women's health australia

the australian longitudinal
study on women's health

Adherence to health guidelines: *Findings from the Australian Longitudinal Study on Women's Health*

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Major Report G

Adherence to health guidelines: Findings from the Australian Longitudinal Study on Women's Health

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1. Executive Summary

This report uses data from the Australian Longitudinal Study on Women's Health (ALSWH) to assess adherence to national guidelines for preventive health behaviours and selected health screening.

Women were randomly selected from the Medicare database in 1995 and have been followed up regularly since 1996. Initially there were more than 40,000 participants in three cohorts, born in 1973-87, 1946-51 and 1921-26.

The guidelines used for this report are those disseminated by the National Health and Medical Research Council, the Royal Australian College of General Practitioners, and/or the Australian Government Department of Health and Ageing, based on the best available evidence at the time.

The main findings over the period 1996-2011 are summarised in Table 1-1.

Smoking

The data from the women in the study show that women are responding to quit smoking messages. While around half the women in the cohorts had smoked at some time, the predominant change since the study began is that women have quit smoking. While some of the younger women took up smoking over the course of the study, the majority of these women quit by 2009 so that overall the prevalence of smoking halved and the prevalence of ex-smoking doubled. However some groups of women, particularly those with lower educational status and those in rural areas, remain at higher risk of continuing to smoke. Around half the smokers in 1946-51 cohort quit smoking by the 6th survey. Smoking rates among women in the 1921-26 cohort remained stable between Survey 1 and Survey 2, but smokers had much poorer survival. Moreover, there were clear benefits of quitting in terms of improved survival among women in this age group with ex-smokers having lower death rates than smokers.

Overweight and obesity

The overall trend was for women to gain weight, and for fewer women to meet the guidelines for healthy weight at each survey. The greatest increases were seen among the women in the 1973-78 cohort. By Survey 5 in 2009, around 45% of this cohort were overweight or obese. Few women lost weight.

The 1946-51 cohort started the study with around 47% overweight. This proportion increased over time but with some levelling off in later years. In contrast, women in the oldest cohort showed little change in the proportion who were overweight or obese. However the interpretation of the results for these women needs to consider loss to follow-up due to illness or death. Importantly, women who had a BMI < 18.5 had the highest rate of mortality. Also, current evidence suggests that a slightly higher BMI (around 27) can be considered to be "healthy" for women in this age group.

Table 1-1 Summary of major findings of this report

Smoking guidelines	No-one should take up smoking and smokers should quit
Cohort	Prevalence of current smoking
1973-78	Decreased from 32% to 15%
1946-51	Decreased from 18% to 9%
1921-26	Only 8% at survey 1

Overweight and obesity	Healthy weight BMI<25 (kg/m^2)
Cohort	Prevalence of overweight and obesity
1973-78	Increased from 23% to 45%
1946-51	Increased from 47% to 62%
1921-26	Changed little, around 46% - percentage underweight increased

Alcohol consumption	No more than 2 drinks per day and 14 per week; no more than 4 drinks on any one occasion
Cohort	No more than 2 drinks per day
1973-78	Increased from 39% to 72%
1946-51	Increased from 81% to 87%
1921-26	More than 90% at survey 1

Adherence to the guideline for no more than 4 drinks on any one occasion also increased

Physical activity	30 mins of moderate activity on most days
Cohort	Change for Survey 2 to Survey 6
1973-78	Decreased from 47% to 44%
1946-51	Increased from 46% to 58%
1921-26	Decreased from 41% to 25%

Diet	Percentages of women meeting the guidelines for different food groups				
Cohort	Cereals 4-9	Vegetables >=5	Fruit>=2	Dairy>=2	Meat>=1
1973-78	2%	<1%	21%	14%	71%
1946-51	12%	2%	11%	45%	64%
1921-26*	N/A	8%*	70%*	N/A	N/A

*Different data collection method. Due to the times and methods for measuring diet in ALSWH few changes can be detected over time.

Screening health checks for 1946-51 cohort	
Blood pressure	>90%
Cholesterol	Increased from 60% to 83% since Survey 3
Mammography	Increased from 53% to 83% since Survey 1
Pap smear	Steady, around 80% since Survey 3
Bowel cancer	33% at Survey 6

Alcohol

Most women in the study did not exceed more than 14 alcoholic drinks per week and most had at least one alcohol free day. Adherence to the guideline to drink no more than two drinks per day was lowest in the youngest cohort, but increased over time in all cohorts. By the time the youngest women were 31-26 years old over 70% were adhering to this guideline. Likewise the percentage adhering to the recommendation to have no more than four drinks on any one occasion increased as the women moved from their 20s into their 30s. Analysis of change across surveys among these younger women shows a high degree of fluctuation in their alcohol intakes, with around 80% being non-adherent to the advice to drink no more than two drinks a day on at least one of the surveys, and 10% not adhering to this advice across all surveys. Other cohorts were more adherent with the guidelines overall and more consistent in their drinking behaviours.

Diet

A majority of women did not meet dietary guidelines for most food groups. The only exception was for intakes of meat, where guidelines were met by 71% of the 1973-78 cohort and 83% of the 1946-51 cohort. Guidelines for consumption of at least 5 serves of vegetables per day were least likely to be met.

A further area of poor adherence to dietary guidelines was in relation to consumption of "extras" in the diet. These are typically nutrient poor high-energy foods and Australians adults are recommended no more than four serves of these foods per day. However, only 10% of the 1973-78 cohort and 30% of the 1946-51 cohort were adherent with this guideline, with most women consuming more than four serves of these foods.

Physical activity

The proportions of women who met guidelines for adequate physical activity declined with each survey among the youngest and oldest cohorts, but increased among the women born 1946-51. Among the 1973-78 cohort, only 18% of women maintained adequate levels of physical activity at all surveys. Women were less likely to stay physically active once they married, had children, or were divorced. Among the 1946-51 cohort, there was a great fluctuation in adherence from survey to survey, but the overall trend was that women moved from inadequate to adequate levels of physical activity so that 57% per cent could be considered to be meeting the guidelines by Survey 6. This increase in activity was associated with changes in work and death of spouse, but a decrease was associated with birth of a grandchild. Activity levels decreased overall in the 1921-26 cohort so that by Survey 6 only 24% met the guideline. Factors associated with decreasing activity included major illness, injury or surgery, and moving into institutional care.

Pregnancy

The message about not smoking during pregnancy was adhered to by most women and adherence increased with women's age, with around 95% of pregnant women aged 31-36 years adhering to this guideline. In contrast, most women continued to consume alcohol while pregnant, even when guidelines for abstinence were in place. However, women who continued to drink while pregnant mostly adhered to the low alcohol guidelines that were in place in 2001.

Few pregnant women were adherent to the general guideline for physical activity, and the proportion of pregnant women who had adequate physical activity declined with age from 40% for 18-23 year olds to around 30% for women having pregnancies at later ages.

Diets of pregnant women were similar to those of other women in the 1973-78 cohort except pregnant women were more likely to meet guidelines for intake of dairy products. A detailed analysis of diet quality revealed that pregnant women's diets were often deficient in important nutrients including fibre, folate, Vitamin E, iodine and iron. There is also potential tension between guidelines to avoid foods that are at high risk of listeria contamination and achieving adequate nutrition.

Screening

There is very high adherence to recommendations for women to have blood pressure, cholesterol and blood sugar checks and for mammograms and Pap testing, with over 80% of women meeting guidelines for these checks. Bowel cancer screening and skin checks appear to be less well covered. However there are some inequities in the coverage of these checks including some small differences according to area of residence, and lower rates of screening among women in full-time work, those who are not married and according to level of education. Screening was strongly associated with more frequent attendance to a GP and with continuity of care and with receiving a reminder from the GP. Checks for cholesterol and blood sugar were more common among women with poor health and with chronic conditions including heart disease and diabetes. Women who smoke were less likely to have all screening procedures.

Conclusion

Among participants in the ALSWH, adherence to guidelines about smoking, alcohol consumption and most health screens has steadily improved or has remained high since the beginning of the study.

The areas in which there are substantial differences between guidelines and actual behaviour relate to energy balance. The prevalence of overweight and obesity has increased, around half the women do not report adequate physical activity and very few meet the dietary guidelines.

This finding brings into sharp focus the national importance of attaining healthy weight for the entire population, not just for children, and the challenges that are faced in changing diet and exercise levels.

2.   Introduction

2.1.   The Australian Longitudinal Study on Women's Health

This report uses data from the Australian Longitudinal Study on Women's Health (ALSWH) to assess women's adherence to national guidelines. The ALSWH is a longitudinal population-based survey funded by the Australian Government Department of Health and Ageing. The project began in 1996 and involves three large, nationally representative, cohorts of Australian women representing three generations:

- the 1973-1978 cohort, aged 18 to 23 years when first recruited in 1996 (N=14 247) and now aged 34 to 39 years in 2012
- the 1946-1951 cohort, aged 45 to 50 years in 1996 (N=13 716), now aged 61 to 66 years in 2012
- the 1921-1926 cohort, aged 70 to 75 years in 1996 (N=12 432), now aged 86 to 91 years in 2012.

The women have now been surveyed up to six times over the past 16 years, providing a large amount of data on their lifestyles, use of health services and health outcomes. The schedule of surveys is shown in Table 2-1 as well as the age in years and number of participants in each cohort.

Table 2-1 Schedule of surveys for the ALSWH, age in years and number of participants in each cohort

Survey	1973-78 cohort	1946-51 cohort	1921-26 cohort
Survey 1	1996 Age 18-23 N=14 247	1996 Age 45-50 N=13 715	1996 Age 70-75 N=12 432
Survey 2	2000 Age 22-27 N=9688	1998 Age 47-52 N=12 338	1999 Age 73-78 N=10 434
Survey 3	2003 Age 25-30 N=9081	2001 Age 50-55 N=11 226	2002 Age 76-81 N=8647
Survey 4	2006 Age 28-33 N=9145	2004 Age 53-58 N=10 905	2005 Age 79-84 N=7158
Survey 5	2009 Age 31-36 N= 8200	2007 Age 56-61 N=10 638	2008 Age 82-87 N=5561
Survey 6	2012 Age 34-39	2010 Age 59-64 N = 10 011	2011 Age 85-90 *N=4044
Survey 7	↓ 2015 Age 37-42	↓ 2013 Age 62-67	↓ 2014 Age 88-93

*Survey intake will be finalised in August 2012.

2.2. Preventive health goals

Much of the chronic disease burden in Australia is preventable through adherence to healthy behaviours and through secondary prevention via screening and early detection and management of chronic conditions (Australian Institute of Health and Welfare, 2008). As the population ages, the prevalence of these preventable chronic conditions is increasing, and the imperative for prevention is becoming ever more urgent. In Australia (National Preventative Health Taskforce, 2009) and internationally (World Health Organization, 2007) there is increasing emphasis on encouraging healthy behaviours and disease prevention as the major means to reduce chronic disease burden and health care costs. The following table illustrates the relationships between lifestyle risk factors and specific chronic diseases and conditions:

Table 2-2 The relationships between lifestyle risk factors and specific chronic diseases and conditions

Chronic disease/condition	Behavioural risk factors				Biomedical risk factors		
	Tobacco smoking	Physical inactivity	Alcohol misuse	Poor diet	Excess weight	High blood pressure	High blood cholesterol
Ischaemic heart disease	✓	✓	✓	✓	✓	✓	✓
Stroke	✓	✓	✓	✓	✓	✓	✓
Type 2 diabetes		✓	✓	✓	✓		
Kidney disease	✓				✓	✓	
Arthritis	✓*	✓*			✓**		
Osteoporosis	✓	✓	✓	✓			
Lung cancer	✓						
Colorectal cancer		✓	✓	✓	✓		
Chronic obstructive pulmonary disease	✓						
Asthma	✓						
Depression		✓	✓		✓		
Oral health	✓		✓	✓			

*Relates to rheumatoid arthritis; ** Relates to osteoarthritis*
Source: Australian Institute of Health and Welfare 2008. Indicators for chronic diseases and their determinants 2008. Canberra: AIHW

Key drivers of chronic disease include tobacco smoking, obesity, and excessive use of alcohol (National Preventative Health Taskforce, 2009). In Australia in 2003 these conditions accounted for 60% of disability adjusted life years (DALYs) with over 7% of the total burden being attributed to each of obesity and smoking, and more than 3% attributed to the harmful effects of alcohol (Australian Institute of Health and Welfare, 2008). Further, while the prevalence of smoking has reduced over past decades, the prevalence of obesity has rapidly risen, and there are trends towards increasing levels of harmful alcohol intake both over time and in younger generations.

These behaviours are key targets for Australia's health reform agenda, with goals to halt and reverse the rise in overweight and obesity; reduce the prevalence of daily smoking; and reduce the proportion of Australians who drink at levels which place them at short term or longer term harm. Underpinning these goals is also a national commitment to fairness with a desire to address

the uneven distribution in the Australian population of health risk behaviours, access to preventive services, and health outcomes according to socio-economic background, particularly for indigenous Australians (National Preventative Health Taskforce, 2009).

These goals and principles are also supported by a range of evidence-based preventive health guidelines. However many Australians do not adhere to these recommendations, and the high prevalence of unhealthy behaviours continues to contribute to serious preventable health burden.

2.3. Preventive health guidelines

2.3.1. The nature of guidelines, guideline development and principles

Preventive health guidelines provide recommendations to guide actions to deliver optimal health benefits. They may target the behaviours of community members, such as guidelines on physical activity, smoking, or alcohol intake; or they may recommend strategies for clinicians in the preventive care of their patients, such as screening or counselling. In principle, guidelines are based on best available evidence of risk and benefit at a population level, aiming to achieve overall improvement in population risk profiles for priority behaviours and conditions. They do not account for individual variations in risk and susceptibility. However some guidelines do include specific recommendations for population sub-groups defined by gender, age, or other factors. Groups of particular interest include pregnant and breastfeeding women who may have different needs and risks for either their own health or the health of their child.

In Australia, the main authority for preventive health guidelines is the National Health and Medical Research Council (NHMRC). NHMRC has a standard approach to establishing guidelines which ensures that recommendations are developed in an unbiased and systematic way, take account of the best available evidence and advice from experts, and are informed by public consultation and peer review prior to their approval and release. NHMRC has recently developed standards for developing guidelines, at http://www.nhmrc.gov.au/guidelines/information-guideline-developers

The Royal Australian College of General Practitioners follows a similar process in producing practice guidelines for use in Australia. Recommendations are based on current evidence, usually drawing on recommendations endorsed by the NHMRC. Where the NHMRC has not issued recent advice, other Australian sources are used, such as the National Heart Foundation of Australia, or guidelines are sourced from overseas bodies. RACGP recommendations are also tailored to be consistent with the current Medicare Benefits Schedule.

2.3.2. Changes to guidelines over time and across settings and countries

As new evidence becomes available guidelines necessarily undergo review and revision. Guidelines will also vary from country to country depending on judgements about risks and benefits, costs and acceptability. Changes to guidelines are common and can complicate the assessment of adherence over time.

2.3.3. Relevance to specific sub-groups

Gender is an important consideration in guideline development. Men and women are likely to have different exposures to behavioural risk factors and the strength of associations between risk and chronic disease can vary, with women being more vulnerable to some environmental exposures. Women also have more disability at older ages potentially complicating their ability to

adhere to some recommendations. The natural history, peak onset, and clinical manifestation of chronic illness can also vary between men and women, while other conditions are gender specific, such as gynaecological cancers, or have a significantly higher incidence among women (such as breast cancer). Given these differences, guidelines should always consider gender and whether specific recommendations are required for men and for women.

Specific guidelines are available for pregnant women and breastfeeding mothers. Pregnant women and their babies are potentially more vulnerable to harm than non-pregnant women. As a result numerous guidelines, ranging from the simple and consistent message, 'Do not smoke', to relatively complex messages about a healthy diet have been developed for pregnant women. The benefits of breastfeeding for both the mother and infant are well recognised and include helping the mother recover from child birth and improved immunity to infections and protection against obesity and chronic diseases later in life for infants (NHMRC, 2003; Gartner et al., 2005).

Specific guidelines for older people are less commonly available, but there is an acknowledged need for specific guidelines for this group (Kane et al., 2011; McLaughlin et al., 2011; Vitry & Zhang, 2008). Particular considerations include different levels of risk, benefit and harm, different health goals, age associated changes in physiological needs, and age (and gender) specific management goals for those with multiple chronic disease, disability and frailty. The development of guidelines for older people is hindered by a lack of evidence for risks and benefits of various preventive practices for older people. The values and preferences of older people themselves should also be considered (Butler et al., 2011).

2.3.4. Equity considerations

Many health risk behaviours follow a socio-economic gradient, with those with fewer financial and social resources being more likely to engage in unhealthy practices and to have poorer health. Likewise, this group of people often have poorer access to health care including preventive services. Preventive health guidelines and other health promotion approaches are also likely to be adhered to better by people who are socio-economically advantaged. A consequence of this effect is that preventive guidelines have the potential to increase health inequalities by improving the health of relatively healthier, more advantaged groups in the population more than the health of the relatively disadvantaged (Aldrich et al., 2003). Guidelines should therefore also consider evidence on the effect of socioeconomic position in terms of higher risk groups and barriers to guideline adherence (NHMRC, 2003).

2.4. Selection of guidelines for this report

This report assesses women's adherence to national preventive guidelines. We have focussed on those areas where there are evidence-based guidelines issued by NHMRC or RACGP that relate to women in the Australian Longitudinal Study on Women's Health (ALSWH) age groups. The health behaviours and actions to be covered in the report are described in sections 2.3.1 to 2.3.6 below.

2.4.1. Smoking

While there are no specific guidelines on tobacco smoking, the advice is clearly and simply not to smoke. The RACGP offers guidelines for health care professionals based on substantial evidence that advice from health professionals including doctors, nurses, pharmacists, psychologists, dentists, social workers and smoking cessation specialists helps smokers to quit (Carr & Ebbert, 2006; Rice & Stead, 2008; Sinclair et al., 2004; Stead et al. , 2008). There is also very strong evidence of tobacco related harm (Doll et al., 2004; US Department of Health and Human Services, 2010), and of the benefits of quitting.

The RACGP guidelines provide particular advice for special groups including pregnant and breastfeeding women, people with mental health problems, and those with pre-existing smoking related conditions. However, the same guidelines for quitting smoking apply to all groups, that is "every opportunity should be taken to offer all smokers advice and support to stop smoking" (RACGP 2004; 2011)

2.4.2. Alcohol

The *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* were published by the NHMRC in 2009 (National Health and Medical Research Council, 2009). These guidelines replace *Australian Alcohol Guidelines: Health Risks and Benefits* published in 2001. The new guidelines are based on estimates of the overall risk of alcohol-related harm over a lifetime, with the level of one death for every 100 people being considered acceptable risk in the context of present-day Australian society. Unlike earlier versions of recommendations for safe levels of alcohol, the new guidelines provide universal advice applicable to all healthy adults aged 18 years and over (regardless of age and gender), and specific guidance for children and young people, and for pregnant and breastfeeding women.

The general recommendation is that "for healthy men and women, drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury"; and "for healthy men and women, drinking no more than four standard drinks on a single occasion reduces the risk of alcohol-related injury arising from that occasion."

For women who are pregnant or planning a pregnancy, and those who are breastfeeding, it is advised that not drinking is the safest option.

2.4.3.Overweight and obesity

Since 2006 obesity has been identified as a national health priority area for Australia (RACGP National Standing Committee Quality Care, 2006). Two measures are recommended for assessing obesity. The first, and most commonly used, is the Body Mass Index (BMI), which is defined as weight (kilograms)/the square of height (metres). A BMI over 25 is considered overweight and BMI over 30 is considered obese (Barba et al., 2004). The second measure is waist circumference which is a better predictor of some health risks. The NHMRC publication *Overweight and Obesity in Adults: A Guide for General Practitioners* (released in 2003) notes that cut-off points for BMI and waist circumference may not apply to all population groups There is also acknowledgement that risk associated with greater weight decreases with age, and that higher BMI levels may be more appropriate for people aged over 65. The NHMRC 2003 Clinical Practice Guideline for the Management of Overweight and Obesity is currently being revised.

A position statement released by the Australian and New Zealand Society for Geriatric Medicine (ANZSGM) in 2011 advises that BMI classifications developed for younger adults should not be directly applied to older people (ANZSGM; Visvanathan, 2009). Based on evidence from a number of studies, including some using data from the ALSWH, ANZSGM identify the optimal BMI for life expectancy in older people to be in the range of 27-30 (Flicker et al., 2010). They also note the obesity paradox whereby older obese people with diseases such as hypertension, coronary artery disease, congestive cardiac failure and peripheral arterial disease have better health outcomes than their normal weight counterparts.

The RACGP recommend that BMI and adult waist circumference should be measured every 2 years for those patients who appear overweight, and that patients who are overweight or obese should be offered individual lifestyle education and skills training. A modest weight loss of 5–10% of starting body weight in adults who are overweight is advised.

2.4.4.Physical activity

Physical activity guidelines for Australians were developed from evidence on the benefits of physical activity for health and fitness and refer to the minimum level of physical activity required for good health and healthy body weight. The guidelines address evidence that inadequate physical activity is an independent risk factor for a range of diseases including heart disease, diabetes, osteoporosis, and obesity, and disease risk factors such as high cholesterol and hypertension, and advise that most individuals can gain health benefits by doing at least 30 minutes of moderate activity on most days, – this can be achieved by combining a few shorter sessions of activity of around 10 to 15 minutes each. A further principle underlying the guidelines is that population benefits in terms of reduction of health risks may be achieved by encouraging even small increases in physical activity among those who are least active (Egger et al., 1999).

2.4.5.Nutrition

The NHMRC produces *Australian Dietary Guidelines* based on the best available scientific evidence about dietary patterns and their effects on health and wellbeing, and to provide advice to reduce the risk of diet-related conditions, such as high cholesterol, high blood pressure and obesity, and the risk of chronic diseases such as type 2 diabetes, cardiovascular disease and some types of cancers. The NHMRC guidelines current at the time of preparing this report were the *Dietary Guidelines for All Australians* which were published in 2003. These guidelines refer to the *Australian Guide to Healthy Eating* (Smith et al., 1998) which is the national food selection guide that provides consumer information on recommended amounts and types of food that are essential for good health.

An update of the NHMRC guidelines is in progress. The new guidelines are expected to include more specific recommendations for males and females, different age groups and for women who are pregnant or breastfeeding.

Dietary guidelines for older Australians were published in 1999 and were rescinded in 2004. New guidelines for older people are expected to be released in 2012. The ANZSGM has released a position statement on under-nutrition in older persons which advocates screening for poor nutrition and nutritional support for those who are undernourished (Visvanathan, 2009).

2.4.6. Pregnancy and early motherhood

The NHMRC provide guidelines for safe levels of alcohol consumption for women who are pregnant or planning a pregnancy, and women who are breastfeeding. However guidelines have been inconsistent over the past few decades, with three different recommendations: for abstinence (1992), then for drinking less than 7 standard drinks a week and no more than 2 drinks on any one day (2001), and then reverting to abstinence (2009). Adherence with guidelines for abstinence and for low levels of drinking are both assessed in this report. The current NHMRC guidelines recommend that for women who are pregnant or planning a pregnancy, and those who are breastfeeding, not drinking is the safest option.

Nutrient Reference Values (NHMRC, 2006) which outline the levels of essential nutrients considered to be adequate to meet the known nutritional needs of practically all healthy people have been used to assess diet quality in pregnant women, along with the Australian Guide to Healthy Eating (Department of Health and Ageing, 1998). To assess physical activity, the guidelines for adults provided by the Department of Health and Ageing (2005) have been used, as there are no specific physical activity guidelines for pregnant women.

In 1995, the NHMRC released dietary guidelines for children stating 'Breastmilk provides all the nutritional needs of a full-term infant for the first four to six months of life and remains an important food for the first 12 months' (NHMRC, 1995). Australian guidelines for breastfeeding have changed from exclusive breastfeeding for 4-6 months in the 1990s to exclusive breastfeeding for the first six months in the 2000s, and to continue breastfeeding to 12 months and beyond, if both mother and infant wish (NHMRC, 2003).

2.4.7.Screening and health checks

The RACGP produce guidelines for preventive activities in general practice (the *Red Book*) which is a synthesis of evidence-based guidelines for screening and other preventive health services based on Australian and international sources. Principles underpinning these guidelines include an attempt to maximise the public health opportunities afforded by the large number and wide population coverage of general practice encounters. Recommendations for screening are also based on World Health Organisation and United Kingdom National Health Services guidelines for applying screening tests to apparently well individuals. These considerations include that the conditions to be screened for should be common and important, that the natural history should include an identifiable latent or early symptomatic stage, that the screening test should be simple, safe, acceptable, precise and valid, with known clinically relevant cut-offs, and that there should be effective and available treatment that leads to better outcomes for screen detected disease. Moreover, the costs (including screening, diagnosis and treatment of patients diagnosed) should be economically balanced in relation to overall health expenditure. Procedures recommended for women in ALSWH age groups include:

Table 2-3 Procedures recommended for women in ALSWH age groups

All cohorts		
	Blood pressure	Every 2 years (every 6-12 months if at risk)
	Skin cancer	Opportunistically
	Depression	Opportunistically
1973-78 cohort		
	Chlamydia	Opportunistically for sexually active women under 25 years of age
1946-51 cohort		
	Mammogram	Every 2 years from age 50
	Faecal occult blood test	Every 2 years from age 50
1921-26 cohort		
	Bone mineral density	Every 2 years
	Falls gait or balance	Every 12 months
	Vision and hearing	Every 12 months
1973-78 and 1946-51 cohorts		
	Pap test	Every 2 years (after becoming sexually active)
1946-51 and 1921-26 cohorts		
	Cholesterol	Every 5 years (every 1-2 years if at higher risk)
	Type 2 diabetes	Every 3 years
	Urinalysis	Every 5 years

2.5. Report structure

This report covers lifestyle risk factors of smoking (section 3.1), overweight and obesity (section 3.2), waist circumference (section 3.3), alcohol use (section 3.4), nutrition (section 3.5) and physical activity (section 3.6). For women in the 1973-78 cohort, the report also presents information on women's adherence to specific guidelines around pregnancy and breastfeeding (section 3.7).

The report also considers adherence with recommended scheduling of preventive screening procedures including Pap tests for cervical cancer, mammograms for breast cancer, blood pressure measurement and blood cholesterol tests for cardiovascular disease (section 4).

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3.   Behavioural Guidelines

3.1.   Smoking

3.1.1. Background

The harmful effects of tobacco smoking on health have been known for nearly 100 years. Public awareness of the hazards was heightened by Sir Richard Doll's study in 1950 linking smoking to lung cancer among British doctors and the US Surgeon General's Report in 1964 on Smoking and Health. Of all the risk factors for ill health, it has been estimated that tobacco smoking is responsible for the greatest burden, accounting for nearly 10% of the total burden of disease in 1996 (Begg et al., 2007)

Health guidelines in relation to smoking are simple: do not smoke. People who do not smoke should not take up this habit and for those who do smoke there are recommendations to help them quit. The National Tobacco Campaign 2011 "aims to contribute to a reduction in the prevalence of adult daily smoking from 16.6 per cent currently, to 10 per cent or less by 2018. To achieve this goal, several marketing activities combine to engage with current smokers to encourage them to make a quit attempt, support current quitters in making their quit attempt and help them reduce their chance of relapse" (http://www.anpha.gov.au/internet/anpha/publishing.nsf/Content/campaigns).

 To complement the National Tobacco Campaign, the Department of Health and Ageing funds and manages the More Targeted Approach campaign which aims to reduce smoking prevalence among high risk and hard to reach groups including pregnant women and their partners; people from culturally and linguistically diverse backgrounds; people living in socially disadvantaged areas; people with mental illness; and prisoners.

The Australian Government supports promoting good practice in tobacco control at a national level through research and policy development. In Australia, targeted smoking cessation programs are managed by state and territory governments who are also responsible for cessation support services in the general community, including Quitlines. Quitlines offer free confidential information, support and advice to help smokers achieve the goal of quitting. In addition, the policy strategies and legislative reforms by the Commonwealth, state and territory governments are a contributing factor to the reduction in smoking behaviour and smoking rates.

3.1.2. Data from the Australian Longitudinal Study on Women's Health

ALSWH data show that women are responding to these health messages with the predominant changes since the study began in 1996 being women who smoked quitting.

Figure 3-1 shows that more than 50% of women born in 1973-78 (aged 18-23 in 1996) and 1946-51 (aged 45-50) and over 60% of those born in 1921-26 (aged 70-75) report never having smoked (circles). This figure is based on data from all women who responded to each survey (see Tables 1A, 2A and 3A in Appendix A).

The prevalence of smoking (× signs in Figure 3-1) has dropped during the study in all cohorts. For the youngest women smoking prevalence dropped from 32% in 1996 when they were aged 18-23 to 15% in 2009 when they were aged 31-36. The corresponding drop among the 1946-51 cohort was from 18% in 1996 to 9% in 2010. For the cohort born in 1921-26 questions about smoking were only asked at Surveys 1 and 2 but there was still evidence of reductions in smoking prevalence.

The + signs in Figure 3-1 show the rise in prevalence of women who reported being ex-smokers illustrating that quitting is common, especially among the youngest women.
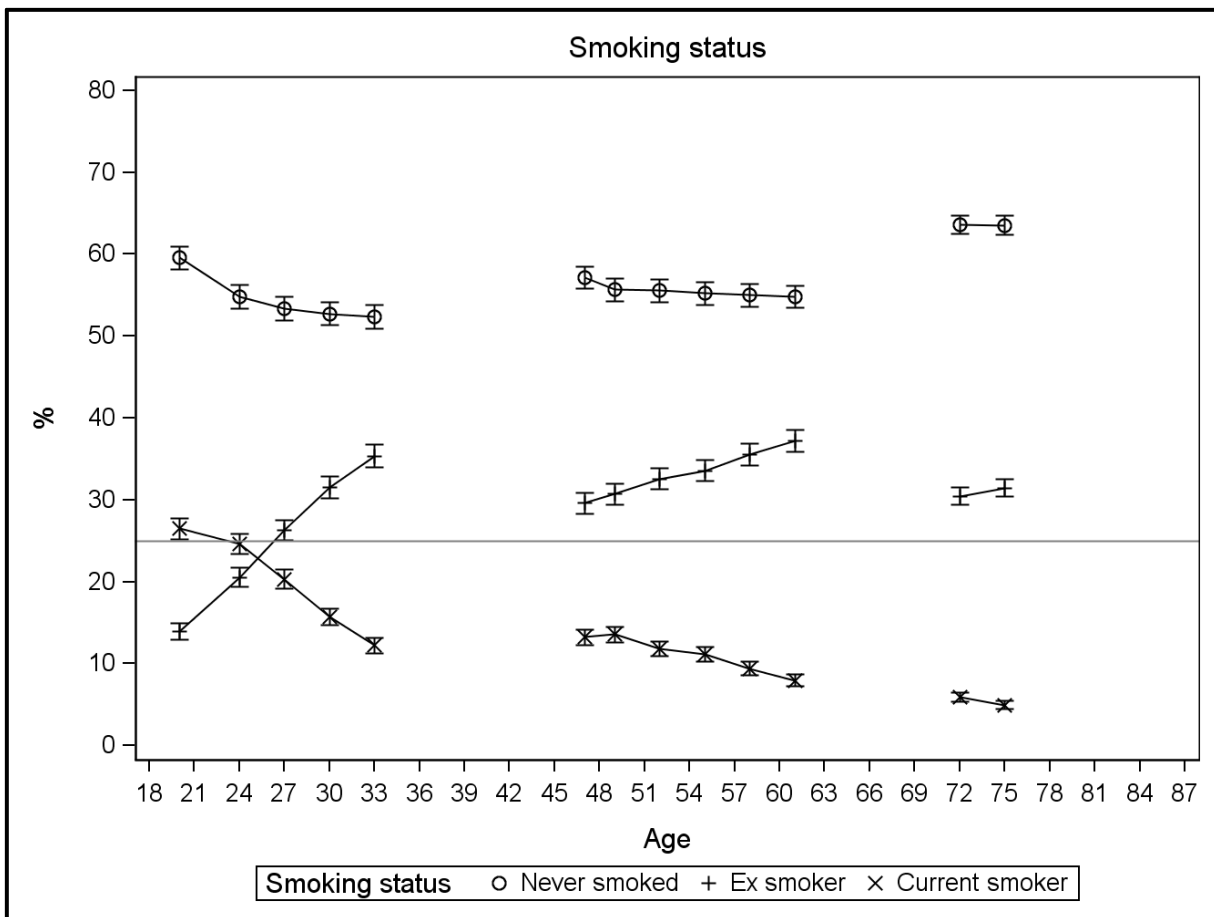
Note: The data for this table are in Appendix A Tables 1A, 2A and 3A and refer to all women who took part in each survey; the percentages (and 95% confidence intervals) are plotted against the average age of the cohort at the time of the survey

Figure 3-1 Percentages of women who reported never having smoked, being ex-smokers or being current smokers at each survey.

While Figure 3-1 summarises the main smoking patterns it does not show details of behaviour change over time. The data in Tables 1B, 2B and 3B in Appendix A show the patterns for those women who participated in every survey. Compared with women who did not participate in every survey (due to drop out or death) women who participated in every survey were more likely never to have smoked. Figure 3-2, Figure 3-3 and Figure 3-4 show that patterns of adoption and quitting smoking differ substantially between the cohorts.

For the youngest women (born in 1973-78), among those who participated in all surveys, at Survey 1 in 1996 26% reported currently smoking (purple bar), 15% were ex-smokers (mauve bar) and 59% had never smoked (green bar) – see Figure 3-2. During the first few years of the study some of these women took up smoking for the first time (those in the green bar moving to mauve or purple). The narrow lines indicating change from purple to mauve and back to purple show that some women took up smoking again after having reported quitting at the previous survey, and some of them subsequently quit again. However the general pattern was for quitting (shown by the increasing proportions of mauve). By Survey 5 smoking prevalence halved, from 26% to 13% and ex-smoking more than doubled (15% to 35%).
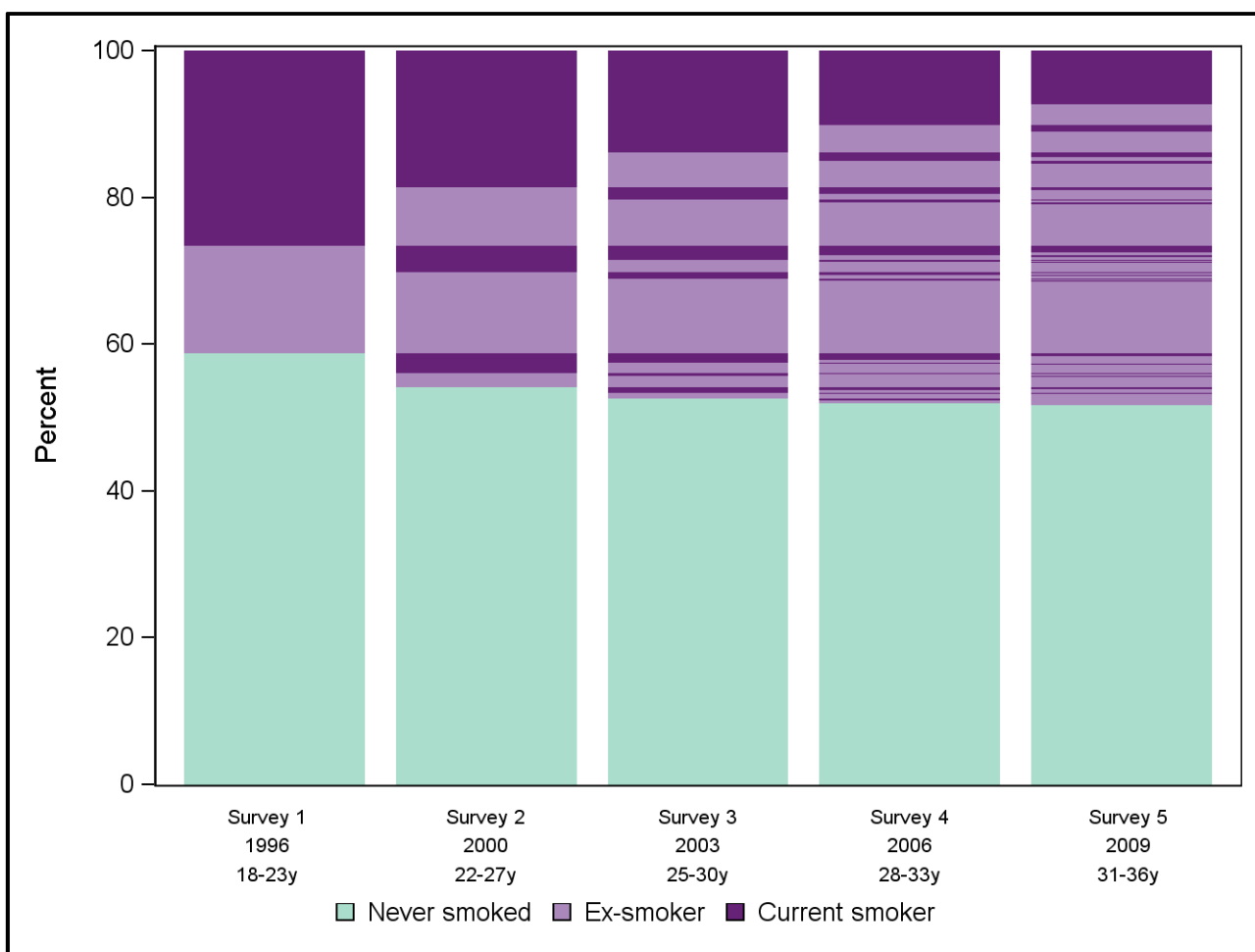
Note: The data for this table are in Appendix A Table 1B and refer to those women (N=5507) who took part in every survey

Figure 3-2 Percentages of women born in 1973-78 who reported never having smoked (green areas), being ex-smokers (mauve areas), or being current smokers (purple areas) at each survey.

We have conducted extensive research into smoking behaviour by the youngest cohort (McDermott et al., 2009). Marriage or being in a committed relationship was associated significantly with quitting, remaining an ex-smoker and not adopting smoking. Living in a rural or remote area and lower educational attainment were associated with continued smoking; moderate and high physical activity levels were associated positively with remaining an ex-smoker. Recent illicit drug use and risky or high-risk drinking predicted continued smoking, relapse and smoking adoption.

For women born in 1946-51, the pattern was dominated by quitting as the purple areas decreased and the mauve ones increased - see Figure 3-3. The prevalence of current smoking declined steadily from 14% to 8%.
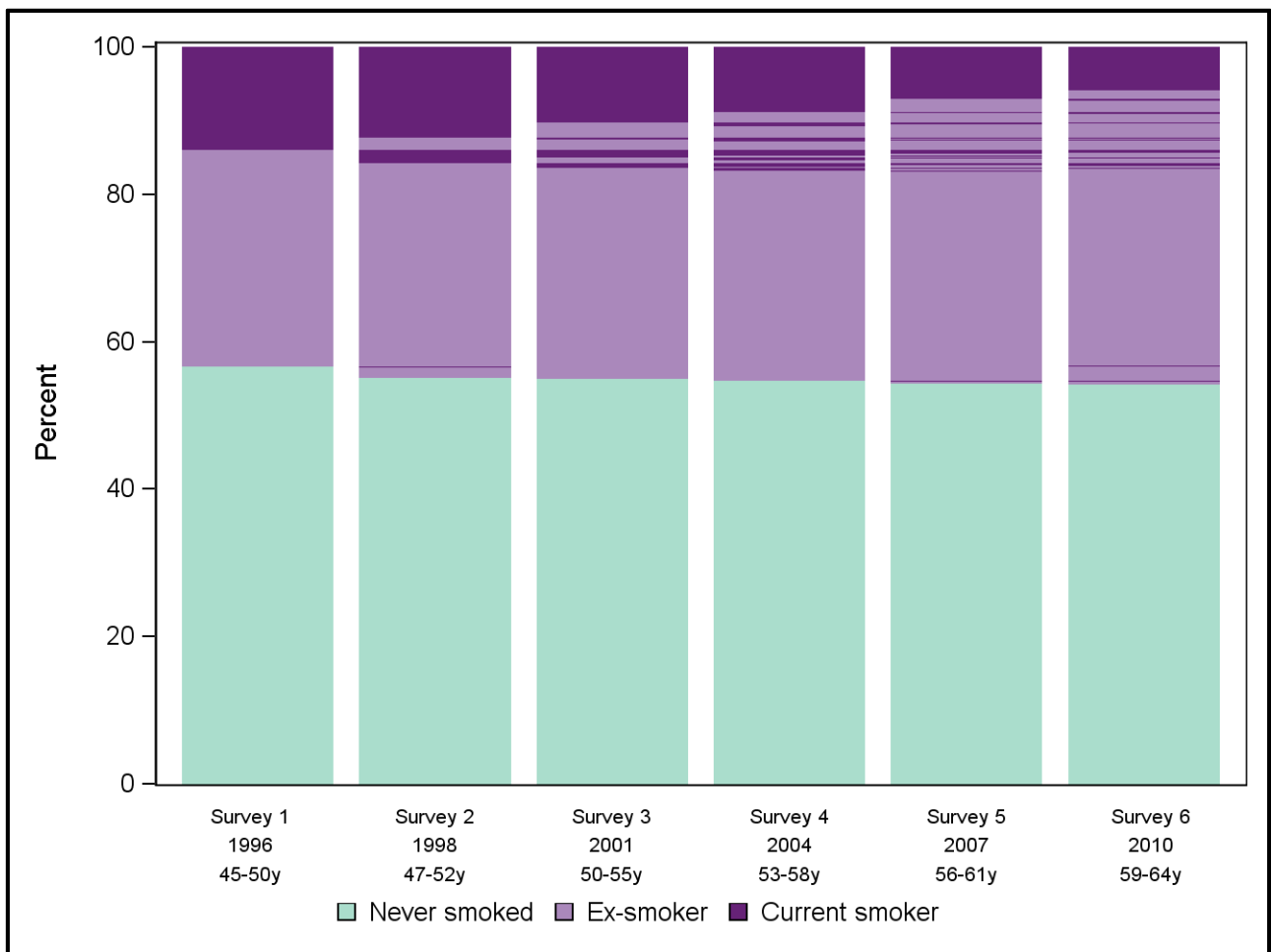
Note: The data for this table are in Appendix A Table 2B and refer to those women (N=7852) who took part in every survey.

Figure 3-3 Percentages of women born in 1946-51 who reported never having smoked (green areas), being ex-smokers (mauve areas), or being current smokers (purple areas) at each survey.

Among the older women, those born in 1921-26, at Survey 1 only 8% reported smoking while 30% reported being ex-smokers. At Survey 2 the numbers of smokers were similarly low and fairly stable – see Figure 3-4. For this reason women in this age group have not been asked about their smoking behaviour at any of the subsequent surveys. Almost two thirds of this cohort had never smoked.
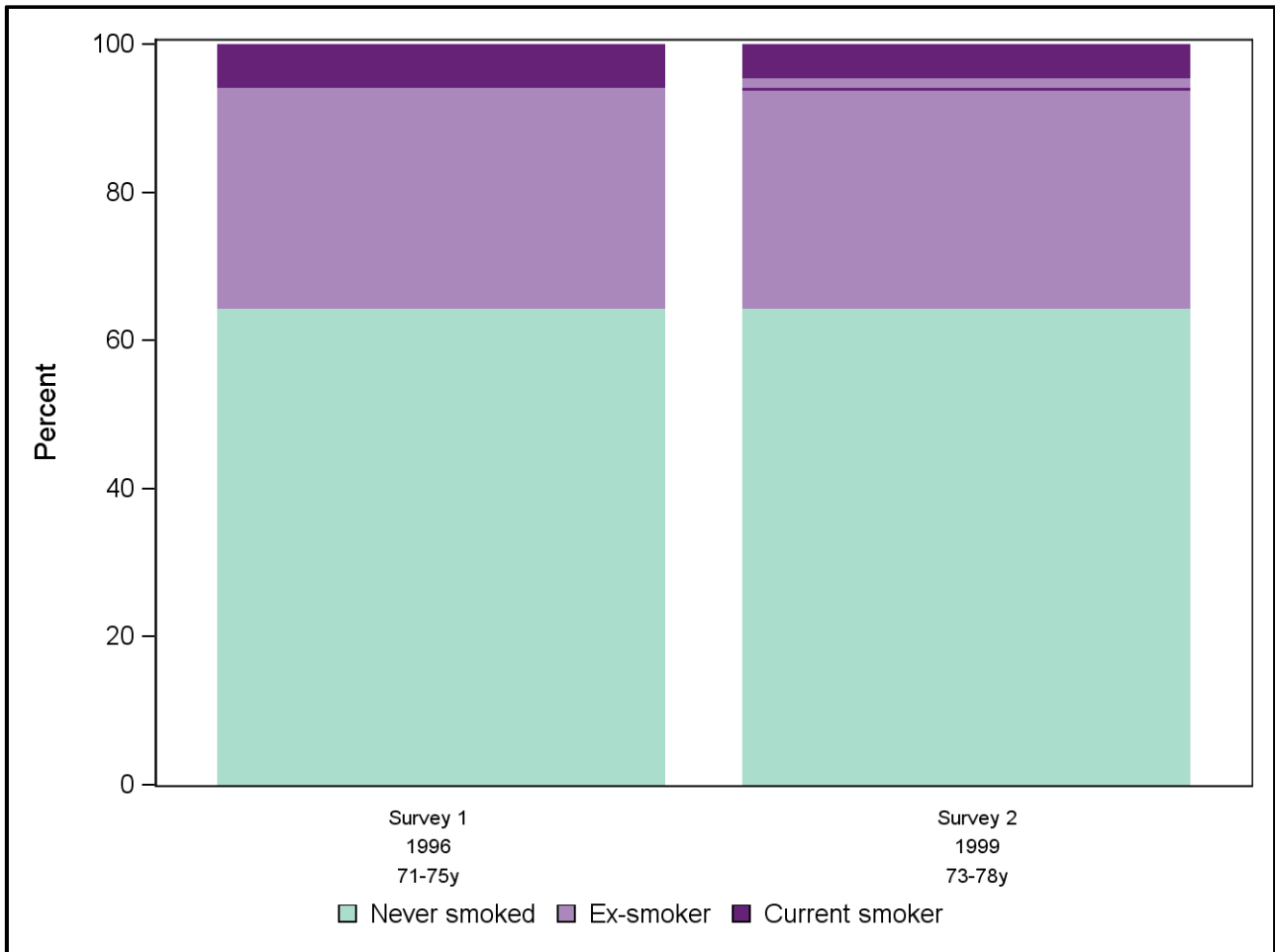
Note: The data for this table are in Appendix A Table 3B and refer to those women (N=9653) who took part in every survey.

Figure 3-4 Percentages of women born in 1921-26 who reported never having smoked (green areas), being ex-smokers (mauve areas), or being current smokers (purple areas) at each survey.

We have conducted detailed analyses of the survival of these older women, comparing them with men of the same age group (Jamrozik et al., 2011). We showed that while the death rates were generally lower among women than men, the effects of smoking were similar: those women whose smoking patterns (in terms of numbers of cigarettes smoked and years since quitting) were similar to men's experienced similar patterns of death overall and from a range of smoking related causes of death. Even in this cohort women who quit within the last 5 years had lower death rates than continuing smokers. So the importance of quitting is apparent even in old age.

3.1.3. Summary

The ALSWH data suggest that Australian women are on track to meet the national goal of less than 10% smoking by 2018. The mid-aged and older cohorts have already reached that level. In the younger cohort, while smoking prevalence was high when the women were first surveyed aged 18-23, and even after that age some took up smoking for the first time, prevalence of smoking has decreased rapidly and quitting rates (the proportion of those who have ever smoked but do not smoke now) increased from 30% to 70% by Survey 5 as their life-stages changed.

3.1.4. References

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3.2. Overweight and obesity

3.2.1. Background

The relationships between high body mass and generally poorer health are well established (National Preventative Health Taskforce, 2009). With an estimated contribution of 7.5%, overweight and obesity is the third most important risk factor for ill health in Australia, after smoking (10%) and high blood pressure (7.6%). High body mass accounts for more than half (55%) of the health loss attributable to type 2 diabetes, and almost one fifth (19.5%) of the health loss attributable to cardiovascular disease (Begg et al., 2008).

Guidelines for healthy body weight are based on *Body Mass Index* (BMI), which is defined as weight (kg)/ square of height (m), and classified according to the World Health Organization (2000) as follows:

Classification	BMI	Risk of co-morbidities
Underweight	<18.50	Low (but possibly increased risk of some medical conditions)
Normal range (Healthy Weight)	18.50 - 24.99	Average
Overweight	>25.00)	
Pre-obese	25.00 - 29.99	Increased
Obese class 1	30.00 - 34.99	Moderate
Obese class 2	35.00 - 39.99	Severe
Obese class 3	>40.00	Very severe

Based on: Obesity: Preventing and Managing the Global Epidemic, 2000, WHO, Geneva.

The Department of Health and Ageing suggests that "BMI is an acceptable approximation of total body fat at the population level and can be used to estimate the risk of diseases in most people." (Department of Health and Ageing, 2010).

It is important to note however, that the Department acknowledges that BMI does not distinguish between weight attributable to fat and that attributable to muscle, making BMI less useful as an indicator of risk in some highly trained athletes and body builders. BMI can also over-estimate the amount of body fat for pregnant women and under-estimate the amount of body fat for the elderly.

Even if BMI is normal, fat around the waist, which gives an indication of fat in and around the body's organs, can increase risk. Importantly, the Department has chosen to use waist circumference as an indicator of risk of chronic disease in the current Measure Up campaign.

Very few women in any of the three ALSWH cohorts were underweight. The exception was for Survey 1 of the 1973-78 cohort, when 10.2% of the young women had a BMI less than 18.5 (see Appendix Table 4A). Therefore, in this report, the cutpoints for BMI and waist circumference in Table 3-1 are used to define 'meeting guidelines', 'increased risk' and 'high risk'.

Table 3-1 Cut-points used to define 'meeting guidelines' and increased/high risk in this report

	BMI (kg/m^2)	Waist circumference (cm)
Meeting guidelines	<25 (Healthy weight)*	<80
Increased risk	25-29.99 (Overweight)	80-88
High risk	≥30 (Obese)	≥88

*Includes WHO underweight and normal weight categories

3.2.2. Data from the Australian Longitudinal Study on Women's Health

Questions about height and weight have been included in every survey to date. The BMI measure was validated with a sample of 159 women in the 1946-51 cohort in 2010 (Burton et al., 2010). Both self-reported height and weight tended to be underestimated, with a mean difference of 0.67cm (95% CI = 0.26 to 1.08) and 0.95kg (95% CI = 0.44 to 1.47) respectively. Women with a BMI of 18.5 - 24.99 reported weight more accurately (average underestimate = 0.21kg, 95% CI = -0.36 to 0.79) than obese women (2.48kg, 95% CI = 0.43 to 4.53). There was 84% agreement between BMI categories derived from self-report and measured data, with 85%, 73% and 94% of women correctly classified as obese, overweight, and healthy BMI using self-report data (kappa = 0.81). Changes in BMI in the three cohorts since Survey 1 in 1996 are shown in Figure 3-5.
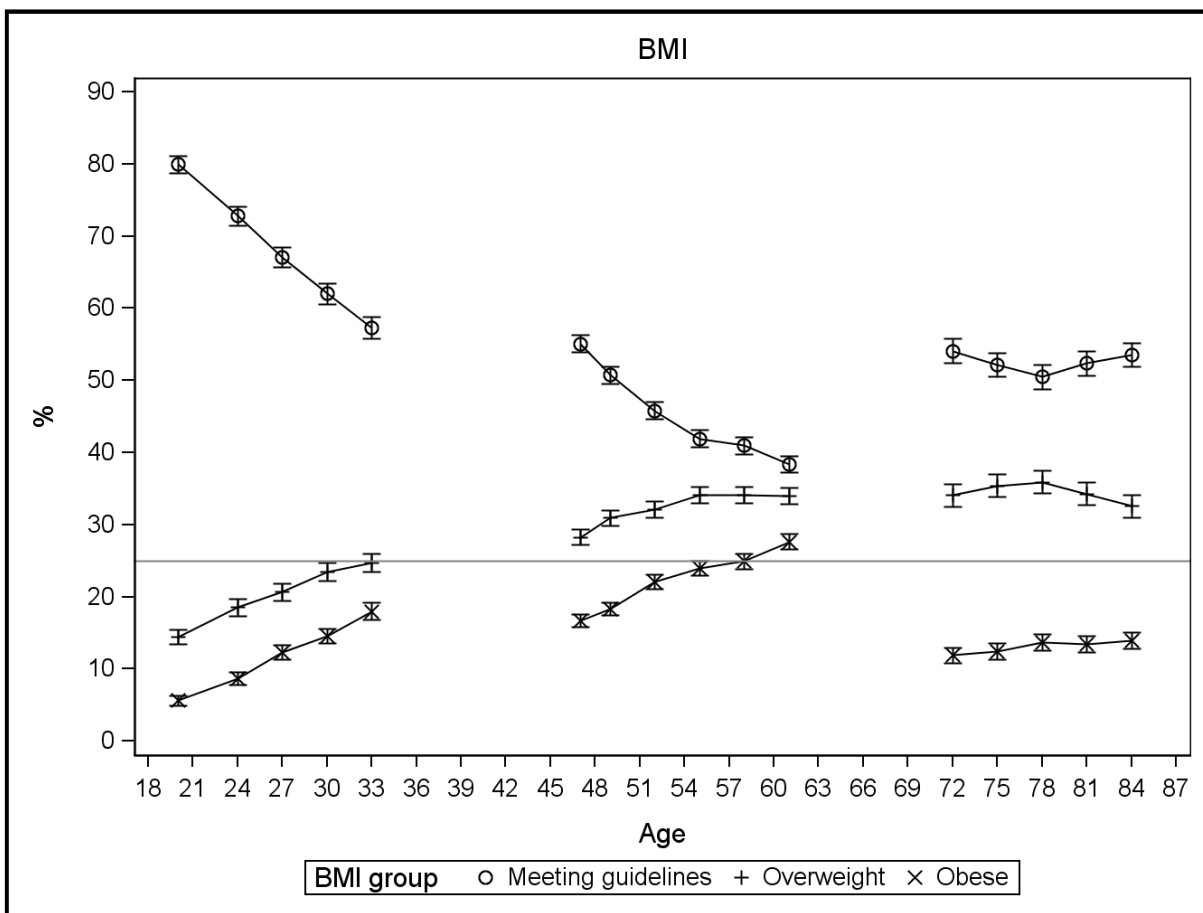
*1973-78 cohort: N = 14 247 (Survey 1), 9688 (Survey 2), 9081 (Survey 3), 9145 (Survey 4), 8200 (Survey 5). 1946-51 cohort: N = 13 715 (Survey 1), 12 338 (Survey 2), 11 226 (Survey 3), 10 905 (Survey 4), 10 638 (Survey 5), 10 011 (Survey 6). 1921-26 cohort: N = 12 432 (Survey 1), 10 434 (Survey 2), 8647 (Survey 3), 7158 (Survey 4), 5561 (Survey 5).

Figure 3-5 BMI for ALL women at each survey.

3.2.3. 1973-78 Cohort

At Survey 1, almost 80% of this cohort (N= 12 086) met the 'healthy weight' guideline (BMI <25); 68% had a BMI between 18.5 and 24.9 and 10% were 'underweight' (BMI <18.5; see Appendix A Table 4A). Just over 20% did not meet the healthy weight guideline: 15% were overweight and 6% were obese. The prevalence of 'meeting guidelines' decreased steadily over time, with corresponding increases in the prevalence of overweight and obesity. By Survey 5 in 2009, almost 45% of the women in this cohort were overweight or obese (see Appendix A Table 4B).

A paper published in 2010 showed that the average rate of weight gain in a subsample of 6458 women in this cohort was 0.93% of initial weight per year (or 605 [95% CI = 580 to 635]

grams/year for an average 65kg woman in 1996) in the ten year period from 1996 and 2006 (Brown et al., 2010). Partnered women who had given birth to one baby gained almost 4kg more, and those with a partner but no baby gained 1.8 kg more, than unpartnered childless women (after adjustment for other significant factors: initial BMI and age; physical activity, sitting time, energy intake (2003); education level, hours in paid work, and smoking).

Of the 4395 women who provided height and weight data at all five surveys, 80% had a BMI less than 25 at Survey 1 in 1996 (pale green bars in Figure 3-6 below), but only 50% maintained this healthy weight consistently at subsequent surveys. About 25% of the women moved from the healthy to the overweight or obese categories, while only 2% moved in the opposite direction over time.

About 15% of the women in this sample remained in the unhealthy category (light [overweight] and dark [obese] purple bars in Figure 3-6) across all five surveys to 2009.
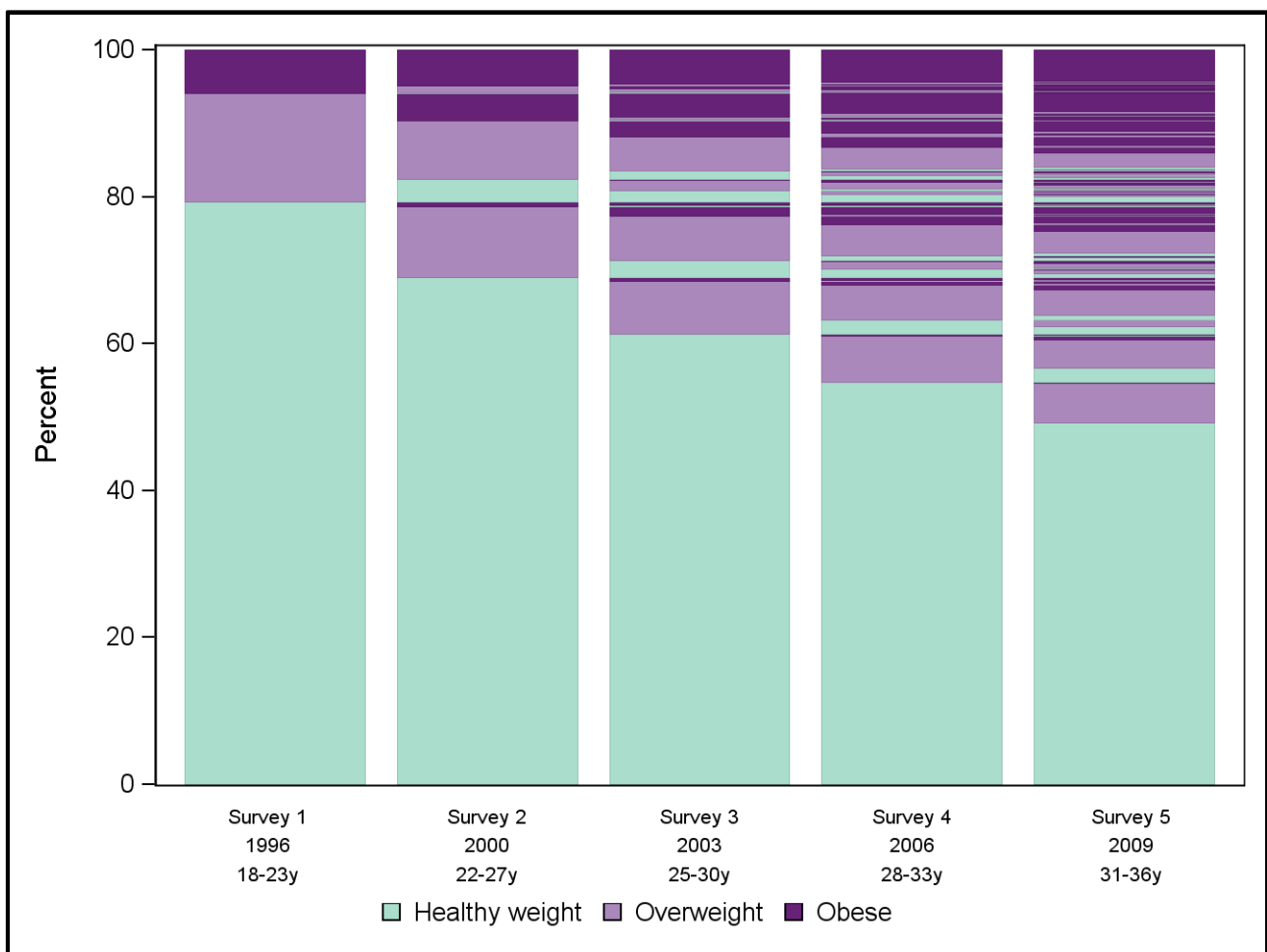
Figure 3-6 Changes in BMI from Survey 1 to Survey 5 for the 1973-78 cohort.

3.2.4. 1946-51 Cohort

At Survey 1 in 1996 just over half (53%, including 1.8% with BMI <18.5; N = 13 090) the mid-age women were 'meeting guidelines' (defined as BMI <25). By Survey 6, this proportion had decreased to 37%. During the 14 year follow-up period the prevalence of overweight increased from 29 to 34% and the prevalence of obesity increased from 18% to 28% (see Appendix A Table 5A).

A paper published in 2005 showed that the average rate of weight gain in a subsample of 8071 women in this cohort was almost 500g per year from 1996 to 2000 (Brown et al., 2005). Variables associated with energy balance (physical activity, sitting time, and energy intake), as well as quitting smoking and baseline BMI category were significantly associated with weight gain, but other behavioural and demographic characteristics were not. The authors estimated that the average weight gain equated with an energy imbalance of only about 10 kcal or 40 kJ per day, which suggests that small sustained changes in the modifiable behavioural variables could prevent further weight gain. This is in line with the messages being promoted in the current *Swap It* campaign (http://swapit.gov.au/).

Among the 6854 women in this cohort who reported their height and weight at all six surveys, the patterns of change in BMI indicate a steadily increasing proportion of women with BMI greater than 25 (indicated by increasing size of the light (overweight) and dark purple (obese) bars in Figure 3-7 below). Overall, about 30% of this cohort remained in the healthy weight category at all surveys (pale/green bars in below). Of those in the healthy weight category at baseline, over half (59%) became overweight and about 8% became obese over fourteen years. Similarly, under half (38%) of those in the overweight category moved into the obese category over time. Only very small proportions of women moved into a lower BMI category at subsequent surveys (see Figure 3-7).
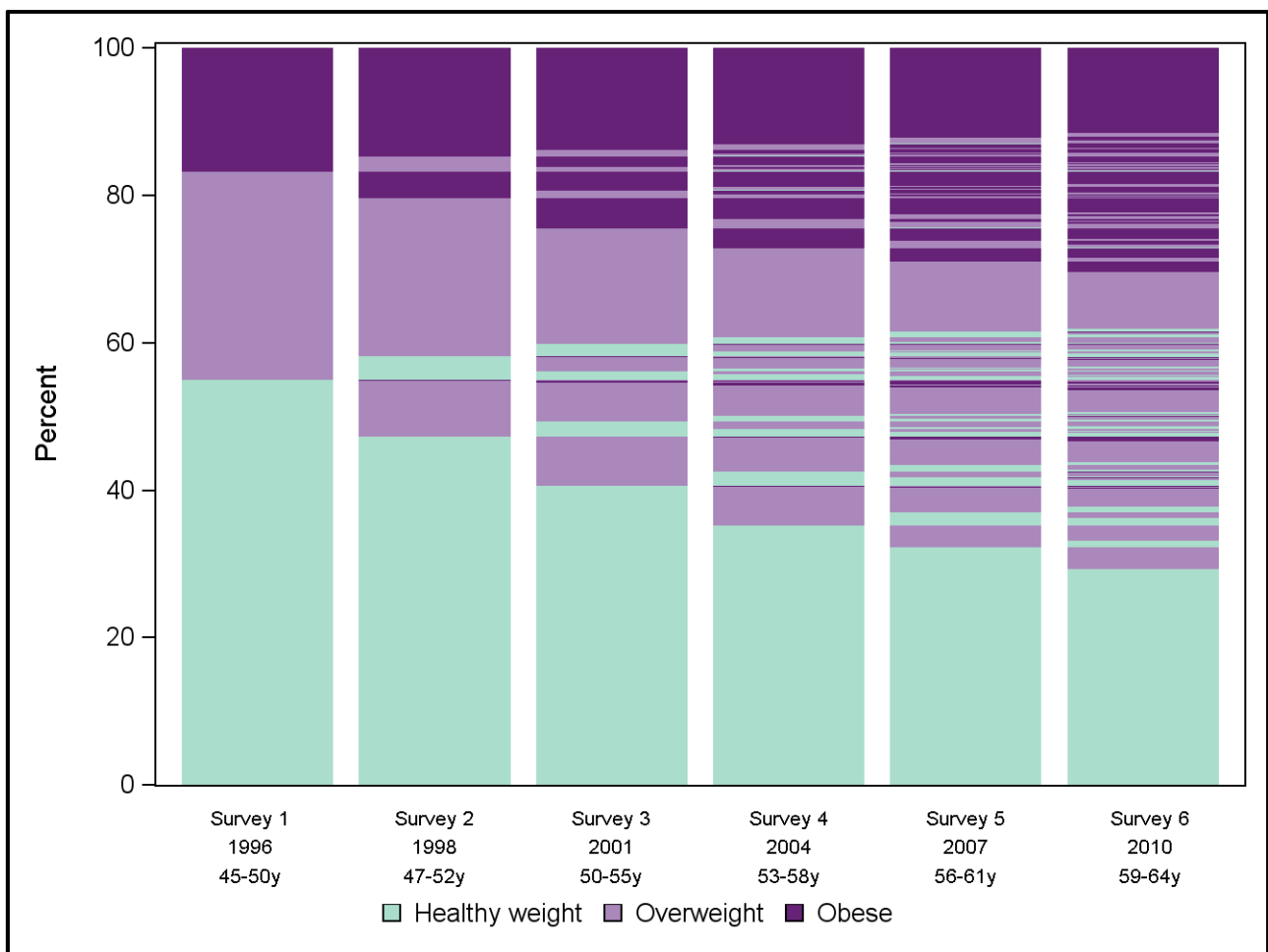
*N = 13 715 (Survey 1); 12 338 (Survey 2); 11 226 (Survey 3); 10 905 (Survey 4); 10 638 (Survey 5); 10 011 (Survey 6).

Figure 3-7 Changes in BMI from Survey 1 to Survey 6 for the 1946-51 cohort.

3.2.5.1921-26 Cohort

The pattern of change in BMI in the 1921-26 cohort contrasts with that of the other two cohorts (see Figure 3-5), but interpretation of the data is difficult because of the high numbers lost to follow-up due to illness or death. At Survey 1, more than half the women in this cohort (N= 11,119) met the 'healthy weight' guideline (BMI <25); 50.1% had a BMI between 18.5 and 24.9 and 3.3% were 'underweight' (BMI <18.5; see Table 5A in Appendix A). Hence just under half did not meet the healthy weight guideline (33.3% were overweight and 13.4% were obese; see Table 6A in Appendix A). The proportions of women in each category did not change markedly over five surveys to 2008.

Presentation of trends for this cohort is complicated by the fact more than one quarter died during the study period and about another quarter have stopped participating in the project. Risk of death was highest in the women with BMI less than 18.5 in 1996, while women who were overweight or obese were less likely to die or drop-out for other reasons (Brilleman et al., 2010). Indeed there is debate about the applicability of the WHO adult BMI categories for older people. Analyses of data from the older ALSWH cohort, and from a large cohort of older men in Western Australia, suggest that the optimal BMI for those over 70 years (in terms of both survival and chronic disease risk) is about 27   (Flicker et al., 2010; van Uffelen et al., 2010).
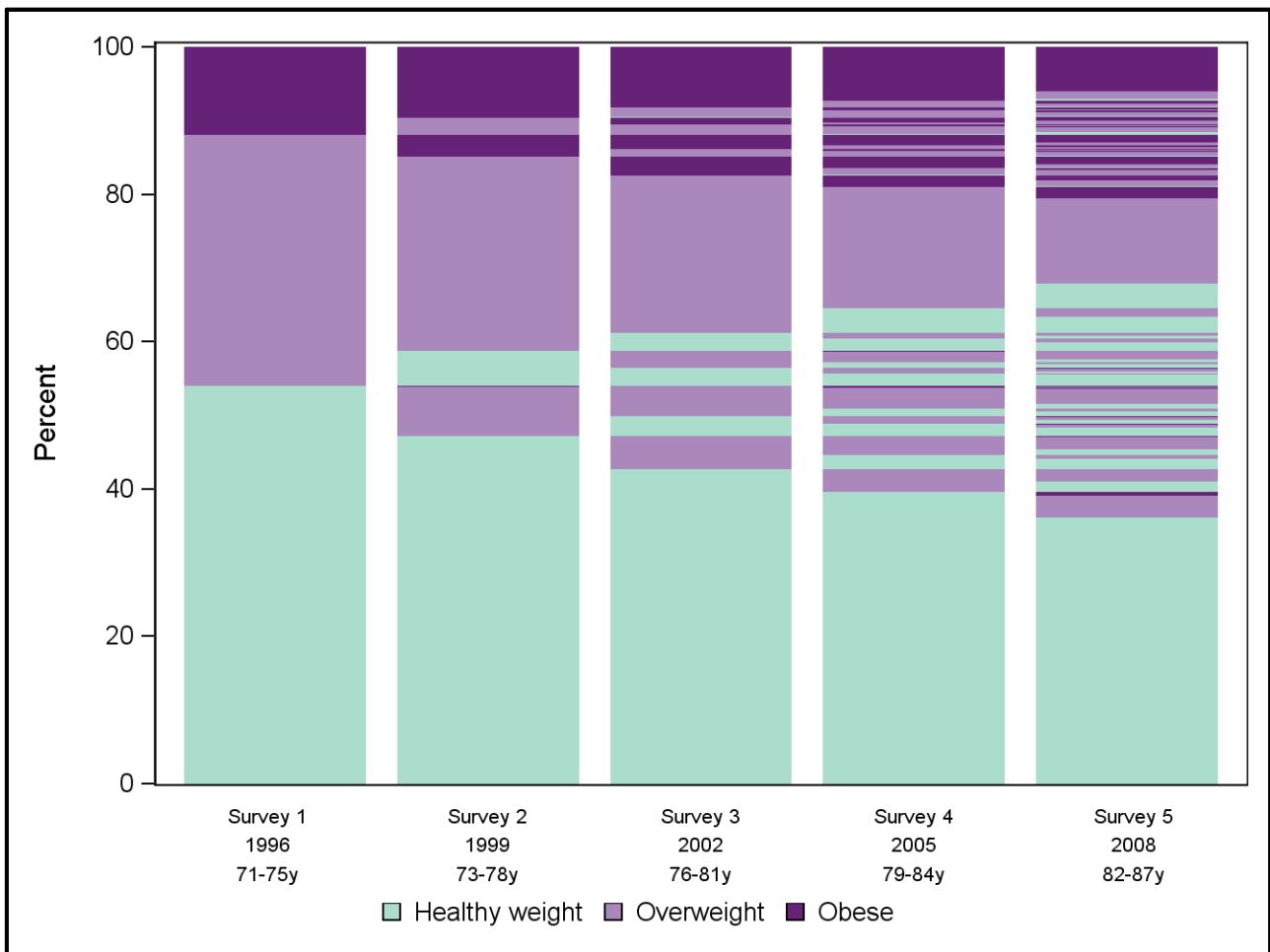
*N = 12 432 (Survey 1); 10 434 (Survey 2); 8647 (Survey 3); 7158 (Survey 4); 5561 (Survey 5).

Figure 3-8 Changes in BMI from Survey 1 to Survey 5 for the 1921-26 cohort.

The patterns of change in BMI in this older cohort show much less change across BMI categories over time than in the other two cohorts. Figure 3-8 includes data from the 3460 older women who provided height and weight data at every survey. Over five surveys, about half the women remained in the same BMI category (36% remained 'healthy weight' (BMI <25); 12% remained 'overweight' and 6% remained obese). Of the remainder, slightly more women gained weight and moved to a higher BMI category (17%) than lost weight and moved in the opposite direction (14%)
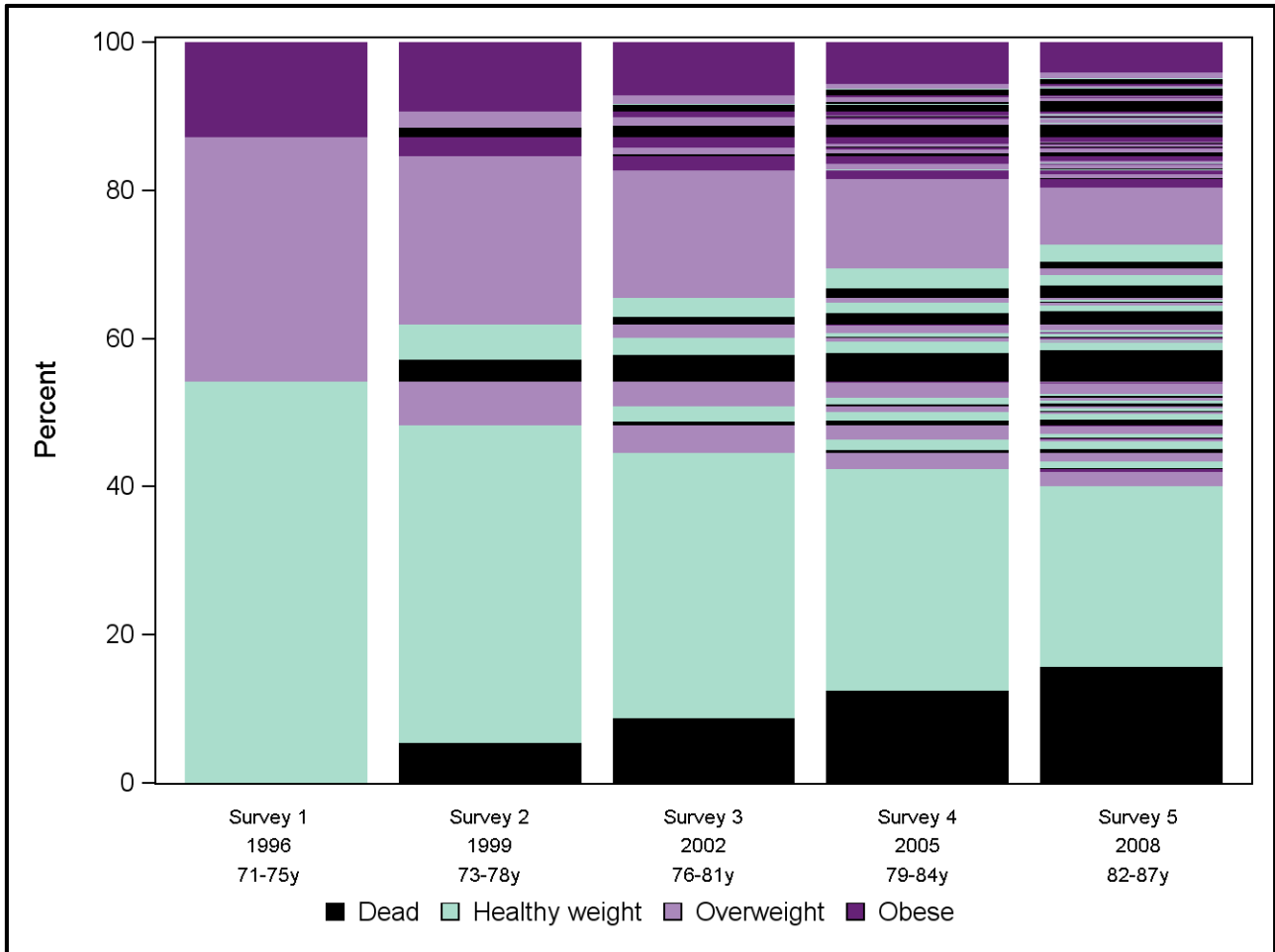
Figure 3-9 Changes in BMI from Survey 1 to Survey 5 for the 1921-26 cohort (including deaths).

3.2.6.Summary

In the 1993 and 1946-51 cohorts, the overall trend was for women's BMI to increase with age and over the course of the study. Few women lost weight. Consequently, the percentage of women who met the healthy weight guidelines was less at each survey. By Survey 5 in 2009, around 45% of the 1973-78 cohort (then aged 31-36 years) were overweight or obese. In comparison around 47% of the 1946-51 cohort were overweight or obese when these women were aged 45-50 at the start of the study. Around 62% of this cohort were overweight or obese at the time of Survey 6 in 2010 when these women were aged 59-64 years.

Women in the oldest cohort showed little change in the prevalence of overweight or obese. However interpretation of these data needs to consider loss to follow up due to illness or death, with women in the underweight category being more likely to have died. Other evidence suggests that a slightly higher BMI may be of benefit for these women.

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3.3. Waist circumference

3.3.1. Data from the Australian Longitudinal Study on Women's Health

Waist circumference (WC) data were collected in 2009 at Survey 5 of the 1973-78 cohort (N= 6269) and at Surveys 5 and 6 (2007 and 2010) of the 1946-51 cohort (N= 9454 and 10,373 respectively).

3.3.2. 1973-1978 cohort

At Survey 5 only one third of the younger cohort met the waist circumference guideline for women (<80cm), with 27% in the increased risk (80-88cm) category and 40% in the high risk (>88cm) category (N=8200).

Table 3-2 Waist circumference for women in the 1973-78 cohort at Survey 5

Waist Circumference	N	%
Less than 80 cm	2121	33
80 - 88 cm	1664	27
More than 88 cm	2484	40

Data on waist circumference and BMI are shown in Table 3-3 below. Most (93%) of the women in the underweight category based on BMI (<18.5) had WC less than 80cm. For women in the healthy BMI range (18.5<25), about half had WC less than 80cm, another third had WC of 80 to 88cm and the remainder had WC greater than 88cm. Similarly for women in the BMI range of 25-30 there was a wide range of WC. Only in the obese category (BMI >=30) were most women (92%) also in the high risk WC range (>=88). The high percentages of women categorised as 'acceptable' weight and 'overweight' according to BMI criteria, but classified as being at increased or high risk according to WC criteria may cause confusion among the public (although data from the 1946-51 cohort shown later in the chapter illustrate the value of both measures).

Table 3-3 Waist circumference and BMI in the 1973-78 cohort at Survey 5

Waist circumference	Underweight (BMI < 18.5)	Acceptable weight (BMI between 18.5 and 24.99)	Overweight (BMI between 25 and 29.99)	Obese (BMI > 30)
	N = 167	N = 3271	N = 1523	N = 1158
Less than 80cm (Recommended)	155 (93%)	1741 (53%)	162 (11%)	22 (2%)
80 – 88 cm (Increased risk)	8 (5%)	1081 (33%)	457 (30%)	74 (6%)
More than 88 cm (High risk)	4 (2%)	449 (14%)	904 (59%)	1062 (92%)

3.3.3.1946-51 cohort

Fewer than one quarter of the women in this cohort who provided WC measurements met the WC guideline (<80cm) at Survey 5 (23%, total N=9454) and Survey 6 (20%, total N=10,373). About one quarter were in the increased risk category and more than half were in the high risk category (53% in 2007 (Survey 5) and 56% in 2010 (Survey 6)). (Data shown in Table 3-4).

Table 3-4 Waist circumference for women in the 1946-51 cohort at Survey 5 and Survey 6

Waist Circumference	Survey 5		Survey 6	
	N	%	N	%
Less than 80 cm	2177	23	2074	20
80 - 88 cm	2272	24	2498	24
More than 88 cm	5005	53	5801	56

Data on the relationship between WC and BMI at Survey 5 are shown in Table 3-5 below. These data show that, of women in the underweight BMI range (<18.5) 86% had a WC less than 80cm, and of women in the healthy BMI range, 48% had a WC in the recommended range, 34% had WC in the increased risk range, and 18% had WC in the high risk range. Among those in the overweight and obese categories only 8% and 2% respectively had WC in the recommended range, with most of these women having WC in the high risk range (>88cm). These relationships were similar at Survey 6 (see Appendix A Table 7A).

Table 3-5 Waist circumference and BMI for women in the 1946-51 cohort at Survey 5

Waist circumference	Underweight (BMI < 18.5)	Acceptable weight (BMI between 18.5 and 24.99)	Overweight (BMI between 25 and 29.99)	Obese (BMI > 30)
	N = 111	N = 3683	N = 3182	N = 2334
Less than 80cm (Recommended)	96 (86%)	1751 (48%)	264 (8%)	44 (2%)
80 – 88 cm (Increased risk)	10 (9%)	1268 (34%)	882 (28%)	85 (4%)
More than 88 cm (High risk)	5 (5%)	664 (18%)	2036 64%)	2205 (94%)

Figure 3-10 (below) shows changes in WC between Survey 5 and Survey 6 in women who provided their WC measurement at both surveys (N=7889) and suggests that about one third of the women who met the WC recommendation at Survey 5 had moved into the increased risk or high risk category at Survey 6, and about one third of those in the increased risk category moved into the high risk category. The proportions moving to a decreased risk category were much smaller (about 15% of women in each of the increased and high risk categories improved their WC category between these surveys).
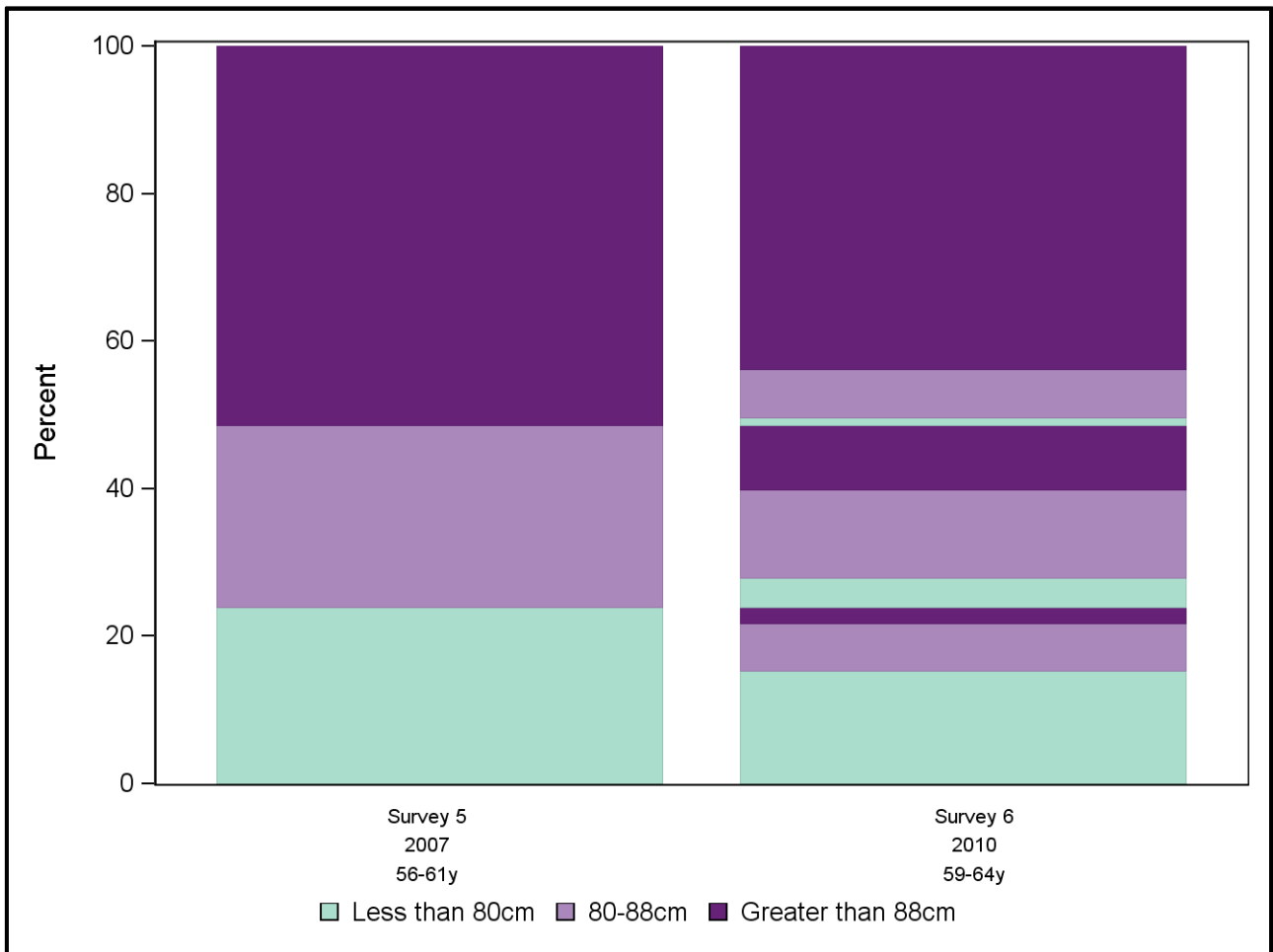
Figure 3-10 Changes in waist circumference from Survey 5 to Survey 6 for the 1946-51 cohort.

3.3.4. Hypertension, diabetes, BMI and waist circumference

The reason for including both BMI and WC in the national guidelines is evidence both relative weight (indicated by BMI) and body shape (indicated by WC) are important. This is illustrated in Figure 3-11 and Figure 3-12 which show the prevalence of hypertension and diabetes among women in the 1946-51 cohort based on data from Survey 6 (more detailed data with numbers of women and confidence intervals for prevalence estimates are shown in Tables 8 and 9 in Appendix A). Prevalence of hypertension increased markedly as BMI increased, reaching over 40% for women with BMI ≥ 30 (see Figure 3-11). However, hypertension prevalence also increased with increasing WC, especially among women in the 'healthy weight' category of BMI ≤ 25.
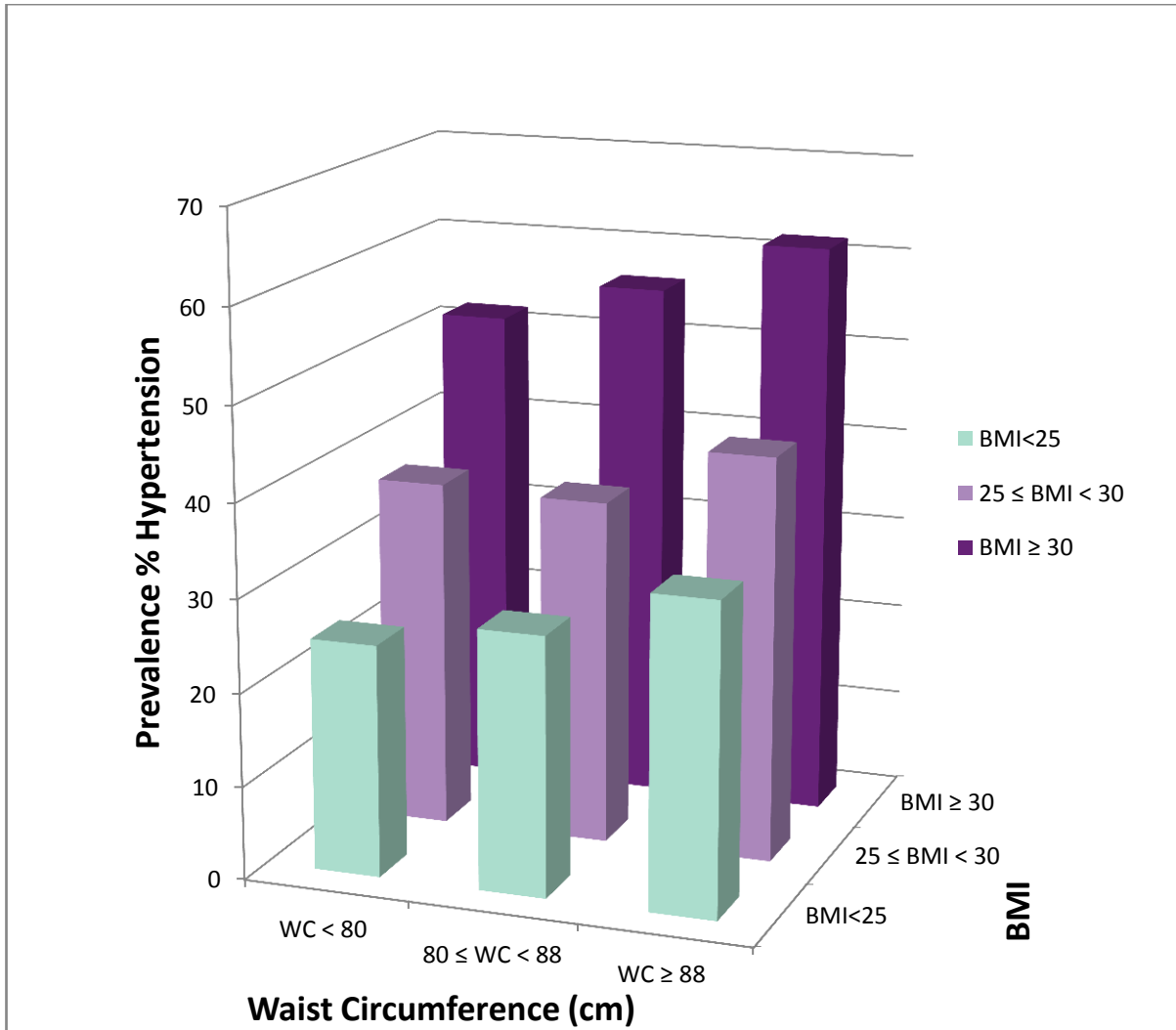
Figure 3-11 Hypertension in relation to BMI and waist circumference at Survey 6 of the 1946-51 cohort.

Prevalence of diabetes was very low among women with WC < 80, so data are presented for women categorised only by WC <88 or WC ≥ 88 (see Figure 3-12). Diabetes increased with increasing BMI, especially for BMI ≥ 30. Additionally, prevalence of diabetes was higher for women with WC ≥ 88 than for women with WC < 88 for each category of BMI.
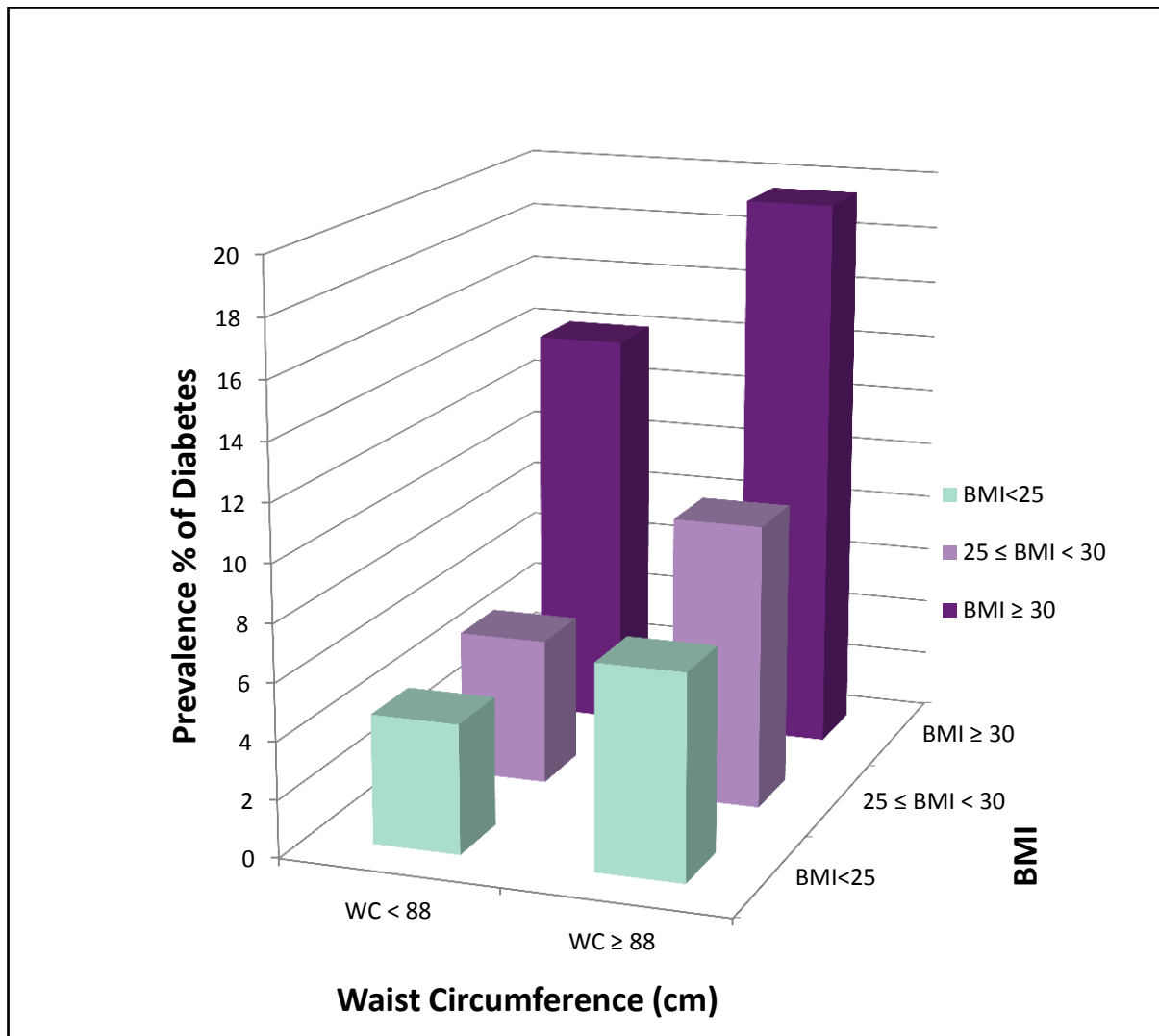
Figure 3-12 Diabetes in relation to BMI and waist circumference at Survey 6 of the 1946-51 cohort.

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3.4. Alcohol use

3.4.1. Background

There is little doubt that heavy alcohol consumption increases the risk of chronic disease, and injury not only to the drinker, but also to others, for example through traffic accidents and violence. In contrast, low to moderate alcohol consumption causes few adverse effects, (NHMRC 2009) and appears to have a beneficial effect on some aspects of health for some people (Doll et al., 2005; Gronbaek et al., 2004).

The *Australian Guidelines to Reduce Health Risks from Drinking Alcohol* were published by the NHMRC in 2009 (National Health and Medical Research Council, 2009). These guidelines replace *Australian Alcohol Guidelines: Health Risks and Benefits* published in 2001. The new guidelines are based on estimates of the overall risk of alcohol-related harm over a lifetime, with the level of one death for every 100 people being considered acceptable risk in the context of present-day Australian society. Unlike earlier versions of recommendations for safe levels of alcohol (Pols, 1992; NHMRC, 2001; NHMRC, 2009), the new guidelines provide universal advice applicable to all healthy adults aged 18 years and over (regardless of age and gender), and specific guidance for children and young people, and for pregnant and breastfeeding women.

The general recommendation is that "for healthy men and women, drinking no more than two standard drinks on any day reduces the lifetime risk of harm from alcohol-related disease or injury"; and "for healthy men and women, drinking no more than four standard drinks on a single occasion reduces the risk of alcohol-related injury arising from that occasion."

For women who are pregnant or planning a pregnancy, and those who are breastfeeding, it is advised that not drinking is the safest option.

3.4.2. Data from the Australian Longitudinal Study on Women's Health

ALSWH data from all cohorts were used to investigate how women have responded to the recommendation to drink no more than two drinks a day. Women were asked how often they usually drank alcohol and how many drinks they usually had. Women who responded that they never drank alcohol or they drank one to two drinks a day were considered to have met the guideline of no more than two drinks a day. The guideline recommending drinking no more than four drinks a day was examined in the 1973-78 cohort (aged 18-23 in 1996) and the 1946-51 cohort (aged 45-50 in 1996). Women were asked how often they had five or more drinks of alcohol on one occasion with response options, 'Never', 'Less than once a month', 'About once a month', 'About once a week' or 'More than once a week'. Women met the guideline of drinking no more than four drinks a day if they never drank five or more drinks on one occasion.

Figure 3-13 shows the percentage of women who met the guideline of drinking no more than two drinks a day (squares) and of drinking no more than four drinks on an occasion (crosses). Drinking no more than two drinks a day increased quite rapidly with age, from 40% for the 1973-78 cohort when they were 18-23 years old to 73% when they were 31-36 years, and from 83 % for the 1946-51 cohort when they were 45-50 years old to 87% when they were 59-64, and from 94% to 96% for the 1921-26 cohort as they advanced through their seventies. The percentage of women drinking no more than four drinks on an occasion was lower, ranging from 27% in the 18-23 year olds to 44% in the same women in their thirties, 67%-78% for women aged 45-61 and 91% for women aged 70-75 years. Drinking more than four drinks on an occasion could be as infrequent as once or twice a year for example when celebrating a birthday, a wedding or Christmas. In all cohorts, similar patterns of adherence were observed for women who provided data at each survey to women who answered all surveys (see Appendix A Tables 10A –12B).
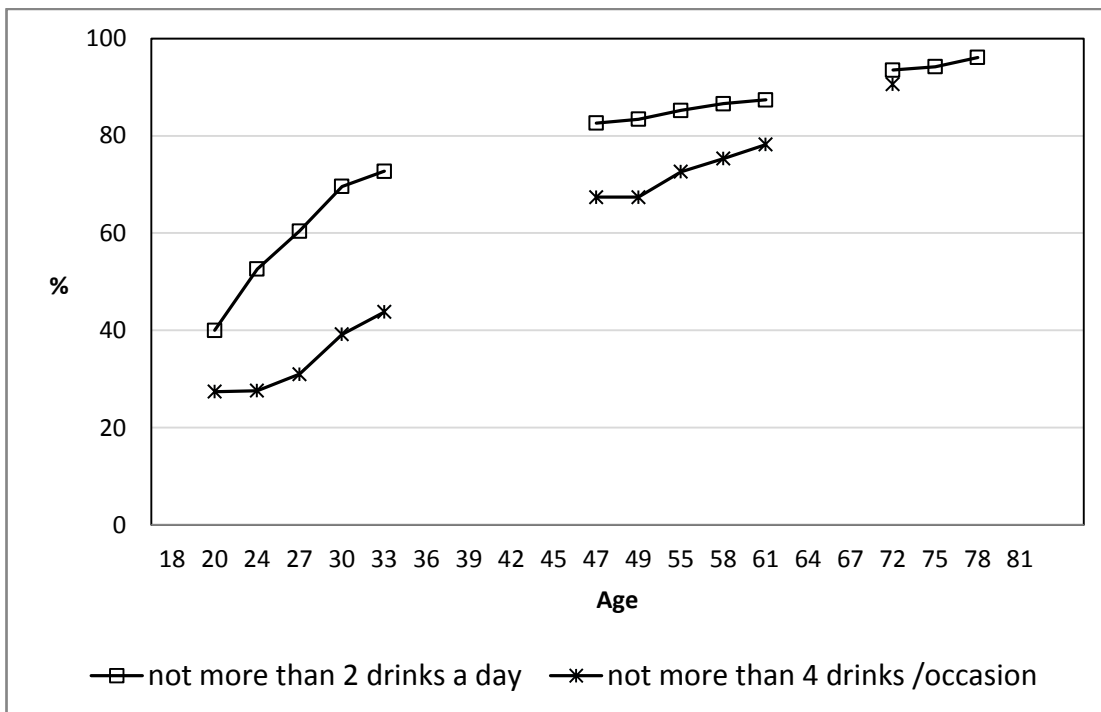
Note: Data for this figure are in Appendix A Tables 10A – 12B

Figure 3-13 Percentages of women who met alcohol guidelines at each survey are plotted against the average age of the women at the time of the survey.

Although Figure 3-13 shows general patterns of adherence to the alcohol guidelines it does not show changes in adherence within each of the cohorts of women. These changes in adherence are presented in the following sections.

3.4.3. Changes in adherence to alcohol guideline of no more than two drinks a day

Figure 3-14, Figure 3-15 and Figure 3-16 show the percentage of women who met the guideline of no more than two drinks a day for each cohort of women who provided responses at every survey. Only 40% of the women who were 18-23 in 1996 (1973-78 cohort) met the guideline of no more than two drinks a day (green or lighter bar), leaving 60% drinking more than two drinks a day (purple or darker bar Figure 3-14). During the next four years, around 20% of women became adherent (changed from purple to green) and around 10% became non-adherent (i.e. changed from green to purple), with the remaining 70% of women fluctuating between adherence and non-adherence. Generally women in this cohort became more adherent but it is interesting to note that around 80% were non-adherent at one of the five surveys and around 10% were non-adherent at all surveys (purple bars for all time points). Marriage, pregnancy and having children were all associated with greater adherence to this guideline. Women were less likely to adhere to this guideline if they were current smokers or had been smokers.
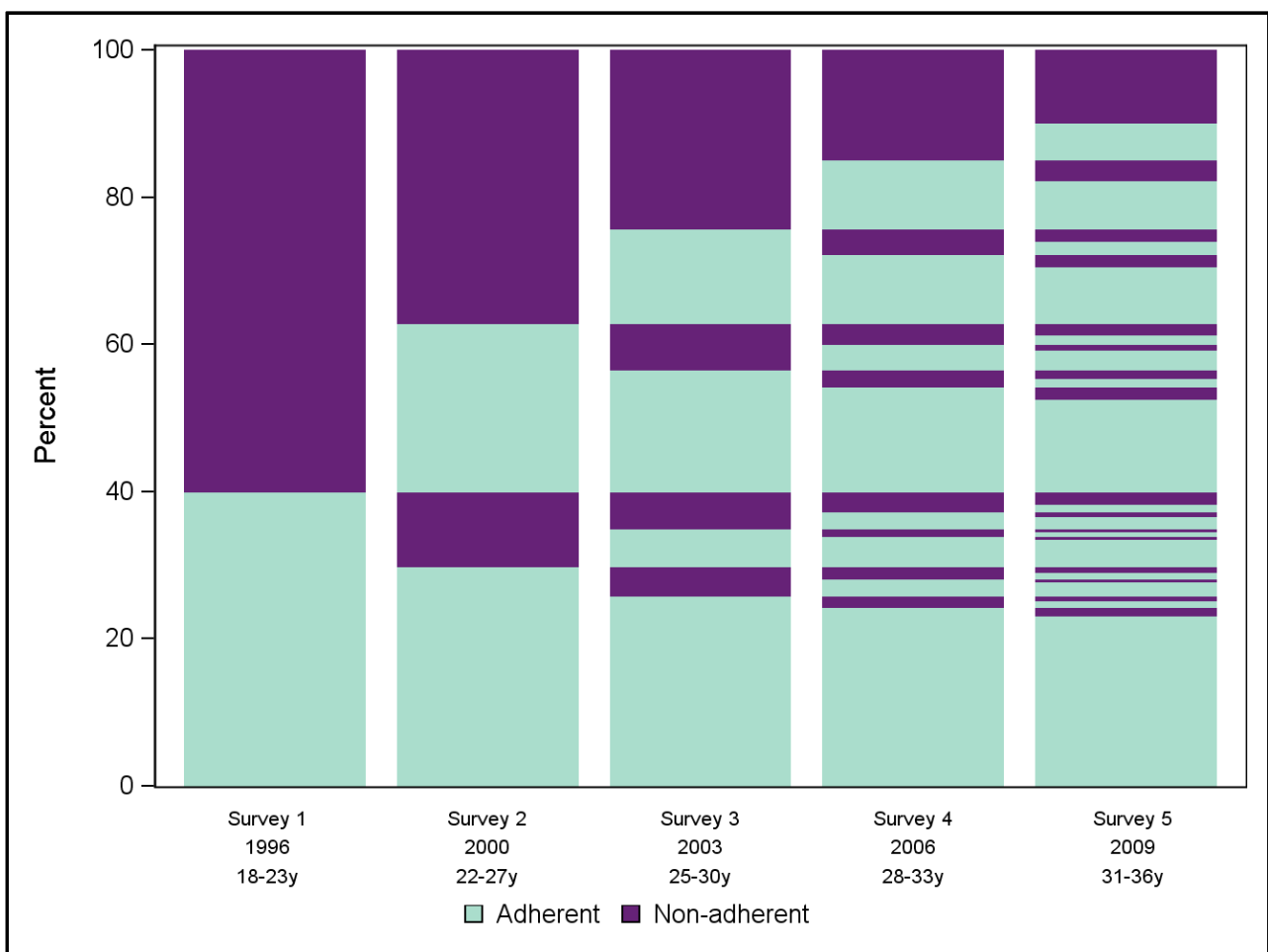
Note: The green or lighter bars indicate adherence and the purple or darker bars indicate non-adherence at each survey

Figure 3-14 Percentages of women in the 1973-78 cohort by adherence to the guideline of no more than two drinks a day.

More than 80% of the women aged 45-50 years in 1996 met the guideline of no more than two drinks a day (green or lighter bar) and around 70% of women met the guideline at all surveys (green or lighter bar at all time points, Figure 3-15). Although there was a general trend towards increasing adherence to this guideline, 5% of women were consistently non-adherent (purple or darker bars at all surveys).
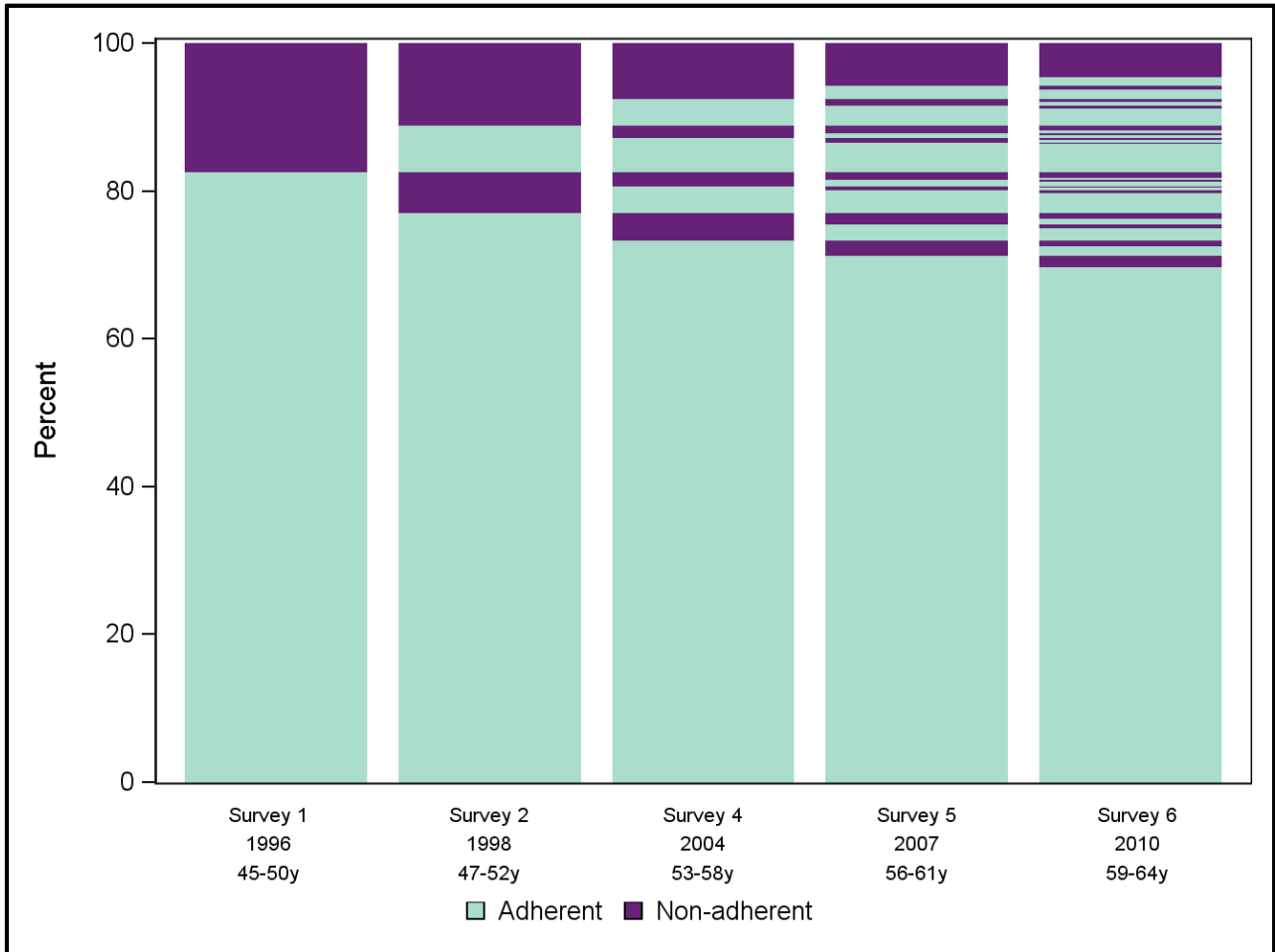
Note: The green or lighter bars indicate adherence and the purple or darker bars indicate non-adherence at each survey

Figure 3-15 Percentages of women in the 1946-51 cohort by adherence to the guideline of no more than two drinks a day.

A quarter of the women fluctuated between adherence and non-adherence to the guideline of no more than two drinks a day. Married women were more likely to meet this guideline, as were women who had children living at home. Women were less likely to meet this guideline if they were current smokers or used to smoke.

Women who were aged 70-75 years in 1996 were the most adherent to the guideline of no more than two drinks a day (Figure 3-16) with more than 90% meeting this guideline at each of the three surveys. There was little change in adherence to this guideline over the three surveys. Around 90% of women were adherent (green or lighter bars) at all surveys and less than 5% were non-adherent (purple or darker bars) at all surveys. As with the other cohorts, women who were smokers or ex-smokers were less adherent to the guideline of no more than two drinks a day.
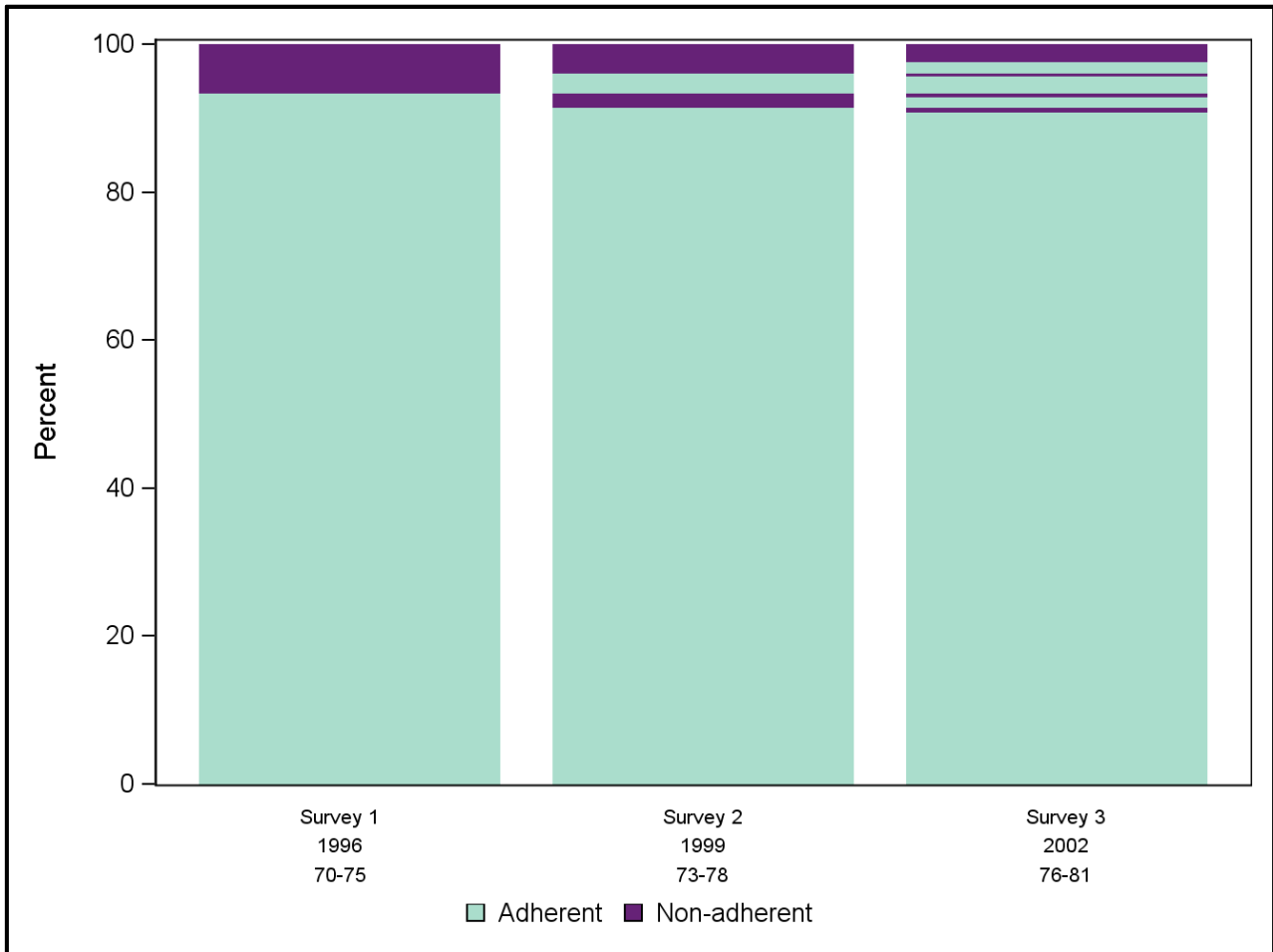
Note: The green or lighter bars indicate adherence and the purple or darker bars indicate non-adherence at each survey

Figure 3-16 Percentages of women in the 1921-26 cohort by adherence to the guideline of no more than two drinks a day.

3.4.4. Adherence to guideline of no more than four drinks on one occasion

This guideline is to reduce the risk of alcohol-related harm on any single occasion. In this report, women were considered to be non-adherent with this guideline if they consumed five or more standard drinks on one occasion, 'more than once a week', 'about once a week', 'about once a month', or 'less than once a month'. Changes in the percentages of women in the 1973-78 cohort and 1946-51 cohort adhering to this guideline are shown in Figure 3-17 and Figure 3-18. Women in the 1921-26 cohort were only asked how often they had consumed five or more standard drinks on one occasion in 1996, when 91% adhered to this guideline.

1973-78 cohort

Less than 30% of women met the guideline of no more than four drinks on one occasion when aged 18-23 in 1996, and the percentage of non-adherence was similar when the women were aged 22-27 in 2000 (green or lighter bars, Figure 3-17). Around 10% of women were consistently adherent to this guideline over the five surveys and almost 40% were consistently non-adherent (purple or darker bars, Figure 3-17). Although the trend was towards increasing adherence, half the women fluctuated between adherence and non-adherence to this guideline. Married women and those who were pregnant and had children were more likely to meet this guideline. Current smokers, ex-smokers, and employed women were less likely to meet this guideline.
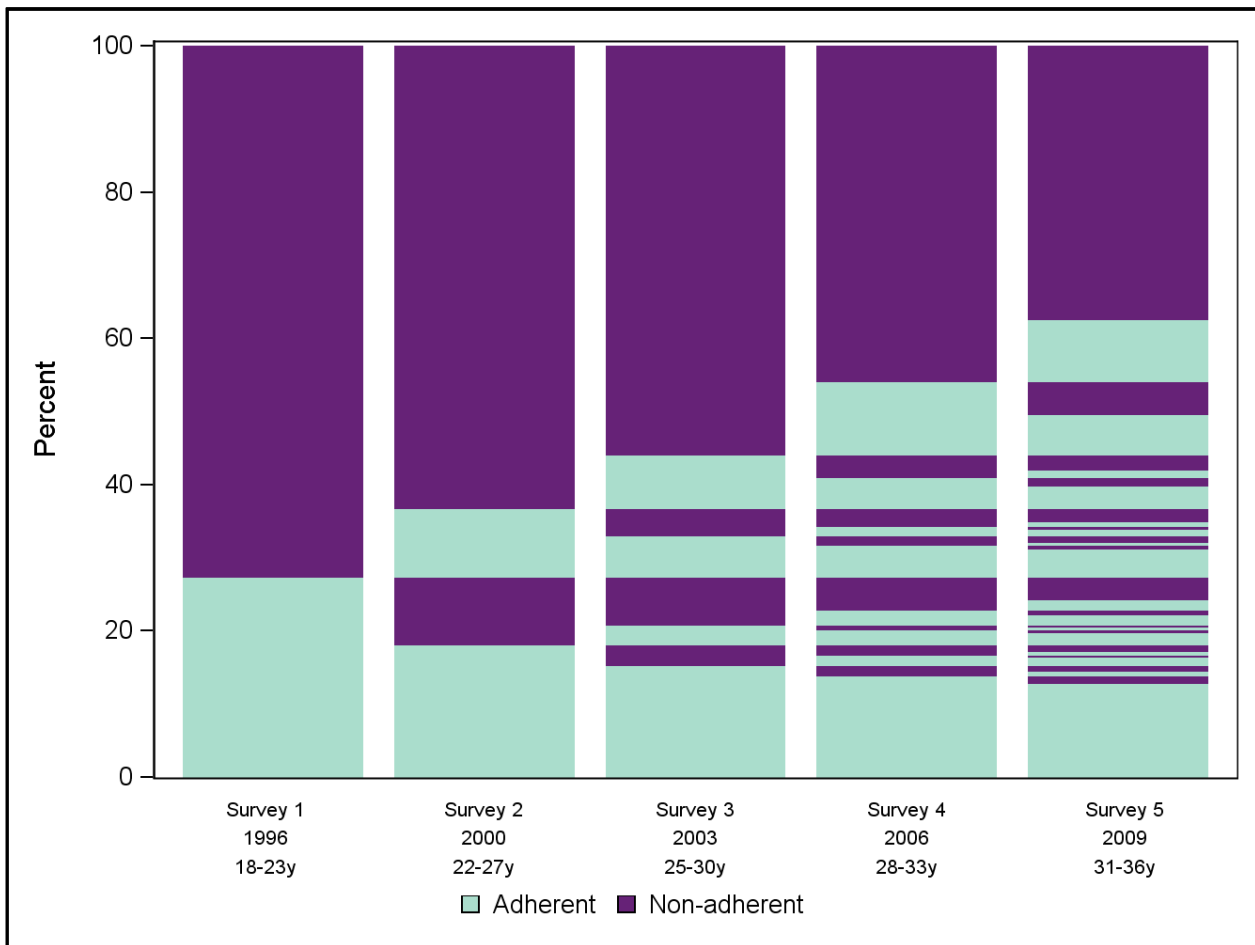
Figure 3-17 Percentages of women in the 1973-78 cohort who met the guideline of no more than four drinks on one occasion.

1946-51 cohort

Around 70% of women met the guideline of no more than four drinks on one occasion when aged 45-50 in 1996 (green bar, Figure 3-18). There was a trend towards increasing adherence over time, with almost 80% of women adherent in 2010. However almost half the women were non-adherent to this guideline at one of the five surveys and 10% (purple bars, Figure 3-18) were non-adherent at all surveys. Married women and those with children living at home were more likely to meet the guideline of no more than four drinks on one occasion. Smokers and ex-smokers were less likely to meet this guideline.
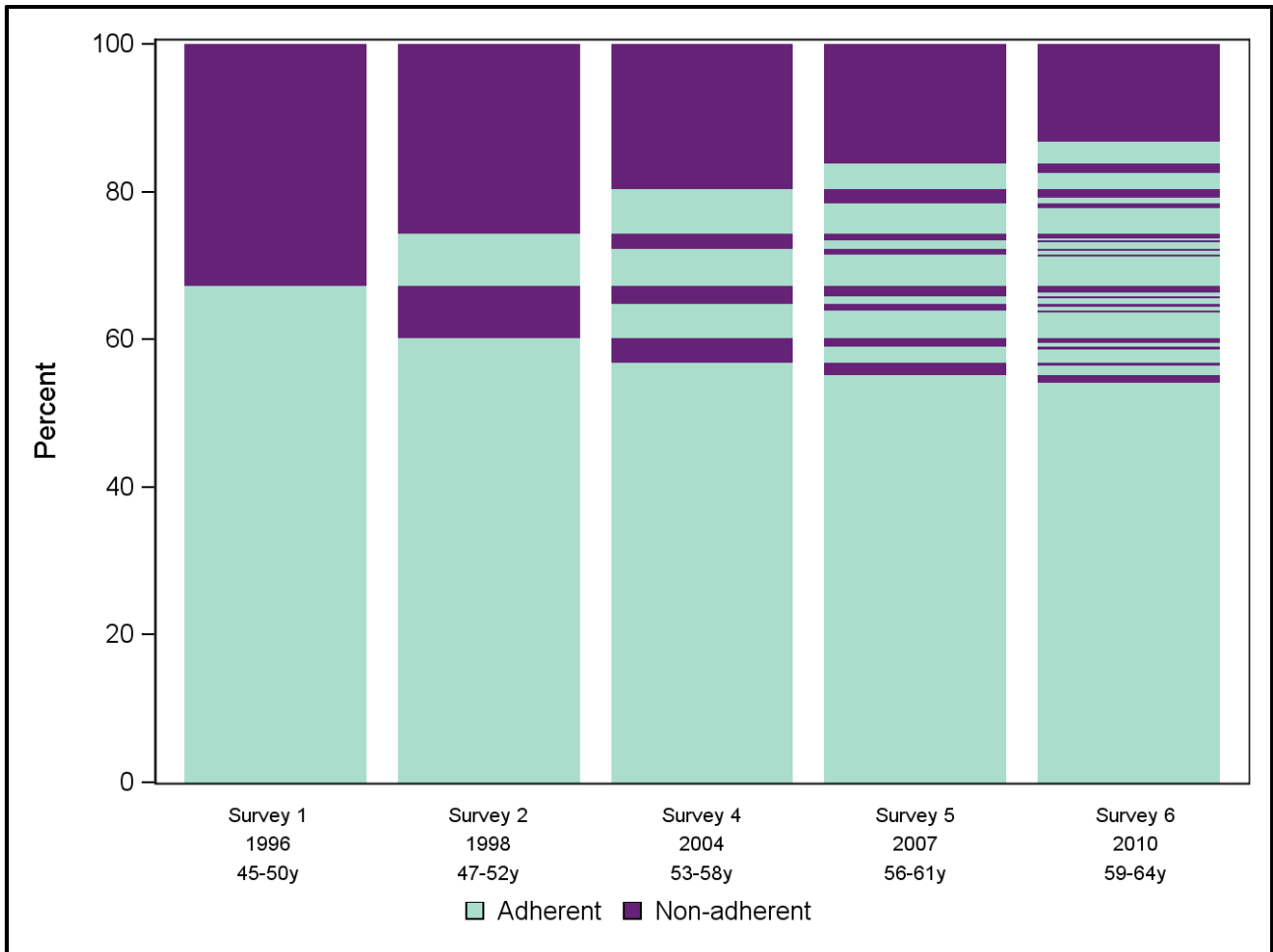
Figure 3-18 Percentages of women in the 1946-51 cohort who met the guideline of no more than four drinks on one occasion.

3.4.5. Summary

Adherence to alcohol guidelines varies. Adherence to the guideline of no more than two drinks a day is low in younger women, but does increase quite rapidly over time. Adherence to the guideline of no more than four drinks on one occasion is poor in younger women and remains at around 70% in women in their forties and fifties. Adherence appears to improve as women become more settled, but past and current smoking are risk factors for non-adherence.

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3.5. Dietary guidelines

3.5.1. Introduction

Dietary guidelines change over time, with changes in food preferences and availability. They provide different recommendations for men and women in different age groups and for some women who are pregnant or breastfeeding. However, because of the complexity of diet, these guidelines tend to change more slowly than other guidelines. They also differ considerably from country to country. For this report we have used the dietary guidelines given in the *Food for Health: Dietary Guidelines for Australians* (2003) and the *Australian Guide to Healthy Eating* (Smith et al., 1998). It is important to note however, that a revision of both of these resources is currently nearing completion.

The *Australian Guide to Healthy Eating* (AGHE) was developed to encourage health-promoting food choices. It encourages daily food consumption for each of the five groups (Table 3-7) in amounts that are consistent with "current" nutritional knowledge about healthy eating as described by the 1992, 1995 and 2003 versions of NHMRC Dietary Guidelines for Australians. (Smith et al., 1998; NHMRC 1992; 1995 and 2003).

The recommended daily servings for each food group have been developed for different segments of the population, for example pregnant or breastfeeding women and adults aged over 60 years, based on their nutrient needs. The *Extras* group describes foods that do not fit into the five food groups and are recommended to be consumed in limited amounts. The group includes foods that are usually nutrient poor, contain too much fat, salt, and sugar and are likely to contribute to large amounts of energy.

Table 3-6 Food groups and recommended daily servings from the AGHE for women generally and for pregnant women

Food Group (see Appendix C for individual food items)	Women (not pregnant or breastfeeding)	Pregnant Women
Cereals (including breads, rice, pasta, noodles)	4-9 serves	4 - 6 serves
Vegetables (including legumes)	≥5 serves	≥5 serves
Fruit	≥2 serves	≥4 serves
Dairy (including milk, yoghurt, cheese)	≥2 serves	≥2 serves
Meat and meat substitutes (including fish, poultry, eggs, nuts, legumes)	≥1 serves	≥1.5 serves
Extras	≤2.5 serves	≤2.5 serves

This report analyses survey data from the three cohorts of ALSWH participants to determine the extent that their diets correspond with recommended intakes from food groups set out in Table 3-6. The diets of the young women (born 1973-78) were examined using data from two food-frequency questionnaires (FFQs) collected six years apart, when they were 25-30 years old (Survey 3) and when they were 31-36 years old (Survey 5). The findings for young women have been split into two groups: those who were *not* pregnant at either of the surveys and those who were pregnant at the time of one or both surveys. The results are based on the consumption found at both surveys (except for women who were pregnant at only one survey) in order to reflect better the sustained diet of these women. For the mid-age cohort of women (born 1946-51) results are

based on one FFQ in 2001 when the women were aged 50-55 years, though our research suggests that dietary patterns in this cohort are very stable (Mishra et al., submitted). Findings on the food intake of older women (born 1921-26) are based on a few survey questions when the women were aged 79-84 years. A more detailed description of the dietary assessment method is provided in Appendix B.

3.5.2. 1973-78 cohort

Young women who were not pregnant (aged 25-30 years at Survey 3 and 31-36 years at Survey 5)

The majority of these young women did not meet guidelines for any food group (Figure 3-19), except *Meat and meat substitutes* (71%). Fewer than one in four reached the intake guidelines for *Fruit* (21%) and *Dairy* (14%) foods and less than 5% had the recommended intake for *Cereals* and *Vegetables*. On average these young women had less than three serves of *Cereals* (2.28) and *Vegetables* (2.22) per day, or less than half of the suggested intakes for these food groups (Table 3-7). In contrast, only one in ten did not exceed the guidelines for the *Extras* group (typically nutrient poor, high fat or high-energy food items); at more than four serves (4.20) average daily intake of *Extras* was almost double the guideline of 2.5 serves.
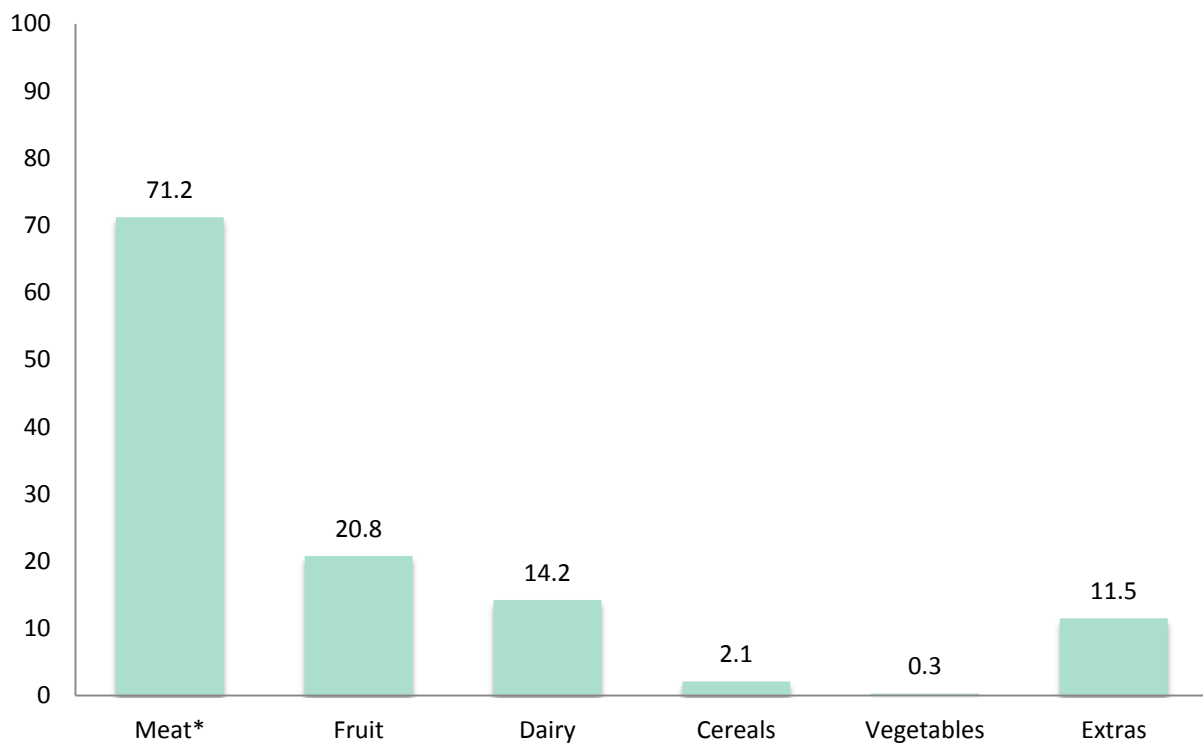
Meat food group includes meat substitutes.

Figure 3-19 Percentage of young women who met dietary guidelines for each food group as set out in the *Australian Guide to Healthy Eating*; for women who were not pregnant at Survey 3 (aged 25-30 years) or Survey 5 (aged 31-36 years) and who completed both surveys (N= 3981).

Table 3-7 Intake in servings per day of food groups for young women (aged 25-30 years at Survey 3 and 31-36 years at Survey 5) who were not pregnant at any of the surveys (N = 3981).

Food group	Mean ± SD[1]	Median (IQR)[2]	Guideline (19-60 years)
Cereals	2.28 ± 0.98	2.15 (1.61 – 2.80)	4-9 serves
Vegetables	2.22 ± 0.92	2.11 (1.58 – 2.70)	≥5 serves
Fruit	1.92 ± 1.15	1.71 (1.11 – 2.46)	≥2 serves
Dairy	1.71 ± 0.63	1.64 (1.27 – 2.07)	≥2 serves
Meat (& meat substitutes)	1.86 ± 0.92	1.69 (1.26 – 2.29)	≥1 serves
Extras	4.20 ± 2.04	3.84 (2.82 – 5.24)	≤2.5 serve

[1]SD, standard deviation

[2]IQR, interquartile range, middle 50% of intake quartiles

Young women who were pregnant (aged 25-30 years at S3 and 31-36 years at S5):

These women showed a similar pattern to other young women (Figure 3-20), except that more (45%) met the recommended level for *Dairy* foods. Only about one in ten, however, followed the guidelines for intakes of *Cereals* (12%) and *Fruit* (10.5%), and on average they consumed less than 2.5 serves of each per day (2.46 and 2.26 serves respectively; Table 3-8). Less than 3% of young pregnant women reached the recommended intake of *Vegetables*, and on average they consumed only 2.26 serves of vegetables per day compared with the suggested minimum intake of six serves recommended in guidelines.
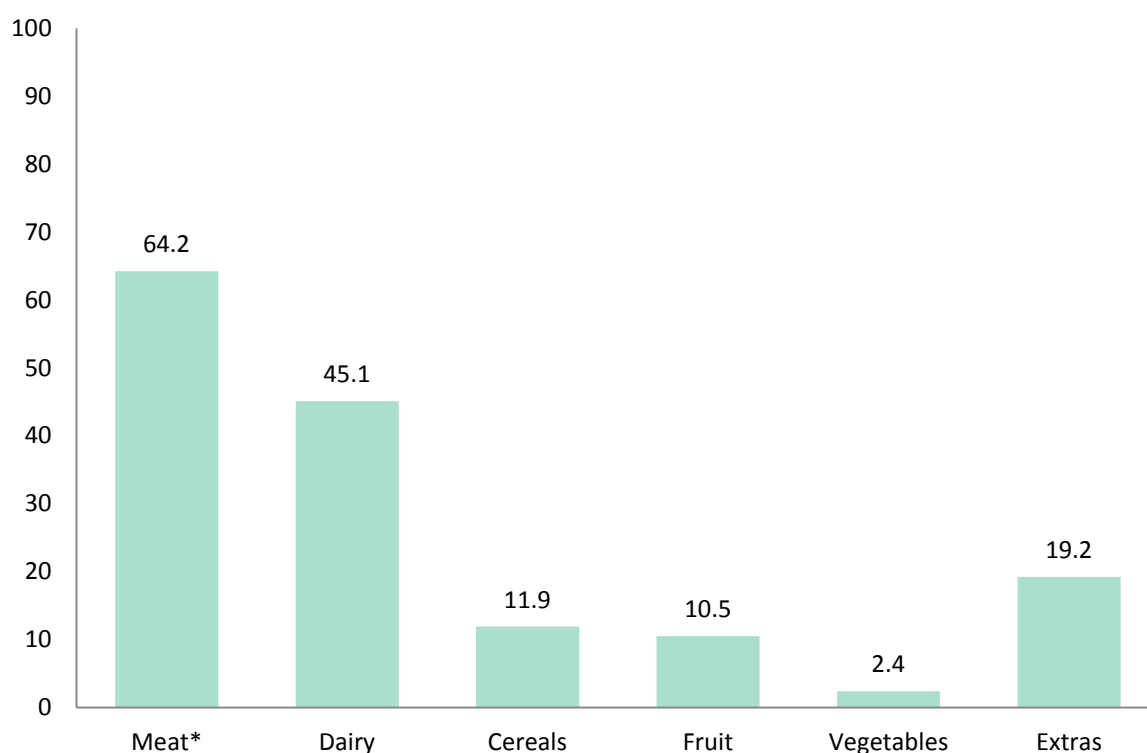
Meat food group includes meat substitutes.

Figure 3-20 Percentage of pregnant women who met dietary guidelines for each food group as set out in the *Australian Guide to Healthy Eating*; for women who were pregnant at Survey 3 (aged 25-30 years) and/or Survey 5 (aged 31-36 years) (N = 2901)

Table 3-8 Intake in servings per day for 5 food groups for young women who were pregnant at Survey 3 (aged 25-30 years) and/or at Survey 5 (aged 31-36 years) (N = 2901).

Food group	Mean ± SD[1]	Median (IQR)[2]	Guideline for pregnant women
Cereals	2.46 ± 0.94	2.35 (1.80 – 2.97)	4-6 serves
Vegetables	2.26 ± 0.87	2.13 (1.66 – 2.72)	≥5serves
Fruit	2.08 ± 1.15	1.89 (1.23 – 2.67)	≥4 serves
Dairy	1.85 ± 0.65	1.78 (1.39 – 2.21)	≥2 serves
Meat (& meat substitutes)	1.89 ± 0.98	1.72 (1.30 – 2.25)	≥1.5 serves
Extras	4.30 ± 2.00	4.00 (2.95 – 5.25)	≤2.5 serve

[1]SD, standard deviation

[2]IQR, interquartile range, middle 50% of intake quartiles

3.5.3.1946-51 cohort:

Most mid-age women (83%) met guidelines for *Meat and meat substitutes*. Half of the women (47%) met guidelines for consumption of *Fruit* and one in three (33%) met the suggested intake of *Dairy* foods of at least 2 serves. Even fewer women met guidelines for *Cereals* (10%) and *Vegetables* (2.2%), with women consuming a daily average of only 2.4 servings of *Vegetables* or less than half the recommended intake of at least five serves. One in three (32%) mid-age women met guidelines for the consumption of *Extras*. Overall just 7 (0.07%) of the mid-age women met dietary guidelines across all the food groups.
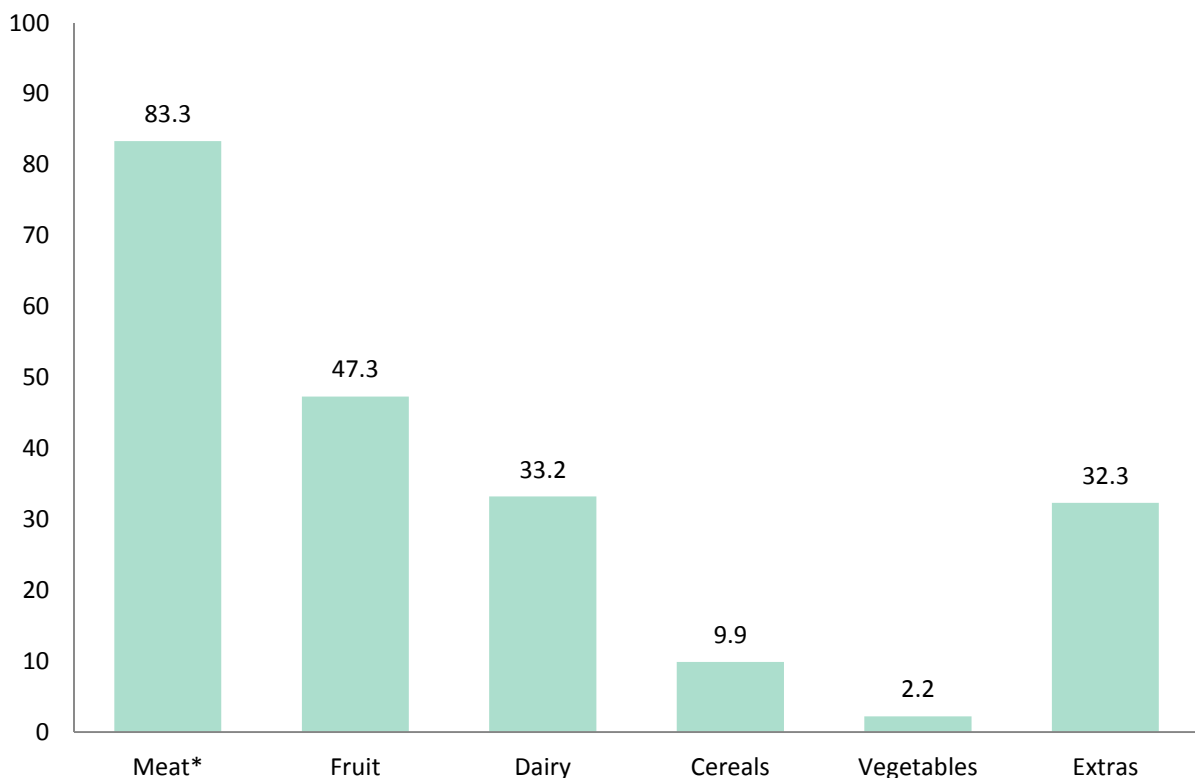
*Meat food group includes meat substitutes.

Figure 3-21 Percentage of mid-age women (aged 50-55 years) who met guidelines for consumption of items in each food group as set out in the *Australian Guide to Healthy Eating*, (N=10,629)

Table 3-9 Intake in servings per day for food groups for mid-age women aged 50-55 years (N = 10,629)

Food group	Mean ± SD[1]	Median (IQR)[2]	Guideline (19-60 years)
Cereals	2.55 ± 1.21	2.40 (1.78 – 3.14)	4-9 serves
Vegetables	2.40 ± 1.08	2.25 (1.69 – 2.99)	≥5 serves
Fruit	2.15 ± 1.39	1.91 (1.08 – 2.86)	≥2 serves
Dairy	1.77 ± 0.80	1.70 (1.18 – 2.23)	≥2 serves
Meat (& meat substitutes)	1.90 ± 1.25	1.64 (1.18 – 2.31)	≥1 serves
Extras	3.60 ± 2.16	3.23 (2.20 – 4.55)	≤2.5 serve

[1]SD, standard deviation

[2]IQR, interquartile range, middle 50% of intake quartiles

3.5.4.1921-26 cohort:

Of the 7158 women in this cohort who responded to Survey 4 in 2005, 70.3% (n=4964) reported having two or more serves of fruit per day, while only 8.5% (n = 602) had at least five serves of vegetables. Just over half of the older women (51.4%) drank 6-8 glasses/cups of non-alcoholic drinks per day.

3.5.5.Summary

The majority of young women did not meet guidelines for any food group, except *Meat and meat substitutes* (71%).

- Fewer than one in four reached intake guidelines for *Fruit* (21%) and *Dairy* (14%) foods and less than 5% had the recommended intake for *Cereals* and *Vegetables*.
- On average these young women had less than three serves of *Cereals per day* (mean 2.28) and *Vegetables* (2.22), well below the suggested intakes for these food groups.
- In contrast, only one in ten did not exceed the guidelines for consumption from the *Extras* group (typically nutrient poor, high fat or high-energy food items). At more than four serves (4.20) average intake of this group was almost double the guideline limit of 2.5 serves.

Young women who were pregnant showed a similar pattern to other young women, except that more of them (45%) met the recommended level for *Dairy* foods.

- Only about one in ten followed guidelines for intakes of *Cereals* (12%) and *Fruit* (10.5%).
- Less than 3% of these women reached the recommended intake of *Vegetables*, and on average they consumed only 2.26 serves per day of *Vegetables* compared with the suggested minimum intake of six serves recommended in the guidelines.

Similarly to the young women, most mid-age women did not meet dietary guidelines for any of the food groups, except for *Meat and meat substitutes* (83%).

- Half of the women (47%) met guidelines for consumption of *Fruit* and one in three (33%) met the suggested intake of *Dairy* foods of at least 2 serves.
- Even fewer women met guidelines for *Cereals* (10%) and *Vegetables* (2.2%), with women consuming a daily average of only 2.4 servings of *Vegetables* or less than half the recommended intake of at least five serves.
- One in three (32%) mid-age women met guidelines for the consumption of *Extras*.
- Overall just 7 (0.07%) of the mid-age women met dietary guidelines across all the food groups.

Of the older women, almost three in four (70.3%) reported having two or more serves of *Fruit* per day, but only 8.5% (n = 602) had at least five serves of vegetables.

Only a small percentage of young women met guidelines for *Cereals*, *Fruit*, and *Vegetables*. Young pregnant women showed a similar pattern to other young women, except that more of them (45%) met the recommended level for *Dairy* foods. Both groups of young women were consuming more *Extras* than recommended. Mid-age women also followed a similar pattern with almost (83%) meeting guidelines for *Meat and meat substitutes*, but very few reached the recommended level for *Cereals* (10%) and *Vegetables* (2.2%). Only 7 (0.07%) of mid-age women met dietary guidelines across all the food groups. Among older women, only 8.5% (n = 602) reported having a daily intake of at least five serves of vegetables.

There are a number of caveats worth noting:

- In the preparation for the analysis a number of anomalies or at least potential points of confusion in the guidelines came to light, such as the inclusion of legumes in two food groups – *Vegetables* and *Meat and meat substitutes*.
- Serving sizes for some items, such as cheese, differed substantially from sizes generally used internationally.
- Although the findings for mid-age women are based on just one FFQ compared with the two FFQs for the young women, other research on this cohort suggests that their dietary patterns remain stable through midlife (Mishra et al, submitted).
- Very limited information on diet is available for the older women, but the results indicate that the majority are probably not meeting dietary guidelines with respect to vegetables intake.

Overall, findings from all age groups in this study suggest that there is considerable scope for encouraging more women in Australia to follow dietary guidelines. Policymakers may wish to review the clarity of the dietary guidelines and health promotion strategies across all food groups to enhance their impact on women's diets, and most notably to increase intakes of *Fruit*, *Vegetables* and *Cereals* and reduce consumption of *Extras*.

3.5.6. References

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3.6.   Physical activity

The National Physical Activity Guidelines for Australians outline the minimum levels of physical activity for health benefit (Department of Health and Ageing, 1999). The guidelines recommend that all adults:

> "put together at least 30 minutes of moderate-intensity physical activity on most, preferably all, days"
> *and*
> "if you can, also enjoy some regular vigorous activity for extra health and fitness"

ALSWH participants have reported their physical activity levels at every survey since 1996. At Survey 1, the women answered questions about the *frequency* of activities and since Survey 2 they have answered questions about the *frequency* and *duration* of walking (for transport or recreation) and of moderate and vigorous intensity leisure time activities. Responses are used to derive a physical activity score in MET.min/week calculated as follows (time in walking*3 + time in moderate activity *4 + time in vigorous activity *7.5). A threshold of 600 MET.mins/week is used to indicate compliance with guidelines (eg 30 mins x 4 METs x 5 days/week).

The proportions of women who met the physical activity guideline at each survey are shown in Figure 3-22 below. Data are included from Survey 2 to Survey 5 for the 1973-78 and 1921-26 cohorts, and from Survey 3 to Survey 6 for the 1946-51 cohort. Data from Survey 1 for all cohorts are not included because a different question was asked in 1996, and data from Survey 2 of the 1946-51 cohort are not included because the question about walking was slightly different (it asked about *brisk* walking) and the responses are therefore not directly comparable.

The data show a decline in physical activity in the younger and older cohorts over time, but a marked increase in the 1946-51 cohort. This may reflect cohort differences as well as differences in life stage, and is in contrast with conventional thinking that there is a decrease in physical activity across the adult life-span (Haskell et al., 2007).
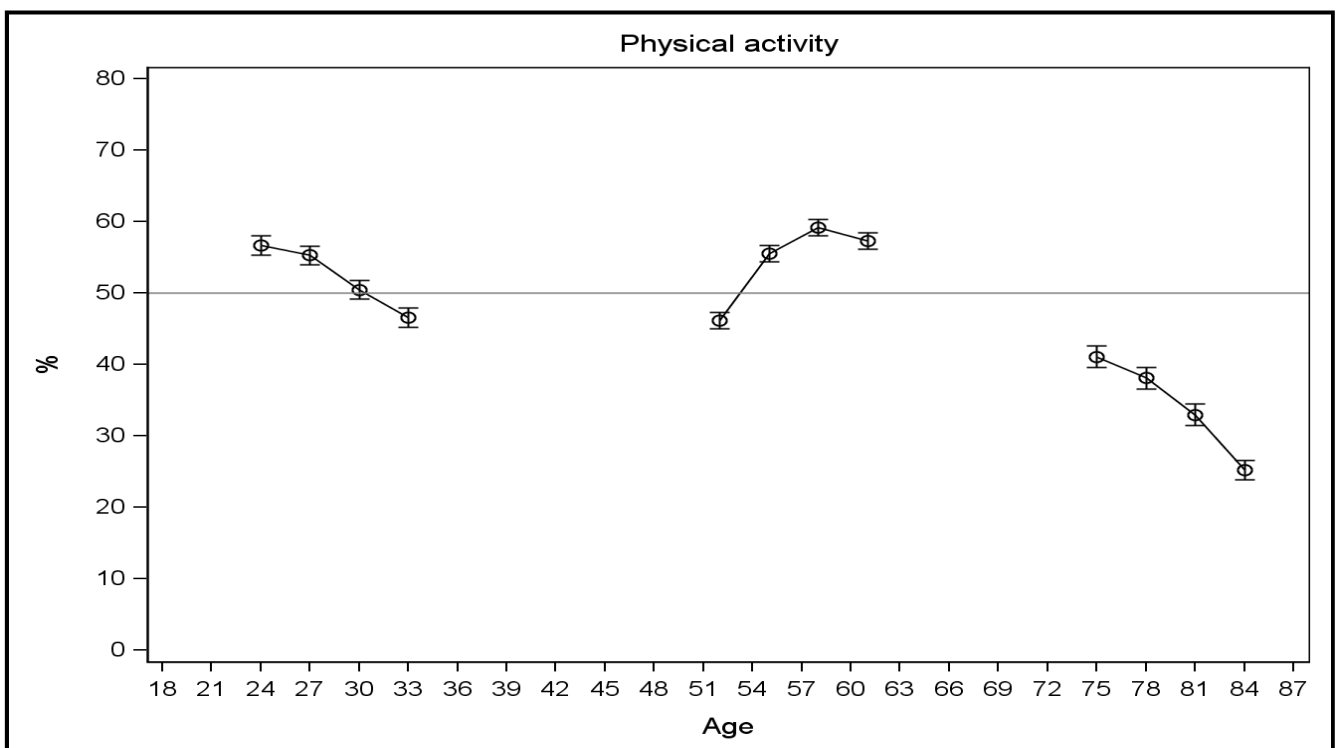
Figure 3-22: Changes in physical activity over 12 years for all ALSWH cohorts.

3.6.1.1973-78 Cohort

At Survey 2 in 2000 55% of the 1973-78 cohort met the guideline ('active') (N= 9436). Using data from all respondents at each survey, this proportion remained stable at Survey 3 (2003: 55%; N=8916) then declined at Survey 4 (2006: 50%; N=8887) and at Survey 5 (2009: 47%; N=7936). (For complete data see Table 13A in Appendix A).

Data from the 5343 women who have answered the physical activity questions at every survey were used to identify patterns of change in physical activity in the 1973-78 cohort (Figure 3-23, complete data in Table 13B in Appendix A). Significant proportions of the women who were active (depicted by pale green bars inFigure 3-23) at Survey 2 became inactive at subsequent surveys; only 18% of this sample remained active at all surveys. Conversely, significant proportions of the women who were inactive (depicted by the purple bars) at Survey 2 became active at subsequent surveys; 13% remained inactive at all four surveys. The remaining two thirds of the women changed their activity status across surveys.

Factors associated with becoming inactive between 2000 and 2003 included getting married, having a baby and separation or divorce (Brown et al., 2009). Further longitudinal analysis of data from 11 853 women found that the lowest odds for being active (compared with the relevant reference categories) during the period 2000 to 2009 were for women born in Asia (OR = 0.54), having less than 12 years of education (OR = 0.79), being married (OR = 0.64) or in a de facto relationship (OR = 0.78), with at least one child (OR ranging from 0.70 to 0.72), and for those categorised as non (OR = 0.65) or rare drinkers (OR = 0.79) (Uijtdewilligen, submitted).
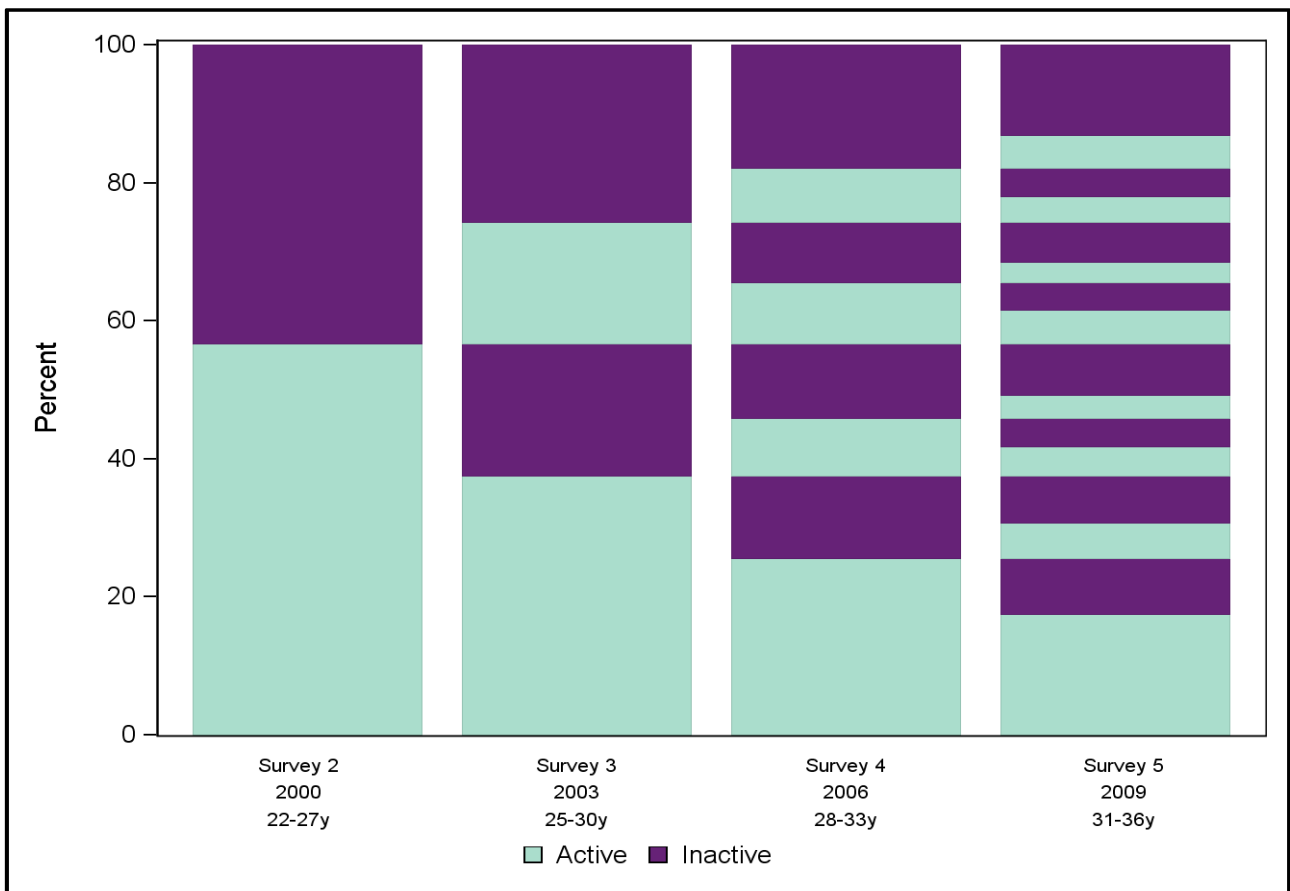
Figure 3-23 Patterns of change in physical activity in the 1973-78 cohort.

3.6.2.1945-51 Cohort

At Survey 3 in 2001 45% of the 1946-51 cohort met the guideline ('active') (N = 10 694). Using data from all respondents to each survey, this proportion increased markedly at Survey 4 (2004: 54%; N = 10 163), and remained high at Survey 5 (2007: 57%; N = 9984) and Survey 6 (2010: 56%; N = 9328). (See Figure 3-22; for complete data see Table 14A in Appendix A).

These data show a pronounced increase in the prevalence of meeting the guideline at this life stage, when the women were aged 50-55 to 59-64 years. Although there was a clear overall upward trend in activity, data from the 7231 women who answered the physical activity questions at every survey show significant changes in physical activity status over time (see Figure 3-24). Just over one third of this sample maintained their activity status as 'inactive' (17%) or 'active' (18%). Of the remainder, more women moved from being inactive (purple) to active (green), so that by Survey 6, 57% of this group were categorised as meeting the guideline.

Factors associated with increasing activity between 2001 and 2004 included those associated with changing work patterns (decreased income, retirement) and widowhood. Women who reported the birth of a grandchild during this period were less likely to become active in this period (Brown et al., 2009).
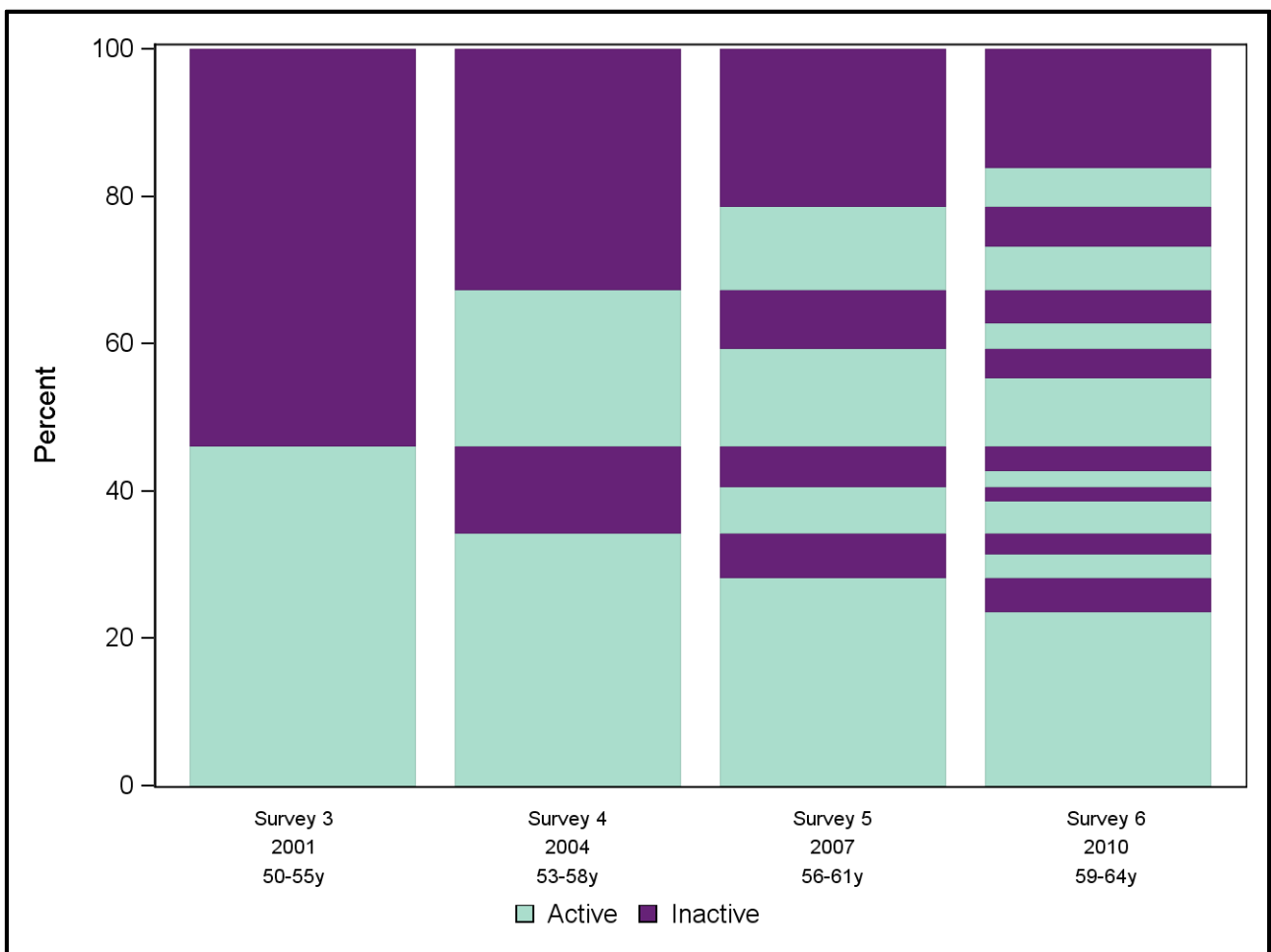
Figure 3-24 Patterns of change in physical activity in the 1946-51 cohort.

3.6.3.1921-26 Cohort

At Survey 2 in 1999, 37% of the 1921-26 cohort met the physical activity guideline ('active') (N= 9050). Using data from all respondents to each survey, this proportion decreased gradually at each survey (2002: 33%, N = 8052; 2005: 30%, N = 6528), so that by Survey 5 in 2008, 24% met the guideline. (See Figure 3-22 and Table 15A in Appendix A for complete data).

These data show a marked decrease in the prevalence of meeting the physical activity guideline at this life stage, when the women were aged 73-78 to 82-87 years. Although there was a clear overall downward trend in activity, data from the 3911 older women who answered the physical activity questions at every survey showed that some women who were categorised as inactive at one survey (purple bars) were active at the next (green bars in Figure 3-25). However, in contrast with the proportions in the other cohorts, more than one third of this sample (37.5%) were inactive at every survey, while only 11% met the guideline at every survey.

Factors associated with decreasing activity between 1999 and 2002 included major illness, injury or surgery, and moving into an institution (Brown et al., 2009).
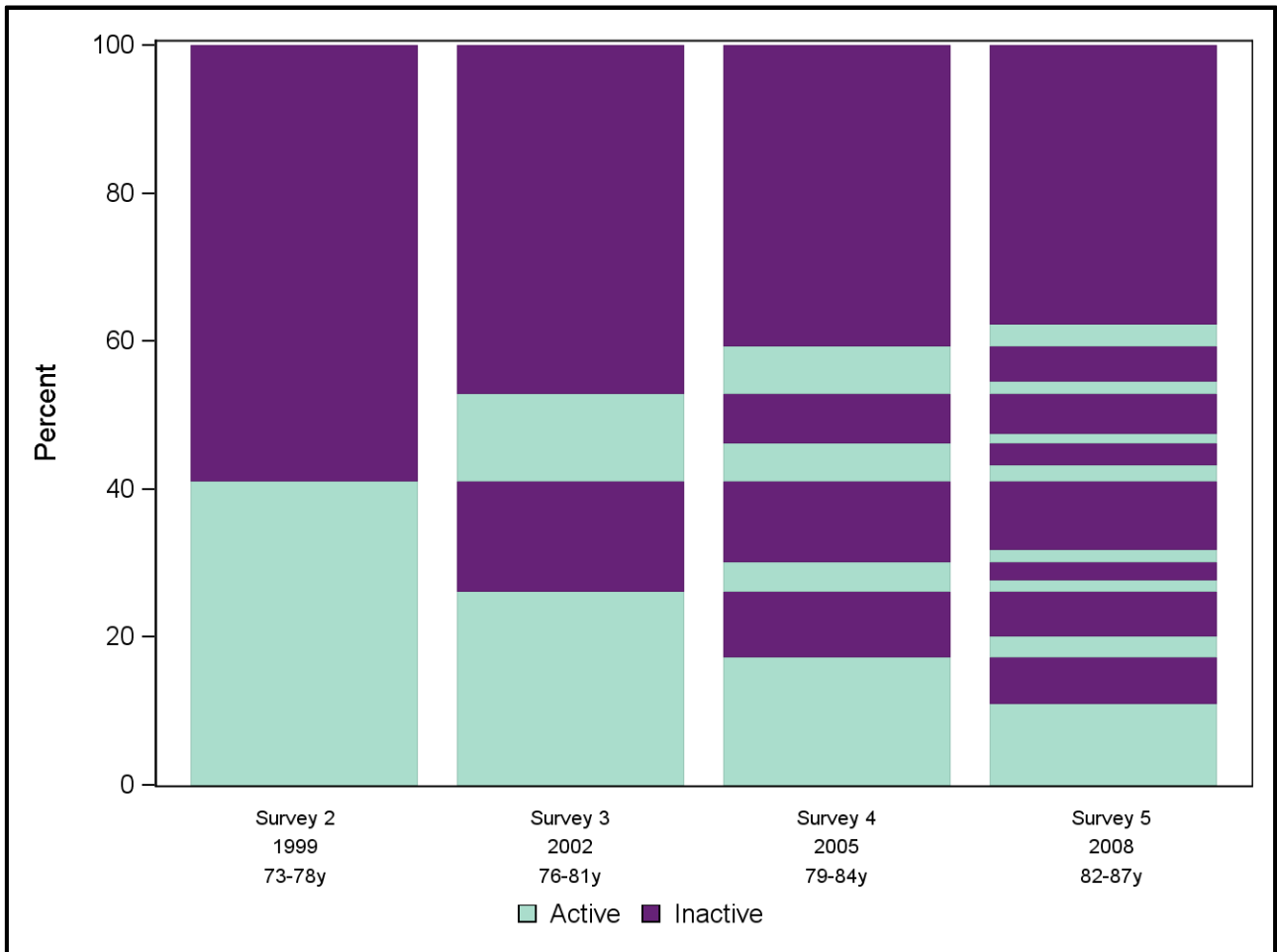
Figure 3-25 Patterns of change in physical activity in the 1921-26 cohort.

3.6.4. Summary

Among the 1973-78 and 1921-26 cohorts, fewer women met guidelines for adequate physical activity with each survey. In contrast, adherence to these guidelines increased among women born 1946-51. These cohort differences may be due to different stages in the women's lives such as marriage, childbirth and work, as well as changes in physical capacity for older women. What is clear is that there is great variation in activity levels from any one time point to another and few women were consistently meeting these guidelines at all surveys. Among the 1973-78 cohort, only 18% of women maintained adequate levels of physical activity at all surveys.   Women were less likely to stay physically active once they married, had children, or were divorced. Likewise, among the 1946-51 cohort, there was a great fluctuation in adherence from survey to survey and 18% were active at all surveys. However, the overall trend in this cohort was that women moved from inadequate to adequate levels of physical activity so that 57% per cent could be considered to be meeting the guidelines by Survey 6. This increase in activity was associated with changes in work and death of spouse, but a decrease was associated with birth of a grandchild. Activity levels decreased overall in the 1921-26 cohort so that by Survey 6 only 24% met the guideline. Factors associated with decreasing activity included major illness, injury or surgery, and moving into institutional care.

3.6.5. References

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3.7. Pregnancy and early motherhood

3.7.1.Adherence to guidelines during pregnancy

Pregnant women and their babies are potentially more vulnerable to harm than women who are not pregnant. As a result numerous guidelines have been developed for pregnant women. In this report, we examine adherence with guidelines on smoking, alcohol, diet and exercise in relation to pregnant women. The recommended guidelines between 1996 and 2009 are shown in Table 3-10.

Table 3-10 Recommended guidelines for pregnant women by years

Guideline	Years
Smoking	
No smoking	1996 - 2009
Alcohol	
Abstinence	1992
No more than 2 standard drinks a day and less than 7 drinks a week	2001
Abstinence	2009
Diet: minimum serves	
4-6 serves of bread, cereals, rice, pasta or noodles	1998 - 2010
5-6 serves of vegetables or legumes	1998 - 2010
4 serves of fruit	1998 - 2010
2 serves of milk, yoghurt or cheese	1998 - 2010
1.5 serves of meat, fish, poultry, eggs, nuts or legumes	1998 - 2010
0-2.5 serves of extra foods	1998 - 2010
Exercise	
30 minutes of moderate activity on most days (600 MET mins per week)	

The guidelines range from the simple and consistent message, 'Do not smoke', to relatively complex messages about a healthy diet. Furthermore the alcohol guidelines are complex and they have changed over time.

3.7.2. Smoking guidelines

Adherence to advice to not smoke during pregnancy is shown for women who answered any survey in Figure 3-26. This figure suggests that adherence to this recommendation improved rapidly with age. Similar results were obtained for women who answered every survey, with about 95% of pregnant women aged 31-36 reporting not smoking during their pregnancy.
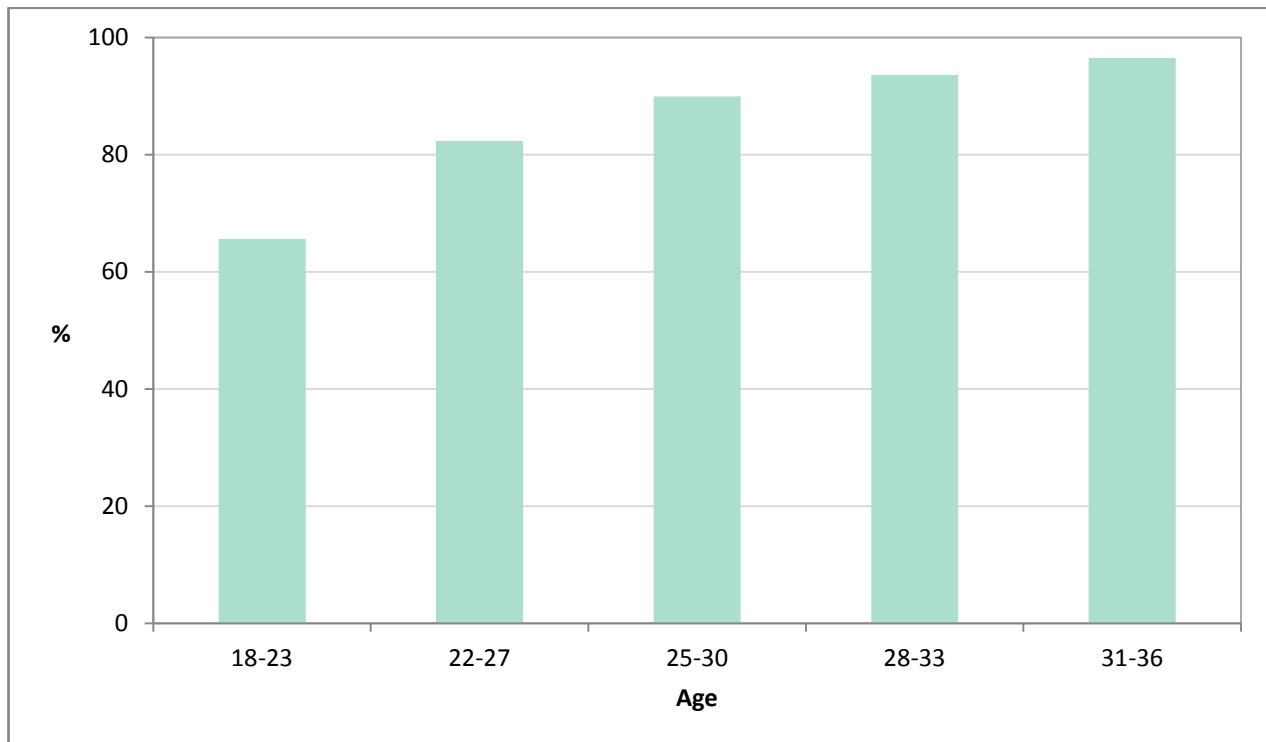
Figure 3-26 Percentages of pregnant women adhering to the guideline not to smoke during pregnancy.

Detailed analyses into changes in smoking behaviour in the younger cohort show that women who were pregnant were more likely to quit smoking. In contrast, those who had been pregnant and were not currently pregnant were more likely to start smoking again (McDermott et al., 2004). More educated and urban women were more likely to decrease smoking during pregnancy (Powers et al., 2012). Women who were single, those who had other children and those who had less social support, experience of partner violence, poor mental health and monetary stress were more likely to continue smoking during pregnancy. Heavier smokers, that is, those smoking 10 or more cigarettes a day before pregnancy were more likely to continue smoking.

3.7.3. Alcohol guidelines

Alcohol guidelines for pregnant women changed from abstinence to low alcohol consumption between the second and third surveys of the 1973-78 cohort, when the cohort was aged 23 to 28 years. Figure 3-27Figure 3-27 shows the percentages of women who reported being abstinent when pregnant (green bars) and those who consumed no alcohol or low levels of alcohol when pregnant (purple bars). More detailed analyses of alcohol consumption during pregnancy and adherence to alcohol guidelines are summarised below.

Due to the inability to determine a safe level of alcohol consumption for pregnant women (Henderson et al., 2007), the NHMRC alcohol guidelines for pregnant women have been
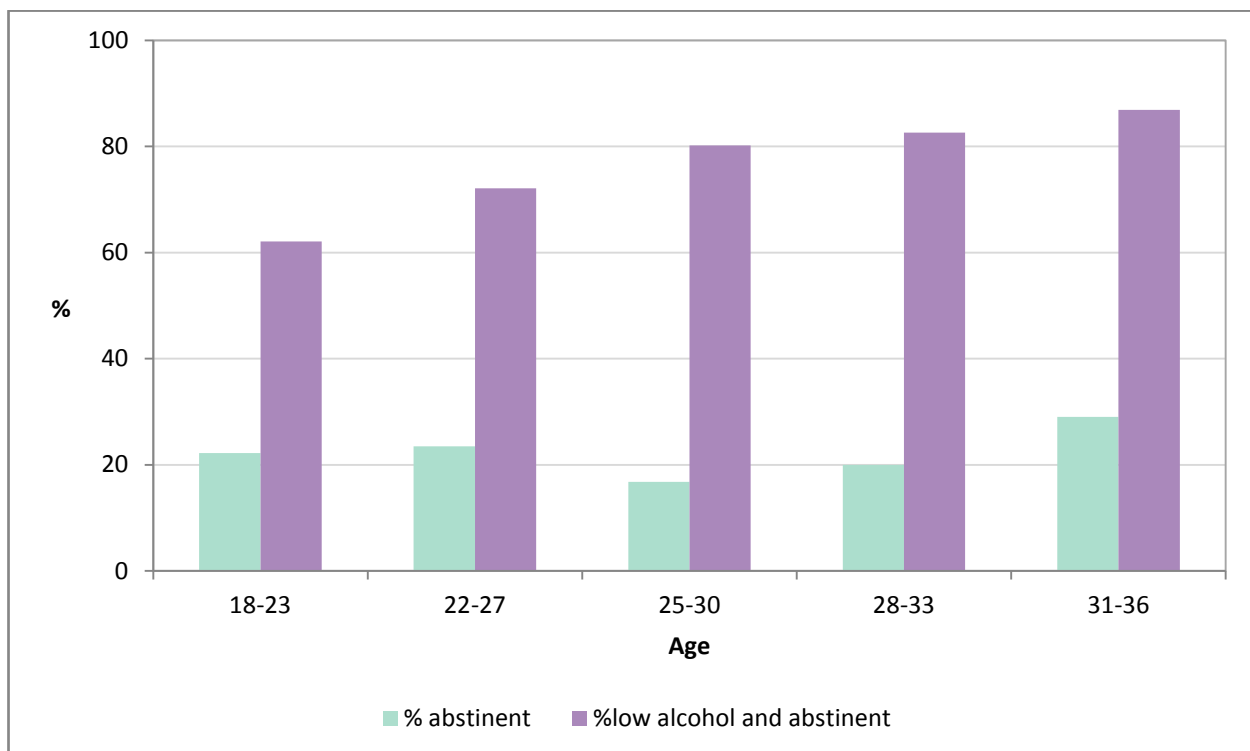
Figure 3-27 Percentages of women consuming no alcohol (abstinent) or no or low alcohol (low alcohol and abstinent) during pregnancy.

inconsistent over the past few decades. Three different guidelines have existed for the 1973-1978 cohort throughout their childbearing years (Table 3-11). At Surveys 1 and 2, the 1992 NHMRC guidelines were in place. The October 2001 guidelines were current during Surveys 3 and 4, and the February 2009 guidelines were implemented one month prior to Survey 5 being sent to participants.

Table 3-11 Changes in NHMRC alcohol guidelines for pregnant women

1992 Guidelines (NHMRC, 1992)
• Abstinence

2001 Guidelines (NHMRC, 2001)
• "may consider not drinking at all; • most importantly should never become intoxicated; • if they choose to drink, over a week, should have less than 7 standard drinks, AND, on any one day, no more than 2 standard drinks (spread over at least two hours); • should note that the risk is highest in the earlier stages of pregnancy, including the times from conception to the first missed period."

2009 Guidelines (NHMRC, 2009)
• Abstinence: "Not drinking is the safest option"

Prevalence of adherence to alcohol guidelines by pregnant women

Data from Surveys 2 through 5 from the 1973-1978 cohort were used to determine the prevalence of adherence to the different alcohol guidelines by pregnant women. Information about adherence to the 1992 and 2001 NHMRC alcohol guidelines by pregnant women has been reported in a 2010 paper in the *Medical Journal of Australia* (Powers et al., 2010). Pregnant women's adherence to the 2009 NHMRC alcohol guidelines was covered in work that is currently being considered for publication (Anderson et al., unpublished). Overall, 2085 pregnancies from the 2000, 2003, 2006, and 2009 surveys were used for these analyses.

Figure 3-28 shows the proportion of pregnant women who consumed alcohol during pregnancy along with their level of compliance with the corresponding NHMRC guidelines. The majority of women (80%, 83%, and 72%, respectively) consumed alcohol during pregnancy, regardless of which alcohol guidelines were in place. Of the 829 women who were pregnant during the time of the 2001 NHMRC guidelines, 80% were either abstaining from alcohol or drinking at low levels consistent with the guidelines. Adherence to the 1992 and 2009 NHMRC alcohol guidelines promoting abstinence was poor, with only 20% and 28% of pregnant women, respectively, adhering to the two sets of guidelines. Formal analysis by Powers et al. (2010) found that pregnant women were three and a half times more likely to adhere to the low alcohol guidelines of 2001 than with the 1992 guidelines that recommended abstinence.
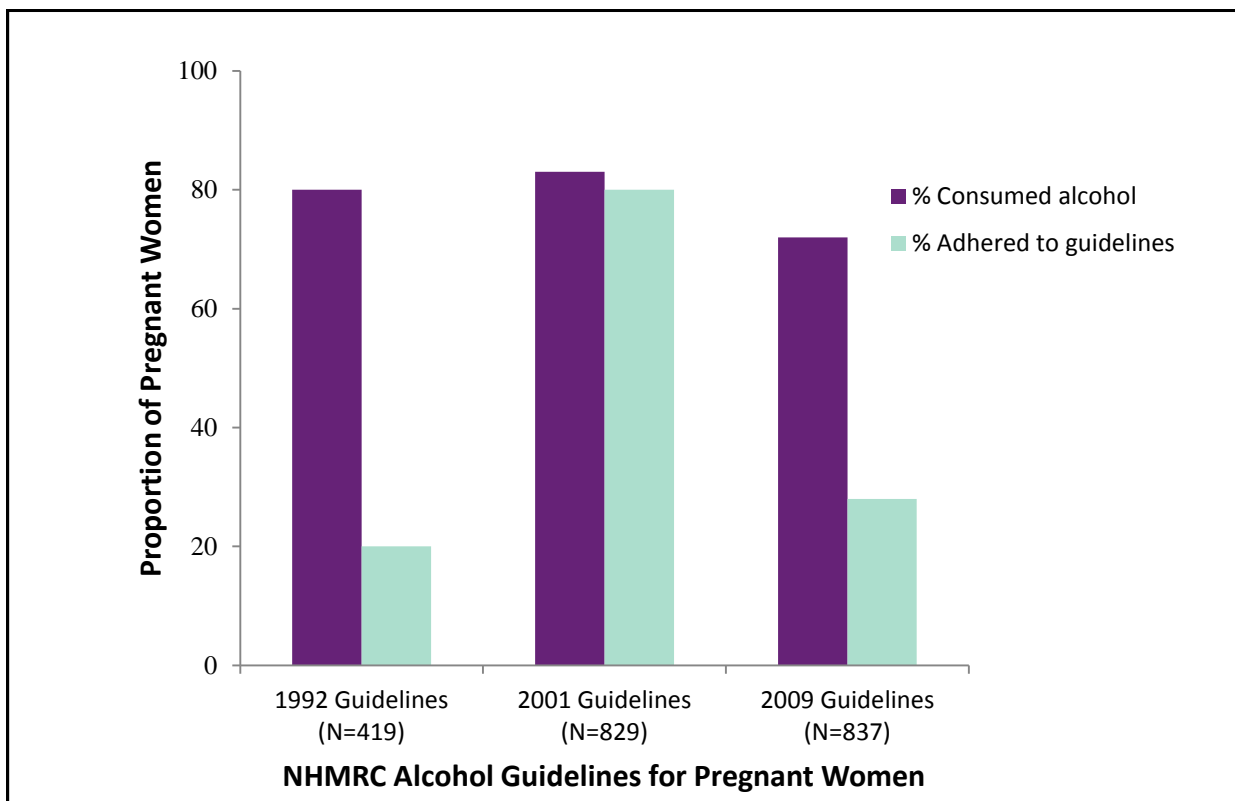
Figure 3-28 Adherence to NHMRC alcohol guidelines by pregnant women of the 1973-1978 ALSWH cohort.

Predictors of pregnant women's adherence to alcohol guidelines

When controlling for maternal age, area of residence, education, marital status, and birth order, pregnant women were more likely to adhere to the 1992 and 2001 guidelines if they had abstained from alcohol prior to pregnancy and if they were pregnant during the period of the 2001 (low alcohol) rather than the 1992 (abstinence) guidelines (Powers et al., 2010).

Previous alcohol use was also a strong predictor of adherence to the 2009 guidelines. After controlling for area of residence, pregnant women who drank before pregnancy at least once a week, or binge drank prior to pregnancy, were far less likely to adhere to the zero alcohol guidelines. Pregnant women who had previously adhered to alcohol guidelines were more likely to adhere to the 2009 guidelines during pregnancy, suggesting a pattern of adherence among the women. Household income was inconsistent in predicting 2009 guideline adherence by pregnant women, but there was some evidence to suggest that women with the lowest household incomes were more likely to adhere.

3.7.4. Exercise guidelines

Adherence to the exercise guideline of 30 minutes exercise on most days a week was examined for women who answered any survey and for those who answered all surveys, with similar results for both sets of analyses. Figure 3-29 shows the percentage of women who answered any survey and adhered to the exercise guideline when pregnant. Adherence to the exercise guideline was poor. Adherence started at around 40% in 18-23 year olds and declined to around 30% for women at subsequent surveys.
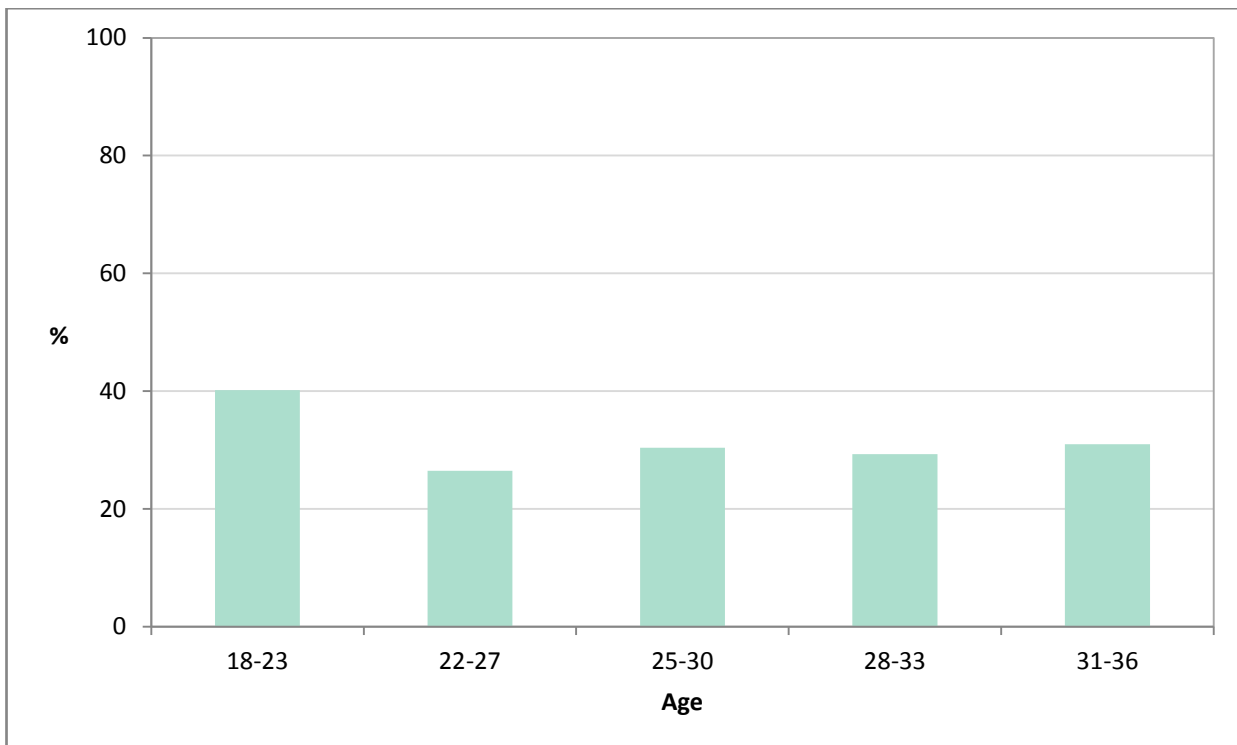
Figure 3-29 Percentages of pregnant women who adhered to the guideline of 30 minutes exercise on most days in a week.

3.7.5. Diet guidelines

Diet quality in pregnancy

As shown in section 3.5, dietary intakes for pregnant women were similar to other women in the 1973-78 cohort, with most women not adhering to guidelines for most food groups. The main difference was that pregnant women were more likely to adhere to guidelines for dairy foods. Here we report additional investigation into diet quality during pregnancy.

In 2009 the first study of diet quality in pregnancy in an Australian cohort was published, using data from Survey 3 of the 1973-1978 cohort, which included a food frequency questionnaire (FFQ), the Dietary Questionnaire for Epidemiological Studies (version 2) (Hure et al., 2009). This FFQ has been previously validated against seven-day weighed food records in a different cohort of Australian women of childbearing age (n=63) (Hodge et al., 2000). In their research, Hure and colleagues reported on nutrient intakes as well as diet quality, using the Nutrient Reference Values for Australia and New Zealand (DoHA & NHMRC, 2006). Participants were categorised into one of four pregnancy groups: (i) pregnant, (ii) trying to conceive, (iii) had a baby in the last 12 months, and (iv) other. They found that macro- and micronutrient intakes were consistently higher in women who were pregnant or had given birth in the previous 12 months, compared with those trying to conceive or otherwise not pregnant. However, some important nutrients consistently fell short of the Nutrient Reference Values; specifically dietary fibre, folate and vitamin E. Reported iron intake was low in the pregnant group. Mean sodium intakes were higher than the upper level of intake at more than2300mg/d for all groups. Potassium was lower than the adequate intake for women trying to conceive and 'others'. As lactation status could not be confirmed, all groups were compared to either the pregnant or non-pregnant Nutrient Reference Values (Hure et al. 2009).

Blumfield and colleagues (2011) went on to further investigate the dietary intakes of the same women, but focused on the food groups defined by the Australian Guide to Healthy Eating (AGHE) (Smith et al., 1998). Food servings per day were calculated using the portion sizes described in the AGHE for each of five core food groups: breads/cereals (grains); lean meat and alternatives (including eggs, nuts and legumes); vegetables (excluding legumes); fruit; and dairy; plus the one non-core food group called 'extras'. Despite using the minimum number of serves per food group, Blumfield and colleagues showed that out of n=7486, no women met all AGHE food group recommendations. They suggest "The AGHE does not align with contemporary diets of Australian women…". The highest rates of adherence were for the number of serves of meat, fruit and dairy, respectively. Blumfield and colleagues were able to model food group intakes that did meet the Nutrient Reference Values while deviating from the AGHE. Typically this meant consuming a greater number of serves of fruit and dairy while pregnant; more dairy, less fruit and vegetable if lactating; and more fruit, meat, and fewer serves of vegetables to achieve the nutrient targets for adult women (Blumfield et al., 2011).

Pezdirc and colleagues have also analysed the data from Survey 3 of the 1973-1978 cohort using the pregnancy categories defined by Hure and colleagues (2009). They assessed the impact of women adhering to Listeria monocytogenes food recommendations on micronutrient intakes and then tested whether more frequent consumption of "high risk" foods was associated with a greater number of miscarriage, preterm birth or stillbirth. A Listeria Food Exposure Score was derived from the potential food sources of listeria identified in the FFQ. There were weak but significant positive correlations between the Listeria Food Exposure Score and all nutrients, meaning that a greater intake of foods that potentially contain Listeria was associated with a higher intake of nutrients. Women with the highest intakes of potentially risky listeria foods reported 19% more miscarriages than those in the lowest exposure group, after adjusting for maternal age, parity, smoking, alcohol and body mass index (BMI). The authors suggest that a

moderate consumption of potential risky foods may be the optimal approach to balancing adequate nutrient intake with reduced risk of listeriosis.

Iodine

Iodine is a nutrient of significance to women of childbearing age, as it is critical to foetal and infant development. Iodine cannot be stored in the body, so small amounts need to be consumed regularly. During pregnancy and breastfeeding, iodine requirements increase substantially (from 150 μg/day for all adults to 200 μg/day for pregnant and lactating women), yet Australian studies consistently suggest that the iodine intake of pregnant women is inadequate (Australian Population Health Development Principal Committee, 2007). Researchers have examined iodine intake in ALSWH participants, and recently estimated the impact of iodine fortification on the diet of pregnant and post-partum women from the 1973-1978 cohort (Mackerras et al., 2011). They categorised women according to pregnancy and childbirth status, and applying the iodine concentrations used by food standards authorities, first estimated current iodine intake gained through consumption of key foods containing iodine, such as bread, and then estimated increases that mandatory fortification of bread with iodine might cause. Consumption was determined based on responses to the FFQ included in the 2003 ALSWH survey. They found women who were pregnant or had recently given birth consumed more bread than other women, but iodine intake was still below dietary recommendations (Mackerras et al., 2011). Their findings suggest that while additional supplements may still also be required, fortification of bread with iodine would increase the likelihood of pregnant and lactating women reaching the 200 μg/day intake of iodine recommended in the current guidelines.

Iron

Iron deficiency is common in women of childbearing age. The consequences of iron deficiency include fatigue, poor cognitive functioning and anaemia (Patterson, Brown, & Roberts, 1998). However, iron deficiency is a preventable and treatable condition. Data from the ALSWH have provided evidence that low iron is associated with lower general health and wellbeing. For instance at the baseline survey (1996), 24% of the 1973-1978 cohort and 31% of the 1946-1951 cohort reported (ever) having 'low iron' (Patterson, Brown, Powers, & Roberts, 2000). Women from both the 1973-1978 and 1946-1951 cohorts who reported ever having low iron were more likely than women with no history of low iron to have poorer physical and mental health. However, the greatest effect for women of both cohorts was lack of vitality. Women who reported having low iron were also more likely to report constant tiredness than women with no history of low iron (1973-1978: 67 and 45%, respectively, 1946-1951: 63 and 48%, respectively) (Patterson et al., 2000). These data support the importance of encouraging women to increase their uptake of iron during the childbearing period, as recommended by the Australian Dietary guidelines.

3.7.6.Breastfeeding

Background

The benefits of breastfeeding for both mother and infant are well recognised. Not only does breastfeeding aid bonding between the mother and the child, but it helps the mother recover from child birth and protects against some cancers later in life (NHMRC, 2003). The short and long term benefits of breastfeeding for infants include improved immunity to infections and protection against obesity and chronic diseases later in life. (Eidelman & Schanler, 2012)

In 1995, the National Health and Medical Research Council (NHMRC) released dietary guidelines for children stating 'Breastmilk provides all the nutritional needs of a full-term infant for the first four to six months of life and remains an important food for the first 12 months.' (NHMRC, 1995). Australian guidelines for breastfeeding have changed from exclusive breastfeeding for 4-6 months in the 1990s to exclusive breastfeeding for the first six months in the 2000s, and then continue breastfeeding to 12 months and beyond, if both mother and infant wish (NHMRC, 2003).

Data from the Australian Longitudinal Study on Women's Health

ALSWH data from Survey 5 (2009) of the 1973-78 cohort were used to investigate how many completed months women had breastfed their children. At Survey 5, women were asked to write the number of complete months they had breastfed each of their children. These data were used to calculate the percentage of infants who were breastfed for at least one month and so on (see Figure 3-30 and Appendix D Table 1). As some children were less than a year old, these children could only be breastfed up to their current age. It was not known if infants less than one month old had ever been breastfed.

Four thousand, eight hundred and eighty-eight women had given birth to 9229 children between 1990 and 2009, with one-third born before 2003. Fifty-two per cent of women had one child, 34% had two children and the remaining 14% had between three and seven children. Figure 3-30 includes data for all children including those who were under a year old. One in ten children was not breastfed for a complete month after birth. A little over half the children were breastfed for six months, less than 40% to 12 months and less than 10% to two years. Results are similar to those obtained from the 2010 Australian National Infant Feeding Survey for breastfeeding up to six months. (Australian Institute of Health and Welfare, 2011) From six months onwards, the percentage of women breastfeeding in the 1973-78 cohort is somewhat lower.
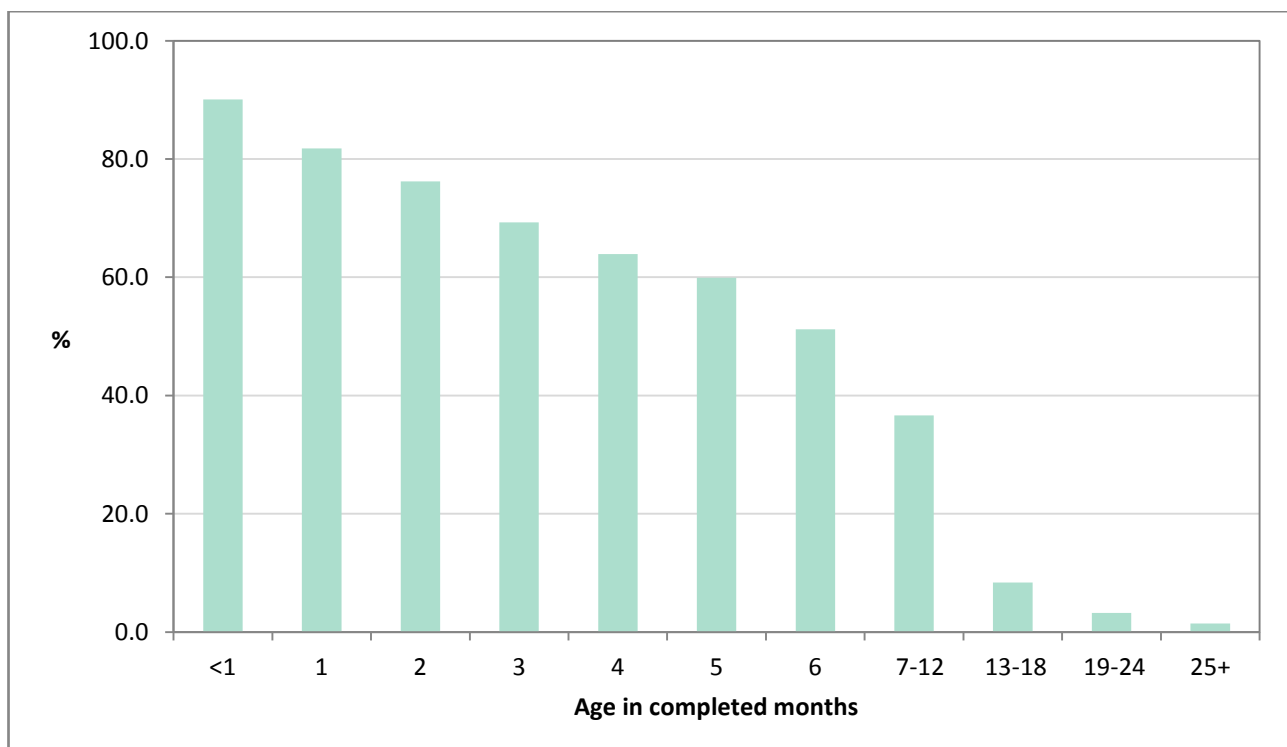
Figure 3-30 Percentages of children by complete months breastfed.

We examined whether women were breastfeeding at six months, one year and two years or more. Women were not asked if they exclusively breastfed, so exclusive breastfeeding is not reported here. As only 3% of the children were breastfed for two years or more, we investigated whether women were still breastfeeding at six months, and at 12 months for 8629 children who were at least one year old. Between 60% and 70% of women aged between 26 and 36 were breastfeeding at six months (see Figure 3-31). Around 30% of women of the same age were breastfeeding at 12 months. Younger women were least likely to breastfeed their children to six months or a year.
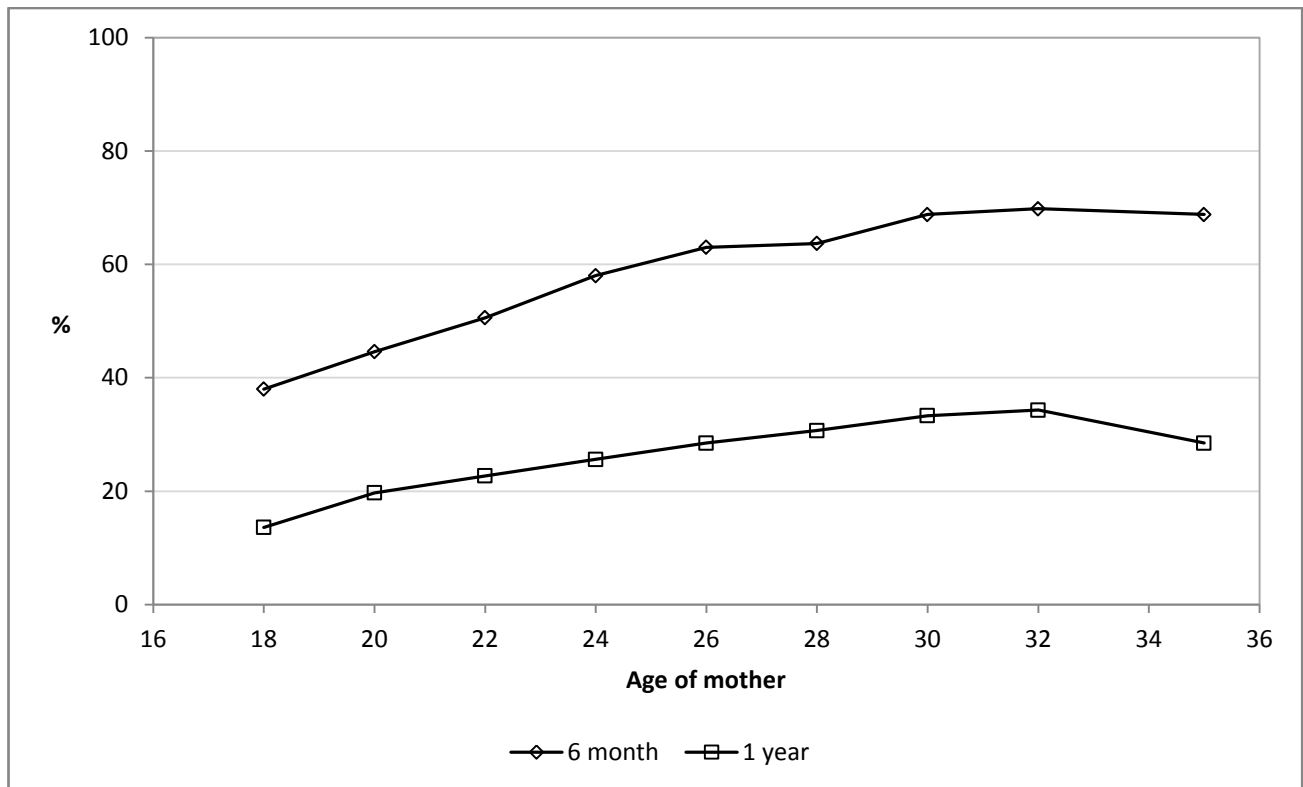
Figure 3-31 Percentage of women breastfeeding at six months and one year.

While the age of the mother has an influence on duration of breastfeeding, Figure 3-32 shows that overall women were equally likely to breastfeed their first, second, third and subsequent children for six months or more.
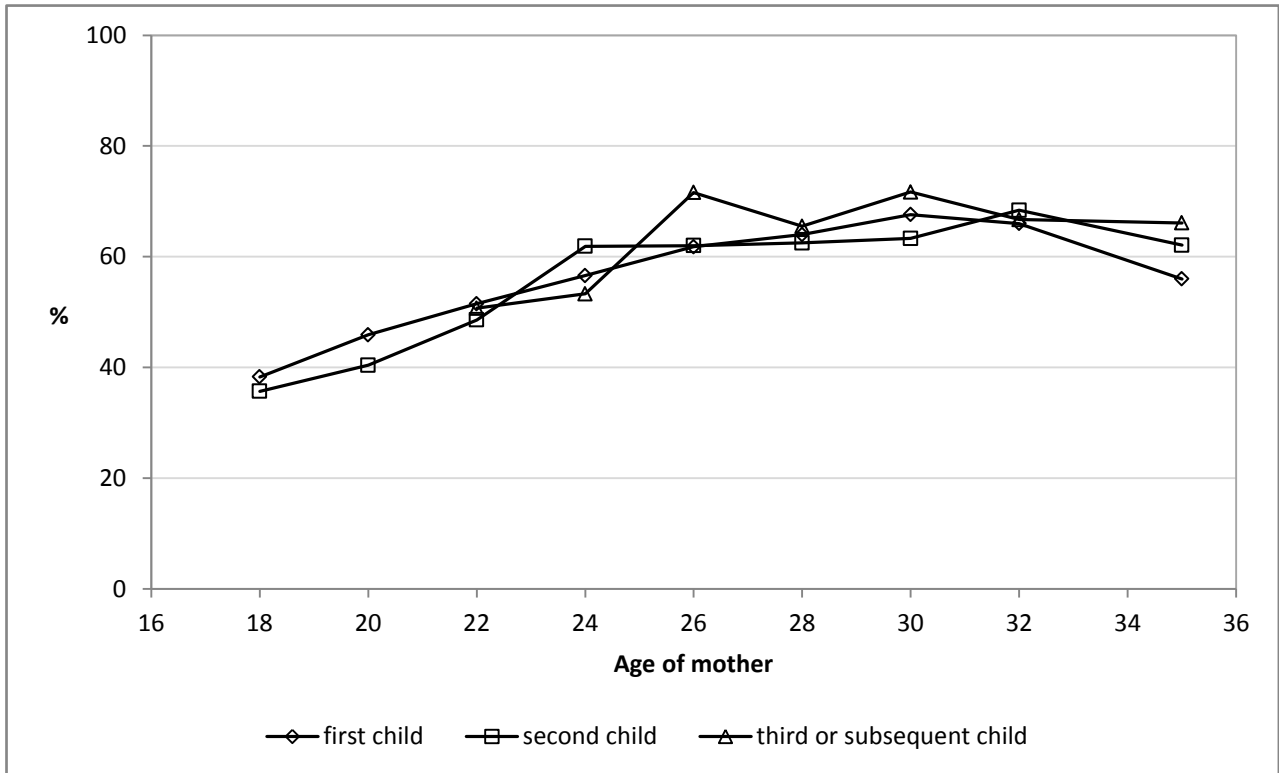
Figure 3-32 Percentages of women who were breastfeeding at six months plotted against average age of the women.

This does not mean that women breastfed all of their children for six months or more. More than half the women (53%) breastfed all their children for six months, 15% breastfed at least one of their children and 32% did not breastfeed any of their children for six months. When demographic characteristics of these groups of women at Survey 5 were compared, women with more education were more likely to breastfeed to six months or more (Figure 3-33) and women who were married were more likely to be adherent to the six month breastfeeding guideline, (Figure 3-34), and so were women who were not stressed about money (Figure 3-35).
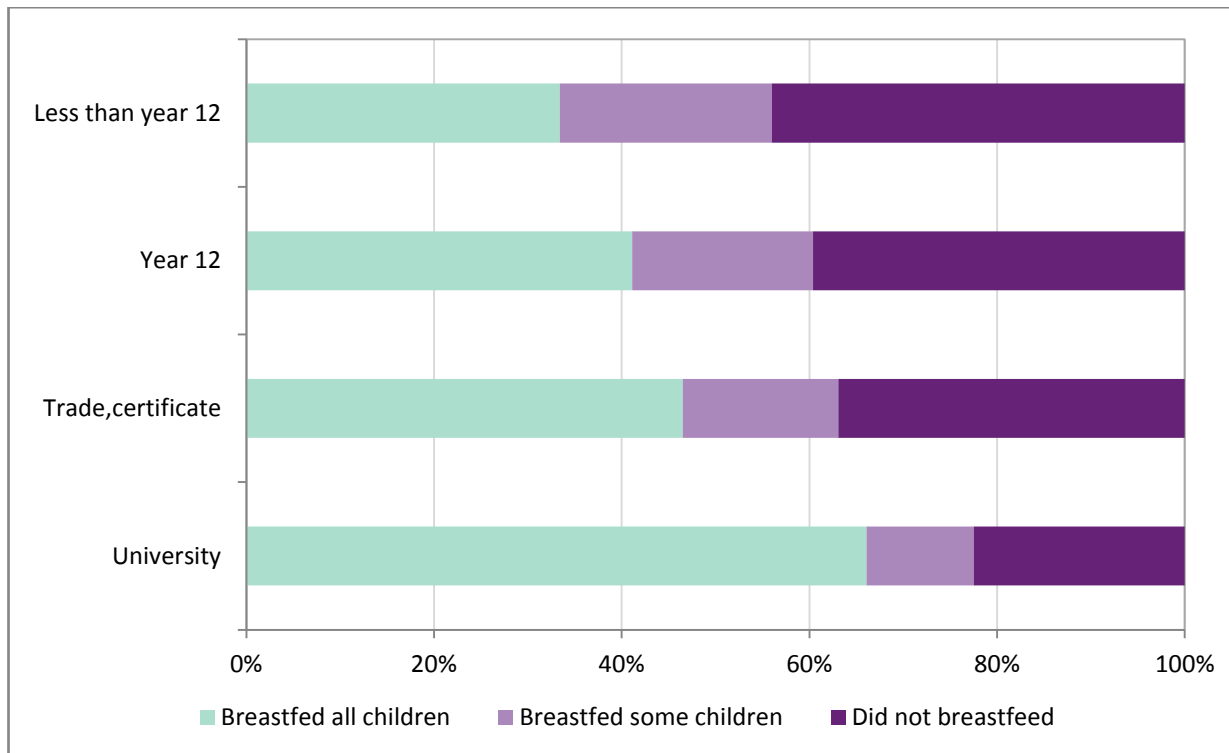
Figure 3-33 Percentage of women breastfeeding at six months by level of education.
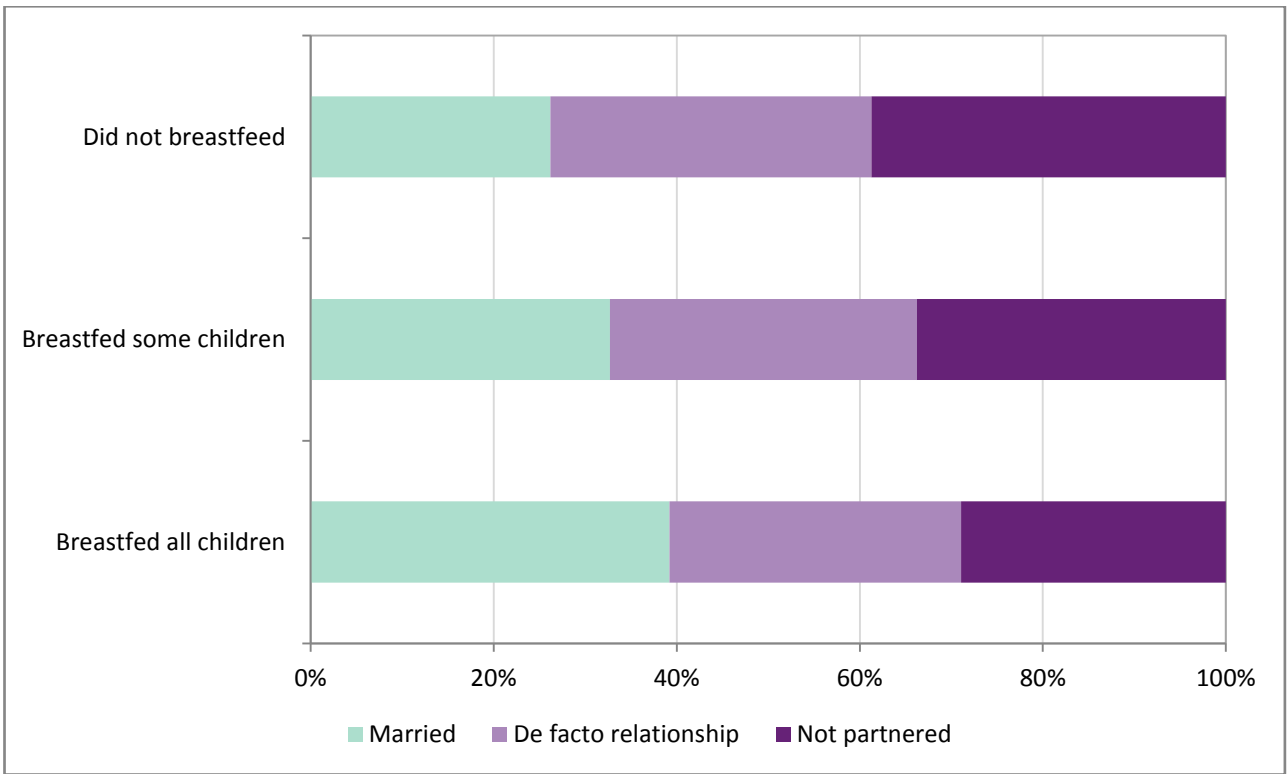
Figure 3-34 Percentage of women breastfeeding at six months by relationship status.
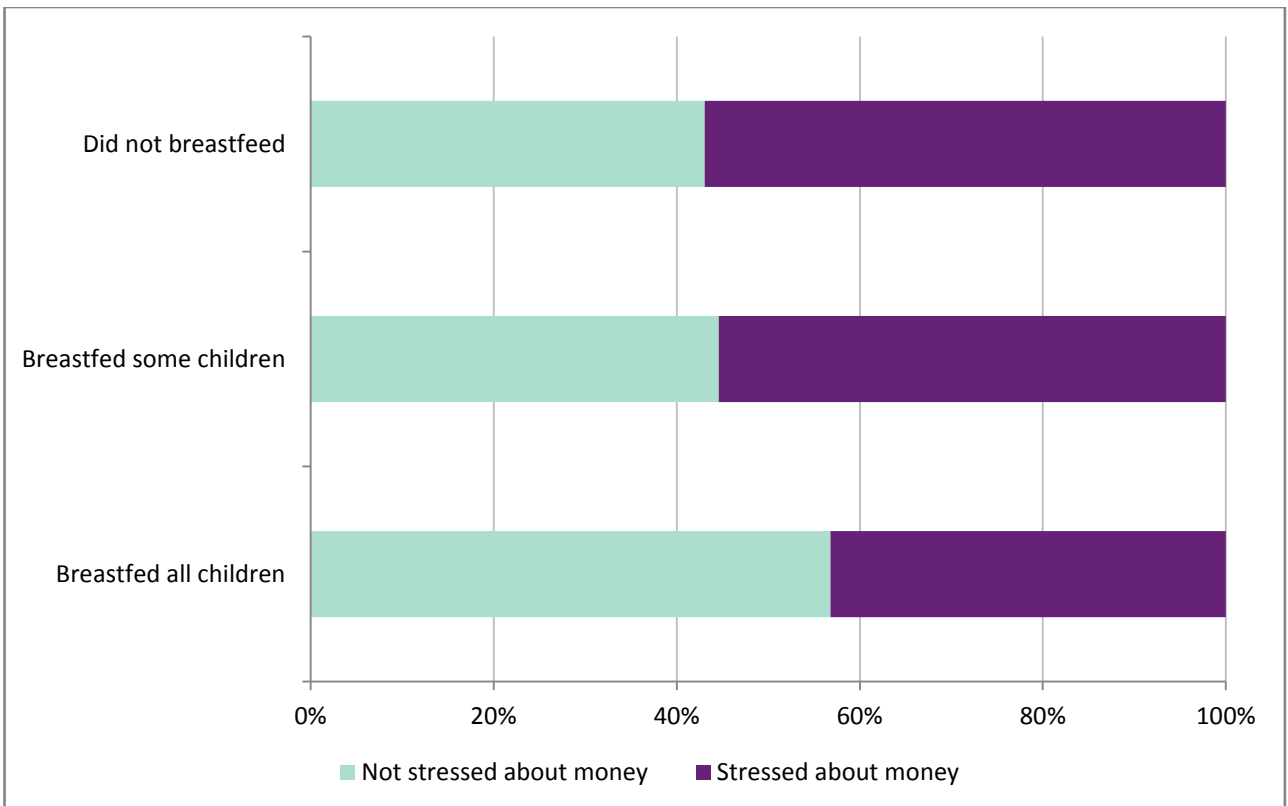
Figure 3-35 Percentage of women breastfeeding at six months by monetary stress.

Summary

Adherence to advice to not smoke during pregnancy increases with the age of the woman, with around 95% of pregnant women aged 31-36 not smoking during their pregnancy. In contrast, the proportions of women from the 1973-1978 cohort who consume alcohol during pregnancy has remained high over time. However, while women are not adherent with the current guideline to not drink alcohol during pregnancy, most women who consume alcohol while pregnant are adherent to the 2001 guideline for lower levels of drinking. These findings suggest that changes to guidelines have not translated into changes in behaviour. Previous drinking behaviour was a strong predictor of whether women would adhere to alcohol guidelines during pregnancy. Adherence to guidelines during pregnancy was most common among women who had abstained from alcohol prior to pregnancy or those who had previously consumed alcohol within recommended levels.

A detailed analysis of diet quality revealed that pregnant women's diets were often deficient in important nutrients including fibre, folate, Vitamin E, iodine and iron. There is also potential tension between guidelines to avoid foods that are at high risk of listeria contamination and achieving adequate nutrition.

Breastfeeding to at least six months varies both within and between women. Overall 60% of women with children aged one year and older breastfed to six months and almost 30% breastfed to one year. Older, more educated and married women appeared more likely to breastfeed to six months, and younger women and those who are more stressed about money were less likely to breastfeed to six months.

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4. Screening Guidelines

4.1. Introduction

RACGP guidelines for preventive activities in general practice (the Red Book) recommend a number of health checks that apply to women in the ALSWH age groups, particularly those in the 1946-51 cohort who were aged 45 to 50 years when the study began. From around the age of 45 women develop increased risk of many chronic conditions including cardiovascular disease (CVD) and cancers. Cardiovascular diseases, particularly coronary heart disease and stroke, are the most common cause of death, and the second largest contributor to Australia's disease burden (AIHW, 2010a). In 2006, CVD accounted for over one-third of all deaths among women in Australia, and around one-quarter of deaths among women aged less than 84 years (premature deaths) (AIHW, 2010b). About two million Australian women currently have CVD, and even more have major preventable risk factors such as high blood pressure, overweight and obesity, high cholesterol, insufficient physical activity, poor nutrition, diabetes, and daily smoking. The Royal Australian College of General Practitioners (RACGP) recommends regular screening for hypertension for all adults and regular testing for high cholesterol and abnormal lipid profiles for all adults aged 45 to 74 years (RACGP, 2009).

RACGP also recommends women are screened for diabetes risk every three years from 40 years of age using the Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK), and those with a risk score of 15 or more should be tested by fasting plasma glucose (RACGP, 2009). Diabetes is a major risk factor for CVD and other complications and accounts for around 6-8% of total disease burden in Australia (AIHW, 2008).

Screening for colorectal, breast, and cervical cancers can reduce illness and death through early detection of cancers and pre-cancers. Pap tests to detect cervical cancer and pre-cancerous changes are recommended by RACGP every 2 years for women who have ever had sex and have an intact cervix, starting from 18–20 years of age (or up to 2 years after first having sexual intercourse, whichever is later). This recommendation is endorsed by the National Cervical Screening Program which was established in 1991 and aims to reduce illness and deaths from cervical cancer through an organised approach to screening in Australia (Department of Health and Ageing, 2012).

Breast cancer is the most common cause of cancer in Australian women. To reduce the risk of breast cancer women aged 50–69 years are recommended to attend for mammographic screening every 2 years (RACGP, 2009). Breast Screen Australia is a comprehensive population-based screening program that aims to reduce morbidity and mortality from breast cancer by providing free biennial mammograms to eligible women in the target age range of 50-69 years of age. Women aged 40-49 years and 70 years of age and older are also eligible to participate in the program. The program offers screening at over 500 locations nationwide, via fixed, relocatable and mobile screening units. In addition to mammographic screening, breast examination by a clinician is a common clinical procedure provided as part of well-women checks. However, there is no evidence that clinical breast examination will provide additional benefit for women who have regular mammograms. Likewise, while breast self-examination is not recommended as an effective means of early detection, women are advised to be familiar with the normal look and feel of their breasts and to report any new or unusual changes to their doctor.

Colorectal cancer is the second most common cause of cancer in women. Screening for colorectal cancer, using faecal occult blood testing is recommended every two years from 50 years of age. This recommendation is based on evidence from several randomised controlled trials (Hardcastle,

et al., 1996; Jorgensen et al., 2002; Kronborg et al., 1996; Mandel, et al., 1993; Mandel et al., 1999; Scholefield et al., 2002), and is supported by NHMRC endorsed Guidelines for the Prevention, Early Detection and Management of Colorectal Cancer distributed by the Cancer Council Australia and Australian Cancer Network (Australian Cancer Network Colorectal Cancer Guidelines Revision Committee, 2005).

Routine screening for skin cancer is not recommended for the general population. However people are advised to observe their skin and to seek advice for any lesions that may be causing concern. The RACGP recommend that high risk individuals from 40 years of age should be examined for skin cancer opportunistically.

Other screening procedures recommended for women in middle age include urinalysis to check for kidney disease, and opportunistic screening for depression. However doctor provided screening for these conditions has not been assessed within the ALSWH Surveys.

The recommended procedures for each ALSWH cohort are summarised in Table 4-1.

Table 4-1 Procedures recommended for women in ALSWH age groups

Procedure	1973-78 cohort	1946-51 cohort	1921-26 cohort
Blood Pressure Assessment	Every 2 years	Every 2 years (every 6-12 months if higher risk)	Every 2 years (every 6-12 months if higher risk)
Cholesterol and Lipids		Fasting blood lipids Every 5 years (every 1-2 years if higher risk)	Fasting blood lipids Every 5 years (every 1-2 years if higher risk)
Type 2 diabetes		Every 3 years using the Australian Type 2 Diabetes Risk Assessment Tool (AUSDRISK). Those with a risk score of 15 or more should be tested by fasting plasma glucose	Every 3 years
Urinalysis		Every 5 years	Every 5 years
Skin Cancer examination		Opportunistically from age 40	Opportunistically
Pap test (for women with a cervix)	Every 2 years from age 18, or 1-2 years after becoming sexually active.	Every 2 years	
Mammogram		Every 2 years from age 50	
Faecal occult blood test		Every 2 years from age 50 (or earlier if high risk)	
Chlamydia	Opportunistically for all sexually active women aged <25		
Depression	Opportunistically	Opportunistically	opportunistically
Bone mineral density			Every 2 years
Falls, gait or balance problems			Every 12 months
Vision and hearing			Every 12 months

Note: Items in bold are asked in ALSWH surveys

4.2. Proportions of women in the 1946-51 cohort who reported having recommended health checks

In 2010 (Survey 6) over 80% of women in the 1946-51 cohort reported they had had their blood pressure, cholesterol and blood sugar checked in the past three years (Figure 4-1). Women also commonly reported recent screening for breast and cervical cancer, with 83% reporting having a mammogram and 80% of eligible women reporting a Pap test in the past 2 years. Women were less likely to be screened for bowel cancer with only one-third of women reporting having had a test for bowel cancer in the past three years.
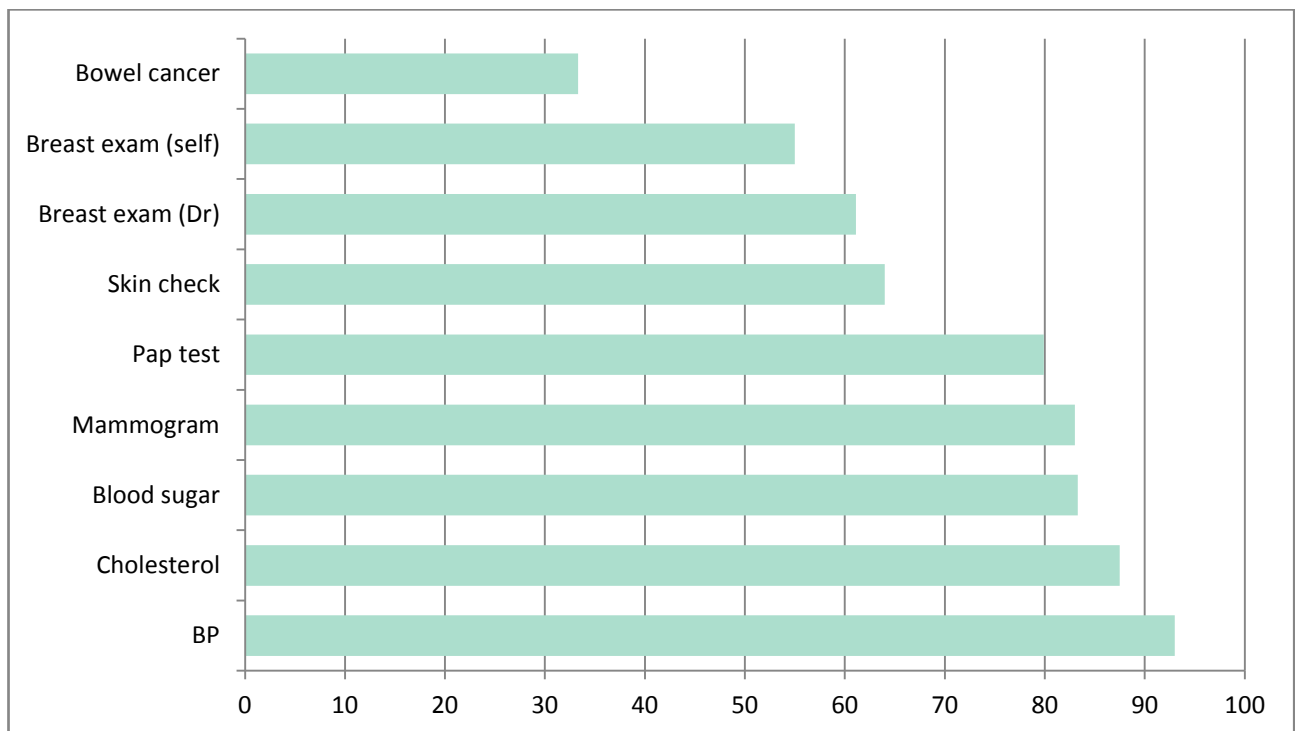
Note: Women who had a hysterectomy were not included in the denominator for calculation of participation in cervical cancer screening.

Figure 4-1 Proportions of women in the 1946-51 cohort reporting screening procedures at Survey 6.

4.3.   Factors associated with recommended health checks

4.3.1. Demographic factors

Table 4-2 shows the demographic characteristics of women who reported Pap tests, Mammography, bowel cancer check, cholesterol testing, blood sugar tests and skin checks at Survey 6. There were few differences in testing according to area of residence. Women in inner regional areas were a little more likely to have a Pap test compared to women living in major cities, and women in outer regional areas were less likely to have cholesterol testing than women in major cities.

Level of educational qualification was also not strongly associated with testing. Women who completed the higher school certificate (but did not have tertiary qualifications) were a little less likely to have bowel cancer checks than those who did not complete high school. Conversely, women with higher tertiary qualifications were less likely to have cholesterol tests and blood sugar checks.

Marital status other than currently married was associated with a lower probability of having Pap tests, mammograms, and bowel cancer checks. Marital status was a particularly strong predictor for Pap tests. Compared to married women, those who had never married were much less likely to have had a recent Pap test.

Compared to those in full-time work, part-time employment status was associated with increased probability of Pap tests, mammography, bowel cancer checks, and cholesterol testing.

4.3.2. Health care factors

Table 4-3 shows health care factors associated with health checks. These factors are associated with testing across the range of tests. Attendance at the same practice, and receiving a reminder from the general practitioner are strongly associated with having recent health checks.

4.3.3. Personal health factors

Personal health factors associated with having health checks are shown in Table 4-4. Poorer self-rated health was associated with lower probability of having Pap tests and mammograms, but increased probability of having cholesterol and blood sugar checks. Likewise, having reported diabetes, heart disease or hypertension (on any survey) increased the probability that women reported having cholesterol and blood sugar checks.

A history of breast cancer was strongly associated with higher probability of mammographic screening, and a history of skin cancer was strongly associated with having a recent skin cancer check. All checks were less likely among those who were current smokers. Overweight and obesity were associated with increased testing for cholesterol and high blood sugar, but obesity was associated with lower probability of having Pap tests, bowel cancer checks, or skin cancer checks. Women who were underweight were less likely to have mammograms than healthy weight women were.

Table 4-2 Demographic factors associated with pap tests, mammography and cholesterol testing (Survey 6).

	Pap test+ (past 2 years)	Mammography (past 2 years)	Bowel Cancer check (past 3 years)	Cholesterol test (past 3 years)	Blood sugar check (past 3 years)	Skin check (past 3 years)
Area of residence:	Major city	Major city	Major city	Major city	Major city	Major city
Inner regional	↑					
Outer regional				↓		
Remote						
Education:	Up to school certificate	Up to school certificate	Up to school certificate	Up to school certificate	Up to school certificate	Up to school certificate
HSC			↓			
Trade/Diploma						
Higher education.				↓	↓	
Marital Status:	Married	Married	Married	Married	Married	Married
Sep/ Divorced	↓	↓	↓			
Widowed	↓↓	↓	↓			
Single	↓↓↓	↓↓				
Employment:	Full-time	Full-time	Full-time	Full-time	Full-time	Full-time
Part-time		↑	↑	↑		
Other						

+excluding women who have had a hysterectomy.

Arrows indicate strength of association (odds ratios):
↑ (1.0<1.5) ↑↑ (1.5<2.5) ↑↑↑ (2.5<3.5) ↑↑↑↑ (3.5<4.5) ↑↑↑↑↑ (4.5+);
↓ (<1.0-0.65) ↓↓ (<0.5-0.4) ↓↓↓ (<0.4-0.3) ↓↓↓↓ (<0.3-0.2) ↓↓↓↓↓ <0.2
No arrow indicates there is no evidence of a relationship.

Table 4-3 Health care factors associated with pap tests, mammography and cholesterol testing.

	Pap test+ (past 2 years)	Mammography (past 2 years)	Bowel Cancer check (past 3 years)	Cholesterol test (past 3 years)	Blood sugar check (past 3 years)	Skin check (past 3 years)
Private hospital insurance	↑↑	↑↑	↑↑	↑		↑
Health care card				↑	↑	
7 or more GP visits each year			↑	↑↑↑	↑↑	↑
Attend same practice each visit	↑↑↑	↑↑↑	↑↑	↑↑↑↑	↑↑↑	↑↑
Attend same GP each visit	↑↑	↑↑	↑	↑↑	↑↑	↑↑
Reminder from GP to have health check	↑↑	↑	↑	↑↑↑↑↑	↑↑↑	↑↑

+excluding women who have had a hysterectomy.

Arrows indicate strength of association (odds ratios):
↑ (1.0<1.5) ↑↑ (1.5<2.5) ↑↑↑ (2.5<3.5) ↑↑↑↑ (3.5<4.5) ↑↑↑↑↑ (4.5+);
↓ (<1.0-0.65) ↓↓ (<0.5-0.4) ↓↓↓ (<0.4-0.3) ↓↓↓↓ (<0.3-0.2) ↓↓↓↓↓ <0.2
No arrow indicates there is no evidence of a relationship.

Table 4-4 Health factors associated with pap tests, mammography and cholesterol testing.

	Pap test+ (past 2 years)	Mammography (past 2 years)	Bowel Cancer check (past 3 years)	Cholesterol test (past 3 years)	Blood sugar check (past 3 years)	Skin check (past 3 years)
Self-rated Health:	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Very good				↑	↑↑	
Good				↑↑	↑↑	
Fair/poor	↓↓	↓↓		↑↑	↑↑	↓
Health conditions						
Diabetes		↓		↑↑↑↑↑	↑↑↑↑↑	↓
Heart disease				↑↑↑↑	↑↑	
Hypertension				↑↑↑	↑↑↑	
Breast Cancer		↑↑↑				
Cervical Cancer		↑				
Skin Cancer	↑	↑	↑			↑↑↑↑↑
Chronic lung disease				↑	↑	
Health behaviours						
HRT use	↑↑	↑		↑	↑	
Smoking:	Never smoked	Never smoked	Never smoked	Never smoked	Never smoked	Never smoked
Ex smoker						
Current smoker	↓↓	↓↓	↓↓	↓↓	↓	↓
BMI:	Healthy weight	Healthy weight	Healthy weight	Healthy weight	Healthy weight	Healthy weight
Underweight		↓↓				
Overweight				↑	↑↑	
Obese	↓↓		↓	↑↑	↑↑	↓

+excluding women who have had a hysterectomy.

Arrows indicate strength of association (odds ratios):
↑ (1.0<1.5) ↑↑ (1.5<2.5) ↑↑↑ (2.5<3.5) ↑↑↑↑ (3.5<4.5) ↑↑↑↑↑ (4.5+);
↓ (<1.0-0.65) ↓↓ (<0.5-0.4) ↓↓↓ (<0.4-0.3) ↓↓↓↓ (<0.3-0.2) ↓↓↓↓↓ <0.2
No arrow indicates there is no evidence of a relationship.

4.4.   Changes in screening over time

Over time, women were more likely to report having had a recent mammogram and cholesterol test, and a little less likely to have Pap tests (Figure 4-2).

Pap test % Yes

Mammogram %Yes

Cholesterol Check (by doctor) % Yes

■ % Yes
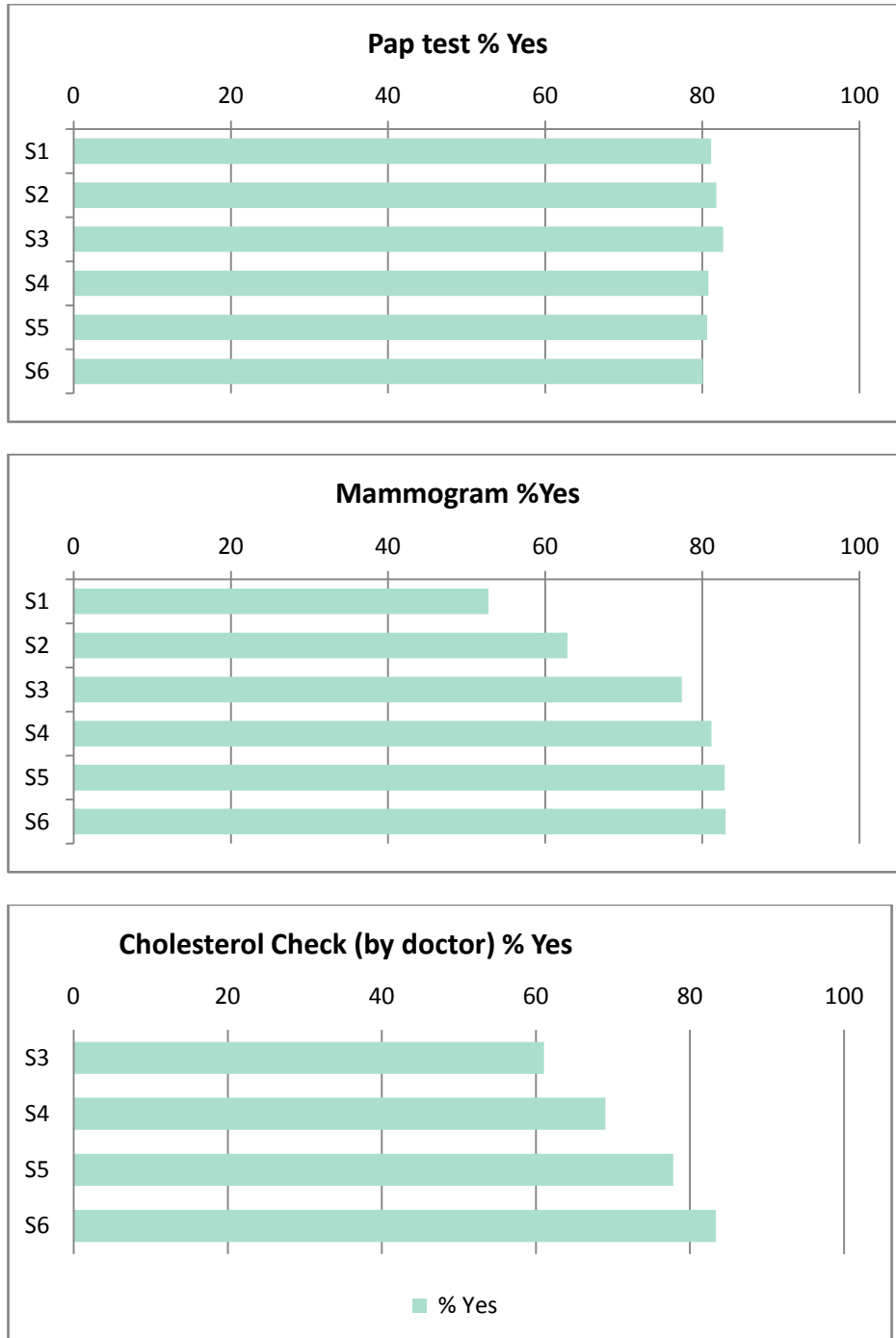
Note: Figures only include responses for women who completed Survey 6. Percentages of women having Pap tests does not include women who ever reported having had a hysterectomy.

Figure 4-2 Changes in reported screening tests

4.4.1. Pap tests

Women were a little less likely to have had a Pap test at Survey 6 compared to Survey 1.   After accounting for this slight decrease in screening over time, demographic factors associated with having a Pap test included marital status, education, and private health insurance.

Married women were more likely to be screened than those who were separated, divorced, widowed or never married. Women with private hospital insurance were more likely to be screened than those without private hospital cover.   After adjusting for these demographic factors, women were:

Less likely to have recent Pap test if they:
- Had no births
- Rated their health as good, fair or poor
- Had no chronic conditions
- Were current smokers
- Were overweight or obese
- Did not use HRT

More likely to have recent Pap test if they:
- Had more than one birth
- Rated their health as excellent
- Had one or more chronic conditions
- Never smoked
- Were healthy weight
- Currently use HRT

4.4.2. Mammography

Women were more likely to report having had a mammogram at Survey 6 compared to Survey 1. This increased participation in screening may reflect the ageing of the women in the cohort, particularly as most women would not have reached the target age for mammographic screening until after Survey 2. The older women were at the start of the study (i.e. closer to age 50 years) the more likely they were to have a mammogram. After accounting for this increase in screening over time, and women's age, demographic factors associated with mammographic screening included area of residence, marital status, and education.

Compared to women living in major cities, women in outer regional and remote areas were more likely to have a recent mammogram. Married women were more likely to be screened than those who were separated, divorced, widowed or never married. Women with higher tertiary education qualifications were less likely to be screened when compared with those who did not complete high school. However, after adjusting for these demographic factors and women's age at the start of the study, women were:

Less likely to have recent mammography if they:
- Had more than 3 children
- Rated their health as fair or poor
- Had no chronic conditions
- Were current smokers
- Were underweight or obese
- Did not use HRT
- Had not had hysterectomy
- Had less than 7 GP visits

More likely to have recent mammography if they:
- Had no children
- Rated their health as excellent
- Had one or more chronic conditions
- Never smoked
- Were healthy weight
- Currently use HRT
- Had a hysterectomy
- Had 7 or more GP visits

4.4.3. Cholesterol testing

Women were more likely to report having **cholesterol** tested at Survey 6 compared to Survey 3 (when this question was first asked). The older the women were at the start of the study the more likely they were to have their cholesterol tested. Women were **less likely** to have had cholesterol testing within the past three years if they:

- lived outside of a major city,
- were in full-time work
- had trade/diploma or higher levels of education
- did not have private health insurance

After adjusting for these demographic factors and women's age at the start of the study, women were:

Less likely to have recent cholesterol test if they:

- Rated their health as excellent
- Had no chronic conditions
- Were current smokers
- Were underweight (compared to healthy weight)
- Did not use HRT
- Had less than 7 GP visits

More likely to have recent cholesterol test if they:

- Rated their health as very good, good, fair or poor
- Had one or more chronic conditions
- Never smoked
- Were overweight or obese (compared to healthy weight)
- Currently use HRT
- Had 7 or more GP visits

4.5. Summary

Apart from blood pressure checks, it appears that many women do not adhere to the full range of guidelines for screening procedures and routine health checks. However, rates for mammographic screening did increase over time, as women moved into the target age ranges for this test, with over 80% of women being screened within the recommended two year interval at the time of Survey 6. Cholesterol screening also increased over time and as the women aged, and Pap test coverage remained at around 80%.

Blood sugar checks and cholesterol were far more likely to be reported by women who also report having hypertension, diabetes or heart disease. This may suggest that these procedures are more commonly being undertaken to monitor existing conditions rather than to screen for previously undiagnosed conditions or as preventive procedures. However, it is also possible that some of this association is due to case finding on routine testing.

The RACGP recommends that people with lower socio-economic status, who are at particular risk for CVD and other chronic conditions, should be specifically included in preventive programs. Our data suggest that there are not large inequities in screening coverage according to education or employment status, although women who work full-time may be less likely to be screened for some procedures (compared to women working part-time). Working women may need to be considered in efforts to increase adherence with screening. Marital status is another factor that is associated with higher rates of screening, particularly for cervical, breast and colorectal cancers.

Women who smoked were less likely to have all screening procedures. Given that these women have higher risk of many chronic conditions, including CVD, targeting smokers for preventive health checks would seem an appropriate action.

Women who were overweight or obese, were more likely to be tested for high cholesterol and blood sugar levels (and more likely to have CVD and diabetes), and were less likely to be tested for cervical cancer, bowel cancer, or skin cancer. Promoting cancer checks among these women may be necessary.

The probability of having recent preventive checks did not vary greatly by area of residence, or by education suggesting there are not large inequities in access to these services according to these demographic factors.

Health care factors do appear to be strong determinants of testing, with continuity of care at the same general practice being very strongly associated with recent testing. Likewise receiving a reminder from the general practitioner to have testing was a strong factor in whether women had recent tests. These findings underscore the important role that general practitioners can play in promoting screening and other preventive health behaviours.

4.6.   References

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5. Appendices

5.1. Appendix A

Smoking data

Table 1A. Numbers and proportions by smoking category for participants in the 1973-78 cohort at *each* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		13 629	9608	9048	9098	8182
Smoking status	Never smoked	52%	51%	50%	50%	51%
	Ex-smoker	15%	21%	26%	30%	34%
	Current smoker	32%	28%	24%	20%	15%

Table 1B. Numbers and proportions by smoking category for participants in the 1973-78 cohort at *every* survey

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		5507	5507	5507	5507	5507
Smoking status	Never smoked	59%	54%	53%	52%	52%
	Ex-smoker	15%	21%	27%	31%	35%
	Current smoker	26%	25%	21%	17%	13%

Table 2A. Numbers and proportions by smoking category for participants in the 1946-51 cohort at *each* survey

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
Total number of respondents		13 205	11 547	11 173	10 851	10 528	9976
Smoking status	Never smoked	53%	53%	54%	54%	54%	54%
	Ex-smoker	29%	30%	32%	33%	35%	37%
	Current smoker	18%	17%	14%	13%	11%	9%

Table 2B. Numbers and proportions by smoking category for participants in the 1946-51 cohort at *every* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
Total number of respondents		7852	7852	7852	7852	7852	7852
Smoking status	Never smoked	57%	56%	55%	55%	55%	55%
	Ex-smoker	29%	31%	33%	34%	35%	38%
	Current smoker	14%	14%	12%	11%	13%	8%

Table 3A. Numbers and proportions by smoking category for participants in the 1921-26 cohort at *each* survey – smoking data only collected at the first two surveys.

		Survey 1	Survey 2
Total number of respondents		11 574	9653
Smoking status	Never smoked	63%	64%
	Ex-smoker	30%	31%
	Current smoker	8%	5%

Table 3B. Numbers and proportions by smoking category for participants in the 1921-26 cohort at *every* survey – smoking data only collected at the first two surveys.

		Survey 1	Survey 2
Total number of respondents		9653	9653
Smoking status	Never smoked	64%	64%
	Ex-smoker	30%	31%
	Current smoker	6%	5%

BMI data

1973-78 cohort

Table 4A: Percentages by BMI category for all participants in the 1973-78 cohort at *each* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		12 086	8608	7884	8612	7910
		%	%	%	%	%
BMI	Underweight	10	7	5	4	3
	Healthy weight	68	63	59	56	52
	Overweight	15	19	22	23	25
	Obese	6	11	14	17	20

Table 4B: Percentages by BMI category for the 4395 participants in the 1973-78 cohort who have participated at *every* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		4395	4395	4395	4395	4395
		%	%	%	%	%
BMI	Underweight	9	7	4	4	3
	Healthy weight	71	66	63	58	54
	Overweight	14	18	21	23	25
	Obese	6	9	12	15	18

1946-51 cohort

Table 5A: Percentages by BMI category for all participants in the 1946-51 cohort at *each* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
Total number of respondents		13 090	10 736	10 455	10 191	10 286	9748
		%	%	%	%	%	%
BMI	Underweight	2	2	1	1	1	1
	Healthy weight	51	47	43	39	38	36
	Overweight	29	31	33	34	34	34
	Obese	18	20	23	26	27	28

Table 5B: Percentages by BMI category for the 6854 participants in the 1946-51 cohort who have participated at *every* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5	Survey 6
Total number of respondents		6854	6854	6854	6854	6854	6854
		%	%	%	%	%	%
BMI	Underweight	2	1	1	1	1	1
	Healthy weight	54	49	44	41	40	37
	Overweight	28	31	32	34	34	34
	Obese	17	18	22	24	25	28

1921-26 cohort

Table 6A: Percentages by BMI category for all participants in the 1921-26 cohort at *each* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		11 119	9044	7501	6305	4611
		%	%	%	%	%
BMI	Underweight	3	4	4	4	4
	Healthy weight	50	49	48	49	49
	Overweight	33	34	34	33	32
	Obese	13	14	14	14	15

Table 6B: Percentages by BMI category for the 3460 participants in the 1921-26 cohort who have participated at *every* survey.

		Survey 1	Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		3460	3460	3460	3460	3460
		%	%	%	%	%
BMI	Underweight	2	2	2	3	4
	Healthy weight	52	50	48	50	50
	Overweight	34	35	36	34	33
	Obese	12	12	14	13	14

Waist circumference data

Table 7: Waist circumference and BMI for women in the 1946-51 cohort at Survey 6.

Waist circumference	Underweight (BMI < 18.5) N = 128	Acceptable weight (BMI between 18.5 and 24.99) N = 3426	Overweight (BMI between 25 and 29.99) N = 3230	Obese (BMI > 30) N = 2572	Total N = 9356
Less than 80cm (Recommended)	115	1476	239	38	1868
80 – 88 cm (Increased risk)	8	1269	863	139	2279
More than 88 cm (High risk)	5	681	2128	2395	5209

Table 8: Hypertension in relation to BMI and Waist circumference in 1946-51 cohort at Survey 6

Survey 6	WC < 80 cm	80 ≤ WC < 88 cm	WC ≥ 88 cm
BMI < 25	15.1% (13.3 - 17.0) N=227	19.2% (17.0 - 21.5) N=236	23.3% (20.1 - 26.7) N=151
25 ≤ BMI < 30	25.5% (19.9 - 31.8) N=56	26.0% (22.9 - 29.2) N=205	31.2% (29.2 - 33.3) N=624
BMI ≥ 30	44.4 % (25.4 - 64.6) N=12	43.8% (34.5 - 53.4) N=50	46.9% (44.8 - 49.1) N=992

*95% Confidence intervals are shown in brackets. N = number women with hypertension in each category.

Table 9: Diabetes in relation to BMI and Waist circumference in 1946-51 cohort at Survey 6.

	WC < 88 cm	WC ≥ 88 cm
BMI < 25	4.5% (3.7-5.3) N=123	7.1% (5.2-9.3) N=46
25 ≤ BMI < 30	5.1% (3.8-6.7) N=52	9.9% (8.6-11.3) N=198
BMI ≥ 30	14.1% (8.8-21.0) N=20	19.5% (17.8-21.2) N=412

*95% Confidence intervals are shown in brackets. N = number of women with diabetes in each category.

Alcohol data

Table 10A. Numbers and proportions by adherence to alcohol guidelines for women in the 1946-51 cohort at *each* survey.

	Survey 1 1996 45-50	Survey 2 1998 47-52	Survey 4 2004 53-58	Survey 5 2007 56-61	Survey 6 2010 59-64
Total number of respondents	13 455	11 474	10 622	10 420	9855
	%	%	%	%	%
No more than 2 drinks a day	81	83	85	86	87
No more than 4 drinks per occasion	67	67	72	75	78

Table 10B. Numbers and proportions by adherence to alcohol guidelines for women in the 1946-51 cohort at *every* survey.

	Survey 1 1996 45-50	Survey 2 1998 47-52	Survey 4 2004 53-58	Survey 5 2007 56-61	Survey 6 2010 59-64
Total number of respondents	7958	7958	7958	7958	7958
	%	%	%	%	%
No more than 2 drinks a day	83	83	85	87	87
No more than 4 drinks per occasion	67	67	73	75	78

Table 11A. Numbers and proportions by adherence to alcohol guidelines for women in the 1921-26 cohort at *each* survey.

	Survey 1 1996 70-75	Survey 2 1999 73-78	Survey 3 2002 76-81
Total number of respondents	11 665	9103	8392
	%	%	%
No more than 2 drinks a day	94	95	96
No more than 4 drinks per occasion	91		

Table 11B. Numbers and proportions by adherence to alcohol guidelines for women in the 1921-26 cohort at *every* survey.

	Survey 1 1996 70-75	Survey 2 1999 73-78	Survey 3 2002 76-81
Total number of respondents	7062	7062	7062
	%	%	%
No more than 2 drinks a day	93	94	96
No more than 4 drinks per occasion	91		

Table 12A. Numbers and proportions by adherence to alcohol guidelines for women in the 1973-78 cohort at *each* survey.

	Survey 1 1996 18-23	Survey 2 2000 22-27	Survey 3 2003 25-30	Survey 4 2006 28-33	Survey 5 2009 31-36
Total number of respondents	13 918	9519	8980	9037	8120
	%	%	%	%	%
No more than 2 drinks a day	39	51	59	68	72
No more than 4 drinks per occasion	28	28	31	38	43

Table 12B. Numbers and proportions by adherence to alcohol guidelines for women in the 1973-78 cohort at *every* survey.

	Survey 1 1996 18-23	Survey 2 2000 22-27	Survey 3 2003 25-30	Survey 4 2006 28-33	Survey 5 2009 31-36
Total number of respondents	5434	5434	5434	5434	5434
	%	%	%	%	%
No more than 2 drinks a day	40	53	60	70	73
No more than 4 drinks per occasion	27	28	31	39	44

Physical Activity data

1973-78 cohort

Table 13A: Percentages by Physical Activity level category for all participants in the 1973-78 cohort at *each* survey.

		Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		9436	8916	8887	7936
		%	%	%	%
PA	Nil/sedentary	10	9	11	14
	Low	35	36	39	39
	Moderate	23	23	23	22
	High	32	32	27	25

Table 13B: Percentages by PA category for the 5343 participants in the 1973-78 cohort who have participated at *every* survey.

		Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		5343	5343	5343	5343
		%	%	%	%
PA	Nil/sedentary	2	2	3	4
	Low	50	48	50	50
	Moderate	35	36	34	33
	High	12	14	13	14

1946-51 cohort

Table 14A: Percentages by Physical Activity level category for all participants in the 1946-51 cohort at *each* survey.

		Survey 3	Survey 4	Survey 5	Survey 6
Total number of respondents		10 694	10 163	9984	9328
		%	%	%	%
PA	Nil/sedentary	18	16	16	17
	Low	37	29	27	27
	Moderate	20	23	22	21
	High	25	31	35	35

Table 14B: Percentages by PA category for the 7231 participants in the 1946-51 cohort who have participated at *every* survey.

		Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		7231	7231	7231	7231
		%	%	%	%
PA	Nil/sedentary	16	15	14	16
	Low	38	30	27	27
	Moderate	21	24	23	22
	High	25	32	36	36

Table 15A: Percentages by Physical Activity level category for all participants in the 1921-26 cohort at *each* survey.

		Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		9050	8052	6528	5117
		%	%	%	%
PA	Nil/sedentary	33	40	44	50
	Low	30	27	26	25
	Moderate	16	15	14	11
	High	21	19	16	13

Table 15B: Percentages by PA category for the 3911 participants in the 1921-26 cohort who have participated at *every* survey.

		Survey 2	Survey 3	Survey 4	Survey 5
Total number of respondents		3911	3911	3911	3911
		%	%	%	%
PA	Nil/sedentary	25	33	41	48
	Low	34	29	27	27
	Moderate	18	17	15	12
	High	23	21	18	13

Table 16 Adherence to screening guidelines at Survey 6 for the 1946-51 cohort.

	Yes (%)
Bowel cancer check	33%
Breast exam (regular self checks)	55%
Breast exam (by doctor)	61%
Skin cancer and lesions	64.0%
Pap Test	80%
Mammogram	83%
Blood sugar check	83%
Cholesterol check	88%
Blood Pressure check	93%

5.2.   Appendix B

Dietary intake assessment for young and mid-age women

Diet was assessed using the Dietary Questionnaire for Epidemiological Studies (DQES), a validated FFQ developed for use with Australian adults (Hodge et al., 2000). This questionnaire assesses usual consumption of 80 food and beverage items over the previous 12 months, using a 10-point frequency scale ranging from 'never' to 'three or more times per day'. The DQES also includes 10 questions on the amount of milk, bread, sugar, and eggs consumed and questions on the type of milk, bread, fat spreads, and cheese used. Consumption of food items (in g/d) were converted into number of serves per day using conversion factors provided in the NHMRC guidelines, 1992.

5.3.   Appendix C

Cereals	Dairy	Fruit	Vegetables	Meat	Extras
White bread	Full cream milk	Tinned fruit	Potatoes	Eggs	Margarine
Wholemeal bread	Reduced fat milk	Fruit juice	Tomato sauce	Nuts	Polyunsaturated margarine
Rye Bread	Skim milk	Oranges	Tomatoes	Peanut butter	Monounsaturated margarine
Multi grain bread	Soya milk	Apples	Capsicum	Beef	Butter-margarine blends
All Bran	Hard cheese	Pears	Lettuce	Veal	Butter
Branflakes	Firm cheese	Bananas	Cucumber	Chicken	Sugar
Weet Bix	Soft cheese	Melon	Celery	Lamb	Sweet biscuits
Corflakes	Ricotta or cottage cheese	Pineapple	Beetroot	Pork	Cakes
Porridge	Cream cheese	Strawberries	Carrots	Ham	Meat pies
Muesli	Low fat cheese	Apricots	Cabbage	Fish	Pizzas
Rice	Flavoured milk drink	Peaches	Cauliflower	Tinned fish	Hamburger
Pasta	Yoghurt	Mango	Broccoli	Baked beans	Chocolate
Crackers		Avocado	Spinach	Tofu	Crisps
			Peas	Other beans	Jam
			Green beans		Vegemite
			Bean sprouts		Ice cream
			Baked beans		Fried fish
			Tofu		Chips
			Other beans		Light beer
			Pumpkin		Heavy beer
			Onion		White wine
			Garlic		Red wine
			Mushrooms		Fortified wines
			Zucchini		Spirits
					Bacon
					Salami
					Sausages

5.4. Appendix D

Table 1: Percentage of infants breastfed at age in completed months

Age in completed months	Number of infants breastfed at age	Percentage breastfed at age
<1	8313	90.1
1	7549	81.8
2	7034	76.2
3	6394	69.3
4	5900	63.9
5	5527	59.9
6	4726	51.2
7-12	3379	36.6
13-18	774	8.4
19-24	299	3.2
25+	135	1.5

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