.9)	199 (10.8)	38 (1.7)

^a Respondent doesn't drink cow's milk, but may drink other types of milk (evaporated, sweetened condensed, soy, rice, goats)

^b Respondent refused the question

Table 2.2.3 Estimates of common response categories for the amount of cow's milk consumed, by age group, survey, and respondent

Age Group	Survey ^a	Year	R	Drinks cow's milk, N	N (weighted %)						
					≥ 5 cups/ day	4 cups/ day	3 cups/ day	2 cups/ day	1 cup/ day	< 1 cup/ day	Not reported ^b
2-4 yrs	NSW Child PHS ^c	2001	P	1, 906	105 (5.4)	176 (8.7)	385 (20.3)	630 (32.8)	515 (28.1)	95 (4.7)	N/A
		2005-06	P	783	30 (3.2)	58 (7.5)	140 (17.2)	274 (35.3)	237 (30.9)	44 (5.9)	N/A
		2007-08	P	868	28 (3.4)	47 (5.3)	130 (16.4)	313 (35.9)	294 (32.6)	56 (5.6)	N/A
5-8 yrs	NSW Child PHS	2001	P	2, 537	61 (2.1)	170 (7.0)	382 (13.7)	867 (35.3)	861 (34.1)	196 (7.6)	N/A
		2005-06	P	1, 013	17 (1.4)	42 (3.6)	139 (13.6)	375 (36.6)	378 (38.6)	62 (6.2)	N/A
		2007-08	P	1, 099	18 (1.3)	32 (2.8)	119 (11.0)	373 (35.4)	466 (41.3)	91 (8.2)	N/A
	SPANS ^d	2010	P	1, 827	8 (0.5)	18 (1.1)	84 (4.3)	448 (24.6)	631 (35.0)	631 (34.2)	7 (0.3)
9-11 yrs	NSW Child PHS	2001	P	2, 301	73 (2.8)	210 (8.3)	340 (14.8)	772 (32.7)	727 (33.0)	179 (8.4)	N/A
		2005-06	P	823	11 (1.4)	54 (6.0)	114 (13.7)	279 (34.9)	297 (35.7)	68 (8.3)	N/A
		2007-08	P	895	14 (1.5)	36 (3.9)	98 (10.5)	281 (34.0)	369 (40.5)	97 (9.7)	N/A
	SPANS	2010	P/C	1, 222	8 (0.6)	17 (1.7)	57 (4.3)	236 (19.5)	320 (26.8)	574 (46.3)	10 (0.8)
12-15 yrs	NSW Child PHS	2005-06	P	1, 153	19 (1.6)	79 (6.2)	136 (12.5)	386 (31.7)	426 (37.7)	107 (10.3)	N/A
	PHS	2007-08	P	1, 240	32 (2.7)	63 (5.0)	131 (11.1)	423 (33.4)	457 (37.4)	134 (10.4)	N/A
	SPANS	2010	C	1, 587	24 (1.6)	32 (1.7)	95 (5.8)	268 (16.8)	317 (19.6)	833 (53.1)	18 (1.4)

^a Data for amount of cow's milk consumed in the 2003-4 NSW Child PHS were not available for this dietary indicator

^b Reported drinking cow's milk as type of milk, but did not report amount consumed

^c Intake data were rounded to the nearest whole number (e.g. 1.5 cups per day was rounded to 2 cups per day) to compare to other survey categories, although this was only required for a small number of cases

^d Data presented only for those that reported drinking cow's milk as the type of milk they usually consume

Table 2.2.4 Estimates of common response categories for the amount of cow’s milk consumed, by age group, national dietary survey (NNS vs. ANCS), and respondent, using 24HR recall methods

Age Group	Survey ^a	Year	R	Drinks cow’s milk, N	N (weighted %)						
					≥ 5 cups/ day	4 cups/ day	3 cups/ day	2 cups/ day	1 cup/ day	< 1 cup/ day	Not reported ^b
2-4 yrs	NNS	1995	P	542	14 (2.5)	18 (3.4)	24 (4.5)	85 (15.6)	172 (31.7)	143 (26.4)	86 (15.9)
	ANCS	2007	P	935	3 (0.3)	10 (1.1)	57 (6.1)	208 (22.2)	400 (42.7)	116 (12.4)	142 (15.2)
5-8 yrs	NNS	1995	C	723	11 (1.5)	17 (2.3)	38 (5.3)	103 (14.2)	238 (32.9)	157 (21.8)	159 (22.0)
	ANCS	2007	P	1, 148	4 (0.3)	4 (0.3)	41 (3.5)	165 (14.3)	81 (50.6)	192 (16.7)	162 (14.2)
9-11 yrs	NNS	1995	C	536	17 (3.1)	21 (3.8)	34 (6.4)	74 (13.8)	157 (29.2)	123 (22.9)	110 (20.6)
	ANCS	2007	C	881	2 (0.3)	8 (0.9)	33 (3.8)	144 (16.3)	380 (43.1)	131 (14.8)	184 (20.9)
12-15 yrs	NNS	1995	P	783	33 (4.1)	24 (3.0)	50 (6.4)	93 (11.8)	201 (25.6)	136 (17.3)	246 (31.4)
	ANCS	2007	P	1, 199	10 (0.8)	8 (0.7)	65 (5.4)	176 (14.7)	444 (37.0)	174 (14.5)	322 (26.8)

^a Data presented in this table for the NNS and ANCS are from all respondents (national), not only NSW

^b Reported drinking cow’s milk as type of milk, but did not report amount consumed

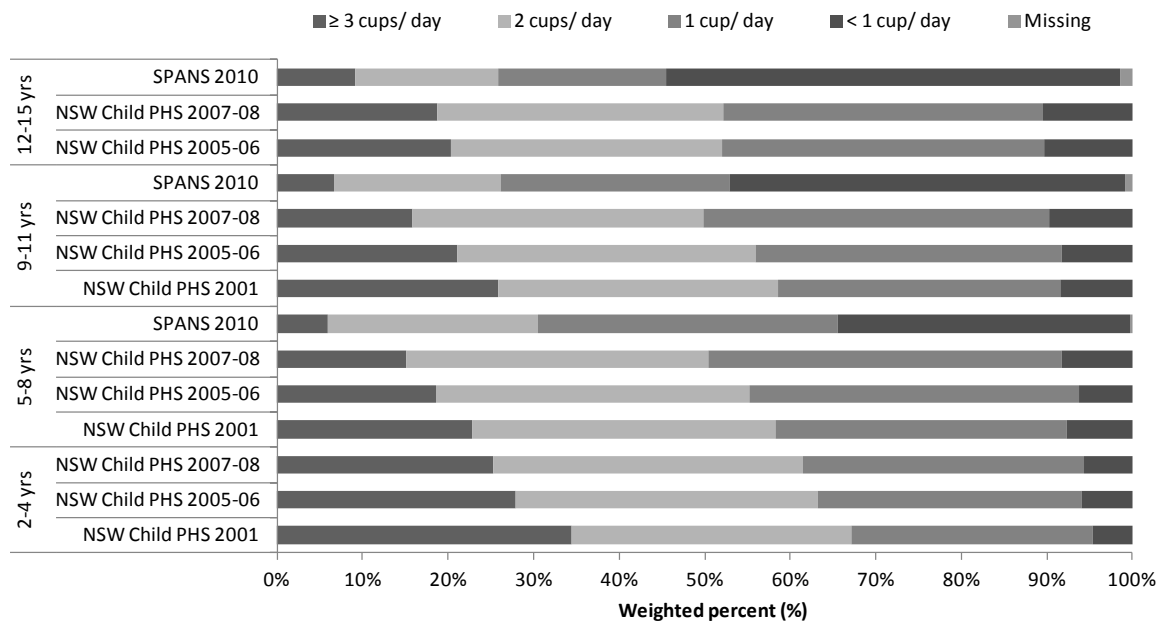


Figure 2.2.1 Estimates of common response categories for the amount of milk consumed, by age group, survey, and respondent

FINDINGS – Estimates for ‘milk amount’

- On average >90% of children aged 2-15 years drink cow’s milk (Table 2.2.2), across all years, and age groups.
- There has been a decline over time in the proportion reporting they consume more than two cups of cow’s milk per day, with few differences across age groups (Figure 2.2.1 and Table 2.2.3).
- For all age groups, there were a higher proportion of respondents to the 2010 SPANS reporting less than one cup of cow’s milk per day, compared with the NSW Child PHS (any year) (Figure 2.2.1 and Table 2.2.3).

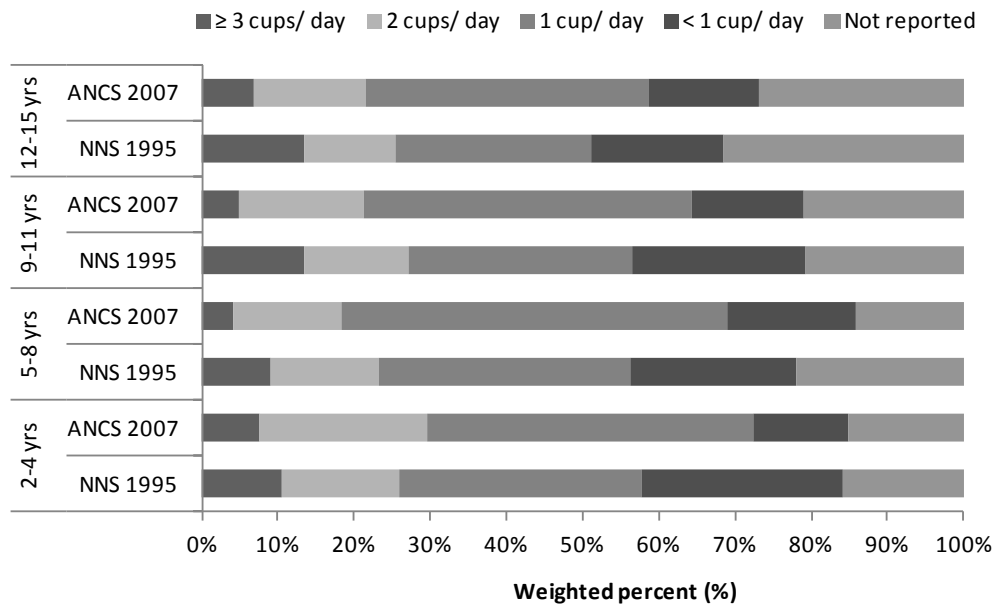


Figure 2.2.2 Estimates of common response categories for the amount of milk consumed, by age group, national dietary survey (NNS vs. ANCS), and respondent, using 24HR recall methods

FINDINGS – Measurement of ‘milk amount’

- Tables 2.2.2 and 2.2.3 again illustrate that missing data occur when respondents are required to answer questions in a written survey (SPANS 2010), compared with responding to verbal questions from an interviewer over the telephone (NSW Child PHS), although missing data accounted for no more than 7% of samples across age groups.

2.3 FRUIT JUICE FREQUENCY

Table 2.3.1 Comparability of measures for the frequency of consuming fruit juice, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-16 yrs	C	How often, on average, did you consume fruit juice in the past 12 months ?	Never or less than once a month 1-3 times per month Once per week 2-4 times per week 5-6 times per week Once per day 2-3 times per day 4-5 times per day 6+ times per day	Less than once per week Once to six times per week Everyday	YES , although potential conflicts with reference time periods, i.e. NNS 1995 particularly specifies previous 12 months while SPANS 2004 is non-specific.
SPANS	2004	12-16 yrs	C	How often do you usually drink pure or 100% fruit juice? (such as orange, apple, pineapple, grapefruit, tomato)	Never or Rarely < 1 time per week About 1-3 times per week About 4-6 times per week Every day		

Table 2.3.2 Estimates of common response categories for the frequency of consuming fruit juice, by age group, survey, and respondent

Age Group	Survey	Years	R	M	Sample size, N	N (weighted %)			
						<1 time/week	1-6 times/week	Everyday	Missing
12-16 yrs	NNS (NSW) ^a	1995	C	FFQ	104	21 (18.6)	49 (46.1)	34 (35.3)	0 (0.0)
	SPANS	2004	C	SDQ	1,809	459 (25.3)	989 (54.7)	350 (19.3)	11 (0.6)

M = Survey Method

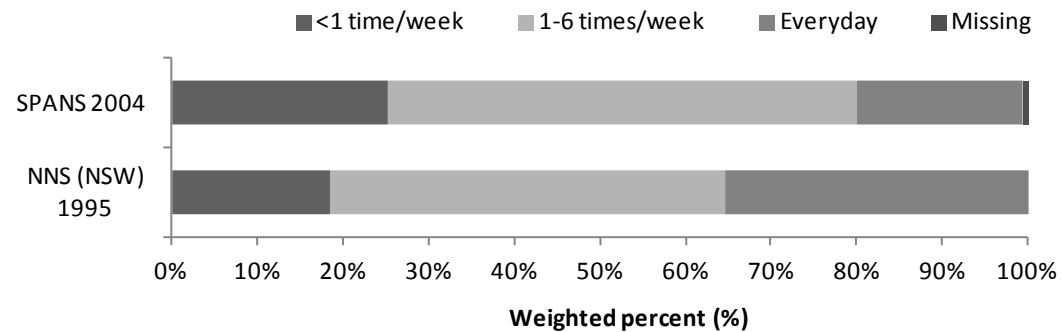


Figure 2.3.1 Estimates of common response categories for the frequency of consuming fruit juice among 12-16 year olds, by survey

^a Data were from NSW respondents.

FINDINGS – *Estimates for 'fruit juice frequency'*

- Across surveys, about one-quarter of children aged 12-16 years consume fruit juice less than once per week (Figure 2.3.1 and Table 2.3.2).

FINDINGS – *Measurement of 'fruit juice frequency'*

- Compared to data from SPANS 2004, NSW Children responding to the 1995 NNS were more likely to report consuming fruit juice every day, rather than six or less times per week. This may be due to:
 - A reduction in the frequency of fruit juice consumption from 1995 to 2004
 - An effect of condensing the original reporting categories (e.g. the 1995 NNS survey permitted reporting the frequency per day according to four categories rather than just one, i.e. 'everyday', in SPANS 2004) which may have led more people to report daily fruit juice consumption in the 1995 NNS, or
 - The smaller sample size from the 1995 NNS, as not all participants completed the FFQ which may have introduced sampling biases.

2.4 FRUIT JUICE AMOUNT

Table 2.4.1 Comparability of measures for the amount of fruit juice consumed, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW Child PHS	2001	2-4	P	How many cups of fruit juice does CHILD usually drink in a day? (1 cup=250ml, a household tea cup or 1 large 'popper')	Number of cups per day		
	2003-04	5-8 yrs	P		Number of cups per week		
	2005-06	9-11 yrs	P		Doesn't drink juice		
	2007-08	12-15 yrs	P		Don't know		
SPANS	2010	5-8 yrs 9-11 yrs 12-15 yrs	P P / C ^a C	How many cups of the following drinks you usually consume: Fruit juice (1 cup =250ml, a household tea cup or 1 large popper)	1 cup or less per week 2-4 cups per week 5-6 cups per week 1 cup or less per day 2 or more cups per day	1 cup or less per week 2-4 cups per week 5-6 cups per week	Yes (P vs. C for some)
ANCS	2007	2-4 yrs 5-8 yrs 9-11 yrs 12-15 yrs	P P C C	Time, frequency, amount	24-hour Dietary Recall	1 cup or less per day 2 or more cups per day	
NNS	1995	2-4 yrs 5-8 yrs 9-11 yrs 12-15 yrs	P C C C	Time, frequency, amount	24-hour Dietary Recall. Parent/carer assistance for children 5-11 years if required.		

^a Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 2.4.2 Estimates of common response categories for the amount of fruit juice consumed, by age group, survey, and respondent, using SDQ and 24HR recall methods

Age Group	Survey ^a	Years	R	M	Sample size, N	N (weighted %) ^b				
						≤ 1 cup/ day	≥ 2 cups/ day	Doesn't drink juice ^c	Don't know	Missing
2-4 yrs	NNS (NSW) ^d	1995	P	24HR	117	36 (28.9)	21 (14.9)	60 (56.2)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 029	836 (41.5)	966 (46.7)	224 (11.6)	3 (0.2)	0 (0.0)
		2005-06	P	SDQ	820	416 (49.4)	244 (30.1)	155 (19.7)	5 (0.7)	0 (0.0)
		2007-08	P	SDQ	928	512 (55.1)	193 (20.0)	220 (24.4)	3 (0.5)	0 (0.0)
5-8 yrs	NNS (NSW)	1995	C	24HR	163	44 (26.3)	27 (17.1)	92 (56.6)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 705	1, 274 (45.9)	1, 006 (38.2)	423 (15.9)	2 (0.1)	0 (0.0)
		2005-06	P	SDQ	1, 069	559 (52.0)	299 (27.3)	205 (20.2)	6 (0.5)	0 (0.0)
		2007-08	P	SDQ	1, 162	664 (57.9)	220 (17.6)	273 (24.1)	5 (0.4)	0 (0.0)
	SPANS	2010	P	SDQ	2, 477	2, 129 (86.0)	172 (6.9)	N/A	N/A	176 (7.1)
9-11 yrs	NNS (NSW)	1995	C	24HR	105	21 (24.4)	13 (10.9)	71 (64.7)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 457	1, 197 (48.0)	849 (35.8)	405 (16.0)	6 (0.3)	0 (0.0)
		2005-06	P	SDQ	853	453 (53.5)	202 (23.6)	194 (22.3)	4 (0.5)	
		2007-08	P	SDQ	967	509 (51.8)	200 (20.1)	254 (27.8)	4 (0.4)	0 (0.0)
	SPANS	2010	P/C	SDQ	2, 329	2, 071 (89.6)	137 (5.7)	N/A	N/A	121 (4.6)
12-15 yrs	NNS (NSW)	1995	C	24HR	116	31 (26.4)	13 (13.0)	72 (60.6)	N/A	N/A
	NSW Child PHS	2005-06	P	SDQ	1, 207	621 (51.6)	380 (31.7)	197 (15.7)	9 (1.0)	0 (0.0)
		2007-08	P	SDQ	1, 370	721 (53.1)	347 (24.9)	286 (20.7)	15 (1.2)	1 (0.0)
	SPANS	2010	C	SDQ	3, 003	2, 734 (91.0)	230 (7.9)	N/A	N/A	39 (1.0)

M = Survey Method

^a Data for amount of juice consumed in the 2003-04 NSW Child PHS were not available for this dietary indicator

^b For those who responded in cups per week, amounts were converted to cups per day by dividing the cups per week by seven; for comparison with 24 hour recall data

^c Includes those who responded 0.00 cups per day or per week

^d Data were from NSW respondents

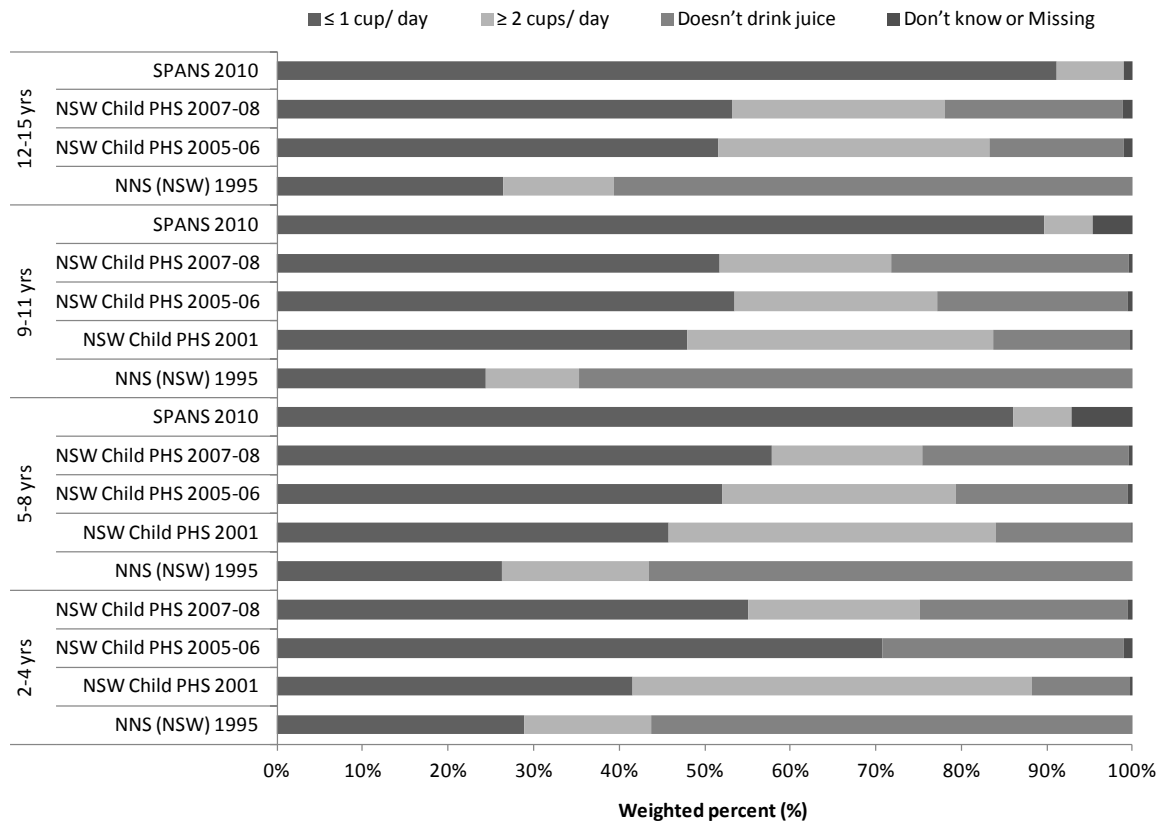


Figure 2.4.1 Estimates of common response categories for the amount of fruit juice consumed, by age group, survey, and respondent, using SDQ and 24HR recall methods

FINDINGS – Estimates for ‘fruit juice amount’

- The NSW child PHS indicates that the proportion of parents reporting their child does not drink fruit juice has increased over time for all age groups (Figure 2.4.1 and Table 2.4.2).
- There does not appear to be any differences in the amount of fruit juice consumed across age groups (Figure 2.4.1).

FINDINGS – *Measurement of 'fruit juice amount'*

- Reporting one or less cups of fruit juice per day was higher in the SPANS 2010 than the NSW Child PHS (86-91% of 5-15 year olds, compared to around 50%). This might be due to differences in response options between surveys. For example, the first four of the five written response options in SPANS 2010 all equate to one or less cups per day, while the NSW Child PHS asks in a continuous format over the telephone about how many cups per day or cups per week are consumed. The difference in estimated proportions may also be due to child (SPANS 2010) versus parent response (NSW Child PHS).
- The 24HR recall method produced higher estimates of the proportion of respondents that did not drink fruit juice than did the SDQ method, for all age groups. This is likely due to respondents reporting on a one day reference period only for the 24HR recall, rather than reporting on their 'usual' intake. For example, some respondents to the NNS 1995 may usually consume two cups of fruit juice per day however on the day of the 24HR recall they did not happen to consume any.

2.5 WATER AMOUNT

Table 2.5.1 Comparability of measures for the amount of water consumed, across surveys, age groups and respondents

Survey	Year(s)	Age Groups	Respondent (R)	Question	Response	Common	Comparability
SSHBS	2005 2008	12-17 years	C	How many cups of water do you usually drink per day? (One cup = 250ml or a household teacup; 1 average bottle of water = 1.5 cups)	Number of cups per day I don't drink water I don't know	1 cup per day 2 + cups per day	Will be biased because using only per day data from SPANS and using all data from SSHBS
SPANS	2010	12-16 years	C	How many cups of the following drinks you usually consume: Water (tap or bottled) (1 cup = 250ml, a household tea cup, 1 average bottle of water = 2 ½ cups)	1 cup per day 2 + cups per day 1 cup or less per week 2-4 cups per week 5-6 cups per week	1 cup per day 2 + cups per day	

Table 2.5.2 Estimates of common response categories for the amount of water consumed, by age group, survey, and respondent

Age Groups	Survey	Years	R	Sample Size, N	N (weighted %)					
					< 1 cup/day	1 cup/day	≥2 cups/day	Doesn't drink water	Don't know	Missing
12-16 yrs	SSHBS	2005	C	2, 428 ^a	0 (0.0)	127 (5.1)	1, 931 (79.8)	57 (2.4)	276 (11.0)	37 (1.8)
		2008	C	6, 479	0 (0.0)	268 (4.0)	4, 811 (74.3)	465 (7.0)	853 (13.3)	82 (1.4)
	SPANS	2010	C	3,062	746 (26.0)	324 (10.2)	1, 961 (62.9)	n/a	n/a	31 (0.9)

^a Approximately half of respondents were selected to answer supplement B which contained this question on water consumption, as opposed to the 2008 survey where all respondents were required to answer this question.

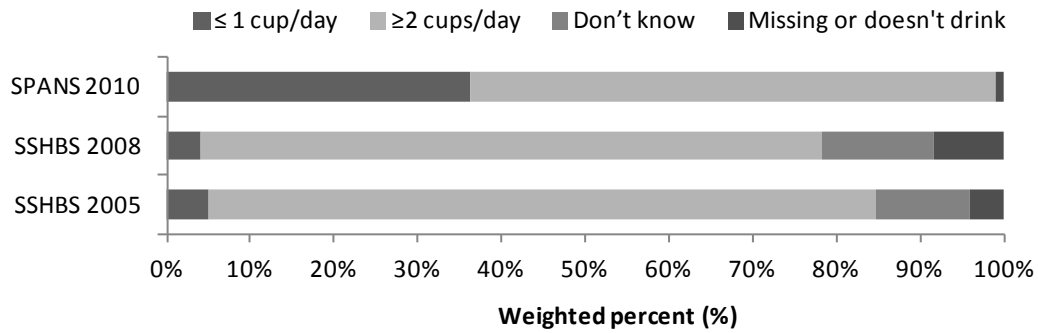


Figure 2.7.1 Estimates of common response categories for the frequency of consuming water among 12-16 year olds, by survey

FINDINGS – Estimates for ‘water amount’

- From all surveys and survey years, most children reported drinking more than two cups of water daily (Figure 2.5.1 and Table 2.5.2).

FINDINGS – Measurement of ‘water amount’

- Comparability is limited by differences in response options provided in the SSHBS and SPANS, for example 26% of students reported their water consumption as 1, 2-4 or 5-6 cups per week in SPANS 2010. However, none in the SSHBS reported a frequency less than one cup per day, most likely due to having an open-ended response to the question ‘How many cups of water do you usually drink per day?’, i.e. without the option of reporting frequency per week.

2.6 SUGAR SWEETENED DRINKS (SOFT DRINKS, CORDIALS AND SPORTS DRINKS)

Table 2.6.1 Comparability of measures for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW PHS	2001 2005-6 2007-8	2-4 yrs	P	How many cups of soft drink, cordials or sports drink, such as lemonade or Gatorade does [child] usually drink in a day? (1 cup=250ml. One can of soft drink=1½ cups. One 500ml bottle of Gatorade =2 cups)	Number of cups per day		
		5-8 yrs	P		Number of cups per week		
		9-11 yrs	P		Doesn't drink		
		12-15 yrs ^a	P		Don't know Refused		
SPANS	2010	5-8 yrs	P	How many cups of the following drinks you usually consume: soft drink, cordials, or sports drink, such as lemonade or Gatorade (1 cup =250ml; 1 can of soft drink= 1 ½ cups) 'Diet' soft drink or diet cordial, such as Diet Coke or Sprite or Coke Zero (1 cup=250ml; 1 can of soft drink = 1 ½ cups).	1 cup or less per week	1 cup or less per week 2-4 cups per week 5-6 cups per week 1 cup per day 2 or more cups per day	Yes (P vs. C for some) 24 hour Dietary Recall data should only be analysed by cups consumed per day
		9-11 yrs	P / C ^b		2-4 cups per week		
		12-15 yrs	C		5-6 cups per week 1 cup per day 2 or more cups per day		
NNS	1995	2-4 yrs	P	Time, frequency, amount. Parent/carer assistance for children 5-11 years if required.	24 hour Dietary Recall		
		5-8 yrs	C				
		9-11 yrs	C				
		12-15 yrs	C				
ANCS	2007	5-8 yrs	P	Time, frequency, amount.	24 hour Dietary Recall		
		9-11 yrs	C				
		12-15 yrs	C				

^a NSW Child PHS 2001 only sampled children aged 2 - 12 years, hence this age group is not included for the 2001 survey

^b Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 2.6.2 Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed, by age group, survey, and respondent

Age Groups	Survey	Years	R	Sample size	N (weighted %)						
					≤1 cup/ week ^a	2-4 cups/ week	5-6 cups/ week	1 cup/ day	≥ 2 cups/ day	Don't know	Missing ^b
2-4 yrs	NSW Child PHS ^c	2001	P	2, 029	1170 (55.2)	288 (15.5)	19 (1.0)	302 (15.9)	248 (12.3)	2 (0.1)	0 (0.0)
		2005-06	P	807	553 (69.0)	84 (10.6)	3 (0.2)	99 (11.9)	66 (8.1)	2 (0.2)	0 (0.0)
		2007-08	P	922	650 (70.6)	77 (8.1)	6 (0.7)	110 (12.2)	76 (8.1)	3 (0.3)	0 (0.0)
5-8 yrs	NSW	2001	P	2, 705	1039 (39.1)	537 (19.8)	34 (1.2)	562 (20.7)	528 (19.1)	4 (0.1)	1 (0.0)
	Child PHS	2005-06	P	1, 050	533 (50.4)	177 (17.3)	7 (0.7)	180 (17.2)	146 (13.8)	7 (0.6)	0 (0.0)
		2007-08	P	1, 151	641 (56.8)	187 (14.9)	13 (1.2)	167 (14.6)	137 (12.0)	6 (0.5)	0 (0.0)
	SPANS	2010	P	2, 477	1, 340 (54.0)	432 (17.2)	141 (5.9)	219 (8.7)	88 (3.8)	N/A	257 (10.3)
9-11 years	NSW	2001	P	2, 457	829 (32.7)	490 (20.4)	34 (1.0)	534 (21.5)	566 (24.3)	4 (0.1)	0 (0.0)
	Child PHS	2005-06	P	843	380 (44.7)	170 (20.8)	15 (1.7)	149 (16.6)	125 (15.5)	4 (0.7)	0 (0.0)
		2007-08	P	959	456 (47.9)	172 (16.0)	19 (1.6)	175 (19.3)	130 (14.6)	7 (0.6)	0 (0.0)
	SPANS	2010	P/C	2, 329	1, 121 (47.3)	635 (28.2)	154 (6.7)	202 (9.0)	63 (3.1)	N/A	154 (5.8)
12-15 yrs	NSW	2005-06	P	1, 198	428 (34.1)	296 (25.2)	31 (2.5)	217 (17.3)	217 (20.4)	9 (0.6)	0 (0.0)
	Child PHS	2007-08	P	1, 351	487 (37.0)	326 (23.1)	40 (2.8)	245 (18.3)	236 (17.6)	16 (1.1)	1 (0.0)
	SPANS	2010	C	3, 003	1, 223 (39.6)	1, 068 (35.2)	296 (10.4)	257 (9.0)	100 (4.2)	N/A	59 (1.6)

^a Includes parents who responded 'doesn't drink' in the NSW Child PHS

^b Includes those who refused the question in the NSW Child PHS

^c To compare continuous responses from the NSW Child PHS to response categories from SPANS 2010, continuous responses for intake of sugar sweetened drinks per day and per week were divided into ranges that corresponded with each SPANS response category, e.g. 1 cup/day corresponded with ≥6.5 to <10.5cups/week as well as ≥0.93 to <1.5 cups/day, while ≥ 2 cups/day corresponded with ≥10.5 cups/week as well as ≥1.5 cups/day

Table 2.6.3 Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed per day, by age group, survey, and respondent, using SDQ and 24HR recall methods

Age Group	Survey	Year	R	M	Sample Size	N (weighted %)				
						< 1 cup/ day	≥ 2 cups/ day	Doesn't drink	Don't know	Missing ^a
2-4 yrs	NNS (NSW) ^{b, c}	1995	P	24HR	117	39 (33.6)	19 (15.3)	59 (51.1)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 029	838 (42.9)	248 (12.3)	941 (44.7)	2 (0.1)	0 (0.0)
		2005-6	P	SDQ	807	262 (32.0)	66 (8.1)	477 (59.7)	2 (0.2)	0 (0.0)
		2007-8	P	SDQ	922	264 (28.3)	76 (8.1)	579 (63.3)	3 (0.3)	0 (0.0)
5-8 yrs	NNS (NSW)	1995	C	24HR	163	56 (39.3)	47 (27.4)	60 (33.3)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 705	1, 447 (52.7)	528 (19.1)	725 (28.1)	4 (0.1)	1 (0.0)
		2005-6	P	SDQ	1, 050	498 (48.2)	146 (13.8)	399 (37.4)	7 (0.6)	0 (0.0)
		2007-8	P	SDQ	1, 151	509 (43.3)	137 (12.0)	499 (44.2)	6 (0.5)	0 (0.0)
	SPANS	2010	P	SDQ	2, 477	2, 132 (85.8)	88 (3.8)	N/A	N/A	257 (10.3)
9-11 yrs	NNS (NSW)	1995	C	24HR	105	27 (26.7)	35 (32.0)	43 (41.4)	N/A	N/A
	NSW Child PHS	2001	P	SDQ	2, 457	1, 365 (55.3)	566 (24.3)	522 (20.3)	4 (0.1)	0 (0.0)
		2005-6	P	SDQ	843	461 (54.3)	125 (15.5)	253 (29.5)	4 (0.7)	0 (0.0)
		2007-8	P	SDQ	959	475 (47.5)	130 (14.6)	347 (37.3)	7 (0.6)	0 (0.0)
	SPANS	2010	P/C	SDQ	2, 329	2, 112 (91.2)	63 (3.1)	N/A	N/A	154 (5.8)
12-15 yrs	NNS (NSW)	1995	C	24HR	116	25 (21.8)	48 (43.1)	43 (35.0)	N/A	N/A
	NSW Child PHS	2005-6	P	SDQ	1, 198	655 (53.7)	217 (20.4)	317 (25.4)	9 (0.6)	0 (0.0)
		2007-8	P	SDQ	1, 351	714 (51.6)	236 (17.6)	384 (29.6)	16 (1.1)	1 (0.0)
	SPANS	2010	C	SDQ	3, 003	2, 844 (94.2)	100 (4.2)	N/A	N/A	59 (1.6)

NB: Categories indicating consumption per week are not included here as this is not appropriate for 24HR recall data (ANCS 2007 and NNS 1995).

M = Survey Method

^a Includes those who refused question in Computer Assisted Telephone Interview

^b Data were from NSW respondents

^c Includes the following food sub-groups: *fruit-based or flavoured cordials and drinks, fruit-flavoured drink base and cordial base*, and the food group: *soft drinks, flavoured mineral waters and electrolyte drinks*

FINDINGS - Estimates for ‘sugar sweetened drinks (soft drinks, cordials and sports drinks)’

- Across all surveys and age groups, there is a trend towards a lower consumption of sugar sweetened drinks (soft drinks, cordials, sports drinks) from 2001-2010. For example, across all age groups, the proportion reporting one cup per week or less increased with each year of the NSW Child PHS, while the proportion reporting two or more cups per week decreased (Figure 2.6.1 and Table 2.6.2).
- Soft drink consumption however, still appears to increase with age, For example, in the NSW Child PHS 2007-08 the proportion of children consuming one or more cups per day increased from 20% in 2-4 year olds, to 27% of 5-8 year olds, 34% of 9-11 year olds and 36% of 12-15 year olds (Figure 2.6.1 and Table 2.6.2).

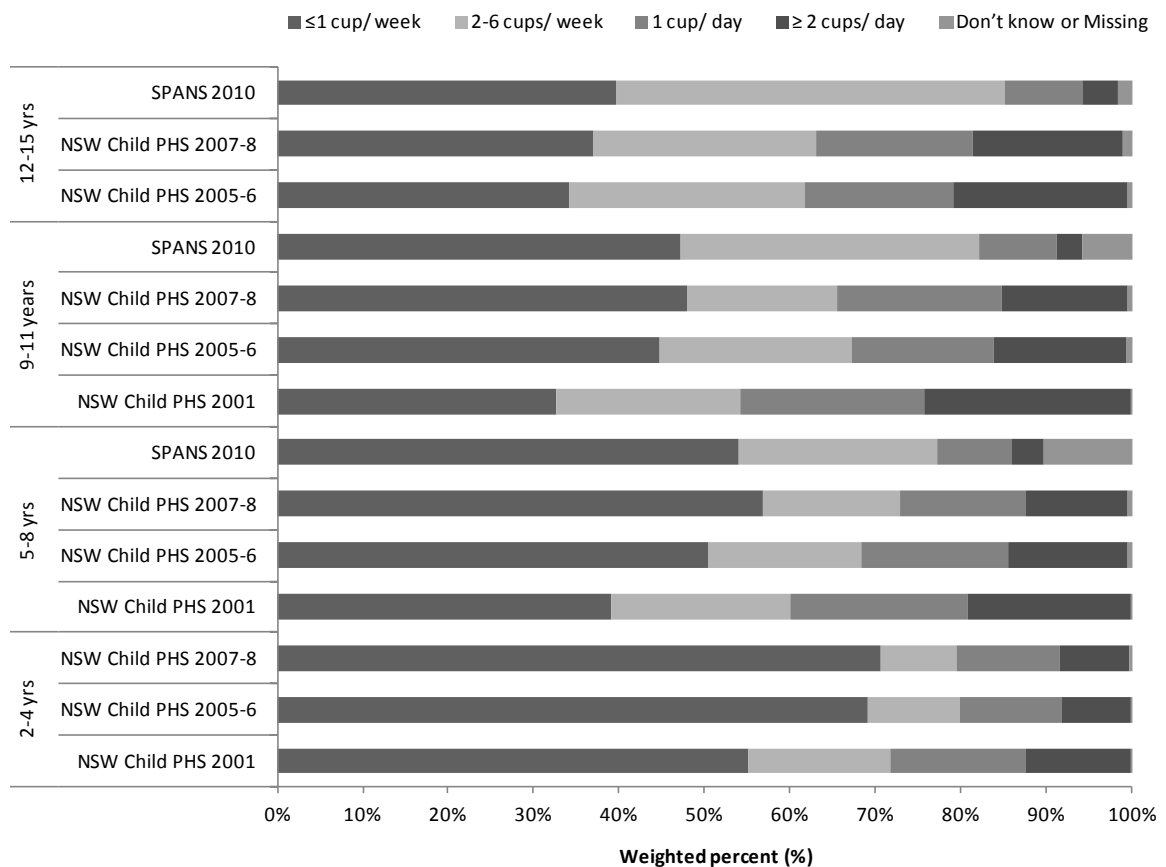


Figure 2.6.1 Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed, by age group, survey, and respondent

FINDINGS – Measurement of ‘sugar sweetened drinks (soft drinks, cordials and sports drinks)’

- The proportion of 5-15 year olds consuming one or more cups of soft drink per day in SPANS 2010 was less than half that in the NSW Child PHS. For example, 12% of 5-8 year olds reported consuming two or more cups per day in the NSW Child PHS, while only 4% did so in SPANS 2010. This may be related to many factors including a potential decline in soft drink consumption from 2007-08 to 2010, differences between parent and child report, or the survey methodology. Another consideration was that the NSW Child PHS question did not specifically exclude ‘diet’, ‘sugar-free’ or ‘low calorie/low joule’ versions. However, in SPANS 2010 there is a separate question addressing diet versions of sugar sweetened drinks, which may have prompted respondents to have only included sugar sweetened varieties in their responses in this survey.

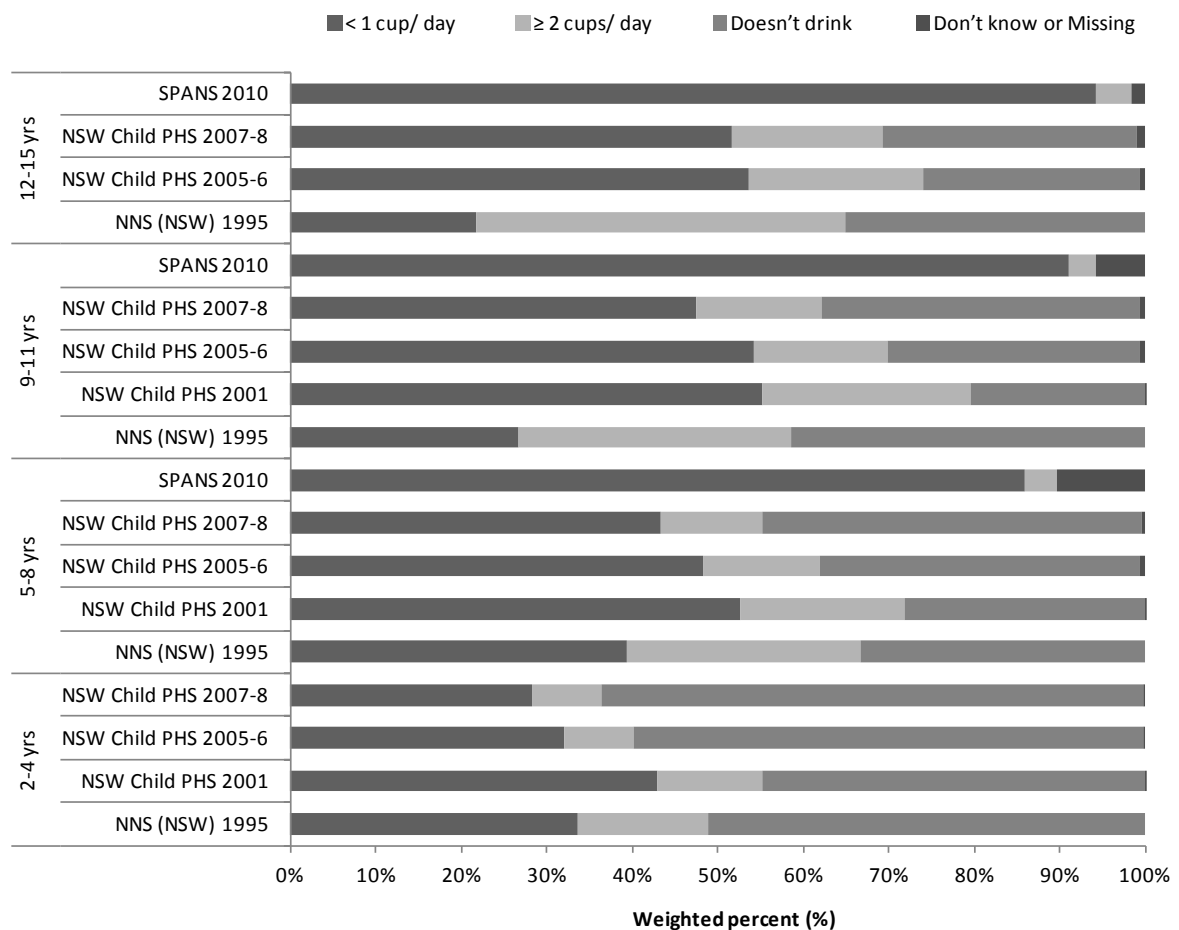


Figure 2.6.2 Estimates of common response categories for the amount of sugar sweetened drinks (soft drinks, sports drinks and cordials) consumed by age group, survey, and respondent, using SDQ and 24HR recall methods

- As with other dietary indicator variables, it appears more likely for missing data to occur when respondents are required to answer questions in a written survey (SPANS), compared with responding to verbal questions from an interviewer over the telephone (NSW Child PHS).
- Figure 2.6.2 and Table 2.6.3 illustrates the differences in using 24HR recall data, as opposed to a short question about sugar sweetened drink consumption. Comparing 24HR recall data from the 1995 NNS to the 2001 NSW Child PHS, the proportions of those that do not drink sugary drinks (soft drinks, cordials and sports/electrolyte drinks) are higher within every age group. Again, this is likely to be due to respondents reporting on a one day reference period only for the 24HR recall during which they may not have consumed any of these drinks, rather than reporting on their 'usual' intake.
- A lower proportion of children aged 9-15 years reported consuming two or more cups of sugary drinks per day in SPANS 2010 compared with parent report in the 2007-08 NSW Child PHS, while a higher proportion reported consuming less than one cup of sugary drinks per day. This may have been due to differences between parent's versus children's ability to assess intake in 'cups per day', an effect of time (2007-08 versus 2010) or the survey response options (e.g. respondents may have been more likely to report their intake in one of the first three response categories (1 cup, 2-4 cups or 5-6 cups per week) from the SPANS 2010 survey, which were then grouped to form the '< 1cup/day' category, whereas the NSW Child PHS asked number of cups per day or per week on a continuous scale).

3 FRUIT AND VEGETABLES

Fruit and vegetables are an excellent source of vitamins, folate, phytochemicals, carbohydrates and dietary fibre. There is sound evidence suggesting that consumption of fruit may protect against chronic diseases such as cardiovascular disease and cancer (17-19). The *Australian Guide*

to *Healthy Eating* recommends that children aged 4-11 years consume at least one serve of fruit and two serves of vegetables per day, and that adolescents aged 12-18 years consume at least three serves of fruit and at least four serves of vegetables per day (12).

National and state-based nutrition and health surveys have asked about the amount (in serves) of fruit and vegetables consumed. These indicators are presented in the following sections with tables describing the nature of the questions used in each survey, and the results from these different questions for each fruit or vegetable indicator.

The format of short dietary questions used in surveys on both adults and children to assess fruit and vegetable intake have been generally the same, “How many serves of fruit do you (does your child) usually eat each day (a serve = 1 medium piece or 2 small pieces or 1 cup of diced pieces)” and, “How many serves of vegetables do you (does your child) usually eat each day (a serve = ½ cup cooked vegetables or 1 cup of salad vegetables)”. These questions may slightly overestimate fruit and vegetable intake in adults when compared with 24HR dietary recall data (9).

Key differences in how these questions have been used to monitor population intake are in their modes of administration, the descriptions of equivalent serve sizes for fruit and vegetables and the response categories or options provided.

Scope:

- Eating behaviours
- Non-alcoholic Beverages
- **Fruit and vegetables**
- Fast foods
- Extra foods

3.1 FRUIT

Table 3.1.1 Comparability of measures for the amount of fruit consumed, across surveys, age groups and respondents

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-15 yrs 16-17 yrs	C C	How many serves of fruit do you usually eat each day? (a 'serve' = 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces).	1 serve or less 2-3 serves 4-5 serves 6 serves or more Don't eat fruit		
NSW Child PHS	2001 2003-04 2005-06 2007-08	2-4 yrs 5-8 yrs 9-11 yrs 12-15 yrs	P P P P	How many serves of fruit does [child] usually eat each day? (1 serve = 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces). OR for 2001 survey How many serves of fruit does [child] usually eat in a day, including fresh, canned and dried fruit? (1 serve = 1-2 piece fruit, 1/3 cup canned fruit, 1 tablespoon of dried fruit).	Serves per day Serves per week Doesn't eat fruit Don't know Refused	1 serve or less/day 2-3 serves/day 4-5 serves/day 6 serves or more Don't eat fruit	Yes (P vs. C, and variation in serving size for 2001 NSW Child PHS).
NSW Adult PHS	^a 2004 2006 2008	16-17 yrs	C	How many serves of fruit do you usually eat each day? (1 serve = 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces).	Serves per day Serves per week Don't eat fruit Don't know Refused		
SSHBS	2002 2005 2008	12-15 yrs 16-17 yrs	C C	How many serves of fruit do you usually eat each day? (A serve is equal to 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces of fruit).	1 serve or less 2-3 serves 4-5 serves 6 serves or more I do not eat fruit		

^a This question was also asked in the 2002 survey however, data were only available for 1, 947 of the 12, 622 respondents aged 16 years and older

Survey	Year	Age Groups	Respondent (R)	Question	Response	Common	Comparability
					OR for 2002 survey 1 serve or less 2 serves 3 serves 4 serves 5 serves 6 serves or more I do not eat fruit		
SPANS	2004 2010	5-8 yrs 9-11 yrs 12-15 yrs ^a	P P/C ^b C	How many serves of fruit do you (<i>does your child</i>) usually eat each day? (a serve = 1 medium piece or two small pieces of fruit or 1 cup of diced pieces; includes fresh, dried, frozen and tinned fruit). OR in the 2004 survey How many serves of fruit do you usually eat each day? (a serve = 1 medium piece or two small pieces of fruit or 1 cup of diced pieces).	Less than 1 serve 1 serve 2 serves 3 serves 4 serves 5 serves 6 or more serves I don't (<i>My child doesn't</i>) eat fruit OR in the 2004 survey I don't eat fruit 1 serve or less 2-3 serves 4-5 serves 6 serves or more		

^a SPANS 2004 only surveyed those aged 11 to 16 years and hence 2004 data are only for this age group

^b Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 3.1.2 Estimates of common response categories for the amount of fruit consumed, by age group, survey, and respondent

Age Group	Survey	Year	R	Sample size, N	N (weighted %)						
					≤1 serve /day	2-3 serves /day	4-5 serves /day	≥6 serves /day	I don't eat fruit	Don't know	Missing
2-4 yrs	NSW Child PHS	2001	P	2,029	356 (19.0)	886 (44.1)	468 (22.5)	270 (11.7)	45 (2.5)	4 (0.2)	0 (0.0)
		2003-04 ^a	P	894	381 (42.5)	421 (47.1)	59 (6.7)	4 (0.7)	23 (2.4)	6 (0.5)	0 (0.0)
		2005-06	P	820	282 (34.6)	417 (50.9)	85 (9.7)	11 (1.2)	22 (3.1)	3 (0.3)	0 (0.0)
		2007-08	P	928	260 (28.9)	529 (57.1)	106 (11.0)	14 (1.5)	16 (1.2)	3 (0.3)	0 (0.0)
5-8 yrs	NSW Child PHS	2001	P	2,705	510 (17.2)	1,165 (44.5)	591 (22.9)	350 (12.5)	80 (2.7)	9 (0.3)	0 (0.0)
		2003-04 ^a	P	1,144	537 (46.2)	498 (44.2)	60 (5.2)	11 (1.0)	32 (2.9)	6 (0.5)	0 (0.0)
		2005-06	P	1,069	393 (37.0)	543 (50.4)	90 (8.6)	9 (0.9)	30 (2.7)	4 (0.4)	0 (0.0)
		2007-08	P	1,162	356 (29.9)	647 (56.2)	114 (10.0)	13 (1.1)	25 (2.3)	7 (0.5)	0 (0.0)
	SPANS	2010	P	2,477	620 (26.2)	1,434 (56.8)	239 (9.5)	20 (0.6)	26 (1.1)	N/A	138 (5.7)
9-11 yrs	NSW Child PHS	2001	P	2,457	501 (19.5)	1,020 (42.5)	530 (22.2)	320 (12.2)	77 (2.7)	9 (0.8)	0 (0.0)
		2003-04 ^a	P	909	396 (43.6)	422 (47.1)	46 (5.4)	9 (1.1)	34 (2.6)	2 (0.2)	0 (0.0)
		2005-06	P	853	347 (40.7)	412 (47.6)	56 (7.2)	9 (1.2)	25 (2.7)	4 (0.7)	0 (0.0)
		2007-08	P	967	352 (35.8)	509 (52.6)	67 (7.6)	6 (0.8)	30 (3.0)	3 (0.2)	0 (0.0)
	SPANS	2010	P / C	2,239	556 (25.7)	1,308 (55.4)	303 (12.6)	49 (2.1)	23 (1.0)	N/A	90 (3.3)
12-15 yrs	NNS (NSW) ^b	1995	C	82	31 (36.5)	38 (47.5)	9 (11.1)	3 (3.9)	0 (0.0)	N/A	1 (1.0)
	SSHBS	2002	C	4,897	1,286 (26.8)	2,155 (43.8)	911 (18.2)	364 (7.6)	94 (1.8)	N/A	87 (1.8)
	NSW Child PHS	2003-04 ^a	P	1,329	611 (45.6)	490 (36.2)	92 (9.1)	19 (1.3)	105 (6.9)	12 (1.0)	0 (0.0)

^a Of the 7,679 respondents to the 2003-04 NSW Child PHS, data on fruit serves was only available for 4,059

^b Data were from NSW respondents

Age Group	Survey	Year	R	Sample size, N	N (weighted %)						
					≤1 serve /day	2-3 serves /day	4-5 serves /day	≥6 serves /day	I don't eat fruit	Don't know	Missing
16-17 yrs	SPANS	2004	C	1,763	534 (31.0)	846 (46.6)	249 (14.2)	82 (5.2)	44 (2.7)	N/A	8 (0.3)
	SSHBS	2005	C	3878	915 (23.2)	2,077 (53.1)	626 (16.4)	149 (4.1)	58 (1.7)	N/A	53 (1.5) ^a
	NSW Child PHS	2005-06	P	1,207	504 (41.9)	538 (44.6)	75 (5.8)	11 (1.4)	67 (5.1)	11 (0.9)	1 (0.2) ^b
		2007-08	P	1,370	563 (41.1)	621 (44.9)	79 (6.1)	20 (1.6)	76 (5.8)	10 (0.5)	1 (0.0)
	SSHBS	2008	C	4,834	889 (18.1)	2635 (54.4)	912 (19.0)	245 (5.2)	100 (2.0)	N/A	53 (1.2)
	SPANS	2010	C	3,003	670 (24.2)	1,685 (55.0)	519 (16.8)	67 (1.8)	43 (1.5)	N/A	19 (0.8)
	NNS (NSW)	1995	C	37	15 (40.0)	17 (42.9)	4 (15.0)	1 (2.1)	0 (0.0)	N/A	0 (0.0)
	SSHBS	2002	C	1283	391 (31.2)	576 (45.5)	208 (15.5)	73 (5.2)	29 (2.1)	N/A	6 (0.4)
	NSW Adult PHS	2004	C	207	98 (46.2) ^c	75 (39.0)	18 (8.6)	3 (1.3)	N/A	N/A	13 (4.9) ^d
	SSHBS	2005	C	1644	452 (28.0)	868 (52.6)	246 (14.3)	41 (2.6)	29 (1.9)	N/A	8 (0.5) ^e
NSW Adult PHS	2006	C	168	67 (40.2) ^b	79 (47.6)	17 (9.2)	4 (2.1)	N/A	N/A	1 (0.8) ^c	
	2008	C	173	72 (40.6)	76 (45.8)	12 (7.0)	2 (1.0)	10 (4.9)	1 (0.6)	0 (0.0)	
SSHBS	2008	C	2,719	587 (21.4)	1470 (54.0)	453 (16.5)	113 (4.2)	60 (2.4)	N/A	36 (1.4)	

^a Missing includes 11 cases where multiple responses were given

^b Respondent refused the question

^c Includes those who responded, 'I don't eat fruit'

^d Includes those who responded, 'Don't know' or refused the question

^e Missing includes 11 cases where multiple responses were given

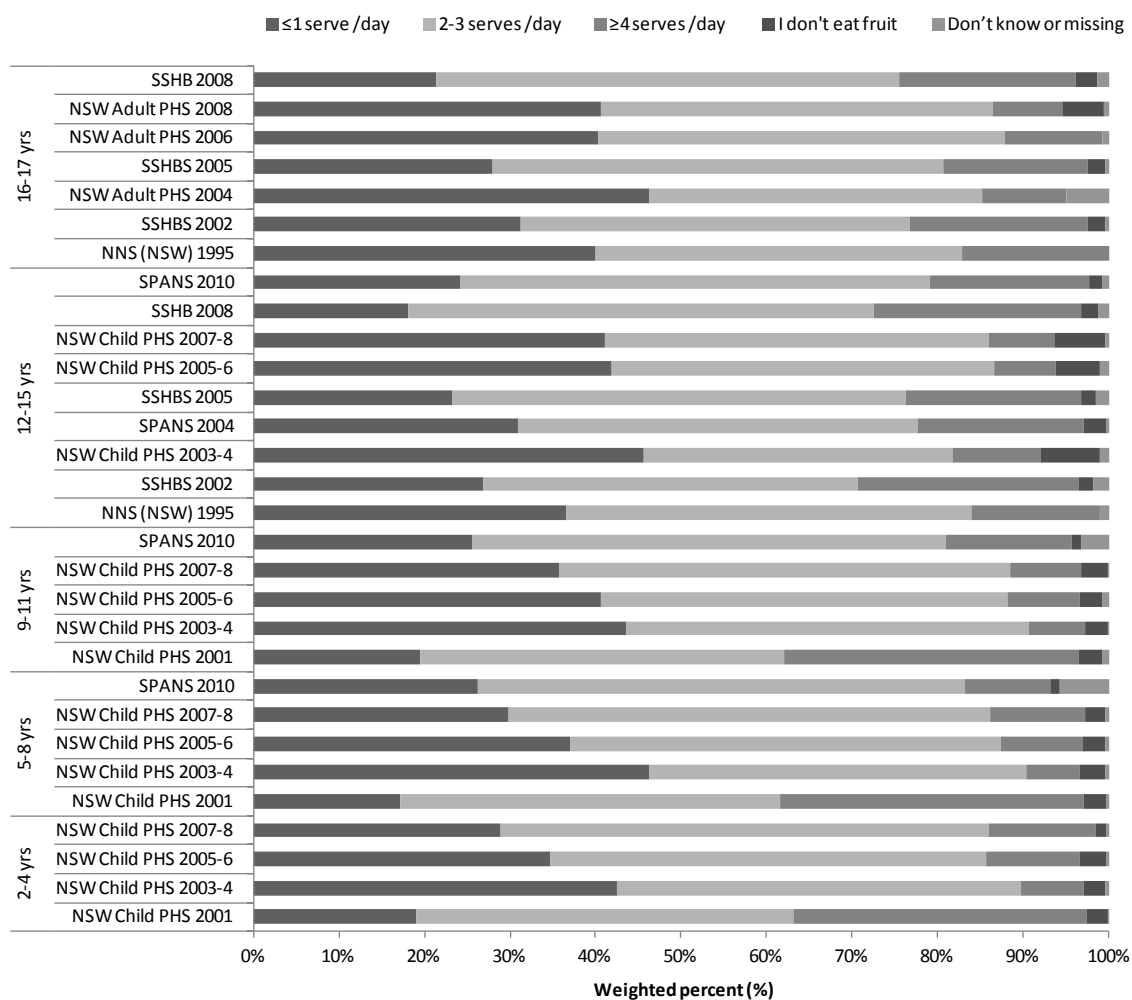


Figure 3.1.1 Estimates of common response categories for the amount of fruit consumed, by age group, survey, and respondent

FINDINGS – Estimates for ‘fruit’

- Across surveys, there appears to be an increase in the proportion of children aged 2-17 years consuming two to three serves of fruit per day, e.g.
 - In the SSHBS the proportion of 12-17 years olds consuming two to three serves of fruit per day increased from 45% in 2002 to 53% in 2005 and 54% in 2008.
 - In the NSW Child PHS the proportion of 2-15 years olds consuming two to three serves of fruit per day increased from 44% in 2001 to 46% in 2003-04, 50% in 2005-06 and 55% in 2007-08.

- Approximately half of children (or parents on their behalf) reported consumption of two to three serves of fruit per day, regardless of age.

FINDINGS – *Measurement of 'fruit'*

- A higher percentage of respondents reported consumption of one or less serves of fruit per day when interviewed over the telephone, compared with written surveys, e.g. 40% and 46% of 16-17 year olds in the 2002 and 2004 NSW Adult PHS, respectively, compared with 28% in the 2005 SSHBS (Table 3.1.2). This may have been due to the response options provided, i.e. the SSHBS provides 'one or less per day' as one of five 'per day' response categories, whereas respondents to the NSW Adult PHS are asked to respond on a continuous scale 'per week' or 'per day' (Table 3.1.1).
- Data from the 2001 NSW Child PHS cannot be compared with more recent surveys due to the different example serve sizes, e.g. in the 2001 survey one serve of fruit was prompted as 1-2 piece fruit, 1/3 cup canned fruit or 1 tablespoon of dried fruit, compared with 1 medium piece, 2 small pieces or 1 cup of diced pieces in later surveys.
- As with other dietary indicator variables, it appears more likely for missing data to occur when respondents are required to answer questions in a written survey (SPANS or SSHBS), compared with responding to verbal questions from an interviewer over the telephone (NSW PHS).

3.2 VEGETABLES

Table 3.2.1 Comparability of measures for the amount of vegetables consumed, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-15yrs 16-17 yrs	C	How many serves of vegetables do you usually eat each day? (a 'serve' = ½ cup cooked vegetables or 1 cup of salad vegetables).	1 serve or less 2-3 serves 4-5 serves 6 serves or more Don't eat vegetables		
NSW Child PHS	2001 2003-04 ^a 2005-06 2007-08	2-4 yrs 5-8 yrs 9-11 yrs 12-15 yrs	P P P P	How many serves of vegetables does [child] usually eat each day? (One serve = ½ cup cooked or 1 cup of salad vegetables). OR for 2001 survey How many serves of salad vegetables or raw vegetables does [child] usually eat in a day? (1 serve=1/4 cup salad or 4 vegetable sticks). How many serves of cooked vegetables (including potato) does [child] usually eat in a day? (1 serve=1/4 cup cooked vegetables) ^b	Serves per day Serves per week Doesn't eat vegetables Don't know Refused	1 serve or less 2-3 serves 4-5 serves 6 serves or more I don't eat vegetables	Yes (P vs. C, and variation in serving size for 2001 NSW Child PHS).
NSW Adult PHS	2002 ^c	16-17 yrs	C	How many serves of vegetables do you usually eat each day? (1 serve = ½ cup cooked or 1 cup raw vegetables or 1 cup salad vegetables).	Serves per day Serves per week Don't eat vegetables Don't know Refused		
NSW Adult PHS	2004 2006 2008	16-17 yrs	C	How many serves of vegetables do you usually eat each day? (1 serve = ½ cup cooked or 1 cup of salad vegetables).	Serves per day Serves per week Don't eat vegetables		

^a Data missing for this survey year

^b Questions were combined to provide total vegetable intake

^c This question was also asked in the 2002 survey however, data were only available for 1, 173 of the 12, 622 respondents aged 16 years and older

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
					Don't know Refused		
SSHBS	2002	12-15 yrs 16-17 yrs	C	How many serves of vegetables do you usually eat each day? (A serve is equal to ½ cup of cooked vegetables or 1 cup of salad vegetables).	1 serve or less 2–3 serves 4–5 serves 6 serves or more I do not eat vegetables		
SSHBS	2005 2008	12-15 yrs 16-17 yrs	C	How many serves of vegetables do you usually eat each day? (A serve is equal to ½ cup of cooked vegetables or 1 cup of salad vegetables).	1 serve or less 2 serves 3 serves 4 serves 5 serves 6 serves or more I do not eat vegetables		
SPANS	2004	12-15yrs	C	How many serves of vegetables do you usually eat each day? (a serve = ½ cup cooked vegetables or 1 cup of salad vegetables).	1 serve or less 2-3 serves 4-5 serves 6 serves or more I don't eat vegetables		
SPANS	2010	5-8yrs 9-11 yrs 12-15yrs	P P / C ^a C	How many serves of vegetables do you (does your child) usually eat each day? (a serve = ½ cup cooked vegetables or 1 cup of salad vegetables; includes fresh, dried, frozen and tinned vegetables).	Less than 1 serve 1 serve 2 serves 3 serves 4 serves 5 serves 6 or more serves I don't (My child doesn't) eat vegetables		

^a Children aged 11 years in year 6 at school, responded on behalf of themselves

Table 3.2.2 Estimates of common response categories for the amount of vegetables consumed, by age group, survey, and respondent

Age Group	Survey	Year	R	Sample size, N	N (weighted %)						
					≤1 serve /day	2-3 serves /day	4-5 serves /day	≥6 serves /day	I don't eat vegetables	Don't know	Missing
2-4 yrs	NSW Child PHS	2001	P	2, 029	487 (24.3)	951 (45.9)	380 (19.9)	153 (7.2)	57 (2.7)	1 (0.1)	0 (0.0)
		2005-06	P	820	387 (47.4)	320 (38.3)	61 (7.0)	5 (0.5)	41 (6.0)	6 (0.9)	0 (0.0)
		2007-08	P	928	418 (47.0)	375 (39.6)	78 (7.4)	9 (1.1)	32 (2.8)	16 (2.1)	0 (0.0)
5-8 yrs	NSW Child PHS	2001	P	2, 705	587 (22.6)	1, 160 (43.0)	588 (22.0)	334 (11.0)	32 (1.3)	4 (0.1)	0 (0.0)
		2005-06	P	1, 069	470 (46.0)	456 (41.2)	97 (8.3)	10 (1.1)	30 (2.7)	6 (0.7)	0 (0.0)
		2007-08	P	1, 162	463 (39.3)	544 (47.8)	112 (8.7)	6 (0.6)	32 (3.3)	5 (0.3)	0 (0.0)
	SPANS	2010	P	2, 477	943 (38.9)	1, 123 (45.0)	194 (7.4)	19 (0.7)	55 (2.1)	N/A	143 (6.0)
9-11 yrs	NSW Child PHS	2001	P	2, 457	448 (19.7)	947 (39.7)	605 (23.9)	432 (15.3)	22 (1.2)	3 (0.3)	0 (0.0)
		2005-06	P	853	315 (38.9)	404 (45.4)	108 (12.5)	6 (0.6)	15 (2.0)	5 (0.7)	0 (0.0)
		2007-08	P	967	332 (35.0)	452 (46.9)	143 (13.7)	14 (1.4)	19 (2.4)	7 (0.6)	0 (0.0)
	SPANS	2010	P / C	2, 329	756 (33.7)	1, 142 (48.9)	277 (11.2)	24 (1.1)	46 (2.0)	N/A	84 (3.1)
12-15 yrs	NNS (NSW) ^a	1995	C	82	24 (24.3)	42 (55.6)	12 (13.8)	0 (0.0)	2 (3.7)	N/A	2 (2.6)
	SSHBS	2002	C	4, 897	1, 454 (29.8)	2, 252 (46.3)	669 (13.5)	262 (5.1)	161 (3.3)	N/A	99 (2.0)
	SPANS	2004	C	1, 763	435 (23.3)	943 (54.8)	265 (15.1)	72 (3.9)	34 (2.3)	N/A	14 (0.6)
	SSHBS	2005	C	3, 878	870 (21.9)	2, 137 (55.1)	587 (15.3)	138 (3.7)	83 (2.3)	N/A	63 (1.8)
	NSW Child PHS	2005-06	P	1, 207	432 (36.9)	548 (45.2)	161 (11.9)	22 (2.1)	31 (2.5)	13 (1.4)	0 (0.0)
		2007-08	P	1, 370	440 (33.2)	624 (45.7)	225 (14.7)	30 (2.2)	41 (3.4)	9 (0.8)	1 (0.0)

^a Data were from NSW respondents

	SSHBS	2008	C	4, 834	898 (18.6)	2, 581 (52.8)	965 (20.2)	217 (4.6)	113 (2.4)	N/A	60 (1.4)
	SPANS	2010	C	3, 003	666 (23.2)	1, 651 (55.4)	587 (18.3)	46 (1.4)	37 (1.2)	N/A	16 (0.4)
16-17 yrs	NNS (NSW) ^b	1995	C	37	15 (41.5)	17 (41.9)	3 (10.6)	1 (1.0)	1 (5.0)	N/A	0 (0.0)
	SSHBS	2002	C	1, 283	389 (31.1)	616 (48.4)	182 (13.3)	58 (4.1)	31 (2.7)	N/A	7 (0.4)
	NSW Adult PHS	2004	C	207	74 (37.1)	100 (44.1)	22 (11.4)	5 (3.6)	N/A	N/A	6 (3.7)
	SSHBS	2005	C	1, 644	360 (22.5)	921 (55.4)	269 (16.4)	54 (3.2)	29 (1.7)	N/A	11 (0.7)
	NSW Adult PHS	2006	C	168	63 (41.6) ^a	89 (49.8)	12 (6.5)	2 (0.6)	N/A	N/A	2 (1.5) ^b
	NSW Adult PHS	2008	C	173	65 (38.3)	81 (44.5)	21 (13.5)	3 (1.2)	1 (0.7)	2 (1.8)	0 (0.0)
	SSHBS	2008	C	2, 719	519 (19.5)	1, 481 (54.7)	518 (18.2)	108 (3.9)	56 (2.1)	N/A	37 (1.4)

^a Includes those who responded, 'I don't eat vegetables'

^b Includes those who responded, 'Don't know' or refused the question

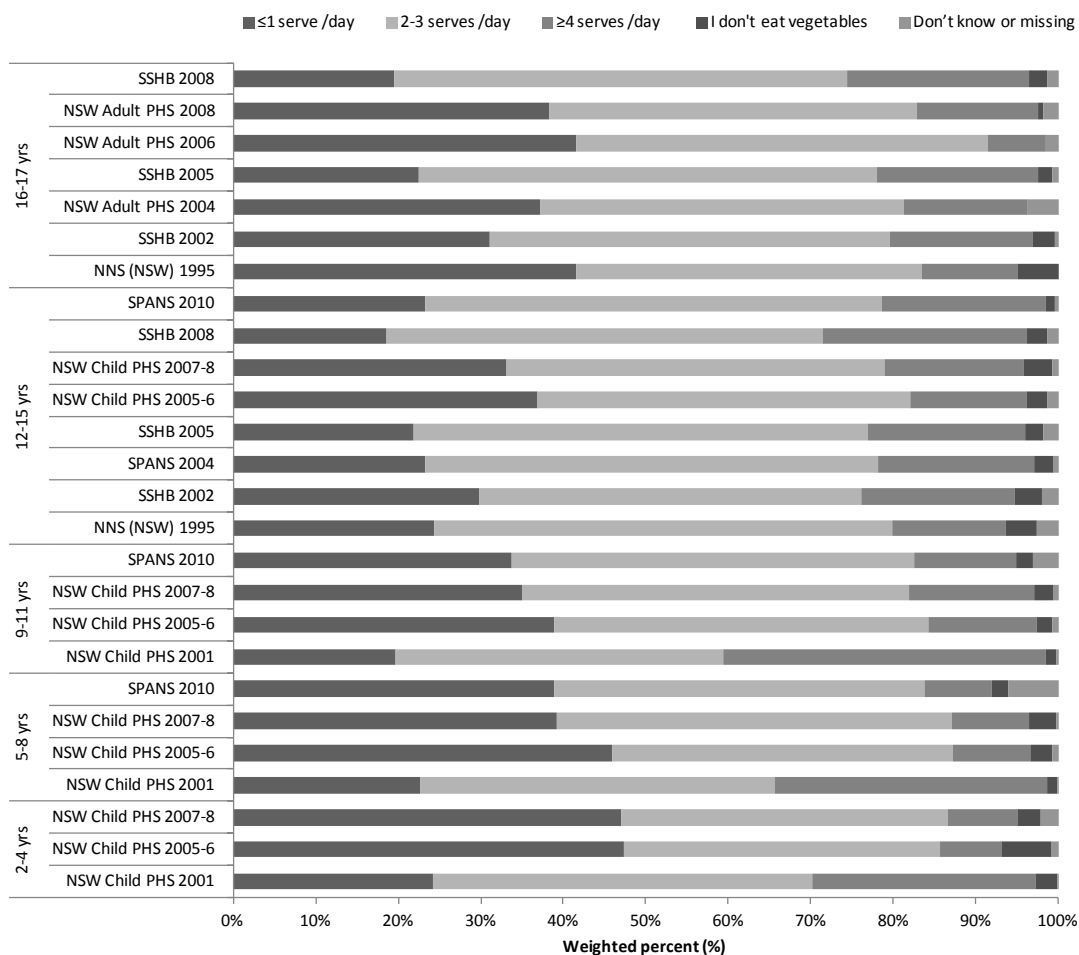


Figure 3.2.1 Estimates of common response categories for the amount of vegetables consumed, by age group, survey, and respondent

FINDINGS – Estimates for ‘vegetables’

- Approximately 41% to 51% of children aged 2-17 years (or parents on their behalf), reported a consumption of two to three serves of vegetables per day (Figure 3.2.1 and Table 3.2.2).
- Estimates from each survey indicate that the proportion of children aged 12-17 years reporting four to five serves of vegetables per day has increased over time, where the recommended number of serves for this age group is at least four serves per day. For example, the proportion of 16-17 year olds reporting a consumption of 4-5 serves of vegetables each day in the SSHBS increased from 13% in 2002, to 16% in 2005 and 18% in 2008 (Figure 3.2.1 and Table 3.2.2).

- Similarly, the proportion of children aged 5-11 years reporting two to three serves of vegetables per day has increased over time, according to estimates from the NSW Child PHS, where the recommended number of serves for this age group is at least two serves per day (Figure 3.2.1 and Table 3.2.2).

FINDINGS – *Measurement of vegetables*

- As with fruit serves, there was also a higher percentage of respondents reporting one or less serves of fruit per day when interviewed over the telephone, compared with written surveys, e.g. the 37% and 33% of 12-15 year olds in the 2005-06 and 2007-08 NSW Child PHS respectively, compared with 22% and 19% in the 2005 and 2008 SSHBS respectively (Table 3.2.2 and Figure 3.2.1). This may have been due to the response options provided, i.e. the SSHBS provides 'one or less per day' as one of five 'per day' response categories, whereas respondents to the NSW Child PHS are asked to respond on a continuous scale 'per week' or 'per day' (Table 3.2.1).
- Data from the 2001 NSW Child PHS cannot be compared with more recent surveys, as the serve size examples are smaller resulting in a higher number of serves being reported by respondents, e.g. one serve of vegetables is prompted as 1/4 cup salad, 4 vegetable sticks or 1/4 cup cooked vegetables in the 2001 survey, compared with 1 cup of salad or 1/2 cup cooked vegetables in later surveys.
- As with other dietary indicator variables, it appears more likely for missing data to occur when respondents are required to answer questions in a written survey (SPANS or SSHBS), compared with responding to verbal questions from an interviewer over the telephone (NSW PHS).

4 FAST FOODS

Fast foods are typically high in kilojoules, fat, saturated fat, sugar, and salt. Frequent consumption of fast food places adolescents at higher risk of becoming overweight and may increase their risk of gaining weight during the transition from adolescence to adulthood (20, 21).

Scope:

- Eating behaviours
- Non-alcoholic Beverages
- Fruit and vegetables
- **Fast foods**
- Extra foods

State-based health surveys have asked about the frequency at which fast food meals and snacks are consumed by children and adolescents.

The most frequently used short question to assess this indicator was recommended by Flood et al. for use in NSW population health surveys (16), “How often do you (does your child) have meals or snacks such as burgers, pizza, chicken, or chips from places like McDonalds, Hungry Jacks, Pizza Hut, KFC, Red Rooster or local takeaway food places?” However, other surveys have used different variations of this question and variations in the response categories provided.

4.1 FAST FOOD FREQUENCY

Table 4.1.1 Comparability of measures for the frequency of consuming fast food, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
SSHBS	2002	12-15 yrs 16-17 yrs	C C	In the past week, how many times have you eaten meals that were bought from fast food outlets like McDonald's, Hungry Jacks, Pizza Hut, Kentucky Fried Chicken (KFC), Red Rooster, Burger King, hamburger shops, and fish and chip shops?	Don't know 6 times or more 4-5 times 2-3 times Once None	SSHBS 2002 vs. 2008 6 times or more 4-5 times 2-3 times	YES (P vs. C for some)
SSHBS	2008	12-15 yrs 16-17 yrs	C C	How many times in the last week did you eat a fast food meal like McDonalds, Hungry Jacks, pizzas, fish and chips, hamburgers, meat pies, pasties etc?	7 or more times 6 times; 5 times 4 times; 3 times 2 times; Once None	Once None SPANS 2004 vs. SSHBS 2008 vs. NSW Child PHS 05-06 and 07-08	Some categories not exactly represented e.g. <1 time per week
SPANS	2004	12-15 yrs	C	How many days each week do you usually do the following? Eat food from a fast food outlet (like MacDonald's, KFC, Burger King)?	Every day 4-6 times/week 1-3 times/week <1 week Never or rarely	Every day (7 or more) 4-6 times/week 1-3 times/week	would fall into either none or once per week in the 2008 SSHBS
SPANS	2010	12-15 yrs	C	How often do you have takeaway meals or snacks from places like McDonalds, Hungry Jacks, Pizza Hut, KFC, Red Rooster or local takeaway food places?	Everyday About 5-6 times a week About 3-4 times a week About 1-2 times a week <1 week Never or rarely	<1 week Never or rarely SPANS 2010 vs. SSHBS 2008 vs. NSW Child PHS 05-06 and 07-08	SSHBS specifies fast-food meals, with other surveys specify any food (both meals and snacks)
NSW Child PHS	2005-06	12-15 yrs	P	How often does child have meals or snacks such as burgers, pizza, chicken or chips from places like McDonald's, Hungry Jacks, Pizza Hut, KFC, Red Rooster, or local takeaway places?	Times per day Times per week Times per month Rarely or never Don't know	Everyday About 5-6 times a week About 3-4 times a week About 1-2 times a week	
NSW Child PHS	2007-08	12-15 yrs	P	How often does child have meals or snacks such as burgers, pizza, chicken or chips from places like McDonald's, Hungry Jacks, Pizza Hut, KFC, Red Rooster, or local takeaway places?	Times per week Times per month Rarely or never Don't know	<1 week Never or rarely	

Table 4.1.2 Estimates of common response categories for fast food frequency in the SSHBS, by age group and survey year (2002 vs. 2008)

Age Groups	Survey	Years	R	Sample size, N	N (weighted %)						
					≥6 times/ week	4-5 times/ week	2-3 times/ week	Once/ week	None	Don't know	Missing
12-15yrs	SSHBS	2002	C	2, 086	52 (2.8)	110 (5.4)	540 (26.0)	788 (37.1)	501 (24.1)	95 (4.6)	0 (0.0)
		2008	C	4, 834	135 (2.8)	282 (6.0)	1, 698 (35.0)	1, 701 (35.4)	964 (19.7)	N/A	54 (1.2)
16-17yrs	SSHBS	2002	C	553	18 (3.2)	34 (7.3)	191 (36.5)	187 (31.9)	113 (19.9)	10 (1.3)	0 (0.0)
		2008	C	2, 719	111 (4.1)	202 (7.6)	1, 041 (38.8)	862 (31.6)	469 (16.5)	N/A	34 (1.3)

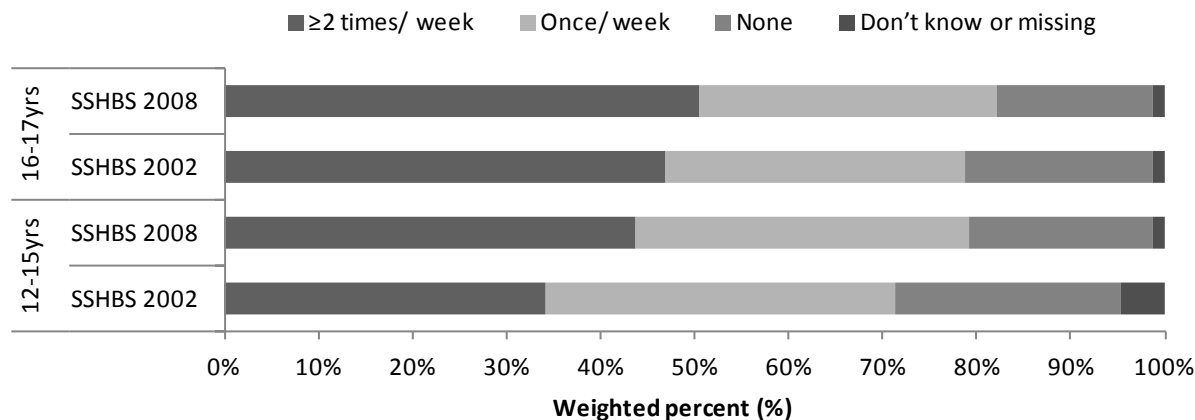


Figure 4.1.1 Estimates of common response categories for fast food frequency in the SSHBS, by age group and survey year (2002 vs. 2008)

Table 4.1.3 Estimates of common response categories for fast food frequency, by age group, survey and year of survey

Age Group	Survey	Years	R	Sample size, N	N (weighted %)						
					Everyday	4-6 times/ week	1-3 times/ week	<1 time/ week	Never or rarely	Don't know	Missing
12-15yrs	SPANS	2004	C	1, 763	54 (2.5)	143 (7.8)	520 (28.2)	808 (47.6)	233 (13.8)	N/A	5 (0.1)
	SSHBS	2008	C	4, 834	92 (1.9)	325 (6.9)	3, 399 (70.4)	N/A	964 (19.7)	N/A	54 (1.2)
	NSW	2005-06	P	1, 207	3 (0.3)	7 (0.9)	478 (40.5)	499 (40.9)	200 (15.3)	5 (0.6)	15 (1.4)
	Child PHS	2007-08	P	1, 380	2 (0.2)	15 (1.2)	546 (39.6)	532 (39.2)	253 (16.6)	0 (0.0)	32 (3.1)

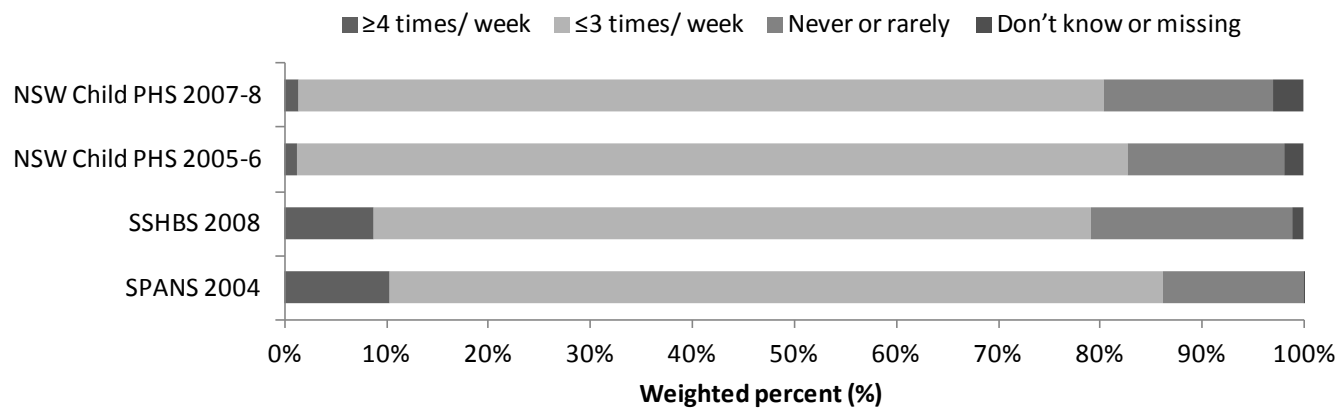


Figure 4.1.2 Estimates of common response categories for fast food frequency among 12-15 year olds , by survey and year of survey

Table 4.1.4 Estimates of common response categories for fast food frequency, by age group, survey and year of survey

Age Group	Survey	Years	R	Sample size, N	N (weighted %)							
					Everyday	5-6 times/ week	3-4 times/ week	1-2 times/ week	<1 time/ week	Never or rarely	Don't know	Missing
12-15yrs	SPANS	2010	C	3, 003	5 (0.2)	12 (0.3)	84 (3.1)	746 (25.0)	2, 133 (70.6)	N/A	N/A	23 (0.2)
	SSHBS	2008	C	4, 834	92 (1.9)	141 (2.9)	715 (15.0)	2, 868 (59.4)	N/A	964 (19.7)	N/A	54 (1.2)
	NSW	2005-06	P	1, 207	3 (0.3)	4 (0.6)	22 (2.1)	459 (38.7)	499 (40.9)	200 (15.3)	5 (0.6)	15 (1.4)
	Child PHS	2007-08	P	1, 380	2 (0.2)	4 (0.2)	35 (3.2)	522 (37.4)	532 (39.2)	253 (16.6)	0 (0.0)	32 (3.1)

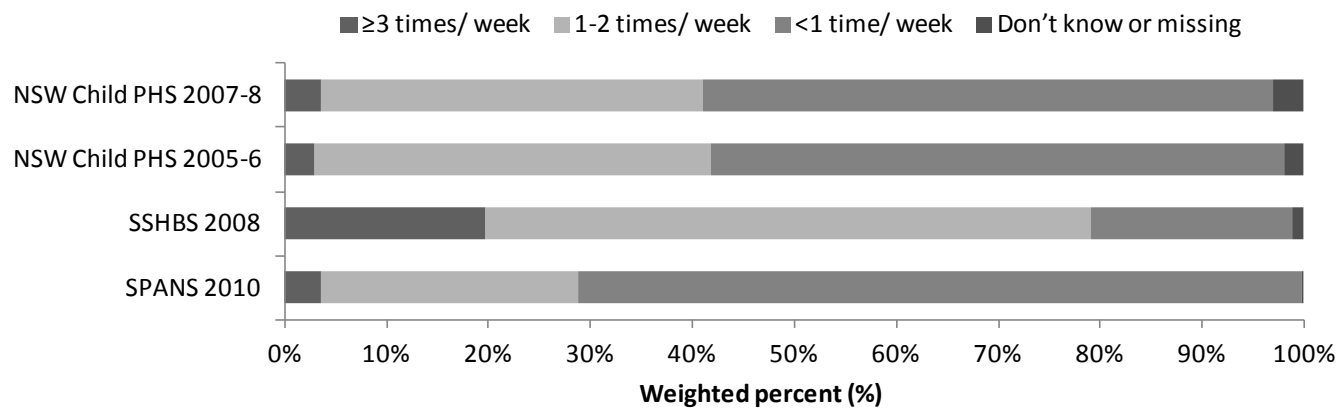


Figure 4.1.3 Estimates of common response categories for fast food frequency among 12-15 year olds , by survey and year of survey

FINDINGS – *Estimates for 'frequency of fast food'*

- Figure 4.1.1 and Table 4.1.2 illustrate that a higher proportion of 16-17 year olds reported eating fast-food two or more times per week, compared with 12-15 year olds (47% vs. 34% in 2002, 51% vs. 44% in 2008).
- These same data also indicate that the proportion of children reporting they consume fast-food two or more times per week increased from 2002 to 2008 (12-15 yrs: 34% vs. 44% and 16-17 yrs: 47% vs. 51%) (Figure 4.1.1 and Table 4.1.2).

FINDINGS – *Measurement of 'frequency of fast food'*

- As the SSHBS does not provide 'less than once per week' as a response option, this may have led to children reporting their consumption as '1-2 times per week', '1-3 times per week' or 'never or rarely'.

5 EXTRA FOODS

Extra foods are generally energy-dense and nutrient-poor foods that should be limited in children's diets, as they often contain large amounts of fat, saturated fat or salt. National and state-based nutrition and health surveys have asked about children's intake of hot fried potato

products, potato crisps and other salty snacks, and confectionery. The *Australian Guide to Healthy Eating* recommends that these foods are eaten sometimes, in small amounts, or not at all (12).

National and state-based nutrition and health surveys have asked about the amount and frequency of consuming hot fried potato products and about the frequency of consuming potato crisps and salty snacks, confectionery and other snacks (e.g. sweet and savoury biscuits, cakes, donuts, or muesli bars).

The only validation data available are for the question about the frequency of consuming fried potato products, "How often do you (does your child) eat hot chips, french fries, wedges or fried potatoes", where the frequency of actual intake from three-day weighed food records was shown to increase with higher frequency response categories (10).

Scope:

- Eating behaviours
- Non-alcoholic Beverages
- Fruit and vegetables
- Fast foods
- **Extra foods**

5.1 HOT FRIED POTATO PRODUCTS

Table 5.1.1 Comparability of measures for the frequency of consuming hot fried potato products, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NSW Child PHS	2001	5-10 yrs 12-15 yrs	P P	How many serves of hot chips or french fries does [child] usually eat in a day? (1 serve=1/2 cup hot chips or french fries)	Serves per day Serves per week Doesn't eat Less than once a week		
NSW Child PHS	2005-06	5-10 yrs 12-15 yrs	P P	How often does child eat hot chips, french fries, wedges or fried potatoes?	Times per day Times per week Times per month Rarely or never		
NSW Child PHS	2007-08	5-10 yrs 12-15 yrs	P P	How often does child usually eat hot fried potato products in a week?	Times per day Times per week Times per month Rarely or never	NSW Child PHS categories with either SPANS 2004 or SPANS 2010 categories	YES (P vs. C for some)
SPANS	2004	12-15 yrs	C	How often do you usually do the following? Eat hot chips, French fries, wedges, or fried potatoes?	Every day 4-6 times per week 1-3 times per week <1 week Never or rarely		
SPANS	2010	5-10 yrs 12-15 yrs	P C	How often do you usually do the following? Eat hot chips, french fries, wedges, or fried potatoes?	2 or more times per day 1 time per day 5-6 times per week 3-4 times per week 1-2 times per week Never or rarely		

Table 5.1.2 Estimates of common response categories for the frequency of consuming hot fried potato products, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)						
					Everyday ^a	5-6 per week	3-4 per week	1-2 per week	Never/rarely ^b	Don't know	Missing
5-10 yrs	NSW Child PHS	2001	P	4, 228	139 (3.6)	19 (0.5)	275 (7.4)	2, 418 (56.8)	1, 376 (31.6)	1 (0.0)	0 (0.0)
		2005-06	P	1, 588	12 (0.7)	9 (0.7)	70 (4.4)	659 (41.3)	837 (52.8)	1 (0.0)	0 (0.0)
	2007-08	P	1, 744	18 (1.1)	5 (0.2)	96 (5.4)	878 (49.3)	744 (43.7)	3 (0.3)	0 (0.0)	
	SPANS	2010	P	3, 914	142 (3.8)	40 (1.0)	266 (7.0)	1, 944 (50.6)	1, 281 (31.6)	N/A	241 (6.0)
12-15 yrs	NSW Child PHS	2005-06	P	1, 170	15 (1.5)	8 (0.8)	73 (6.7)	503 (43.1)	568 (47.6)	3 (0.3)	0 (0.0)
		2007-08	P	1, 333	22 (1.6)	11 (1.0)	100 (7.6)	673 (49.1)	519 (40.2)	8 (0.4)	0 (0.0)
	SPANS	2010	C	3, 003	85 (3.6)	33 (1.1)	270 (9.1)	1, 537 (51.9)	1, 059 (33.7)	N/A	19 (0.7)

^a For the SPANS 2010, this category is comprised of '2 or more times per day' and '1 time per day'

^b For the NSW Child PHS, this category includes those who reported less than once per week

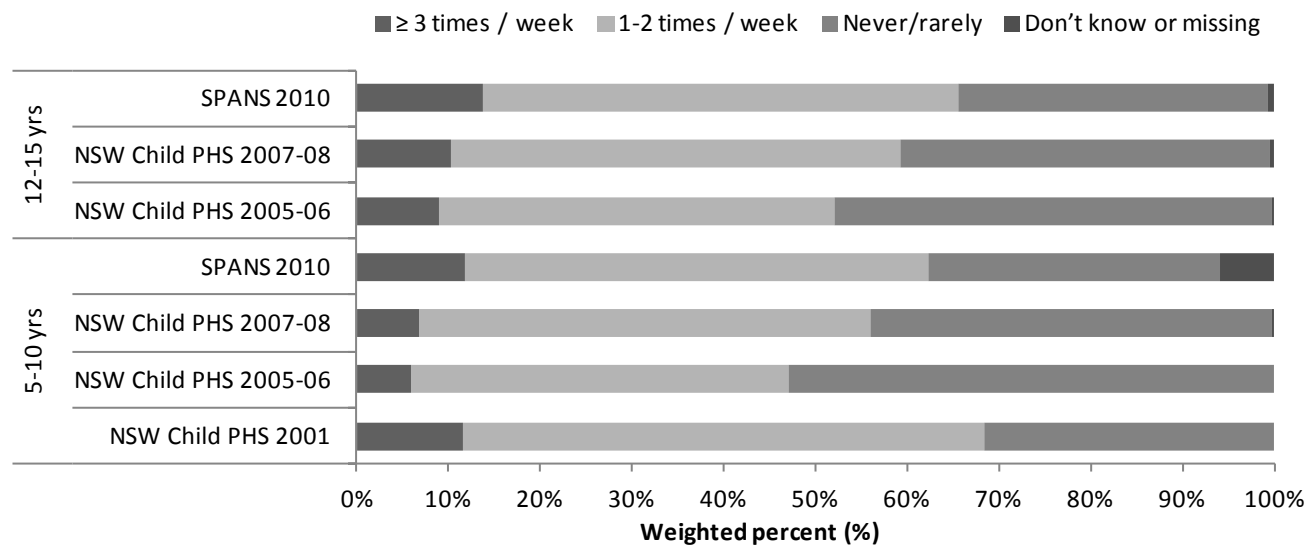


Figure 5.1.1 Estimates of common response categories for frequency of consuming hot fried potato products, by age group, survey and respondent

Table 5.1.3 Estimates of common response categories for the frequency of consuming hot fried potato products, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)						
					Everyday ^a	4-6 per week	1-3 per week	<1 per week	Never/rarely	Don't know	Missing
12-15 yrs	NSW Child	2005-06	P	1, 170	15 (1.5)	22 (1.9)	562 (48.6)	451 (38.0)	117 (9.6)	3 (0.3)	0 (0.0)
	PHS	2007-08	P	1, 333	22 (1.6)	28 (2.4)	756 (55.4)	330 (25.2)	189 (15.0)	8 (0.4)	0 (0.0)
	SPANS	2004	C	1, 763	36 (2.0)	137 (8.8)	629 (36.3)	749 (41.3)	201 (10.8)	N/A	11 (0.8)

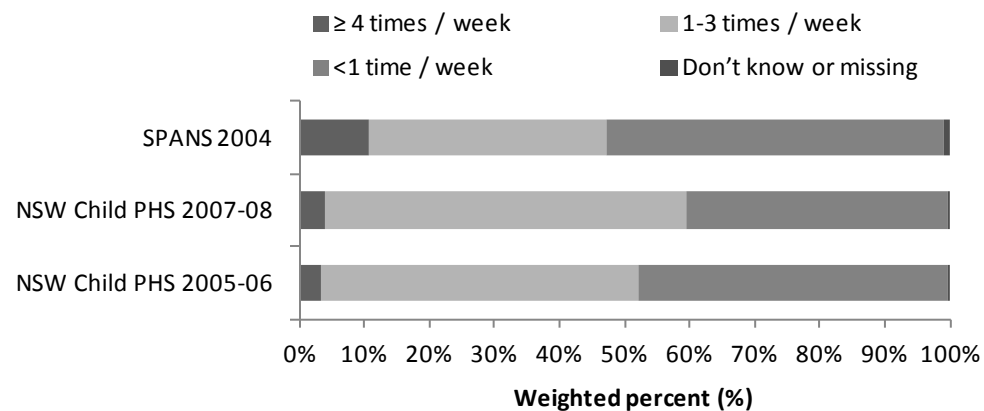


Figure 5.1.2 Estimates of common response categories for frequency of consuming hot fried potato products among 12-15 year olds, by survey and respondent

FINDINGS – *Estimates for 'hot fried potato products'*

- On average, less than one tenth (9.8%) of children aged 5-15 years (or parents on their behalf) reported consuming fried potato products three or more times per week (Figure 5.1.1 and Table 5.1.2).

FINDINGS – *Measurement of 'hot fried potato products'*

- Children reported a higher frequency of fast food consumption (and those reporting never or rarely is lower) in SPANS 2010 compared with parent reported data in the NSW Child PHS 2007-08 (Tables 5.1.2). This may be due to parents perceiving their child's intake as less frequent than their children do, social desirability bias, or related to the survey method, as in SPANS response categories are ordered in decreasing frequency, so that children may select a response in a higher frequency category before looking at all response options, while in the NSW Child PHS parents are simply asked to report the number of times per day/per week.

5.2 POTATO CRISPS AND SALTY SNACKS

Table 5.2.1 Comparability of measures for the frequency of consuming potato crisps and salty snacks, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
NNS	1995	12-15 yrs	C ^a	How often on average you consumed that food in the past 12 months <i>Potato chips, corn chips, Twisties, etc.</i>	Never/less than once a month 1-3 times per month Once per week 2-4 times per week 5-6 times per week Once per day 2-3 times per day 4-5 times per day ≥6 times per day	NNS 1995 vs. NSW Child PHS Never/less than once a month 1-3 times per month Once per week 2-4 times per week 5-6 times per week Once per day 2-3 times per day 4-5 times per day 6+ times per day	
NSW Child PHS	2005-06 2007-08	11-15 yrs	P	How often does child eat potato crisps or other salty snacks?	Times per day Times per week Times per month Rarely or never	NSW Child PHS vs. SPANS 2004 Every day 4-6 times/week 1-3 times/week <1 week Never or rarely	YES (P vs. C for some)
SPANS	2004	11-15 yrs	C	How often do you usually do the following? Eat potato chips or other salty snacks?	Every day 4-6 times/week 1-3 times/week <1 week Never or rarely		
SPANS	2010	5-10 yrs 11-15 yrs	P C	Please indicate how often you (your child) usually eat the following foods? Potato crisps or other salty snacks (such as Twisties or corn chips)?	2 or more times/day 1 time per day 5-6 times per week 3-4 times per week 1-2 times per week Never/rarely	NSW Child PHS vs. SPANS 2010 2 or more times per day 1 time per day 5-6 times per week 3-4 times per week 1-2 times per week Never/rarely	

^a Children aged 15 years were interviewed with their own consent and the permission of a parent or responsible adult. Parents or guardians who did not consent were interviewed on their child's behalf.

Table 5.2.2 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group (12 to 15 years), survey, and respondent

Age Group	Survey	Years	R	Sample size, N	Times per day N (weighted %)										
					≥6 per day	4-5 per day	2-3 per day	Once per day	5-6 per week	2-4 per week	Once per week	1-3 per month	Never or <1 per month	Don't know	Missing
12-15 yrs	NNS (NSW) ^a	1995	C	82	0 (0.0)	0 (0.0)	3 (4.7)	3 (4.3)	11 (10.9)	17 (17.4)	21 (24.3)	24 (35.0)	3 (3.3)	N/A	0 (0.0)
	NSW Child	2005-06	P	900	1 (0.0)	0 (0.0)	9 (0.8)	169 (18.5)	29 (2.9)	233 (25.4)	162 (18.3)	132 (15.9)	160 (17.4)	5 (0.7)	0 (0.0)
	PHS	2007-08	P	1, 334	2 (0.2)	3 (0.3)	9 (0.6)	226 (17.5)	42 (2.9)	350 (27.5)	252 (18.1)	204 (14.7)	233 (17.4)	11 (0.8)	2 (0.0)

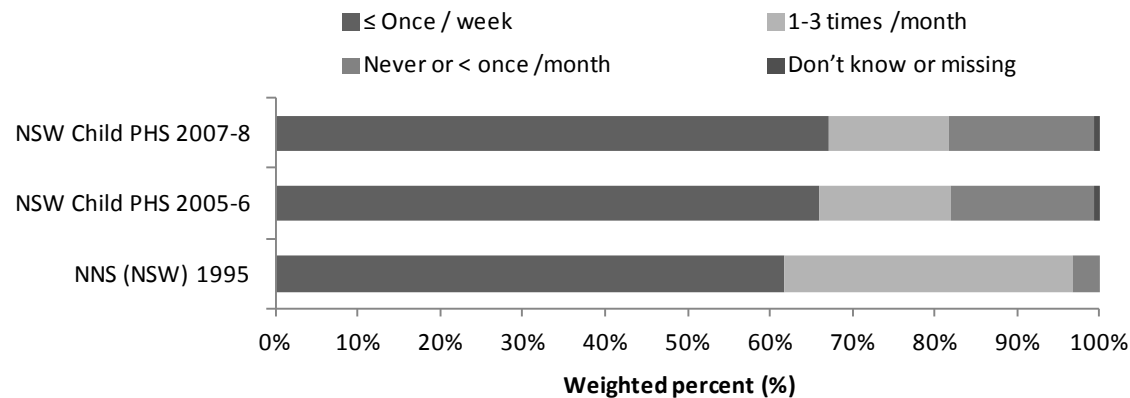


Figure 5.2.1 Estimates of common response categories for frequency of consuming potato crisps and salty snacks among 12-15 year olds, by survey and respondent

^a Data were from NSW respondents

Table 5.2.3 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)						
					Everyday	4-6 times/ week	1-3 times/ week	<1 time/ week	Never or rarely	Don't know	Missing
11-15 yrs	SPANS	2004	C	2, 524	199 (6.6)	321 (13.7)	829 (33.9)	840 (33.5)	289 (11.0)	N/A	46 (1.2)
	NSW	2005-06	P	1, 109	219 (19.2)	75 (6.9)	454 (40.8)	163 (15.2)	193 (17.3)	5 (0.6)	0 (0.0)
	Child PHS	2007-08	P	1, 678	308 (19.2)	109 (6.3)	710 (42.7)	264 (14.9)	273 (16.1)	12 (0.7)	2 (0.1)

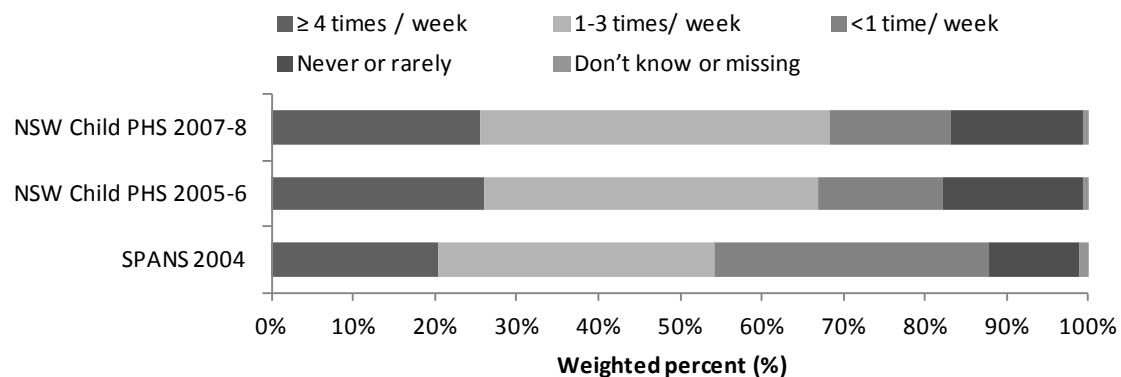


Figure 5.2.2 Estimates of common response categories for frequency of consuming potato crisps and salty snacks among 11-15 year olds, by survey and respondent

Table 5.2.4 Estimates of common response categories for the frequency of consuming potato crisps and salty snacks, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)							
					≥2 times /day	Once / day	5-6 times /week	3-4 times /week	1-2 times/ week	Never or rarely	Don't know	Missing
5-10 yrs	SPANS	2010	C	3,914	25 (0.6)	324 (8.8)	262 (7.1)	695 (18.2)	1,304 (33.2)	1,070 (26.4)	N/A	234 (5.8)
	NSW	2005-06	P	1,204	13 (1.2)	210 (17.1)	40 (3.9)	160 (13.5)	375 (31.3)	404 (32.8)	2 (0.2)	0 (0.0)
	Child PHS	2007-08	P	1,744	9 (0.4)	248 (13.6)	49 (2.5)	235 (12.8)	587 (34.2)	609 (35.9)	7 (0.5)	0 (0.0)
11-15 yrs	SPANS	2010	C	3,895	55 (2.1)	248 (7.0)	270 (7.2)	864 (24.2)	1,449 (36.5)	978 (22.3)	N/A	31 (0.7)
	NSW	2005-06	P	1,109	12 (0.9)	207 (18.3)	36 (3.1)	156 (14.0)	337 (30.6)	356 (32.5)	5 (0.6)	0 (0.0)
	Child PHS	2007-08	P	1,678	16 (1.0)	292 (18.2)	49 (2.7)	218 (13.6)	552 (32.7)	537 (31.0)	12 (0.7)	2 (0.1)

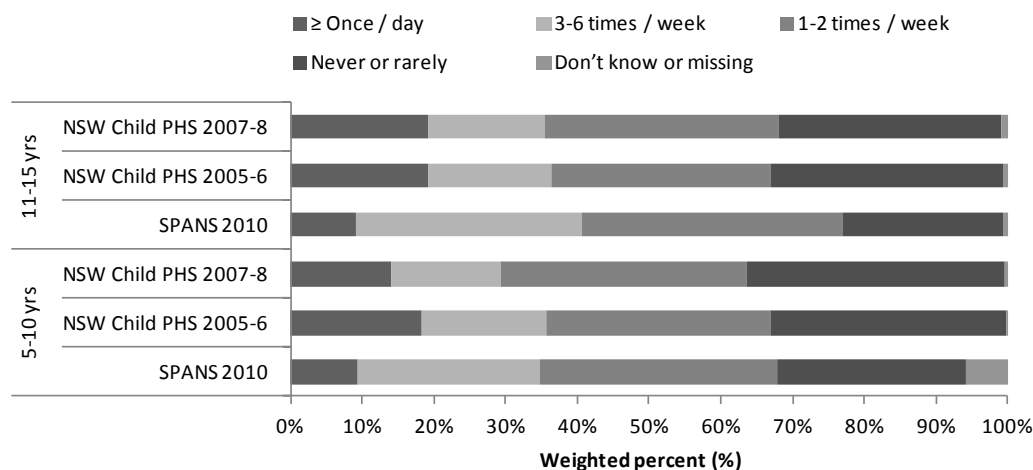


Figure 5.2.3 Estimates of common response categories for frequency of consuming potato crisps and salty snacks, by age group, survey and respondent

FINDINGS – *Estimates for 'potato crisps and salty snacks'*

- Less than a fifth of children reported consuming potato crisps or salty snacks one or more times per day, across all surveys (Figure 5.2.3 and Table 5.2.4).
- Comparing younger (5-10 years) and older (11-15 years) children's responses within the same surveys (Figure 5.2.3 and Table 5.2.4), there was little or no difference in the frequency of consumption of potato crisps or salty snacks.
- Between survey years (2005-06 to 2007-08) within the NSW Child PHS (Figure 5.2.3 and Table 5.2.4), for both age groups there were slight increases in the proportion of parents reporting their children consuming potato crisps or salty snacks only once or twice a week, while slightly fewer reported consuming these snacks 3-4 or 5-6 times a week.

FINDINGS – *Measurement of 'potato crisps and salty snacks'*

- Table 5.2.2 shows that in the NNS (NSW), the highest proportion of children reported to consume potato crisps or salty snacks 1-3 times per month was 35%. However, a larger proportion of parents reported their children's consumption as 'once per week', '2-4 times a week' or 'once per day' in the NSW Child PHS (2005-06 and 2007-08). This may be due to changes over time or the method of questioning, as the NSW Child PHS uses open responses in the following order: 'times per day', 'times per week', and 'times per month' which may lead more parents to respond in times per day, given this is the first response category offered.

5.3 CONFECTIONERY

Table 5.3.1 Comparability of measures for the frequency of consuming confectionery, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent (R)	Question	Response	Common	Comparability
SPANS	2004	11-15 yrs	C	How often do you usually eat confectionery (including chocolate, confectionary bars and lollies?)	Every day 4-6 times per week 1-3 times per week <1 times per week Never or rarely	NSW Child PHS vs. SPANS 2004 Every day 4-6 times per week 1-3 times per week	
SPANS	2010	5-10 11-15 yrs	P C	Please indicate how often your child/you usually eat confectionery, such as lollies and chocolate?	2 or more times/day 1 time per day 5-6 times per week 3-4 times per week 1-2 times per week Never/rarely	<1 week Never or rarely NSW Child PHS vs. SPANS 2010 2 or more times per day 1 time per day	YES (P vs. C for some)
NSW Child PHS	2007-08	11-15 yrs	P	How often does child usually eat confectionery including chocolate, confectionary bars and lollies in a week?	Times per day Times per week Times per month Rarely or never	5-6 times per week 3-4 times per week 1-2 times per week Never/rarely	

Table 5.3.2 Estimates of common response categories for the frequency of consuming confectionery, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)						
					Everyday	4-6 times/ week	1-3 times/ week	<1 time/ week	Never or rarely	Don't know	Missing
11-15 yrs	SPANS	2004	C	2, 524	265 (12.4)	381 (15.8)	883 (35.4)	754 (28.9)	194 (6.2)	N/A	47 (1.3)
	NSW Child PHS	2007-08	P	1, 723	274 (17.0)	113 (6.9)	938 (54.0)	160 (8.8)	212 (11.6)	25 (1.7)	1 (0.0)

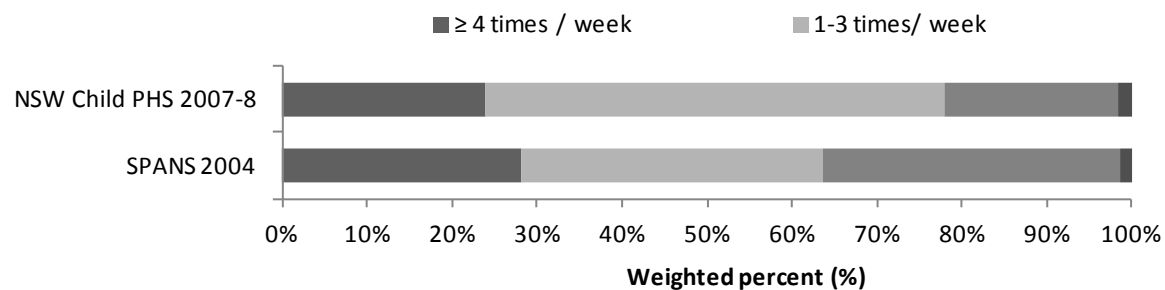


Figure 5.3.1 Estimates of common response categories for frequency of consuming confectionery among 11-15 year olds, by survey and respondent

Table 5.3.3 Estimates of common response categories for the frequency of consuming confectionery, by age group, survey and respondent

Age Group	Survey	Years	R	Sample size, N	N (weighted %)							
					≥2 times /day	Once / day	5-6 times /week	3-4 times /week	1-2 times/ week	Never or rarely	Don't know	Missing
5-10 yrs	SPANS	2010	C	3, 914	60 (1.7)	232 (6.3)	157 (4.2)	708 (18.9)	1, 748 (43.3)	767 (19.7)	N/A	242 (6.0)
	NSW Child PHS	2007-08	P	1, 772	15 (1.1)	241 (13.5)	32 (1.8)	317 (17.0)	814 (45.9)	343 (20.2)	10 (0.4)	0 (0.0)
11-15 yrs	SPANS	2010	C	3, 895	67 (1.8)	211 (5.6)	255 (6.6)	812 (22.7)	1, 685 (42.7)	814 (19.6)	N/A	51 (1.0)
	NSW Child PHS	2007-08	P	1, 723	26 (1.7)	248 (15.3)	39 (2.5)	277 (16.9)	735 (41.4)	372 (20.4)	25 (1.7)	1 (0.0)

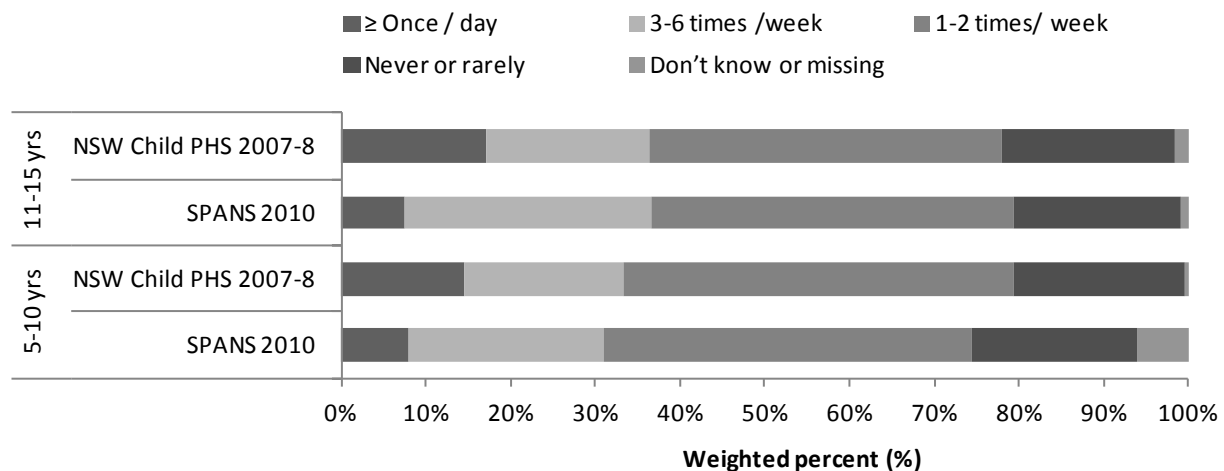


Figure 5.3.2 Estimates of common response categories for frequency of consuming confectionery , by age group, survey and respondent

FINDINGS – *Estimates for 'confectionery'*

- The majority of children (or parents on their behalf) reported consuming confectionery 1-2 times or 1-3 times per week, across all surveys (Tables 5.3.2, 5.3.3 and Figures 5.3.1, 5.3.2).
- Frequency of consumption of confectionery was similar across age groups within the same surveys (Table 5.3.3 and Figure 5.3.1).

FINDINGS – *Measurement of 'confectionery'*

- Comparing estimates from SPANS 2010 to the NSW Child PHS in Table 5.3.3, the proportion reporting having confectionery once per day is more than double. This may be due to the method of questioning, as the NSW Child PHS uses open responses 'times per day', 'times per week', and 'times per month' which may lead more parents to respond in times per day given this is the first response category offered, and they may also be more likely to say 'once a day' or 'once a week' for ease of response.

5.4 OTHER SNACKS

Table 5.4.1 Comparability of measures for the frequency of consuming other snacks, across surveys, age groups and respondents

Survey	Years	Age Groups	Respondent	Question	Response	Common	Comparability
SSHBS	2005	12-15 years 16-17 years	C C	How many times in the last week did you eat snacks like a chocolate bar, a piece of cake, a packet of chips/ Twisties/ corn chips, ice cream, 3-4 sweet biscuits?	Times last week		Non-comparable. The only two surveys to ask about the same type of foods as a snack (SSHBS 2008 and SPANS 2004) measure different reference periods (the previous week versus yesterday)
SSHBS	2008	12-15 years 16-17 years	C C	How many times in the last week did you eat snacks?	Times last week		
SPANS	2004	12-15 years	C	Thinking about yesterday, how many times did you have a snack between your main meals?	Not at all Once or twice 3-4 times 5-6 times 7-8 times More than 8 times	None	
SPANS	2010	12-15 years	C	How often your child/you usually eat snack foods, such as sweet and savoury biscuits, cakes, donuts, or muesli bars?	1 time per day 5-6 times per week 3-4 times per week 1-2 times per week Never/rarely		

CONCLUSIONS

This report provides a novel approach to presenting dietary indicators as measured by NSW population-based dietary surveys, by illustrating the range of estimates that may be obtained from different measures for the same dietary indicator. It also reports on trends over time (1995 to 2010) in some of the dietary indicators analysed.

For some of the dietary indicators, data were available from national nutrition surveys that have been collected using 24HR recall methods. A limitation to using the 24HR recall method is that it does not give a good indication of the usual frequency and amount of foods and drinks consumed. For example, using 24HR recall methods, a much higher proportion reported not consuming sugar sweetened drinks compared with short dietary questions. This is likely due to 24HR recall data only capturing one day of intake, during which an individual may not consume a specific food or drink despite consuming it regularly.

The dietary indicators included in this report were most frequently assessed using short dietary questions about the amount consumed or frequency of consuming selected foods or food groups. Short dietary questions provide a useful indication of the nutritional status of populations. However, they should only be used in between more detailed national nutrition surveys, as nutrition status and health are influenced by multiple dietary factors, rather than single foods or food groups. Also, most validation research used as the basis for short dietary questions for population monitoring has come from national data collected in 1995-96. Hence, there may be a need to re-check the validity of short questions currently used in routine food and nutrition monitoring, in order to reflect the eating patterns of contemporary populations.

There were only slight variations in the format of short dietary questions used to measure the same dietary indicator, e.g. 'How often do you usually have something to eat for breakfast?' versus 'How often do you usually have something for breakfast?' The method of questioning however varied from paper-based ('written') survey, to interviews in person or by computer assisted telephone interview (CATI). The use of the CATI survey method reduces missing responses and typographical errors common to written surveys (such as providing multiple responses). This is likely to be due to respondents feeling more compelled to answer questions, and to only provide one response, when questions are verbally posed to them by an interviewer.

This report found that the estimates for prevalence of various eating behaviours and food consumption indicators varied over time, across survey methods, by age group, and by parent versus child reported data. Determining which of these specific factors influenced the estimates however is not possible, as many factors affect people's responses and hence the subsequent prevalence estimates. A limitation to this report was the exclusion of National Health Survey data which was due to the data available for this survey being grouped into specific age categories that did not reflect those adopted to present estimates in this report. A further limitation was that breads and cereals, sweet and savoury biscuits, red meat and processed meats were excluded, due to few surveys reporting on these indicators and/or limitations to the comparability of these indicators.

Furthermore, attention to the content and format of response options used for short dietary questions is indicated, as this may influence the resulting estimates. For example, where respondents were asked to use a continuous scale, this often resulted in different estimates compared to categorical responses which limited the response options available to the respondent. Providing adequate response options that reflect the diets of contemporary populations and of the prevailing food supply is important, such as including full fat and reduced fat soy milks as well as other milks (almond, rice, oat, goats), in the type of milk response options.

The results of this report provide valuable information to guide the interpretation of NSW population dietary surveillance data, and help to inform future decisions around population nutrition monitoring among children and adolescents in NSW.

RELATED CITATIONS

Flood V, Webb, K, Rangan A. Recommendations for short questions to assess food consumption in children for NSW Health Surveys, 2005. Available at:

http://www.cphn.mmb.usyd.edu.au/pdfs/2005_short_questions_children.pdf

NSW Centre for Public Health Nutrition. Recommendations for food and nutrition monitoring in NSW, 2000. NSW Department of Health, State Publication No (HP) 000027. Available at:

http://www.health.nsw.gov.au/pubs/2000/pdf/recom_nutrition.pdf

REFERENCES

1. Utter J, Scragg R, Mhurchu CN, Schaaf D. At-home breakfast consumption among New Zealand children: associations with body mass index and related nutrition behaviors. *J Am Diet Assoc.* 2007;107(4):570-6.
2. Williams P. Breakfast and the diets of Australian children and adolescents: an analysis of data from the 1995 National Nutrition Survey. *Int J Food Sci Nutr.* 2007;58(3):201-16.
3. MacFarlane A, Cleland V, Crawford D, Campbell K, Timperio A. Longitudinal examination of the family food environment and weight status among children. *Int J Pediatr Obes.* 2009;4(4):343-52.
4. Feldman S, Eisenberg ME, Neumark-Sztainer D, Story M. Associations between watching TV during family meals and dietary intake among adolescents. *J Nutr Educ Behav.* 2007;39(5):257-63.
5. Liang T, Kuhle S, Veugelers PJ. Nutrition and body weights of Canadian children watching television and eating while watching television. *Pub Health Nutr.* 2009;12(12):2457-63.
6. Fitzpatrick E, Edmunds LS, Dennison BA. Positive effects of family dinner Are undone by television viewing. *J Am Diet Assoc.* 2007;107(4):666-71.
7. Kant AK, Graubard BI. Contributors of water intake in US children and adolescents: associations with dietary and meal characteristics: National Health and Nutrition Examination Survey 2005-2006. *Am J Clin Nutr.* 2010 August 4, 2010:ajcn.2010.29708.
8. Newman J, Taylor A. Effect of a means-end contingency on young children's food preferences. *Journal of Experimental Child Psychology.* [doi: DOI: 10.1016/0022-0965(92)90049-C]. 1992;53(2):200-16.
9. Rutishauser IHE, Webb K, Abraham B, Allsopp R. Evaluation of short dietary questions from the 1995 National Nutrition Survey: Australian Food and Nutrition Monitoring Unit 2001.
10. Riley M, Rutishauser IHE, Webb K. Comparison of short questions with weighed dietary records: Australian Food and Nutrition Monitoring Unit. 2001.
11. Economos CD, Sacheck JM, Kwan Ho Chui K, Irizzary L, Guillemont J, Collins JJ, et al. School-Based Behavioral Assessment Tools Are Reliable and Valid for Measurement of Fruit and Vegetable Intake, Physical Activity, and Television Viewing in Young Children. *Journal of the American Dietetic Association.* 2008;108(4):695-701.
12. Smith A, Kellett E, Schmerlaib Y. *Australian Guide to Healthy Eating.* Commonwealth Department of Health and Family Services. Commonwealth of Australia: Canberra, ACT, 1998.
13. National Health and Medical Research Council and the New Zealand Ministry of Health, 2006. Nutrient Reference Values for Australia and New Zealand Including Recommended Dietary Intakes. Commonwealth of Australia, Canberra, ACT.
14. Hector D, Rangan A, Louie J, Flood V, Gill T. Soft drinks, weight status and health: a review. A project for NSW Health. Cluster of Public Health Nutrition PRC, University of Sydney, NSW Health; 2009.

15. National Health and Medical Research Council. Food for health. Dietary guidelines for children and adolescents in Australia. Canberra, ACT: Commonwealth of Australia; 2003.
16. Flood V, Webb K, Rangan A. Recommendations for short questions to assess food consumption in children for the NSW Health Surveys. Sydney, NSW: NSW Centre for Public Health Nutrition; 2005.
17. Hu FB, Rimm EB, Stampfer MJ, Ascherio A, Spiegelman D, Willett W. Prospective study of major dietary patterns and risk of coronary heart disease in men. *Am J Clin Nutr* 2000;72(4):912-21.
18. Liu S, Manson JE, Lee IM, Cole SR, Hennekens CH, Willett WC. Fruit and vegetable intake and risk of cardiovascular disease: the Women's Health Study. *Am J Clin Nutr*. 2000;72(4):922-8.
19. World Cancer Research Fund / American Institute for Cancer Research. Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective. Washington DC: AICER; 2007.
20. MacFarlane A, Cleland V, Crawford D, Campbell K, Timperio A. Longitudinal examination of the family food environment and weight status among children. *Int J Pediatr Obes*. 2009;4(4):343-52.
21. Niemeier HM, Raynor HA, Lloyd-Richardson EE, Rogers ML, Wing RR. Fast food consumption and breakfast skipping: predictors of weight gain from adolescence to adulthood in a nationally representative sample. *J Adolesc Health*. 2006;39(6):842-9.

APPENDICIES

Appendix 1 General description of surveys

Survey	Age range	Sampling Frame	Sampling Technique	Mode of Administration	Years	Response Rate	Sample Size
NSW School Students Health Behaviours Survey (SSHBS)	12-17 years	Schools	Random, stratified 2-stage sampling. Representative of all students in years 7-12 across Australia.	Self-administered questionnaire to students	2002	23%	6,180
					2005	62%	5,522
					2008	62%	7,553
NSW Schools Physical Activity and Nutrition Survey (SPANS)	5-16 years	Schools	Random, stratified 2-stage sampling. Representative of all NSW students in Years K, 2, 4, 6, 8 and 10. Excluded special schools, schools with less than 180 enrolments and those in remote areas.	Questionnaire completed by caregiver for Year K, 2 and 4. Self-administered questionnaire to students in year 6, 8 and 10.	2004	78%	5,407
					2010	61%	8,058
National Nutrition Survey (NNS)	2-18 years	Child's home	Multi-stage area sample of private dwellings (houses, flats etc).	Home interviews conducted with adults, adolescents (15-17 years, with parental consent), and caregivers (on behalf of children aged 0-14 years). Interviews comprised a 24HR recall and additional food related questions, 10% provided a second 24HR recall. A FFQ was left with those aged 12+ years to complete themselves and return.	1995	65.5%	3,007

Survey	Age range	Sampling Frame	Sampling Technique	Mode of Administration	Years	Response Rate	Sample Size
Australian National Children's Nutrition and Physical Activity Survey (ANCNPAS)	2-16 years	Child's home	Random selection of 1 st by postcode and 2 nd of households (with a fixed line telephone) by random digit dialling. Not inclusive of children living in remote or Indigenous areas.	Computer-assisted personal interview conducted with persons aged 9+ years or caregiver (2-8 years). Interview included a 24HR recall and food habits questions. A second 24HR recall was provided by 97% of those interviewed, by computer-assisted telephone interview.	2007	40%	4,487
NSW Population Child Health Survey	0 -15 years	Child's home	Households with telephone line randomly selected by geographic area using random digital dialling.	Caregiver completed computer assisted telephone interview	2003-04	65%	7,679
					2005-06	58%	4,578
					2007-08	64%	5,171
NSW Population Adult Health Survey	16 + years	Child's home	Households with telephone line randomly selected by geographic area using random digital dialling.	Participant completed computer assisted telephone interview	2004	61.2%	11,830
					2006	59.3%	10,345
					2008	63.4%	12,485

Appendix 2 Age groups covered by the selected surveys and survey years

Survey	Year	Age groups				
		2-4 years	5-8 years	9-11 years	12-15 years	16-17 years
NNS (Main Survey)	1995	√	√	√	√	√
NNS (FFQ recall)					√	√
NSW Child PHS	2001	√	√	√		
	2003-04, 2005-06, 2007-8	√	√	√	√	
NSW Adult PHS	2004, 2006, 2008					√
ANCNPAS	2007	√	√	√	√	
SSHBS	2002, 2005, 2008				√	√
SPANS	2004, 2010		√	√	√	

NB: Ages of children responding to the Schools Physical Activity and Nutrition Survey (2004, 2010) and the School Students Health Behaviours survey (2002, 2005 and 2008) correspond to the ages of children enrolled in the specific school years sampled for these surveys.