

women's health *a u s t r a l i a*

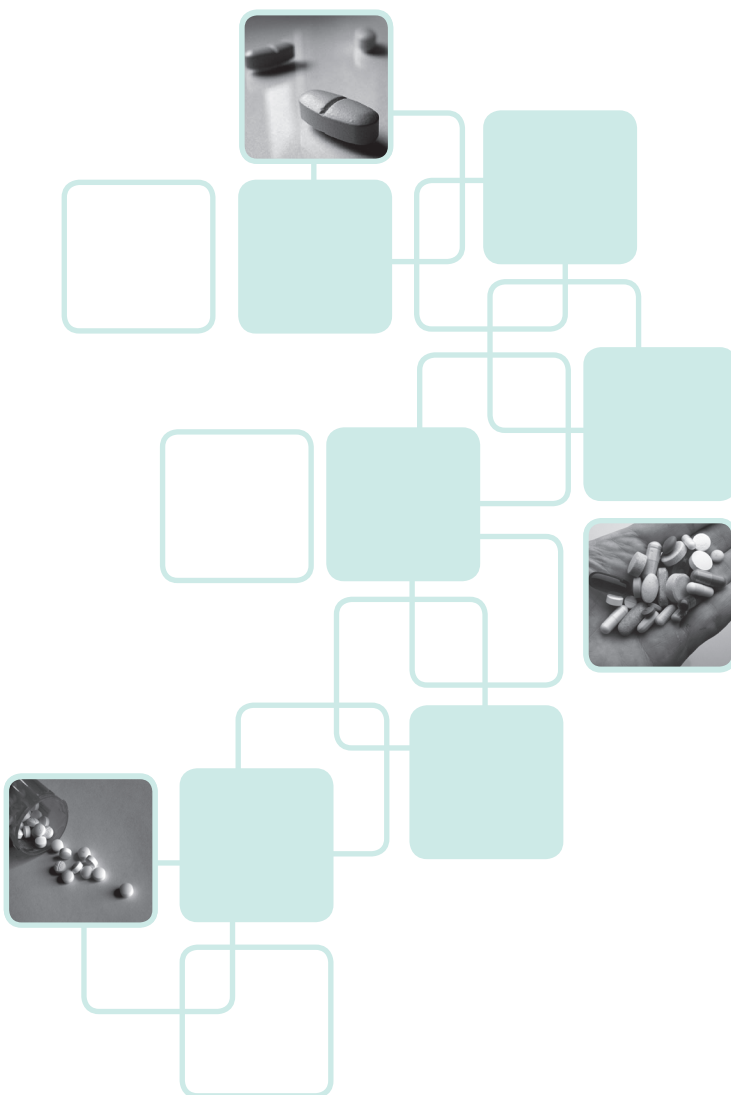


the australian longitudinal
study on women's health

Use and costs of medications and other health care resources: *Findings from the Australian Longitudinal Study on Women's Health*

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Report prepared for the Australian Government Department of Health and Ageing
ISBN: 978-1-76007-447-0

June 2008



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA



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OF QUEENSLAND
AUSTRALIA

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1. Executive Summary

1.1. Aims of this Report

The Australian Longitudinal Study on Women's Health (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:

- Younger women, aged 18 to 23 years when first recruited in 1996 (n=14,247) and now aged 30 to 35 years;
- Mid-age women, aged 45 to 50 years in 1996 (n=13,716), now aged 57 to 62 years;
- Older women, aged 70 to 75 years in 1996 (n=12,432), now aged 82 to 87 years.

The women have now been surveyed at least four times over the past 12 years providing a large amount of data on the women's lifestyles, use of health services and health outcomes. Details about the ALSWH design, attrition and retention are available in Appendix A. The survey schedule is reported in Table 1-1.

Table 1-1 Schedule of Surveys for the Australia Longitudinal Study on Women's Health

	96	98	99	00	01	02	03	04	05	06	07	08	09	...2015
Younger	☒			☒			☒			☒			☒	
Mid-aged	☒	☒			☒			☒			☒			
Older	☒		☒			☒			☒			☒		
	S1		S2			S3			S4			S5		

This report has been prepared on the basis of discussions between the ALSWH research team and staff of the Australian Government Department of Health and Ageing and will present findings on claims for, and costs of, medications and other health care resources from four surveys of the three cohorts.

The report makes use of Pharmaceutical Benefits Scheme and Medicare data that are linked to survey data and provide details on the women's health, health behaviours, and social circumstances. Combined, these data provide unique and rich information on health service use by particular sub-groups of women, longitudinal changes and health outcomes.

The report has the following aims:

- To describe the major trends in medication claims and costs among the three age groups of women in the ALSWH according to urban, rural and remote area of residence.
- For common conditions, to assess factors associated with medication claims by women with:
 - Depression
 - Asthma
 - Arthritis
 - Cardiovascular disease
 - Diabetes.

This work:

- describes medications claims for the index condition
- compares costs of medication and other health services for women with different conditions

- assesses health outcomes associated with medication claims for selected conditions.
- For common medications, to assess factors affecting the women's long-term claims for:
 - Statins
 - Bisphosphonates
 - Proton Pump Inhibitors.
- To assess the uptake of new health care items and the impact of these items on women's use of health care services, costs, and health outcomes:
 - 75+ Health Assessment
 - Annual Cycle of Care for Diabetes.
- To examine the use of complementary and alternative medical care by women in the three cohorts.

The Report includes summaries of published and unpublished papers, as well as primary analyses. Additional Appendices provide current information about ALSWH data (i.e., the study design, attrition and retention rates, data sources), and some of the measurements used in the report.

1.2. Summary of major findings

1.2.1. Commonly used medications

Medications play an important role in preventing and managing illness and improving quality of life for Australian women. In this report we examine claims to the Pharmaceutical Benefits Scheme (PBS) for ALSWH participants in the three age groups and those factors that are associated with medication claims for these women. The data are for women who have consented to the release of these data and who were alive and participating in the study in each calendar year 2003-2005. Medications for women in each cohort were grouped and described according to the Anatomical and Therapeutic Class coding system developed by the World Health Organisation. Using this coding system results revealed that Mid-age and Older women had claims for similar groups of medications except that Older women were more likely to have claims for each medication group. Younger women were least likely to be identified as having any PBS claims overall and within each group of medications.

Among Younger women, the most commonly identified PBS claims were for nervous system drugs, and particularly antidepressants (used by 8%). Antidepressants were also common among Mid-age women (14% of Mid-age women) and Older women (18%) and prevalence of these medications increased with age. However not all women who reported a diagnosis of depression on the surveys were identified as having antidepressant medications. Among Younger women who reported a diagnosis of depression, 60% had no claims for any antidepressant medication in 2005 and 40% had no claims at any time during the period 2002-2005. For Mid-age women the corresponding percentages were 36% and 17%, and for Older women the percentages were 33% and 18%. Depression and claims for antidepressant medications were associated with area of residence (women in rural areas were less likely to receive antidepressant medications), marital status, socio-economic status, health care use, and the presence of comorbid conditions such as arthritis, back pain and heart disease.

Many women with depression continued to have claims for antidepressant medications for long periods. Among Mid-age and Older women, more than 50% of women had claims in both 2002 and 2005. Younger women were less likely to have claims in both periods, and were equally likely to cease, or take up antidepressant medications, or to have no claims in either year. A significant improvement in scores on the SF-36 Mental Health Index was observed for women with self-reported depression who ceased antidepressant medications between 2002 and 2005, indicating positive outcomes for women in this group.

Among Mid-age and Older women, the most common PBS claims were for cardiovascular medications, claimed for 28% of Mid-age women and 75% of the Older women in 2005. The most commonly used combination of CVD medications for Mid-age and Older women were angiotensin converting enzyme inhibitors (ACE) and angiotensin II receptor agonists (AII) with statins, and ACE/AII with aspirin with or without statins. Statins were the main class of medications in this group (claimed for 16% of Mid-aged women and 38% of Older women). Statins were also the medications with the highest full-cost per woman (costing \$588 per year per Mid-age woman in the cohort, and \$1,022 per woman prescribed these medications), and the highest out-of-pocket costs with the median annual cost for each Mid-age woman with claims for statins being \$257.

Between 2002 and 2005, PBS claims for statins increased in the Mid-age and Older cohorts in line with the whole Australian population. In the Mid-age cohort claims for statins also increased after natural menopause as well as after 'surgical' menopause (hysterectomy and/or oophorectomy). Mid-age women with claims for statins had lower levels of education, were less likely to be employed, had more difficulty managing on their income than women without statins and were also more likely to have diabetes, hypertension or heart disease (e.g. angina pectoris or a history of myocardial infarction). However, in many cases Mid-age women did not use statins over the longer term. In the Mid-age cohort, half the women with statins missed a claim for this medication within five months of observation. Longer-term use was more likely among women who reported higher levels of physical activity, but was not associated with other socio-demographic or health variables.

Alimentary tract medications were also common among Mid-age and Older women (claimed for 22% and 57% of these women respectively in 2005), and were among the top five most commonly used medications in all age groups. The most common type of medication in this group was medications for peptic ulcer or gastro-oesophageal reflux disease (GORD) with claims identified in 2005 for 3% of the Younger women, 16% of the Mid-age women, and 38% of the Older women. The most common of these types of medications were Proton Pump Inhibitors (PPIs) which are used for the treatment of conditions causing heartburn or gastric pain, such as gastro-oesophageal reflux disease and peptic ulcers. Among Mid-age and Older women, PPIs were commonly claimed in association with non-steroidal anti-inflammatory drugs (NSAIDs) and rarely in association with *Helicobacter Pylori* eradication treatment. PPI claims were mostly (64%) not associated with either of these conditions, but were more likely to be for the treatment of reflux disease. Claims for PPIs by Mid-age and Older ALSWH participants, already considerable in 2002, increased between 2002 and 2005. This increase was not solely due to ageing.

PPIs also appear to be used for long periods. For the initial treatment for reflux disease, two to four weeks of use of PPIs is recommended. In reality 60% of initial prescriptions between 2002 and 2005 contained five repeats. Of the women who initiated PPI treatment for reasons other than gastro-protection while taking NSAIDs or during the eradication of ulcer disease, more than two thirds had claims for more than six months. Women who had claims for PPIs were also more likely to have claims for NSAIDs and asthma medication, and they were also twice as likely to have claims for antidepressants. PPI script filling among Mid-age women was associated with depression and anxiety as well as lower levels of education, more difficulties managing on available income, more frequent GP visits, and higher BMI. Likewise, depression was also associated with heartburn/indigestion and Mid-age women who reported having this symptom 'often' were twice as likely to report depression as women who reported never having this symptom.

Drugs for the musculoskeletal system were also among the most commonly used medications in the Mid-age and Older cohorts, with 16% of Mid-age women and 43% of Older women having claims for this class of medication in 2005. The use of these medications reflects the high prevalence of arthritis which was reported by 32% of Mid-age women and 64% of the Older women by Survey 4. However, in 2005, 71% of Mid-age women and 63% of Older women who reported having arthritis did not have PBS claims for arthritis medications. Those Mid-age women who reported having arthritis and/or who had PBS claims for arthritis medication had lower levels of education and more difficulty managing on their income than women without arthritis or arthritis medication. Most Mid-age and Older women who had claims for arthritis

medication, had claims for only one type of arthritis medication. However, there were large changes in the types of arthritis medications during 2004, following changes to the availability of some of the coxib medications.

The other commonly claimed musculoskeletal medication was bisphosphonates. These drugs are for the treatment of osteoporosis and the subsequent prevention of fractures, and heartburn and dyspepsia are commonly reported side-effects. Claims for bisphosphonates by Mid-age and Older women increased between 2002 and 2005. However, many women did not remain on bisphosphonates long-term, as is the intended use. Within six months of starting to claim bisphosphonates, more than half of the Older women were missing at least one expected claim for bisphosphonates (indicating discontinuous use). Older women with a healthy lifestyle, in terms of physical activity and not smoking, were more likely to fill bisphosphonates prescriptions on time. Women claiming PBS medication for heartburn before starting to claim bisphosphonates were less likely to fill bisphosphonates prescriptions on time.

Respiratory system drugs were among the five most commonly claimed medications among the Younger cohort, and were also commonly claimed for Mid-age and Older women. In 2005, 7% of Younger women, 10% of Mid-age women and 20% of Older women had claims for respiratory system drugs. Adrenergic inhalants were the third most common therapeutic subgroup claimed for Younger women, and across all cohorts the most common medications claimed for asthma were beta-2 receptor agonists, adrenergics, glucocorticoids and anticholinergics. Younger women were less likely to have claims for asthma medication than Mid-age or Older women, possibly because Younger women were more likely to buy over-the-counter medications which would not appear in PBS data. Across all cohorts, women with claims for asthma medication were more likely to be overweight or obese.

Overweight and obesity were also strongly associated with claims for diabetes medication. Almost 90% of Mid-age women and two thirds of Older women who had claims for diabetes medications were overweight or obese. Women who claimed for diabetes medications also had higher levels of morbidity, more GP visits and were more likely to see specialists, hospital doctors and pharmacists than other women. However, about half of the Mid-age women and more than 40% of the Older women who had ever reported diabetes did not make claims for diabetes medications. Furthermore, many of these women did not report diabetes at Survey 4, suggesting that many of these women were being successfully managed by diet and lifestyle alone.

1.2.2. Impact of new health care items

Over the past several years, a number of new health care items have been introduced with the intention to improve health care and prevent disability for people with particular needs. This report examined women's use of two groups of these items, the 75+ Health Assessments, and the Diabetes Annual Cycle of Care (ACC), and assessed associated costs and changes in quality of life.

Health assessments are government-subsidised annual health check-ups for people aged 75 years and over and are designed to evaluate a person's health and physical, psychological and social function and to determine whether preventative healthcare and education should be considered. Of the 4020 women in the Older cohort who consented to linkage to Medicare data and were eligible for a health assessment, 58% had at least one health assessment between November 1999 and the end of 2005 and 40% had two or more assessments. Women with at least one health assessment had more visits to the GP and took more medications than women who had no assessments. They were also more likely to rate their health as fair or poor and to have been admitted to hospital. However, health assessments did not have a measurable impact on survival. Also, among women who were still alive in 2004, there was no statistically significant difference in physical function scores between women who did and did not have health assessment. There was a small trend towards a lesser decline in scores for women who had more than one health assessment.

The Diabetes Annual Cycle of Care was introduced as part of a national diabetes integrated program to provide incentives for GPs for early diagnosis and effective management of people with diabetes. The ACC includes pathology testing (including a haemoglobin A1c (HbA1c) test which indicates average blood glucose over a period of two to three months) and lifestyle risk factor assessment, as well as screening for retinopathy and foot problems.

Of the women in the Mid-age cohort who consented to linkage to Medicare data and completed Survey 4 (2004), 6% reported being diagnosed with diabetes, up from 2% of the same women at Survey 1 (1996). Of the women in the Older cohort who consented to linkage to Medicare data and completed Survey 4, 6% reported being diagnosed with diabetes in Survey 1 (1996) and 14% reported diabetes at any survey, by Survey 4 (2005).

For both Mid-age and Older women, compared with uptake of HbA1c only, uptake of ACC was associated with a higher number of GP visits and bulk billing. However, MBS costs were similar for Older women with diabetes who did and did not have ACC. Among Mid-age women MBS and PBS costs were higher for women with diabetes who had ACC compared with those who had HbA1c only, whereas PBS costs were almost identical for Older women with diabetes who had ACC compared with HbA1c only.

Differences were also apparent between Mid-age and Older women when health outcomes of ACC were examined. Furthermore, among Mid-age women, differences in health outcomes emerged between prevalent and incident diabetes. Mid-age women with prevalent diabetes who went on to have ACC tended to have the poorest health at baseline, prior to the introduction of ACC. However, Mid-age women with incident diabetes who had ACC tended to have similar health at baseline to those women with incident diabetes who did not go on to have ACC. Mid-age women with prevalent diabetes who had ACC continued to have poorer health than those who did not have ACC, although the decline in health was less pronounced than prior to the uptake of ACC. Those Mid-age women with incident diabetes who had ACC experienced better physical health outcomes than Mid-age women with incident diabetes who did not undertake ACC.

These findings are important in assessing whether strategies such as the 75+ Health Assessments and Diabetes Annual Cycle of Care are achieving their objectives for better patient outcomes. Both sets of items seem to have been adopted fairly widely and are now a mainstream component of primary care. The data from ALSWH show some small health benefits from these items in terms of health related quality of life. A question remains as to whether these systems of care could be improved, to increase their uptake and efficiency and to enhance their impact.

1.2.3. Complementary and alternative medical care

Use of complementary and alternative medicine (CAM) is increasing worldwide. At Survey 1 in 1996, 19% of the Younger cohort, 28% of the Mid-age cohort and 15% of the Older cohort reported having consulted an alternative health practitioner over the last 12 months. CAM users in all three cohorts were more likely to live in non-urban areas; Younger and Mid-age CAM users also had higher levels of education and were more likely to be employed. CAM users also reported poorer physical and mental health, more symptoms and illness, and higher use of conventional health services than non-users, and use of non-prescription medication was more common among CAM users. Women with cancer and women reporting more illness were more likely to adopt CAM use than other women.

Longitudinal analyses have shown that both Mid-age and Older women with declining health were more likely to start using CAM. Among Older women, use of CAM declined as they aged but increased as the number of reported symptoms increased and for non-urban residents compared with urban residents. Among Mid-age women those who ceased taking prescription medicines were more likely to start using CAM.

In considering the use of specific providers, Mid-age women who used chiropractic, osteopathy and acupuncture appear to be higher users of conventional health services and to be suffering

from a wide range of symptoms. These results suggest that chiropractic, osteopathy and acupuncture are used in conjunction with conventional care and used within an overall health care regime.

Because CAM is often used in conjunction with conventional care, there may be a need for increased communication and interfacing between CAM and conventional practitioners. Knowledge of the use CAM is important as there is potential for drug interaction between conventional medicine and some CAM treatment. In addition, patient safety may be jeopardised by CAM users failing to inform their conventional medical practitioners about their CAM use and GPs underestimating their patient's use of other medicines.

1.3. Discussion

Medications are an important part of women's health care. The prevalence of medication use among women in the ALSWH increases with age and as chronic health conditions become more common, but use of some medication is likely for women in all cohorts. At older ages however, women are not only more likely to be using medications, but are also more likely to be using two or more medications in combination. The need for these medications may be due to the need to treat a number of co-existing conditions, or as in the case of the use of chemoprophylaxis for prevention of cardiovascular disease, to reduce a number of co-operative risk factors. In other cases, the need for some medications may be to treat the side effects of other medications or, as seen in the case of bisphosphonates, the addition of one medication may exacerbate another underlying condition.

Both side effects and costs of medications may limit their longer-term use. This poses a particular problem for drugs such as statins and bisphosphonates that are designed for long-term use and to prevent potential health problems rather than treat existing symptoms. The effectiveness and cost-effectiveness of these preventative strategies may be severely hampered if those women who take up these strategies do not continue treatment long enough for them to be effective.

The cost to the women of any single medication may not seem particularly large, but it needs to be considered that women who use one medication are also likely to be using another medication. This multiple medication use is not limited to older women. The cumulative out-of-pocket cost of medication can be substantial. Moreover, medications are more likely to be used by women who have less socio-economic advantage and who have more difficulty managing on their income.

An analysis of medications for women with common chronic conditions also shows that these conditions are often more widespread among people with socioeconomic disadvantage for whom the costs of medications may be a significant burden. These analyses also show a relationship between medication use and other health behaviours and risks. For example, body mass index and smoking were both associated with asthma and with asthma medications. Attention to these behaviours and conditions would appear to be important for reducing medication costs as well as improving health.

2. Trends in Medication Use and Costs

2.1. Key findings

This section reports data on claims to the Pharmaceutical Benefits Scheme (PBS) for women who participate in the Australian Longitudinal Study on Women's Health (ALSWH) and consented to linkage of the these data to ALSWH survey data.

- Among Younger women the most common claims were for antidepressants (8%), hormonal contraceptives (6%, representing only those agents subsidised by the PBS) and the asthma medications: adrenergics and inhalants (5%).
- Among Mid-age women the most common claims were for medications for peptic ulcer or gastro-oesophageal reflux disease (GORD) (17%), lipid modifying agents (16%), antidepressants (14%) and non-steroidal anti-inflammatory drugs (NSAIDs) (13%).
- Among Older women the most common claims were for lipid modifying agents (38%), drugs for peptic ulcer or GORD (38%), antithrombotic agents (37%), NSAIDs (26%) and other analgesics and antipyretics (35%).
- Out-of-pocket costs were highest for the Mid-age women with the median cost per patient per year for lipid modifying agents at \$143, for antidepressants \$57 and for peptic ulcer/GORD medications \$55. For Younger women the out-of-pocket costs were \$113 for antidepressants; their most commonly claimed category of medications. Out-of-pocket costs were lower for the Older women due to higher PBS subsidies but the total costs (to the women and the Government) were far higher due to a higher number of claims.
- Women who made claims for common medications of one type were also likely to have claims for other types of medications so that their total costs were relatively high. For example, the median total out-of-pocket costs for Mid-age women who took lipid modifying agents was \$257 because of other claims (e.g., for the cardiovascular system). Older women claiming for commonly used medications had a median total out-of-pocket cost of around \$200.
- Older women, in particular, mentioned the impact of costs of medications on their ability to manage on their incomes.
- There were few differences in patterns of claims between women living in urban, rural and remote areas of Australia.
- Women who made claims for common medications tended to be higher users of health services than other women. For example, they had more GP and specialist visits. They also had poorer self-rated health.
- There was also some evidence that women who made claims for common medications had lower socio-economic status; for example, they reported having difficulty managing on their income and lower levels of education.
- For some of the most commonly claimed medications such as proton pump inhibitors (PPIs – used for GORD), statins (for lowering lipid levels) and antidepressants there was evidence that women using these drugs had complex patterns of multiple drug use. These patterns are explored in subsequent chapters.

2.2. Introduction

Used appropriately, medications play an important role in preventing and managing illness and improving quality of life for Australian women. In this section we identify those medications that are most commonly prescribed to ALSWH participants in the three age groups and those factors that are associated with prescription of medications to these women. The data come from Pharmaceutical Benefits Scheme claims for women who have consented to the release of these data and who were alive and participating in the study in each calendar year reported. These data may under-represent some women, but in general the differences between women who did and did not consent to PBS linkage were small (see Appendix B).

The main purpose of the PBS is to provide the Australian community with reliable, timely access to appropriate and affordable prescription medications at the lowest cost to the Government and consumers. Currently, the Government subsidises the cost of approximately 4900 products that are available to the Australian public through the PBS (Department of Health and Ageing, 2008). The total cost of the PBS has grown from \$1.1 billion in 1990-91 to over \$6.4 billion in 2006-2007 (Department of Health and Ageing, 2007a). In the 2006-07 period the Government subsidised over 80% of the total cost of PBS prescriptions, while patient contributions amounted to \$1,151.3 million (Department of Health and Ageing, 2007a). The average price per prescription in 2006-07 was \$39.35 with an average Government cost of \$32.50 (Department of Health and Ageing, 2007a).

Despite the wide coverage of the PBS some medications may be under-represented in these data, particularly those medications that are not covered under the PBS. Medications not covered by the PBS include those that are purchased over-the-counter, provided in hospital, or purchased without subsidy (including herbal, vitamin and minerals and other alternative-type medications). Agreement between PBS data and self-reported medications use has been found to be relatively high among women in the Older cohort for the prescribed medications that are subsidised by PBS and used on a regular basis (see Appendix B).

For this report, the PBS code for each medication claim has been recoded to conform to the Anatomical Therapeutic Chemical (ATC) code used by World Health Organisation, which is the standard classification system for drug consumption studies. In the ATC classification system, drugs are divided into different groups according to the organ or system on which they act (Anatomical Group) and their chemical, pharmacological and therapeutic properties. For this section of the report we analysed the medications according to the Anatomical Group (ATC code Level 1) and the Therapeutic sub-class (ATC code Level 3). Further details of ATC coding are also provided in Appendix B.

A note on terminology

In this report the terms 'claims', 'claiming', and 'claimed' are used to denote the process of having a prescription filled by a pharmacist whether this is an original prescription or a repeat. Where a woman submitted a prescription for two or more different medications these would be counted as two or more different claims. From ALSWH and PBS data, actual use of medication cannot be determined, nor can information about medications prescribed by a medical practitioner be ascertained, as women may have been given prescriptions but not had them filled. While we note that the women have not directly 'claimed' PBS medications, by presenting their prescriptions to be filled, they are making a de facto claim to PBS. Although these distinctions between 'claims' and 'prescriptions' are technically important, 'prescription' is also used in the report where it is the simpler, plain English term for ease of reading.

2.3. Medications commonly used by Australian women

Table 2-1 indicates the PBS medication claims made for each anatomical group in the ATC system (ATC level 1), and highlights the five most commonly claimed medication groups for each ALSWH cohort. Across all anatomical groupings, women in the Older cohort were most likely to claim for medications and women in the Younger cohort were least likely to claim. The most commonly claimed medications in all cohorts were for: nervous system, alimentary tract, anti-infectives, respiratory system and genito-urinary and sex hormones.

Table 2-1 Prevalence of claims for PBS listed medications according to Anatomical Therapeutic Chemical Code Main Anatomical Group (ATC Code Level 1): the percentage of women in each cohort having at least one claim for a medication during the calendar year

Number of women	Younger (28-33 years in 2003)			Mid-age (52-57 years in 2003)			Older (77-82 years in 2003)		
	2003	2004	2005	2003	2004	2005	2003	2004	2005
	4,372	4,372	4,364	7,171	7,171	7,170	5,562	5,491	5,464
Anatomical Group									
A-Alimentary tract and metabolism	5	5	5	19	21	22	58	58	57
B-Blood and blood forming organs	1	1	1	4	4	4	39	41	42
C-Cardiovascular system	1	2	2	26	29	28	76	75	75
D-Dermatologicals	2	2	2	5	5	5	25	27	27
G-Genito urinary system and sex hormones	10	10	10	12	12	11	18	16	15
H-Systemic hormonal preparations, excl. sex hormones and insulins	1	1	1	6	6	6	22	22	22
J-Anti-infectives for systemic use	9	9	9	18	19	19	57	56	53
L-Antineoplastic and immunomodulating agents	0	0	0	3	3	3	5	5	5
M-Musculo-skeletal system	3	3	2	20	21	16	51	49	43
N-Nervous system	12	12	11	21	22	22	63	62	61
P-Antiparasitic products, insecticides and repellents	0	0	0	1	1	1	9	9	5
R-Respiratory system	7	6	7	11	10	10	21	21	20
S-Sensory organs	1	1	1	5	5	6	41	41	41
V-Various	0	0	0	1	1	1	3	3	4

Bold text highlights the five most commonly claimed medication groups in each cohort

The Table only includes women who have consented to PBS linkage and who were alive during that year.

The medications claimed by the highest proportions of women in each cohort are summarised below.

Within the **Younger cohort**:

- Younger women were most likely to make claims for nervous system drugs with around 12% claiming for at least one prescription in this anatomical group each year. Of these medications, the most commonly claimed therapeutic sub-group was the **antidepressants** (8% of Younger women in 2005 when they were aged 27-32 years). These antidepressant medications were also the most commonly claimed of all therapeutic sub-groups for this age group. Opioids were another commonly claimed medication among this anatomical group (2% of Younger women). (See Appendix C, Table C.1).
- The next most commonly claimed medication group included **genitourinary and sex hormones** (10% of Younger women). These medications include some oral contraceptive agents which are covered under the PBS, but many of these preparations are not identified in PBS data. It is therefore likely that the claims for these medications by the Younger cohort are underestimated in these data.

- **Anti-infectives** for systemic use were claimed by 9% of the Younger women. These include the Beta-lactam antibacterials and penicillins, which were the most commonly claimed medications in this anatomic group (4% of Younger women in 2005). Other anti-infectives include macrolides, lincosamides and streptogramins, direct acting antivirals and tetracyclines (between 1 and 2% of Younger women).
- **Respiratory system drugs** were claimed by around 7% of women in this cohort, mostly for asthma. Adrenergic inhalants were claimed by 5% of Younger women and were the third most common therapeutic sub-group.
- **Alimentary tract and metabolism drugs** were claimed by 5% of the Younger women. These are most commonly **drugs for peptic ulcer and gastro-oesophageal reflux disease** (GORD; including Proton Pump Inhibitors) which were claimed by 3% of the Younger women.

Figure 2-1 shows the top 10 therapeutic sub-groups according to the proportions of women who had at least one claim for these medications in 2005. This figure identifies major sub-groups that may not be revealed by simply looking at anatomical groupings. Among Younger women, as well as showing the prevalence of antidepressants, contraceptives, anti-infectives, respiratory inhalants, drugs for peptic ulcer and GORD claims, the figure also identifies anti-inflammatory medication claims as being among the most common made by Younger women in 2005.

Within the **Mid-age cohort**:

- Women were also likely to claim the drugs commonly claimed by the Younger cohort, but with higher prevalence in these anatomical groups. However, in the Mid-age cohort other medications were more common than some of these groups.
- The five most commonly claimed medications:
 - **Cardiovascular drugs**: 28% of the Mid-age women had at least one claim for a drug in this group in 2005 (when the women were aged 54-59 years). Claims for these medications increased each year. The most commonly claimed therapeutic sub-group in this anatomical group was **lipid modifying agents (statins)** with 16% of the Mid-age women having at least one claim for these drugs in 2005. (See Appendix C, Table C-2.).
 - **The next most commonly claimed anatomical group of medications** was for the **nervous system** (20% of Mid-age women). Within this group, the most common therapeutic sub-group was **antidepressant medication** which was claimed by 14% of Mid-age women in 2005.
 - **Alimentary tract medications** were claimed by around 20% of the Mid-age women and claims for this category increased over time. As for Younger women, the most common therapeutic sub-group in this anatomical group was **drugs for peptic ulcer and GORD**. Prescription claims for drugs in this class were identified for 16% of the women in the Mid-age cohort in 2005.
 - **Musculoskeletal system medications** were claimed by around 20% of Mid-age women in 2003-2004, and 16% in 2005. This decrease is inconsistent with the increase in prevalence of arthritis among this cohort (Brown et al., 2006). This anomaly may represent a shift from subsidised medications to over-the-counter products. This possibility is explored in a later section of this report (See Section 4.3: Arthritis). Non-steroidal anti-inflammatory products, claimed by 13% of women in the Mid-age cohort, were the most commonly claimed musculoskeletal system medications.
 - **Anti-infectives** were claimed by 18 to 19% of Mid-age women.

Analysis of the top ten therapeutic sub-groups of medications that were claimed by Mid-age women in 2005 (see Figure 2-1, middle block) highlights the importance of estrogens, inhalants, antibacterials and viral vaccines as other therapeutic sub-groups claimed by high proportions of women in this age group.

Within the **Older cohort**:

- Patterns of prescription medication claims among the **Older cohort** were similar to those seen in the Mid-age cohort, except the prevalence of claims for each medication group was higher among this Older cohort.
- The five most commonly claimed medications:
 - **Cardiovascular drugs** were claimed by almost three in four (75%) of Older women each year. As for Mid-age women, **lipid modifying agents** were the sub-group claimed by the highest proportion of women (38%), but women were also likely to claim for **beta blocking agents** (25%), **ACE inhibitors** (24%), **calcium channel blockers** (19%), and **angiotensin II antagonists** (18%). (See Appendix C, Table C-3.)
 - The next most commonly claimed anatomical group of medications was for the **nervous system** (61% of women in the Older cohort in 2005 when they were aged 79 to 84 years). The claims in this medication group showed a slightly different pattern among the Older women compared with the other cohorts. In the Older women, the main sub-group was **analgesics and antipyretics** (35% of the Older women) which may reflect the use of these drugs for musculoskeletal and other pain. The prevalence of claims for **opioids** in this group was also high with 18% of Older women having a claim in this sub-group in 2005 (compared with 2% of women in the Younger cohort and 5% in the Mid-age cohort). The proportion of women who claimed for **antidepressants** (18%) was slightly higher in this age group than in the Mid-age and Younger cohorts.
 - **Alimentary tract medications** were claimed by 57% of the Older women. As with the Younger and Mid-age women, **drugs for peptic ulcer and GORD** were the sub-group that was claimed by the highest proportion of women, with 38% of Older women having at least one claim for this class of medication. Calcium and potassium supplements, oral glucose lowering drugs, and laxatives were also claimed by more than 5% of women in this cohort.
 - Claims for **anti-infectives** were identified for 53% of Older women.
 - Claims for **musculoskeletal system medications** were identified for 43% of Older women in 2005. As for the Mid-age group the percentage of women with PBS claims for this group of medications declined over time. Commonly claimed therapeutic sub-groups included **non-steroidal anti-inflammatory drugs (NSAIDs)** (26% of Older women) and **drugs affecting bone structure and mineralisation** (especially bisphosphonates for osteoporosis) which were prescribed for around 22% of women in the Older cohort.

Figure 2-1 (bottom block) identifies antithrombotic agents and corticosteroids as other medications commonly claimed by Older women.

In assessing change in prevalence of PBS medication claims in this Older cohort over time it is important to recognise the higher mortality rate among these women, and that women with higher medication claims in one year may be more likely to have died before the next year.

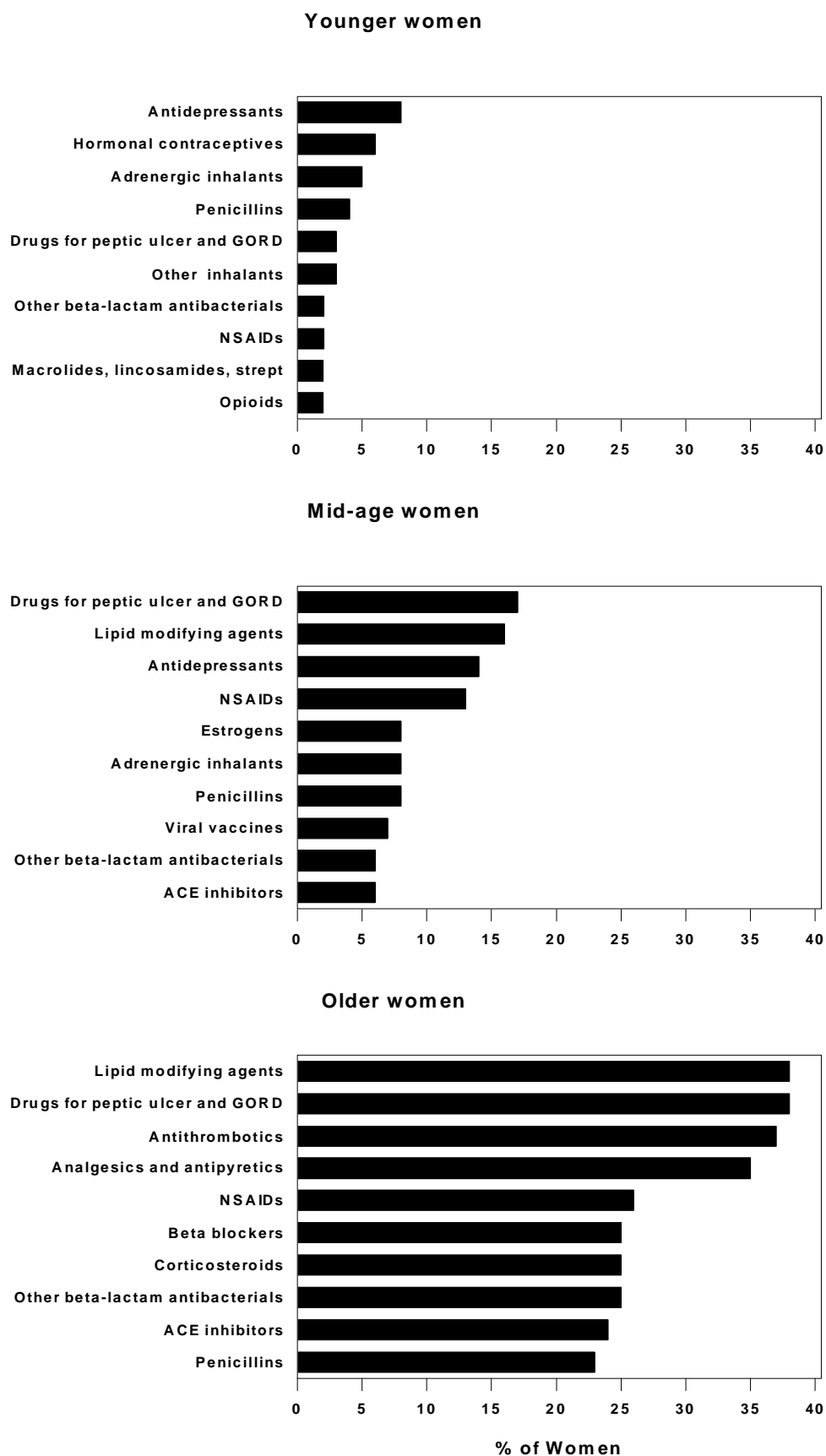


Figure 2-1 Ten most commonly claimed therapeutic subgroups of medications for each cohort of women in 2005

2.4. Medication costs

Table 2-2 provides details on the number and costs of claims for the most common therapeutic sub-groups for women in each cohort. In each case, women tended to have more than one claim for these medications in a year with the highest number of claims being for lipid modifying agents in the Mid-age and Older women (11 claims), and the lowest number being for airway inhalants, opioids and beta-lactam/penicillin antibiotics. Among Younger women using antidepressants, each woman had a median of seven claims in this sub-group in 2005.

The median antidepressants cost in this subgroup was \$228 for the year, with a median cost of \$52 being paid by PBS and a median of \$113 being a direct cost to the woman.

Table 2-2 Number of claims, medication types and costs for common therapeutic sub-groups per woman in 2005

Drug	No. of Claimants	Median no. claims /woman	Median no. of different medication substances /woman	Median full costs for claims /woman	Median benefit cost for claims /woman	Median patient cost for claims /woman
Younger cohort						
N06A Antidepressants	360	7	1	\$228	\$52	\$113
R03A Adrenergics, inhalants	210	2	1	\$115	\$60	\$29
R03B Other drugs for obstructive airway diseases, inhalants	110	1	1	\$44	\$16	\$29
J01C Beta-lactam antibacterials, penicillins	171	1	1	\$19	\$13	\$5
N02A Opioids	85	1	1	\$9	\$4	\$5
Mid-age cohort						
A02B Drugs for peptic ulcer and GORD	1,170	7	1	\$340	\$183	\$55
C10A Lipid modifying agents, plain	1,182	11	1	\$588	\$411	\$143
N06A Antidepressants	1,125	8	1	\$231	\$73	\$57
M01A Anti-inflammatory and antirheumatic products, non-steroids	925	3	1	\$64	\$28	\$29
G03C Estrogens	537	4	1	\$49	\$35	\$14
Older cohort						
A02B Drugs for peptic ulcer and GORD	2,057	11	1	\$465	\$417	\$28
B01A Antithrombotic agents	2,034	4	1	\$38	\$25	\$14
C10A Lipid modifying agents, plain	2,064	11	1	\$582	\$548	\$37
N02B Other analgesics and antipyretics	1,915	3	1	\$23	\$15	\$9
M01A Anti-inflammatory and antirheumatic products, non-steroids	1,394	4	1	\$87	\$62	\$14

Costs are presented as whole dollars. 'Full cost' is the PBS terminology for benefit +patient (out-of-pocket) cost for the claim.

Older women tended to have the greatest number of claims in each sub-group, but Younger and Mid-age women had the highest costs for these medications, as a consequence of higher subsidies for older people. These data show that claims for these medications were common in these cohorts, and patterns of medication use were complex and these medications were expensive to both the PBS and to the individual.

Table 2-3 presents similar data to Table 2-2, but in this case shows the total number of claims and costs for all medications claimed by the women. So while the previous table provides information about claims for a single medication type, Table 2-3 provides more information about the women claiming the medication, and highlights that women tended to claim not one medication but several. For example, among Younger women, those claiming opioids also claimed medications in six different sub-groups.

Table 2-3 Number of claims, medication types and costs for all medications claimed by women using the common therapeutic sub-groups – 2005

Drug	No. of claimants	Median no. claims/woman	Median no. of different medication sub-groups/woman	Median full costs/woman	Median benefit/woman	Median patient cost/woman
Younger cohort						
N06A Antidepressants	360	9	2	\$325	\$142	\$147
R03A Adrenergics, inhalants	210	5	2	\$239	\$153	\$78
R03B Other drugs for obstructive airway diseases, inhalants	110	2	1	\$89	\$32	\$57
J01C Beta-lactam antibacterials, penicillins	171	7	4	\$168	\$112	\$37
N02A Opioids	85	14	6	\$284	\$220	\$69
Mid-age cohort						
A02B Drugs for peptic ulcer and GORD	1,170	19	4	\$784	\$502	\$207
C10A Lipid modifying agents, plain	1,182	22	4	\$1,022	\$665	\$257
N06A Antidepressants	1,125	22	4	\$778	\$509	\$216
M01A Anti-inflammatory and antirheumatic products, non-steroids	925	20	5	\$680	\$396	\$156
G03C Estrogens	537	29	6	\$834	\$659	\$143
Older cohort						
A02B Drugs for peptic ulcer and GORD	2,057	59	11	\$1,798	\$1,582	\$198
B01A Antithrombotic agents	2,034	57	10	\$1,730	\$1,518	\$202
C10A Lipid modifying agents, plain	2,064	56	9	\$1,804	\$1,594	\$193
N02B Other analgesics and antipyretics	1,915	57	11	\$1,561	\$1,353	\$193
M01A Anti-inflammatory and antirheumatic products, non-steroids	1,394	52	10	\$1,419	\$1,222	\$179

Median cost of the three most commonly claimed medications within these therapeutic subgroups are shown in Appendix tables C5-C7.

Older women claiming drugs for peptic ulcer and GORDS had the greatest total number of claims for medications overall and one of the highest overall medications costs. However the highest out-of-pocket costs (patient costs) for medications were incurred by Mid-age women using lipid modifying agents.

Older women tended to have the greatest number of claims overall, the highest number of medication sub-groups, and the highest total medication costs, although their out-of-pocket costs tended to be lower than for Mid-age women.

2.5. Variation in medication claims by area of residence

Table 2-4 shows the variation in medication claims across urban and rural areas. Claims for medications were similar across areas among Younger women except for anatomical groups G (genito-urinary system and sex hormones), and J (anti-infectives for systemic use), with women in rural and remote areas tending to be more likely to claim these medications, and N (nervous system), with women in rural areas more likely to claim these medications. There was little variation in claims by Mid-age women according to area of residence. Variation across areas in the Older women occurred in anatomical groups D (dermatologicals) with women in urban areas more likely to claim these medications.

Table 2-4 Prevalence of medication claims in 2005 according to area of residence (RRMA). Percentage of women in each cohort having at least one claim

ATC Level1	Younger				Mid-age				Older			
	Urban	Large Rural	Small Rural	Other rural/ Remote	Urban	Large Rural	Small Rural	Other rural/ Remote	Urban	Large Rural	Small Rural	Other rural/ Remote
A	5	6	6	6	22	22	24	22	61	59	58	58
B	1	2	0	2	4	5	6	4	44	45	44	40
C	2	2	3	2	28	29	28	30	80	79	80	80
D	2	2	2	2	5	6	6	5	30	25	26	25
G	9	15	16	12	10	12	13	11	17	17	17	15
H	1	2	3	1	6	7	7	8	24	21	22	24
J	8	14	13	11	19	20	22	20	56	58	54	53
L	0	1	0	1	3	2	3	3	4	4	5	5
M	2	3	3	2	15	16	16	17	47	47	45	44
N	10	18	15	12	22	24	23	22	65	65	62	62
P	0	0	1	0	1	0	1	1	5	6	6	5
R	7	9	7	7	10	12	11	10	22	22	19	21
S	1	2	1	1	5	8	6	6	46	42	44	40
V	0	0.0	0.0	0	1	1	0	1	4	6	3	4

2.6. Factors associated with claims for common and costly medications

This section describes the characteristics of women claiming medications in the most common therapeutic sub-groups. The information presented was obtained by linking the PBS data for 2005 to data from the fourth survey for each ALSWH cohort.

Table 2-5 to 2-7 show patterns of health care use and major conditions reported by women in the three cohorts claiming the five most commonly claimed medication sub-groups (excluding hormonal contraceptives).

Younger women claiming any of the groups of medications in Table 2-5 were more likely to consult a doctor seven or more times compared to all women in the cohort for this analysis. Younger women with claims for drugs for peptic ulcers or GORD and those with claims for antidepressants were most likely to have consulted a specialist, and those with claims for drugs for peptic ulcer and GORD were most likely to consult a hospital doctor and a specialist.

Younger women using any of the medications in the table reported a higher prevalence of asthma compared with the overall prevalence for this cohort (with highest prevalence, as expected, being among those using other inhalants but not adrenergics). Among those using antidepressant medications, 90% reported a diagnosis of this condition, but reported prevalence of depression was also high among women using drugs for peptic ulcer and GORD and the major anti-infectives.

Younger women using any of these medications were more likely to report having fair or poor health, and having difficulty managing on their income when compared to the cohort overall. Women with claims for medications in the subgroup 'beta lactam antibacterials, penicillin' were most likely to have difficulty managing on their income and had the lowest levels of education.

Mid-age women claiming any of the top five medication sub-groups (Table 2-6) for that cohort had more consultations with GPs and specialists than for the cohort overall. They were also less likely to have private hospital cover, more likely to report difficulty managing on income, had lower education levels, and were more likely to have depression, diabetes and heart disease. As would be expected, women claiming any of these medications were more likely to rate their health as 'fair' or 'poor' compared to the cohort overall. Mid-age women claiming lipid modifying agents (C10A) were more likely than other women to report diabetes, but only 8% reported heart disease. Only 67% of women who were claiming antidepressants (N06A) reported having been diagnosed with depression.

Table 2-5 Health care use, major conditions and other factors reported by Younger women at Survey 4 (2006) claiming the five most commonly claimed sub-groups of medications in 2005 (weighted for unequal sampling by area of residence). (Other inhalants=for obstructive airway disease)

Variable	Women claiming specific types of medications					
	Antidepressants	Adrenergic inhalants	Beta-lactam anti-bacterials	Peptic ulcer/ GORD drugs	Other inhalants	All women
	N06A	R03A	J01C	A02B	R03B	
Number of women	315	186	137	105	101	3,884
	%	%	%	%	%	%
Consult GP						
At most 4	38	44	40	35	47	64
5-6 times	26	23	26	22	22	16
7 or more	35	32	34	42	29	15
Consult specialist						
At most 4	37	36	36	51	45	34
5-6 times	8	7	9	9	6	4
7 or more	18	11	9	18	14	10
Consult hospital doctor	35	30	36	48	25	23
Private hospital cover	49	56	26	60	54	59
Self-reported conditions:						
Diabetes	4	3	6	6	0.5	3
Asthma/ bronchitis	24	79	38	21	70	15
Depression	90	32	45	44	25	19
Self-rated health						
Excellent/ very good/ good	77	80	77	77	89	92
Fair/poor	23	20	23	23	11	8
Manage on income						
Difficult	57	50	73	52	49	38
Not too bad	35	36	22	36	29	38
Easy	8	13	6	13	22	24
Education						
School only	24	22	40	20	16	18
Post school	76	78	60	80	84	82
Area of residence*						
Urban	55	57	44	56	64	61
Large rural	15	13	16	14	9	10
Small rural	12	11	15	9	2	9
Other rural/remote	18	18	25	21	25	20

* Unweighted

Table 2-6 Health care use, major conditions and other factors reported by Mid-age women at Survey 4 (2004) claiming the five most commonly claimed sub-groups of medications in 2005 (weighted for unequal sampling by area of residence)

Variable	Women using specific types of medications					
	Peptic ulcer/ GORD A02B	Lipid modifying C10A	Antidepress ant N06A	NSAID M01A	Estrogens G03C	All women
Number of women	1,120	1,097	956	867	510	6,770
	%	%	%	%	%	%
Consult GP						
At most 4	42	50	42	45	45	64
5-6 times	26	24	23	21	23	16
7 or more	31	24	33	33	31	14
Consult specialist						
At most 4	52	45	48	50	52	42
5-6 times	9	6	8	9	7	4
7 or more	6	5	9	6	5	3
Consult hospital doctor						
At most 4 times	20	18	19	19	21	13
More than 4 times	3	2	3	3	2	1
Private hospital cover	67	68	65	64	59	72
Self-reported condition:						
Diabetes	7	14	8	9	8	4
Heart disease	6	8	5	6	6	2
Depression	27	22	67	27	30	16
Asthma/bronchitis/ emphysema	23	18	22	22	22	13
Arthritis	40	33	36	61	42	26
Self-rated health						
Excellent/very good/ good	72	77	70	73	74	88
Fair/poor	28	23	30	28	26	12
Manage on Income						
Difficult	48	43	53	48	56	35
Not too bad	38	42	36	40	34	45
Easy	14	15	12	12	10	20
Education						
School only	69	68	65	69	75	58
Post school	31	32	35	31	25	42
Area of residence*						
Urban	37	39	38	34	34	38
Large rural	14	14	16	14	14	14
Small rural	16	14	15	14	18	14
Other rural/remote	33	32	31	38	34	34

* Unweighted

Older women claiming the five most commonly claimed medications (Table 2-7) were more likely to have more consultations with GPs and specialists, when compared with all women in the cohort. They were also generally likely to report lower levels of self-rated health. Older women claiming lipid modifying agents (C10A) were a lot more likely to report diabetes (but not heart disease) and those claiming antithrombotic agents were more likely to report heart disease. Those using analgesics, antipyretics (N02B) and NSAIDs were more likely to report arthritis than other women.

Table 2-7 Health care use, major conditions and other factors reported by Older women at Survey 4 (2005) taking the five most commonly claimed sub-groups of medications in 2005 (weighted for unequal sampling by area of residence)

	Women using specific types of medications					All women
	Peptic ulcer/ GORD A02B	Lipid Modifying C10A	NSAID M01A	Analgesic N02B	Anti- thrombotic B01A	
Number of Women	1,850	1,869	1,279	1,718	1,832	4,692
Characteristic at Survey 4	%	%	%	%	%	%
Consult GP						
At most 4	21	29	29	22	24	35
5-8 times	33	33	33	30	31	31
9 or more	46	38	38	48	45	33
Consult specialist	62	57	56	57	60	53
Consult hospital doctor	25	23	21	24	26	20
Private health cover- hospital	45	43	44	37	42	44
Self-reported condition						
Diabetes	12	19	11	13	14	11
Heart disease	35	37	23	34	46	27
Depression	13	10	12	15	12	11
Arthritis	57	47	69	63	49	44
Asthma/bronchitis/ emphysema	19	15	16	19	16	14
Self-rated health						
Excellent/very good/ good	59	67	68	58	61	70
Fair/poor	41	33	32	42	39	30
Manage on Income						
Difficult	20	21	20	23	20	19
Not too bad	52	50	53	53	50	50
Easy	28	29	27	24	30	31
Education						
School only	83	82	81	85	83	80
Post School	17	18	19	15	17	20
Area of residence*						
Urban	44	46	44	44	44	44
Large Rural	13	12	12	14	13	12
Small Rural	15	14	15	15	16	15
Other rural/remote	28	28	28	27	27	28

* Unweighted

2.7. Women's comments

Many women have made free-text comments on the topic of medication use. These qualitative data illustrate some of the findings of the quantitative data.

Some Older women commented that the cost of their medication was prohibitive:

With the extra money I have to pay for medication, I find some weeks of the month when prescriptions have to be purchased, my meager budget is very badly bent. I suffice by walking in the park each day and do my daily exercises by bending and collecting the empty bottles, cartons and soft drink cans, cashing them in for extra money.

Several Older women also commented on the high cost of specific medications relating to specific conditions:

I am finding it a bit hard as a widow living in my home by myself. I have an aged pension but I must take expensive tablets to keep myself fit. I have osteoporosis. The doctor put me on a capsule that costs me \$2 a day. The government does not help with the cost of these which makes it very expensive.

Comments on the costs of medication were not limited to the older age group. Women in the Mid-age and Younger groups also made comments. A Mid-age woman wrote:

My continuing bad health leads to excessive costs for medication, tests and medical appointments. This takes almost all my small pension and means my husband cannot retire due to having to pay normal household bills without any money from me.

A Younger woman described how her employment had affected her ability to see her doctor:

Now that I work full-time I put off going to the Dr for a while because it costs a lot of money just for basic prescriptions. When I was a student the costs were reduced as I had a health care card.

The effects of medication prompted many comments. For example a Mid-age woman wrote:

My disease is not responding to medications so far. Arthritis is causing deformities of all my fingers and toes. My teeth are breaking from constant reflux that does not respond well to the medications. High doses of steroids over 11 years has been a factor in a large weight gain (help I need a new body).

A Younger woman commented that the use of drugs for asthma may have reduced her bone density:

I broke both my wrists in a skating accident through which I discovered I have reduced bone density. Doctors said this was presumably because of the constant use of asthma preventing drugs.

In the Older cohort women mentioned that they were not able to take some medications because of adverse events:

I trip over when going upstairs because of arthritis in right leg. Writing is becoming difficult too because of arthritis in right hand and shoulder. Cannot take medication for it as it causes bleeding from the bowel.

Other Mid-age women described how they felt about their use of drugs to manage chronic disease:

Unfortunately my rheumatoid arthritis continues to deteriorate despite this being the golden age of arthritis drugs. However I can only imagine how much worse it would be without them.

My rheumatoid arthritis continues to be a problem. The use of my hands for fine motor skills is diminishing. I am drawing closer to using biological disease modifying drugs - but I still maintain a happy and purposeful life.

You cannot predict the effect of pain on mind and body. Pain twists the way you think and act with people. I have been told by several people my tolerance to pain is high - this arthritic state of bones rubbing on bones is not agonizing but unrelenting and nagging especially at night and is referred to other parts of the body. I have been frustrated irritable, impatient, low in spirits, bored, very anti-social and difficult. As you can probably see my mood has lifted considerably since the prescription for effective pain relief (strong but I get a comfortable night and can put up with being a bit dopey during the day) and anti-inflammatory tablets, which suit my stomach. I usually have a reasonably even temper and agreeable nature so this experience has been a bit of a rude shock.

2.8. Discussion

Across the Younger, Mid-age and Older cohorts, nervous system, alimentary tract, anti-infective, respiratory system and genitourinary and sex hormone medications were the most commonly claimed medications.

Alimentary tract, anti-infectives and nervous system medications were among the top five medications for all three of the age cohorts. For all three cohorts the most common alimentary tract drugs claimed were those for peptic ulcers and GORD. Antidepressants were the most commonly claimed nervous system medication by Younger and Mid-age women, while Older women most commonly claimed analgesics or antipyretics from the nervous system group.

The remaining two of the top five medications claimed by the Mid-age and Older women were cardiovascular and musculoskeletal system medications. Lipid modifying agents were the most commonly claimed cardiovascular medication by both groups of women, with non steroidal anti-inflammatories being the most commonly claimed musculoskeletal medication for both cohorts. These findings accord with data for the general population with the most commonly prescribed medications (ATC level 1) in 2006-2007 being for the cardiovascular system, nervous system and alimentary tract and metabolism (Department of Health and Ageing, 2007b). These three groups also had the highest total cost; the cardiovascular system costing approximately \$2.1 million, nervous system \$1.2 million, and alimentary tract and metabolism costing approximately \$960,000.

In the ALSWH data, the total costs of medication were the highest for the Older cohort, as would be expected given they are the highest claimers of medication. However, out of pocket costs were highest among the Mid-age women. Among the Younger women, those claiming nervous system drugs had the highest overall costs and the highest out of pocket costs

compared to Younger women claiming other medications. The highest total costs and out of pocket costs among the Mid-age and Older cohorts were for cardiovascular medications.

Across all the cohorts women claiming any of the top five medications for their age-group were more likely to have high doctor and specialist consultations, to have poorer self-rated health and to have more difficulty managing on their available income than other women.

2.9. References

Brown W, Byles J, Carrigan G, Dobson A, Dolja-Gore X, Gibson R, Hockey R, Powers J, Russell A, Spallek M, Young A. (2006). Trends in women's health: Results from the ALSWH – priority conditions, risk factors and health behaviours. Report for the Department of Health and Ageing.

Department of Health and Ageing. (2007a). Expenditure and Prescriptions for Twelve Months to 30 June, 2007. Department of Health and Ageing, Data Modelling Section, Pharmaceutical Policy and Analysis Branch.

Department of Health and Ageing. (2007b). Expenditure and prescriptions twelve months to 30 June 2007. Retrieved 26/05/08 from:
[http://www.health.gov.au/internet/main/publishing.nsf/Content/A58720844CBFCB47CA257218000D91C7/\\$File/pbpa%20annual%20report%202007.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/A58720844CBFCB47CA257218000D91C7/$File/pbpa%20annual%20report%202007.pdf)

Department of Health and Ageing. (2008). Schedule of Pharmaceutical Benefits: Effective 1 February 2008- 29 February 2008. Department of Health and Ageing.

3. Medications for Depression

3.1. Key findings

- Rates of antidepressant medication use increased with age. 8% of Younger women, 14% of Mid-age women and 18% of Older women had at least one claim for antidepressant medications in 2005.
- Women who reported a doctor diagnosis of depression were more likely to have claims for antidepressant medications than those who did not report this diagnosis.
- Many women who reported a doctor diagnosis were not identified as using antidepressant medications in the PBS data. Among Younger women who reported a diagnosis of depression, 60% had no claims for any antidepressant medication in 2005 and 40% had no claims at any time during the period 2002-2005. For Mid-age women the corresponding percentages were 36% and 17%, and for Older women the percentages were 33% and 18%.
- Depression and claims for antidepressant medications were associated with area of residence (women in rural areas were less likely to receive antidepressant medications), marital status, socio-economic status, health care use, and the presence of comorbid conditions such as arthritis, back pain and heart disease.
- Four claim patterns for antidepressant medications were defined for women who reported depression during the period 2002-2005: 1) women who were taking antidepressant medications at both the start of the study period and at the end, 2) women who commenced antidepressant medications during this period, 3) women who ceased antidepressant medications, 4) women who did not take antidepressant medications during this time. Among Mid-age and Older women, the most common pattern was continuing antidepressant medications, with more than 50% of women in both cohorts having claims in 2002 and 2005. Younger women with claims for antidepressant medications during this period were equally likely to continue, cease, or take up antidepressant medications.
- A significant improvement in scores on the SF-36 Mental Health Index was observed for women who ceased antidepressant medications during this period, indicating positive outcomes for women in this group.
- Many women with depression continued to have claims for antidepressant medications for long periods.

3.2. Introduction

Medications for depression are one of the most common groups of drugs in PBS data for all cohorts (see Section 2). These drugs were identified in PBS data of 2005 for 8% of women in the Younger cohort, 14% of women in the Mid-age cohort, and 18% of women in the Older cohort. Depression medications represented the most commonly prescribed therapeutic sub-group for Younger women, and the third most commonly prescribed sub-group for Mid-age women. Younger and Mid-age women had an average of 7 claims per year for these drugs, with a total median cost (to the women and the Government) of \$228 per year for each Younger woman with claims for these medications and \$231 per year for each Mid-age woman.

As seen in Section 2 of this report, when compared to the full cohort, women with claims for antidepressant medications tended to have higher health service use overall, and were also more likely to report physical conditions such as heart disease, asthma, and arthritis. Women taking antidepressant medications were also more likely to have difficulty managing on their income, indicating a range of comorbid health and socioeconomic factors that may complicate their condition and its treatment.

3.3. Self-reported doctor diagnosis of depression

Across Surveys 2-4, 18% of Younger women, 13% of Mid-age women and 10% of Older women could be classified as ever having been told by a doctor that they had depression. However, there was some fluctuation over time, as shown in Table 3-1.

Table 3-1 Self-reported doctor diagnosis of depression (women completing Surveys 2, Survey 3 and Survey 4)

	Younger N=8,973	Mid-aged N=10,697	Older N=7,161
Diagnosed with depression			
Survey 2	12	9	5
Survey 3	12	11	6
Survey 4	13	13	7
Ever diagnosis of depression	18	13	10

Due to missing data on some surveys, depression history could not be calculated for 110 Younger women, 283 Mid-age women and 13 Older women.

Ever/Never was calculated from S3 and S4 for younger and older women and from S4 for mid aged women accounting for proximity of surveys to available PBS data.

3.4. Medications for depression identified in PBS data

The total number of types of depression medication as identified in the PBS data (ATC code N06A) for the years 2002 to 2005 is presented in Figure 3-1 for the women who reported having a diagnosis of depression during the period 2002-2005.¹

There was little variation in the proportion of women having claims for antidepressant medications across the years.

Mid-age and Older women who reported depression were more likely to be identified as having claims for depression medications than Younger women reporting this condition: among the Younger women who reported depression at Survey 3 or Survey 4, 40% had a claim for at least one type of antidepressant medication in 2005; for Mid-age women and Older women reporting depression, 64% and 67%, respectively, had a claim for antidepressants in 2005. Few women were prescribed more than one type of antidepressant medication.

Small proportions of women who had not reported depression were identified as having antidepressant medications (see Appendix D, Table D-1). This occurred more commonly in the Older age group, among whom antidepressant medication is sometimes prescribed as treatment for other symptoms or conditions (eg. pain, incontinence).

¹ Mid-age women were considered to have depression if they reported this condition at Survey 4 in 2004; Older women were considered to have depression if they reported this condition at Survey 3 in 2002 or Survey 4 in 2005; Younger women were considered to have depression if they reported this condition at Survey 3 in 2003 or Survey 4 in 2006.

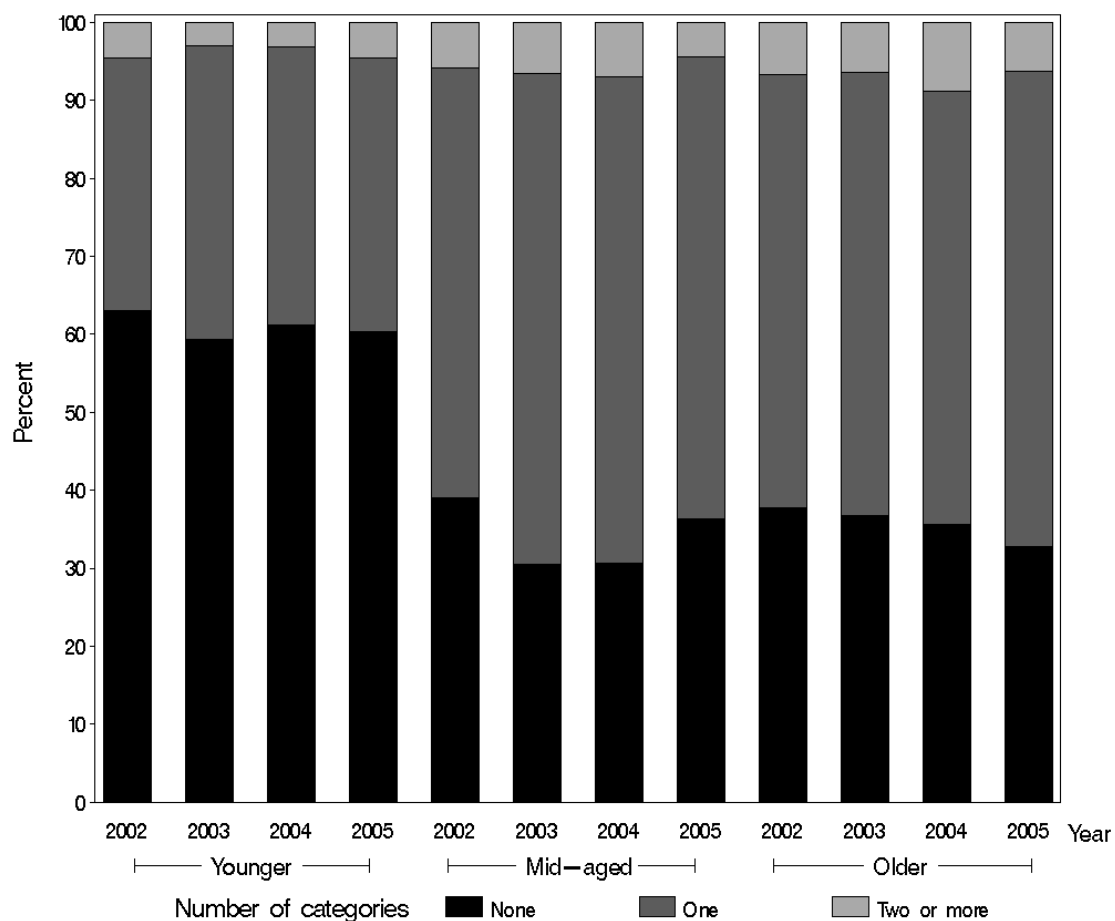


Figure 3-1 Number of antidepressant medication categories identified for women with depression by calendar year

Figure 3-2 shows the main types of antidepressant medications claims for women in 2005. The figure also shows the proportions of women with claims for anxiolytics (for anxiety), hypnotics (sleeping pills) and opiates. Between 31% and 44% of the women who ever reported they had depression were identified as having claims for Selective Serotonin Reuptake Inhibitors (SSRIs) and these appeared to be the most popular class of antidepressant medications prescribed to women in all age groups. These medications include Sertraline, Citalopram, Paroxetine, Fluoxetine, and Fluvoxamine. Tricyclic antidepressant drugs, such as Amitriptyline, Dosulepin, and Doxepin, were also widely identified, particularly among the Older women (20% of Older women with depression in any year). A small proportion of women in every cohort had claims for Monoamine Oxidase Inhibitors. Other antidepressant medications include the serotonin-norepinephrine reuptake inhibitors such as Venlafaxine and other antidepressants such as Mirtazapine.

Anxiolytics and hypnotic medications (such as benzodiazepine derivatives) were also identified for Older women, and appeared to be more commonly identified for women who report ever being told they had depression. Doctor-diagnosed depression also appears to be associated with a higher prevalence of opioid claims.

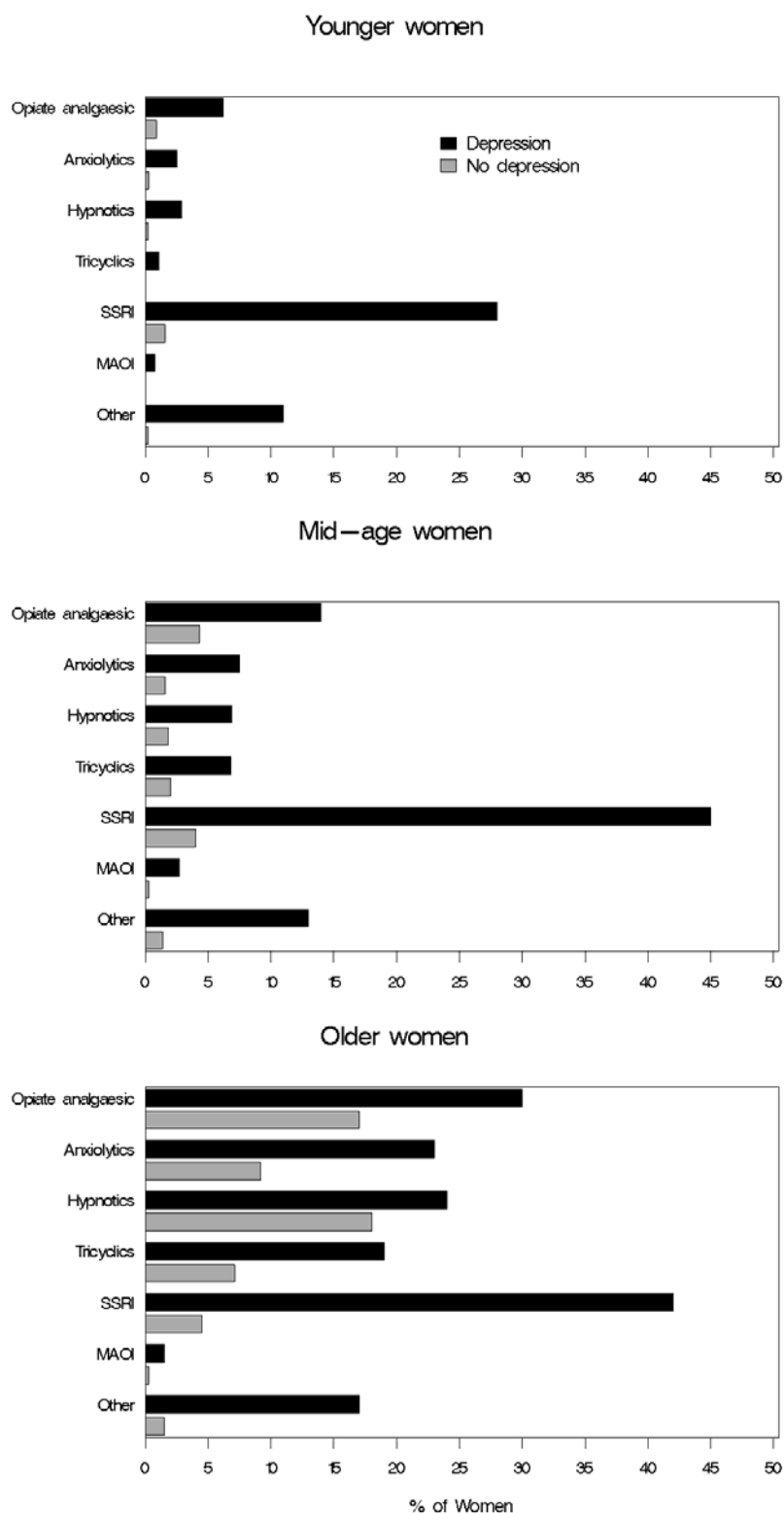


Figure 3-2 Proportion of women with claims for medications for depression and related therapeutic categories

Note. Mid-age women were considered to have depression if they reported this condition at Survey 4 in 2004; Older women were considered to have depression if they reported this condition at Survey 3 in 2002 or Survey 4 in 2005; Younger women were considered to have depression if they reported this condition at Survey 3 in 2003 or Survey 4 in 2006.

3.5. Characteristics of women with claims for antidepressant medications

3.5.1. Demographic characteristics

Table 3-2 shows the areas of residence of women from the three cohorts according to their reports of depression and claims for antidepressant medications (NO6As) at any time during the period 2002-2005. For each cohort, women are grouped according to self-reported depression at any survey or not. Within each group, women are categorised as claimants of antidepressants or not. Younger women who did not report depression but who were nonetheless identified as having claims for antidepressant medications (n=151) tended to be more likely to live in rural areas than other women in this cohort. Conversely, Older women who did report depression but who had no claims for antidepressant medication (n=71) were more likely to be living in rural areas. Area of residence for Mid-age women did not vary according to depression/medication group. (See also Appendix D, Tables D-2 a-c).

Table 3-2 Area of residence of Younger, Mid-age and Older women according to report of depression at Survey 3 or 4 and claims for antidepressant medications

Area of residence at Survey 4		Depression		No Depression	
		Anti-depressants %	No anti-depressants %	Anti-depressants %	No anti-depressants %
Cohort					
Younger	<i>Number of women</i>	428	263	151	2,975
	Urban	70	74	59	73
	Rural	27	21	37	24
	Remote	3	5	4	3
Mid-age	<i>Number of women</i>	698	132	667	5,129
	Urban	68	69	66	68
	Rural	30	29	33	30
	Remote	2	2	1	2
Older	<i>Number of women</i>	386	71	873	3,378
	Urban	70	58	71	71
	Rural	30	41	28	27
	Remote	0	1	1	2

Table 3-3 shows other demographic characteristics of women in each cohort according to their report of depression and claims for antidepressant medications during 2002 to 2005. There were few difference in education level, except that Mid-age women who did not report depression but who were identified as having claims for antidepressant medications tended to have lower levels of education.

Differences in marital status varied by age group:

- Younger women reporting depression appeared to be less likely to be married or in de facto relationships, more likely to be divorced or separated, and more likely to be never married than women who did not report this condition.
- Mid-age women reporting depression were also less likely to be married and more likely to be divorced or separated than others.

- Older women reporting depression were less likely to be married and more likely to be widowed than others, and the group with depression but no medications had the highest proportion of widows, suggesting that widows who are diagnosed with depression are less likely to receive medication for this condition than other women.

Younger women reporting depression were more likely than others to have difficulty managing on their income, and more likely to be caring for someone else with illness or disability, but these differences were not present when claims for medication were considered. Mid-age and Older women who reported depression, and Mid-age women who did not report depression but who had a claim for antidepressant medication, were more likely than other women in their cohort to experience difficulty managing on their income.

Table 3-3 Demographic characteristics of (a) Younger, (b) Mid-age and (c) Older women according to report of depression and claims for antidepressant medications

a) Younger cohort

Number of women	Depression		No Depression	
	Anti-depressant 438	No anti-depressant 248	Anti-depressant 160	No anti-depressant 2,963
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	2	3	2	1
School/higher school certificate	70	65	56	66
Trade/apprentice/certificate/diploma	16	18	17	15
University/higher degree	13	14	24	18
Marital Status				
Married/defacto	57	61	78	76
Divorced/separated/widowed	7	8	3	3
Never married	35	32	19	21
Difficult managing on income	21	18	12	9
Caring for someone	11	6	3	4

b) Mid-age cohort

	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Number of women	705	129	704	5,197
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	14	7	20	11
School/higher school certificate	45	55	48	45
Trade/apprentice/certificate/diploma	21	19	19	22
University/higher degree	20	19	14	21
Marital Status				
Married/defacto	64	73	75	81
Widowed	6	1	3	3
Divorced/separated	25	25	18	12
Never married	5	1	3	3
Difficult managing on income	24	19	17	8
Caring for someone:				
Lives with me	10	12	9	7
Lives elsewhere	25	21	20	23

c) Older cohort

	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Number of women	385	81	876	3,372
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	32	26	29	26
School/higher school certificate	49	50	54	54
Trade/apprentice/certificate/diploma	13	15	13	14
University/higher degree	6	9	5	6
Marital Status				
Married/defacto	32	23	39	37
Widowed	57	67	54	54
Divorced/separated	8	7	4	5
Never married	3	3	3	4
Difficult managing on income	9	11	5	4
Caring for someone:				
Lives with me	12	11	12	11
Lives elsewhere	14	18	14	18

3.5.2. Health risk behaviours

Table 3-4 shows women's reported health risk behaviours according to their reports of depression and claims for antidepressant medications.

Among the Younger women, those with claims for antidepressant medications and those who had had a diagnosis of depression were more likely to smoke than others. Younger women with claims for antidepressant medications tended to be more likely to be overweight or obese. Mid-age women who were diagnosed with depression or who had claims for antidepressant medication were also more likely to smoke and were more likely to be overweight or obese than others.

Older women showed slightly different patterns of health behaviour. Those diagnosed with depression were only slightly more likely to smoke than those not diagnosed with depression,² but smoking rates were generally much lower among the Older women. Older women who were diagnosed with depression but who had no claims for antidepressants were the least likely to be overweight or obese; they were also the most likely to be drinking alcohol three or more times per week.

² Note that these analyses do not take death into account, so the smaller difference in smoking among Older women compared to Mid-age and Older women might have occurred due to deaths among smoking Older women.

Table 3-4 Health risk behaviours of (a) Younger, (b) Mid-age and (c) Older women according to report of depression and claims for antidepressant medications

a) Younger cohort

Number of women	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	438	248	160	2,963
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	24	23	22	14
BMI (Overweight/obese)	48	41	42	37
Alcohol:				
None/rare/less than once/wk	54	54	60	56
1-2 times/wk	29	23	18	23
3 or more time/wk	18	23	21	21

b) Mid-age cohort

Number of women	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	705	129	704	5,197
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	18	14	14	11
BMI (Overweight/obese)	66	58	67	55
Alcohol:				
None/rare/less than once/wk	54	57	55	46
1-2 times/wk	13	16	16	17
3 or more time/wk	34	26	29	37

c) Older cohort

	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Number of women	385	81	876	3,372
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker (Survey 2)	6	7	4	3
BMI (Overweight/obese)	48	37	46	45
Alcohol (Survey 3):				
None/rare/less than once/wk	69	41	63	64
1-2 times/wk	6	16	7	8
3 or more time/wk	25	43	30	28

3.5.3. Comorbidities and self-rated health

Comorbid conditions and self-rated health of women with and without depression and claims for antidepressant medications are presented in Table 3-5. Women with depression and women with claims for antidepressant medications tended to have more comorbidities and were more likely to report fair or poor health than women without depression who had no claims for antidepressant medications.

Younger women with depression tended to be more likely to have asthma or bronchitis and back pain than women without depression, but the prevalence of these conditions did not differ according to claims for antidepressant medication. Mid-age women with depression, or with claims for antidepressant medication, had higher rates of arthritis, heart disease, asthma and back pain. Mid-age women with claims for antidepressants appeared slightly more likely than those with no claims for these medications to report having been diagnosed with diabetes. Older women with depression and those with claims for antidepressant medications had higher rates of arthritis, asthma, and back pain. Those with diagnosed depression tended to be more likely to have heart disease. Older women with diagnosed depression and with claims for antidepressants were the most likely to have diabetes. These findings indicate the importance of depression as being comorbid with other conditions and not always a single isolated condition.

Table 3-5 Comorbid conditions and self-rated health of (a) Younger, (b) Mid-age and (c) Older women according to report of depression and claims for antidepressant medications

a) Younger cohort

Number of women	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	438	248	160	2,963
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	51	37	41	20
Common comorbid conditions:				
Arthritis	NA	NA	NA	NA
Heart disease	1	2	0	0
Diabetes	1	2	0	1
Asthma/bronchitis	24	22	15	14
Back pain	51	49	43	41
Self-rated health: Fair/poor	20	11	9	6

b) Mid-age cohort

Number of women	Depression		No Depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	705	129	704	5,197
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	55	56	49	26
Common comorbid conditions:				
Arthritis	34	36	37	23
Heart disease	4	5	5	2
Diabetes	7	4	7	4
Asthma/bronchitis/emphysema	23	19	16	11
Back pain	60	68	59	46
Self-rated health: Fair/poor	30	19	27	8

c) Older cohort

		Depression		No Depression	
		Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Number of women		385	81	876	3,372
Characteristic at Survey 4 (unless indicated)		%	%	%	%
Comorbidity (two or more conditions)		84	86	80	68
Common comorbid conditions:					
Arthritis		59	51	51	41
Heart disease		34	39	25	23
Diabetes		14	7	12	11
Asthma/bronchitis/emphysema		19	12	17	13
Back pain		77	72	75	61
Self-rated health	Fair/poor	49	40	41	25

3.6. Health service use by women with claims for antidepressant medications

Table 3-6 presents the findings for health service use among women in the three cohorts, by depression diagnosis and claims for antidepressant medication. Younger and Older women with depression were less likely than others to have private health insurance for hospital cover, but there were no differences in private health cover for Mid-age women by depression status, and no differences in any cohort by claims for antidepressant medication.

Across all cohorts, women who did not have depression and were not prescribed antidepressants were the least likely to have undertaken more than 4 GP consultations, or visited a specialist or a hospital doctor within the previous 12-month period.

Around 40% (35%-45%) of Younger women with depression and 23% of Younger women who did not report depression but who were taking antidepressant medications had visited a counsellor or other mental health worker. Among Mid-age women, 26-30% of women with depression had visited one of these health professionals. Questions about visits to these professionals were not included in the surveys of Older women.

Table 3-6 Health service use according to report of depression and claims for antidepressant medications among (a) Younger, (b) Mid-age and (c) Older women

a) Younger cohort

Number of women	Depression		No depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	438	248	160	2,963
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	51	54	54	60
GP visits in last 12 months				
0-4	44	62	55	73
5-12	44	33	38	23
13 or more	12	5	7	3
Specialist visit in last 12 months	63	50	49	47
Hospital doctor in 12 months	33	25	30	22
Allied health in 12 months				
Counsellor/mental health worker	45	35	22	9
Physiotherapist	25	25	17	19
Community nurse/nurse practitioner	13	9	17	12
Alternative practitioner in 12 months				
Naturopath/herbalist	17	21	14	12
Acupuncturist	6	8	7	6
Chiropractor	17	17	14	15
Osteopath	7	9	7	5
Massage therapist	42	47	33	36
Other alternative practitioner	13	16	8	8

b) Mid-age cohort

	Depression		No depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Number of women	705	129	704	5,197
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	67	67	65	74
GP visits in last 12 months				
0-4	41	54	48	77
5-12	45	37	41	21
13 or more	15	9	10	2
Specialist visit in last 12 months	65	62	61	45
Hospital doctor in 12 months	21	23	21	12
Allied health in 12 months				
Counsellor/psychiatrist/social worker	27	32	9	4
Physiotherapist	28	23	26	18
Podiatrist	18	18	19	13
Optician	58	51	52	48
Dentist	63	64	62	67
Pharmacist	75	66	64	50
Dietician	9	7	8	4
Alternative practitioner in 12 months				
Naturopath/herbalist	14	21	14	10
Acupuncturist	8	8	6	4
Chiropractor	16	17	18	14
Osteopath	4	6	4	3
Massage therapist	23	33	28	19
Other alternative practitioner	7	4	6	5

c) Older cohort

Number of women	Depression		No depression	
	Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
	385	81	876	3,372
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	41	36	45	44
GP visits in last 12 months				
0-4	20	27	28	39
5-12	51	46	51	48
13 or more	29	27	22	12
Specialist visit in last 12 months	78	65	74	65
Hospital doctor in 12 months	25	29	25	18
Allied health in 12 months				
Physiotherapist	25	25	26	16
Podiatrist	51	42	49	40
Optician	54	56	54	48
Dentist	51	44	41	42
Alternative health practitioner in last 12 months	13	15	12	9

3.7. Patterns of antidepressant medication claims over time

This section reports on changes in antidepressant medication claims for the period 2002 to 2005 among women with self-reported depression. Four patterns of medication claims can be defined. The first group are women who had antidepressant medications in both 2002 and 2005 (they are referred to as 'continued' users, although they may have ceased and restarted antidepressants within this timeframe). The second group are women who had no claims for antidepressant medications in 2002, but who started to have claims for these medications between 2003 and 2005 (uptake). The third group had claims for antidepressant medication in 2002, but not in 2005 (cessation of claims). The fourth group did not have any claims for antidepressant medications during this time (see Table 3-7).

Table 3-7 Patterns of claims for antidepressant medication among women with depression

Group	No. of claims for antidepressant medications 2002-2005							
	2002	2003	2004	2005	N	%	median	range
Younger women								
Continued	Y	Y/N	Y/N	Y	150	24	8	2-51
Uptake	N	Y/N	Y/N	Y	122	20	7	1-94
Cessation	Y	Y/N	Y/N	N	103	17	5	1-40
No claims	N	N	N	N	248	40	0	0
Mid-age women								
Continued	Y	Y/N	Y/N	Y	401	52	11	2-86
Uptake	N	Y/N	Y/N	Y	130	17	9	1-25
Cessation	Y	Y/N	Y/N	N	107	14	5	1-57
No claims	N	N	N	N	129	17	0	0
Older women								
Continued	Y	Y/N	Y/N	Y	244	55	41	3-98
Uptake	N	Y/N	Y/N	Y	69	16	12	1-45
Cessation	Y	Y/N	Y/N	N	46	11	6	1-44
No claims	N	N	N	N	81	18	0	0

Note: the pattern N Y/N Y/N N has been omitted from this table

A majority of the Younger women with self-reported doctor-diagnosed depression (40%) had no identified claims for antidepressant medications during this period, although they may have had medications for depression prior to 2002. Around 20% started medications during this period, and 17% had claims for antidepressant medications in 2002 but had ceased these medications in 2005. Around 24% had claims for antidepressant medications both at the start and at the end of the period.

Compared with Younger women, Mid-age women who had reported depression were more likely to have claims for antidepressant medications at some time during the four year period, with only 17% having no claims in the PBS data during this period. Mid-age women were also more likely to be identified as having continued antidepressant medications over the four years, with 52% of the women with depression being in this category.

Among Older women with depression, 18% had no claims for antidepressant medications in the PBS data from 2002-2005. The most common claim pattern was for women to continue antidepressant medication claims during the period of observation, with 55% of the women with depression having this pattern.

Older women had a higher median number of claims for antidepressant medications over the period than Mid-age and Younger women.

3.8. Factors associated with different claim patterns for antidepressant medications

Tables showing the characteristics of women with different patterns of claims for antidepressant medication are provided in Appendix D, Tables D-3 a - c. There were few substantial differences. Among Younger and Mid-age women, those who continued to have claims for antidepressant medication were more likely to be overweight or obese at Survey 4 than those who ceased to have claims or who had no claims. A different association between claim patterns and BMI was observed for the Older women, with those who ceased the medications being more likely to be overweight or obese at Survey 4. There was also an association

between divorce or marital separation and uptake of medications. Among Younger and Mid-age women those who took up medications were more likely to have comorbid conditions. In contrast, among Older women comorbid conditions were less prevalent among those who took up antidepressant medications. In all age groups, women who used antidepressants in both 2002 and 2005 or who took up these medications between 2003 and 2005 were more likely to rate their health as fair or poor than women with other claim patterns.

3.9. Association between claims for antidepressant medication and changes in mental health among Older women with depression.

This section reports on the changes in mental health scores for Older women with depression defined according to their claim patterns for antidepressant medication over the period 2002 to 2005.

Before undertaking this analysis for these women in the Older cohort, it was important to first check whether the underlying condition, in this case depression, had an effect on remaining alive and in the study, as this can be an important source of bias when examining differences over time. After adjusting for area of residence (as reported at Survey 3), highest level of education (at Survey 1), smoking status (at Survey 2) and total number of comorbidities (as measured at Survey 3), the relative risk of death given a woman said she had been diagnosed with depression at Survey 2 was 1.09 (95% CI 0.85, 1.35). Relative risk of withdrawal from the study given by a woman who said she had been diagnosed with depression at Survey 2 was 0.93 (95% CI 0.55, 1.39). Reporting of depression at Survey 2 was therefore not associated with death or withdrawal from the study by Survey 4.

Figure 3-3 shows the difference in Mental Health sub-scale scores for women with different claim patterns for antidepressant medications. Assessment of the change in scores for each group indicated that there was:

- **no change** in scores for women who continued antidepressants
- **a negative change** in scores for Mid-age and Older women who commenced medication (worsening mental health related quality of life)
- **an improvement in scores** for women who ceased medications
- **no change** in scores for women who did not claim medications at any time.

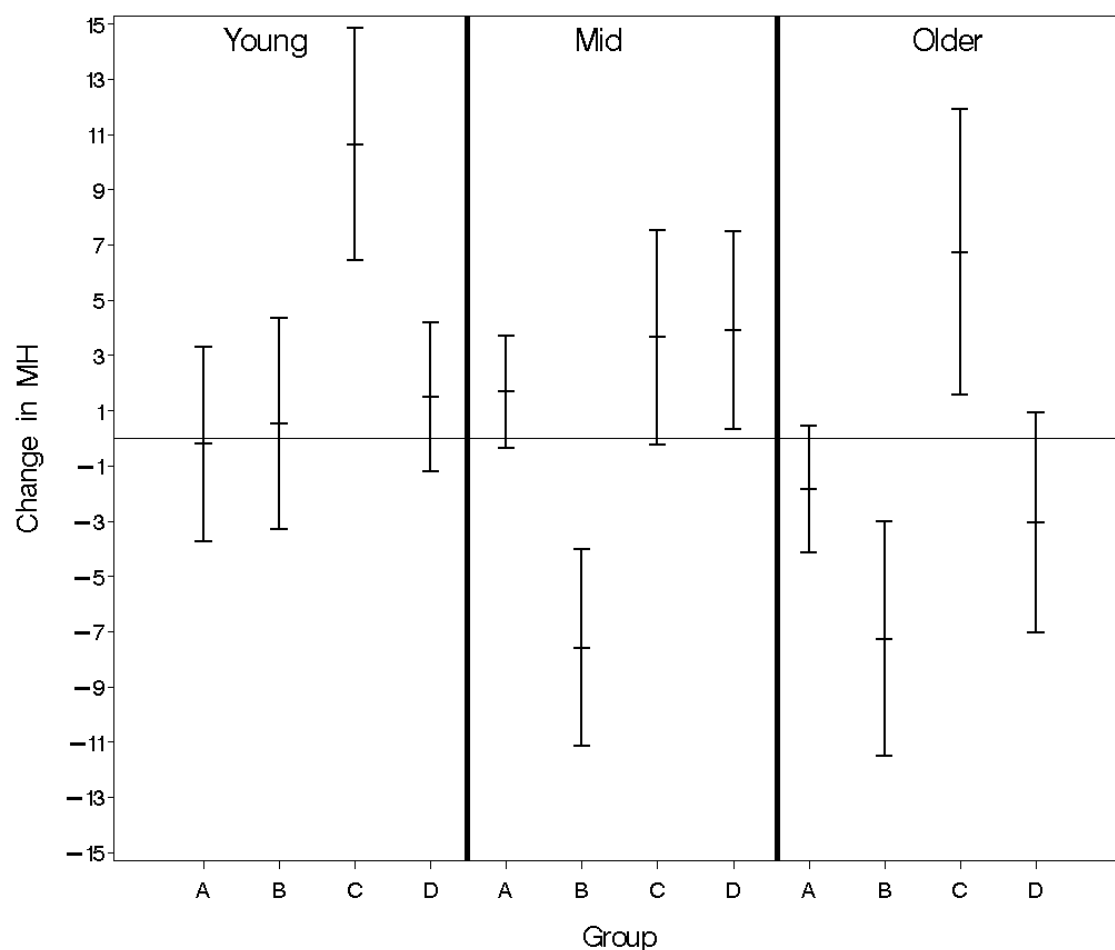


Figure 3-3 Change in SF-36 Mental Health scores Survey 3-4. A=continuing antidepressants; B=uptake of antidepressants; C=cessation of antidepressants; D=no antidepressants

The change in Mental Health scores is calculated by subtracting the S3 score from the S4 score ($S4 - S3$). I.e. a +10 point improvement in scores would be achieved for a person who scored 80 at S3 and 90 at S4; a -10 point deterioration in score would be achieved for a person who scored 90 at S3 and 80 at S4. Group A 'continued': antidepressants in both 2002 and 2005; group B 'uptake': took up antidepressants between 2003 and 2005; group C 'ceased': claimed antidepressants in 2002 but not in 2005; group D 'no claims': did not claim antidepressants between 2002 and 2005.

3.10. Women's comments

Women in all three age cohorts have taken the opportunity provided in the free-text section of the survey to make comment on their experiences of taking medications for depression.

The women in the Younger cohort commented on negative and positive aspects of taking medication for depression. This comment from a young woman describes the difficulties she has encountered when withdrawing from her medication:

I have withdrawal syndrome. I have been reducing a high dose of antidepressant for several months. It has been horrendous. I have had very bad physical side-effects, anxiety and panic attacks. I have an awesome GP and psychiatrist and psychological support. I am very optimistic this difficult phase will pass as the antidepressant is weaned out of my body.

Another Young woman wrote of her opiate dependency and the difficulty of managing her treatment:

My opiate dependency was concluded to be as a direct result of depression and poor self treatment and medication. Depression has been part of most of my adult life and I disappoint myself for not keeping it in better check.

Young women also wrote of the positive effects medication for depression had had on their lives. For example:

My main health concern in recent months has been depression related. My Doctor placed me on drugs to control this around 5 months ago and things are great – I feel less pressure and stress, I am confident and happy again, my personal relationships are better and more fulfilling. I am optimistic about the future. Even the extra kilos aren't so much of a worry.

Many Mid-age women have commented on the effect of depression medication on their lives, with many comments relating to the onset of menopause:

I have attended a women's health clinic in Melbourne for menopausal problems, including severe hot flushes which led to sleeping problems and lots of other associated changes in my life. After three or four appointments the doctor thought that I may have a form of depression. Hence I am on medication and feel wonderful. The fact that I no longer have hot flushes or sleep deprivation has certainly helped the situation, but had I not had the help from the women's health clinic and the medication for the depression, I don't know what I would have done.

Another woman described the difficulties she faced when confronted with menopausal symptoms and overwhelming anxiety:

Reaching menopause two years ago was the most devastating debilitating stressful event in my life. Despite having consulted menopause clinics & gynaecologists etc, not one single person was able to help ease the distress & the physical & mental symptoms. No one really gave me any explanation about anything. All emphasis on menopause seem to be on 'hot flushes', anything else was almost considered to be just an over reaction. My main problem was the overwhelming anxiety that suddenly descended on me. Consulting psychologists initially appeared ineffective. It is only after antidepressants were prescribed that I began to have a grip on life again. I'm by no means fully recovered but I'm making my way out of that deep, frightening, dark, unreal, confidence sapping, dizzy tunnel again. The funny thing is that I'm usually a happy, stable, peace loving person and I desperately want the old me back. I found talking to other women my age was the single most helpful way to deal with menopause.

Not all women achieved positive effects from taking depression medication. A Mid-age woman described her experiences of depression:

Chronic Depression. I can't be bothered. I'm taking industrial quantities of antidepressants, vitamins, fish oil etc etc. The shrink doesn't seem to want to distinguish between not being depressed e.g. crying all the time, can't get out of bed etc etc (which no longer applies) and not being fully functional, e.g. can't concentrate, can't organise my way out of a wet paper bag, achieve very little in a day can't be bothered doing anything, including cooking, housework, going out anywhere (including to

the supermarket, PO etc etc). I'm no longer frustrated by this, I can't be bothered. Life just seems to float past, I don't go anywhere or do anything. I used to get very frustrated/angry about life in general and raising kids in particular but one kid has left and the other is no trouble. I used to want to get my life back but now that I could, I can't be bothered. Don't know where this will lead, I have to scrape the energy to talk to the GP and shrink about new things, the lifestyle developments haven't worked!!

Some Mid-age woman who wrote about depression medication made comment on having used antidepressant medications for a period of time and then stopped:

I was diagnosed with depression 2 years ago. Treated successfully with anti depressants (for 1 year) I have ceased antidepressants for 1 year and have had no recurrence.

I'm a generally happy well adjusted person. However, menopause really "pulled the rug out from under me". I experienced severe anxiety attacks, depression, crying, thinking I was going mad, not able to think at work, difficulty making decisions - lots of hot flushes, loss of appetite, lack of sleep. Ultimately, after 4 1/2 months of Sheer Hell, it was going onto antidepressants, that sorted me out & got me back to being me. However, it's taken 8 mths to successfully wean myself off them.

Fewer Older women chose to comment on their experiences with depression medications than the women in the mid-age and younger age groups. One woman wrote about her medication usage at two time points, surveys three and four. At Survey 3 she wrote:

Have developed serious osteoarthritis in right knee during last six months. Daily medication, anti-inflammatory tablets. Atrial fibrillation of heart controlled by 4 different prescribed tablets taken daily. Clinical depression stable at present with high daily antidepressant dosage. Combination of these medication results in constipation controlled by self medicated tablets.

At time four she wrote again:

*1 1/2 years ago developed anxiety leading to severe depression requiring admission to hospital where anti depression medication was successful.
-- prior to admission psychotherapy for eight weeks had not been successful.
-- I do my best to follow doctors instructions re medications (eight different medicines), diet, sleep, exercise and lifestyle.*

Another woman wrote of her inability to tolerate antidepressant medications and the effect of her illness on her life:

My activities and social contacts are restricted because of several reasons-although not frightened or nervous I do suffer from anxiety which I can find no reason for and no remedy, this leads to bouts of depression. Also several of my friends are deceased, others the same generation as me are in quite bad physical health with some disabilities. I have no physical disabilities. I have help with my mental problems from a caring female psychiatrist. I do not tolerate anti depressant medication. I've tried most. I have to fall back upon my own personal resources.

Some women expressed the positive effects of medication for depression on their lives. For example one woman wrote:

Twelve months ago, I was diagnosed with Clinical Anxiety Depression. It had been creeping on and I didn't know what was happening to me, none of it added up, I really couldn't find a reason for what I was feeling. After one month on medication I have not looked back.

One Older woman wrote that she was surprised to discover that a drug she thought she was taking for a skin disease was actually a medication used to treat depression:

Treated for Scabies (six months ago) for which a drug was prescribed. I was surprised to find that this drug is prescribed for depression which I didn't think I had - lonely at times but not depressed. I'm taking the medication and I feel O.K.

3.11. Discussion

This section of the report shows the rates of use of antidepressant medications by women participating in the ALSWH, and factors associated with the use of these medications among women with self-reported doctor diagnosed depression. Selective Serotonin Reuptake Inhibitors (SSRIs) were the main class of antidepressant medications identified among the women in the study. It is of note that tricyclic antidepressant drugs, such as Amitriptyline, Dosulepin, and Doxepin, were also in common usage, particularly among the Older women (used by about 20% of Older women with depression in any year). These drugs are no longer considered the most appropriate therapy for depression in Older people, however, these tricyclic drugs may be used for conditions other than depression such as anxiety disorder, chronic insomnia, neuropathic pain, migraine, incontinence and smoking cessation treatments. They also have a strong H₂ receptor antagonism and so can be used in the treatment of gastrointestinal ulcer and other gastrointestinal problems.

A small proportion of women had claims for Monoamine Oxidase Inhibitors. Due to potentially fatal dietary and drug interactions, these medications are not usually recommended as a first line treatment for depression, but may be used for cases of depression that are resistant to other classes of antidepressant medication. These drugs can also be used to treat other conditions, and may be used to assist with smoking cessation. Other antidepressant medications in popular use, particularly among Mid-age and Older cohorts, included the Serotonin-Norepinephrine Reuptake Inhibitors such as Venlafaxine and other antidepressants such as Mirtazapine.

Anxiolytics and hypnotic medications (such as benzodiazepine derivatives) were also in common usage by Older women with depression, and appeared to be more commonly identified for women who report ever being told they have depression. Depression also appeared to be associated with a higher prevalence of opioid use.

Mant et al. found similar patterns of antidepressant medication use. They also found a rapid increase in use of antidepressant medications from 1998-2002, with only a 35% reduction in use of tricyclics when SSRIs were introduced. This pattern suggests that SSRIs were being taken up by new users and old users were continuing on the tricyclics (Mant et al., 2004).

Small proportions of women who had not reported depression were identified as having claims for antidepressant medications, more commonly in the Older age group where these are likely to be used for other indications such as pain and incontinence.

3.12. References

Mant A, Rendle VA, Hall WD, Mitchell PB, Montgomery WS, McManus PR & Hickie IB (2004). Making new choices about antidepressants in Australia: the long view 1975–2002. *MJA*, 181, S21–S24.

4. Medication Use for Common Priority Health Conditions

4.1. Key findings

Asthma

- The ALSWH survey question referring to asthma asked: “Have you been diagnosed or treated for asthma?”. This question was included in all surveys for all three cohorts.
- For Older women, differentiation between asthma, bronchitis and emphysema is sometimes difficult. The ALSWH survey question referring to bronchitis/emphysema asked: “Have you been diagnosed or treated for bronchitis/emphysema?”.
- By Survey 4, 30% of Younger women, 20% of Mid-age women and 15% of Older women had reported having doctor-diagnosed asthma.
- More than 20% of Older women reported having doctor-diagnosed bronchitis or emphysema by Survey 4.
- The most commonly claimed asthma medications across all cohorts were beta-2 receptor agonists, adrenergics, glucocorticoids and anticholinergics.
- Younger women with asthma were less likely to claim for asthma medication than Mid-age and Older women: Younger women may have been more likely to buy over-the-counter asthma medication (which does not appear in PBS data).
- Mid-age women claiming for asthma medication were less likely to be married, had lower levels of education and more trouble managing on their available income: this may reflect a greater likelihood of holding a health care card.
- Women claiming for asthma medications were more likely to be overweight or obese than women without, across all cohorts.

Arthritis

- The ALSWH survey question referring to arthritis asks about doctor-diagnosed arthritis. Although this includes all types of arthritis, osteoarthritis is expected to be the most common condition among Mid-age and Older women.
- 32% of Mid-age women and 64% of the Older women reported having doctor-diagnosed arthritis by Survey 4 (in 2004 and 2005, respectively).
- Not making any claims for arthritis medications was common among women with arthritis: 61% to 71% of Mid-age women and 51% to 63% Older women who reported having arthritis did not make claims for arthritis medications across all years.
- Most Mid-age and Older women with doctor diagnosed arthritis and who had claims for arthritis medicines, had claims for only one type of arthritis medicine.
- Mid-age women who reported having arthritis and/or who had a claim for arthritis medication had lower levels of education and more difficulty managing on their income than women without arthritis or arthritis medication claims.
- Mid-age women with doctor-diagnosed arthritis and/or with claims for arthritis medication were more likely to be obese than those without.

Cardiovascular disease

- Cardiovascular disease (CVD) conditions, mainly comprising high blood pressure, heart disease and stroke, were commonly reported among women who gave consent to record linkage and participated in Survey 4: 33% for the Mid-age women and 75% for the Older women.

- Claims for medications for CVD conditions, principally angiotensin converting enzyme (ACE) inhibitors, angiotensin II (AII) receptor antagonist, statins and beta blockers were also very commonly used, by 33% of the Mid-age women and 80% of the Older women.
- Statins were commonly used by women who reported a diagnosis of diabetes (50% in this group of Mid-age women and 64% of Older women). Statins were also commonly used by women with hypertension (as well as for women with a history of heart disease or stroke). These results show the extent to which statins were being used for chemoprophylaxis to prevent CVD event.
- The most commonly used combination of CVD medications for Mid-age and Older women were ACE/AII with statins, and ACE/AII with aspirin with or without statins.
- Mid-age and Older women who reported CVD conditions and claimed for CVD medications were much more likely to be overweight or obese and reported more comorbidity than other women. They also made more use of GPs and were more likely to see specialists and hospital doctors.

Diabetes

- Younger women who reported having a doctor diagnosis of diabetes were more likely to use insulin whereas Mid-age and Older women were more likely to use oral blood glucose lowering drugs. This could reflect the difference in prevalence of type 1 and type 2 diabetes.
- About half the Mid-age women and more than 40% of the Older women who had ever reported diabetes did not make claims for diabetes medications and many of them did not report diabetes at Survey 4. This suggests that many of these women were being successfully managed by diet and lifestyle modification alone.
- Mid-age women who reported diabetes with or without medication claims had lower levels of education and more difficulty managing on their income than other women.
- Almost 90% of Mid-age women and two-thirds of Older women who claimed for diabetes medications were overweight or obese.
- Women who claimed for diabetes medications had higher levels of morbidity, more GP visits and were more likely to see specialists, hospital doctors and pharmacists than other women.

4.2. Medications for Asthma

4.2.1. Introduction

In 2004-05, approximately 10% of the Australian population reported having asthma. Asthma is the most common chronic illness in children (Australian Bureau of Statistics, 2006; Australian Centre for Asthma Monitoring, 2007a), but also affects older adults, and is more common among females (11%) compared to males (9%).

Medication, in conjunction with an asthma management plan, is the most common method to control and prevent asthma attacks. Medication for asthma consists of preventative medication (to be taken on a regular basis) and symptom relief medication (to be taken as needed). In 2004-2005, 55% of people with asthma used pharmaceutical medications to prevent and/or relieve their asthma symptoms (Australian Bureau of Statistics, 2006). Furthermore, 85% of people with asthma had used a reliever and 39% had used a preventer in the previous two weeks. Many people do not use preventer inhalants as regularly as recommended (Australian Centre for Asthma Monitoring, 2007b) and most people take short-acting reliever drugs (e.g. Ventolin) which should not be needed if symptoms are under control (Australian Centre for Asthma Monitoring, 2007b).

Over \$17 million worth of asthma medication prescriptions were subsidised by the PBS between 2002 to 2004 (Australian Centre for Asthma Monitoring, 2007b). Asthma medication use increases with age and is more common among females than males (55% of medications were

purchased by females). Two-thirds of asthma medications are purchased by people who live in major cities (Australian Centre for Asthma Monitoring, 2007b). In PBS data, people with concession cards are twice as likely to be identified as using asthma medications as general patients (Australian Centre for Asthma Monitoring, 2007b).

4.2.2. Self-reported doctor diagnosis of asthma and bronchitis/emphysema

The ALSWH survey question referring to asthma asked: “Have you been diagnosed or treated for asthma?” This question was included in all surveys for all three cohorts. The proportions of women reporting a diagnosis of asthma are shown in Figure 4-1. By Survey 4, around 30% of the Younger women, 20% of the Mid-age women and 15% of the Older women reported a diagnosis of asthma. Among older adults, differentiation between asthma and chronic bronchitis or other chronic obstructive airways disease can be particularly problematic, and so it is worth also considering respiratory medication use among older women with a diagnosis of bronchitis/emphysema (See Figure 4-2). The ALSWH survey question referring to bronchitis/emphysema asked: “Have you been diagnosed or treated for bronchitis/emphysema?”

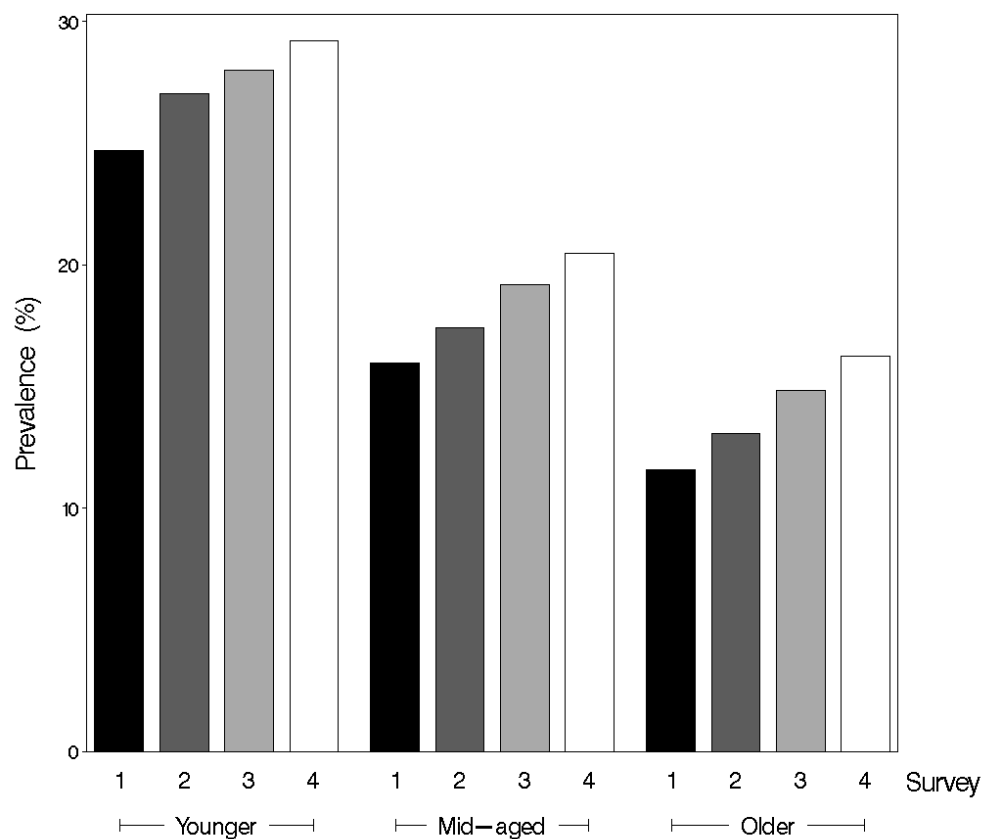


Figure 4-1 Prevalence of asthma for Younger, Mid-age and Older women across Surveys 1 – 4

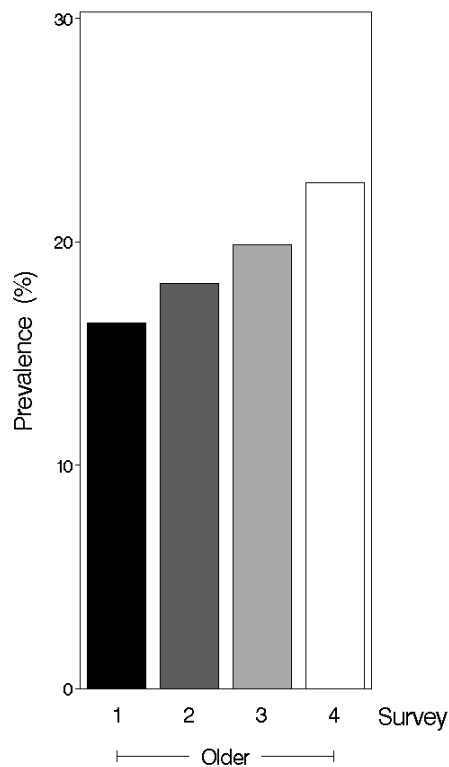
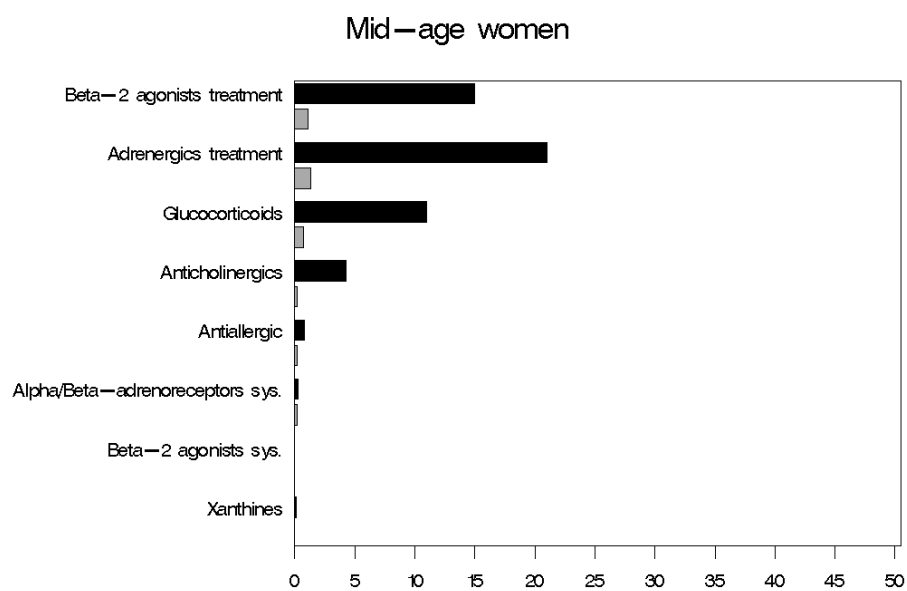
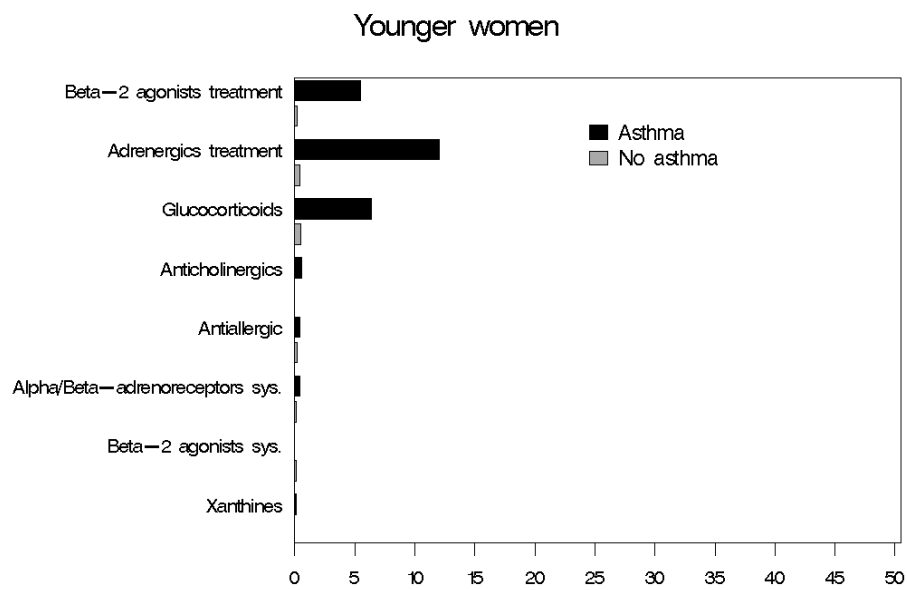


Figure 4-2 Prevalence of bronchitis/emphysema for Older women across Surveys 1-4

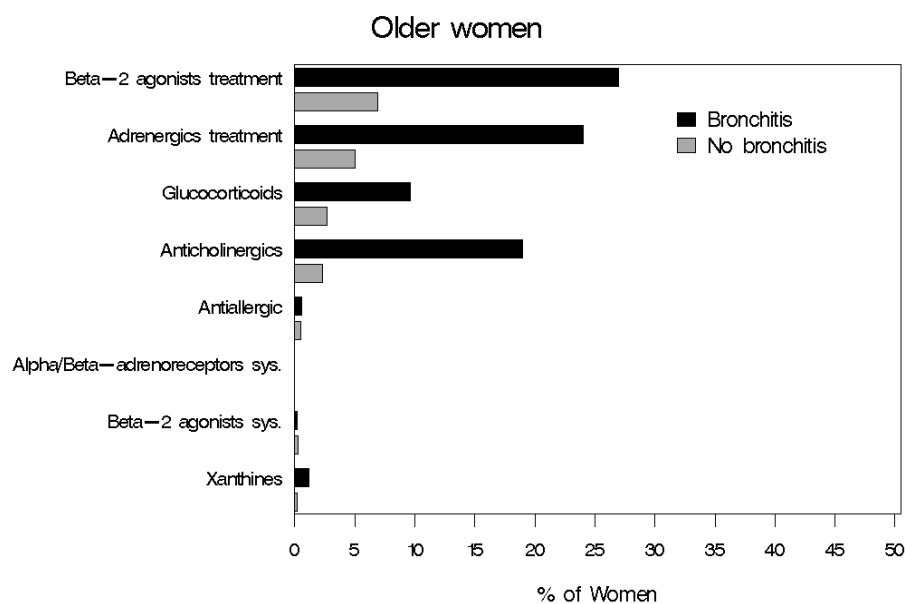
4.2.3. Major medications for asthma

Figure 4-3a shows the most common medications for asthma, used by women with and without self-reported diagnosis of asthma in 2005. Figure 4-3b shows similar data for Older women reporting a doctor diagnosis of bronchitis/emphysema. Patterns of asthma medications were similar across the three cohorts with Beta-2 receptor agonists, adrenergics, glucocorticoids and anticholinergics being the most common medications identified in the PBS data. The proportions of women with asthma who were identified as using these medications were greater among the Mid-age and Older women; however, this may be due to the fact that many of these medications are available over-the-counter, without prescription. For Younger women and women without a health care card over-the-counter purchase could be a cheaper and more convenient way to obtain these medications.

Younger women also tended to have fewer types of asthma medications identified in the PBS data (see Figure 4-4) but again these data do not include over-the-counter purchases.



a)



b)

Figure 4-3 Percentage of women with PBS claims for medications for a) asthma in the Younger, Mid-age and Older cohorts and b) bronchitis in the Older cohort in 2005.

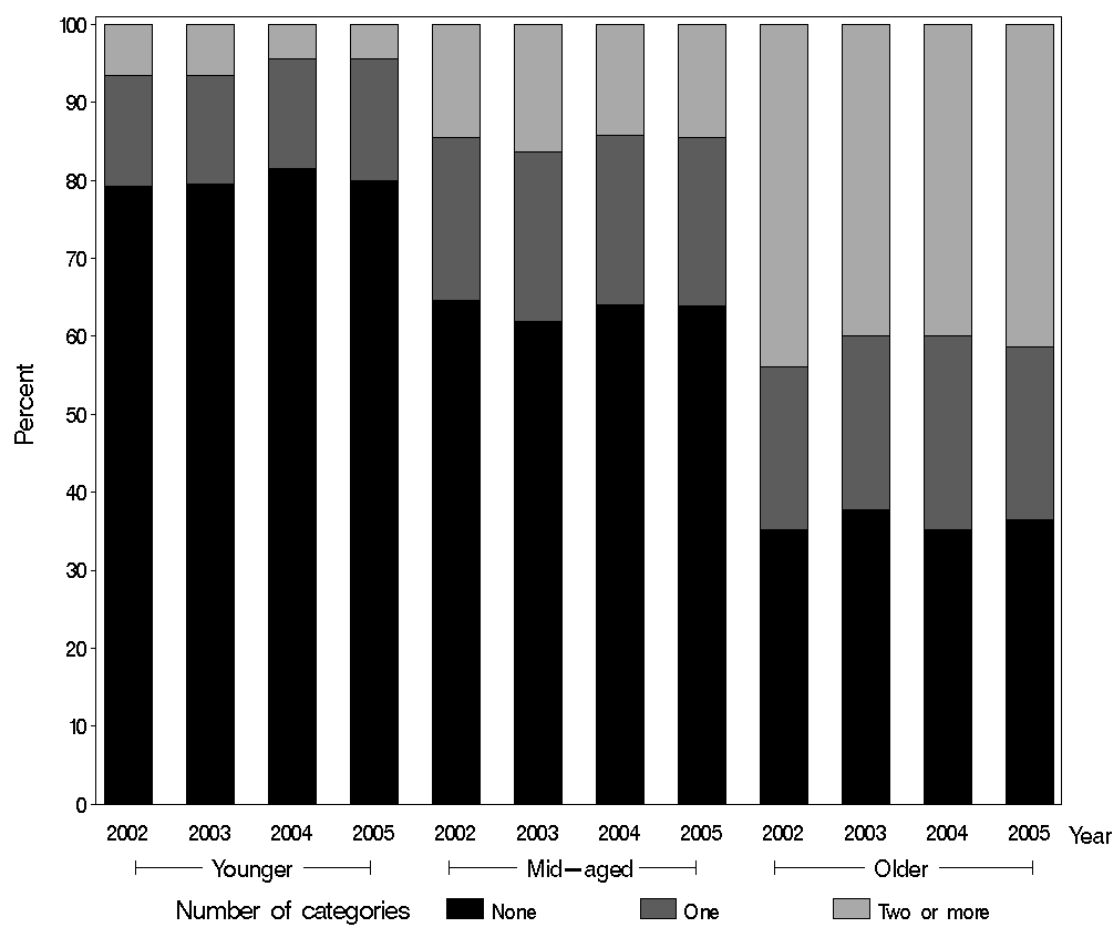


Figure 4-4 Number of asthma medication categories claimed by women with asthma by calendar year

4.2.4. Factors associated with asthma medication use

Table 4-1 shows there were few differences in area of residence for women in each cohort, according to their report of asthma at any survey and use of asthma medications as identified in the PBS data for any year from 2002 to 2005.

Table 4-1 Area of residence of Younger, Mid-age and Older women according to report of asthma at Survey 3 or 4 and PBS claims for asthma medications

Area of residence at Survey 4		Asthma		No Asthma	
		Asthma medications %	No asthma medications %	Asthma medications %	No asthma medications %
Cohort					
Younger	<i>Number of women</i>	417	725	116	2,572
	Urban	71	72	74	72
	Rural	25	26	25	24
	Remote	4	2	0	4
Mid-age	<i>Number of women</i>	751	711	435	4,912
	Urban	68	70	69	68
	Rural	30	28	30	30
	Remote	2	2	1	2
Older	<i>Number of women</i>	617	165	775	3,153
	Urban	71	73	73	70
	Rural	28	26	25	28
	Remote	1	1	1	2

Table 4-2 shows other demographic characteristics of women in each cohort according to their report of asthma and PBS claims for asthma medications during 2002 to 2005. Younger and Mid-age women claiming for asthma medications (whether or not they reported having a diagnosis of asthma) were less likely to be married, and more likely to have difficulty managing on income than other women in the cohort. Mid-age women claiming for asthma medications (whether or not they reported the diagnosis of asthma) had lower levels of education. These effects were not as apparent for the Older women (see Table 4-2c).

Table 4-2 Demographic characteristics of (a) Younger, (b) Mid-age, and (c) Older women according to report of asthma and PBS claims for asthma medication; 2002 to 2005

a) Younger cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	419	732	119	2,550
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	2	1	2	1
School/higher school certificate	67	68	67	65
Trade/apprentice/certificate/diploma	16	15	11	16
University/higher degree	15	16	20	18
Marital Status				
Married/defacto	67	74	76	73
Divorced/separated/widowed	4	5	6	3
Never married	28	22	18	24
Difficult managing on income	17	12	19	9
Caring for someone	7	4	9	4

b) Mid-age cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	775	702	443	5,001
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	19	10	18	11
School/higher school certificate	44	44	46	46
Trade/apprentice/certificate/diploma	18	23	20	22
University/higher degree	19	23	16	20
Marital Status				
Married/defacto	72	80	77	80
Widowed	3	4	4	3
Divorced/separated	20	14	14	14
Never married	4	2	5	3
Difficult managing on income	19	9	17	9
Caring for someone:				
Lives with me	11	8	8	7
Lives elsewhere	24	25	28	22

c) Older cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	623	157	731	3,205
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	28	25	29	26
School/higher school certificate	50	45	54	54
Trade/apprentice/certificate/diploma	15	17	11	14
University/higher degree	6	14	5	6
Marital Status				
Married/defacto	36	40	34	38
Widowed	53	50	59	54
Divorced/separated	7	4	4	5
Never married	5	6	3	4
Difficult managing on income	8	6	5	4
Caring for someone:				
Lives with me	9	10	10	12
Lives elsewhere	16	19	17	17

4.2.5. Health risk behaviours

Table 4-3 shows the health risks behaviours of women according to report of asthma and claims for asthma medications. Younger and Mid-age women who did not report asthma but who were identified as having PBS claims for asthma medications were more likely to smoke. Regardless of self-reported asthma, Younger and Mid-age women with asthma medications were more likely to be non-drinkers or only occasional drinkers of alcohol.

Younger, Mid-age and Older women with asthma and those who were identified as using asthma medications from PBS data were more likely to be overweight or obese than women with no asthma and no medications.

While few Older women were current smokers, those claiming for asthma medications were more likely to smoke: those with no report of asthma but claiming for asthma medications were most likely to smoke.

Table 4-3 Health risk behaviours of (a) Younger, (b) Mid-age and (c) Older women according to report of asthma and claims for asthma medication

a) Younger cohort

Number of women	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
	419	732	119	2,550
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	17	18	18	15
BMI (Overweight/obese)	48	42	48	35
Alcohol:				
None/rare/less than once/wk	58	56	64	55
1-2 times/wk	26	24	18	23
3 or more time/wk	16	20	18	22

b) Mid-age cohort

Number of women	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
	775	702	443	5,001
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	16	12	17	11
BMI (Overweight/obese)	71	58	64	55
Alcohol:				
None/rare/less than once/wk	56	45	51	47
1-2 times/wk	13	15	17	17
3 or more time/wk	31	40	33	36

c) Older cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	623	157	731	3,205
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker (Survey 2)	3	1	6	3
BMI (Overweight/obese)	53	44	50	42
Alcohol (Survey 3):				
None/rare/less than once/wk	63	61	63	64
1-2 times/wk	10	9	6	8
3 or more time/wk	27	30	31	28

4.2.6. Comorbidities and self-rated health

Comorbid conditions and self-rated health for women who did or did not report having had a doctor's diagnosis of asthma and according to claims for asthma medications are presented in Table 4-4. Across all cohorts, women with no asthma and no asthma medications had the lowest probability of reporting other conditions at Survey 4. Women who claimed for asthma medications were more likely to have depression than were those who did not claim for asthma medications; similarly depression was more common among women with asthma than among women without this condition. In Younger women and Older women, back pain was also slightly more common among women with asthma than without, regardless of asthma medications; whereas for Mid-age women, back pain was less common among women with asthma medications than among other women.

Among Mid-age women, heart disease and diabetes were more commonly reported by those identified as using asthma medications (regardless of self-reported asthma). Similar results were observed for Older women, except there was no apparent difference in reporting of diabetes.

Younger women were not asked if they had arthritis, but among Mid-age and Older women arthritis was most common among those with asthma (among Older women) and among those with asthma and asthma medications (among Mid-age women).

Women with PBS claims for asthma medications were more likely to report their health as fair or poor than women without medications. Similarly, women with asthma and medications were most likely to report fair or poor self-rated health (Mid-age and Older) and women with no asthma and no asthma medications were least likely to report only fair or poor health.

Table 4-4 Comorbid conditions reported by (a) Younger, (b) Mid-age and (c) Older women according to report of asthma and claims for asthma medication

a) Younger cohort

Number of women	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
	419	732	119	2,550
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	32	28	35	20
Common comorbid conditions:				
Depression	21	14	21	11
Diabetes	1	2	0	1
Arthritis	NA	NA	NA	NA
Back pain	47	46	46	41
Self-rated health: Fair/poor	16	9	11	6

b) Mid-age cohort

Number of women	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
	775	702	443	5,001
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	50	38	40	26
Common comorbid conditions:				
Depression	25	12	19	10
Heart disease	5	3	6	2
Diabetes	7	5	8	3
Arthritis	42	29	32	22
Back pain	58	71	68	78
Self-rated health: Fair/poor	26	10	22	10

c) Older cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	623	157	731	3,205
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	78	73	78	67
Common comorbid conditions:				
Depression	8	12	8	6
Heart disease	33	21	32	21
Diabetes	12	12	12	11
Arthritis	58	52	47	41
Back pain	72	76	70	62
Self-rated health: Fair/poor	43	36	35	26

4.2.7. Health service use by women with claims for asthma medications

Table 4-5 presents the findings for health service use among women in the three cohorts by asthma diagnosis and claims for asthma medication. Women had more visits to GPs and other health care providers if they reported asthma or were identified as claiming for asthma medications. For Younger women there was a tendency for more use of complementary and alternative medicine among those with asthma (regardless of PBS claims for asthma medication).

Table 4-5 Health service use by (a) Younger, (b) Mid-age and (c) Older women according to report of asthma and PBS claims for medications for asthma

a) Younger cohort

Number of women	Asthma		No asthma	
	Asthma medications 419	No asthma medications 732	Asthma medications 119	No asthma medications 2,550
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	56	59	51	59
GP visits in last 12 months				
0-4	54	67	53	72
5-12	37	28	38	25
13 or more	9	5	9	3
Specialist visit in last 12 months	56	50	53	48
Hospital doctor in 12 months	28	24	23	22
Allied health in 12 months				
Counsellor/mental health worker	22	15	23	14
Physiotherapist	25	22	24	18
Community nurse/nurse practitioner	12	12	11	12
Alternative practitioner in 12 months				
Naturopath/herbalist	16	15	11	12
Acupuncturist	6	7	4	7
Chiropractor	18	17	8	14
Osteopath	5	5	5	6
Massage therapist	38	39	32	37
Other alternative practitioner	11	10	12	9

b) Mid-age cohort

	Asthma		No asthma	
	Asthma medications	No asthma medications	Asthma medications	No asthma medications
Number of women	775	702	443	5,001
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	64	75	64	74
GP visits in last 12 months				
0-4	48	67	50	76
5-12	38	29	40	22
13 or more	14	4	9	3
Specialist visit in last 12 months	58	50	60	46
Hospital doctor in 12 months	20	14	26	12
Allied health in 12 months				
Counsellor/psychiatrist/ social worker	12	8	7	6
Physiotherapist	26	22	21	19
Podiatrist	20	15	15	13
Optician	51	50	55	49
Dentist	35	31	39	34
Pharmacist	72	60	68	50
Dietician	10	3	7	4
Alternative practitioner in 12 months				
Naturopath/herbalist	11	10	12	11
Acupuncturist	6	5	6	5
Chiropractor	15	11	18	15
Osteopath	4	4	3	3
Massage therapist	20	24	21	20
Other alternative practitioner	6	5	5	5

c) Older cohort

Number of women	Asthma		No asthma	
	Asthma medications 623	No asthma medications 157	Asthma medications 731	No asthma medications 3,205
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	44	45	39	45
GP visits in last 12 months				
0-4	22	32	25	41
5-12	56	54	53	46
13 or more	22	14	22	13
Specialist visit in last 12 months	75	69	72	65
Hospital doctor in 12 months	22	22	22	19
Allied health in 12 months				
Physiotherapist	23	26	21	17
Podiatrist	48	49	47	39
Optician	55	54	50	49
Dentist	38	53	45	42
Alternative health practitioner in last 12 months	10	10	11	10

4.3. Medications for Arthritis

4.3.1. Introduction

Arthritis is the most common cause of activity limitation and disability among middle age and older women (Buckwalter & Lappin, 2000). Arthritis is Australia's major cause of disability and chronic pain, and more than 60% of all people with arthritis are women (Macdougall, 2004). In 2004, there were 3.4 million Australians with arthritis, and arthritis affected 18.4% of women and 15.1% of men (Access Economics Pty Ltd, 2005). Over 50% of Australians aged 75 or over have arthritis. It is expected that demographic ageing will increase the number and proportion of Australians with arthritis by 35% to around 4.6 million (to one in every five people) by 2020 (Access Economics Pty Ltd, 2005).

4.3.2. Self-reported doctor diagnosis of arthritis

At Surveys 3 and 4 for the Mid-age cohort, and Surveys 2, 3 and 4 for the Older cohort, women were asked: "In the past three years have you been diagnosed or treated for Arthritis?". 'Doctor diagnosed arthritis' is an internationally accepted measure of arthritis (CDC Arthritis Data and Statistics). Self-definition of arthritis type was not asked as self-reported data on arthritis type have been shown to be inaccurate (Medical Expenditure Panel Survey). Women's reports of arthritis could therefore include all arthritis types: osteoarthritis, rheumatoid arthritis, psoriatic arthritis and septic arthritis. Arthritis reported by older women would be expected to be predominantly osteoarthritis.

Figure 4-5 details the prevalence of self-reported doctor diagnosed arthritis across two surveys for Mid-age women and three surveys for Older women. In 2001, 21% of Mid-age women (then aged 50-55 years) reported arthritis, and by 2004, 32% of this cohort (then aged 53-58 years) had reported arthritis. In 1999 when the Older women were aged 73-78 years, 42% reported arthritis, and by 2005 of these women, then aged 79-84 years, 64% had reported arthritis. The prevalence of arthritis

increased with age, as expected; however, the proportion of new cases among older women declined from 23% between Surveys 2 and 3 to 12% between Surveys 3 and 4.

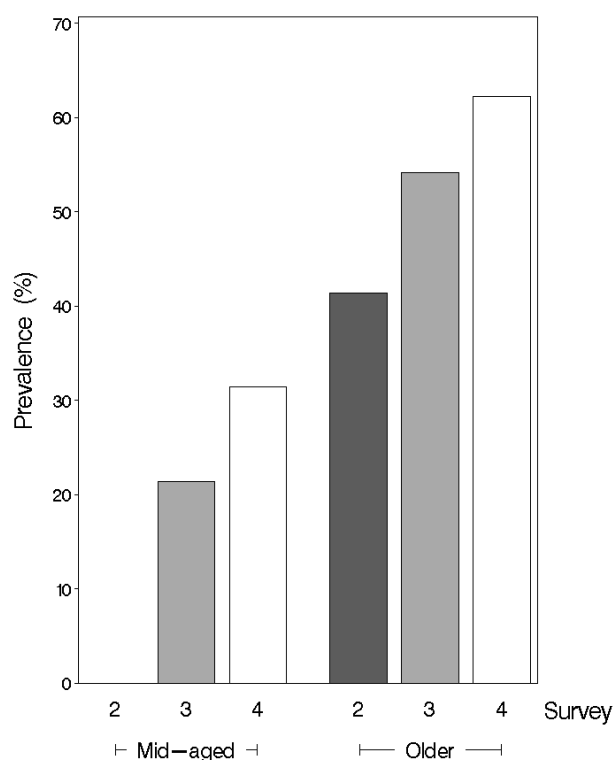


Figure 4-5 Prevalence of Arthritis for Mid-age and Older women across Surveys 2-4.

4.3.3. Women's prescription of medications for arthritis identified in PBS data

Figure 4-6 shows the PBS claims for Mid-age women for medications that are specifically prescribed for arthritis such as specific anti-rheumatic agents (including quinolines, gold salts, penicillamine, and other disease-modifying, anti-rheumatic drugs [DMARDs]); medications that are predominantly prescribed for arthritis (such as selective and non-selective non-steroidal anti-inflammatory drugs [NSAIDs]) and other medications that may be prescribed for many other conditions as well as arthritis (such as analgesics and corticosteroids). ATC codes for arthritis medications are listed in Appendix E, Table E-1.

However, as several NSAIDs can be obtained over-the-counter without a prescription, these data may represent an under-estimate of use of these medications. Similarly, while some women were recorded as claiming for glucosamine, this medication is predominantly obtained over-the-counter without a prescription. Among medications included in PBS data, the most common medications included coxibs, oxicams and analides. Opioids were also claimed more by women with arthritis than women without a diagnosis of arthritis. Older women were prescribed more corticosteroids, opiates and analides than Mid-age women. These medications are not only used by people with arthritis and may be prescribed for the treatment of other conditions.

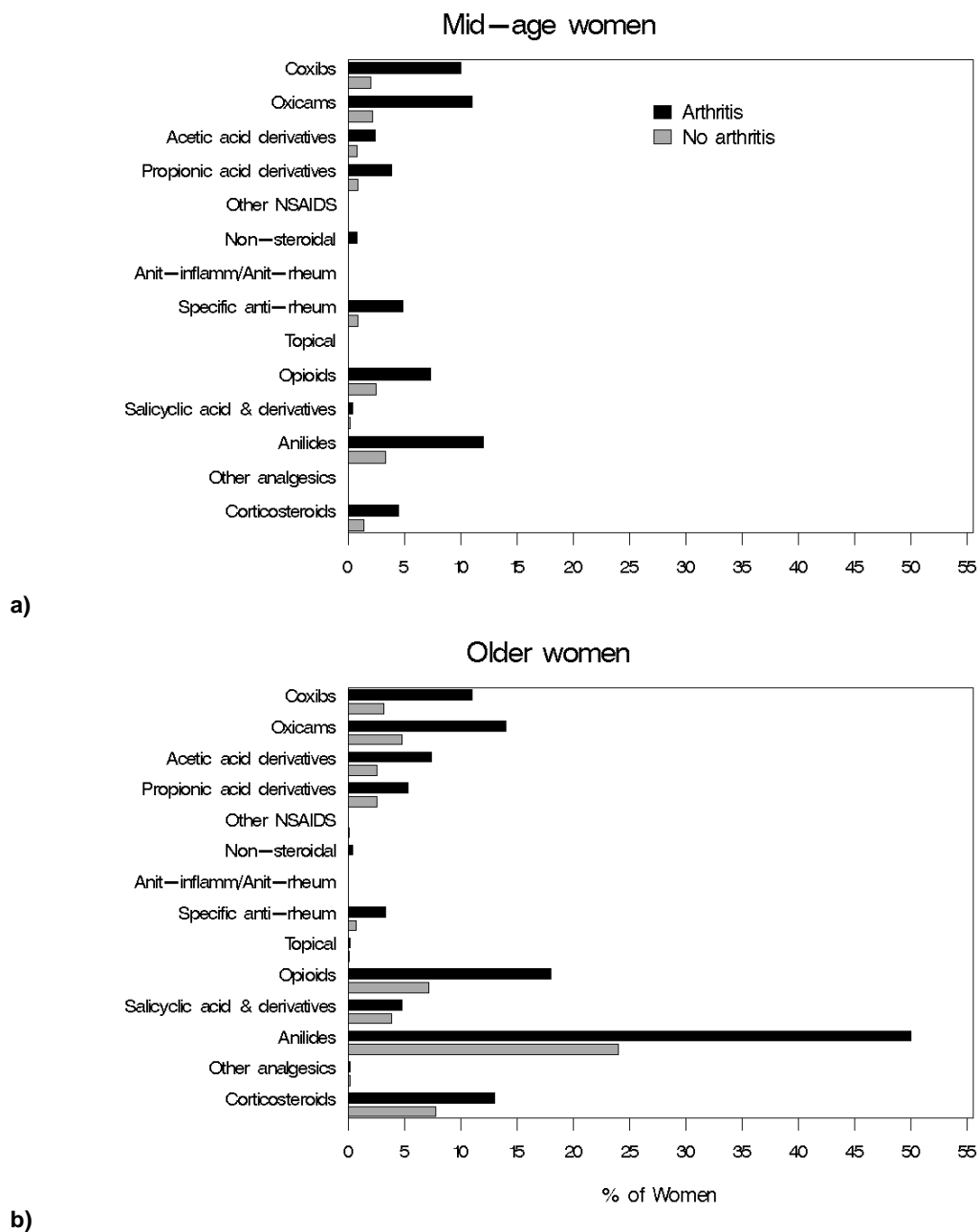


Figure 4-6 Proportion of (a) Mid-age and (b) Older women prescribed medications for arthritis, 2005

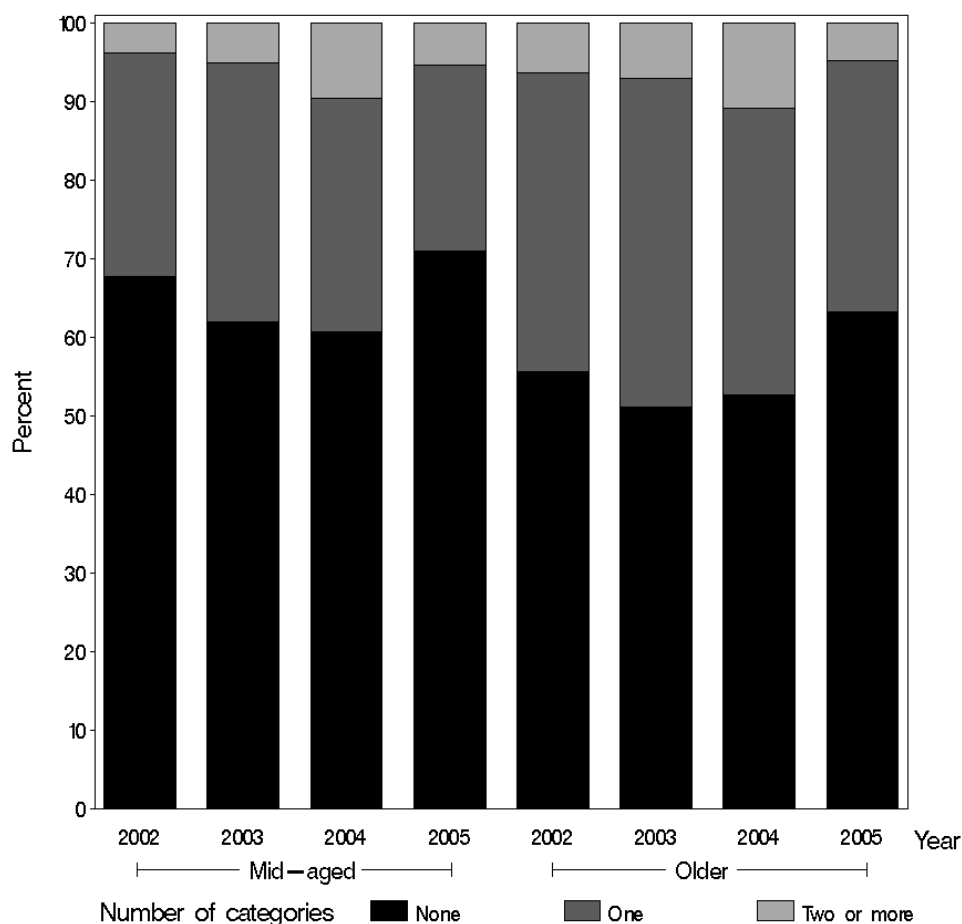


Figure 4-7 Number of arthritis medication categories identified for women with arthritis by calendar year

Figure 4-7 details the number of different types of specific arthritis medication (other than analgesics and corticosteroids) identified for women reporting a doctor diagnosis of arthritis. Each year, more than half of Mid-age women with arthritis (61% to 71%) did not claim any arthritis medications. Between 24% and 33% of Mid-age women with arthritis claimed one arthritis medication, and between 4% and 9% were prescribed two medications.

Of the Older women with arthritis more than half (51% to 63%) did not claim any arthritis medications in a given year. Between 32% and 42% of Older women with arthritis were prescribed one arthritis medication, 5% to 10% were prescribed two medications.

For both Mid-age and Older women, there was a 10% difference in proportions of those not prescribed any arthritis medications between 2004 and 2005: 61% up to 71% for Mid-age women and 54% up to 63% for Older women. This difference could be related to the concerns about the safety of coxibs, which arose in September 2004. This issue will be considered further in Section 4.3.9.

Table 4-6 Main types of medications for arthritis claimed by ALSWH participants in 2005. ATC codes for arthritis medications are listed in Appendix E, Table E-1.

Medication Sub-group	Number of prescriptions	
	Mid-age women	Older women
Anti-inflammatory and anti-rheumatic products, non-steroids		
Coxibs	1,533	2,335
Oxicams	1,766	2,656
Acetic acid derivatives and related substances	486	1,143
Propionic acid derivatives	452	869
Other NSAIDs: Butylpyrazolidines, Fenamates	0	1
Glucosamine	198	140
Other anti-inflammatory and anti-rheumatic products, non-steroids	NA	NA
Antinflammatory/Anti-rheumatic agent in combination	0	0
Specific Anti-rheumatic agents (includes DMARDS)	1,311	935
Topical products for joint and muscular pain	1	14
Other drugs for the disorders of the musculoskeletal system	0	0
Opioids	1,538	3,438
Salicyclic acid and derivatives	36	428
Anilides (paracetamol combinations)	1,407	9,365
Other analgesics and antipyretics	0	14
Corticosteroids for systemic use	589	2,449

Table 4-6 provides details on the number of claims for the different types of medications for arthritis to Mid-age and Older women with arthritis in 2005. The pattern of medications appeared somewhat different for Mid-age and Older women. The top five most claimed medications for Mid-age women were oxicams, opioids, coxibs, anilides, and specific anti-rheumatic agents, respectively. For Older women, the top five most claimed medications were anilides, opioids, oxicams, corticosteroids and coxibs. Paracetamol combinations (anilides) claims were more common among Older women compared to Mid-age women. This difference may be partly accounted for by Mid-age women buying paracetamol products over-the-counter, and Older women being able to obtain these for less cost by prescription, due to health care card benefits. If the sixth most prescribed medication is included, the top six prescribed medications were the same for each cohort of women, but their order was different.

4.3.4. Characteristics of women claiming medications for arthritis

Medications for arthritis for the purposes of the next series of figures and tables include only medicines specifically for arthritis (including quinolines, gold salts, penicillamine, and other disease-modifying, anti-rheumatic drugs [DMARDs]); and medications that are predominantly prescribed for arthritis (such as selective and non-selective non-steroidal anti-inflammatory drugs [NSAIDs]). Medications that may be prescribed for many other conditions as well as arthritis (such as analgesics and corticosteroids) were not included as these were often used by those who did not report arthritis.

4.3.5. Demographic characteristics

Table 4-7 shows the area of residence for women according to report of arthritis and medications for arthritis, as identified in PBS data at any time during the period 2002-2005. There was very little variation according to arthritis medication claim or self-reported arthritis diagnosis across area of residence for Mid-age or Older women.

Table 4-7 Area of residence of Mid-age and Older women according to report of arthritis and PBS claims for arthritis medications

Area of residence at Survey 4		Arthritis		No arthritis	
		Arthritis medications %	No arthritis medications %	Arthritis medications %	No arthritis medications %
Cohort					
Mid-age	<i>Number of women</i>	1,210	989	957	3,646
	Urban	65	68	68	69
	Rural	33	30	30	29
	Remote	2	2	2	2
Older	<i>Number of women</i>	1,987	989	592	1,143
	Urban	72	71	70	68
	Rural	26	28	28	31
	Remote	1	1	2	1

Table 4-8 shows other demographic characteristics of women according to report of arthritis and PBS claims for prescription medications for arthritis at any time during 2002-2005. Mid-age women with arthritis and arthritis medication had lower education qualifications and more difficulty in managing on their income than women who had no arthritis and no arthritis medications. Among women with arthritis, the association between arthritis medication use and income difficulty may reflect that more affluent women made greater use of over-the-counter medications.

Older women displayed very little variation in demographic characteristics, according to arthritis or arthritis medications.

Table 4-8 Demographic characteristics of (a) Mid-age and (b) Older women according to report of arthritis and PBS claims for arthritis medication.

a) Mid-age cohort

	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
Number of women	1,297	997	969	3,649
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	19	13	13	10
School/higher school certificate	47	45	52	44
Trade/apprentice/certificate/diploma	19	22	19	23
University/higher degree	15	19	16	23
Marital Status				
Married/defacto	75	78	82	80
Widowed	4	4	3	3
Divorced/separated	16	15	13	14
Never married	4	3	2	3
Difficult managing on income	15	13	11	8
Caring for someone				
Lives with me	10	8	9	7
Lives elsewhere	24	26	21	22

b) Older cohort

	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
Number of women	1,960	971	596	1,189
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education (Survey 1)				
Primary	28	28	27	23
School/higher school certificate	52	53	56	55
Trade/apprentice/certificate/diploma	14	13	12	14
University/higher degree	6	5	5	8
Marital status				
Married/defacto	36	37	37	38
Widowed	55	55	55	53
Divorced/separated	5	5	3	4
Never married	4	3	4	5
Difficult managing on income	5	5	3	4
Caring for someone				
Lives with me	11	10	12	11
Lives elsewhere	16	16	19	19

4.3.6. Health risk behaviours

Table 4-9 shows the health risk behaviours of women according to report of arthritis and claims for medications for arthritis during 2002-2005. Mid-age and Older women who had arthritis and/or arthritis medication were more likely to be obese than women with no arthritis or arthritis medications, and were less likely to drink alcohol.

Table 4-9 Health risk behaviours of (a) Mid-age and (b) Older women according to report of arthritis and PBS claims for arthritis medication

a) Mid-age cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
	1,297	997	969	3,649
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	15	12	11	11
BMI (Overweight/obese)	73	61	60	51
Alcohol:				
None/rare/less than once/wk	57	48	52	44
1-2 times/wk	13	17	16	18
3 or more time/wk	29	36	32	39

(b) Older cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
	1,960	971	596	1,189
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker (Survey 2)	3	5	4	5
BMI (Overweight/obese)	53	45	40	35
Alcohol (Survey 3):				
None/rare/less than once/wk	63	66	59	66
1-2 times/wk	9	8	6	7
3 or more time/wk	28	26	35	27

4.3.7. Comorbidities and self-rated health

Comorbid conditions and self-rated health for women with and without arthritis and according to arthritis medications are presented in Table 4-10. Mid-age and Older women who did not have arthritis or arthritis medications were less likely to have two or more comorbid conditions than Mid-age women with arthritis or arthritis medications. Mid-age women who did not have arthritis or arthritis medication were less likely than other groups to have depression, heart disease, diabetes, or asthma, or to rate their health as poor or fair. Older women with arthritis were more likely to rate their health as fair or poor than women with no arthritis regardless of arthritis medications. Among Mid-age women, those with arthritis and arthritis medications were more likely to report fair or poor self-rated health. Women with no arthritis medications were least likely to report fair or poor health.

Table 4-10 Comorbid conditions and self-rated health of (a) Mid-age and (b) Older women according to report of arthritis and PBS claims for arthritis medication during 2002-2005

a) Mid-age cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
	1,210	989	957	3,646
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	42	35	30	20
Common comorbid conditions:				
Depression	19	15	13	9
Heart disease	4	3	2	2
Diabetes	8	4	6	3
Asthma/bronchitis/emphysema	21	16	11	10
Back pain	66	68	55	39
Self-rated health: Fair/poor	27	13	15	7

b) Older cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
	1,960	971	596	1,189
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (two or more conditions)	68	67	57	53
Common comorbid conditions:				
Depression	9	6	6	4
Heart disease	26	28	19	21
Diabetes	12	12	11	10
Asthma/bronchitis/emphysema	17	15	14	9
Back pain	78	67	55	45
Self-rated health: Fair/poor	37	38	19	19

4.3.8. Health service use by women claiming for arthritis medications

Table 4.11 shows the health service use of women according to report of arthritis and claims for medications for arthritis during 2002-2005. Women with arthritis who claimed for arthritis medications had more visits to GPs than other women. Mid-age women in this group were also more likely to have visited a specialist, and seen a hospital doctor, physiotherapist, pharmacist, dietician and podiatrist in the previous 12 months than other Mid-age women.

Table 4-11 Health care use of (a) Mid-age and (b) Older women according to report of arthritis and PBS claims for arthritis medication. Percentages of women.
a) Mid-age cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications 1,297	No arthritis medications 997	Arthritis medications 969	No arthritis medications 3,649
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	68	70	74	74
GP visits in last 12 months				
0-4	46	68	62	81
5-12	42	27	34	17
13 or more	12	5	5	2
Specialist visit in last 12 months	66	51	54	41
Hospital doctor in 12 months	22	16	15	11
Allied health in 12 months				
Counsellor/psychiatrist/social worker	9	8	8	6
Physiotherapist	32	21	24	15
Podiatrist	20	17	15	11
Optician	57	52	46	48
Dentist	39	34	36	32
Pharmacist	69	59	55	48
Dietician	8	6	5	3
Alternative practitioner in 12 months				
Naturopath/herbalist	10	13	10	10
Acupuncturist	7	6	5	4
Chiropractor	16	15	16	14
Osteopath	5	4	3	3
Massage therapist	22	23	21	20
Other alternative practitioner	5	6	5	6

b) Older cohort

Number of women	Arthritis		No arthritis	
	Arthritis medications	No arthritis medications	Arthritis medications	No arthritis medications
	1,960	971	596	1,189
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover- hospital	44	42	44	46
GP visits in last 12 months				
0-4	26	34	40	51
5-12	53	50	50	41
13 or more	21	16	10	9
Specialist visit in last 12 months	75	69	65	55
Hospital doctor in 12 months	23	23	18	13
Allied health in 12 months				
Physiotherapist	27	17	16	8
Podiatrist	50	42	38	31
Optician	51	54	46	47
Dentist	46	38	44	40
Alternative health practitioner in last 12 months	11	10	12	7

4.3.9. Patterns of medication claims and characteristics of Older women with arthritis claiming for coxibs and other NSAIDs over time

This section reports on changes in coxib and other NSAID claims over time, and the characteristics of those Older women whose claims continued and those whose did not. Cyclooxygenase-2 inhibitors (commonly called coxibs), which include medicines such as rofecoxib (Vioxx), celecoxib (Celebrex), and meloxicam (Mobic/Movalis), were first approved for marketing in Australia in 1998, and were listed on the PBS from 2000. Prescriptions for these medications increased rapidly thereafter, to a peak of about 250,000 Australian users in 2004 (Buckwalter & Lappin, 2000; National Prescribing Service, 2005). The coxibs were shown to have high efficacy in relieving pain and inflammation associated with arthritis, and their expected advantage over other NSAIDs was fewer gastrointestinal side effects compared with other prostaglandin inhibitors. Some trials of long-term safety supported this claim, but these early studies also showed an increase in cardiovascular (CVD) events, with one Canadian study showing that risk of myocardial infarction for people using rofecoxib was 0.4% compared with 0.1% for people using naproxen (another NSAID) (Bombardier et al., 2000). Trials of the efficacy of coxibs in preventing recurrent colonic polyps also showed an excess of CVD events, (Bresalier et al., 2005; Solomon et al., 2005) and a retrospective cohort study found that users of high-dose rofecoxib were more likely than non-users to have coronary heart disease (Ray et al., 2002). Concerns regarding the safety of coxibs intensified and rofecoxib was withdrawn by the manufacturer world-wide in September 2004 (Drazen, 2005). Similar concerns were associated with other coxibs, (Nussmeier et al., 2005) but these medications were not withdrawn. Rather, the Australian Therapeutic Goods Administration (TGA) required manufacturers to place explicit warnings in product information about increased risk of CVD adverse events and advised that all medications in the class of coxibs should be regarded as potentially increasing CVD risk (TGA, 2005). In 2006, celecoxib and meloxicam were both

among the top 25 highest volume medicines on the PBS (Pharmaceutical Pricing Section, 2006). Alternatives to these medicines include other NSAIDs, although some of these medications have also recently been found to be associated with increased risk of CVD events (McGettigan & Henry, 2006). Paracetamol is the other mainstream alternative, and should be considered first line therapy, especially for older people with arthritis (National Prescribing Service, 2005). A number of factors have been shown to influence whether people are prescribed an NSAID or a coxib in the US (Patino et al., 2003). Coxibs are more likely to be prescribed to people seeing rheumatologists and internists (compared with those seeing a GP), and to those with osteoarthritis, gastrointestinal disease, or congestive heart failure.

Figure 4-8 shows numbers of claims for specific coxibs by ALSWH Older women with arthritis over the period 2002 to 2005. Mid-age women were not included here: their Survey 4 occurred in 2004 just before the coxibs withdrawal, so their characteristics are less easily explored. The sudden cessation of rofecoxib availability in the fourth quarter of 2004 was at first matched by a rise in celecoxib prescription of about 200 prescriptions and meloxicam of about 400 prescriptions. However, this level of use dropped in the first quarter of 2005 (about 600 prescriptions for rofecoxib and about 250 prescriptions for meloxicam), and stayed comparatively steady for the remainder of 2005.

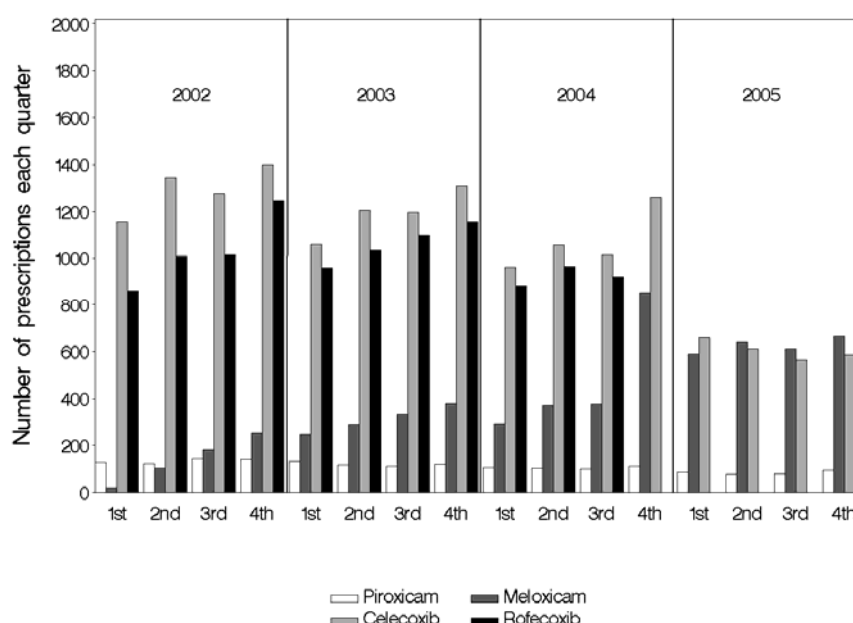


Figure 4-8 Number of selected coxib and oxicam prescriptions for Older women, 2002 to 2005.

Table 4-12 presents the characteristics of Older women with arthritis according to their claims for coxibs and other NSAIDs. The groups for coxib use include a) Older women who did not claim coxibs in 2003 or in 2005 ('never coxibs'), b) Older women who claimed coxibs in 2003, but not in 2005 ('stopped coxibs'), and c) Older women who claimed coxibs in both 2003 and 2005 ('always coxibs'). Similarly, the groups for other NSAIDs (not including aspirin) prescription include a) Older women claiming for NSAIDs in 2003 and 2005 ('always NSAIDs') and b) Older women who claimed for NSAIDs in 2005, but not in 2003 ('new NSAIDs'). The overlap between these five groups has not yet been explored, and it should be noted that the groups are not all mutually exclusive.

The two groups that differed most from the others were those who always claimed for coxibs or NSAIDs. Those Older women with arthritis who always claimed for coxibs through this time period were more likely to be partnered, least likely to have difficulty managing on income or to be caring for someone who lived with them, and less likely to drink rarely or not at all, than other groups.

Older women with arthritis who always claimed for NSAIDs in 2003 and 2005 were more likely to live in urban areas. They were less likely to have only a primary education and more likely to have a school or higher school certificate. They were less likely to have more than two comorbid conditions, or heart disease, diabetes, asthma or cancer, fair or poor self rated health, and more likely to have private health insurance.

Table 4-12 Characteristics of Older women reporting arthritis by claims for coxibs and other NSAIDs in 2003 and 2005

	Never coxibs 2,171	Stopped coxibs 543	Always coxibs 140	Always NSAIDs 193	New NSAIDs 414
Number of women					
Characteristic at Survey 4 (unless indicated)	%	%	%	%	%
Area of residence*					
Urban	72	73	74	72	69
Rural/Remote	28	27	27	28	31
Education					
Primary	28	30	30	25	29
School/higher school certificate	52	55	43	56	50
Trade/apprentice/certificate/dip	15	10	18	14	12
University/higher degree	5	5	8	5	8
Marital status					
Married/defacto	36	34	42	33	36
Widowed	55	58	54	58	56
Divorced/separated	5	7	3	5	5
Never married	4	2	1	4	3
Difficult managing on income	5	6	2	4	5
Caring for someone:					
Lives with me	10	13	5	13	12
Lives elsewhere	16	16	16	19	15
Current smoker (Survey 2)	4	3	2	4	3
BMI (Overweight/obese)	49	51	60	56	55
Alcohol (Survey 3):					
None/rare/less than once/wk	65	62	53	60	62
1-2 times/wk	9	7	10	8	10
3 or more time/wk	26	31	36	32	28
Comorbidity (two or more conditions)	67	69	68	52	68
Common comorbid conditions:					
Depression	7	10	11	8	8
Heart disease	28	26	23	14	23
Diabetes	12	11	13	7	10
Arthritis	68	73	89	78	81
Back pain	73	80	81	80	76
Self-rated health: Fair/poor	38	33	32	24	32
Private health cover- hospital	44	42	42	48	41

	Never coxibs	Stopped coxibs	Always coxibs	Always NSAIDs	New NSAIDs
GP visits in last 12 months					
0-4	29	26	27	36	28
5-12	51	56	54	52	54
13 or more	20	17	19	12	18
Specialist visit in last 12 months	72	74	76	68	71
Hospital doctor in 12 months	23	22	24	16	19
Allied health in 12 months					
Optician	53	49	54	56	52
Dentist	42	47	44	48	50
Physiotherapist	23	26	28	21	30
Podiatrist	47	46	57	41	48
Alternative health practitioner in last 12 months	11	10	9	10	11

*Area of residence is unweighted

4.4. Medications for Cardiovascular Disease

4.4.1. Introduction

Cardiovascular diseases (CVD) are a major cause of morbidity and mortality among Australian women. CVD mainly comprises coronary heart disease, which leads to angina, heart attack and other conditions, and stroke. The main risk factors for CVD are high blood pressure (hypertension), high cholesterol, cigarette smoking together with less proximal factors such as overweight and obesity, diabetes, and lack of physical activity. Many clinical trials provide evidence in support of the effectiveness of drug therapy in primary and secondary prevention of cardiovascular disease (CVD). For instance, lipid lowering drugs (statins) can effectively reduce serum cholesterol, one of the major risk factors for coronary heart disease and stroke, and it is estimated that the use of these medications could reduce coronary heart disease by around 60% and stroke by around 17%. Anti-hypertensive agents that lower blood pressure (such as diuretics, beta-blockers, angiotensin converting enzyme inhibitors) could reduce around 40-50% of coronary heart disease and around 60% of stroke. Overall, it has been estimated that the combined effects of six preventive drugs in combination (three low-dose anti-hypertensives, a statin to lower cholesterol, aspirin, and folic acid) could prevent up to 88% of coronary heart disease and 80% of stroke.

4.4.2. Self-reported doctor diagnosis of cardiovascular disease and PBS claims for CVD medications

The prevalence of cardiovascular conditions among Mid-age and Older women is shown in Table 4-13. Prevalence of CVD is very low among Younger women so they are not included in this section of the report. By Survey 4, around one in five of the Mid-age women and three in five of the Older women reported having been diagnosed with hypertension. Other CVD diagnoses were less common, but were more commonly reported by the Older cohort than by the Mid-age cohort. In 2004, 7,276 Mid-age women and 5,522 Older women consented to data linkage of PBS and ALSWH Survey data. Of Mid-age women who gave consent to linkage and provided adequate data at Survey 4 (in 2004) one third (33%) had some CVD conditions and a similar percentage made claims for CVD medications. The corresponding data for the Older women were 75% for CVD conditions and 80% for CVD medications.

Table 4-13 Percentages of Mid-age and Older women reporting having had a diagnosis of a cardiovascular condition in the last three years

	Mid-age women Survey 4 2004 53-58 years	Older women Survey 4 2005 79-84 years
Number of women	10,905	7,153
	%	%
High Blood Pressure (hypertension)	21	57
Angina		11
Heart Attack	-	5
Other Heart Problems*		15
Any heart condition**	4	25
Stroke	0.5	4
Diabetes	5	12

* Mid age women were not asked to differentiate between different forms of 'heart disease' and so can only be considered to have 'any heart condition'

** For the Older women 'any heart condition' includes women who reported angina, heart attack or other heart problem.

The prevalence of use of CVD chemoprophylaxis as ascertained from PBS data is shown in Table 4-14. In both cohorts, angiotensin converting enzyme inhibitors (ACE)/ angiotensin II receptor antagonists (AII) and statins were the most commonly identified class of CVD chemoprophylaxis.

Table 4-14 Percentages of Mid-age and Older women with PBS claims for CVD medications

	Mid-age women Survey 4 2004 53-58 years	Older women Survey 4 2005 79-84 years
Number of women	6,921	4,690
Medication	%	%
Angiotensin converting enzyme inhibitor/ Angiotensin II receptor antagonists	17	54
Statin	14	39
Aspirin	5	32*
Calcium channel blocker	5	30
Beta blocker	4	26
Other diuretic	2	18
Thiazide diuretic	2	11
Folic acid	0.5	4*

* Use of aspirin and folic acid is likely to be under-estimated since these medications are available over-the-counter

Statins were used by 14% of women in the Mid-age group and 39% of women in the Older age group. Figure 4-9 compares the prevalence of use of statins according to whether women were had previously reported heart disease, diabetes, high blood pressure or stroke. These groups are not mutually exclusive, but exclude the women who reported none of these conditions and who are included as a reference group for comparisons. Use of these lipid lowering medications was more common among women reporting these conditions than women who did not report these conditions. In the Mid-age cohort, only 10% of women with no history of any of these conditions were taking statins, whereas over 50% of women who had reported diabetes, stroke or heart disease were identified as using these medications. Among the Older women,

30% of those who had not reported any of the conditions were using statins. Such use is consistent with chemoprophylaxis for primary prevention of heart disease.

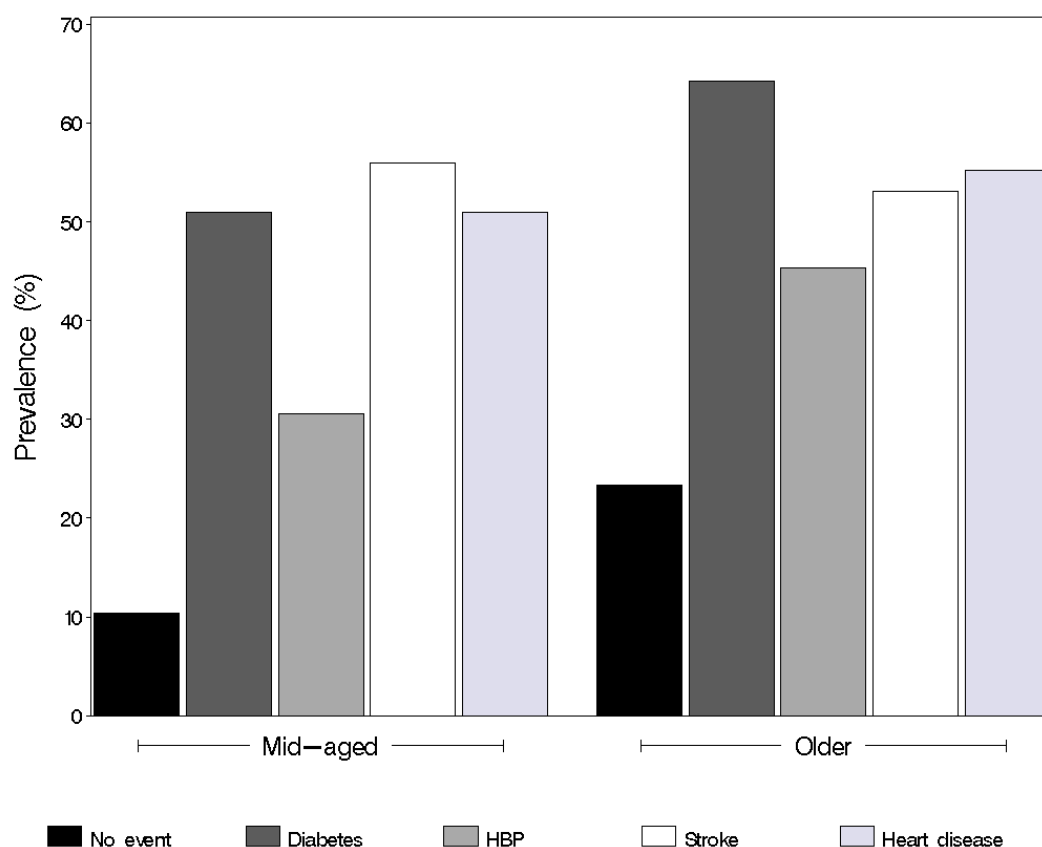


Figure 4-9 Prevalence of use of statins according to previous reports of cardiovascular conditions

4.4.3. Use of combinations of cardiovascular medications

In the Mid-age cohort, 30% of women were identified as taking any of the categories of CVD medications, and 10% were identified to be taking more than one agent. Utilisation of these drugs was higher among the older women, with 79% taking at least one class of agent, and 52% taking at least two classes in combination. The numbers of combinations taken by the women are shown in Table 4-15, and the most common combinations identified are shown in Table 4-16. The most common combination was the use of either an ACE inhibitor or angiotensin II receptor blocker in combination with a statin and with or without aspirin.

Table 4-15 Numbers of Drugs used in combination (thiazide, ACE/All, beta blocker, statin, aspirin, folic acid)

	Mid-age women 2004 53-58 years	Older women 2005 79-84 years
Number of women:	6,921	4,690
Number of Combinations	%	%
0	70	21
1	20	27
2	7	28
3	2	18
4	1	6
5 or more	0	1

Table 4-16 Most common combinations of cardiovascular medication

	Mid-age women 2004 53-58 years		Older women 2005 79-84 years
Number of women	6,921		4,690
Combination		Combination	
ACE/All + Statin	249	ACE/All + Statin	387
ACE/All + Aspirin	48	ACE/All, Statin + Aspirin	264
ACE/All + Beta blockers	46	ACE/All + Aspirin	253
Statin + Aspirin	41	ACE/All, Statin + Beta blockers	198
ACE/All, Statin + Aspirin	37	ACE/All + Beta blockers	191

4.4.4. Characteristics of women with CVD conditions and medication claims

Table 4-17 shows the characteristics of women with at least one claim for CVD medications (thiazide, ACE/All, beta blocker, statin) at any time from 2002 to 2005 compared with women who have not been identified as having a claim for these medications.

Among Mid-age women with CVD and claims for the medications considered in Table 4-18, 80% were overweight or obese. They had lower levels of education (shown in Table 4-17); they were also more likely to have comorbidities (including diabetes: 12%) and fair or poorer self rated health than other women (shown in Table 4-19). In contrast, those without the CVD conditions and medications considered, were least likely to be overweight or obese (47%), had less comorbidity and had better self-reported health. Those women with diagnoses for the CVD conditions considered but not taking CVD medications and those without these CVD conditions but taking the medications, were between the other two groups with around 60% being overweight or obese; they reported less comorbidity and better health than women with CVD conditions and medications.

Similar patterns are seen among the Older women. In particular those with CVD conditions and medications were most likely to be overweight and obese (50%, compared with 31-37% in the other group); they also had more comorbidity and were more likely to rate their health as fair or poor. As could be expected, women without the CVD conditions considered but with CVD medications had relatively higher prevalence of diabetes (10%), consistent with the medications being used for prevention.

Table 4-17 Demographics of (a) Mid-age and (b) Older women using CVD medications

a) Mid-age cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	1,627	745	706	3,845
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education				
Primary	16	11	17	10
School/higher school certificate	49	47	49	44
Trade/apprentice/certificate/ diploma	20	22	19	23
University/higher degree	15	20	15	23
Marital status:				
Married/defacto	79	76	82	79
Widowed	5	3	3	3
Divorced/separated	13	19	11	15
Never married	3	2	3	3
Difficult managing on income	15	12	14	8
Caring for someone:				
Lives with me	10	8	11	6
Lives elsewhere	23	22	22	23

b) Older cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	3,354	233	452	677
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education				
Primary	28	18	27	24
School/higher school certificate	53	60	54	51
Trade/apprentice/certificate/diploma	13	14	13	16
University/higher degree	5	8	5	9
Marital status				
Married/defacto	37	31	37	36
Widowed	54	60	56	53
Divorced/separated	4	5	5	7
Never married	4	4	2	4
Difficult managing on income	5	2	3	4
Caring for someone:				
Lives with me	10	15	14	13
Lives elsewhere	16	16	18	21

Table 4-18 Health behaviour of (a) Mid-age and (b) Older women using CVD medications

a) Mid-age cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	1,627	745	706	3,845
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current Smoker	12	16	15	11
BMI (Overweight/obese)	80	60	62	47
Alcohol:				
None/rare/ less than once/wk	59	45	56	43
1-2 times/wk	13	17	5	18
3 or more times/wk	28	38	30	39

b) Older cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	3,354	233	452	677
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	4	3	5	4
BMI (Overweight/obese)	50	34	37	31
Alcohol:				
None/rare/ less than once/wk	66	56	60	59
1-2 times/wk	7	14	7	8
3 or more times/wk	27	30	33	32

Table 4-19 Comorbidity of (a) Mid-age and (b) Older women using CVD medications

a) Mid-age cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	1,627	745	706	3,845
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (Two or more conditions)	55	33	25	16
Common comorbid conditions:				
Depression	15	14	19	10
Diabetes	12	2	7	1
Arthritis	34	25	31	22
Back pain	56	53	51	45
Asthma/bronchitis/emphysema	18	14	15	10
Self-rated health: Fair/poor	23	10	16	8

b) Older cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	3,354	233	452	677
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (Two or more conditions)	74	55	35	27
Common comorbid conditions:				
Depression	7	5	7	5
Diabetes	14	2	10	3
Arthritis	49	36	35	33
Back pain	68	66	61	55
Asthma/bronchitis/emphysema	15	14	10	12
Self-rated health: Fair/poor	36	22	17	14

4.4.5. Health service use by women with CVD conditions and medication claims

Table 4-20 shows the use of health care services by women with CVD medications and medication claims. Among the Mid-age women those who claimed for the CVD medications considered here had more GP visits and were more likely to have seen specialists, hospital doctors and pharmacists. Their use of other health care services was similar to women who did not make claims for these medications. The Older women were asked fewer questions about health service use and health care providers, in order to reduce responder burden. Women with the CVD conditions and medications considered here had more GP visits and were more likely to have seen specialists and hospital doctors in the last 12 months than women in the other groups. Women without the CVD conditions or medications had the fewest GP visits and

were less likely to have seen hospital doctors – as would be expected. Women without the CVD conditions considered but claiming for the medications also had relatively high use of doctors. CVD medications are sometimes prescribed for the prevention rather than treatment of cardiovascular disease, in those at risk: for example diabetics. This is consistent with the data in Table 4-19 which showed that this group was more likely to have diabetes and other chronic medical conditions.

Table 4-20 Health care use by (a) Mid-age and (b) Older women using CVD medications

a) Mid-age cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	1,627	745	706	3,845
Characteristic at Survey 4 (unless indicated)				
Private health cover-hospital	66	75	73	74
GP visits/12 months				
0-4	50	75	58	79
5-12	42	20	34	18
13 or more	8	5	7	2
Specialist visit/12 months	54	46	54	46
Hospital doctor/ 12 months	20	14	16	11
Allied health/12 months				
Counsellor/psychiatrist/social worker	8	7	8	7
Physiotherapist	22	18	24	19
Podiatrist	18	14	17	13
Optician	51	48	53	49
Dentist	63	63	65	68
Pharmacist	68	53	65	48
Dietician	11	5	6	2
Alternative practitioner/ 12 months				
Naturopath/herbalist	10	11	10	11
Acupuncturist	4	4	6	5
Chiropractor	14	13	15	15
Osteopath	3	4	4	4
Massage therapist	19	22	20	22
Other alternative health practitioner	4	5	5	6

b) Older cohort

	CVD		No CVD	
	CVD medications	No CVD medications	CVD medications	No CVD medications
Number of women	3,354	233	452	677
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover-hospital GP visits in last 12 months	43	45	46	46
0-4	28	52	43	57
5-12	53	39	48	37
13 or more	19	9	8	6
Specialist visit in last 12 months	71	58	66	58
Hospital doctor in 12 months	22	16	17	12
Allied health in last 12 months				
Physiotherapist	20	14	20	16
Podiatrist	45	33	43	31
Optician	50	52	51	46
Dentist	42	42	44	46
Alternative health practitioner in last 12 months	9	14	11	11

4.5. Medications for Diabetes

4.5.1. Introduction

Diabetes is a costly chronic disease and is associated with a variety of complications and premature mortality. It is estimated that 7% of people aged 25 years or over have diabetes, with half this number unaware they have the condition. Consistently high blood sugar levels can, over time, lead to blindness, kidney failure, heart disease, limb amputations, and nerve damage. Diabetes is the seventh most common problem managed in general practice and the cost of diabetes has been predicted to rise dramatically over the next decade in Australia unless measures are taken to reduce complications from poorly controlled diabetes and prevent or delay onset.

Medications for diabetes can include oral hypoglycaemic agents and injectable insulins. However, the range of medications in these categories is increasing rapidly. The use of these medications is also expected to increase as attempts to detect diabetes early and to maintain better diabetic control are enhanced.

4.5.2. Self-reported doctor diagnosis of diabetes and medication use

In each survey, 0-1% of Younger women, 1-5% of Mid-age women and 7-12% of Older women reported they had been told by a doctor that they had diabetes (in the past three years) (see Figure 4-10). Across the Surveys, about 2% of Younger women, 6% of Mid-age women and 15% of Older women could be classified as having diabetes ever (reported on any Survey 2-4).

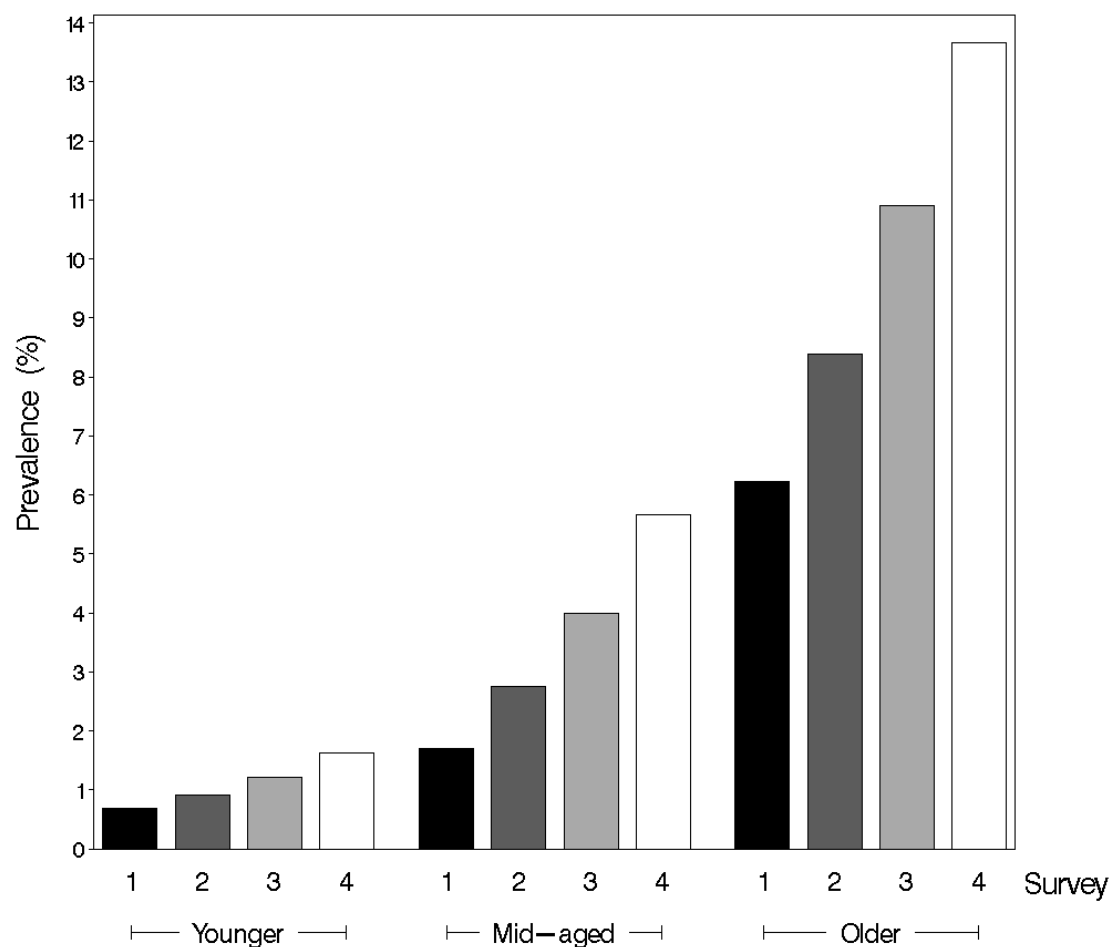


Figure 4-10 Self-reported doctor diagnosis of diabetes across Surveys 1-4.

4.5.3. Women's use of medications for diabetes identified in PBS data

Numbers and percentage of women who made claims for medications for diabetes identified in the PBS data are shown in Table 4-21. In this table, the use of diabetes medications during 2005 is classified for women who 'ever' reported having been diagnosed as having diabetes. Younger women who reported having a doctor diagnosis of diabetes were more likely to use insulin whereas Mid-age and Older women were more likely to use oral blood glucose lowering drugs.

Table 4-21 Number and percentage of women using medications for diabetes

Medication	Self-reported diagnosis of diabetes at Survey 4
Younger cohort	%
A10A - Insulins and analogues	21
A10B - Oral blood glucose lowering drugs	5
Mid-age cohort	
A10A - Insulins and analogues	15
A10B - Oral blood glucose lowering drugs	38
Older cohort	
A10A - Insulins and analogues	10
A10B - Oral blood glucose lowering drugs	48

4.5.4. Characteristics of women using diabetes medications

Table 4-22 shows demographic characteristics, Table 4.23 shows health behaviour and Table 4-24 shows comorbidity of women with at least one prescription for diabetes medication at any time from 2002 to 2005 compared with women who have not been identified as having a prescription for a medication in this sub-group.

Among the Younger women the number reporting ever being told that they had diabetes and the numbers claiming for diabetes medication are small so that it is difficult to make any meaningful comparisons. However, the fact that not all those who ever reported having diabetes reported having the condition at Survey 4 (fewer than half among those not claiming for diabetes medication) suggests that there may be misreporting of gestational diabetes as type 1 or type 2 diabetes.

Approximately half of the Mid-age women who reported they had ever been told they had diabetes did not make PBS claims for diabetes medication. This suggests that many were being managed by diet and lifestyle modifications alone, although only half of them reported having diabetes at Survey 4, and reporting of having a history of gestational diabetes or obtaining medication without PBS claims (e.g. from hospitals) cannot be excluded.

Mid-age women who reported diabetes with or without medication had lower levels of education and greater difficulty managing on their income compared with women without diabetes or medication claims. Almost 90% of women who claimed for diabetes medication were overweight or obese. They also had more comorbidity, especially heart disease.

More than 40% of the Older women who had ever reported diabetes did not make claims for diabetes medications and only 66% of them reported diabetes at Survey 4. As for Mid-age women this suggests that many of them were being managed without drugs. Older women with diabetes, especially those who claimed for diabetes medication had more comorbidity and were more likely to be overweight or obese than the other groups of women, however, the differences were less pronounced than for the Younger and Mid-age women.

Table 4-22 Demographics of (a) Younger, (b) Mid-age and (c) Older women using diabetes medications grouped according to whether or not they had ever reported having a diagnosis of diabetes

a) Younger cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	22	49	17	3,783
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education:				
Primary	5	4	6	1
School/higher school certificate	59	69	47	66
Trade/apprentice/certificate/diploma	14	14	29	17
University/higher degree	23	12	18	16
Marital status:				
Married/defacto	64	69	71	73
Divorced/separated/widowed	14	6	6	6
Never married	23	25	24	22
Difficult managing on income	18	22	29	11
Caring for someone	5	10	18	5

b) Mid-age cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	213	214	41	6,455
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education:				
Primary	22	17	31	12
School/higher school certificate	53	53	38	45
Trade/apprentice/certificate/diploma	15	19	11	22
University/higher degree	10	11	21	21
Marital status:				
Married/defacto	75	77	78	79
Widowed	5	3	2	3
Divorced/separated	15	17	13	14
Never married	5	3	6	3
Difficult managing on income	24	21	22	10
Caring for someone:				
Lives with me	14	6	25	8
Lives elsewhere	17	20	37	23

c) Older cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	369	295	31	4,021
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Education:				
Primary	29	29	36	26
School/higher school certificate	55	53	47	53
Trade/apprentice/certificate/diploma	12	13	7	14
University/higher degree	3	5	11	6
Marital status:				
Married/defacto	33	33	44	37
Widowed	61	61	50	54
Divorced/separated	4	5	5	5
Never married	3	1	1	4
Difficult managing on income	7	7	0	4
Caring for someone:				
Lives with me	7	9	16	11
Lives elsewhere	13	19	5	17

Table 4-23 Health behaviours of (a) Younger, (b) Mid-age and (c) Older women using diabetes medications grouped according to whether or not they had ever reported having a diagnosis of diabetes

a) Younger cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	22	49	17	3,783
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	14	24	18	16
BMI (Overweight/obese)	68	56	75	40
Alcohol:				
None/rare/ less than once/wk	91	59	71	57
1-2 times/wk	0	12	6	23
3 or more times/wk	9	29	24	20

b) Mid-age cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	213	214	41	6,455
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	15	11	14	12
BMI (Overweight/obese)	87	69	88	56
Alcohol:				
None/rare/ less than once/wk	78	64	56	46
1-2 times/wk	10	14	17	17
3 or more times/wk	12	22	28	37

c) Older cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	369	295	31	4,021
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Current smoker	3	4	0	4
BMI (Overweight/obese)	66	52	50	43
Alcohol:				
None/rare/ less than once/wk	81	71	83	62
1-2 times/wk	4	7	9	8
3 or more times/wk	15	23	8	30

Table 4-24 Comorbidity of (a) Younger, (b) Mid-age and (c) Older women using diabetes medications grouped according to whether or not they had ever reported having a diagnosis of diabetes

a) Younger cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	22	49	17	3,783
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (Two or more conditions)	64	62	65	24
Common comorbid conditions :				
Depression	18	17	47	13
Asthma/bronchitis	14	30	29	15
Back pain	33	48	71	43
Self-rated health: Fair/poor	23	24	18	8

b) Mid-age cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	213	214	41	6,455
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (Two or more conditions)	70	53	67	25
Common comorbid conditions:				
Depression	16	17	16	12
Arthritis	34	33	28	25
Heart disease	11	6	14	2
Back pain	57	56	55	48
Asthma/bronchitis/emphysema	18	21	22	12
Self-rated health: Fair/poor	45	21	28	11

c) Older cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	369	295	31	4,021
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Comorbidity (Two or more conditions)	89	84	72	58
Common comorbid conditions:				
Depression	7	8	14	7
Arthritis	44	57	51	44
Heart disease	31	25	46	24
Back Pain	74	71	58	36
Asthma/bronchitis/emphysema	13	14	16	14
Self-rated health: Fair/poor	46	35	52	28

4.5.5. Health care use of women using diabetes medications

Health care use for women with or without diabetes diagnoses and claims for diabetes medications is summarised in Table 4-25. Mid-age women who claimed for diabetes medications had more GP visits and were more likely to see specialists, hospital doctors and pharmacists than women who did not claim for these medications. In other respects the use of those health care services considered here was similar across all groups of women. Likewise, among the Older women those who reported diabetes and made claims for diabetes medications had the highest number of doctor visits.

Table 4-25 Health care use by (a) Younger, (b) Mid-age and (c) Older women using diabetes medications grouped according to whether or not they had ever reported having a diagnosis of diabetes

a) Younger cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women:	22	49	17	3,783
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover-hospital	45	47	29	56
GP visits/12 months				
0-4	55	55	41	69
5-12	36	27	47	27
13 or more	9	18	12	4
Specialist visit/12 months	82	55	76	47
Hospital doctor/ 12 months	55	37	59	23
Allied health/12 months				
Counsellor/mental health worker	23	22	35	15
Physiotherapist	24	22	29	19
Community nurse/nurse practitioner	27	14	18	12
Alternative practitioner in 12 months				
Naturopath/herbalist	5	8	24	13
Acupuncturist	0	14	12	6
Chiropractor	23	16	41	16
Osteopath	9	4	6	5
Massage therapist	36	35	47	37
Other alternative health	14	10	6	9

b) Mid-age cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	213	214	41	6,455
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover-hospital	57	64	62	73
GP visits/12 months				
0-4	37	55	30	72
5-12	51	38	55	24
13 or more	11	7	15	4
Specialist visit/12 months	69	56	73	48
Hospital doctor/ 12 months	26	21	22	13
Allied health/12 months				
Counsellor/mental health worker	8	8	5	7
Physiotherapist	22	20	18	20
Podiatrist	32	20	12	14
Optician	65	58	37	49
Dentist	58	66	45	66
Pharmacist	72	64	73	54
Dietician	33	20	8	3
Alternative practitioner in 12 months				
Naturopath/herbalist	5	17	12	11
Acupuncturist	6	7	6	5
Chiropractor	12	16	4	15
Osteopath	3	5	0	4
Massage therapist	14	24	16	21
Other alternative health practitioner	4	9	6	5

c) Older cohort

	Diabetes		No Diabetes	
	Diabetes Medications	No Diabetes Medications	Diabetes Medications	No Diabetes Medications
Number of women	369	295	31	4,021
Characteristic at Survey 4 (unless indicated)	%	%	%	%
Private health cover-hospital	37	41	54	45
GP visits in last 12 months				
0-4	18	28	30	37
5-12	57	53	31	48
13 or more	25	19	40	14
Specialist visit in last 12 months	79	68	69	67
Hospital doctor in 12 months	26	25	31	19
Allied health in 12 months				
Physiotherapist	18	18	20	19
Podiatrist	45	33	43	31
Optician	50	52	51	46
Dentist	42	42	44	46
Alternative health practitioner in last 12 months	6	10	3	10

4.6. Discussion

This section examined medications for four common chronic conditions. The first, asthma, is a condition that is increasing in prevalence in all cohorts. By Survey 4, 30% of Younger women, 20% of Mid-age women and 15% of Older women had reported having doctor-diagnosed asthma, but not all women reporting asthma had claims for asthma medications. However, it is unlikely that the PBS data fully reflect asthma medication use as some asthma medications can be purchased over-the-counter without prescription. As such, the lower rate of use of medications among Younger women, married women and those with higher levels of education may reflect that these women are purchasing medications off prescription, or that they are using fewer medications. Likewise women who had claims for arthritis medications were also more likely to have lower education and to have more difficulty managing on their income. However, as for asthma, not all arthritis medications are reflected in PBS data.

Medications for CVD and diabetes are more likely to be reflected in PBS data. Examination of PBS claims for medications for these conditions indicates that these medications are in common use among women in the Mid-age and Older cohorts. Claims for medications for CVD conditions, principally angiotensin converting enzyme (ACE) inhibitors, angiotensin II (AII) receptor antagonist, statins and beta blockers were identified for 33% of the Mid-age women and 80% of the Older women. Statins were commonly used by women who reported a diagnosis of diabetes, hypertension heart disease and/or stroke who are at increased risk of a primary or secondary CVD event.

Patterns of use of diabetes medications varied across the cohorts, with Younger women who reported having a doctor diagnosis of diabetes being more likely to have claims for insulin whereas Mid-age and Older women were more likely to have claims for oral blood glucose lowering drugs. About half the Mid-age women and more than 40% of the Older women who had ever reported diabetes did not make claims for diabetes medications. This suggests that many of these women were being successfully managed by diet and lifestyle modification alone.

Lifestyle factors are known to be important risk factors for these conditions, however they may also impact on women's needs for medications to treat these conditions. Across all cohorts, women claiming for asthma, arthritis, CVD and diabetes medications were more likely to be overweight or obese than women not claiming the medications; and among older women those using asthma medications were more likely to be smokers. Attention to these risks and conditions may be important for reducing the need for medications even among those women who have established conditions.

4.7. References

Access Economics Pty Ltd. (2005). Arthritis - the bottom line: The economic impact of arthritis in Australia., from <http://Arthritisaustralia.com.au/reports>

Australian Bureau of Statistics. (2006). *Asthma in Australia: A snapshot, 2004-2005. Cat no. 4819.0.* Canberra.

Australian Centre for Asthma Monitoring. (2007a). *Asthma in Australia: findings from the 2004-2005 National Health Survey. Cat. no. ACM 10.* Canberra: Australian Institute of Health and Welfare.

Australian Centre for Asthma Monitoring. (2007b). *Patterns of asthma medication use in Australia. Cat. no. ACMI.* Canberra: Australian Institute of Health and Welfare.

Bombardier, C., Laine, L., Reicin, A., Shapiro, D., Burgos-Vargas, R., Davis, B., et al. (2000). Comparison of upper gastrointestinal toxicity of rofecoxib and naproxen in patients with rheumatoid arthritis. VIGOR Study Group. *N Engl J Med*, 343(21), 1520-1528, 1522 p following 1528.

Bresalier, R. S., Sandler, R. S., Quan, H., Bolognese, J. A., Oxenius, B., Horgan, K., et al. (2005). Cardiovascular events associated with rofecoxib in a colorectal adenoma chemoprevention trial. *N Engl J Med*, 352(11), 1092-1102.

Buckwalter, J. A., & Lappin, D. R. (2000). The disproportionate impact of chronic arthralgia and arthritis among women. *Clin Orthop Relat Res*(372), 159-168.

CDC Arthritis Data and Statistics. from http://www.cdc.gov/arthritis/data_statistics/faqs/case_definition.htm#8

Drazen, J. M. (2005). COX-2 inhibitors--a lesson in unexpected problems. *N Engl J Med*, 352(11), 1131-1132.

MacDougall, R. (2004). The voice of arthritis: A social impact study of arthritis in Australia., from <http://Arthritisaustralia.com.au/reports>

McGettigan, P., & Henry, D. (2006). Cardiovascular risk and inhibition of cyclooxygenase: a systematic review of the observational studies of selective and nonselective inhibitors of cyclooxygenase 2. *Jama*, 296(13), 1633-1644.

Medical Expenditure Panel Survey. from <http://www.meps.ahrq.gov/mepsweb/>

National Prescribing Service. (2005). *NPS News*(43), 1.

Nussmeier, N. A., Whelton, A. A., Brown, M. T., Langford, R. M., Hoeft, A., Parlow, J. L., et al. (2005). Complications of the COX-2 inhibitors parecoxib and valdecoxib after cardiac surgery. *N Engl J Med*, 352(11), 1081-1091.

Patino, F. G., Allison, J., Olivieri, J., Mudano, A., Juarez, L., Person, S., et al. (2003). The effects of physician specialty and patient comorbidities on the use and discontinuation of coxibs. *Arthritis Rheum*, 49(3), 293-299.

Pharmaceutical Pricing Section. (2006). Expenditure and prescriptions twelve months to 30 June 2006., from [http://www.health.gov.au/internet/wcms/publishing.nsf/Content/A58720844CBFCB47CA257218000D91C7/\\$File/Book27.pdf](http://www.health.gov.au/internet/wcms/publishing.nsf/Content/A58720844CBFCB47CA257218000D91C7/$File/Book27.pdf)

Ray, W. A., Stein, C. M., Daugherty, J. R., Hall, K., Arbogast, P. G., & Griffin, M. R. (2002). COX-2 selective non-steroidal anti-inflammatory drugs and risk of serious coronary heart disease. *Lancet*, 360(9339), 1071-1073.

Solomon, S. D., McMurray, J. J., Pfeffer, M. A., Wittes, J., Fowler, R., Finn, P., et al. (2005). Cardiovascular risk associated with celecoxib in a clinical trial for colorectal adenoma prevention. *N Engl J Med*, 352(11), 1071-1080.

TGA. (2005). Expanded information on Coxib inhibitors for doctors and pharmacists., from http://www.tga.gov.au/media/2005/050214_cox2.htm

5. Long-Term Use of Medications

5.1. Key findings

Long-term use of statins

- Statins are lipid lowering drugs for the prevention of cardiovascular disease.
- In women, cholesterol levels and cardiovascular disease risk increase after menopause.
- Between 2002 and 2005 PBS claims for statins increased in the Mid-age and Older cohorts in line with the whole Australian population.
- In the Mid-age cohort claims for statins increased after natural menopause as well as after 'surgical' menopause (hysterectomy and/or oophorectomy).
- Women with statin claims had lower levels of education, were less likely to be employed and had more difficulty managing on their income than women without statin claims, in the Mid-age cohort.
- Statin claimants were more likely to have diabetes, hypertension or heart disease such as angina pectoris or a history of myocardial infarction than non-claimants, in the Mid-age cohort.
- Patterns of claims for statins in the Mid-age cohort did not reflect recommendations; in less than five months half the women had failed to fill a script on time.

Long-term use of bisphosphonates

- Bisphosphonates are pharmaceuticals for the treatment of osteoporosis and the subsequent prevention of fractures.
- Heartburn and dyspepsia are the most commonly reported side-effects.
- Claims for bisphosphonates by Mid-age and Older women increased between 2002 and 2005.
- Patterns of claims for bisphosphonates, intended as long-term medication, did not reflect recommendations. Within six months of starting to claim bisphosphonates, more than half of the Older women had failed at least once in timely script filling.
- Older women with a healthy lifestyle, in terms of physical activity and (non) smoking, were more likely to fill bisphosphonates prescriptions on time.
- Women claiming PBS medication for heartburn before starting to claim bisphosphonates were less likely to fill bisphosphonates prescriptions on time.
- There were no indications that among Older women eligible for bisphosphonate benefits, affordability affected timely filling of prescriptions.

Long-term use of proton pump inhibitors

- Proton pump inhibitors (PPIs) are pharmaceuticals commonly used for the treatment of conditions causing heartburn or gastric pain, such as gastro-oesophageal reflux disease and peptic ulcers.
- PPIs are a major contributor to yearly PBS expenditure.
- Claims for PPIs by Mid-age and Older ALSWH participants, already considerable in 2002, increased between 2002 and 2005. This is not solely due to ageing.
- For the initial treatment for reflux disease, two to four weeks of PPIs use is recommended. In reality 60% of initial prescriptions between 2002 and 2005 contained five repeats.
- PPIs were commonly claimed in association with NSAIDs and rarely in association with H.Pylori eradication treatment. The most common claims (64%) were not associated with either of these conditions but were most likely to be for the treatment of reflux disease.

- Of the women who initiated PPI treatment for reasons other than gastro-protection while taking NSAIDs or during the eradication of ulcer disease, more than two thirds became claimants for more than 6 months.
- Women who claimed PPIs were more likely to claim NSAIDs and asthma medication. They were also twice as likely to claim antidepressants.
- Mid-age women who reported having heartburn/indigestion 'often' were twice as likely to report depression as women who reported never having heartburn/indigestion.
- PPI script filling among Mid-age women was associated with depression and anxiety as well as lower levels of education, more difficulties managing on available income, more frequent GP visits, and higher BMI.

5.2. Introduction

This section examines claim patterns and explores factors affecting women's long-term claims for some selected common medications. This section particularly examines women's adherence to medications that are intended to be used long-term and those factors that might limit women's ability to continue claiming medications over the long-term. We also examine the factors associated with claims for proton pump inhibitors which are not meant to be used long-term but which commonly are used long-term.

5.3. Long-term use of Statins

HMG CoA reductase inhibitors, also called statins, are lipid-lowering drugs. Together with a diet, they are given as treatment for hypercholesterolemia and for cardiovascular disease risk reduction. The most common adverse effects of statins are muscle pain (myalgia) and increased muscle enzymes (myopathy), and raised liver enzymes. The uptake of statins in Australia has been substantial, amounting to a total yearly cost of more than \$1,100m in 2005 (government and patient contribution combined) (Department of Health and Ageing, 2005).

The PBS qualifying criteria for statin benefits are complex. According to a flowchart, first lifestyle and dietary changes should be made for at least 6 weeks, and continued henceforth. Statin therapy is then subsidised if fasting cholesterol exceeds a threshold level. The threshold depends on age and gender, family history, and conditions such as diabetes and coronary heart disease. In some cases statins are subsidised without raised cholesterol levels, for example in patients with symptomatic coronary heart disease or in diabetes patients over 60 years of age (Department of Health and Ageing, 2005).

Women and men differ in their life course of cholesterol profile and cardiovascular disease risk. In both sexes the risk increases with age, but the increase occurs about 10 years later in women than in men. This is thought to be at least partly due to a (menopausal) reduction in circulating estrogens, resulting in an increase in LDL cholesterol. Ageing, hypertension and changes in body composition are also likely to contribute. The sharp increase in cardiovascular disease risk associated with menopause makes mid-age an interesting phase to study statin uptake by women; this section therefore focuses on the Mid-age cohort. The following sections address uptake of statins over time; characteristics of users, and adherence.

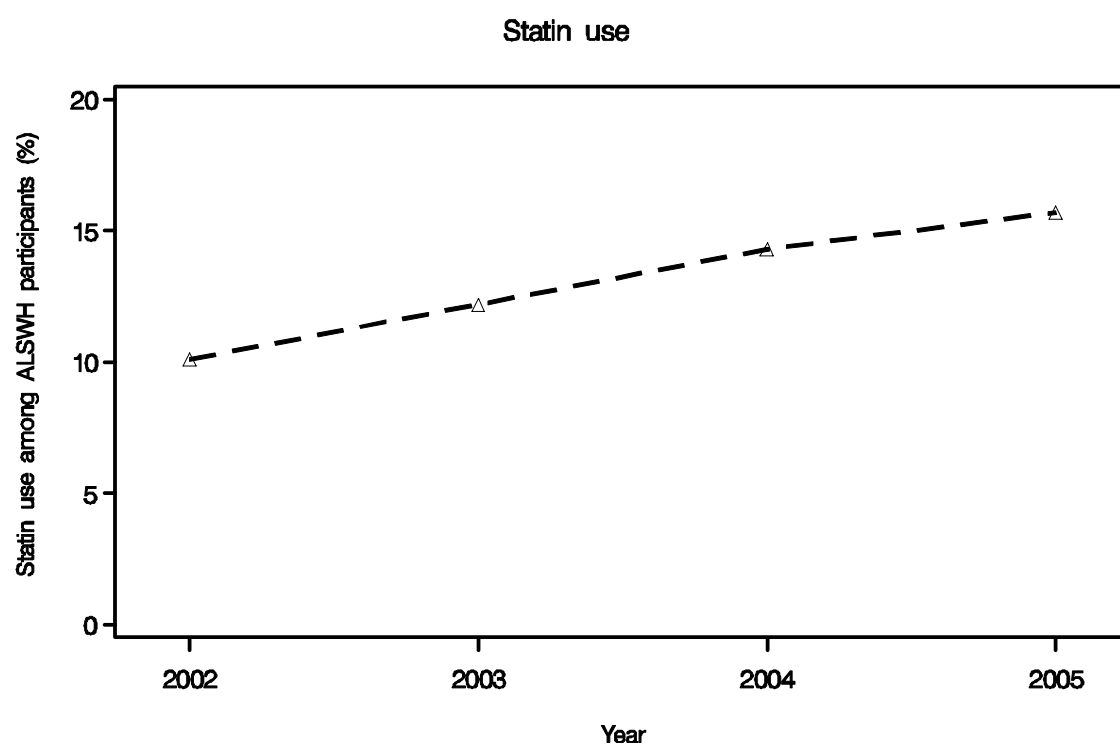
5.3.1. Uptake over time

Statin prescriptions were identified in the PBS by ATC coding: C10AA/C10B. Although uncommon in the Younger cohort, statin use was common and increasing between 2002 and 2005 in the Mid-age and Older cohorts, shown in Table 5-1. The pattern of increase in use in the Mid-age cohort, in percentages, is shown with the national statistics for all ages and both sexes, expressed as the number of defined daily doses per 1,000 people per day (Department of Health and Ageing, 2005) in Figure 5-1. Although on different scales, the patterns of increase are similar. This suggests that although a sharp increase in statin uptake by the Mid-age cohort can be expected on the basis of increased incidence of hypercholesterolemia in this

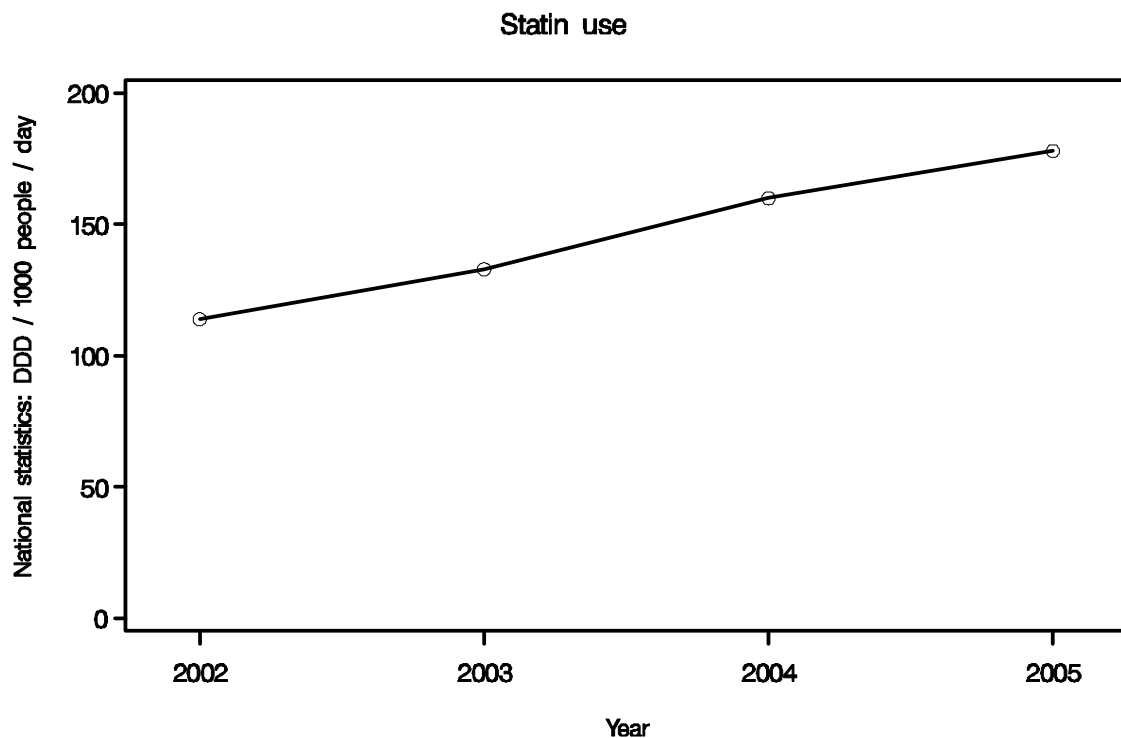
age group, part of the increase reflects a trend in the whole Australian population beyond the effects of ageing.

Table 5-1 Statin use in the three age cohorts, per year (column percentages)

	2002	2003	2004	2005
Younger cohort (n=4,376)				
Yes	0	0	1	1
No	100	100	99	99
Mid-age cohort (n=7,318)				
Yes	10	12	14	16
No	90	88	86	84
Older cohort (n=5,752)				
Yes	32	33	33	34
No	68	67	67	66



a)



b)

Figure 5-1 Statin claims over time; (a) among ALSWH participants and (b) national statistics

5.3.2. Longer-term use of statins

Characteristics of statin claimants at Survey 3 are shown in Table 5-2 for Mid-age women who consented to linkage to PBS data. Current claimants are women who were claiming statins at the start of PBS data collection in 2002, new claimants are those who first started claiming statins at least three months after the start of data collection. Non claimants are women who consented to linkage to PBS data but did not have a claim for statin medications between 2002 and 2005. Statin claimants had lower levels of education, were less likely to be employed and had more difficulty managing on their available income than non-claimants ($P < 0.001$). There were no statistically significant differences in area of residence or marital status. Health and use of health services are shown in Table 5-3. As expected statin claimants were more likely to be postmenopausal, this includes surgical menopause such as having had a hysterectomy and/or oophorectomy. They were also more likely to have diabetes, hypertension or heart disease, and they had more yearly visits to a GP or specialist.

Table 5-2 Sociodemographics of Mid-age women according to statin claims

Characteristics at Survey 3	Statins		
	Non claimants N=5,860 %	Claimants in 2002 N=544 %	New claimants 2002 - 2005 N=788 %
Level of education			
No formal qualification	13	22	16
School or leaving certificate	48	50	53
Trade, apprenticeship, diploma or higher education	39	28	31
Area of residence			
Urban	37	38	39
Rural/remote	63	62	61
Marital status			
Married/defacto	82	79	83
Separated/divorced/widowed	15	17	14
Single	3	4	3
Ability to manage on income			
Impossible/difficult all the time	9	16	14
Not too bad/difficult some of the time	70	70	69
Easy	21	14	17
Employment			
No permanent paid work	41	58	48
Full or part time paid work	59	42	52

Table 5-3 Health and use of health services among Mid-age women according to Statin claims

Characteristics at Survey 3	Statins		
	Non claimants	Claimants in 2002	New claimants 2002 - 2005
	N=5,860 %	N=544 %	N=788 %
Menopause status			
Premenopausal	10	3	6
Perimenopausal	32	21	30
Postmenopausal	31	34	28
Surgical menopause	26	41	35
Diabetes			
Yes	3	16	9
No	97	84	91
Hypertension			
Yes	23	45	43
No	77	55	57
Heart disease (angina, heart attack)			
Yes	2	14	6
No	98	86	94
Number of yearly GP visits			
Never, once or twice	46	21	32
3 to 6	42	51	48
7 to 24	11	24	19
More than 24	1	2.8	1
Number of yearly specialist visits			
Never, once or twice	87	77	81
3 to 6	10	18	15
7 to 24	2	4	3
More than 24	0	1	0

* Statistically significantly different at $P < 0.0001$

Statins are maintenance drugs; they have to be taken over a long period of time to be effective. Generally, less than 50% of patients on long-term medication adhere adequately to prescriptions (N. H. Miller, 1997). Especially for drugs such as statins, that do not relieve symptoms but are taken exclusively for prevention of future morbidity, adherence is generally poor. This poor adherence leads to missed health benefits and subsequently increased disease related medical costs. We can infer non-adherence to medication from PBS data: that is, those women who do not fill repeat prescriptions are not adhering to recommended use patterns for statins. To determine adherence to statins in the Mid-age cohort, we identified new claimants of statins: a total of 788 women started claiming statins between 2002 and 2005. They were aged 55 [51 to 59] years at the time (median [range]). By the PBS requirements, they must all have had raised fasting cholesterol levels in spite of dietary measures, or they had significant cardiovascular risk factors. Risk factors include having symptomatic coronary heart disease, symptomatic cerebrovascular or peripheral artery disease, or having a first degree family member who died of coronary heart disease before the age of 45.

A majority of the initial statin prescriptions were issued by GPs (80%). The remainder of first prescriptions were issued by practitioners from a range of specialties such as cardiology, general medicine and endocrinology. Adherence was measured by determining the duration of continuous PBS claims. The period of continuous use was defined as the time from starting to claim statins, until failing to fill a script on time. 'On time' was defined as two weeks; because

each script lasts for a month, filling the next script after a break of more than two weeks means treatment coverage of less than two-thirds. The median number of days of continuous use was 137 (95% confidence intervals [125 to 157]) for new users. In other words, in less than five months half the women had failed to fill a script on time. Overall adherence is shown in Figure 5-2. A sharp decrease is seen at the start of claiming for statins; this corresponds with failure to fill the second (9%) script; 26% failed in timely script filling before the third script.

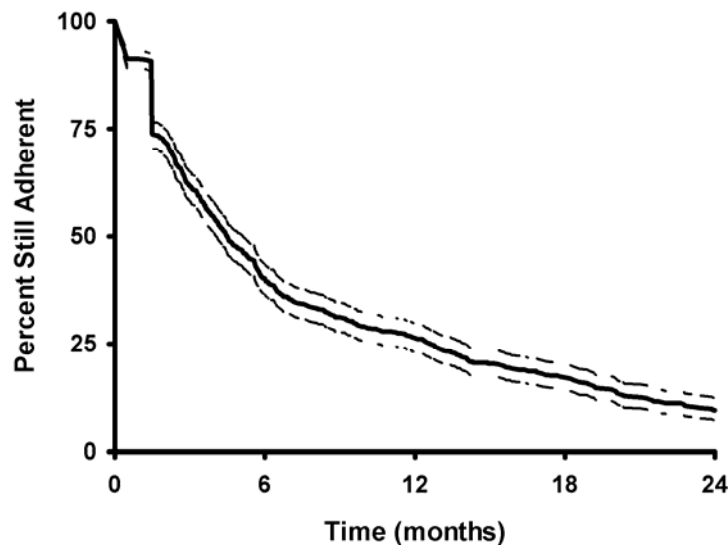


Figure 5-2 The declining percentage of Mid-age women who are still continuous users of statin medication

5.4. Long-term use of bisphosphonates for treatment of osteoporosis and prevention of fracture

Osteoporosis is a condition characterised by low bone mass, leading to increased bone fragility and, consequently, increased fracture risk. Osteoporotic fractures are common among older, postmenopausal women and are associated with substantial morbidity and mortality. Management strategies for women at risk include lifestyle interventions such as regular exercise, eating a balanced diet with adequate sources of calcium, and prevention of falls (The North American Menopausal Society, 2006). For women with established post-menopausal osteoporosis, drug treatment is indicated; bisphosphonates are the first-line drugs for this group (The North American Menopausal Society, 2006). With the ageing population, the incidence of osteoporosis and the need for treatment is growing.

Osteoporosis is a chronic condition and bisphosphonates are long-term medications. Bisphosphonates are most effective when treatment is sustained for years, provided that the recommended dosage is taken for at least two-thirds of time. In practice, however, adherence to bisphosphonates is poor (Rossini et al., 2006; Papaioannou, Kennedy, Dolovich, Lau, & Adachi, 2007; Brookhart et al., 2007; Solomon et al., 2005; Penning-van Beest, Goettsch, Erkens, & Herings, 2006). Because quitting or insufficient use of osteoporosis medication is expensive in terms of (missed) health benefits as well as ineffective expenditure, we investigated how well elderly women adhere to bisphosphonates. We also studied adherence to bisphosphonates in relation to sociodemographic, health and lifestyle characteristics obtained from ALSWH survey data. This information could help the prescribing physician to identify women at risk for inadequate adherence to treatment.

5.4.1. Uptake over time

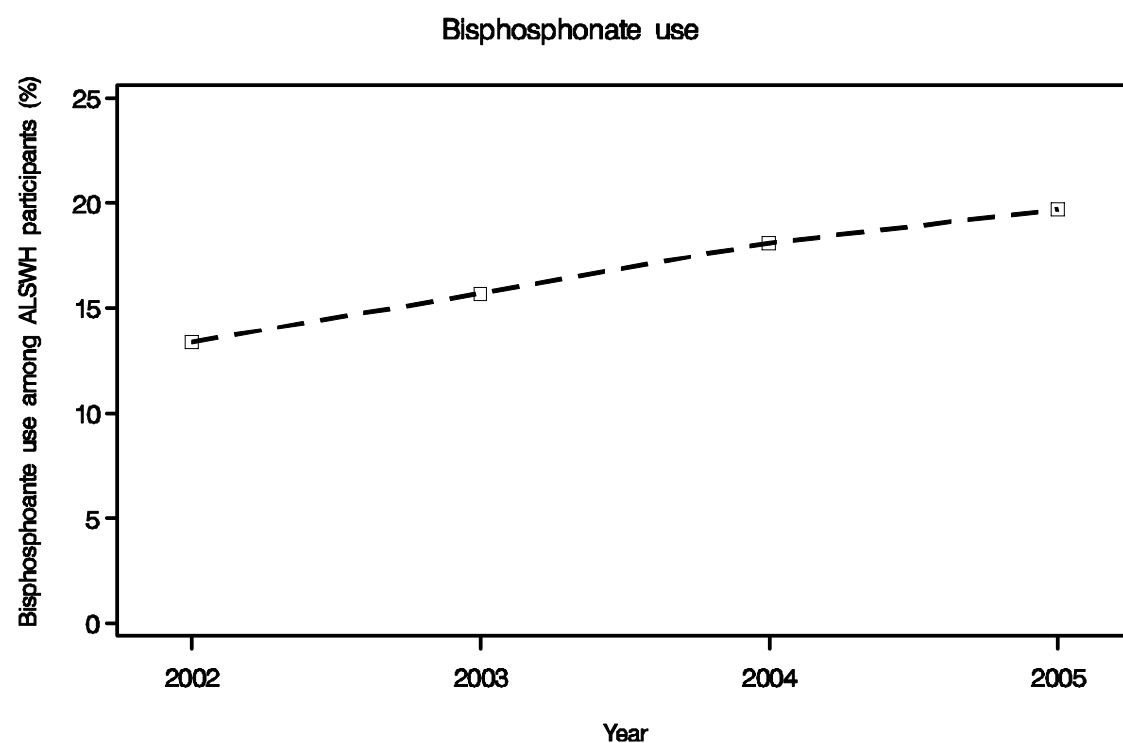
Bisphosphonate claims were identified in the PBS by ATC coding: CM05BA/B. Claims for bisphosphonates by the Mid-age and the Older cohorts increased between 2002 and 2005, as

shown in Table 5-4. Part of this may be due to ageing, as the prevalence of osteoporosis increases over time. National statistics, however, also show an increase in bisphosphonate use (PBS prescription facts sheet, Department of Health and Ageing, 2005). Expressed as the number of defined daily doses per 1000 people per day, use increased between 2002 and 2005 as shown in Figure 5-3. Although this figure shows a different definition of bisphosphonate use for the Older cohort compared to National Statistics, their increased uptake does not appear to be solely due to ageing.

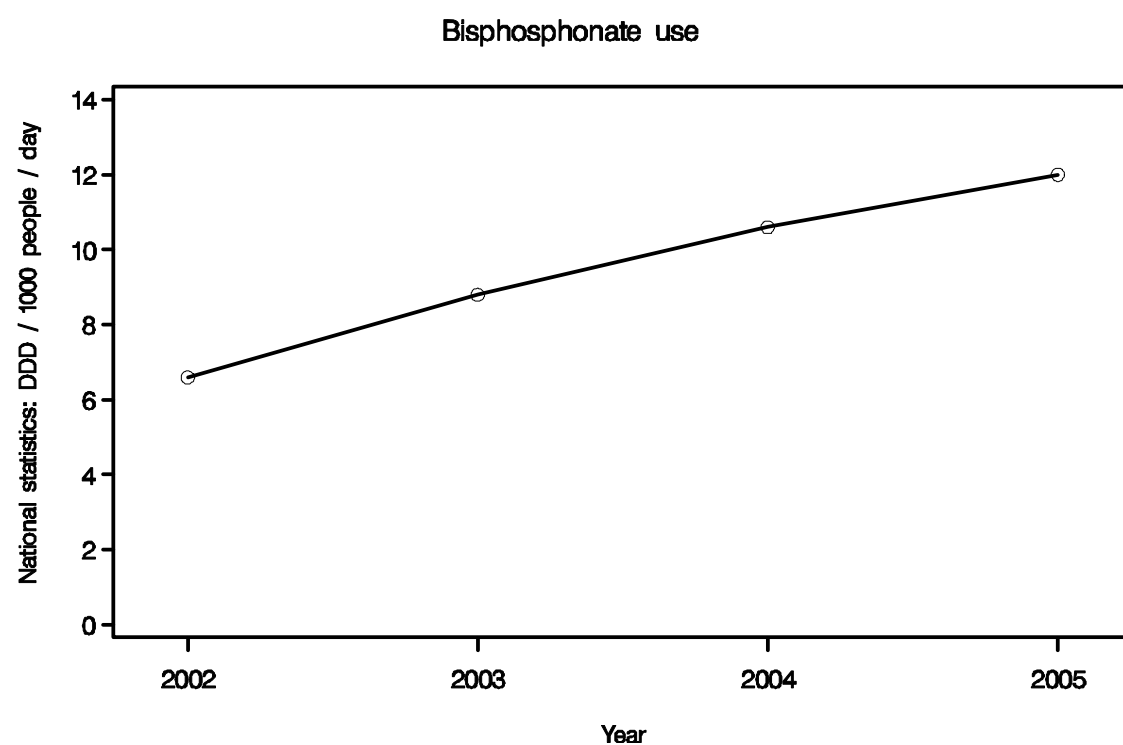
The yearly cost of the most commonly prescribed bisphosphonates (alendronic and risedronic acid) for all people in Australia, was \$177,265,289 in 2005 (government and patient contribution combined). Previously subsidised under the PBS only for patients with a bone fracture due to minimal trauma, bisphosphonates are currently subsidised for all patients aged 70 years or more, with a bone mineral density measurement indicating osteoporosis (T-score of -3.0 or less). Use of bisphosphonates, and subsequently the number of PBS subsidies, which were already substantial in 2005, can therefore be expected to increase more steeply from 2007 onwards. Lowered PBS threshold, increasing awareness of bisphosphonates as drugs of choice for osteoporosis and the ageing of the population will contribute to increased use.

Table 5-4 Bisphosphonate use in the three age cohorts, per year (column percentages)

	2002	2003	2004	2005
Younger cohort (n=4,376)				
Yes	0	0	0	0
No	100	100	100	100
Mid-age cohort (n=7,318)				
Yes	1	1	2	3
No	99	99	98	97
Older cohort (5,752)				
Yes	13	16	18	20
No	87	84	82	80



a)



b)

Figure 5-3 The uptake of bisphosphonates over time; (a) among ALSWH participants and (b) national statistics

5.4.2. Longer-term use of bisphosphonates

To analyse long-term bisphosphonate use for menopausal osteoporosis, bisphosphonates coded for the treatment of Paget's disease or hypercalcaemia of malignancy, or solely for the preservation of bone mineral density in patients on long-term glucocorticoid therapy were not included (PBS items 6371H, 6223M, 8209C, 8463K, 6343W, 6279L, 8462J, 8267D, 2920Q, 8090T, 8265B, 8482K, 4444X, 8132B). Among women in the Older cohort who consented to linkage of their Survey data to PBS data (n=5,752), 788 (14%) became new claimants of bisphosphonates between 2002 and 2005 (they started claiming it after a bisphosphonate claim free period of at least 6 months). These women had a median age of 80 years [range 76 to 84] in 2005. By the PBS requirements at the time, all these women would be expected to have had osteoporosis and a fracture after a minimal trauma in the past. The prescription was usually issued by a GP or another primary care medical practitioner (89%) and less commonly by a rheumatologist (2%), endocrinologist (1%), internist (1%), geriatrician (1%) or other (6%).

The period of continuous use was calculated as the time from starting to claim bisphosphonates, until failing to fill a script on time.³ The median number of days of continuous use was 170 (95% confidence intervals [154 to 186]). In other words, in less than six months half the women had failed to fill a script on time (Berecki-Gisolf, Hockey, & Dobson, 2008). Overall adherence is shown in Figure 5-4. A sharp decrease is seen at the start of claiming for bisphosphonates; this corresponds with failure to fill the second (8%) script; 20% failed in timely script filling before the third script.

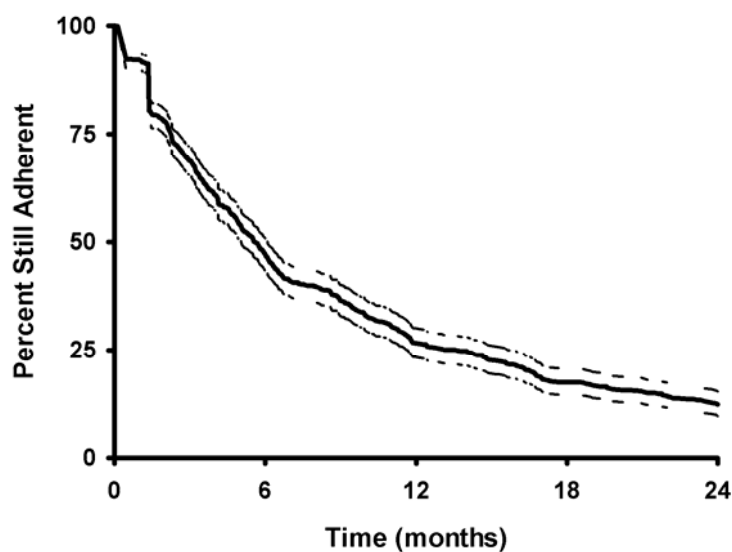


Figure 5-4 The declining percentage of Older women who continued with timely bisphosphonates claims

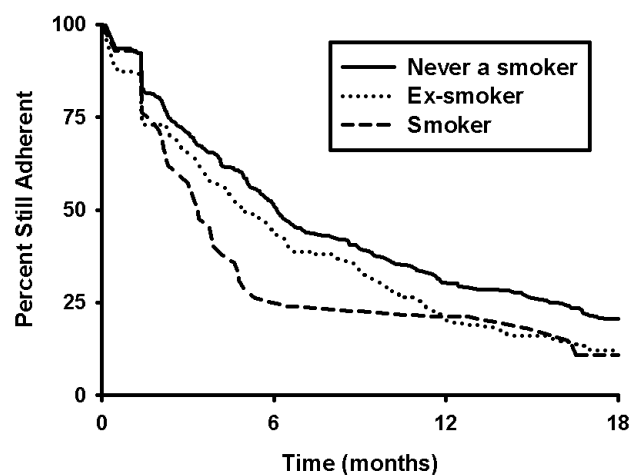
Women's characteristics were analysed in relation to continuous claiming (or time to first failure to fill a prescription). Smoking was associated with failing to fill a prescription, as was former smoking (Figure 5-5, top). Adherence was better among women who reported high levels of physical activity compared to those with low levels (Figure 5-5, middle). Alcohol consumption and body mass index were not associated with failing to fill a prescription. Failure to fill scripts was also not associated with level of education, rurality, marital status, the ability to manage on available income, frequency of visiting a GP, or health (in terms of the number of chronic

³ 'On time' script filling allows a gap of two weeks between running out of medication and picking up a refill from the pharmacy. The rationale for this 'maximum allowed gap' is that because each script lasts for a month, filling the next script after a break of more than two weeks means treatment coverage of less than two-thirds. In other words, adherence is defined as the time until medication use drops below two-thirds of the prescribed dosage.

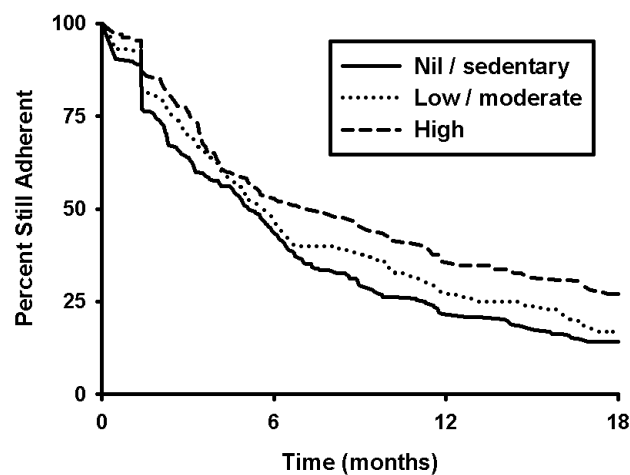
conditions, prior use of non-osteoporosis medication, body mass index and SF-36 scores for physical functioning, bodily pain, general health, vitality and mental health).

Heartburn and abdominal pain are commonly reported as side-effects of bisphosphonates. This effect may be due to a high prevalence of heartburn among elderly women with osteoporosis rather than a medication effect (P. D. Miller et al., 2000). Medications for conditions such as heartburn and stomach ulcer (ATC codes A02BA/B/C/X) were claimed by 44% of women in the six months prior to commencing to claim bisphosphonates. These women were less likely to continue claiming bisphosphonates in the longer term (Figure 5-5, bottom). A similar pattern was seen in women who reported often having heartburn before starting to claim bisphosphonates, but who did not claim prescribed (PBS) medication for acid-related disorders.

Smoking



Physical Activity



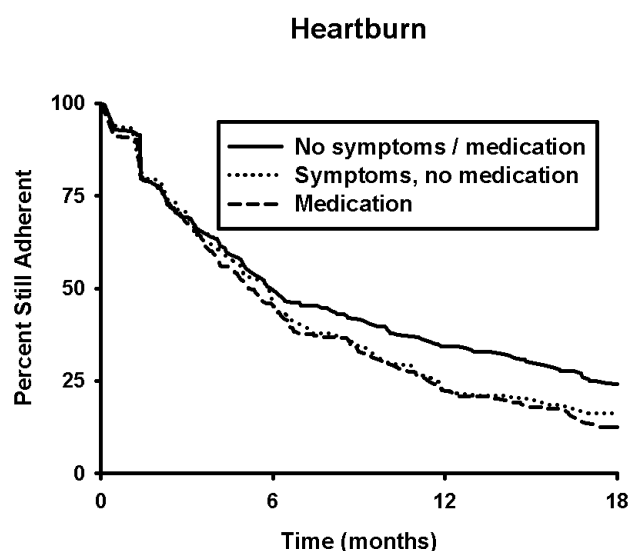


Figure 5-5 The declining percentage of women who are still continuous users, in relation to smoking, levels of physical activity and heartburn

Determining if adherence to bisphosphonates is affected by medication out-of-pocket cost was made difficult by the safety net. It is a chicken-and-the-egg problem: women who generally adhere to medication are more likely to reach the safety net threshold; subsequently lowered cost might be an incentive to adhere to medication. Most of the women were concession card holders (94%). Taking into account safety net status, having a concession card was not related to claiming bisphosphonates, neither was the reported ability to manage on the available income. In short, among Older women eligible for bisphosphonate benefits, affordability did not appear to determine adherence.

In conclusion, Older women who participated in the ALSWH and consented to linkage to pharmaceutical claims data showed poor long-term adherence to bisphosphonates. Within six months, half the women stopped making timely claims. Women who smoked or took acid-related medication or who had gastro-intestinal symptoms prior to starting bisphosphonates were less likely to continue claiming bisphosphonates while women who reported high levels of exercise were more likely to continue, suggesting that enquiry about health behaviour and symptoms could alert the prescribing physician to women at risk for adherence failure.

5.5. Long-term use of proton pump inhibitors

Proton-pump inhibitors (PPIs) are drugs that reduce acid-production of the stomach. They are commonly prescribed for conditions such as gastro-oesophageal reflux disease and peptic ulcer disease. Symptoms of these conditions include heartburn and abdominal discomfort or pain. PPIs are widely used and have a marked contribution to the yearly Pharmaceutical Benefits Scheme (PBS) expense in Australia. Esomeprazole and omeprazole, the most commonly used PPIs, were both in the list of top 10 drugs by cost to the Government (Drug Utilisation Subcommittee (DUSC), 2007). In 2005 the annual cost of PPIs for all people in Australia was \$634m (government cost and patient contribution combined) (Department of Health and Ageing, 2005).

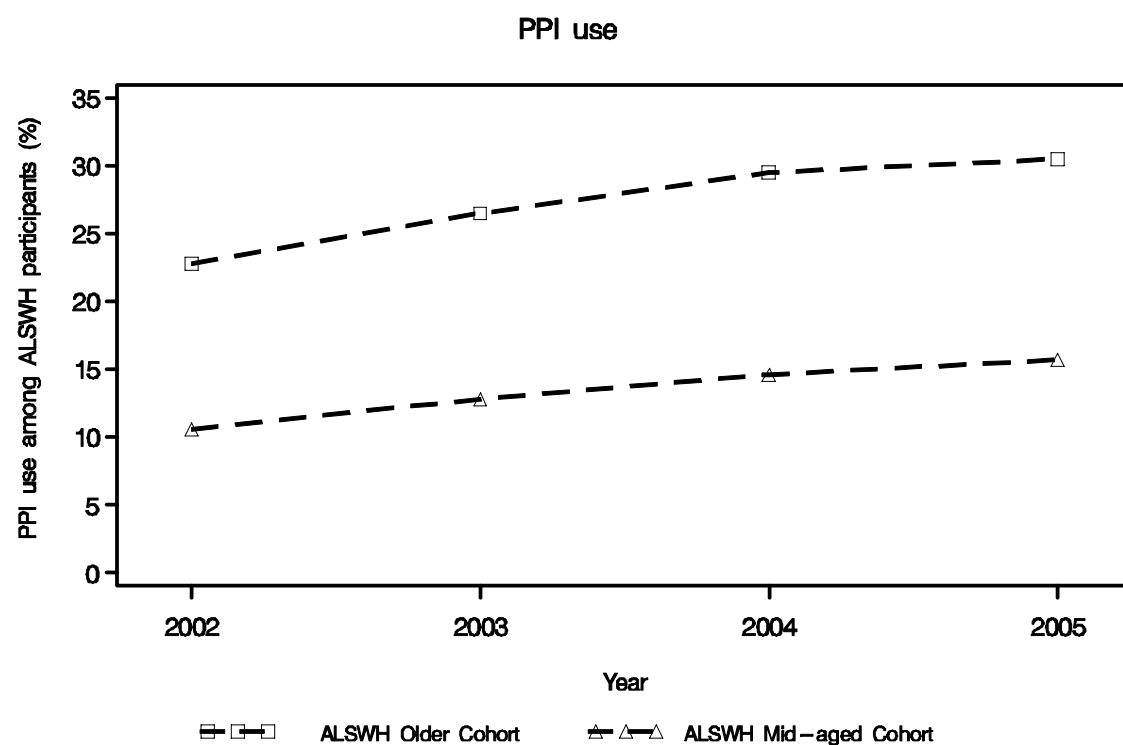
The most common indication, gastro-esophageal reflux disease, usually requires a short trial of PPIs. In practice, however, PPIs are often used as long term medication. Prolonged use if it is not strictly indicated, poses a health risk as well as causing unnecessary expense and patient burden. Health risks associated with prolonged use are increased risk of pneumonia (Laheij et al., 2004), hip fracture, supposedly because of interference with calcium absorption (Yang, Lewis, Epstein & Metz, 2006) and *C. difficile*-associated disease, causing diarrhoea (Dial, Delaney, Barkun & Suissa, 2005).

5.5.1. Uptake over time

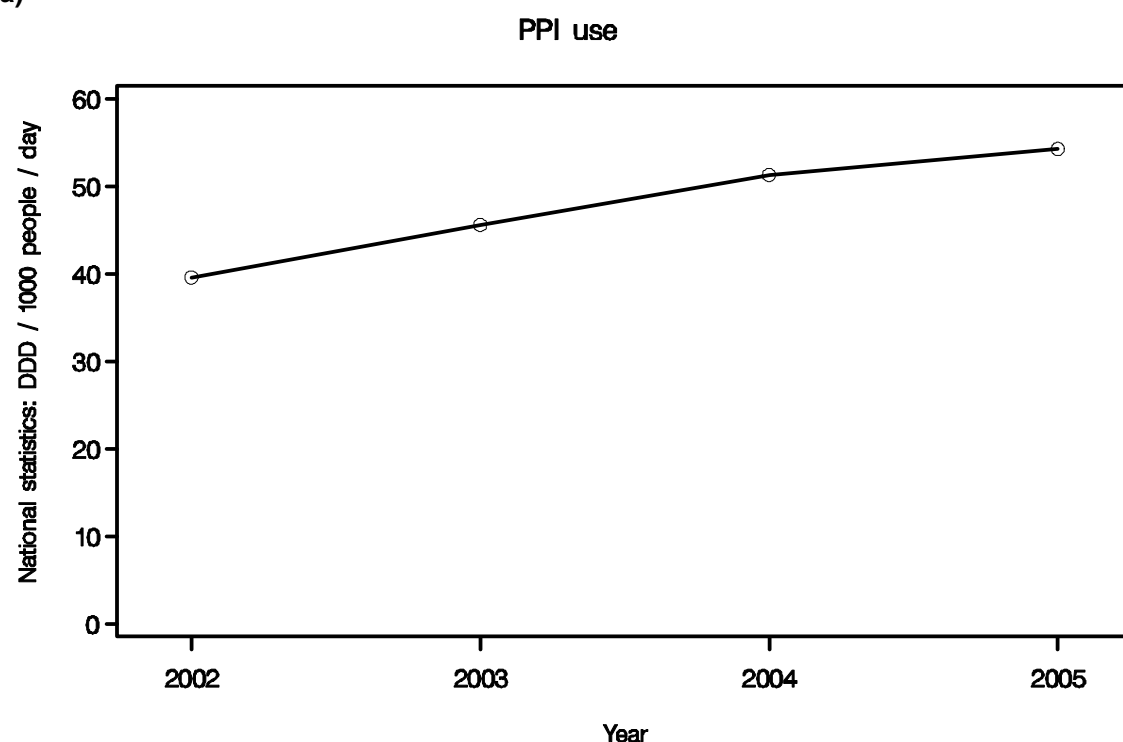
The use of PPIs was ascertained from PBS data by identifying women who filled a prescription for PPIs (ATC codes A02BC/D) at an Australian pharmacy between 2002 and 2005. PPIs claims by the Mid-age and Older cohort between 2002 and 2005 was common and increasing, as shown in Table 5-5. This may be partly due to ageing of the women over four years, because acid-related conditions are more common with increasing age. Figure 5-6 shows the increased claims for PPIs among ALSWH cohorts, expressed as the percentage of women who filled a PPI script during the year, as well as the National Statistics for PPI use, expressed as the number of defined daily doses per 1000 people per day. A similar pattern of increase, although on a different scale, indicates that the increased claims by ALSWH participants is not just an ageing effect but is similar to the increasing trend in the whole Australian population. The use of PPIs is therefore common and growing, and the consequent expense is considerable.

Table 5-5 Proton pump inhibitor (PPI) use in the three age cohorts, per year (column percentages)

	2002	2003	2004	2005
Younger cohort (n=4,376)				
Yes	2	3	3	3
No	98	97	97	97
Mid-age cohort (n=7,318)				
Yes	11	13	15	16
No	89	87	85	84
Older cohort (n=5,752)				
Yes	23	27	29	30
No	77	73	70	70



a)



b)

Figure 5-6 The uptake of PPIs over time; (a) among ALSWH participants and (b) national statistics

5.5.2. Patterns of use

Among women in the Mid-age and Older cohorts who consented to linkage to PBS claims records, 6% of Younger, 23% of Mid-age and 41% of Older women had at least one claim for

PPIs between 2002 and 2005 (a total of 4356 women across the three cohorts). The women's claims for these drugs has been considered in relation to the various indications for PPI therapy. PPIs in conjunction with non-steroidal anti-inflammatory drugs (NSAIDs), for conditions such as arthritis, justify long term PPI use as these drugs are associated with dyspepsia and gastric ulcers. PPIs are also part of a *Helicobacter pylori* (*H.pylori*) eradication scheme, for *H.pylori* – associated peptic ulcer disease. Of the remaining PPI users, the majority is treated for gastro-oesophageal reflux disease (GORD).

A decision tree of PPI prescribing is shown in Figure 5-7. Of all women who claimed PPIs, one-third did so in conjunction with NSAIDs (with overlapping use of these medications, determined from script filling data). The great majority of these women initiated PPI claims after starting on NSAIDs and may be claiming this medication for the treatment of side-effects of NSAIDs; remaining women with overlapping script filling of NSAIDs and PPIs were prescribed these at the same time and were categorised as 'preventive' PPI users. Most women claiming PPIs in conjunction with NSAIDs were long-term claimants of PPIs (72%).

Eradication of *H.pylori*-associated peptic ulcer disease (ATC code A02BD) accounted for a small number of PPI claimants (4%), and more than half of these women claimed PPIs for more than six months. Of the remaining PPI claimants, who are most likely to be treated for reflux disease, more than two-thirds claimed PPIs for at least six months. Furthermore, of the long-term claimants among women in this category, 62% were 'chronic claimants' who filled more than 10 scripts per year; 29% were 'on demand claimants' who filled 3 to 10 scripts; and 9% were 'sporadic claimants' <3 scripts per year.

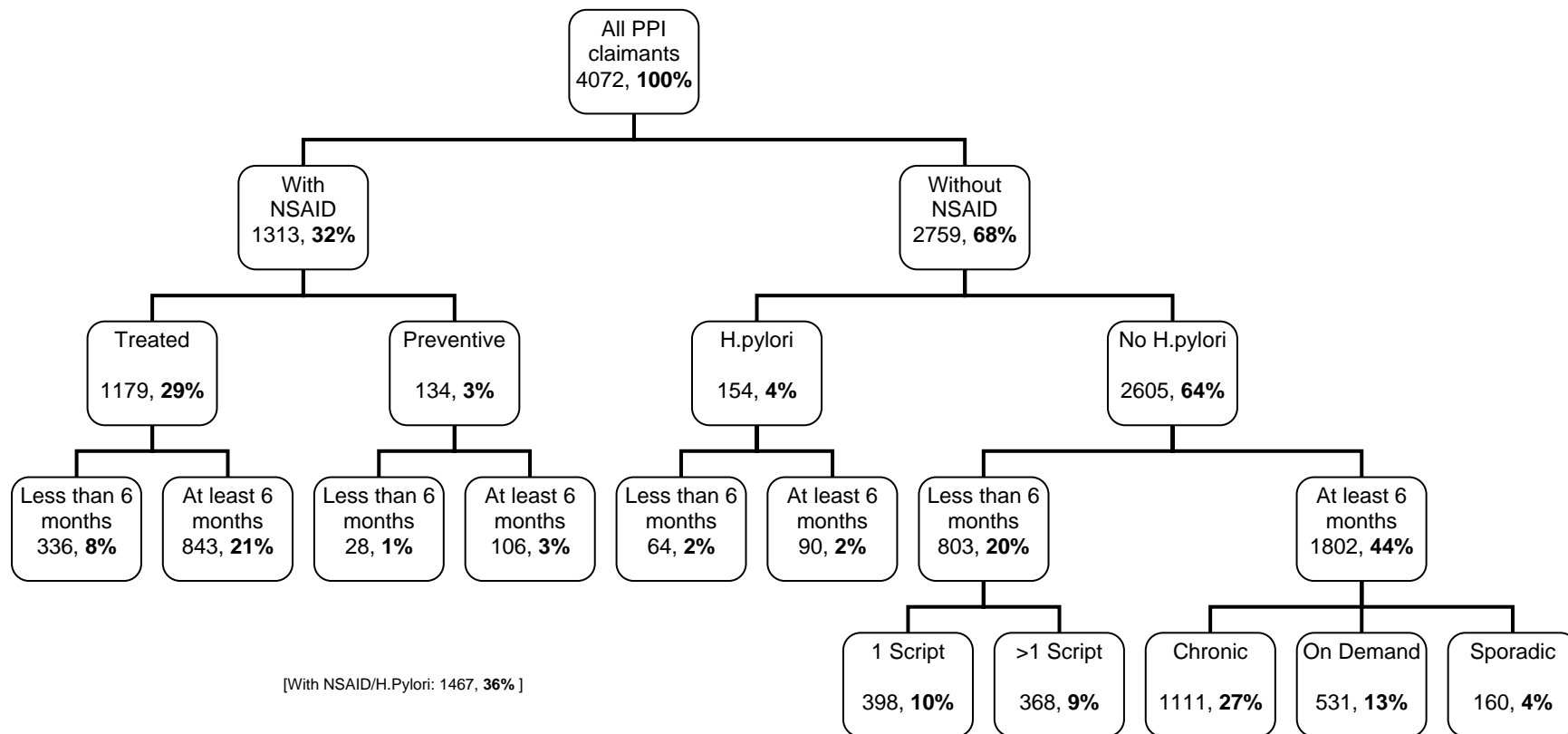


Figure 5-7 Patterns of PPI claims among Mid-age and Older women

5.5.3. Initial prescribing

The use of PPIs in Australia has increased dramatically over the last decade. Inappropriate use of PPIs has been reported previously both in Australia and overseas (Batuwitage, Kingham, Morgan, & Bartlett, 2007; Bjornsson et al., 2006; Pillans, Kubler, Radford, & Overland, 2000). To gain insight into PPI usage we investigated initial prescription patterns.

The Gastroenterological Society of Australia's guidelines recommend two to four weeks of proton pump inhibitors for the initial treatment of gastro-oesophageal reflux disease (GORD) (Gastroenterological Society of Australia, 2001). While patients with severe oesophagitis should continue on long-term treatment, for the majority of patients after initial treatment a step-down to symptom driven therapy is indicated.

We determined the number of repeats on initial PPI prescriptions by analysing pharmaceutical benefits scheme (PBS) claims for women in the Younger, Mid-age and Older cohorts who had consented to linkage of their survey data to the PBS. During the period 1 July 2002 and 31 December 2005, 1143 women were identified as having claimed PPIs after a PPI free interval of at least 6 months and not in association with non-steroidal anti-inflammatory drugs (NSAID) or as part of an H. pylori eradication scheme or treatment of peptic ulcer (determined from PBS coding 1326T, 2240X, 8007K, 8331L, 8509W, 8528W). Among these women, initial prescriptions came with no repeats (12.6%), one repeat (21.9%), two or three (5.8%) or 5 repeats (59.7%). Actual script filling from the initial prescription amounted to one (38.3%), two (22.2%), three to five (15.2) or six scripts filled (23.8%). Amongst those whose claims spanned 6 months or more, a greater percentage (69%) received 5 repeats initially compared with those who used PPIs for less than 6 months (45%). Amongst 'chronic' claimants (those who claimed PPIs for >6 months and filled 10 or more scripts per year) there were more initial prescriptions with 5 repeats than among 'on demand' claimants (those who claimed PPI's for >6 months and filled 3 to 10 scripts per year), with 73% compared with 64%.

Although we cannot determine appropriateness of PPI prescribing because data on symptoms are lacking, the duration of initial PPI therapy appears to be longer than recommended by prescribing guidelines. This may be due to clinicians' anticipating relapse or a rebound effect upon withdrawal. Given the high proportion of women with an initial PPI treatment for non-ulcer, non-NSAID related conditions exceeding six months, it may be prudent for the PBS to review the criteria for the authorisation for, and the initial treatment duration of GORD. The potential for cost savings if this was implemented are considerable given the high contribution of PPIs to yearly PBS expenditure.

5.5.4. PPIs and medications for depression

Characteristics of PPI claimants in the Mid-age cohort, determined from responses to Survey 4, are shown in Table 5-6. Mid-age women who filled at least one PPIs prescription between 2002 and 2005 (recorded in the PBS data), compared to those who did not, had lower levels of education and found it more difficult to manage on their income. PPI claimants were more likely to be obese, had more anxiety and depression and more yearly visits to a GP. All of these differences were highly statistically significant ($P < 0.0001$), except for area of residence which was of borderline significance ($P = 0.05$).

Table 5-6 Mid-age cohort characteristics of PPI claimants (row percentages)

Characteristic	Any PPI use 2002-2005	No PPI use 2002-2005
Highest Education		
No formal qualification	32	68
School cert/ Higher school cert	24	76
Trade/ Apprentice/ Cert/ Diploma	21	79
University degree/ Higher degree	17	83
Area of residence		
Major urban	22	78
Large rural centre	24	76
Small rural centre	25	74
Other rural/remote	24	76
Manage on income		
Impossible	35	65
Difficult always	32	68
Difficult sometimes	26	74
Not too bad	22	78
Easy	18	82
Consulted family doctor last 12 months		
0 – 2 times	13	87
3 – 4 times	23	77
5 – 6 times	33	67
7 or more times	44	56
BMI group		
Underweight	19	81
Healthy weight	18	82
Overweight	25	75
Obese	33	67
Treated/diagnosed depression last 3 years		
Yes	36	64
No	22	78
Treated/diagnosed anxiety last 3 years		
Yes	39	61
No	22	78
Symptoms depression last 12 months		
Never	21	79
Rarely	21	79
Sometimes	30	70
Often	34	66
Symptoms anxiety last 12 months		
Never	21	79
Rarely	27	73
Sometimes	29	71
Often	40	60

Heartburn and gastric discomfort or pain can occur in otherwise healthy individuals but often exists alongside other medical conditions and medications. To gain more insight into characteristics of women who use PPIs, we determined the most commonly used co-

medications. Among 1,700 Mid-age women who claimed PPIs between 2002 and 2005, the most common co-medications were NSAIDs, claimed by 57% of PPI users, asthma-medications (claimed by 17%) and psychotropic medications (claimed by 42%). Asthma and NSAIDs use are known to be related to heartburn and dyspepsia, whereas the association between psychotropic medications and PPI use among women is less obvious. Psychotropic medications included antidepressants (34%), antipsychotics (3%), antiepileptics (5%), anxiolytics and hypnotics (19%). Table 5-7 shows claims for antidepressants among PPI claimants (A02BC/D), among claimants for other acid-related medications (A02BA/B/X), and remaining women. Claims for antidepressants was twice as common among PPI claimants compared to those who did not claim PPIs or any other acid-related medication.

Table 5-7 Acid-related medications and antidepressants (column percentages)

Antidepressant medication	PPI (n=1,700)	Other acid- related. med. (n=112)	No acid-related medications (n=5,462)
SSRI (n=1,043)	22	29	12
Other antidepressant (n=483)	12	15	5
No antidepressant (n=5748)	66	56	84

Survey results of the Mid-age cohort show that the relation between depression and heartburn/dyspepsia holds true not only in terms of medication use but also in terms of symptoms. Figure 5-8 shows the rates of self-reported depression among women who reported never, sometimes, rarely and often having heartburn/indigestion in the last twelve months. Depression was asked in the question: "In the past three years, have you been diagnosed or treated for depression?". The patterns at Surveys 3 and 4 are similar; women who often experience heartburn/indigestion were twice as likely to report depression.

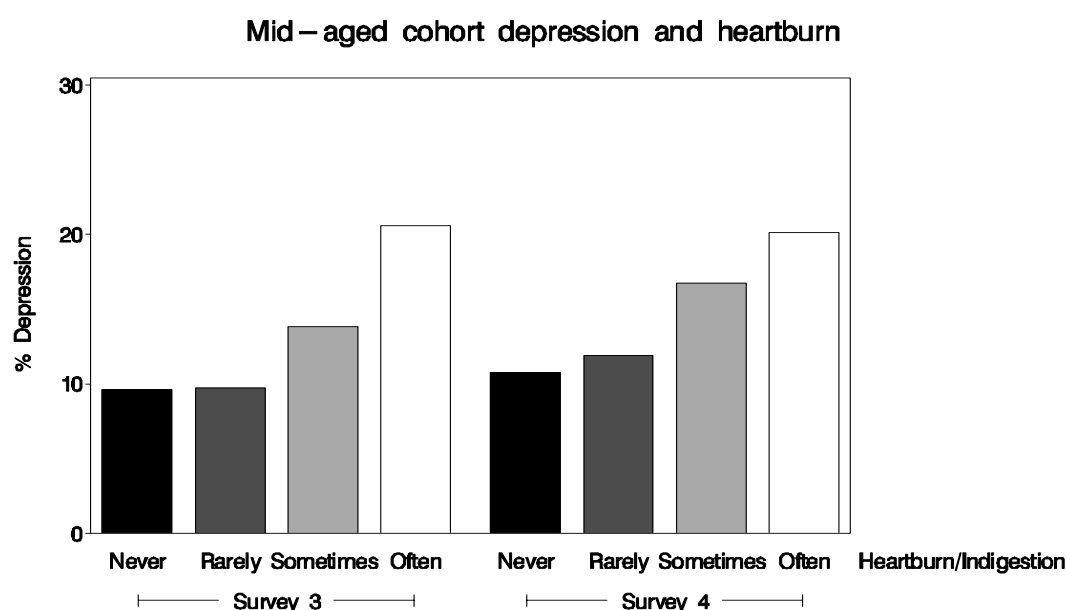


Figure 5-8 Prevalence of depression among Mid-age women with symptoms of heartburn/indigestion

5.6. Discussion

Adherence to statins by mid-age Australian women was comparable to that reported in other studies. A Canadian study reported a drop in the proportion of continuous users of statins for secondary prevention, to 71% after six months; 65% for primary prevention (Perreault et al., 2005). Adjusting our methods to match this study's (allowing for a gap of 60 days instead of 14 days), we found that 68% was still a continuous claimant after six months, among Mid-age

ALSWH participants with statins claims for both primary and secondary prevention (undifferentiated). The Canadian study included both men and women: men had better adherence; adherence in our study was therefore similar or slightly better than that reported in the Canadian study.

Older women who started using bisphosphonates, continued timely claims for 170 days until a first gap in script filling. Other studies appeared to show slightly better adherence than our findings: a study of postmenopausal women in the US, UK and France reported 227, 249 and 179 days of continuous use, respectively (Cramer, Lynch, Gaudin, Walker, & Cowell, 2006). Another study in the US reported 269 days of continuous adherence to bisphosphonates (Cramer, Amonkar, Hebborn, & Altman, 2005). The differences in results between these and our study were due to the length of the permissible gap, which was one month, compared to 14 days in our study. Adjusting our methods to match this study's (allowing for a gap of one month instead of 14 days), adherence increased considerably to 303 days: adherence failure is not a bigger problem in Australia than in other countries such as the US. Although adherence failure is expensive in terms of missed health benefits and ineffective expenditure, not every adherence failure is an irreversible loss to treatment: a US study found that of patients who discontinued osteoporosis medication for at least 60 days, 30% restarted within six months, and 50% restarted within two years (Brookhart et al., 2007).

Of the Mid-age and Older women with PPI claims, 60% received an initial prescription with five repeats. Five repeats allow one to be a chronic user for six months without a further consultation, which is inconsistent with the recommended guidelines of short treatment followed by re-evaluation. Although our analysis does not address the appropriateness of PPI prescribing, it does address initial prescribing and the subsequent duration of use. Limiting initial PPI prescriptions for moderate GORD to a maximum of one repeat would support the present guidelines recommending re-evaluation after 4 to 8 weeks of therapy. Preventing chronic use by early re-evaluation and step-down to symptom driven therapy could lead to a considerable reduction in costs as well as PPI-associated health risks.

5.7. References

- Department of Health and Ageing. (2005). Australian Statistics on Medicines 2004-05. Retrieved 05/02/2008, from <http://www.pbs.gov.au/html/healthpro/publication/list>
- Batuwitage, B., Kingham, J., Morgan, N. & Bartlett, R. (2007). Inappropriate prescribing of proton pump inhibitors in primary care. *Postgrad Med J*, 83(975), 66-68.
- Berecki-Gisolf, J., Hockey, R., & Dobson, A. (2008). Adherence to bisphosphonates by elderly women. *Menopause*, 15(5).
- Bjornsson, E., Abrahamsson, H., Simren, M., Mattsson, N., Jensen, C., Agerforz, P., et al. (2006). Discontinuation of proton pump inhibitors in patients on long-term therapy: a double-blind, placebo-controlled trial. *Aliment Pharmacol Ther*, 24(6), 945-954.
- Brookhart, M. A., Avorn, J., Katz, J. N., Finkelstein, J. S., Arnold, M., Polinski, J. M., et al. (2007). Gaps in treatment among users of osteoporosis medications: the dynamics of noncompliance. *Am J Med*, 120(3), 251-256.
- Cramer, J. A., Amonkar, M. M., Hebborn, A., & Altman, R. (2005). Compliance and persistence with bisphosphonate dosing regimens among women with postmenopausal osteoporosis. *Curr Med Res Opin*, 21(9), 1453-1460.
- Cramer, J. A., Lynch, N. O., Gaudin, A. F., Walker, M., & Cowell, W. (2006). The effect of dosing frequency on compliance and persistence with bisphosphonate therapy in postmenopausal women: a comparison of studies in the United States, the United Kingdom, and France. *Clin Ther*, 28(10), 1686-1694.

Dial, S., Delaney, J. A., Barkun, A. N., & Suissa, S. (2005). Use of gastric acid-suppressive agents and the risk of community-acquired *Clostridium difficile*-associated disease. *Jama*, 294(23), 2989-2995.

Drug Utilisation Sub-Committee (DUSC). (2007). Top 10 drugs. *Australian Prescriber*, 30(6), 142.

Gastroenterological Society of Australia. (2001). Gastro-oesophageal reflux disease in adults. Retrieved 12/02/2008, from www.gesa.org.au/pdf/RefluxDisease1Ed07.pdf

Laheij, R. J., Sturkenboom, M. C., Hassing, R. J., Dieleman, J., Stricker, B. H., & Jansen, J. B. (2004). Risk of community-acquired pneumonia and use of gastric acid-suppressive drugs. *Jama*, 292(16), 1955-1960.

Miller, N. H. (1997). Compliance with treatment regimens in chronic asymptomatic diseases. *Am J Med*, 102(2A), 43-49.

Miller, P. D., Woodson, G., Licata, A. A., Ettinger, M. P., Mako, B., Smith, M. E., et al. (2000). Rechallenge of patients who had discontinued alendronate therapy because of upper gastrointestinal symptoms. *Clin Ther*, 22(12), 1433-1442.

Papaioannou, A., Kennedy, C. C., Dolovich, L., Lau, E., & Adachi, J. D. (2007). Patient adherence to osteoporosis medications: problems, consequences and management strategies. *Drugs Aging*, 24(1), 37-55.

Penning-van Beest, F. J., Goettsch, W. G., Erkens, J. A., & Herings, R. M. (2006). Determinants of persistence with bisphosphonates: a study in women with postmenopausal osteoporosis. *Clin Ther*, 28(2), 236-242.

Perreault, S., Blais, L., Lamarre, D., Dragomir, A., Berbiche, D., Lalonde, L., et al. (2005). Persistence and determinants of statin therapy among middle-aged patients for primary and secondary prevention. *Br J Clin Pharmacol*, 59(5), 564-573.

Pillans, P. I., Kubler, P. A., Radford, J. M., & Overland, V. (2000). Concordance between use of proton pump inhibitors and prescribing guidelines. *Med J Aust*, 172(1), 16-18.

Rossini, M., Bianchi, G., Di Munno, O., Giannini, S., Minisola, S., Sinigaglia, L., et al. (2006). Determinants of adherence to osteoporosis treatment in clinical practice. *Osteoporos Int*, 17(6), 914-921.

Solomon, D. H., Avorn, J., Katz, J. N., Finkelstein, J. S., Arnold, M., Polinski, J. M., et al. (2005). Compliance with osteoporosis medications. *Arch Intern Med*, 165(20), 2414-2419.

The North American Menopausal Society. (2006). Management of osteoporosis in postmenopausal women: 2006 position statement of The North American Menopause Society. *Menopause*, 13(3), 340-367; quiz 368-349.

Yang, Y. X., Lewis, J. D., Epstein, S., & Metz, D. C. (2006). Long-term proton pump inhibitor therapy and risk of hip fracture. *Jama*, 296(24), 2947-2953.

6. Impact of New Health Care Items

6.1. Key findings

75+ Health Assessment

- Health Assessments are government-subsidised health check-ups for people aged 75 years and over; they can be repeated annually.
- Health Assessments evaluate a patient's health and physical, psychological and social function and whether preventative healthcare and education should be considered.
- Of the 4,020 women in the Older cohort who consented to linkage to Medicare data and were eligible for a health assessment, 58% had at least one health assessment between November 1999 and the end of 2005; 40% had two or more assessments.
- Compared to those without, women with at least one Health Assessment had more visits to the GP and took more medications. They were also more likely to rate their health as fair or poor and to have been admitted to hospital.
- Among women who were still alive in 2004, there was no statistically significant difference in physical function scores between women who did and did not have health assessment.

Diabetes Annual Cycle of Care (ACC)

- The Diabetes Annual Cycle of Care (ACC) was introduced as part of a national diabetes integrated program to provide incentives for GPs for early diagnosis and effective management of people with diabetes.
- The HbA1c test is a lab test which reveals average blood glucose over a period of two to three months.
- The ACC includes pathology (with an HbA1c test) and lifestyle risk factor assessment, as well as screening for retinopathy and foot problems.
- Of the women in the Mid-age cohort who consented to linkage to Medicare data and completed Survey 4 (2004), 6% reported being diagnosed with diabetes, up from 2% of the same women at Survey 1 (1996).
- Of the women in the Older cohort who consented to linkage to Medicare data and completed Survey 4, 268 (6%) reported being diagnosed with diabetes in Survey 1 (1996); 616 (14%) had reported diabetes at any survey, by Survey 4 (2005).
- Of the Mid-age women with diabetes, 29% had a Medicare item for an ACC at some time prior to the end of 2005; 41% had an HbA1c test but not the full ACC; and 30% reported diabetes but had no record of either of these items.
- Of the Older women with diabetes, 40% had a Medicare item for an ACC at some time prior to the end of 2005; 46% had an HbA1c test but not the full ACC; and 14% reported diabetes but had no record of either of these items.
- Among both Mid-age and Older women, ACC uptake was more common among women who had more GP visits and received bulk billed consultations.
- Among Mid-age women, those with ACC were more likely to have difficulty managing on their income, while among Older women, those with ACC were less likely to have difficulty managing on their income. There was no differences for either cohort according to area of residence.
- Mid-age women with diabetes who had ACC incurred higher PBS costs than those who had not had ACC; similar results were apparent for MBS costs, although the cost difference was not as pronounced. By contrast, there were no apparent differences in mean MBS or PBS costs between Older women who had ACC or only HbA1c.
- For Mid-age women, analysis of health scores suggested that women with prevalent diabetes were more likely to undergo ACC when they experienced a steeper decline in

physical and social functioning and general health. By contrast, analysis of health scores for Mid-age women with incident diabetes provided some evidence that physical functioning and general health improved after undertaking ACC.

- For Older women, analysis of the general health sub-scale scores provided some evidence of better scores for women with prevalent diabetes who had ACC compared with women who had HbA1c only.

6.2. 75+ Health Assessment

6.2.1. Introduction

In November 1999, the Australian government introduced Medical Benefits Schedule item numbers for health assessments for people aged 75 years and over (items 700, 702, 704, 706). Assessments are to be conducted annually by a general practitioner or by another health care provider working on behalf of the general practitioner, and include a review of the person's health and physical, psychological and social function and consideration of whether preventative health care and education should be offered to improve the person's current and future function. A number of aspects are covered including blood pressure, pulse rate and rhythm; medications; continence; immunisation for influenza, tetanus and pneumococcus; activities of daily living, recent falls, cognition and mood; instrumental and expressive social support, and whether the patient is responsible for caring for another person. The assessments also allow for multi-system review: assessment of fitness to drive, hearing, vision, oral health, diet and nutritional status, smoking, foot care, sleep, need for community services, home safety, and alcohol use. Item 702 provides the opportunity to undertake the assessment in the person's own home; however, most assessments occur in the general practice setting and are covered by item 700, which includes the same elements as those undertaken in the home, but attracts a lower fee. Items 704 and 706 are for assessments conducted for Aboriginal or Torres Strait Islander persons. The Indigenous older person's checks are for those 55 years and older. The uptake of these benefits was initially limited but has since increased (Byles et al. 2007).

6.2.2. Uptake of 75+ Health Assessment by women in the ALSWH

In the Older cohort, 4,020 women consented to the release of Medicare data and were 75 years of age or older in November 1999 (and therefore eligible for a health assessment). As seen in Figure 6-1, 58% of these women had at least one health assessment between November 1999 and the end of 2005. Repeat assessments were less common: 40% of women had two or more assessments, 26% had three or more assessments, 14% had four or more, 6% had five or more, 2% had six or more, and only 3 women (0.1%) had an assessment every year since the introduction.

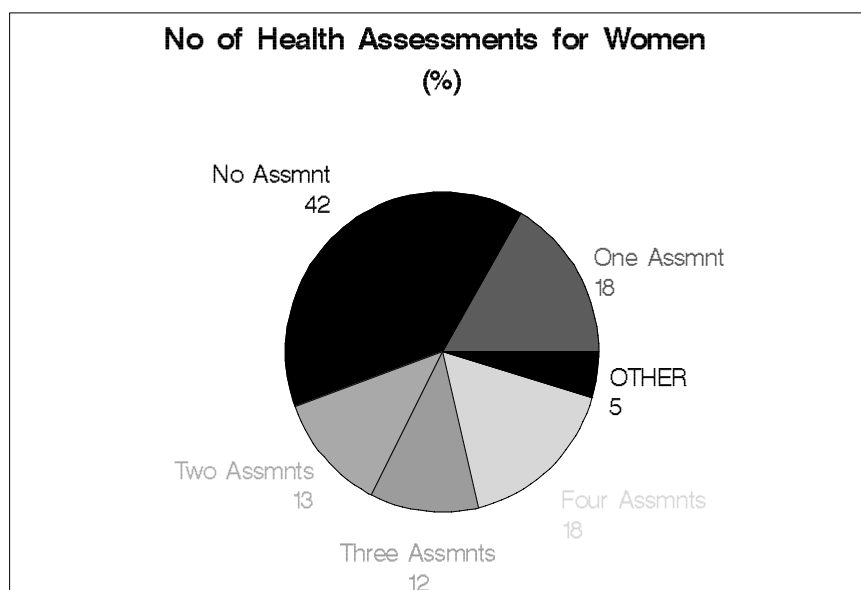


Figure 6-1 Number of Health Assessments provided to eligible women in the Older cohort from 1999 to 2005.

6.2.3. Factors associated with uptake of 75+ Assessment

There was little difference in the uptake of health assessments according to whether women had a self-reported doctor diagnosis of heart disease, cancer, diabetes, asthma/bronchitis/emphysema, or any of these conditions or none of these conditions at Survey 2 (See Figure 6-2).

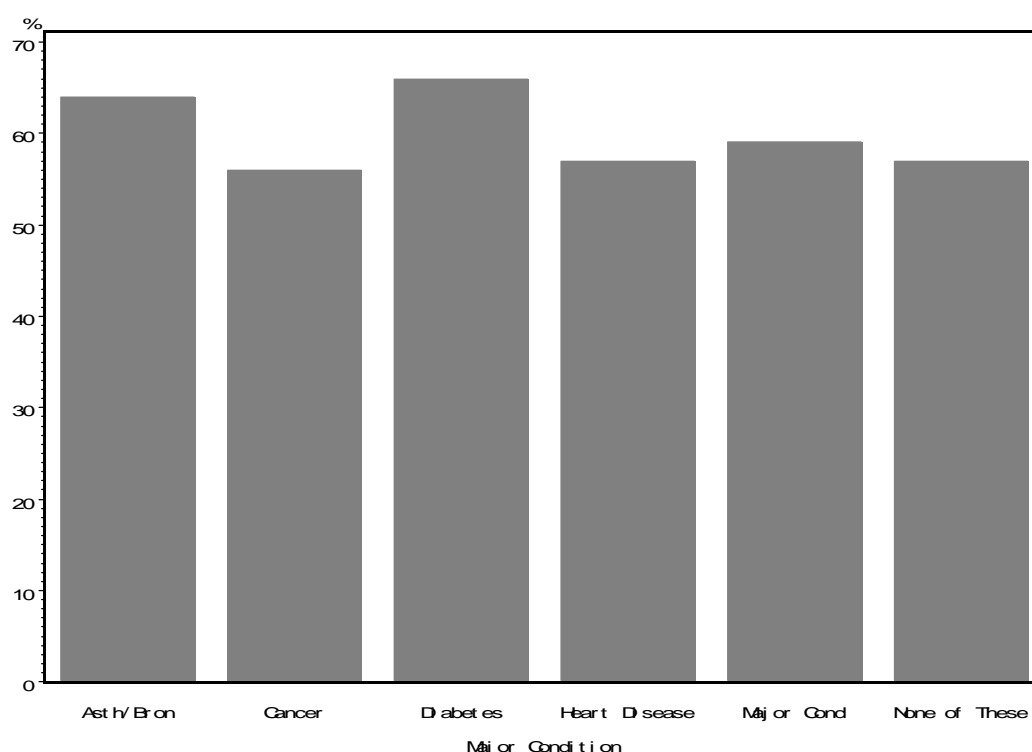


Figure 6-2 Percentage of Older women who had a health assessment according to self-report of major conditions at Survey 2 in 1999. (Asth/Bron= asthma and/or bronchitis/emphysema)

Women who had at least one health assessment had more visits to the GP, and were more likely to have reported having hypertension, to be taking more than five prescribed medications,

and to have been admitted to hospital in the 12 months prior to Survey 2 (1999). Among women who did not report heart disease, cancer, diabetes, or asthma/bronchitis, women who had at least one health assessment were more likely to have been born in Australia and more likely to live in rural areas when compared to women who did not have an assessment. These differences were not apparent for women who had any one or more of these conditions (See Table 6-1)

Table 6-1 Survey 2 (1999) characteristics of women who did and did not have at least one health assessment since November 1999.

Variable as reported at Survey 2	Women with no major conditions		Women with heart disease, cancer, diabetes and/or asthma/bronchitis	
	No Health Assessment	Health Assessment	No Health Assessment	Health Assessment
	%	%	%	%
GP visits				
At most 4	62	48	40	28
5-8 times	24	29	31	34
9 or more	15	24	29	38
5 or more medications	9	12	25	30
Hospital admission	19	21	28	33
Self-reported health				
Fair/poor	9	14	28	30
Area of residence				
Urban	72	70	70	70
Rural	12	16	14	14
Remote	17	14	16	16
Country of birth				
Australia	75	80	78	78

6.2.4. Trends in medication and health service use for older women who had at least one 75+ Assessment

Figure 6-3 and Figure 6-4 show the trends in medications and health service use by women who were eligible for the 75+ assessment according to whether or not they had a health assessment since 1999 and whether or not they had a major condition (heart disease, cancer, diabetes, asthma/bronchitis). Mean benefit costs were greater for women with these major conditions than for women who did not have any of these conditions. Within these groups, costs were also greater for women who had a health assessment. In 2005, mean PBS costs were \$1,634 for women with major conditions and who had health assessment and \$1,495 for those who did not have a health assessment. Among women with none of the conditions, 2005 PBS costs were \$1,065 for women with no assessment and \$1,180 for women who had an assessment.

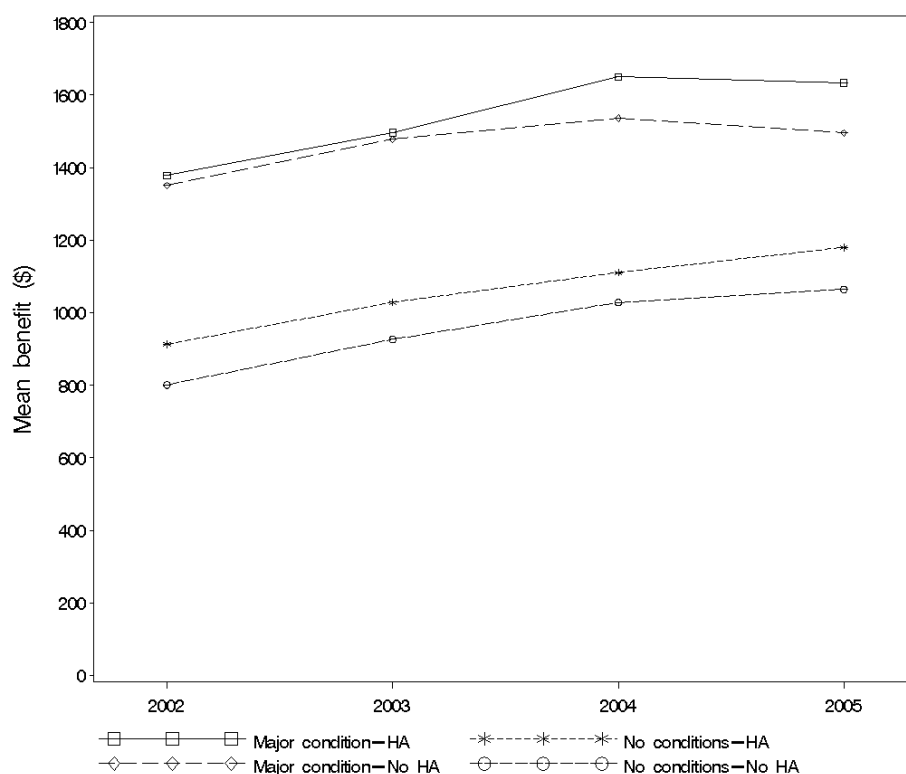
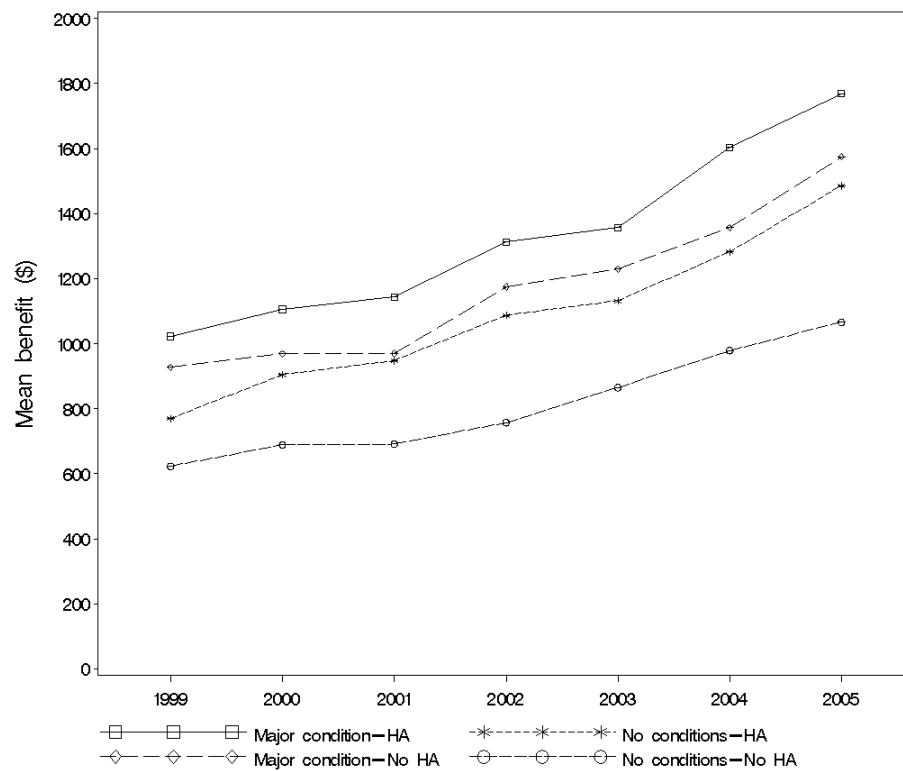
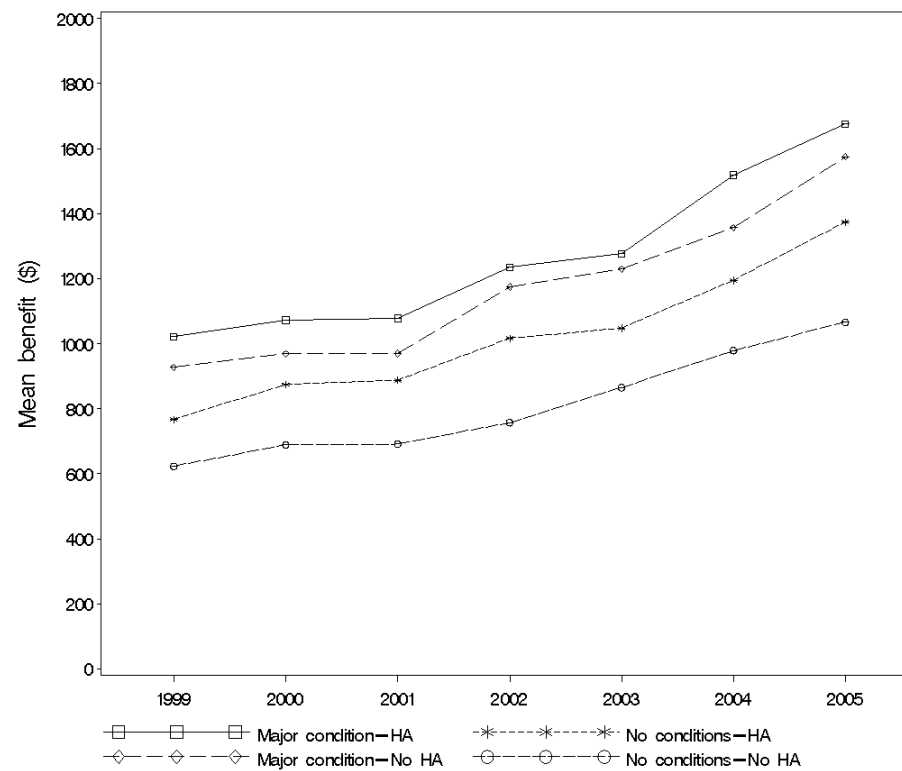


Figure 6-3 Mean benefit PBS costs (costs to Government) from 2002-2005 for Older women (HA=Health Assessment. Costs adjusted to 2005 dollars)

Medicare benefits were also greater for women with one or more of the major conditions and for those who had health assessments. These differences existed in 1999, before the introduction of health assessments, but have widened since that time. However, when the cost of the assessment item is excluded from consideration this effect attenuates. In 2005, excluding the cost for the health assessment item, mean costs for women who had a health assessment but had none of the major conditions, were \$308 more than the mean cost for women who had not had a health assessment.



MBS (including Health Assessment cost)



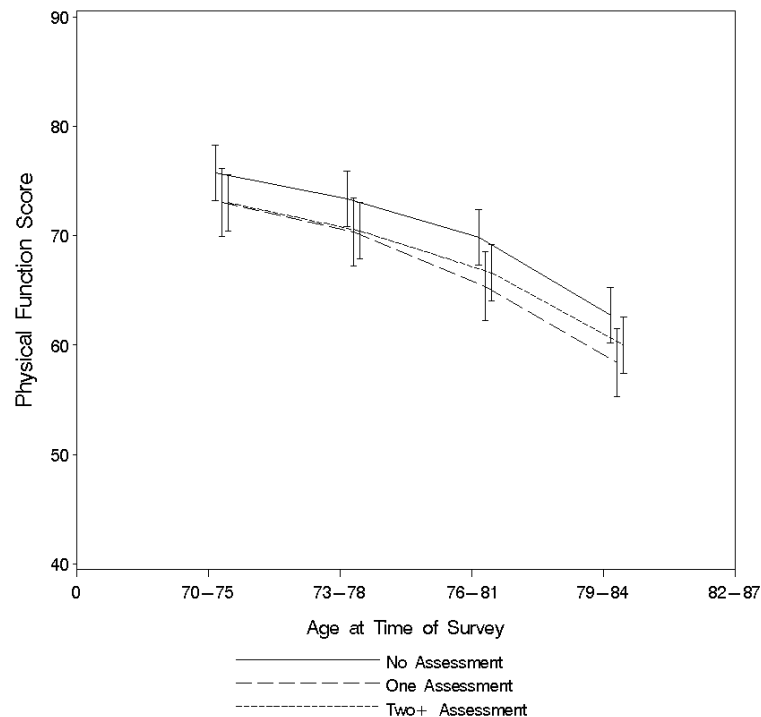
MBS (excluding Health Assessment cost)

Figure 6-4 Mean benefit MBS costs from 1999-2005 for Older women

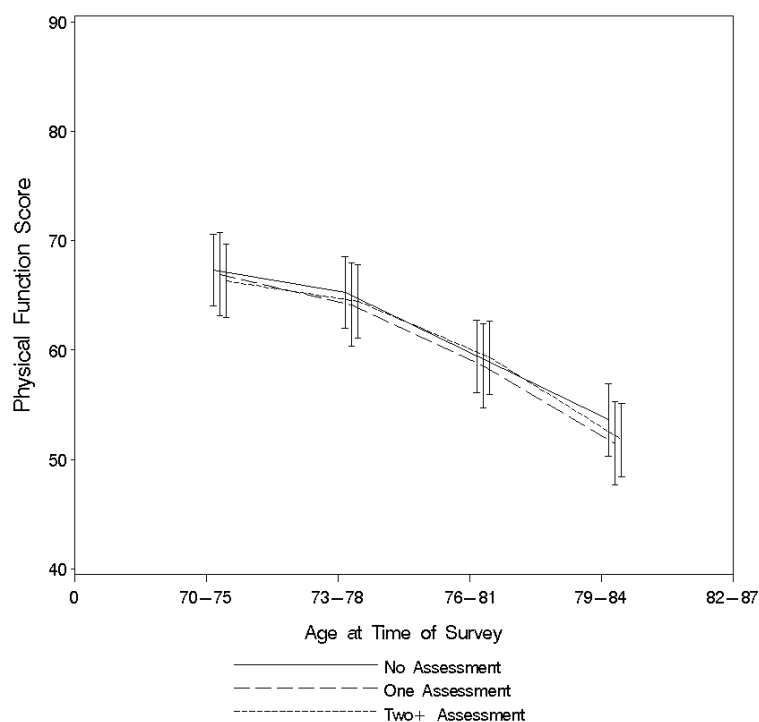
6.2.5. Impact of health assessments on health outcomes

Health assessments had no great impact on survival. While there was a slight trend for women who had a health assessment to have better survival than women who had no assessments, interpretation of these data is difficult since assessments are dependent on survival. Among women who were still alive in 2004, there was no statistically significant difference between physical function scores for women who did and did not have health assessment. However, there was a small trend towards a lesser decline in scores for women having more than one assessment (See Figure 6-5). There were no differences in SF-36 Mental Health sub-scale score (See Figure 6-6).

Additional tables for Section 6.2.5 can be found in Appendix F.

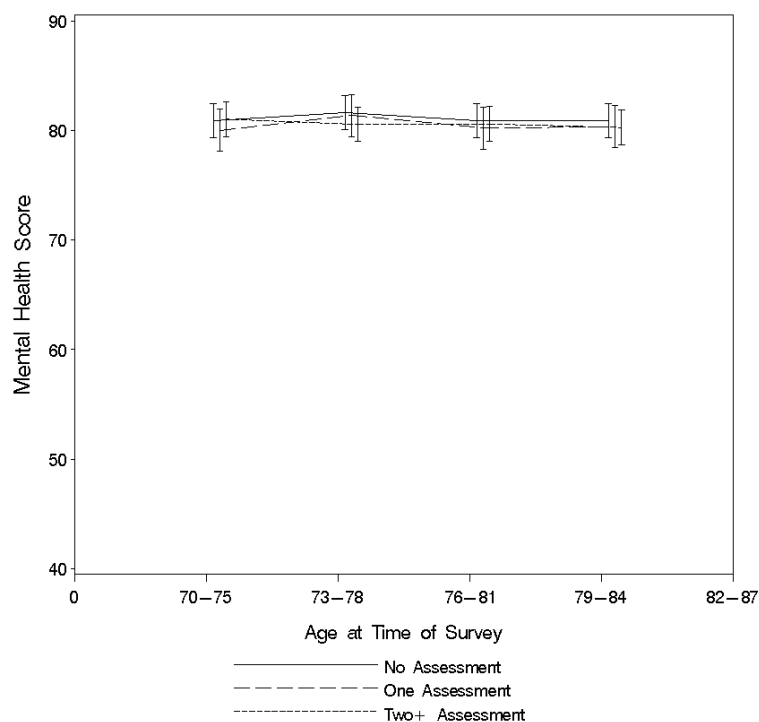


a) Women with no report of heart disease, cancer, diabetes, asthma or bronchitis at Survey 2 (n=2,222)

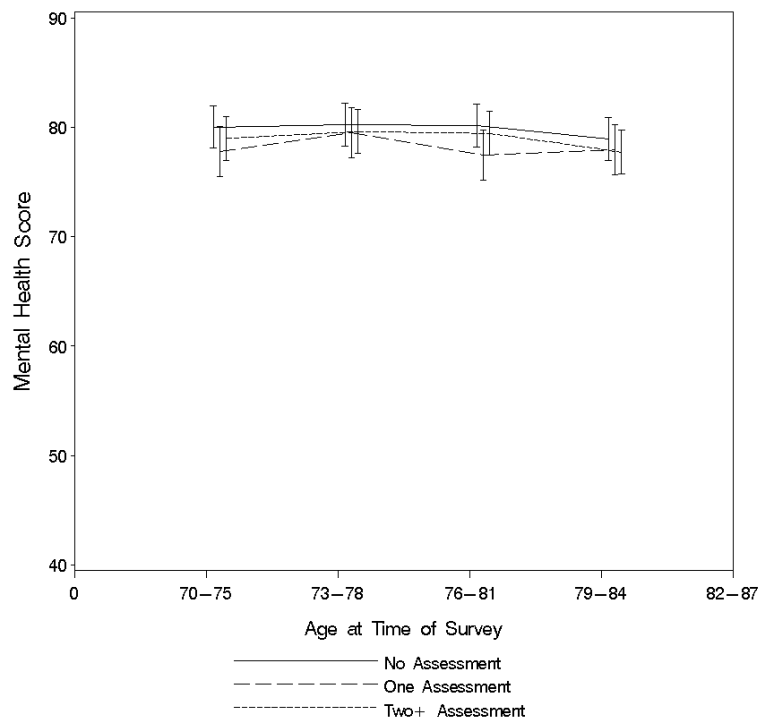


b) Women reporting heart disease, cancer, diabetes, or asthma/bronchitis at Survey 2 (n=1694)

Figure 6-5 SF-36 Physical function scores for Older women with no health assessments, one health assessment and two or more health assessments. (Least square means adjusted for time, education, smoking, urban/non-urban area of residence and BMI.)



a) Women with no report of heart disease, cancer, diabetes, asthma or bronchitis at Survey 2 (n=2,222)



b) Women reporting heart disease, cancer, diabetes, asthma or bronchitis at Survey 2 (n=1,694)

Figure 6-6 SF-36 Mental Health scores for Older women with no health assessments, one health assessment and two or more health assessments (Least square means adjusted for time, education, smoking, urban/non-urban area of residence and BMI.)

6.3. Diabetes Annual Cycle of Care

6.3.1. Introduction

In the 2001-2002 budget, the federal government provided funding for a national diabetes integrated program that provided incentives for GPs for early diagnosis and effective management of people with diabetes. These extra payments provide a 'signing on' fee for GPs to establish a diabetes register and additional payments for each patient who completes an annual cycle of care (ACC). The ACC includes pathology (HbA1c, lipids, microalbuminuria) and lifestyle risk factor assessment (body mass index, blood pressure, nutrition, smoking, alcohol and physical activity measures) as well as screening for retinopathy and foot problems. The HbA1c test (hemoglobin A1c test) is a lab test which reveals average blood glucose over a period of two to three months.

6.3.2. Uptake of Annual Cycle of Care

At Survey 1 (1996), 153 (2.4%) of the women in the Mid-aged cohort who consented to access to Medicare and PBS data reported being diagnosed with diabetes. By 2004, 403 (6%) of these Mid-aged women, who completed Survey 4, had self-reported that they had been diagnosed with diabetes on at least one of the four surveys. Of these women with diabetes, 29% had a Medicare item for an ACC (including a HbA1c test) at some time prior to the end of 2005 (N=117); 41% had a HbA1c test item but not the full ACC (N=166); and 30% (120 women) reported diabetes but had no record of either of these items (see Figure 6-7).

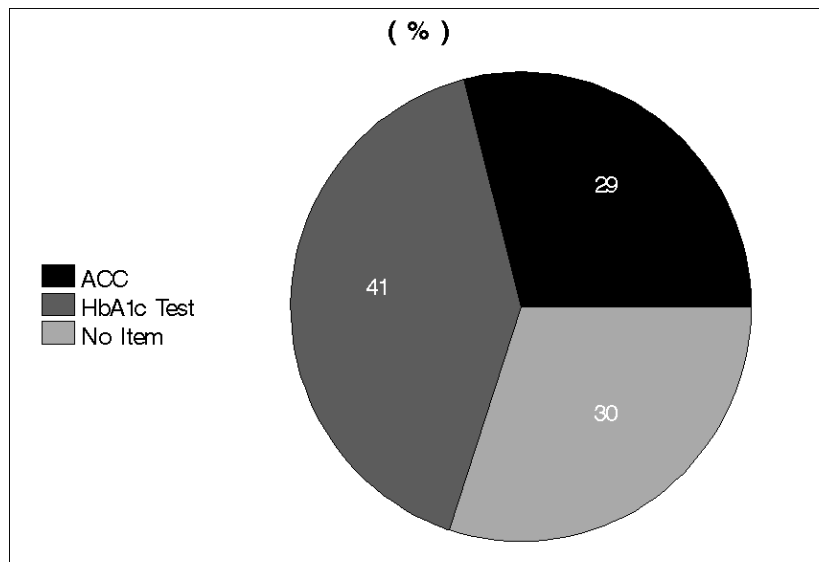


Figure 6-7 Diabetes Medicare items for 403 Mid-age women with diabetes

Compared to Mid-age women, a higher percentage of Older women reported diabetes and a higher percentage of Older women with diabetes undertook Annual Cycles of Care. At Survey 1 (1996), 268 (6%) of the women in the Older cohort who consented to access to Medicare and PBS data reported being diagnosed with diabetes. By 2005, 616 (14%) of these Older women, who completed Survey 4, had self-reported that they had been diagnosed with diabetes on at least one of the four surveys. Of these women with diabetes, 40% had a Medicare item for an ACC (including a HbA1c test) at some time prior to the end of 2005 (N=248); 46% had a HbA1c test item but not the full ACC (N=284); and 14% (84 women) reported diabetes but had no record of either of these items (see Figure 6-8).

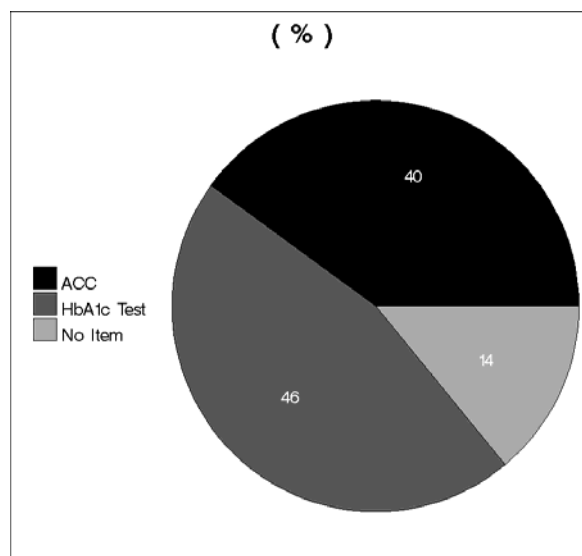


Figure 6-8 Diabetes Medicare items for 616 Older women with diabetes

6.3.3. Factors associated with uptake of Annual Cycle of Care

Table 6-2 shows characteristics at Survey 2 (1998 and prior to the introduction of ACC) of Mid-age women with diabetes who subsequently had an ACC and women who had HbA1c with no ACC. ACC uptake was associated with more GP visits and bulk billing. Women who had ACC were less likely to experience hypertension compared to women who had HbA1c only. Women who had ACC were more likely to have been overweight at Survey 2. Women who had ACC were more likely to find it difficult to manage on their income. There was no difference according to area of residence.

Table 6-3 shows characteristics at Survey 2 (1999 and prior to the introduction of ACC) of Older women with diabetes who subsequently had an ACC and women who had HbA1c with no ACC. ACC uptake was associated with more GP visits and bulk billing. There was no association between ACC uptake and hypertension and heart disease, conditions that are commonly comorbid with diabetes. Women who had ACC were more likely to have been overweight at Survey 2. Women who had ACC were less likely to find it difficult to manage on their income, and were less likely to have been born in Australia. There was no difference according to area of residence.

Table 6-2 Characteristics of Mid-age women with diabetes and according to uptake of ACC

Characteristic at Survey 2	Diabetes ACC (%)	Diabetes HbA1c (%)
GP visits		
At most 4	37	53
5-8 times	32	17
9 or more	31	30
Prescribed medications		
None	14	17
1-4 times	57	62
5 or more	29	21
Cost of last GP consultation		
No Cost	58	50
Excellent/Very good/Good	17	16
Fair/poor	25	34
Hypertension		
Yes	52	64
No	48	36
Heart disease		
Yes	2	5
No	98	95
BMI		
Underweight	3	0
Healthy weight	8	18
Overweight	89	82
Manage on income		
Difficult	70	51
Not too bad	26	39
Easy	4	10
COB		
Australia	77	76

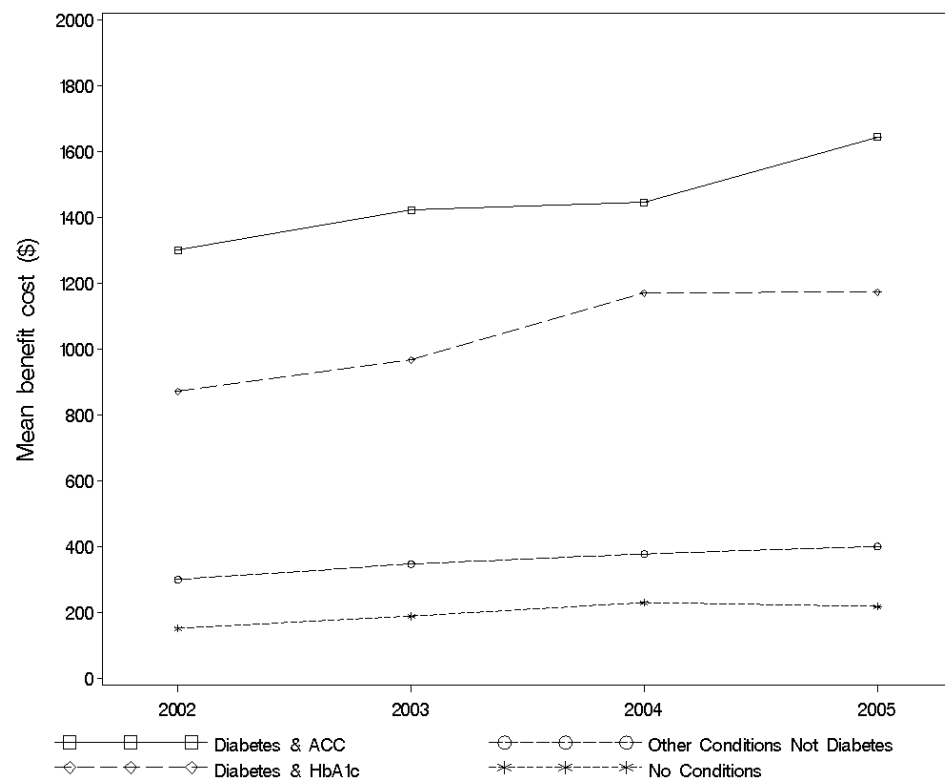
Table 6-3 Characteristics of Older women with diabetes and according to uptake of ACC

Characteristic at Survey 2	Diabetes ACC (%)	Diabetes HbA1c (%)
GP visits		
At most 4	24	28
5-8 times	37	32
9 or more	39	40
Prescribed medications		
None	2	3
1-4 times	61	64
5 or more	37	33
Hospital admission	34	36
Cost of last GP consultation		
No Cost	79	74
Excellent/Very good/Good	18	19
Fair/poor	3	7
Hypertension		
Yes	46	44
No	54	56
Heart disease		
Yes	19	20
No	81	80
BMI		
Underweight	1	2
Healthy weight	31	42
Overweight	68	56
Manage on income		
Difficult	25	32
Not too bad	55	48
Easy	19	20
COB		
Australia	73	81

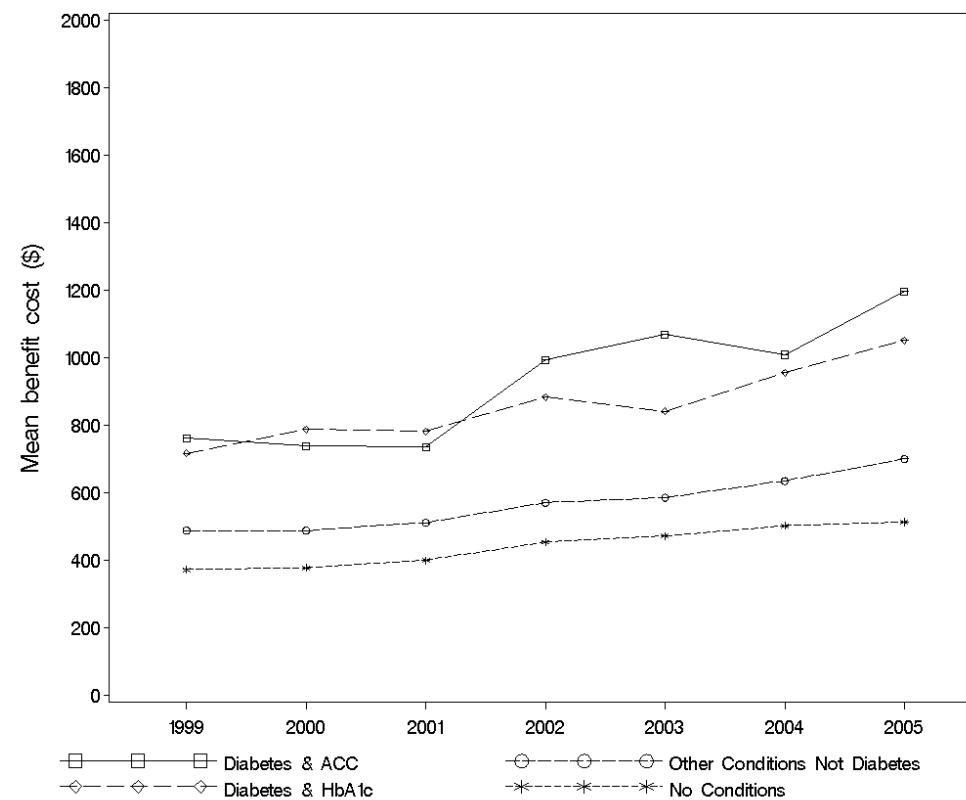
6.3.4. Impact of ACC on health care costs

Figure 6-9 shows PBS and MBS mean benefit costs for Mid-age women for 2002 to 2005 and 1999 to 2005 respectively. The figure includes women with diabetes who had an ACC or who had only an HbA1c test; comparison groups consist of 2,166 women who completed Survey 4 and who did not have diabetes but who had heart disease, cancer, or asthma/bronchitis (major conditions other than diabetes), and a group of 3,860 women who had none of these conditions. Women with none of the conditions had significantly lower PBS and MBS costs when compared with women with diabetes or with other morbidities, and women with diabetes had the highest costs regardless of whether they had the full ACC or just the HbA1c test. Among Mid-age women with diabetes those who had an ACC incurred higher PBS costs than those who had not had ACC. Similar results were apparent for MBS costs, although the cost difference was not as pronounced.

Figure 6-10 shows PBS and MBS mean benefit costs for Older women for 2002 to 2005 and 1999 to 2005 respectively. This figure includes women with diabetes who had an ACC or who had only an HbA1c test; comparison groups consist of 1,556 women who completed Survey 4 and who did not have diabetes but who had heart disease, cancer, or asthma/bronchitis (major conditions other than diabetes), and a group of 2,114 women who had none of these conditions. As with the Mid-age women, Older women with none of the conditions had significantly lower PBS and MBS costs when compared with women with diabetes or with other morbidities, and women with diabetes had the highest costs regardless of whether they had the full ACC or just the HbA1c test. However, unlike the results for Mid-age women, PBS and MBS costs were similar for those Older women with diabetes who had and had not had ACC.

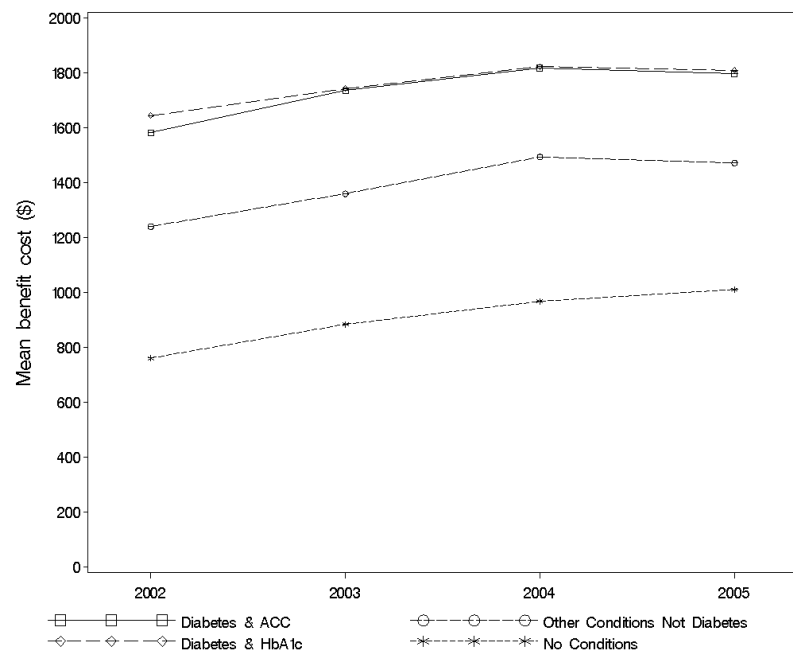


PBS costs

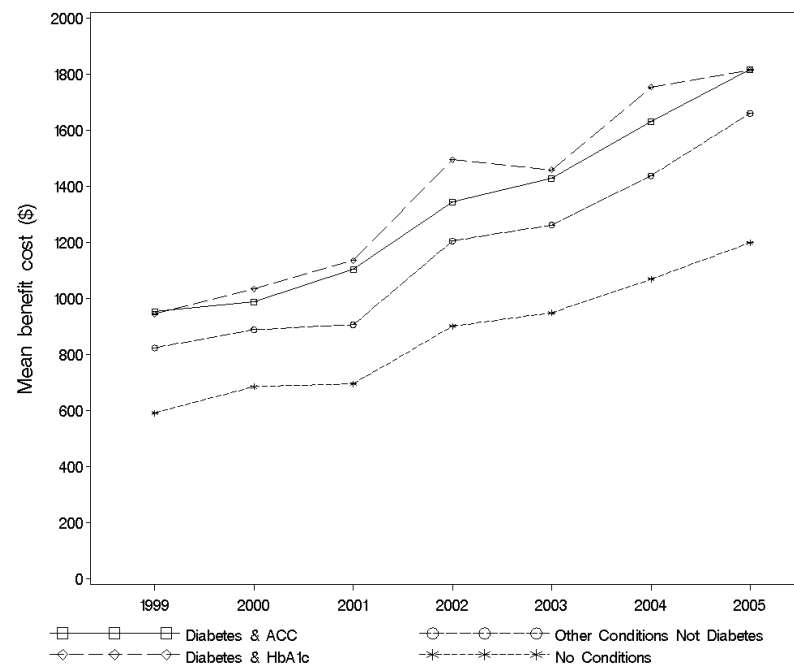


MBS costs

Figure 6-9 Mean PBS and MBS benefit costs for Mid-age women with and without diabetes



PBS costs



MBS costs

Figure 6-10 Mean PBS and MBS benefit costs for Older women with and without diabetes

Figure 6-11 shows PBS costs according to whether Mid-age women had diabetes at Survey 1 in 1996 (prevalent diabetes) or whether they reported diabetes for the first time on a subsequent survey (incident diabetes). Among women with prevalent and incident cases of diabetes, PBS costs were higher for women who had the full ACC when compared with women who only had an HbA1c. Mid-age women who had prevalent diabetes incurred a higher mean benefit PBS cost per year when compared with women who had incident diabetes.

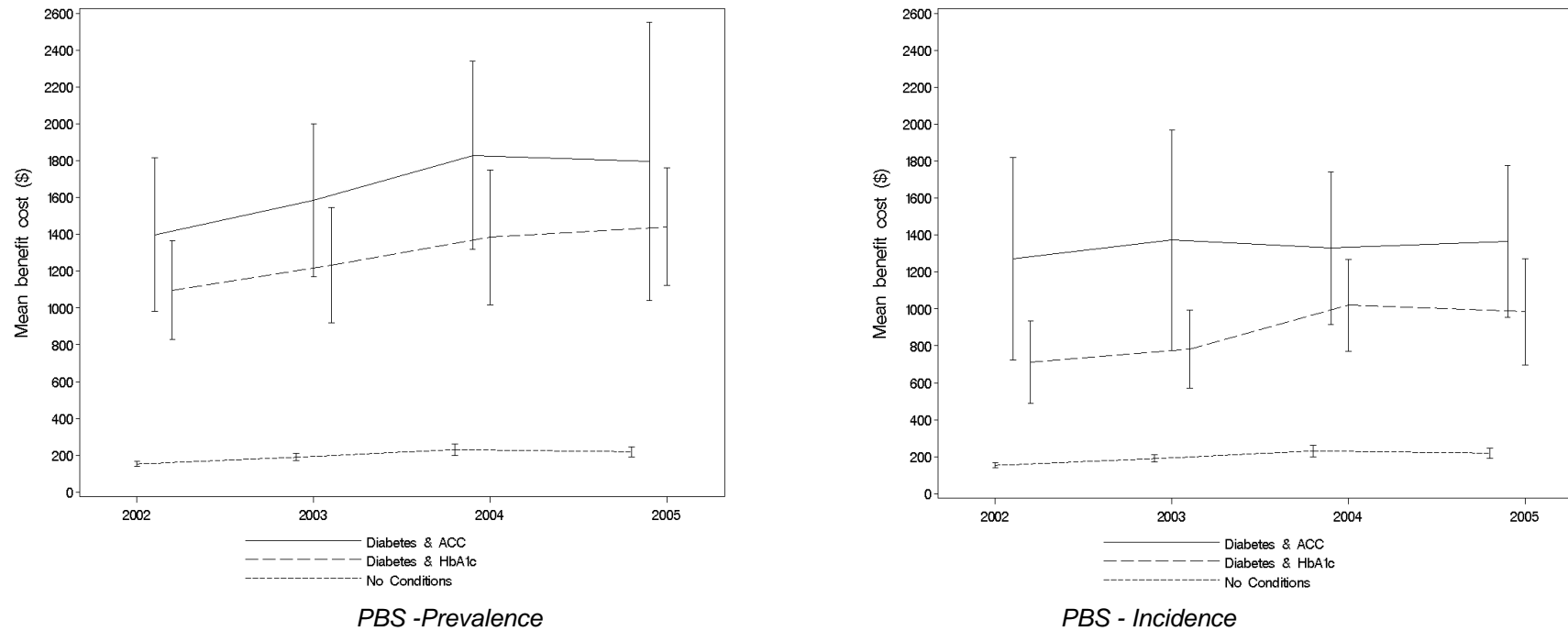


Figure 6-11 Mean PBS benefit costs for those Mid-age women who reported diabetes at Survey 1 (prevalent diabetes) and after Survey 1 (incident diabetes). Women who died prior to the end of 2005 were not included in these analyses.

Figure 6-12 shows PBS costs according to whether Older women had diabetes at Survey 1 in 1996 (prevalent diabetes) or whether they reported diabetes for the first time on a subsequent survey (incident diabetes). Among Older women with prevalent diabetes, PBS costs were initially higher for women who only had HbA1c when compared with women who had the full ACC. In later years these there were no differences in PBS costs for these two groups of women. For women with incident diabetes, there were no differences in costs according to whether women had ACC or only had HBA1C. As with the results for Mid-age women, Older women who had prevalent diabetes incurred a higher mean benefit PBS cost per year when compared with Older women who had incident diabetes.

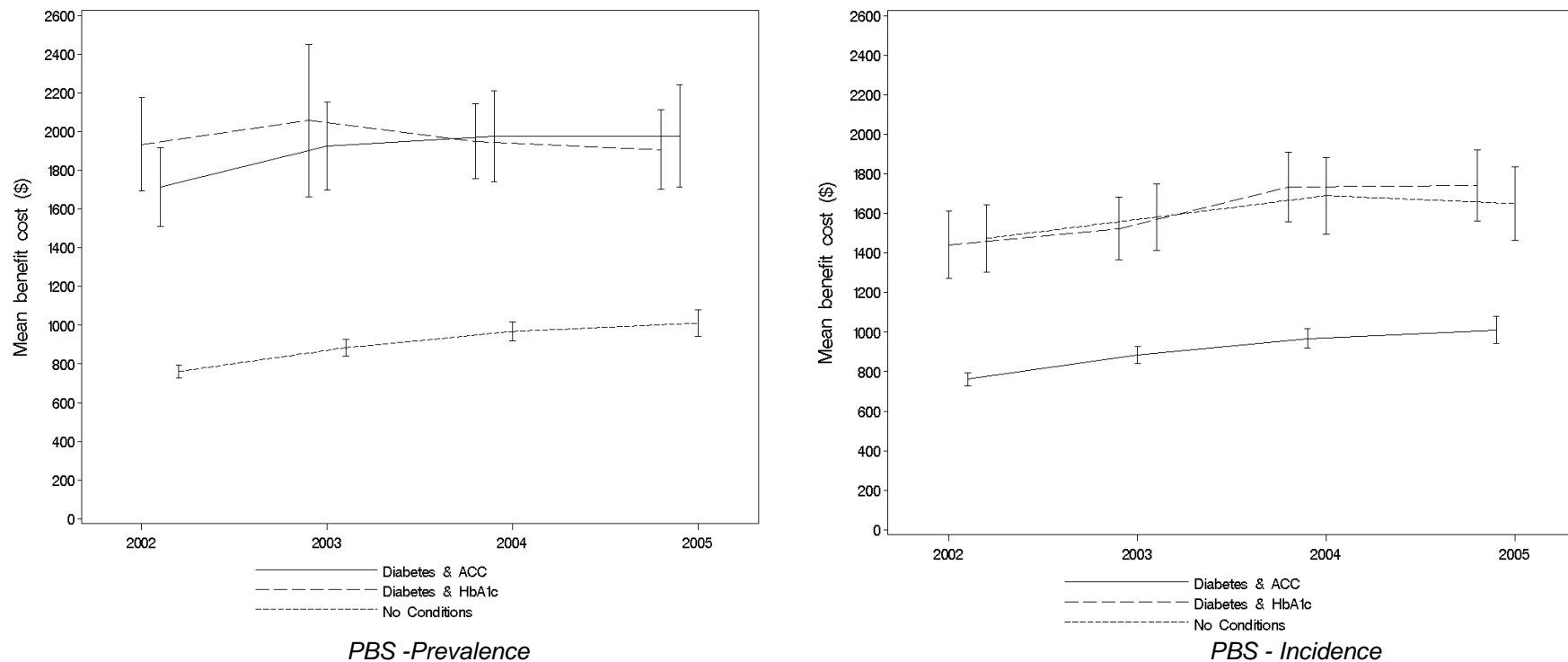
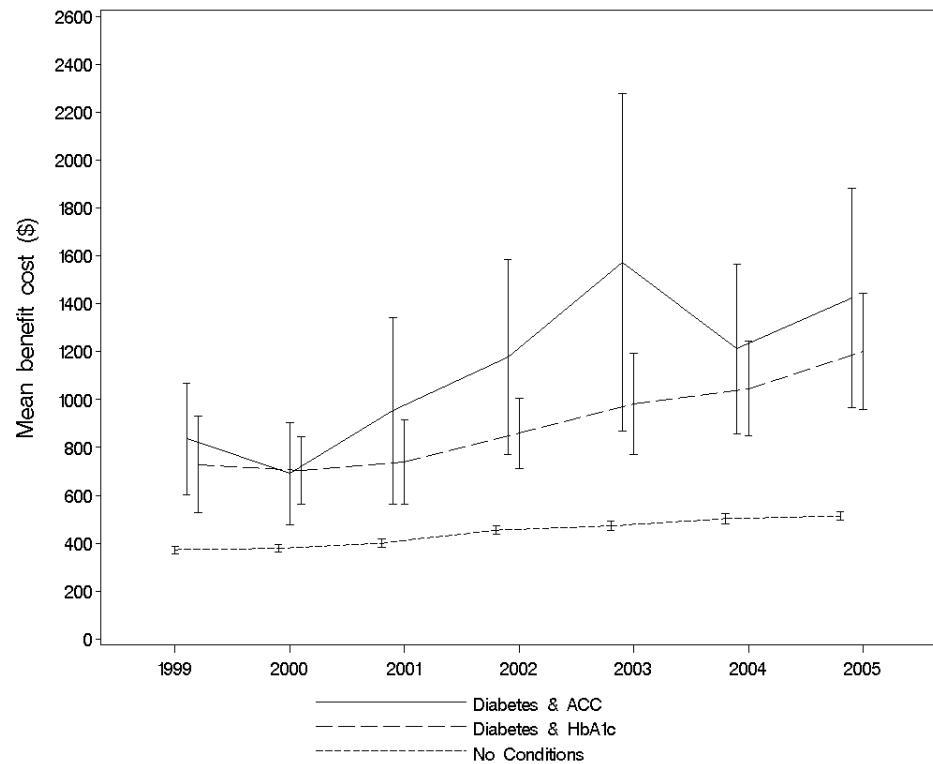
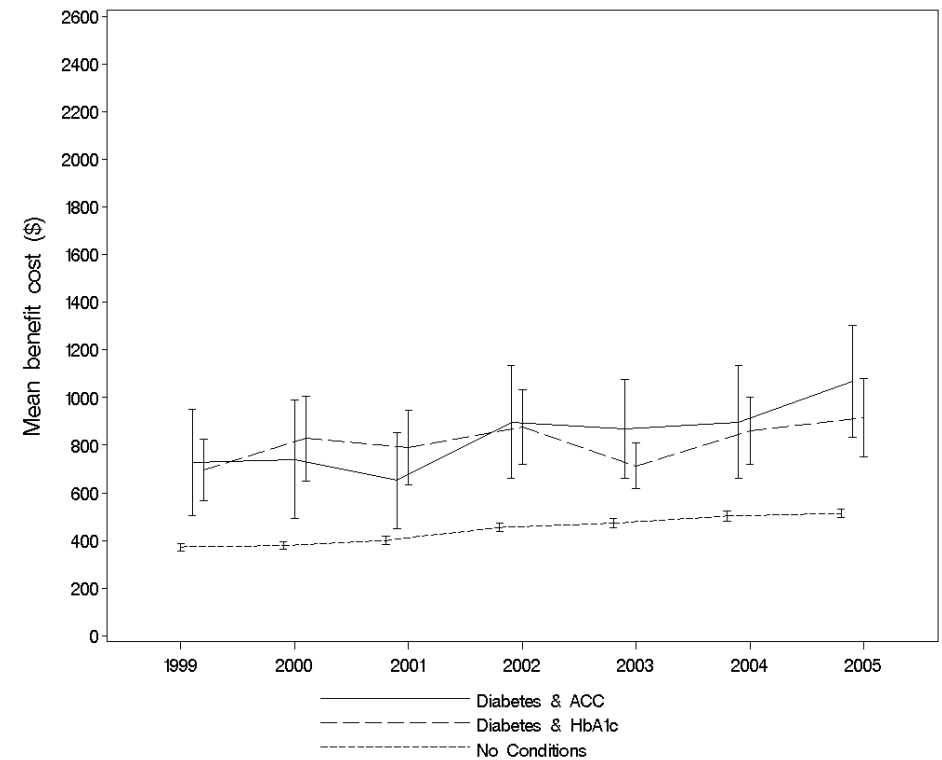


Figure 6-12 Mean PBS benefit costs for those Older women who reported diabetes at Survey 1 (prevalent diabetes) and after Survey 1 (incident diabetes). Women who died prior to the end of 2005 were not included in these analyses.

Figure 6-13 shows the MBS costs for Mid-age women with prevalent and incident diabetes (excluding costs for ACC and HbA1c items). Costs for women with no diabetes, heart disease, cancer or asthma/bronchitis are also included for comparison. MBS costs for Mid-aged women with prevalent diabetes were higher than costs for women with incident diabetes. Women with prevalent diabetes who had ACC had higher MBS costs than women with prevalent diabetes who had not had ACC. There were few differences according to whether women had ACC or only HbA1c among women with incident diabetes.



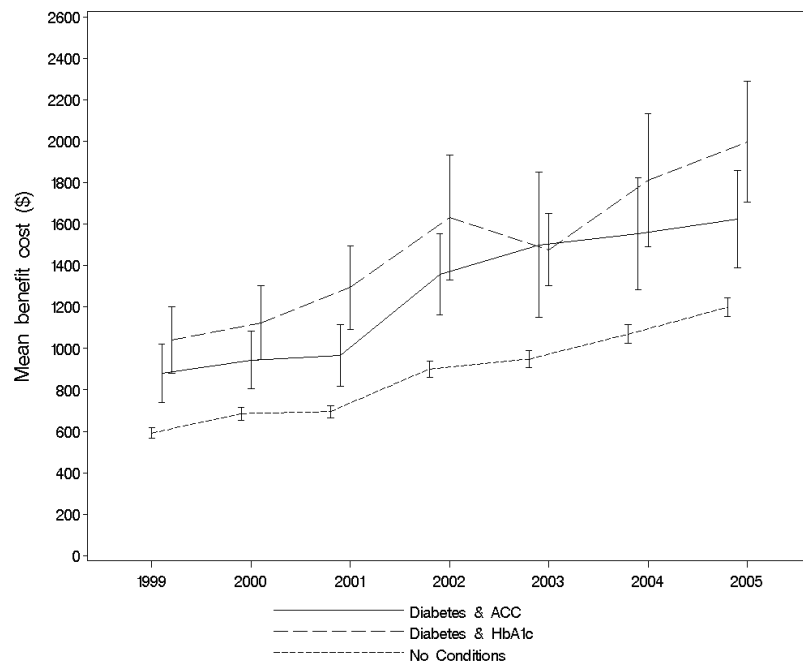
MBS costs for women with prevalent diabetes



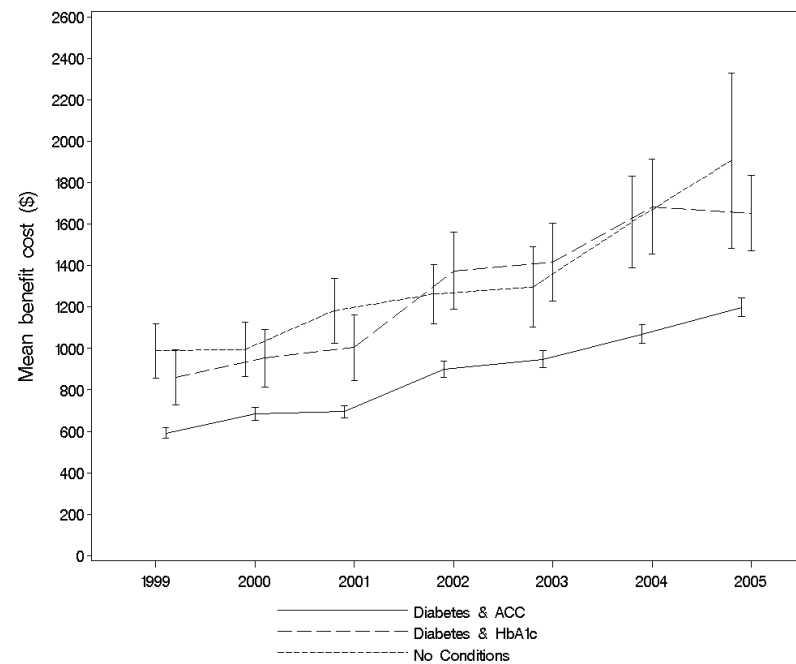
MBS costs for women with incident diabetes

Figure 6-13 Mean MBS costs for Mid-age women with prevalent and incident diabetes compared with costs for Mid-age women with no diabetes, heart disease, cancer or asthma/bronchitis. (ACC and HbA1c costs excluded.)

Figure 6-14 shows the MBS costs for Older women with prevalent and incident diabetes (excluding costs for ACC and HbA1c items). Costs for women with no diabetes, heart disease, cancer or asthma/bronchitis are also included for comparison. The MBS costs for older women with prevalent diabetes were higher than costs for women with incident diabetes. There were few differences according to whether women had the full ACC or only HbA1c, although among Older women with prevalent diabetes there was a trend for women who had HbA1c only, to have higher costs at most time points.



MBS costs for women with prevalent diabetes



MBS costs for women with incident diabetes

Figure 6-14 Mean MBS costs for Older women with prevalent and incident diabetes compared with costs for Older women with no diabetes, heart disease, cancer or asthma/bronchitis. (ACC and HbA1c costs excluded.)

6.3.5. Impact of ACC on health outcomes

Figures 6-15 to 6-20 show the SF-36 Physical Function, General Health, and Social Function sub-scales scores for Mid-age and Older women with prevalent and incident diabetes and according to whether they have had ACC or only HbA1c testing. Women with no report of diabetes, heart disease, cancer or asthma/bronchitis are included for comparison.

Mid-age women with incident diabetes tended to have better Physical Function sub-scale scores than women with prevalent diabetes (see Figure 6-15). Prior to the introduction of ACC, those women with prevalent diabetes who went on to have ACC tended to have worse physical functioning in their late forties and early fifties than those who went on to have HbA1c only. By the time Mid-age women with prevalent diabetes reached their mid fifties, those who had ACC had significantly worse physical functioning than women who had HbA1c only. The opposite was true for incident cases, those who undertook ACC tended to start and maintain better physical functioning than those who had HbA1c only. Among Mid-age women, the SF-36 General Health sub-scale scores showed similar patterns to those of the Physical Function sub scale scores (see Figure 6-16). Mid-age women with prevalent diabetes and who had worse general health at baseline tended to undertake ACC when they were introduced, while those with slightly better health tended to have HbA1c only. The reverse was true of incident cases, Mid-age women with incident diabetes who undertook ACC tended to start and maintain better general health than those who had HbA1c only.

On the SF-36 Social Function sub-scale scores, those Mid-age women with prevalent diabetes and poorer social functioning tended to undertake ACC when they were introduced, but continued to have worse social functioning compared to women with prevalent diabetes who undertook HbA1c only (see Figure 6-17). Women with prevalent diabetes who undertook ACC tended had the poorest social functioning, while those with prevalent diabetes who had HbA1c only and those with incident diabetes (with ACC or HbA1c only) tended to have similar social functioning scores.

Taken together the results for Mid-age women suggest that women with prevalent diabetes are more likely to undergo ACC when they experience a steeper decline in physical and social functioning and general health. By contrast, women with incident diabetes appeared to experience improved physical functioning and general health after undertaking ACC.

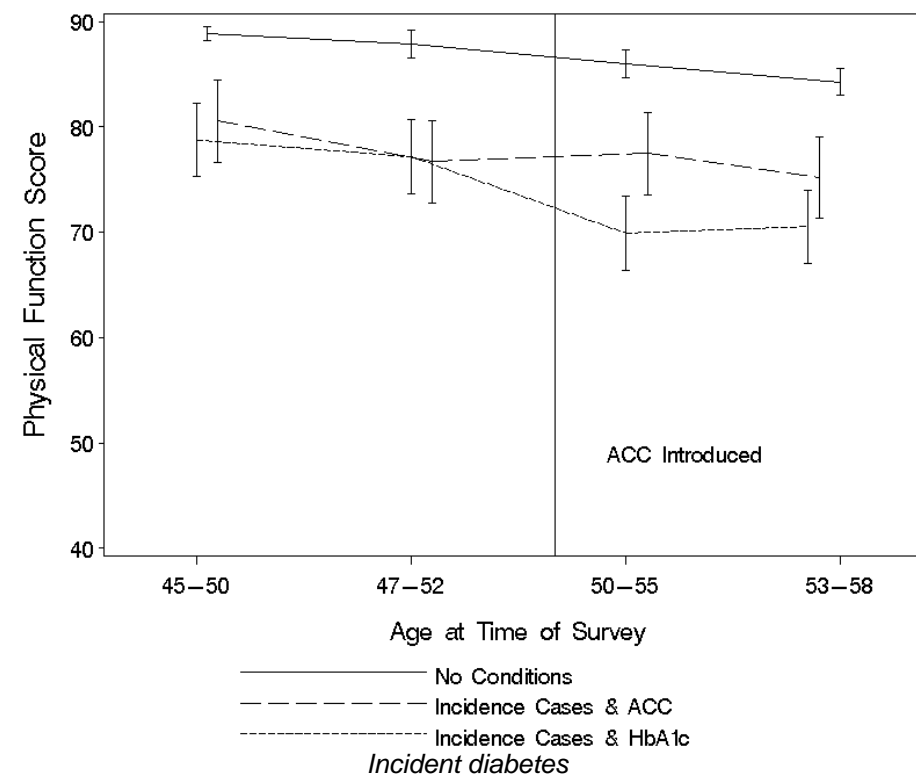
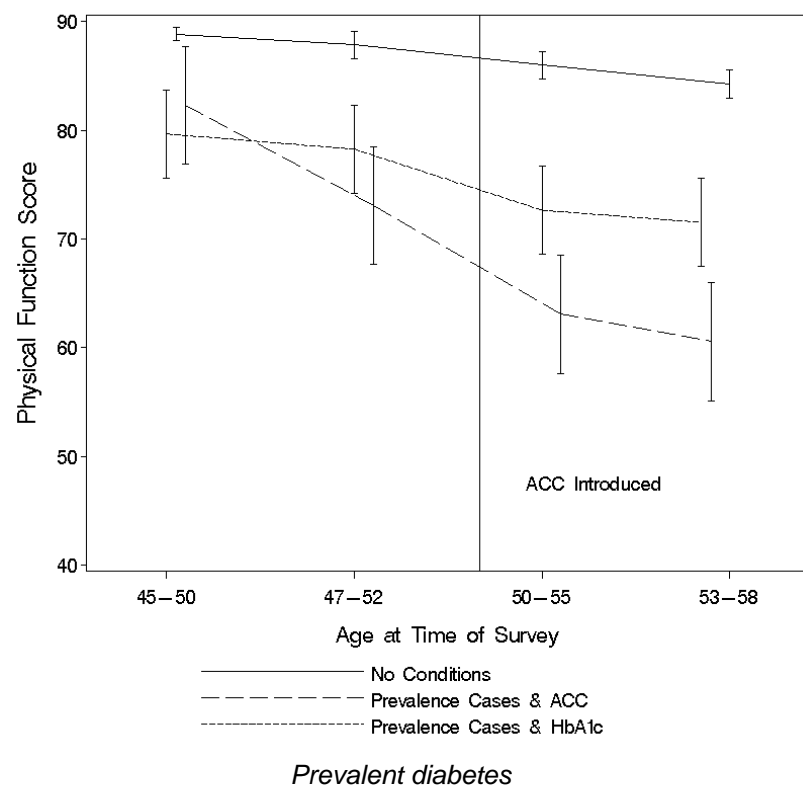


Figure 6-15 SF-36 Physical Function scores for Mid-age women with a prevalent or incident diabetes according to whether they had ACC or HbA1c only. Least square means adjusted for time, education, smoking, urban/non-urban area of residence and BMI.

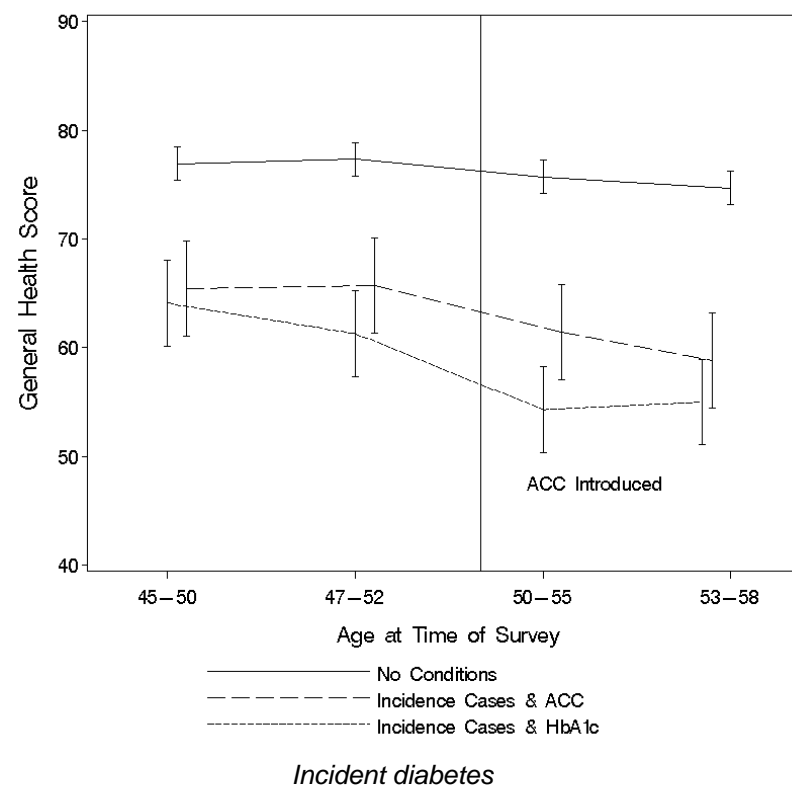
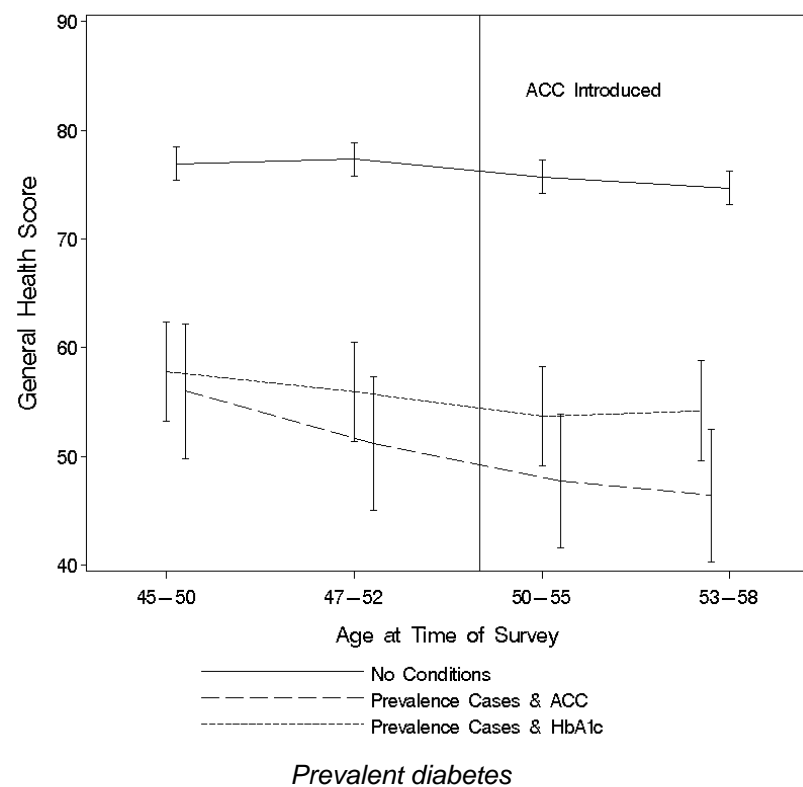


Figure 6-16 SF-36 General Health scores for Mid-age women with prevalent and incident diabetes according to whether they had ACC or HbA1c only

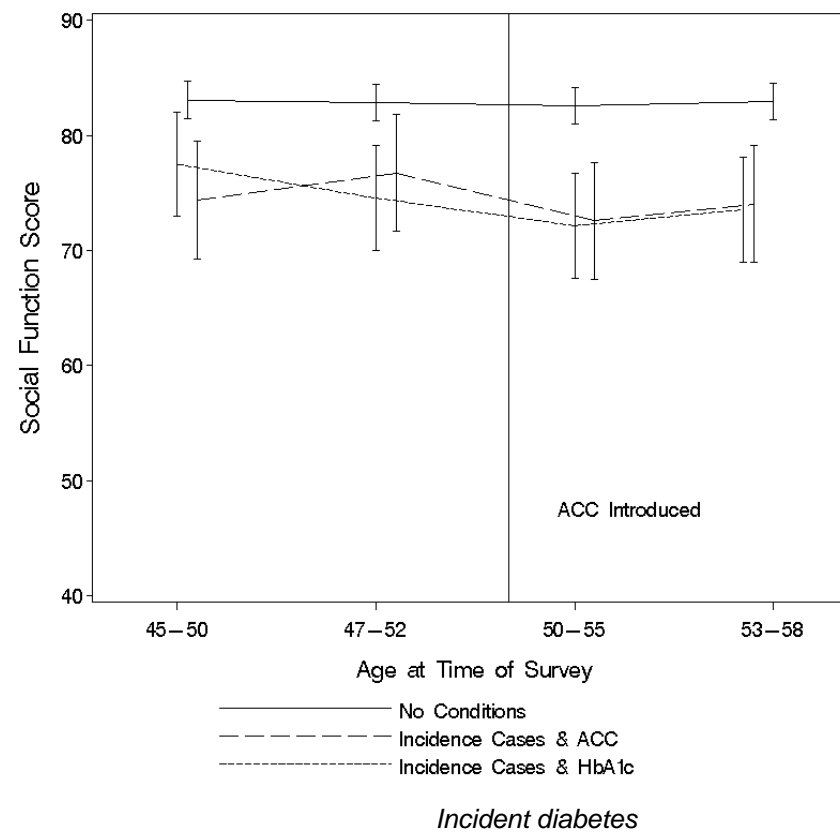
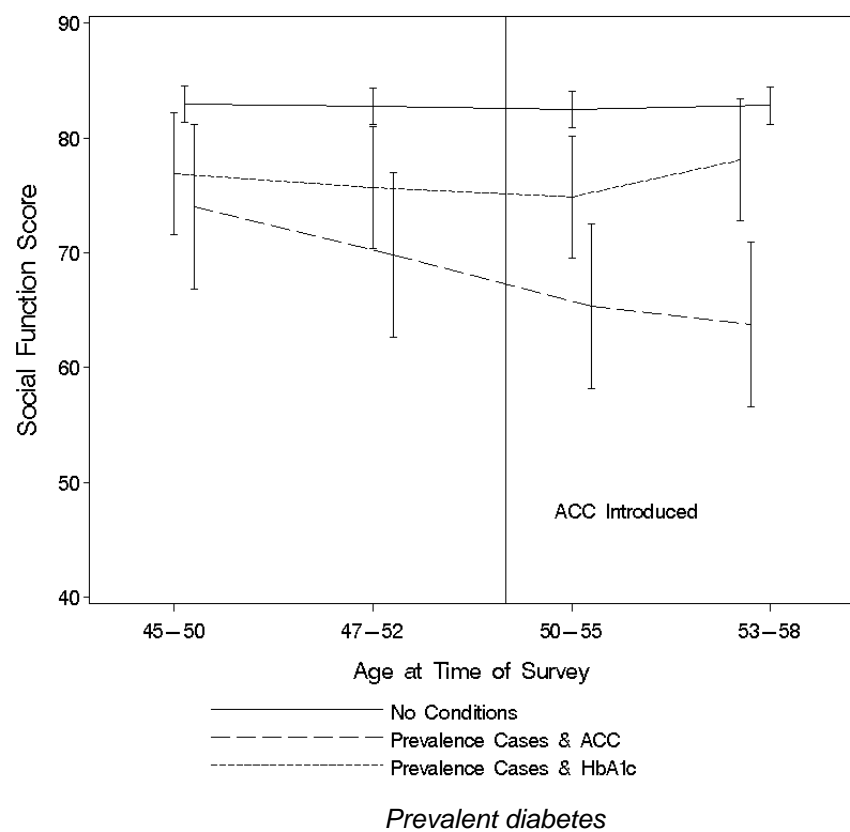


Figure 6-17 SF-36 Social Function scores for Mid-age women with prevalent and incident diabetes according to whether they had ACC or HbA1c only.

Older women with incident diabetes tended to have better Physical Function sub-scale scores than women with prevalent diabetes, but there was little difference according to whether women had ACC or only HbA1c (see Figure 6-18). Among the Older cohort, the SF-36 General Health sub-scale scores showed some evidence of better scores for Older women with prevalent diabetes who had ACC compared with women who had HbA1c only (see Figure 6-19). Similarly, Older women with prevalent diabetes who had ACC also had better SF-36 Social Function scores than women with prevalent diabetes that had only had HbA1c testing (See Figure 6-20).

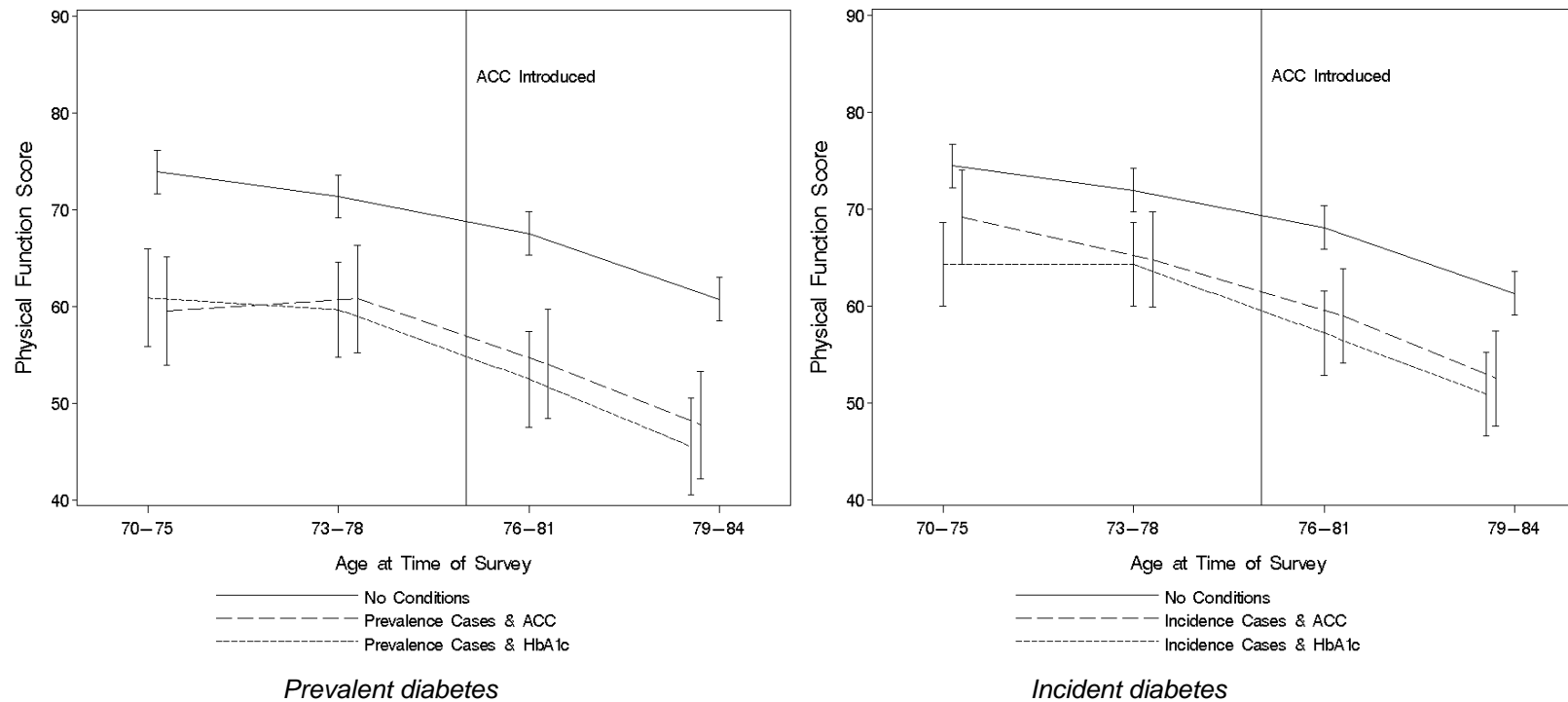
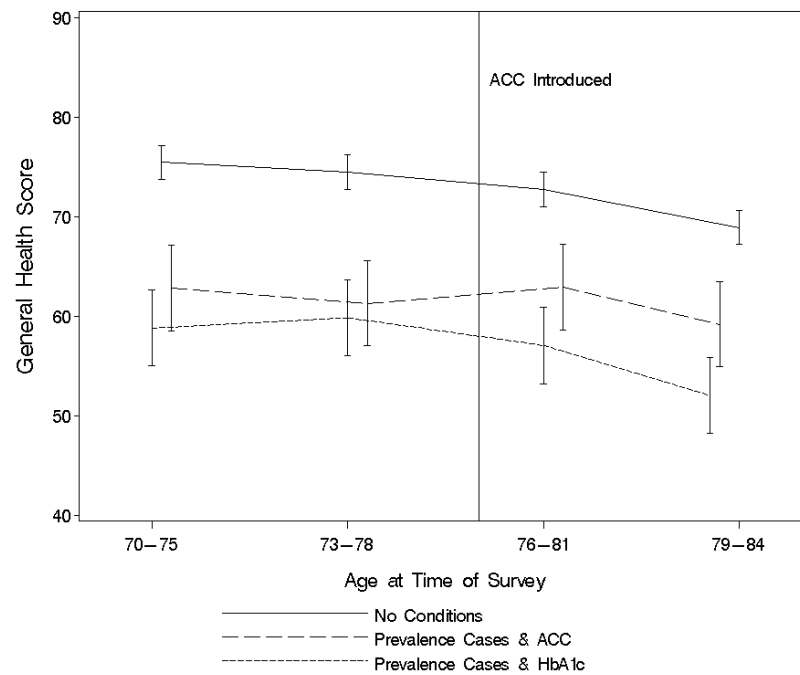
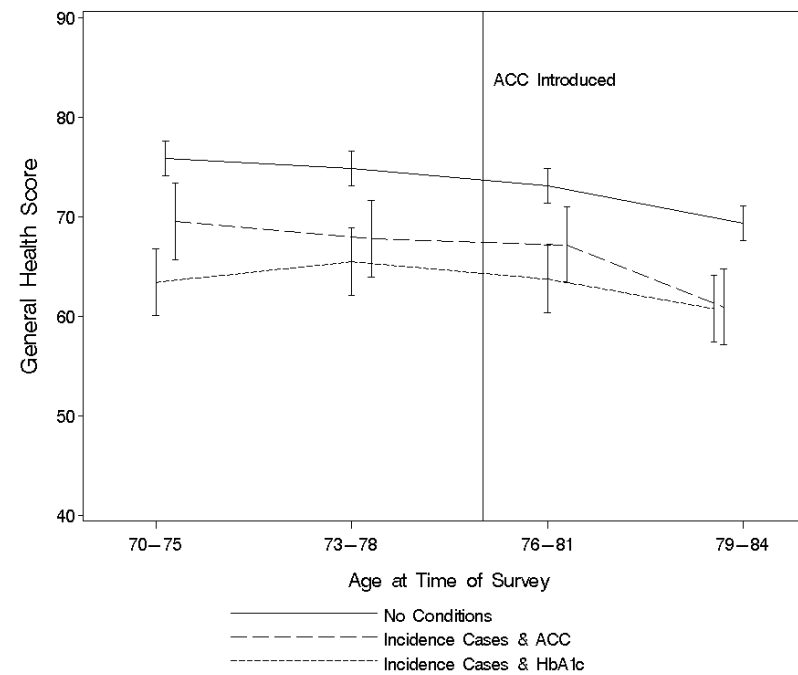


Figure 6-18 SF-36 Physical Function scores for Older women with prevalent or incident diabetes according to whether they had ACC or HbA1c only. Least square means adjusted for time, education, smoking, urban/non-urban area of residence and BMI.

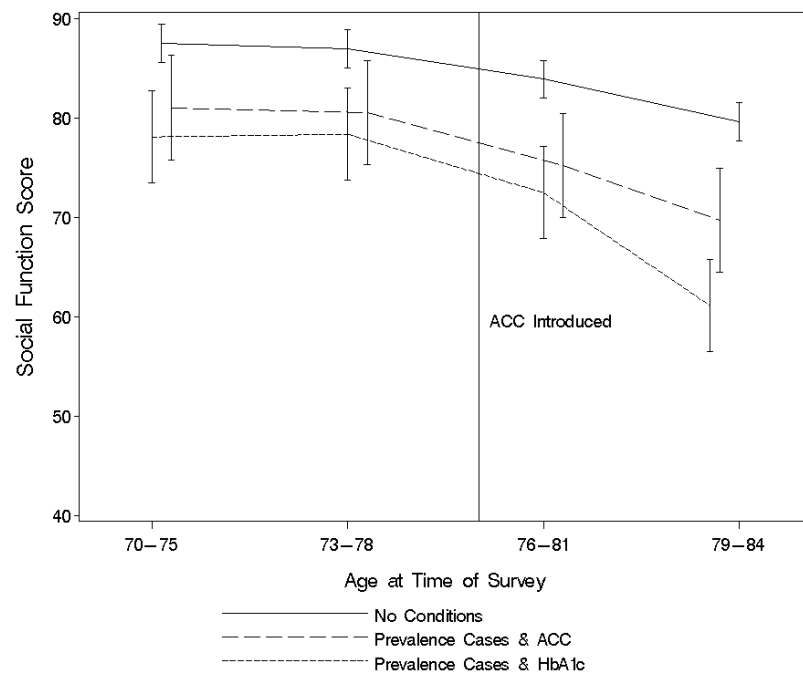


Prevalent diabetes

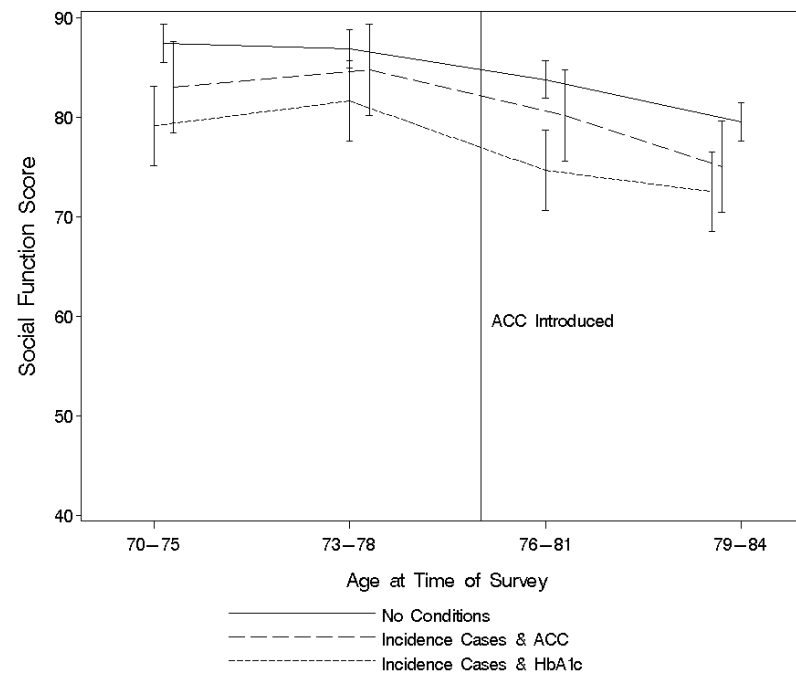


Incident diabetes

Figure 6-19 SF-36 General Health scores for Older women with prevalent and incident diabetes according to whether they had ACC or HbA1c only.



Prevalent diabetes



Incident diabetes

Figure 6-20 SF-36 Social Function scores for Older women with prevalent and incident diabetes according to whether they had ACC or HbA1c only.

6.4. Discussion

6.4.1. Health Assessments

Over half of the women in the Older cohort have participated in at least one health assessment. By linking MBS data with survey data we are able to identify the characteristics of women who are more likely to engage in this preventive health activity. In general, there were few differences between women who had assessments and those who did not, except that women who had assessments were more likely to have had more visits to the GP, be taking more medications, and have been admitted to hospital. They were also more likely to have rated their health as fair or poor. This information adds to the few other evaluations of health assessments as funded under Medicare, which have mostly examined uptake of the items rather than health outcomes.

The ALSWH is also able to examine the change in health outcomes for women who did and did not have health assessments. Since data were available before and after the assessments, it is possible to disentangle those factors that affect uptake, and those factors that affect the outcomes of assessment.

Among women who were still alive in 2004, there was no statistically significant difference between physical function scores of women who did and did not have health assessment. However, there was a small trend towards a lesser decline in scores for women who had more than one assessment. These results are consistent with results of a large randomised controlled trial of home visits and health assessments for older people in Australia, where people in the intervention groups reported higher quality of life than control-group participants (Byles et al. 2004). However, in this trial the impacts on mental health were greater than the impacts on physical health.

6.4.2. Annual Cycle of Care

The percentage of women with diabetes increased among both Mid-age and Older women over the study period and as the women aged. Of women with diabetes, less than a third of Mid-age women and less than half (40%) of the Older women had undertaken an ACC. Women in both age groups were more likely to have had HbA1c tests than ACC, although of some concern were the 30% of Mid-age women and 14% of Older women who self-reported diabetes but had not had either a HbA1c test or ACC.

For both Mid-age and Older women, compared with uptake of HbA1c only, uptake of ACC was associated with a higher number of GP visits and bulk billing. However, MBS costs were similar for Older women with diabetes who did and did not have ACC. Among Mid-age women MBS and PBS costs were higher for women with diabetes who had ACC compared with those who had HbA1c only, whereas PBS costs were almost identical for Older women with diabetes who had ACC compared with HbA1c only.

Differences were also apparent between Mid-age and Older women when health outcomes of ACC were examined. Furthermore, among Mid-age women, differences in health outcomes emerged between prevalent and incident diabetes. Mid-age women with prevalent diabetes who went on to uptake ACC tended to have the poorest health at baseline, prior to the introduction of ACC. However, Mid-age women with incident diabetes who had ACC tended to have similar health at baseline to those women with incident diabetes who did not go on to have ACC. Mid-age women with prevalent diabetes who had ACC continued to have poorer health than those who did not have ACC, although the decline in health was less pronounced than prior to the uptake of ACC. Those Mid-age women with incident diabetes who had ACC experienced better physical health outcomes than Mid-age women with incident diabetes who did not undertake ACC.

Older women with incident diabetes tended to have better physical function sub-scale scores than women with prevalent diabetes, but there was little difference according to whether women had ACC or only HbA1c. On the general health sub-scale scores, there is evidence of better scores for women with prevalent diabetes who had ACC compared with women who had HbA1c only. Similarly, women with prevalent diabetes who had ACC also had better social function than women with prevalent diabetes that had only had HbA1c testing.

These findings are important in assessing whether strategies such as Health Assessments and diabetes annual cycle of care are achieving their objectives for better patient outcomes. Both sets of items seem to have been adopted fairly widely and are now a mainstream component of primary care. The data from ALSWH show some small health benefits from these items in terms of health related quality of life. A question remains as to whether these systems of care could be improved, to increase their efficiency and enhance their impact.

6.5. References

Byles J, Young A, & Whewey V. (2007). Annual health assessments for Older Australian Women: uptake and equity. *Australian and New Zealand Journal of Public Health*, 31, 170-173.

Byles JE, Tavenner M, Nair K et al (2004). A randomised controlled Trial of Health Assessments for Older Australian Veterans And War Widows. *Medical Journal of Australia*, 181, 186-190.

7. Use of Complementary and Alternative Medical Care (CAM)

7.1. Key findings

- Use of complementary and alternative medicine (CAM) is increasing worldwide.
- Knowledge about the use of CAM is important for practitioners, because there is a potential for interaction with conventional treatment.
- At Survey 1 in 1996, 19% of the Younger cohort, 28% of the Mid-age cohort and 15% of the Older cohort reported having consulted an alternative health practitioner over the previous 12 months.
- In 1996, CAM users in all three cohorts were more likely to live in non-urban areas; Younger and Mid-age CAM users also had higher levels of education and were more likely to be employed.
- In all three cohorts CAM users reported poorer physical and mental health, more symptoms and illness, and higher use of conventional health services than non-users.
- Use of non-prescription medication was more common among CAM users.
- Longitudinal analysis shows that women in both Mid-age and Older cohorts whose health declined were more likely to start using CAM.
- Mid-age women who ceased taking prescription medicine were more likely to start using CAM.
- Among Older women, use of CAM increased as number of reported symptoms increased and for non-urban residents compared to urban residents.
- Use of CAM declines among Older women as they age.
- Data from the Mid-age women in 2001, and the Older women in 1999 showed that women with cancer were more likely to consult an alternative health practitioner than women without cancer.
- Mid-age women who reported in 2001 that they had experienced poorer health and were higher users of conventional health services were more likely to have recently consulted a chiropractor or osteopath.
- Because CAM is often used in conjunction with conventional care, there may be a need for increased communication and interfacing between CAM and conventional practitioners.

7.2. Introduction

The ALSWH has provided a unique opportunity for researchers to investigate the use of complementary and alternative medicines (CAM) in an Australian female population. CAM usage has increased in popularity worldwide. Recent estimates suggest that the cost of CAM and CAM therapists in Australia in 2004 was AUD \$1.8 billion (MacLennan, Myers and Taylor 2006). The literature clearly suggests that users of CAM frequently do so in conjunction with conventional treatments (Adams, Sibbritt, Easthope & Young, 2003; MacLennan, Myers & Taylor 2006), and so the rise in popularity highlights the need to provide information on both the users of CAM and methods of consumption, to healthcare organisations and providers.

This section will summarise papers, published by Investigators and Collaborators from ALSWH, that describe the characteristics of CAM users, and CAM use by women with cancer.

CAM refers to those practices, technologies and medications not traditionally part of conventional care and include acupuncture, aromatherapy, chiropractic, homeopathy, reflexology, massage therapy and osteopathy, among others.

7.3. Characteristics of women who consult alternative health practitioners in Australia.

This research was reported in: Adams J., Sibbritt D.W., Easthope G. & Young, A. (2003). The profile of women who consult alternative health practitioners in Australia. *Medical Journal of Australia*, 179, 297-300.

This research encompassed all three cohorts of women taking part in the baseline survey of the ALSWH. CAM use within this section is defined as consulting an alternative health practitioner and was obtained from responses to the question: "How many times have you consulted an 'alternative' health practitioner (e.g., chiropractor, naturopath, acupuncturist, herbalist) for your own health in the last twelve months?"

The Medical Outcomes Survey Short-Form 36 (SF 36) was used as a measure of health status and quality of life. The women in all three cohorts were asked about their frequency of health practitioners and hospital use in the previous twelve months, for a range of services. Additional questions asked how many different kinds of medication participants had used in the previous four weeks that were prescribed by a doctor, bought without prescription or used to treat a chronic illness (Adams, Sibbritt, Easthope & Young, 2003).

7.3.1. CAM use within the Younger cohort

The Younger cohort were aged 18-23 years when they completed this survey (n=14,779), and 19% indicated that they had consulted an alternative health practitioner in the past year. Among this age group CAM users were more likely than non-users to reside in non-urban areas. There was no difference in marital status between users and non-users, however, CAM users in this age group had higher levels of education and were more likely to be employed.

Younger cohort CAM users reported a greater number of symptoms and chronic conditions than non-users and rated their physical and mental health as poorer than non-users. They also reported lower vitality than non-users. CAM users in this cohort were more limited in their daily activities by their emotional problems, and a greater proportion of them had experienced a major illness in the previous twelve months. In this age group there were no differences in smoking and alcohol consumption between CAM users and CAM non-users.

Compared to non-users, CAM users were more likely to use health services. Over the previous 12 months they had experienced more frequent visits to general practitioners, outpatient/casualty departments and specialists, and had more hospital admissions than non-users. CAM users also reported use of more prescription and non-prescription medications than non-users, and were more likely to have been taking medication for a chronic illness.

7.3.2. CAM users within the Mid-age Cohort

The women in the Mid-age group were aged 45-50 years (n=14,099) when surveyed. Of those surveyed, 28% reported at least one consultation with an alternative health practitioner in the previous twelve months. This proportion is considerably higher than that recorded in the Younger (19%) or the Older (15%) cohorts. CAM users and non-users did not differ according to marital status. CAM users in this age group were more likely to be employed, had higher levels of education, and were more likely to live in a non-urban area than were non-users.

In this age group a greater proportion of CAM users than non-users indicated they were experiencing menopause. Mid-age CAM users experienced a greater number of symptoms and rated their physical and mental health as poorer than non-users. As in the Younger cohort, Mid-age CAM users had lower vitality (felt tired and worn out all of the time), and were more likely to have experienced a major illness in the previous year. Mid-age CAM users indicated they were experiencing more problems with their work or other daily activities as a result of their physical and emotional health compared to non-users. CAM users in this age group had higher levels of bodily pain, and indicated that their physical and mental health interfered with their normal

social activities more than non-users. Mid-age CAM users were less likely to smoke than non-users. There was little difference in the consumption of alcohol between the two groups.

Mid-age CAM users made more visits to GP's, outpatient/casualty departments and specialists than non-users. There was little difference between the two groups in the number hospital stays in the previous 12 months; however, Mid-age CAM users were more likely to have had a hysterectomy.

In this age group there were little differences in the use of prescription medications between CAM users and non-users; however, there were significant differences in the use of non-prescription medications. CAM users were much more likely to have used non-prescription medications than non-users.

7.3.3. CAM users within the Older Cohort

The women in the Older cohort were aged 70-75 years (n=12,939) at this survey time point. Of the women in this cohort 15% indicated they were CAM users. The demographic profile of CAM users was similar to that of the Young and Mid-age cohorts: compared to non-users, CAM users were more likely to live in non-urban areas, and there was little difference in marital status between users and non-users. In this cohort there was no difference between users and non-users with regard to their levels of education.

As was evident in the Younger and Mid-age cohort, CAM users in the Older cohort appeared to experience poorer health than non-users. CAM users in this cohort were experiencing more bodily pain than non-users. In addition, they had lower levels of physical functioning, and experienced more interference with their normal activities as a result of their physical health in comparison to non-users.

As was found in the Younger and Mid-age cohorts, CAM users in the Older cohort were more likely than non-users to have experienced a major illness in the previous 12 months.

CAM users in the older cohort had more visits to GPs, outpatients/casualty departments and specialists. A larger proportion of Older cohort CAM users were admitted to hospitals in the previous 12 months than non-users. There was no difference between CAM users and non-users in the use of prescription medications; however, CAM users in this cohort were much more likely to be using non-prescription medication. The overall rate of non-prescription medication use in this cohort was much lower than that in either of the other cohorts.

Women in the Older cohort who used CAM were more likely to use medication to help them sleep than non-users. There was little difference between users and non-users in the rates of medication for chronic illness in the Older cohort. As was found in the Mid-age cohort, CAM users had higher rates of hysterectomy than non-users.

7.4. Factors associated with changing use of CAM medication over time

7.4.1. Changing use of CAM in the Mid-age cohort

This research was reported in: Sibbritt, D., Adams, J., & Young, A. (2004). A longitudinal analysis of Mid-age women's use of complementary and alternative medicine (CAM) in Australia 1996-1998. *Women & Health*, 40, 41-56.

This section compares responses of the Mid-age women at two time points of the longitudinal survey, Survey 1 in 1996 and Survey 2 in 1998 to the question: "How many times have you consulted an 'alternative' health practitioner (e.g., chiropractor, naturopath, acupuncturist, herbalist) for your own health in the last twelve months?"

For each survey, a CAM user was defined as a women who had had a least one consultation with an alternative health practitioner in the last twelve months. Women who were not defined as CAM users in Survey 1 but were in Survey 2 were considered *adopters*. Women who were considered CAM users in Survey 1 but not in Survey 2 were considered *relinquishers*.

The results suggest that adopters of CAM use were more likely to experience illness (based on increasing GP visits), continue to reside in a non-urban area, cease taking prescription medication, take non-prescription medication at both Survey points, and experience a decline in physical health (decreased SF-36 Physical Component score). That is to say women who experienced no changes to their health status or better health throughout the time period between the two surveys were less likely to adopt CAM. The adoption of CAM was associated with both an increase and decrease in visits to the GP. This suggests that some women consult a CAM practitioner to augment their usual care, whereas other women use CAM practitioners as an alternative to their usual care.

Conversely women were more likely to have *relinquished* CAM if they did not take non-prescription medications in Survey 1 and 2 or stopped taking non-prescription medication at Survey 2 (Sibbritt, Adams and Young 2004).

7.4.2. Changing use of CAM in the Older cohort

This research was reported in: Adams, J., Sibbritt, D., & Young, A.F. A longitudinal analysis of 6,044 older Australian women's consultations with complementary and alternative medicine (CAM) practitioners, 1996-2005.

This section examines the factors associated with complementary and alternative medicine among older Australian women over time.

The percentage of women who consulted a CAM practitioner in the years 1996, 1999, 2002 and 2005 were 15%, 12%, 11% and 10% respectively. There were 6,044 women who answered the question related to consultation with a CAM practitioner at all four survey points. Of these women: none indicated CAM use at all four surveys; 39 (1%) indicated CAM use at three surveys; 417 (7%) indicated CAM use at two surveys; 1929 (31.9%) indicated CAM use at only one survey; and 3,659 (60%) indicated at all surveys that they did not use CAM.

Table 7-1 shows the results of multivariate modelling. Use of CAM increased as the number of reported symptoms increased, as physical health decreased, and for non-urban residents compared to urban residents. Use of CAM amongst older women appears to be strongly influenced by poor physical health. There is also an overall decline in the use of CAM among older women as they age.

Table 7-1 Factors associated with CAM use by older Australian women, derived from a longitudinal analysis using multivariate GEE modelling with backward stepwise elimination.

Factors	Odds ratio	95% C.I.
Number of symptoms	1.05	1.04, 1.07
SF-36 components:	0.95	0.93, 0.97
Physical health		
PCS (5 pt increase)		
Area of Residence:		
Urban	1.00	-
Non-urban	1.31	1.20, 1.43
Time:		
Time 1	1.00	-
Time 2	0.85	0.80, 0.92
Time 3	0.72	0.67, 0.78
Time 4	0.56	0.51, 0.61

7.5. Characteristics of Mid-Age women who consult specific CAM practitioners

7.5.1. Characteristics of Mid-age women in the ALSWH who use chiropractor and osteopath services

This research was reported in: Sibbritt, D., Adams, J. & Young, A. (2006). A profile of Middle-aged women who consult a chiropractor or osteopath: Findings from a survey of 11,143 Australian women. *Journal of Manipulative and Physiological Therapeutics*, 29, 349-353.

At Survey 3 (conducted in 2001 when the women were aged 50-55 yrs), 16% of women in the Mid-age cohort of the ALSWH responded that they had consulted with a chiropractor or osteopath in the last twelve months for their own health. Women who lived in non-urban areas were more likely to consult a chiropractor or osteopath compared to women who lived in urban areas. Women who consulted chiropractors and osteopaths were more likely to perform home duties only, than women who did not.

Women from the Mid-age cohort were more likely to consult with a chiropractor or osteopath if they responded that they had had a major personal injury in the previous year. Users of chiropractors or osteopaths appeared to experience more symptoms than non-users. Symptoms that were significantly more common among users included allergies, hayfever and sinusitis, headaches and migraines, stiff or painful joints, back pain, vaginal discharge or irritation, bowel problems, and hot flushes.

Mid-age women who consulted chiropractors and osteopaths scored lower on several dimensions of the SF-36 compared to non-users, indicating they were experiencing poorer health. Users were experiencing bodily pain and more problems with work or other activities, as a result of their physical and emotional health. In addition, women who attended chiropractors and osteopaths had lower mental health scores and experienced lower vitality.

Women who consulted chiropractors or osteopaths were higher users of conventional health services compared to non-users. Users made more visits to GP's, specialists and outpatient/casualty than non-users. In addition, users were more likely to have had a mammogram in the previous 2 years. Users of chiropractors and osteopaths were more likely than non-users to take non-prescription medication. There was no statistically significant difference between users and non-users in relation to prescription medication usage (Sibbritt, Adams & Young 2006).

7.5.2. The characteristics of Mid-age women who consult acupuncturists

This research was reported in: Sibbritt, D., Adams J. & Young, A. (2007). The characteristics of middle aged Australian women who consult acupuncturists. *Acupuncture in Medicine*, 25, 22-28.

Of the women from the ALSWH who completed the third survey for Mid-age women, 4.5% indicated they had consulted an acupuncturist in the previous 12 months. Marital status was the only demographic characteristic associated with acupuncture use in this population. Women who were not married or in a defacto relationship, were more likely to consult an acupuncturist than women who were married or in a defacto relationship.

Mid-age women were more likely to consult with an acupuncturist if they had experienced a major personal illness in the previous year. Women who consulted with an acupuncturist were experiencing a variety of symptoms including headaches, migraines, stiff or painful joints, back pain, sleeping difficulties, depression and anxiety. They also scored lower on all 8 dimensions of the SF-36.

Acupuncture users from the Mid-age cohort were higher users of 'conventional' health services. They had more GP and specialists visits and outpatient/casualty visits than women who did not consult acupuncturists. Of the women who had consulted an acupuncturist in the previous year, 27% had more than seven GP visits in the previous year: This figure was only 14% amongst women who did not consult an acupuncturist in the previous year (Sibbritt, Adams and Young 2007).

7.6. CAM use among Mid-age and Older women who have cancer

This research was reported in: Adams, J. Sibbritt D.W. & Young, A. (2005). Naturopathy/herbalism consultations by mid-aged Australian women who have cancer. *European Journal of Cancer Care*, 14, 443-447 and Sibbritt D., Adams, J., Easthope, G. & Young, A. (2003). Complementary and alternative medicine (CAM) use among elderly Australian women who have cancer. *Support Care Cancer* 11, 548-550.

At the time of the second survey of the Mid-age cohort of the ALSWH, 15.7% of women who had been diagnosed with cancer reported they had consulted a naturopath/herbalist in the previous twelve months. In comparison 10.9% of women without cancer had consulted a naturopath/herbalist. The results suggested that the women with cancer in this cohort were more likely to consult a naturopath/herbalist than the women without cancer. There was some variation in the percentage of naturopath/herbalist consultations, dependent on the type of cancer diagnosis. Women with breast, bowel and other cancers had higher rates of consultations than women with cervical cancer (Adams, Sibbritt & Young, 2005).

Among the Older cohort of the ALSWH, at the time of the second survey, significantly more women with a diagnosis of cancer had consulted with an alternative practitioner than women without cancer (14.5% compared to 11.6%). This difference was statistically significant. Women with skin and other cancers were higher CAM users than women with breast or bowel cancer (Sibbritt, Adams, Easthope & Young, 2003).

7.7. Self-reported use of complementary medicines and supplements by Older women

Survey 4 of the Older cohort asked women to write down all their medications. While the question asked for medications prescribed by a doctor, many women recorded herbal medications and supplements that may or may not have been prescribed by a doctor. While the following data do not provide systematically collected information on the prevalence of use of complementary medicines and supplements by older women in Australia, it does describe the range of preparations that are in common use.

Table 7-2 Number of Older women that reported using CAM medications (OTC= over-the-counter medications)

CAM Use	All		Diabetes		Heart		Asthma		Arthritis		Cancer	
	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%	Cnt	%
Survey not completed	623	9	48	6	98	6	66	6	183	6	126	7
Herbals	353	5	38	5	98	6	63	6	209	7	115	6
OTC	53	1	2	0	12	1	22	2	28	1	18	1
Supplementary	11	0	1	0	2	0	3	0	3	0	5	0
Non-Medical	83	1	12	2	27	2	23	2	51	2	33	2
Probiotics	6	0	2	0	1	0		0	3	0	2	0
PBS Medicines	6,530	91	768	94	1,666	94	988	94	3,055	94	1,808	93
Total		7,161		815		1,765		1,054		3,239		1,938

Table 7-3 The twenty most common self-reported CAM medications used by Older women (OTC meds= over-the-counter medications)

Description	Count	%
Herbals For Alimentary Tract And Metabolism	17	0.24
Herbals For Cardiovascular System	10	0.14
Herbals For Dermatologicals	0	0.01
Herbals For Genito Urinary System And Sex Hormones	26	0.36
Herbals For Anti-infectives For Systemic Use	1	0.01
Herbals For Musculo-Skeletal System	103	1.44
Herbals For Musculo-Skeletal System and Nervous System	5	0.07
Herbals For Nervous System	2	0.02
Herbals For Respiratory System	10	0.14
Herbals For Sensory Organs	166	2.32
Herbals For Various	51	0.71
OTC Meds For Alimentary Tract And Metabolism	8	0.12
OTC Meds For Dermatologicals	2	0.02
OTC Meds For Anti-infectives For Systemic Use	2	0.02
OTC Meds For Musculo-Skeletal System	2	0.03
OTC Meds For Respiratory System	16	0.23
OTC Meds For Sensory Organs	25	0.35
Non-Classified Meds	37	0.51
Non-Medical Meds	47	0.65
Probiotics Meds	6	0.08
Supplement Meds	11	0.16

Table 7-4 Number of Older women that reported taking specific CAM medications

CAM Description	Count	%
Macu-Vision	165	2.30
Fish Oil	66	0.92
Lutein-Vision	33	0.46
Cranberry	24	0.33
Mag Min	20	0.27
Arthroaid	18	0.26
Garlic	18	0.26
Acupuncture	12	0.16
Herbal	10	0.14
Bisolvon	9	0.13
Coenzyme Q10	7	0.10
De-Gas	6	0.09
Healthy Joints	6	0.09
Fess Nasal Spray	6	0.08
Celery	5	0.08
Lyprinol	5	0.07
Evening Primrose Oil	4	0.06
Total Population		7,161

7.8. Women's comments

Many of the women from all three cohorts wrote of their satisfaction with complementary and alternative medicine. Younger and Mid-age women commented that while CAM had been beneficial to their health, the cost tended to restrict their access to these services:

If naturopathy, massage and reflexology was cheaper I would go every week to one of the three. Younger participant.

My naturopath and GP working together have done wonders for me. However it is costly. Mid-age participant.

Across all cohorts women commented on their use of traditional and CAM health services in tandem:

My naturopath deserves a great deal of credit toward how I feel today...I believe that in our society there is a place for the orthodox and complementary practitioners alike. Younger participant.

While Older women tended to write about using CAM for physical health problems and its usefulness in maintaining physical wellbeing, Mid-age women also wrote about benefits they had experienced using CAM when going through menopause, and in helping with depression.

Younger participants also wrote about mental health benefits they had experienced as a result of using CAM:

*I have recently begun yoga on a weekly basis and this is extremely helpful in calming me and controlling panic attacks.
Younger participant.*

Younger and Mid-age participants wrote about using CAM for a variety of physical health problems, however, many of the Older women wrote about CAM use in the context of treatments for arthritis and pain management:

I had the first attack of Osteoarthritis in my right knee thirty-three years ago. I now have it in my left knee, lower back, neck, both shoulders and both hands...I had my first treatment to relieve pain 33 years ago of acupuncture and have continued to have this treatment approximately twice a year since then. Older participant.

7.9. Discussion

Knowledge about CAM use is important for practitioners who provide primary medical care as there is potential for drug interactions between conventional medicine and some CAM treatments. In addition, patient safety may be jeopardised by CAM users failing to inform their conventional medical practitioners about their CAM use and by GPs underestimating their patients' use of other medicines. The results of the research to date, that has explored the use of CAM among women in the ALSWH, indicates that CAM use is common, and is more likely among those women who have poorer health (Adams, Sibbritt, Easthope & Young, 2003) and specific conditions such as cancer (Sibbritt, Adams, Easthope & Young, 2003).

Women reporting more illness were more likely to adopt CAM use (Adams, Sibbritt, Easthope & Young, 2003). Additionally, women who continued to live in non-urban areas across were more likely to adopt CAM use than those who remained in urban areas (Adams, Sibbritt, Easthope & Young, 2003). Higher use and uptake of CAM in non-urban areas may reflect limited access to and availability of conventional health services in these hard to service areas (Young, Dobson, & Byles, 2002).

Longitudinal analyses have shown that both Mid-age and Older women whose health declined were more likely to start using CAM (Adams, Sibbritt & Young, under revision; Sibbritt, Adams & Young, 2004). Among Older women, use of CAM declined as they aged but increased as number of reported symptoms increased and for non-urban residents compared to urban residents (Adams, Sibbritt & Young, under revision). Among Mid-age women those who ceased taking prescription medicine were more likely to start using CAM (Sibbritt, Adams & Young, 2004).

In considering the use of specific providers, Mid-age women who use chiropractic, osteopathy and acupuncture appear to be higher users of conventional health services, and to be suffering from a wide range of symptoms (Sibbritt, Adams & Young, 2006; Sibbritt, Adams & Young, 2007). These results suggest that chiropractic, osteopathy and acupuncture is used in conjunction with conventional care, and used within an overall health care regime. There may be a need for increased communication and interfacing between CAM providers and other health care professionals to ensure the effective coordination and management of patient care. The authors concluded that it is important that all health care practitioners involved in caring for patients with cancer are informed about CAM (Adams, Sibbritt, Easthope & Young, 2003). The literature suggests that CAM users frequently do not disclose their use of CAM to their medical practitioners (Eisenberg, Davis, Ettner et al, 1998).

In considering the use of CAM by women reporting a diagnosis of cancer, it is important to note that ALSWH data show a lower percentage of CAM use amongst women with cancer than has

been reported in other studies of cancer patients which may have been due to the way the question was asked (Adams, Sibbritt, & Young 2005; Ernst & Cassileth, 1998).

7.10. References

Adams J., Sibbritt D.W., Easthope G. & Young, A. (2003). The profile of women who consult alternative health practitioners in Australia. *Medical Journal of Australia*, 179, 297-300.

Adams, J., Sibbritt, D., & Young, A.F. A longitudinal analysis of 6,044 older Australian women's consultations with complementary and alternative medicine (CAM) practitioners, 1996-2005. (under revision).

Adams, J. Sibbritt D.W. & Young, A. (2005). Naturopathy/herbalism consultations by mid-aged Australian women who have cancer. *European Journal of Cancer Care*, 14, 443-447.

Eisenberg D., Davis R., Ettner S., et al. (1998). Trends in alternative medicine use in the United States. 1190-1997: results of a follow-up national survey. *JAMA*, 280, 4569-1575.

Ernst E & Cassileth B.R. (1998). The prevalence of complementary/alternative medicine in cancer. *Cancer*, 83, 777-782.

MacLennan, A.H., Myers, S.P. & Taylor A.W (2006). The continuing use of complementary and alternative medicine in South Australia: costs and beliefs in 2004. *Medical Journal of Australia*, 184(1), 27-31.

Sibbritt D., Adams, J., Easthope, G. & Young, A. (2003). Complementary and alternative medicine (CAM) use among elderly Australian women who have cancer. *Support Care Cancer* 11, 548-550.

Sibbritt, D., Adams, J. & Young, A. (2004). A longitudinal analysis of Mid-age women's use of complementary and alternative medicine (CAM) in Australia 1996-1998. *Women & Health*, 40, 41-56.

Sibbritt, D., Adams, J., & Young, A. (2006). A profile of Middle-Aged women who consult a chiropractor or osteopath: Findings from a survey of 11,143 Australian women. *Journal of Manipulative and Physiological Therapeutics*, 29, 349-353.

Sibbritt, D., Adams J., & Young, A. (2007). The characteristics of middle aged Australian women who consult acupuncturists. *Acupuncture in Medicine*, 25, 22-28.

Young, A.F., Dobson, A.J., Byles, J.E. (2002). Access and equity in the provision of general practitioner services in Australia. *Australian and New Zealand Journal of Public Health*, 24, 474-480.

APPENDICES

Appendix A. The Australian Longitudinal Study on Women's Health

The Australian Longitudinal Study on Women's Health (ALSWH) - widely known as Women's Health Australia - is a longitudinal population-based survey, funded by the Australian Government Department of Health and Ageing. The Project began in 1996 and examines the health of over 40,000 Australian women (Brown et al., 1998).

The ALSWH involves three large, nationally representative, cohorts of Australian women representing three generations:

- The Younger women, aged 18-23 when first recruited in 1996 (n=14,247), are in their late 20s, the peak years for relationship formation, childbearing, and establishing adult health habits (e.g. physical activity, diet) and paid and unpaid work patterns.
- The Mid-age women, initially aged 45-50 (n=13,716), are experiencing menopause, as well as changes in household structure, family care giving, and impending retirement, which are common at this life stage. Some are showing early signs of age-related physical decline, while some are adopting new health behaviours in preparation for a healthy old age.
- The Older women, aged 70-75 when first recruited (n=12,432), are moving into their 80s and facing the physical, emotional and social challenges of old age.

Features of the Study design include:

- Women were randomly selected from the Medicare Australia database and invited to participate in the longitudinal Study.
- Women in rural and remote areas of Australia were intentionally over-sampled to ensure adequate numbers for statistical analysis.
- After Survey 1 in 1996, the three age cohorts have been surveyed sequentially, one cohort per year, on a rolling basis since 1998.

The Study was designed to explore factors that influence health among women who are broadly representative of the entire Australian population. The Study assesses:

- Physical and emotional health (including well-being, major diagnoses, symptoms).
- Use of health services (GP, specialist and other visits, access, satisfaction).
- Health behaviours and risk factors (diet, exercise, smoking, alcohol, other drugs).
- Time use (including paid and unpaid work, family roles, and leisure).
- Socio-demographic factors (location, education, employment, family composition).
- Life stages and key events (such as childbirth, divorce, widowhood).

The Project provides a valuable opportunity to examine associations over time between aspects of women's lives and their physical and emotional health. It provides an evidence base to the Australian Government Department of Health and Ageing – as well as other Australian and State/Territory Departments – for the development and evaluation of policy and practice in many areas of service delivery that affect women. An overview of the Study and investigators, copies of the questionnaires, and abstracts of publications and presentations can be located on the study's website <http://www.alswh.org.au>

Response rates to Survey 1 (1996) cannot be exactly specified as some women selected for the sample may not have received the invitation. For example, deaths or changes of address may

not have been notified to the Health Insurance Commission (now Medicare Australia). It is estimated that 41-42% of the Younger women, 53-56% of the Mid-age women and 37-40% of the Older women agreed to participate in the longitudinal Study. Comparison with the 1996 Census showed that the respondents were broadly representative of the general population of women of the same age, with some over-representation of women with tertiary education and under-representation of immigrant women of non-English speaking background.

The Project has been able to retain a very high proportion of the original participants, particularly among the Mid-age and Older women.

Table A-1 Participation and retention of Younger women

	Survey 1	Survey 2	Survey 3	Survey 4
Age in years	18-23	22-27	25-30	28-33
Eligible at previous survey		14,247	14,116	13,886
Ineligible				
deceased between surveys		22	10	15
frailty (e.g. intellectual disability)		3	6	4
withdrawn before mailout survey date		106	214	311
<i>Total ineligible</i>		<i>131</i>	<i>230</i>	<i>330</i>
Eligible at current survey		14,116	13,886	13,556
Non-respondents				
withdrawn from the project		124	200	171
contacted but did not return		1,332	653	1,371
unable to contact participant		2,972	3,952	2,869
<i>Total non-respondents</i>		<i>4,428</i>	<i>4,805</i>	<i>4,411</i>
Respondents				
completed survey	14 247	9,688	9,081	9,145
Retention rate as % eligible		68.6%	65.4%	67.5%

Among the Younger women, 69% responded to Survey 2 in 2000, 65% to Survey 3 in 2003 and 67% have responded to Survey 4 in 2006 (Table A-1). This retention compares well with other surveys of this highly mobile age group. The major reason for non-response among the Younger women was that the research team was unable to contact the women (21% of eligible women at Survey 2, 28% at Survey 3 and 21% at Survey 4), despite using all possible methods of maintaining contact (Lee et al., 2000; Lee et al., 2005; Young, Powers & Bell, 2006). Women in their twenties are characterised by high levels of mobility, change of surnames on marriage, often not having telephone listings and not being registered to vote, and making extended trips outside Australia for work, education or recreation.

Demographic characteristics (country of birth, marital status, education, employment and living arrangements) of the Younger respondents at Survey 1 (1996) and Survey 2 (2000) were compared with those of women of the same age in the Australian population, using data from the 1996 and 2001 Censuses respectively. The comparisons revealed few differences; however, there was some under-representation of women from non-English language countries at both surveys. The disparity in education increased between 1996 and 2001. Whereas at the 1996 Census almost 70% of women in the Younger cohort had no post school qualifications (ALSWH and the general population), 31% and 49% had no post school qualifications in the ALSWH sample and the 2001 Census respectively. Some of these differences will be due to overseas graduates returning home and Australian graduates working overseas. ALSWH women were less likely to be employed compared with women of the same age in the 1996 Census (52% versus 60%). When many were still students, they were more likely to be employed than women of the same age in the 2001 Census (85% versus 67%).

Table A-2 Participation and retention of Mid-age women

	Survey 1	Survey 2	Survey 3	Survey 4
Age in years	45-50	47-52	50-55	53-58
Eligible at previous survey		13,716	13,606	13,309
Ineligible				
deceased between surveys		50	66	88
frailty (e.g. dementia, stroke)		7	14	14
withdrawn before mailout survey date		53	217	229
<i>Total ineligible</i>		<i>110</i>	<i>297</i>	<i>331</i>
Eligible at current survey		13,606	13,309	12,978
Non-respondents				
withdrawn from the study		156	155	136
contacted but did not return		254	999	886
unable to contact participant		858	929	1,051
<i>Total non-respondents</i>		<i>1,268</i>	<i>2,083</i>	<i>2,073</i>
Respondents				
completed survey	13,716	12,338	11,226	10,905
Retention rate as % eligible		90.7%	84.3%	84.0%

Retention has been much higher among the Mid-age women; 91% responded to Survey 2 in 1998 and 84% responded to Survey 3 in 2001 and Survey 4 in 2004 (Table A-2). The major reasons for non-response among Mid-age women were that the research team was unable to contact the women (6%, 7% and 8% of eligible women at Survey 2, Survey 3 and Survey 4 respectively) and non-return of questionnaires by women who could be contacted (2%, 8% and 7% of eligible women at the second, third and fourth Surveys). Mid-age women typically lead busy lives, often working as well as caring for their parents and children. Our data revealed that the women who could not be contacted were more likely to be separated, divorced or widowed.

Data from the 1996 and 2001 Censuses were used to compare demographic characteristics (country of birth, marital status, education, employment and living arrangements) of women of the same age in the Australian population with Mid-age respondents at Survey 1 (1996) and Survey 3 (2001). There were few differences, however there was some under-representation of women from non-English speaking countries and women who were separated or divorced at both surveys.

Table A-3 Participation and retention of Older women

	Survey 1	Survey 2	Survey 3	Survey 4
Age in years	70-75	73-78	76-81	79-84
Eligible at previous survey		12,432	11,535	10,187
Ineligible				
deceased between surveys		529	569	769
frailty (e.g. dementia, stroke)		106	264	380
withdrawn before mailout survey date		262	515	508
<i>Total ineligible</i>		<i>897</i>	<i>1,348</i>	<i>1,657</i>
Eligible at current survey		11,535	10,187	8,530
Non-respondents				
withdrawn from the study		311	385	267
contacted but did not return		481	860	592
unable to contact participant		309	295	513
<i>Total non-respondents</i>		<i>1,101</i>	<i>1,540</i>	<i>1,372</i>
Respondents				
completed survey	12 432	10,434	8,647	7,158
Retention rate as % eligible		90.5%	84.9%	83.9%

Of the Older women, 91% responded to Survey 2 in 1999, 85% to Survey 3 in 2002 and 84% to Survey 4 in 2005 (Table A-3). Among Older women the major reason for non-response was non-return of the questionnaire (4% of eligible women at Survey 2, 8% at Survey 3 and 7% at Survey 4). These and other non-respondents tended to report poorer self-rated health at Survey 1 than respondents.

Demographic characteristics (country of birth, marital status, education and living arrangements) of the Older respondents at Survey 1 (1996) and Survey 3 (2002) were compared with those of women of the same age in the Australian population, using data from the 1996 and 2001 Censuses respectively. Comparisons showed few differences. There was some under-representation of women from non-English speaking countries in the ALSHW sample at both surveys. The high level of missing data in the Census made comparisons difficult for marital status and educational qualifications.

Data are available for the Younger cohort at Survey 1 (1996), Survey 2 (2000), Survey 3 (2003) and Survey 4 (2006), for the Mid-age cohort at Survey 1 (1996), Survey 2 (1998), Survey 3 (2001) and Survey 4 (2004) and for the Older cohort at Survey 1 (1996), Survey 2 (1999), Survey 3 (2002) and Survey 4 (2005). The following tables provide information on completion of surveys.

Table A-4 Completion of surveys by Younger women (n=14 247)

Completion of Surveys	n
Respondent at Surveys 2, 3 and 4	6,840
Respondent at Surveys 2 and 3, non-respondent at Survey 4	932
Respondent at Surveys 2 and 3, deceased/ withdrawn due to frailty at Survey 4	9
Respondent at Surveys 2 and 3, other ineligible at Survey 4	9
Respondent at Survey 2, non-respondent at Survey 3, respondent at Survey 4	822
Respondent at Survey 2, non-respondent at Surveys 3 and 4	927
Respondent at Survey 2, non-respondent at Survey 3, deceased/ withdrawn due to frailty at Survey 4	3
Respondent at Survey 2, non-respondent at Survey 3, other ineligible at Survey 4	108
Respondent at Survey 2, deceased/ withdrawn due to frailty by Survey 3	9
Respondent at Survey 2, other ineligible by Survey 3	29
Non-respondent at Survey 2, respondent at Surveys 3 and 4	906
Non-respondent at Survey 2, respondent at Survey 3, non-respondent at Survey 4	380
Non-respondent at Survey 2, respondent at Survey 3, deceased/ withdrawn due to frailty at Survey 4	1
Non-respondent at Survey 2, respondent at Survey 3, other ineligible at Survey 4	4
Non-respondent at Surveys 2 and 3, respondent at Survey 4	577
Non-respondent at Surveys 2, 3 and 4	2,172
Non-respondent at Surveys 2 and 3, deceased/ withdrawn due to frailty at Survey 4	6
Non-respondent at Surveys 2 and 3, other ineligible at Survey 4	190
Non-respondent at Survey 2, deceased/ withdrawn due to frailty at Surveys 3 and 4	7
Non-respondent at Survey 2, other ineligible at Surveys 3 and 4	185
Deceased/ withdrawn due to frailty by Survey 2	25
Other ineligible by Survey 2	106

The numbers of Younger women who completed different surveys are shown in Table A-4. Forty-eight percent of Younger women completed Surveys 1, 2, 3 and 4, 19% completed three of the four surveys and a further 14% completed two of the four surveys. Few Younger women were deceased (n=47) and 13 were too ill to complete further surveys.

Table A-5 Completion of Surveys by Mid-age women (n=13 716)

Completion of Surveys	n
Respondent at Surveys 2, 3 and 4	9,876
Respondent at Surveys 2 and 3, non-respondent at Survey 4	821
Respondent at Surveys 2 and 3, deceased/ withdrawn due to frailty at Survey 4	74
Respondent at Surveys 2 and 3, other ineligible at Survey 4	38
Respondent at Survey 2, non-respondent at Survey 3, respondent at Survey 4	577
Respondent at Survey 2, non-respondent at Surveys 3 and 4	701
Respondent at Survey 2, non-respondent at Survey 3, deceased/ withdrawn due to frailty at Survey 4	15
Respondent at Survey 2, non-respondent at Survey 3, other ineligible at Survey 4	122
Respondent at Survey 2, deceased/ withdrawn due to frailty by Survey 3	63
Respondent at Survey 2, other ineligible by Survey 3	51
Non-respondent at Survey 2, respondent at Surveys 3 and 4	299
Non-respondent at Survey 2, respondent at Survey 3, non-respondent at Survey 4	107
Non-respondent at Survey 2, respondent at Survey 3, deceased/ withdrawn due to frailty at Survey 4	5
Non-respondent at Survey 2, respondent at Survey 3, other ineligible at Survey 4	6
Non-respondent at Surveys 2 and 3, respondent at Survey 4	153
Non-respondent at Surveys 2, 3 and 4	444
Non-respondent at Surveys 2 and 3, deceased/ withdrawn due to frailty at Survey 4	8
Non-respondent at Surveys 2 and 3, other ineligible at Survey 4	63
Non-respondent at Survey 2, deceased/ withdrawn due to frailty at Surveys 3 and 4	17
Non-respondent at Survey 2, other ineligible at Surveys 3 and 4	166
Deceased/ withdrawn due to frailty by Survey 2	57
Other ineligible by Survey 2	53

Table A-5 shows the numbers of Mid-age women who were enrolled in Survey 1 according to their history of completing Surveys 2, 3 and 4. Seventy-two percent of the Mid-age women completed all four surveys. A further 13% completed three of the four surveys and 9% completed two of the four surveys. Women were mainly ineligible to continue in the Study due to withdrawal.

Table A-6 Completion of Surveys by Older women (n=12 432)

Completion of Surveys	n
Respondent at Surveys 2, 3 and 4	6,721
Respondent at Surveys 2 and 3, non-respondent at Survey 4	727
Respondent at Surveys 2 and 3, deceased at Survey 4	579
Respondent at Surveys 2 and 3, withdrawn due to frailty at Survey 4	274
Respondent at Surveys 2 and 3, other ineligible at Survey 4	97
Respondent at Survey 2, non-respondent at Survey 3, respondent at Survey 4	234
Respondent at Survey 2, non-respondent at Surveys 3 and 4	383
Respondent at Survey 2, non-respondent at Survey 3, deceased at Survey 4	128
Respondent at Survey 2, non-respondent at Survey 3, withdrawn due to frailty at Survey 4	70
Respondent at Survey 2, non-respondent at Survey 3, other ineligible at Survey 4	331
Respondent at Survey 2, deceased by Survey 3	497
Respondent at Survey 2, withdrawn due to frailty by Survey 3	219
Respondent at Survey 2, other ineligible by Survey 3	174
Non-respondent at Survey 2, respondent at Surveys 3 and 4	144
Non-respondent at Survey 2, respondent at Survey 3, non-respondent at Survey 4	67
Non-respondent at Survey 2, respondent at Survey 3, deceased at Survey 4	18
Non-respondent at Survey 2, respondent at Survey 3, withdrawn due to frailty at Survey 4	15
Non-respondent at Survey 2, respondent at Survey 3, other ineligible at Survey 4	5
Non-respondent at Surveys 2 and 3, respondent at Survey 4	59
Non-respondent at Surveys 2, 3 and 4	195
Non-respondent at Surveys 2 and 3, deceased at Survey 4	44
Non-respondent at Surveys 2 and 3, withdrawn due to frailty at Survey 4	22
Non-respondent at Surveys 2 and 3, other ineligible at Survey 4	74
Non-respondent at Survey 2, deceased at Surveys 3 and 4	72
Non-respondent at Survey 2, withdrawn due to frailty at Surveys 3 and 4	44
Non-respondent at Survey 2, other ineligible at Surveys 3 and 4	342
Deceased by Survey 2	529
Withdrawn due to frailty by Survey 2	106
Other ineligible by Survey 2	262

The numbers of Older women who completed different surveys are shown in Table A-6. Fifty-four percent of Older women completed Surveys 2, 3 and 4, 17% completed three of the four surveys and a further 16% completed two of the four surveys. Not unexpectedly in this age group, discontinuation was commonly due to death or frailty.

A.1 Area of residence

Throughout this report area of residence has been classified according to the Rural, Remote and Metropolitan Areas classification scheme (DPIE & DHSH, 1994). The classification uses postcodes to produce seven categories (2 metropolitan, 3 rural and 2 remote areas) that are based primarily on population numbers and an index of remoteness. For all area of residence analyses these categories were collapsed into four groups: 'urban' including capital cities and other metropolitan centres, 'large rural centres', 'small rural centres' and 'other rural/remote areas'.

When area of residence is not shown, estimates (such as prevalence and incidence) have been weighted to correct for the purposeful over-sampling of women from rural and remote areas, so

that the Study populations are representative of the Australian population of women in these age groups.

A.2 References

Brown, W. J., Bryson, L., Byles, J. E., Dobson, A. J., Lee, C., Mishra, G., et al. (1998). Women's Health Australia: recruitment for a national longitudinal cohort study. *Women & Health*, 28(1), 23-40.

Lee, C., Dobson, A., Brown, W., Adamson, L. & Goldsworthy, J. (2000). Tracking participants: lessons from the Women's Health Australia Project. *Australian & New Zealand Journal of Public Health*, 24(3), 334-336.

Lee, C., Dobson, A. J., Brown, W. J., Bryson, L., Byles, J., Warner-Smith, P., et al. (2005). Cohort Profile: the Australian Longitudinal Study on Women's Health. *Int J Epidemiol*, 34(5), 987-991.

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

Young, A.F., Powers, J.R. & Bell, S.L. (2006). Attrition in longitudinal studies: who do you lose? *Australian & New Zealand Journal of Public Health*, 30(4), 353-361.

Appendix B. Use of ALSWH Survey Medication Data and Medicare/PBS data

B.1 Coding of Medication Data in Older Survey 4

In Survey 4 of the Older cohort (2005), participants were asked to list all their medications prescribed by a doctor (see Figure B-1 for the question and a typical response).

69. Please write down the names of all your medications prescribed by a doctor. Where possible, copy names from the packets, or obtain a list from your regular pharmacist and return it with your survey.

FOSAMAX	
WARFARIN	
LIPITOR	
NIDEM	
ANPEC	
PANAMAX	

Figure B-1 Survey 4: Medication question and an example of a response from Participant X

A database was written to record the participant's medications along with any extra information that the participant provided. For example, Participant Y gave the following information:

Prednisone Tablets 1mg

Fosamax once weekly 70mg

Mobic 7.5mg

Table B-1 shows how this case was recorded in the database.

Table B-1 Participant Y's database entries.

ID	Medications_Name	Dosage	Frequency	ExtralInfo
Y	Prednisone	1mg		Tablets
Y	Fosamax	70mg	Once weekly	
Y	Mobic	7.5mg		

As each medication was entered, it was checked against the recognized list of medications. Each time a new medication term was found, it was checked to confirm that it really was a new medication (and not an alternative proprietary name or mis-spelling) by cross referencing with MIMS, the Schedule of Pharmaceutical Benefits or the World Health Organisation (WHO) Anatomical Therapeutic Chemical (ATC) list of Medications. New items were then added into the table of medications.

In the longer term, we plan to link the self-reported list of medications taken by a participant with the Pharmaceutical Benefits Scheme (PBS) records for that participant. While looking at the data from the surveys and the PBS coding scheme, it became apparent that there was going to be difficulty with using the PBS coding for linking the self-reported data and the PBS data, which consists of PBS Codes.

B.1.1 Pharmaceutical Benefit Scheme (PBS) Code

The PBS Code consists of five digits; the first four are numbers and the last digit a letter. The four digit number is allocated according to the PBS Code Blocks as shown in Table B-2 (the colour of the pages refers to those in the Schedule of Pharmaceutical Benefits) which indicates that PBS Codes are allocated on the basis of the purpose of the medication (e.g. the patient's diagnosis or prognosis) rather than its chemical composition.

Table B-2 Code Block allocations used for allocating PBS codes to medications

PBS Code Block Allocation			

10 -	99	Extemporaneous non-standard formula	green pages
100 -	999	Extemporaneous ingredients	green pages
1000 -	3200	General ready-prepared	white pages
3201 -	3249	Colostomy and Ileostomy Associations	not in book
3250 -	3299	Paraplegic and Quadriplegic Associations...	not in book
3300 -	3399	Dental ready-prepared	white pages
3450 -	3499	Doctor's bag	white pages
3500 -	4000	Stoma Appliances	not in book
4001 -	4950	Repatriation	buff pages
4951 -	4999	RPBS Therapeutic Group Premium exemption ..	buff pages
5001 -	5300	Dental	pink pages
5301 -	5800	Palliative Care.....	blue pages
5801 -	5999	Section 100 chemotherapy scheme drugs	not in book
6100 -	6500	Section 100	orange pages
6501 -	7299	Combined codes for injectable/solvent pairs (both general and dental)	
7300 -	7999	Extemporaneous standard formula	green pages
8000 -	8899	General ready-prepared	white pages
8900 -	8999	PBS Therapeutic Group Premium exemption....	white pages
9000 -	9899	(reserved for future use)	
9900 -	9999	Stoma Appliances	not in book

Figure B-2 gives an example of an entry for one specific medication, Fosamax. This shows that there are two PBS codes for Fosamax, 8511Y (for osteoporosis) and 8090T (for Paget's Disease), depending on whether the dosage was 70mg once weekly or 40mg. With participant Y we can determine that the PBS code should be 8511Y, but for participant X we have no extra information to tell us which dosage of Fosamax she is taking. We can possibly get around this problem by using the Anatomical Therapeutic Chemical (ATC) Code to classify the medications.

MUSCULO-SKELETAL SYSTEM —cont.

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Code	Name, Restriction, Manner of administration and form	Max. No. of Qty Rpts Premium	Dispensed Price for Max. Qty \$	Maximum Recordable Value for Safety Net \$	Proprietary Name and Manufacturer
DRUGS FOR TREATMENT OF BONE DISEASES					
Drugs affecting bone structure and mineralization					
• Bisphosphonates					
ALENDRONATE SODIUM					
<u>Authority required</u>					
<i>Initial treatment for established osteoporosis in patients with fracture due to minimal trauma. The fracture must have been demonstrated radiologically and the year of plain x-ray or CT-scan or MRI scan must be included in the authority application. A vertebral fracture is defined as a 20% or greater reduction in height of the anterior or mid portion of a vertebral body relative to the posterior height of that body, or, a 20% or greater reduction in any of these heights compared to the vertebral body above or below the affected vertebral body;</i>					
<i>Continuing treatment for established osteoporosis in patients with fracture due to minimal trauma, where the patient has previously been issued with an authority prescription for this drug.</i>					
8511Y	Tablet equivalent to 70 mg alendronic acid	4 5 ..	55.95	23.70	Fosamax Once Weekly MK
<u>Authority required</u>					
<i>Symptomatic Paget's disease of bone.</i>					
8090T	Tablet equivalent to 40 mg alendronic acid	30 5 ..	163.96	23.70	Fosamax 40 mg MK

Figure B-2 An extract from the Schedule of Pharmaceutical Benefits

B.1.2 ATC Classification – Structure and Principles

The WHO uses the Anatomical Therapeutic Chemical (ATC) classification system and this system is internationally recognized as the standard classification system for drug consumption studies.

Structure

In the ATC classification system, the drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties. Drugs are classified in groups at five different levels. The drugs are divided into fourteen main groups (1st Level), with pharmacological/therapeutic subgroups (2nd Level). The 3rd and 4th levels are chemical/pharmacological/therapeutic subgroups and the 5th level is the chemical substance. The 2nd, 3rd and 4th levels are often used to identify pharmacological subgroups when that is considered more appropriate than therapeutic or chemical subgroups. For example, Fosamax is the brand name for alendronic acid and the complete classification of alendronic acid (Table B-3) illustrates the structure of the code. In the ATC system, all plain alendronic acid preparations are given the code M05BA04.

Table B-3 ATC classification of Alendronic Acid

M	Musculo-Skeletal System	(1st level, anatomical main group)
M05	Drugs For Treatment Of Bone Diseases	(2nd level, therapeutic subgroup)
M05B	Drugs Affecting Bone Structure And Mineralization	(3rd level, pharmacological subgroup)
M05BA	Bisphosphonates	(4th level, chemical subgroup)
M05BA04	Alendronic Acid	(5th level, chemical substance)

Principles for classification

Medicinal products are classified according to the main therapeutic use of the main active ingredient, on the basic principle of only one ATC code for each pharmaceutical formulation (i.e. similar ingredients, strength and pharmaceutical form).

A medicinal product can be given more than one ATC code if it is available in two or more strengths or formulations with clearly different therapeutic uses. A medicinal product may be used for two or more equally important indications, and the main therapeutic use of a drug may differ from one country to another. This will often give several classification alternatives. Such drugs are usually only given one code, the main indication being decided on the basis of the available literature.

The ATC system is not strictly a therapeutic classification system. At all ATC levels, ATC codes can be assigned according to the pharmacology of the product. Subdivision on the mechanism of action will however, often be rather broad, since a too detailed classification according to mode of action often will result in having only one substance per subgroup, which as far as possible is avoided. Some ATC groups are subdivided in both chemical and pharmacological groups. If a new substance fits in both a chemical and pharmacological 4th level, the pharmacological group is normally chosen.

B.1.3 Using the ATC Code to Classify the Old 4 Medications Data

We will not always have sufficient information in the answer to the medication question in the Older 4 Survey to allocate a PBS Code for each medication listed by our participants, but we can allocate an ATC Code instead.

The PBS data from Medicare Australia contains a PBS Code and so this PBS Code will be linked to a matching ATC Code. Medicare Australia have supplied us with quarterly files that give ATC Codes for each PBS Code along with other drug information, and we will use these files to link the Older Survey 4 Medication Data to the PBS data (see Figure B-3).

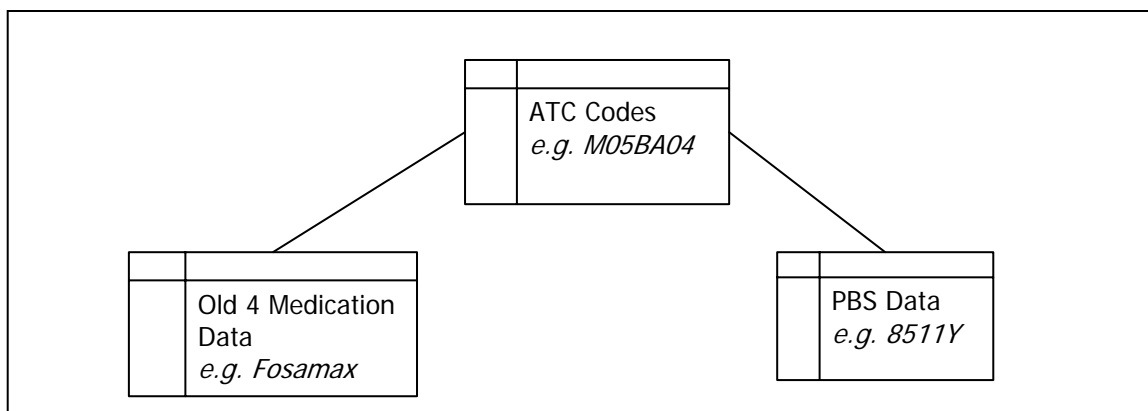


Figure B-3 Diagram showing how Self-Reported Medication Data can be linked to the PBS Data by using the ATC Code

One advantage of using the ATC code to classify self-report medication data is that researchers can use the classifications system to select a group of drugs that has a particular therapeutic effect (e.g. the drugs with ATC code starting with M05 are drugs for the treatment of bone diseases).

Some of the medications listed by our participants are herbal remedies. These do not have ATC Codes or PBS Codes, but a framework for ATC classification of herbal remedies has been developed and we will explore the possibility of using this scheme to classify them. The PBS

does not cover herbal remedies, so there will be no linkage to this database, but the ATC herbal remedy classification could assist researchers in grouping and studying these medications.

B.1.4 Self-Reported Medications in Older Survey 4: Preliminary Results

All self-reported medication use data have been entered by staff at the Newcastle office. Table B-4 summarises the responses from the first 3,032 respondents.

Table B-4 Number of medications reported by women responding to Older Survey 4: Preliminary Data (N=3032)

No Medications Taken	N	%
0	359	11.8
1	209	6.9
2	331	10.9
3	354	11.7
4	410	13.5
5	382	12.6
6	287	9.5
7	220	7.3
8	172	5.7
9	115	3.8
10	78	2.6
11	49	1.6
12	29	1.0
13	16	0.5
14	10	0.3
15	3	0.1
16	2	0.1
17	2	0.1
18	3	0.1
20	1	0.0
Total	3,032	100

Of this preliminary sample, 11.8% indicated that they do not take any medications or did not answer the question, while of those that do take medication the average number of medications taken is 4.4 per person. Table B-5 lists the ten most frequently reported medications in this age group.

Table B-5 Most frequently reported medications: Older survey 4, preliminary data

Top ten most frequently taken medications

Medications	Indication
lipitor	High cholesterol
panamax	Moderate to severe pain/fever
fosamax	Osteoporosis/Paget's disease
caltrate	Calcium deficiency/osteoporosis
astrix	Prevents blood clots
aspirin	Prevents blood clots
zocor	Treatment of high cholesterol
avapro	Treatment of high blood pressure
coversyl	Mild to moderate hypertension
noten	Hypertension, cardiac failure and angina

B.2 Preliminary Work with PBS Data Provided from Medicare Australia

B.2.1 Summary of PBS Data provided from Medicare Australia (2002, 2003)

Two files were provided by the Health Insurance Commission:

PBSDATA02.txt : all PBS claims from consenting women in 2002 (299513 records)

PBSDATA03.txt : all PBS claims from consenting women in 2003 (318013 records)

PBSITEM.txt : gives full names for each PBS item code

PBSMSP.txt : Gives name of specialties for referring providers

The two latter files (PBSITEM.txt and PBSMSP.txt) are used to link to the raw PBS claims files for each year.

Variables included in PBSDATA02 and PBSDATA03 are as follows:

Idfull (woman's unique ID from ALSWH)

postcode

date prescribed (= date the original script was prescribed)

date filled (=date the script was filled at the pharmacy)

PBS item number

Patient category (e.g. ordinary, safety net, RPBS, concessional etc.)

Number of scripts

Provider number (scrambled to preserve anonymity of providers)

Provider speciality (links to PBSMSP.txt)

Formtype (PBS form script type – e.g. doctor's bag, concession, safety net)

Number dispensed

Number of repeats

Number of previous (=number previously supplied)

Full cost (=dispensed price full cost)

Benefit (=benefit paid)

Patient cost (=patient contribution)

Card type used by customer (e.g. PBS concession card, pensioner, DVA.)

B.2.2 Age group distribution in PBS data

The ALSWH consenters file contained IDs for 17,446 women, and a separate ALSWH file contains IDs for withdrawn women, of which there are 220 women. This leaves 17,226 women for whom the PBS database was queried. The PBS data contain records from all three age cohorts: 4,356 (25%) Younger, 7,276 (42%) Mid-age and 5,594 (32%) Older (NB: this does not

represent the proportion of women surveyed who gave consent, but the proportion of each age in the PBS data).

Distribution of total number of claims by age group

Table B-6 presents the distribution of total PBS claims by age group in 2002 and 2003. For both years, over 70% of claims were made by Older women, with the Younger women accounting for fewer than 5% of all claims, and Mid-age women making approximately 24%.

Table B-6 Breakdown of total number of PBS claims by age group: 2002 and 2003

Cohort	2002		2003	
	Number	Percent	Number	Percent
Younger	12,792	4.2	12,498	3.9
Mid-age	72,809	23.8	80,523	24.8
Older	220,128	72.0	231,137	71.3
TOTAL	305,729		324,158	

B.2.3 PBSDATA - 2002

The PBSDATA02.txt file was merged with the IDs of the 17,226 consenting women. This results in a file with n=305,729 records. This file now includes records for those women who consented to have their PBS data queried, but had no actual claims in the year 2002. These records contain the woman's ID number and the remaining fields are empty.

What percentage of women in each age group had no PBS claim in 2002?

Table B-7 gives a breakdown of the number of women in each age group who did not have any PBS claims in the year 2002.

Table B-7 Percentage of women in each age group with and without PBS claims, 2002

Cohort	Claims		No Claims		TOTAL
	Number	Percent	Number	Percent	
Younger	1,528	35.0	2,828	65.0	4,356
Mid-age	4,154	57.1	3,122	42.9	7,276
Older	5,328	95.2	266	4.8	5,594
TOTAL	11,010		6,216		17,226

What are the most highly prescribed medications for each age group in 2002?

Table B-8 counts across ALL scripts dispensed, counting repeat prescriptions as multiple cases, while Table B-9 counts by individuals, with repeats not included in the count.

Table B-8 Top Ten prescriptions by volume, 2002: By Prescription

PBS Code	Medication Name and Type	N	Rank
Younger			
08220P	CITALOPRAM HYDROBROMIDE antidepressant	485	1
01394J	LEVONORGESTREL WITH ETHINYLOESTRADIOL contraceptive pill	352	2
02237R	SERTRALINE HYDROCHLORIDE antidepressant	349	3
02242B	PAROXETINE HYDROCHLORIDE antidepressant	329	4
02236Q	SERTRALINE HYDROCHLORIDE antidepressant	314	5
01214X	CODEINE PHOSPHATE	284	6
01392G	LEVONORGESTREL WITH ETHINYLOESTRADIOL contraceptive pill	235	7
01215Y	CODEINE PHOSPHATE WITH PARACETAMOL	229	8
08288F	SALBUTAMOL SULFATE ventolin	222	9
08302Y	VENLAFAXINE HYDROCHLORIDE antidepressant	212	10
Mid-age			
08333N	OMEPRAZOLE MAGNESIUM peptic ulcer	2,556	1
08440F	CELECOXIB arthritis (celebrex)	2,207	2
08472X	ROFECOXIB arthritis (Vioxx)	1,488	3
08214H	ATORVASTATIN CALCIUM lipid lowering	1,412	4
08213G	ATORVASTATIN CALCIUM lipid lowering	1,221	5
02242B	PAROXETINE HYDROCHLORIDE antidepressant	1,056	6
02012X	SIMVASTATIN lipid lowering	1,032	7
02236Q	SERTRALINE HYDROCHLORIDE antidepressant	997	8
08405J	IRBESARTAN WITH HYDROCHLOROTHIAZIDE heart	983	9
08247C	IRBESARTAN high blood pressure	970	10
Older			
01746X	PARACETAMOL	6,737	1
08333N	OMEPRAZOLE MAGNESIUM peptic ulcer	5,734	2
01081X	ATENOLOL beta-blocking agent	5,301	3
08511Y	ALENDRONATE SODIUM osteoporosis	5,241	4
08440F	CELECOXIB arthritis (celebrex)	4,616	5
02012X	SIMVASTATIN lipid lowering	3,903	6
08243W	LATANOPROST eye drops	3,102	7
01978D	RANITIDINE HYDROCHLORIDE peptic ulcer	3,052	8
08213G	ATORVASTATIN CALCIUM cholesterol	2,715	9
02089Y	TEMAZEPAM sleeping tablets	2,664	10

Table B-9 Top Ten prescriptions by individuals, 2002: By Prescription

PBS Code	Medication Name and Type	Rank
Younger		
08487Q	08487Q ETONOGESTREL contraceptive pill	1
01394J	LEVONORGESTREL WITH ETHINYLOESTRADIOL contraceptive pill	2
01392G	LEVONORGESTREL WITH ETHINYLOESTRADIOL contraceptive pill	3
01889K	01889K AMOXYCILLIN general antibiotic	4
01215Y	CODEINE PHOSPHATE WITH PARACETAMOL	5
08220P	CITALOPRAM HYDROBROMIDE antidepressant	6
02236Q	SERTRALINE HYDROCHLORIDE antidepressant	7
08288F	SALBUTAMOL SULFATE ventolin	8
03119E	CEPHALEXIN general antibiotic	9
02237R	SERTRALINE HYDROCHLORIDE antidepressant	10
Mid-age		
08440F	CELECOXIB arthritis (celebrex)	1
08333N	OMEPRAZOLE MAGNESIUM peptic ulcer	2
08472X	ROFECOXIB arthritis (Vioxx)	3
02852D	INFLUENZA VACCINE	4
01215Y	CODEINE PHOSPHATE WITH PARACETAMOL	5
01734G	OESTROGENS - CONJUGATED~(56) – HRT	6
08471W	ROFECOXIB arthritis (Vioxx)	7
01215Y	CODEINE PHOSPHATE WITH PARACETAMOL panadeine forte	8
03119E	CEPHALEXIN general antibiotic	9
08288F	SALBUTAMOL SULFATE ventolin	10
Older		
01746X	PARACETAMOL	1
03119E	CEPHALEXIN general antibiotic	2
02089Y	TEMAZEPAM sleeping tablets	3
08440F	CELECOXIB arthritis (celebrex)	4
08333N	OMEPRAZOLE MAGNESIUM peptic ulcer	5
08202Q	ASPIRIN	6
01903E	PNEUMOCOCCAL VACCINE	7
03117C	CALCIUM	8
01081X	ATENOLOL beta-blocking agent	9
08511Y	ALENDRONATE SODIUM osteoporosis	10

What is the distribution of the number of PBS claims for each woman (by age group) in 2002?

In this analysis, repeats are counted as multiple claims. Table B-10 shows some basic statistics for the distribution of total number of PBS claims per woman, in each age group. The median number of claims for young women is 0, for Mid-age is 2, and for Older women 34. Maximum values may warrant further investigation as they may indicate extreme outliers. Table B-11 shows the same figures for unique medications (i.e. repeat prescriptions are not included). The median number of unique medications is 0 for Younger, 1 for the Mid-age and 8 for Older women.

Table B-10 Descriptive statistics for total PBS claims, 2002, by age group

Cohort	Min	Q25	Median	Q75	Max
Younger	0	0	0	1	487
Mid-Age	0	0	2	12	301
Older	0	17	34	56	241

Table B-11 Descriptive statistics for Unique Medication claims, 2002, by age group

Cohort	Min	Q25	Median	Q75	Max
Younger	0	0	0	1	25
Mid-Age	0	0	1	3	58
Older	0	5	8	13	59

The maximum values, even for unique prescriptions, seem very high. Further investigation of a claim with 58 unique medications shows that the 'same' medication being counted twice as it has more than one PBS item number. This may occur for different dosages of the same medication, or different application methods of the same medication (e.g. cream vs. pills).

To continue with more representative results for the distributions of number of medications, the PBS data need to be merged with the ATC codes and considerable data checking and cleaning will need to be carried out. This work is in progress.

B.3 Medicare/PBS data received for consenting ALSWH participants

In this six-month period, Medicare/DVA and PBS/RPBS claims data for 2005 have been received from Medicare Australia, and the data files have been cleaned, checked and readied for analysis. To date 4,887,806 records have been received and a summary of the number of consenting women and the number of records received each year since 1995 is shown in Table B-12 to Table B-15

Table B-12 Number of consenting ALSWH women 1995-2005 (new consent period began in 2002)

	1995, 1996	1997-1999	2000- 2001	2002- 2003	2004	2005
Younger	5,260	6,219	6,187	4,356	4,357	4,349
Mid-age	7,898	8,883	8,767	7,276	7,276	7,275
Older	6,542	7,531	7,259	5,594	5,522	5,494
TOTAL	19,700	22,633	22,213	17,226	17,155	17,118

Table B-13 Number of Medicare claims received 1995-2001 (first consent period)

	1995	1996	1997	1998	1999	2000	2001
Younger	48,790	53,217	62,554	63,375	64,989	64,706	65,628
Mid-age	85,955	87,733	100,963	103,924	107,687	110,963	117,994
Older	115,272	118,314	147,765	156,396	161,948	171,689	177,270
TOTAL	250,017	259,264	311,282	323,695	334,624	347,358	360,892

Table B-14 Number of Medicare claims received 2002-2005 (new consent period)

	2002	2003	2004	2005
Younger	49,480	49,957	57,005	62,685
Mid-age	99,430	102,356	124,053	131,396
Older	150,853	156,553	217,584	218,192
TOTAL	299,763	308,866	398,642	412,273

Table B-15 Number of PBS claims received for analysis 2002-2005 (new consent period)

	2002	2003	2004	2005
Younger	9,964	9,587	10,128	9,849
Mid-age	69,687	77,609	84,587	82,996
Older	219,862	230,817	239,902	236,142
TOTAL	299,513	318,013	334,617	328,987

B.3.1 Summarising the Medicare claims data

A large number of new variables are created for each woman for each year from the Medicare/DVA records. These new variables for each woman include:

- the number of GP attendances
- total GP charges
- total number of bulk-billed attendances
- total out of pocket costs for GP visits
- total number of GPs visited
- number of female GP attendances
- average out of pocket cost per GP attendance
- use of particular services such as annual health assessments.

B.3.2 Summarising the PBS claims data

The WHO uses the Anatomical Therapeutic Chemical (ATC) classification system and this system is internationally recognized as the standard classification system for drug consumption studies. The PBS/RPBS claims data have been matched to a file of ATC codes and PBS items numbers have been recoded, where possible. In the ATC classification system, the drugs are divided into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties.

Several projects have been using the linked data (see below), resulting in several conference presentations during 2006 and submitted papers.

- A166 Comparison of self-reported medications and PBS records
- A158 Use of the polypill among older women
- A150 Adequacy and equity of treatment for depression among older Australian women
- A134 Health care for women with diabetes living in rural areas
- A133 Women and arthritis: the burden of suffering for older Australian women.
- A115 Characteristics of frequent attenders at general practice
- A104 Health costs of inactivity and overweight
- A077 Use of Enhanced Primary Care services by older Australian women

For example, in Project A134, the use of particular types of medications for women with diabetes and without diabetes has been studied. To illustrate the types of analyses being undertaken, Figure B-4 shows the percent of older women with and without diabetes (determined by their survey responses) taking commonly prescribed medications (determined from their PBS records).

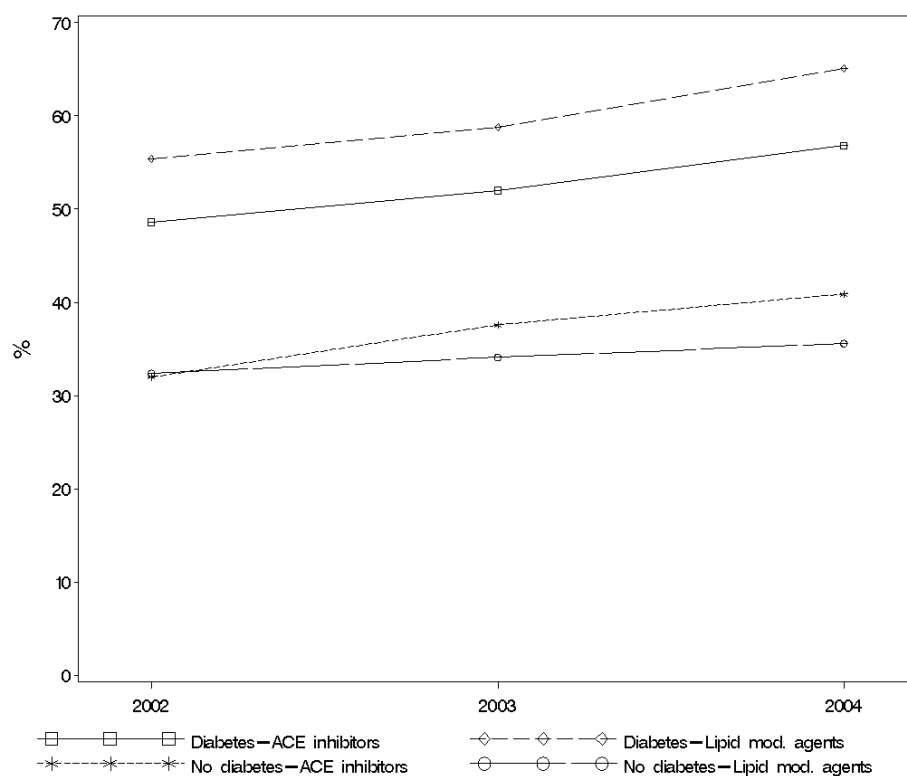


Figure B-4 Percent of older ALSWH women with diabetes and without diabetes taking ACE Inhibitors

These projects are continuing and will be considerably enhanced when data for all ALSWH participants become available under the new protocol that is currently being negotiated.

B.4 Progress on Medicare/PBS Linkage for all ALSWH participants

The progress on developing ethically appropriate strategies for linking all participants' survey data with Medicare and PBS unit records prospectively from 2005 onwards was discussed at the Project Advisory Committee (PAC) meeting on 16 February 2007. The Department of Health and Ageing is developing processes, including seeking ethics approval, to enable de-identified data linkage based on the WA Data Linkage model. Unfortunately, the implementation of these processes is not anticipated for some time.

Nationally, there is a lot of work being undertaken to explore the potential of health information data linkage and the role of data linkage units. Any issues identified in this work influence the development and pace of development of Departmental processes in relation to establishing a protocol for linkage with de-identified MBS/PBS data.

To avoid further delay, the Department of Health and Ageing will be asking Medicare Australia to consider again the ALSWH proposal for the release of data to be extended to cover all participants in the ALSWH study. More comprehensive documentation, including the revised linkage protocol, is currently being prepared for submission to Medicare Australia.

As explained to the ALSWH participants in the 2004, 2005 and 2006 newsletters and in the letters that accompany the surveys, the research based on the linked data will be conducted in accordance with relevant privacy requirements and other legislation protecting this information and is subject to final approval being granted by government and university ethics committees. The mechanisms to link to the Aged Care dataset and other sources of health service utilisation data will be explored once the MBS/PBS linkage has been established.

B.4.1 Medicare/PBS data summary files for consenting ALSWH participants

So far, the records for consenting women have been received and summarised for the years 1995-2005. Table B-16 shows the data extraction periods and costs associated with data extraction.

Table B-16 Amount charged by Medicare Australia (previously the Health Insurance Commission) for extraction and provision of data for the Australian Longitudinal Study on Women's Health

Time period	No of years	No of women (approx)	Amount charged	Records extracted
1995-1996	2 years, requested in 1997	20,000	\$ 10,300	MBS/DVA individual claims data for 20,000 consenters. Also aggregated descriptive data on non-consenting participants (20,000) and non-participants from the full sample of 106,000 women who were selected. Cost included set-up of programs and provision of data.
1997-1999	3 years, requested in 2000	23,000	\$5,247.60	MBS/DVA for individual consenters
2000-2001	2 years, requested in 2002	23,000	\$2,530.00	MBS/DVA for individual consenters
2002-2003	2 years, requested in 2004	17,000	\$4,720.00	MBS/DVA + PBS/RPBS for individual consenters
2004	1 year, requested in 2005	17,000	\$1,355.00	MBS/DVA + PBS/RPBS for individual consenters
2005	1 year, requested in 2006	17,000	\$3,620.00	MBS/DVA + PBS/RPBS for individual consenters

B.4.2 Summarising the Medicare claims data

The records for each year for each woman for 1997 to 2005 have been summarised for use by approved projects. The variables available in the Medicare summary files are shown in Table B-17.

Table B-17 Variables available in summary files for each year for each woman.

Variable explanation	Summary Variables	SAS Variable Name
ALSWH Study number - masked		IDalias
Cohort (younger = 1, mid-age = 2, older = 3)		Age
Deceased flag (alive = 0, deceased = 1)		Deceased
Year of death (value only if the participant is deceased)		DOD_Year
For each Broad Type of Service Category, 3 summary fields have been created	Amount Charged	BTOSC_?ch
	Benefit Amount	BTOSC_?ben
	Number of claims	BTOSC_?cl
Grand Total over all the BTOS categories (all claims)	Amount Charged	TOT_ch
	Benefit Amount	TOT_ben
	Number of claims	TOT_cl

Note: The SAS variable name represents the Broad Type of Service Category e.g. A, B, C, D, as described in Table B.18.

The definitions of the Broad Type of Service Categories (BTOSC) are shown in Table B-18 below. The full Medicare Benefits Schedule is available electronically:
at:<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/Medicare+Benefits+Schedule-2>

Table B-18 Broad Type of Service Categories in summary files for each year for each woman

BTOSC	Broad Type of Service Definitions
A *	Unreferred attendances - VRGP/GP (Vocationally registered General Practitioner / General Practitioner)
B *	Unreferred attendances - Other
C	Specialist attendances
D	Obstetrics
E	Anaesthetics
F	Pathology Tests
G	Diagnostic Imaging
H	Operations
I	Assistance at Operations
J	Optometry
K	Radiation Oncology
L	Miscellaneous
M *	Unreferred attendances - Enhanced Primary Care
N	Pathology Collection Items
O *	Services by a Practice Nurse on Behalf of a Medical Practitioner
P	Allied Health Services
X	DVA items not elsewhere classified

* When calculating number of attendances to General Practitioners, the BTOS categories 'A', 'B', 'M' and 'O' should generally be included to cover all general practice activity. The relative proportions of services in each of these categories varies over time.

B.4.3 Summarising the PBS claims data

Claims data for medications subsidised under the PBS have been available for consenting women since 2002. It is estimated nationally that the PBS data include approximately 80% of prescriptions dispensed. Whilst this dataset does not collect information on medications where there is no PBS subsidy or general preparations dispensed over-the-counter such as herbal, vitamin and mineral supplements, the database does give us a good indication of use of medications, particularly for the older cohort, over time.

PBS data have been summarised by year, with the totals of amount charged, benefit received and number of claims calculated for each participant. All years are summed to give overall participant totals for amount charged, benefit received and number of claims. Variable names and definitions are shown in Table B-19.

Table B-19 Variable names and definitions for PBS summary files for each consenting woman

Variable name	Interpretation
IDalias	IDalias – for consenting women only
Age	Age cohort (1=Younger, 2 = Mid-age, 3 = Older)
death	1 = deceased, 0 = alive
Year_death	Year of death if deceased, missing otherwise
Tfullcostyy **	Total amount charged to the woman for the specified year.
Tbenefityy **	Total benefits paid to woman for the specified year.
Tnoclaimsyy **	Total number of claims for the specified year.
Tot_ch	Total amount charged to the woman (IDalias) for the period from 2002-2005
Tot_ben	Total benefits paid to woman (IDalias) for the claims made from 2002-2005.
Tot_cl	Total number of claims for the specified period 2002-2005.

** These three fields will be repeated for all years the claims were available.

Several projects have been using linked survey and MBS/PBS data, resulting in several conference presentations and submitted papers. These projects are continuing and will be considerably enhanced when data for all ALSWH participants become available under the new protocol that is currently being negotiated.

B.5 Accuracy of medications data for Older 4

Data on medications taken by the women are available from two sources:

- Pharmaceutical Benefits Scheme (PBS) data
- self-report on their prescribed medications.

In Survey 4, the Older Women were asked to:

O4q69: Please write down the names of all your medications prescribed by a doctor. Where possible, copy names from the packets, or obtain a list from your regular pharmacist and return it with your survey.

Participants recorded medications in open-ended text format and the data were coded as described in the June 2007 Technical Report (28).

A similar question was included in Survey 5 for the Mid-age women. However these women were also asked to record over-the-counter medications.

For the Older women participating in Survey 4, these self-reported medications were compared with three and six months of PBS data. The PBS data was collated for the month the survey was returned and the two or five months retrospective of the month the survey was returned.

B.5.1 Assessment of agreement between self-reported medication use and PBS data

Of the 7,158 women that returned Survey 4, 6,495 (90.7%) had completed the self-reported medications question (q69). However, comparison of these self-reported medications could only be accurately matched to the PBS data for those 4,687 (66%) participants who consented to the release of their MBS/PBS data.

Among these women, 392 (8%) did not have any current medications according to Survey 4, and a similar percentage had no medications within three months of PBS data. When five months of PBS data were examined, 5% of women were found to have no medications recorded on PBS (see Table B-20).

Table B-20 Medication use by Older women at Survey 4

	Old 4	Consenters	
		PBS (3 Months)	PBS (6 months)
No medications	392 (8%)	338 (7%)	233 (5%)
Recorded medications	4,295 (92%)	4,349 (93%)	4,454 (95%)

Table B-21 shows the agreement between these two sources of data in terms of whether women have any medications or not. A number of the women who did not report medications on the survey were found to have medications within three months and six months of PBS data indicating that these women had under-reported their medication use. A total of 152 (3.2%) had no medication documented in either the survey data or the PBS (3 months) and 129 (2.8%) of participants had no medications for the survey and PBS (6 months) files.

Table B-21 Survey medications compared to PBS data for 3 months and 6 months

Survey	PBS (3 Months)			PBS (6 Months)		
	Yes	No	Total	Yes	No	Total
Yes	4,109 (87.7%)	186	4,295	4,191 (89.4%)	104	4,295
No	240	152 (3.2%)	392	263	129 (2.8%)	392
Total	4,349	338	4687	4,454	233	4,687

Table B-22 shows the mean number of medications for the Older women according to whether self-report or PBS data were used to estimate this number. The mean number obtained from the PBS data is higher than the number obtained from self-report.

Table B-22 Self-reported vs PBS data summary statistics

	Returned surveys in 2005 *	PBS - 3 months prior	PBS - 6 months prior
No of obs	4,687	4,687	4,687
Mean	4	5	7
Median	4	5	6
Min	0	0	0
Max	25	23	32

* sample excluded women that failed to return their survey in 2005

To further test the agreement between these two sources of medication data, self-reported medications were compared with PBS data for the two different time periods for groups of drugs listed in Table B-23, B-24 and B-25. These tables show the class of drug, the generic names of drugs in this group, and how these drugs are coded in the Anatomical Therapeutic Classification (ATC).

Table B-23 Diabetes medications

Medication category	Medication	ATC code
Insulin and Analogues	Insulins (Fast-acting, long-acting)	A10A
Oral blood glucose lowering drugs	Metformin, Sulfonamides, Glucosidase inhibitors, Thiazolidinediones etc	A10B

Table B-24 Anti-hypertensives, statins, aspirin and folic acid

Medication	ATC description	ATC code
Thiazide diuretic or Any Cardiac diuretic Any diuretic	Low-Ceiling Diuretics, Thiazides Diuretics	C03AA, C03AB03, C03AX01, C03EA01, C03BA11 C03
Angiotensin II receptor antagonists or Angiotensin converting enzyme inhibitor	Agents Acting On The Renin-Angiotensin System or Angiotensin-Converting Enzyme (Ace) Inhibitors, Plain Converting Enzyme Blockers	C09 or C09AA
Beta blocker	Beta Blocking Agents, Plain, Non-Selective And Non-Selective	C07AA, C07AB
Statin	Cholesterol- And Triglyceride Reducers HMG COA Reductase Inhibitors	C10AA
Aspirin	Platelet Aggregation Inhibitors Excl. Heparin (Aspirin)	B01AC06, N02AA59, N02AA51, N02BA01, N02BA51
Folic acid	Iron In Combination With Folic Acid	B03AD03, B03BB, B03AE02, B03AE01

Table B-25 Psychotropic medications

Medication category	Medication	ATC code
Depression Drugs	Tricyclics	N06AA
	SSRI	N06AB
	MAOI	N06AF, N06AG
	Other	N06AX
Acting on Nervous System Drugs	Anxiolytics	N05B
	Hypnotics	N05C

Table B-26 reports the prevalence of use of these drugs according to self-reported medications and six months of PBS data, and the agreement between these two measures (the proportion of women consistently classified as taking or not taking the drug according to both data sources). Sensitivity (the probability that a woman identified as taking a medication according to PBS data will report this medication on her survey) and specificity (the probability that a woman who is not taking a medication will not report this on her survey) are also shown in Table B-26. The positive predictive value (PPV) indicates the probability that a woman reporting a medication will also be found to be using this medication on PBS data. Negative Predictive Value (NPV) is the probability that a woman who does not report the medication will also be found to be not taking this medication according to PBS data.

Prevalence of medication use is generally higher in PBS data except for Aspirin intake. This could be accounted for by over-the-counter purchases of Aspirin which will not appear in the PBS data. Specificity is high for all medication use. Overall agreement and Sensitivity are highest for glucose lowering drugs and lowest for nervous system medications. PPV and NPV are generally high, except for Aspirin and folic acid which can be purchased over-the-counter without prescription.

Table B-27 shows self-reported medications and three months of PBS data. Prevalence of medication use is still generally higher in PBS data except for Aspirin intake which is twice as high in self-reported data. Sensitivities tend to be higher in this table, but are still low for nervous system drugs. These drugs may be used on a short-term or as needed basis and so recent prescriptions recorded on PBS may not reflect current use at the time of the survey.

In general, this analysis indicates good agreement between these two sources of medication information for most of the groups of medications assessed. The findings are similar to other research involving a separate sample of Older people in Australia that compared the same groups of drugs (Pit & Byles, In Press). Care must be taken when using PBS data as a source of information about drugs that can be bought over-the-counter or that are used as needed. Consideration must also be given to the time-frame when using PBS data to identify current prescriptions as some medications may not appear within a three month window if a prescription has not been completed in this time-period. Medications that are not covered under the PBS scheme will also be under-represented in PBS data and self-report is a better source of information on the use of these medicines.

B.5.2 References

The ATC/DDD system, available at <http://www.whocc.no/atcddd/>

Pit S & Byles J. Agreement and accuracy between telephone self-report of drug use in Older people and pharmaceutical claims data. *Drugs and Ageing* (In Press).

Table B-26 Prevalence of self-report and pharmaceutical claims data, observed agreement, sensitivity, specificity and positive and negative predictive value of self-report compared with six months of pharmaceutical claims data among 4,687 participants

Prescription drug group	Prevalence		Observed agreement		Sensitivity		Specificity		PPV	NPV
	SR	PBS	%	95% CI	%	95% CI	%	95% CI	%	%
Insulin	0.9%	1.2%	72%	(62, 82)	63%	(50, 75)	99.8%	(99.7, 99.9)	85%	99%
Glucose lowering	6%	6%	94%	(92, 96)	91%	(88, 94)	99.8%	(99.7, 99.9)	98%	99%
Thiazide	9%	10%	85%	(82, 87)	82%	(79, 86)	99%	(98.7, 99.4)	90%	98%
Angiotensin	46%	50%	88%	(86, 89)	89%	(88, 90)	98.5%	(98, 99)	98%	90%
Beta Blockers	20%	23%	83%	(81, 85)	80%	(77, 82)	98.5%	(98, 99)	94%	94%
Statin	32%	36%	90%	(89, 91)	89%	(87, 90)	99.3%	(99, 99.6)	99%	94%
Aspirin	33%	25%	50%	(47, 52)	75%	(72, 77)	80%	(79, 82)	55%	91%
Folic acid	3%	3.5%	60%	(54, 67)	60%	(52, 67)	98.8%	(98.4, 99.1)	63%	99%
Depression	12%	16%	80%	(77, 82)	72%	(68, 75)	99.6%	(99.4, 99.8)	97%	95%
Nervous System	10%	21%	44%	(41, 48)	37%	(34, 40)	98%	(97.6, 98.5)	83%	85%

Table B-27 Prevalence of self-report and pharmaceutical claims data, observed agreement, sensitivity, specificity and positive and negative predictive value of self-report compared with three months of pharmaceutical claims data among 4,687 participants

Prescription drug group	Prevalence		Observed agreement		Sensitivity		Specificity		PPV	NPV
	SR	PBS	%	95% CI	%	95% CI	%	95% CI	%	%
Insulin	0.9%	0.8%	60%	(47, 73)	66%	(50, 81)	99.6%	(99.4, 99.8)	56%	99%
Glucose lowering	6%	6%	88%	(85, 91)	92%	(88, 95)	99.1%	(98.7, 99.4)	86%	99%
Thiazide	9%	7%	75%	(72, 79)	88%	(85, 92)	97%	(96.6, 97.6)	69%	99%
Angiotensin	46%	48%	87%	(86, 88)	91%	(90, 92)	96%	(95,97)	95%	92%
Beta Blockers	20%	20%	79%	(76, 81)	81%	(79, 84)	96%	(95.5, 96.8)	84%	95%
Statin	32%	34%	90%	(89, 91)	91%	(89, 92)	98%	(97.5, 98.5)	96%	95%
Aspirin	33%	15%	35%	(33, 38)	79%	(76, 82)	75%	(73, 76)	35%	95%
Folic acid	3%	2%	48%	(40, 55)	65%	(55, 75)	98%	(97.6, 98.4)	39%	99%
Depression	12%	14%	82%	(79, 84)	78%	(75, 81)	98.9%	(98.6, 99.3)	92%	97%
Nervous System	10%	16%	47%	(44, 51)	43%	(39, 46)	96.8%	(96.3, 97.4)	72%	90%

B.6 Comparison of consenters and non-consenters to Medicare and PBS linkage

Research based on linked records has the potential to make a major contribution to the understanding of the factors influencing health and wellbeing and will become increasingly important in the evaluation of health services. The ALSWH provides the opportunity to link survey data and Medicare data for large numbers of women. This section reports the results of several postal requests for consent to record linkage and the socio-demographic characteristics of the women who consented to linkage as of 2005.

B.6.1 Consent to data access

Women were asked to provide consent to access to Medicare data in 1996, after completing Survey 1. This consent was not enduring and needed to be re-obtained for 2000 onwards. This new consent also included access to PBS data and other health service records.

A summary of the number of consenting women each year since 1996 is shown Table B-28 and Figure B-5

Table B-28 Number of consenting ALSWH women 1995-2005 (new consent period began in 2002)

	Original consent period			New consent period		
	1995-1996	1997-1999	2000-2001	2002- 2003	2004	2005
Younger	5,260	6,219	6,187	4,356	4,357	4,349
Mid-age	7,898	8,883	8,767	7,276	7,276	7,275
Older	6,542	7,531	7,259	5,594	5,522	5,494
TOTAL	19,700	22,633	22,213	17,226	17,155	17,118

There was an accumulation of consent during the period 1996-2001, but a reduction in the number of consents during the second consent gaining period. Some of this effect is due to attrition in the cohort. The request for renewed consent resulted in a further 3,000 women giving consent. However while the details for new consenters were added, women who had withdrawn from the study were excluded from the data extraction process for that period. Hence the number of consenters differs for each data extraction period.

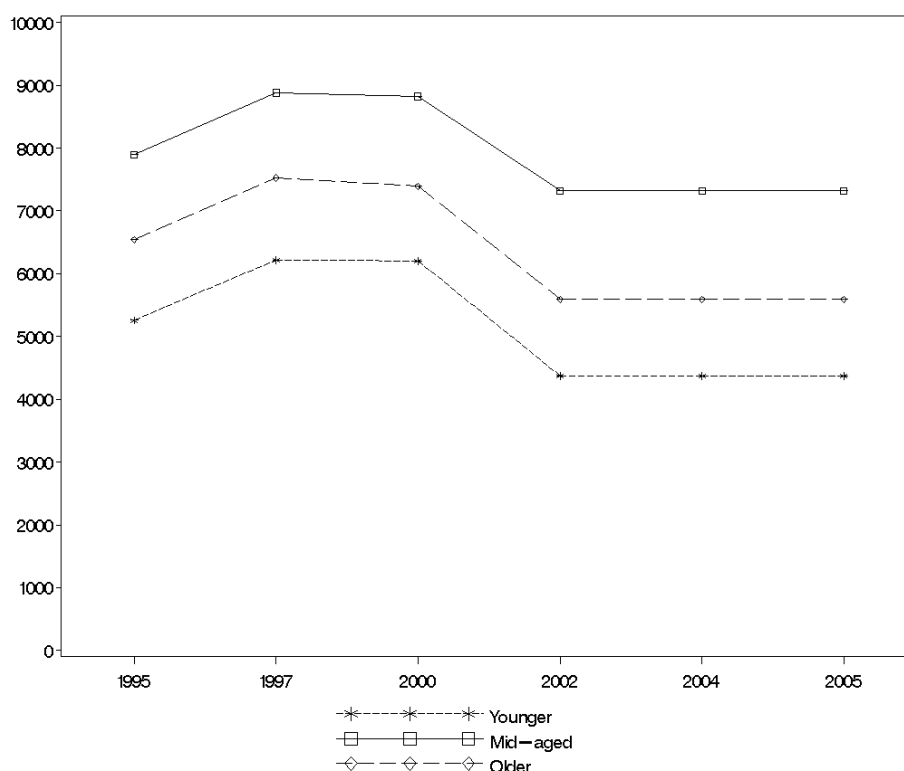


Figure B-5 Number of consenting women for each period

Comparisons of consenters and non-consenters at the time of completing Survey 4 are shown in Table B-29 and B-30 (Mid 4 in 2004, Old 4 in 2005, Young 4 in 2006). There were significant but small differences between consenters and non-consenters according to area of residence (Table B-29)⁴. Women who gave consent to linkage in all three age cohorts tended to be better educated and were more likely to be able to manage on their available income (Table B-30)⁵. These findings provide evidence of a socioeconomic bias among the consenters.

Among the Younger and Mid-age cohorts, consenters were more likely to say their health was excellent, very good or good than non-consenters, but there were no differences in self rated health between consenters and non-consenters among the Older cohort.

Table B-29 Percentage of consenters versus non-consenters by area of residence

Area	Younger cohort			Mid-age cohort			Older cohort		
	Consent			Consent			Consent		
	Yes %	No %	p	Yes %	No %	p	Yes %	No %	p
	0.056			<0.0001			<0.0001		
Major City	56	55		34	34		44	44	
Inner Regional	26	28		42	38		38	34	
Outer Regional	15	14		20	22		16	19	
Remote	3	3		3	6		2	3	

⁴ Area of residence is based on ARIA+ scores, the most recent aria-plus scores differ between cohorts (y3aria+, m4aria+, o3aria+). Unfortunately the Younger and Older cohorts do not have an aria-plus score for Survey 4. For the purpose of this report the figures for those Mid-age women that completed Survey 4 use m3aria+ which may be more useful.

⁵ Education was measured at Survey 1 for the Mid-age and Older cohorts, and at Survey 4 for the Younger cohort.

Table B-30 Comparison of consenters and non-consenters at Survey 4

	Younger cohort			Mid-age cohort			Older cohort		
	Consent			Consent			Consent		
	Yes %	No %	p	Yes %	No %	p	Yes %	No %	p
Consented	43	57		64	36		66	34	
School Education only	18	25	<0.0001	58	68	<0.0001	80	85	<0.0001
Self-rated health									
Excellent/very good/good	70	62	<0.0001	88	84	<0.0001	92	92	0.3
Fair/poor	30	38		12	16		8	8	
Diabetes	2	2	0.7	6	8	0.0003	14	15	0.1
BMI			0.1			0.1			0.2
Underweight	4	4		1	1		4	5	
Acceptable	58	57		41	42		51	48	
Overweight	23	22		34	32		32	34	
Obese	15	17		23	25		13	14	
Self-reported number of GP visits			0.5			0.003			0.9
None	5	5		6	8		1	1	
1-4	64	65		64	61		35	34	
5 or more	31	30		30	31		64	65	
Able to manage on income	61	59	0.006	65	58	<0.0001	81	75	<0.0001

Appendix C. Additional tables for Section 2: Trends in medication use and costs

Table C-1 Five most commonly prescribed medication types in main anatomical groups of drugs prescribed to women in the Younger cohort in 2005

Anatomical Group (ATC Level 1)	Therapeutic Sub-group (ATC Level 3)	Number and percentage of women with at least one claim in 2005	
		N	%
N-Nervous system			10.9
	N06A Antidepressants	360	8.3
	N02A Opioids	85	1.9
	N05A Antipsychotics	47	1.1
	N03A Antiepileptics	41	0.9
	N05B Anxiolytics	32	0.7
G-Genito urinary system and sex hormones			9.9
	G03A Hormonal contraceptives for systemic use	279	6.4
	G03D Progestogens	58	1.3
	G03G Gonadotropins and other ovulation stimulants	51	1.2
	G02B Contraceptives for topical use	44	1.0
	G02C Other gynecologicals	10	0.2
J-Anti-infectives			9.0
	J01C Beta-lactam antibacterials, penicillins	171	3.9
	J01D Other beta-lactam antibacterials	97	2.2
	J01F Macrolides, lincosamides and streptogramins	87	2.0
	J05A Direct acting antivirals	63	1.5
	J01A Tetracyclines	32	0.7
A-Alimentary tract and metabolism			5.4
	A02B Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	123	2.8
	A01A Stomatological preparations	36	0.8
	A10A Insulins and analogues	30	0.7
	A03F Propulsives	29	0.7
	A02B Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	123	2.8
R-Respiratory system			7.0
	R03A Adrenergics, inhalants	210	4.8
	R03B Other drugs for obstructive airway	110	2.5

	diseases, inhalants		
R05D	Cough suppressants, excl. combinations with expectorants	4	0.1
R06A	Antihistamines for systemic use	2	0.1
R03D	Other systemic drugs for obstructive airway diseases	2	0.0

Table C-2: Five most commonly claimed medication types in main anatomical groups of drugs claimed by women in the Mid-age cohort in 2005

Anatomical Group (ATC Level 1)	Therapeutic Sub-group (ATC Level 3)	Number and percentage of women with at least one claim in 2005	
		N	%
C-Cardiovascular system			28.4
	C10A Lipid modifying agents, plain	1,182	16.5
	C09A ACE inhibitors, plain	370	5.2
	C09C Angiotensin II antagonists, plain	349	4.9
	C09D Angiotensin II antagonists, combinations	292	4.1
	C08C Selective calcium channel blockers with mainly vascular effects	242	3.4
N-Nervous system			21.8
	N06A Antidepressants	1,025	14.3
	N02A Opioids	379	5.3
	N02B Other analgesics and antipyretics	274	3.8
	N05C Hypnotics and sedatives	180	2.5
	N05B Anxiolytics	172	2.4
A-Alimentary tract and metabolism			21.7
	A02B Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	1,170	16.3
	A10B Oral blood glucose lowering drugs	203	2.8
	A12A Calcium	127	1.8
	A01A Stomatological preparations	109	1.5
	A03F Propulsives	92	1.3
M-Musculo-skeletal system			15.5
	M01A Anti-inflammatory and antirheumatic products, non-steroids	925	12.9
	M05B Drugs affecting bone structure and mineralization	192	2.7
	M04A Antigout preparations	34	0.5
	M03B Muscle relaxants, centrally acting agents	11	0.2
	M01C Specific antirheumatic agents	1	0.0
J-Anti-infectives for systemic use			
	J01C Beta-lactam antibacterials, penicillins	535	7.5
	J07B Viral vaccines	433	6.0
	J01D Other beta-lactam antibacterials	432	6.0
	J01F Macrolides, lincosamides and streptogramins	305	4.3
	J01E Sulfonamides and trimethoprim	138	1.9

Table C-3 Five most commonly claimed medication types in main anatomical groups of drugs claimed by women in the Older cohort in 2005

Claimed by women in the Older cohort in 2005				
Anatomical Group (ATC Level 1)	Therapeutic Sub-group (ATC Level 3)		Number and percent of women with at least one claim in 2005	
			N	%
C-Cardiovascular system				74.4
	C10A	Lipid modifying agents, plain	2,064	37.8
	C07A	Beta blocking agents	1,345	24.6
	C09A	ACE inhibitors, plain	1,292	23.6
	C08C	Selective calcium channel blockers with mainly vascular effects	1,025	18.8
	C09C	Angiotensin II antagonists, plain	975	17.8
N-Nervous system				61.1
	N02B	Other analgesics and antipyretics	1,915	35.0
	N06A	Antidepressants	1,002	18.3
	N02A	Opioids	995	18.2
	N05C	Hypnotics and sedatives	985	18.0
	N05A	Antipsychotics	612	11.2
A-Alimentary tract and metabolism				57.0
	A02B	Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	2,057	37.6
	A12A	Calcium	935	17.1
	A10B	Oral blood glucose lowering drugs	360	6.6
	A12B	Potassium	317	5.8
	A06A	Laxatives	311	5.7
J-Anti-infectives				52.6
	J01D	Other beta-lactam antibacterials	1,341	24.5
	J01C	Beta-lactam antibacterials, penicillins	1,246	22.8
	J01F	Macrolides, lincosamides and streptogramins	752	13.8
	J01E	Sulfonamides and trimethoprim	535	9.8
	J01A	Tetracyclines	237	4.3
M-Musculo-skeletal system				43.2
	M01A	Anti-inflammatory and antirheumatic products, non-steroids	1,394	25.5
	M05B	Drugs affecting bone structure and mineralization	1,186	21.7
	M04A	Antigout preparations	225	4.1
	M03B	Muscle relaxants, centrally acting agents	14	0.3
	M02A	Topical products for joint and muscular pain	4	0.1

Table C-4 Data used to compile Figure 2-1. Ten Most Common Therapeutic Sub-Groups (ATC Code Level 3) for (a) Younger, (b) Mid-age and (c) Older cohorts.

Table C-4a: Younger cohort (2005)

Therapeutic sub-group		%
N06A	Antidepressants	8
G03A	Hormonal contraceptives for systemic use	6
R03A	Adrenergics, inhalants	5
J01C	Beta-lactam antibacterials, penicillins	4
A02B	Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	3
R03B	Other drugs for obstructive airway diseases, inhalants	3
J01D	Other beta-lactam antibacterials	2
M01A	Anti-inflammatory and antirheumatic products, non-steroids	2
J01F	Macrolides, lincosamides and streptogramins	2
N02A	Opioids	2

Table C-4b: Mid-age cohort (2005)

Therapeutic sub-group		%
A02B	Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	17
C10A	Lipid modifying agents, plain	16
N06A	Antidepressants	14
M01A	Anti-inflammatory and antirheumatic products, non-steroids	13
G03C	Estrogens	8
R03A	Adrenergics, inhalants	8
J01C	Beta-lactam antibacterials, penicillins	8
J07B	Viral vaccines	7
J01D	Other beta-lactam antibacterials	6
C09A	ACE inhibitors, plain	6

Table C-4c: Older cohort (2005)

Therapeutic sub-group		%
C10A	Lipid modifying agents, plain	38
A02B	Drugs for peptic ulcer and gastro-oesophageal reflux disease (GORD)	38
B01A	Antithrombotic agents	37
N02B	Other analgesics and antipyretics	35
M01A	Anti-inflammatory and antirheumatic products, non-steroids	26
C07A	Beta blocking agents	25
D07A	Corticosteroids, plain	25
J01D	Other beta-lactam antibacterials	25
C09A	ACE inhibitors, plain	24
J01C	Beta-lactam antibacterials, penicillins	23

C.1 Additional data for costs of medications (Table 2.3)

Tables C-5 to C-7 list the highest median full costs per claim for medications within each of the ten most commonly claimed therapeutic sub-groups for each cohort (as identified in Table 2-3). The range of full cost for each medication is also shown.

Table C.5 lists the highest cost medications for 2005 among Younger women. For example, the Median full cost of Venlafaxine for Younger women is \$52.10 (Range: \$35.20-\$147.10). In comparison, the median cost of this medication for Mid-age women is \$43.60 (Range: 24.30, 198.30) (See Table C-6). The highest Median cost medication for Younger women was Etonogestrel at \$220.50 per prescription.

Table C-5 Three highest cost medications in each sub-group in 2005 for Younger women

Therapeutic Sub-group	ATC Code	Full Cost	
		Median	Range
A02B Peptic Ulcer and GORD	A02BD06-Esomeprazole, amoxicillin and clarithromycin	97.9	(97.8, 98.0)
	A02BC05-Esomeprazole	75.3	(37.8, 75.5)
	A02BC04-Rabeprazole	46.5	(38.0, 170.8)
G03A	G03AC08-Etonogestrel	220.5	(220.5, 220.7)
H03A Hormonal contraceptive	G03AC01-Norethisterone	15.3	(15.3, 15.5)
	G03AB03-Levonorgestrel and estrogen	15.3	(15.3, 15.6)
J01C	J01CR02-Amoxicillin and enzyme inhibitor	17.1	(11.2, 78.8)
Beta-lactam antibacterials, penicillin	J01CF05-Flucloxacillin	18.6	(11.5, 23.5)
	J01CF01-Dicloxacillin	18.6	(11.6, 18.8)
J01D	J01DD04-Ceftriaxone	107.4	(66.7, 148.1)
Other Beta- lactam antibacterials	J01DB04-Cefazolin	63.3	(58.6, 68.1)
	J01DB03-Cefalotin	36.5	(29.4, 43.5)
J01F	J01FA10-Azithromycin	22.1	(22.0, 22.1)
Macrolides, lincosamides and streptogramins	J01FF01-Clindamycin	18.5	(18.5, 18.5)
	J01FA09-Clarithromycin	18.2	(14.7, 19.6)
M01A	M01AC06-Meloxicam	32.5	(23.8, 32.7)
Anti- inflammatory/ antireumatic, non-steroids	M01AH01-Celecoxib	31.1	(30.5, 57.5)
	M01AB01-Indometacin	20.6	(12.6, 20.6)
N02A	N02AB03-Fentanyl	103.6	(24.4, 171.4)
Opioids	N02AA01-Morphine	70.6	(18.9, 70.8)
	N02AE01-Buprenorphine	35.7	(35.7, 55.8)
N06A	N06AX16-Venlafaxine	52.1	(35.2, 147.1)
Antidepressants	N06AG02-Moclobemide	48.5	(23.9, 92.3)
	N06AX11-Mirtazapine	36.2	(32.3, 87.7)
R03A Adrenergics, inhalants	R03AK06-Salmeterol and other drugs for obstructive airway diseases	79.5	(45.9, 79.9)
	R03AK07-Formoterol and other drugs for obstructive airway diseases	58.9	(54.3, 88.1)
	R03AC13-Formoterol	34.5	(34.4, 34.6)
R03B	R03BB04-Tiotropium bromide	77.9	(77.7, 77.9)
Other drugs for obstructive airways disease	R03BB01-Ipratropium bromide	52.8	(22.1, 59.8)
	R03BA08-Ciclesonide	40.2	(40.2, 40.2)

Table C-6 lists the drugs with the highest median full costs for each of the ten most popular therapeutic sub-groups for Mid-age women. The highest median cost prescription for Mid-age women was for Hydromorphone at a cost of \$336.10 per claim.

Table C-6 Three highest cost medications in each sub-group for 2005 for Mid-age women

Therapeutic Sub-group	ATC Code	Full Cost	
		Median	Range
A02B Drugs for peptic ulcer and GORD	A02BD-Combinations for eradication of Helicobacter pylori	98.1	(98.1, 98.3)
	A02BD06-Esomeprazole, amoxicillin and clarithromycin	97.9	(97.8, 98.2)
	A02BC05-Esomeprazole	46.3	(31.8, 146.1)
C10A Lipid modifying agents, plain	C10AA05-Atorvastatin	115.4	(115.3, 115.7)
	C10AA03-Pravastatin	75.7	(56.5, 146.7)
	C10AX09-Ezetimibe	71.5	(71.4, 71.6)
G03C Estrogens	G03CA03-Estradiol	16.4	(10.3, 34.0)
	G03CA04-Estriol	16.1	(10.7, 34.0)
	G03CA57-Conjugated estrogens	12.3	(5.7, 12.7)
J01C Beta-lactam antibacterials, penicillins	J01CR03-Ticarcillin and enzyme inhibitor	152.2	(85.0, 169.5)
	J01CE01-Benzylpenicillin	39.6	(39.6, 213.9)
	J01CE09-Procaïne penicillin	52.4	(52.4, 52.4)
J01D Other beta-lactam antibacterials	J01DB04-Cefazolin	68.1	(68.1, 575.1)
	J01DA13-Other Beta-Lactam Antibacterials	90.8	(90.8, 90.8)
	J01DD04-Ceftriaxone	82.2	(62.0, 148.1)
J07B Viral vaccines	J07BB- Influenza vaccines	17.8	(17.8, 18.1)
M01A Anti-inflammatory /antirheumatic products, non-steroids	M01AH01-Celecoxib	31.1	(18.2, 57.7)
	M01AC06-Meloxicam	32.5	(23.0, 32.7)
	M01AB01-Indometacin	20.6	(8.7, 20.8)
N02A Opioids	N02AA03-Hydromorphone	336.1	(110.3, 1,547.6)
	N02AB03-Fentanyl	112.8	(24.3, 991.8)
	N02AA01-Morphine	36.1	(6.1, 601.4)
N06A Antidepressants	N06AF03-Phenelzine	198.3	(101.5, 198.5)
	N06AX16-Venlafaxine	43.6	(24.3, 198.3)
	N06AB10-Escitalopram	31.3	(27.9, 120.9)
R03A Adrenergics, inhalants	R03AK06-Salmeterol and other drugs for obstructive airway diseases	79.5	(45.9, 154.5)
	R03AK07-Formoterol and other drugs for obstructive airway diseases	58.9	(54.3, 88.1)
	R03AC12-Salmeterol	34.4	(34.4, 64.3)

Table C-7 lists the three highest median full cost medications for each of the ten most commonly claimed therapeutic sub-groups for Older women. The highest cost prescription in this list was Abciximab at a median full cost of \$1531.40 per claim.

Table C-7 Three highest cost medications in each sub-group for 2005 for Older women

Therapeutic Sub-group	ATC Code	Full Cost	
		Median	Range
A02B Drugs for peptic ulcer and GORD	A02BD-Combinations for eradication of Helicobacter pylori	98.1	(98.1, 98.4)
	A02BD06-Esomeprazole, amoxicillin and clarithromycin	97.8	(84.7, 98.1)
	A02BC05-Esomeprazole	46.3	(37.8, 145.9)
B01A Antithrombotic agents	B01AC13-Abciximab	1,531.4	(1,531.3, 1,531.6)
	B01AC04-Clopidogrel	84.1	(72.2, 84.6)
	B01AB05-Enoxaparin	57.7	(14.9, 156.2)
C07A Beta blocking agents	C07AG02-Carvedilol	88.5	(12.9, 214.2)
	C07AB07-Bisoprolol	68.1	(46.1, 156.8)
	C07AA07-Sotalol	17.1	(11.2, 31.5)
C09A ACE inhibitors, plain	C09AA01-Captopril	27.1	(0.5, 49.1)
	C09AA06-Quinapril	26.2	(17.1, 48.0)
	C09AA02-Enalapril	25.8	(14.8, 54.7)
C10A Lipid modifying agents, plain	C10AA05-Atorvastatin	115.4	(100.6, 115.7)
	C10AA03-Pravastatin	75.7	(64.5, 146.7)
	C10AX09-Ezetimibe	71.5	(71.4, 71.7)
D07A Corticosteroids, plain	D07AC13-Mometasone	10.5	(10.4, 82.9)
	D07AC14-Methylprednisolone aceponate	10.4	(10.4, 72.5)
	D07AB09-Triamcinolone	13.3	(9.0, 13.6)
J01C Beta-lactam antibacterials, penicillins	J01CR03-Ticarcillin and enzyme inhibitor	152.2	(97.0, 169.5)
	J01CE01-Benzylpenicillin	39.6	(22.1, 39.6)
	J01CE-Beta-lactamase sensitive penicillins	22.2	(22.2, 22.3)
J01D Other beta-lactam antibacterials	J01DE01-Cefepime	188.2	(188.1, 340.1)
	J01DA13-Other Beta-Lactam Antibacterials	90.9	(90.8, 156.8)
	J01DD04-Ceftriaxone	82.2	(20.4, 148.1)
M01A Anti-inflammatory /antirheumatic products, non-steroids	M01AB55-Diclofenac, combinations	34.7	(34.7, 34.9)
	M01AH01-Celecoxib	31.1	(11.9, 57.7)
	M01AC06-Meloxicam	31.3	(7.8, 60.4)
	N02BA11-Diflunisal	15.0	(14.9, 15.2)
N02B Other analgesics and antipyretics	N02BA51-Acetylsalicylic acid, comb. excl. psycholeptics	11.6	(11.5, 11.8)
	N02BE51-Paracetamol, combinations excl. psycholeptics	9.8	(5.6, 11.2)

Table C-8 The twenty highest costing medications claimed for each ALSWH cohort for 2005

Cohort	ATC Code	ATC Description	Full Cost	
			Median	Range
Younger	L01XX28	Imatinib	3,928.0	(3,928.0, 3,928.0)
	L03AX13	Glatiramer acetate	1,090.9	(1,090.9, 6,522.1)
	V06DX	Other combinations of nutrients	1,335.0	(1,334.9, 1,419.4)
	L03AB08	Interferon beta-1b	1,178.5	(1,178.4, 1,178.5)
	G03GA05	Follitropin alfa	868.1	(580.3, 868.1)
	G03GA06	Follitropin beta	771.3	(771.3, 771.3)
	J05AB09	Famciclovir	415.4	(159.0, 415.6)
	L02AE03	Goserelin	341.6	(341.6, 341.8)
	L04AA01	Ciclosporin	414.8	(109.9, 414.9)
	L01XA02	Carboplatin	277.6	(277.6, 277.6)
	A10AD	Insulins and analogues, intermediate-acting combined with fast-acting	270.6	(270.6, 270.6)
	V06DB	Fat/carbohydrates/proteins/minerals/vitamins, combinations	256.2	(256.2, 256.2)
	A10AB05	Insulin aspart	270.6	(57.9, 270.7)
	A10AB04	Insulin lispro	270.6	(162.7, 270.8)
	N05AX12	Aripiprazole	222.7	(222.7, 222.7)
	G03AC08	Etonogestrel	220.5	(220.5, 220.7)
	G02BA03	Plastic IUD with progesterone	220.5	(197.8, 220.7)
	A10A	INSULINS AND ANALOGUES	229.3	(41.3, 229.5)
	N03AX12	Gabapentin	228.7	(97.9, 258.1)
	J05AB01	Aciclovir	223.0	(104.1, 223.0)
Mid-Age	L01BA04	Pemetrexed	3,691.1	(3,691.1, 3,691.1)
	L01CD01	Paclitaxel	2,030.2	(175.9, 4,649.7)
	L04AA11	Etanercept	1,888.3	(1,888.3, 1,888.5)
	L04AA17	Adalimumab	1,888.3	(1,888.3, 1,888.5)
	J05AB54	Ribavirin, combinations	1,786.3	(1,786.3, 1,786.3)
	L01CD02	Docetaxel	1,357.8	(1,019.6, 3,484.1)
	L03AA02	Filgrastim	1,568.9	(1,568.9, 1,568.9)
	L01XC02	Rituximab	1,358.2	(589.2, 2,358.9)
	B01AC13	Abciximab	1531.3	(1,531.3, 1,531.3)
	L03AB08	Interferon beta-1b	1178.5	(1,178.4, 1,178.7)
	L01AX03	Temozolomide	587.3	(1,99.7, 2,515.9)
	L03AB07	Interferon beta-1a	1,090.9	(1,090.9, 1,091.2)
	L03AX13	Glatiramer acetate	1,090.9	(1,090.9, 1,091.0)
	L01XA03	Oxaliplatin	875.4	(440.1, 1,681.5)
	B03XA01	Erythropoietin	895.8	(895.8, 895.8)
	L01BC06	Capecitabine	693.5	(662.3, 1,382.4)
	N07XX02	Riluzole	682.2	(682.2, 682.4)
	L01DB03	Epirubicin	771.6	(139.1, 1,027.2)
	B03XA02	Darbepoetin alfa	614.3	(614.2, 614.5)
	L01XX19	Irinotecan	559.7	(334.7, 784.7)
Older	H01CB02	Octreotide	1,928.8	(1,928.8, 2,412.5)

Cohort	ATC Code	ATC Description	Full Cost	
			Median	Range
Older (cont.)	L01XX19	Irinotecan	1,954.7	(1,954.7, 1,954.7)
	L04AA11	Etanercept	1,888.3	(1,888.3, 1,888.6)
	L01XC02	Rituximab	2,358.8	(589.2, 2,359.1)
	L03AA02	Filgrastim	1,568.9	(1,568.9, 1,568.9)
	B01AC13	Abciximab	1,531.4	(1,531.3, 1,531.6)
	L01XA03	Oxaliplatin	1,450.9	(875.3, 1,681.3)
	L01CA04	Vinorelbine	1,438.0	(1,258.7, 1,438.0)
	L03AX13	Glatiramer acetate	1,090.9	(1,090.9, 1,091.2)
	L01BC05	Gemcitabine	475.4	(475.4, 841.9)
	M05BA08	Zoledronic acid	409.6	(409.6, 814.4)
	L01BC06	Capecitabine	677.9	(239.7, 1,382.3)
	B03XA02	Darbepoetin alfa	506.9	(371.8, 889.7)
	A07AA09	Vancomycin	489.0	(489.0, 489.0)
	J02AC01	Fluconazole	624.5	(177.5, 624.6)
	M05BA02	Clodronic acid	393.7	(342.7, 393.9)
	N04BA03	Levodopa, decarboxylase inhibitor and COMT inhibitor	381.9	(350.9, 382.1)
	L01DB01	Doxorubicin	437.5	(149.0, 497.7)
	D05BB02	Acitretin	403.8	(210.2, 403.9)
	M05BA03	Pamidronic acid	359.7	(275.6, 360.0)

Appendix D. Additional data for Section 3: Medications for depression

Table D-1 Number of antidepressant medication categories per woman by calendar year and depression status

Drug categories	2002		2003		2004		2005	
	Depression	No depression	Depression	No Depression	Depression	No Depression	Depression	No Depression
Younger cohort	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
0	433 (63)	3,065 (98)	407 (59)	3,054 (98)	420 (61)	3,044 (97)	414 (60)	3,059 (98)
1	222 (32)	57 (1.8)	259 (38)	67 (2.1)	245 (36)	76 (2.4)	241 (35)	62 (2)
2	29 (4.2)	1 (0)	19 (2.8)	2 (0.1)	19 (2.8)	2 (0.1)	30 (4.4)	2 (0.1)
3	2 (0.3)		1 (0.1)		2 (0.3)	1 (0)	1 (0.1)	
Mid-age cohort								
0	326 (39)	5,563 (94)	254 (30)	5,573 (94)	256 (31)	5,522 (94)	303 (36)	5,454 (92)
1	459 (55)	320 (5.4)	526 (63)	309 (5.2)	520 (62)	359 (6.1)	494 (59)	423 (7.2)
2	42 (5)	17 (0.3)	51 (6.1)	19 (0.3)	55 (6.6)	18 (0.3)	37 (4.4)	23 (0.4)
3	7 (0.8)	1 (0)	3 (0.4)		3 (0.4)	2 (0)		1 (0)
Older cohort								
0	176 (38)	3,806 (90)	171 (37)	3,720 (88)	166 (36)	3,722 (88)	153 (33)	3,704 (87)
1	259 (56)	424 (10)	265 (57)	501 (12)	259 (56)	500 (12)	284 (61)	513 (12)
2	26 (5.6)	18 (0.4)	27 (5.8)	25 (0.6)	39 (8.4)	22 (0.5)	26 (5.6)	25 (0.6)
3	5 (1.1)		3 (0.6)	2 (0)	1 (0.2)	4 (0.1)	3 (0.6)	6 (0.1)
4					1 (0.2)			

Table D-2 a-c Area of residence of women according to report of depression and claims for antidepressant medications

Table D-2 a: Younger cohort

Characteristic at Survey 4 (unless indicated)		Depression		No Depression	
		Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Area of residence:	Urban	257 (59)	154 (64)	73 (47)	1,764 (61)
	Rural	161 (37)	75 (31)	76 (49)	995 (35)
	Remote	16 (3.7)	11 (4.6)	6 (3.9)	114 (4)

Table D-2 b: Mid age cohort

Characteristic at Survey 4 (unless indicated)		Depression		No Depression	
		Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Area of residence:	Urban	283 (40)	52 (40)	257 (37)	1,954 (38)
	Rural	398 (56)	71 (55)	425 (60)	3,042 (59)
	Remote	24 (3.4)	6 (4.7)	22 (3.1)	201 (3.9)

Table D-2 c: Older cohort

Characteristic at Survey 4 (unless indicated)		Depression		No Depression	
		Anti-depressant	No anti-depressant	Anti-depressant	No anti-depressant
Area of residence:	Urban	163 (44)	24 (32)	382 (45)	1,451 (44)
	Rural	206 (56)	49 (66)	448 (53)	1,765 (54)
	Remote	2 (0.5)	1 (1.4)	14 (1.7)	66 (2)

Table D-3 a-c Characteristics of women with different claim patterns for antidepressant medication

Table D-3 a: Characteristics of Younger women with different claim patterns for antidepressant medication

Characteristic at Survey 4 (unless indicated)		Continued Use N = 150	Uptake N = 122	Cessation N = 103	No use N = 248
Area of residence:	Urban	97 (65)	59 (49)	60 (60)	154 (64)
	Rural	50 (33)	60 (50)	31 (31)	75 (31)
	Remote	3 (2)	2 (1.7)	9 (9)	11 (4.6)
Education	Primary	4 (2.7)	2 (1.7)	2 (1.9)	8 (3.3)
	School/Higher school certificate	113 (76)	74 (62)	77 (75)	160 (65)
	Trade/Apprentice/Certificate/Dip	18 (12)	30 (25)	13 (13)	46 (19)
	University/Higher degree	14 (9.4)	14 (12)	11 (11)	31 (13)
Marital Status:	Married/defacto	77 (52)	69 (57)	72 (70)	155 (63)
	Widowed	1 (0.7)	0	0	0
	Divorced/separated	11 (7.4)	14 (11)	5 (4.9)	21 (8.5)
	Never Married	60 (40)	39 (32)	26 (25)	72 (29)
Current Smoker		46 (31)	35 (29)	25 (24)	60 (24)
BMI (Overweight/Obese)		78 (54)	63 (55)	41 (41)	97 (41)
Alcohol:	None/rare/less than once/wk	82 (55)	68 (56)	57 (55)	137 (55)
	1-2 times/wk	37 (25)	32 (26)	28 (27)	58 (23)
	3 or more times/wk	31 (21)	21 (17)	18 (17)	53 (21)
Difficult managing on income		38 (25)	27 (22)	12 (12)	44 (18)
Caring for someone		14 (9.4)	15 (12)	9 (8.7)	17 (6.9)
Comorbidity (Two or more conditions)		83 (56)	68 (56)	37 (36)	92 (38)
Common comorbid conditions:					
	Arthritis	NA	NA	NA	NA
	Heart Disease	1 (0.7)	2 (1.6)	1 (1)	4 (1.6)
	Diabetes	4 (2.7)	2 (1.6)	0	4 (1.6)
	Asthma/Bronchitis	37 (25)	35 (29)	16 (16)	55 (23)
	Depression	128 (86)	109 (89)	44 (43)	141 (58)
Back pain		62 (42)	70 (57)	60 (59)	126 (51)
Self-rated health					
	Excellent/very good/good	105 (70)	96 (79)	88 (85)	217 (88)
	Fair/poor	45 (30)	26 (21)	15 (15)	31 (13)
Health Care Use:					
	Consult GP/12 month: At most 4 times	63 (42)	40 (33)	56 (54)	147 (59)
	5-12 times	69 (46)	56 (46)	43 (42)	86 (35)
	13 or more	18 (12)	25 (21)	4 (3.9)	15 (6)
	Specialist visit/12 month	43 (47)	28 (35)	58 (56)	68 (36)
	Consult Hospital Doctor/ 12 month	49 (33)	48 (40)	32 (31)	60 (24)
	Private health Cover-hospital	67 (59)	56 (60)	49 (49)	131 (70)
Health consult:	Counsellor/MH worker	70 (47)	72 (60)	31 (30)	87 (35)
	Physiotherapist	34 (23)	30 (25)	27 (26)	62 (25)

Characteristic at Survey 4 (unless indicated)	Continued Use N = 150	Uptake N = 122	Cessation N = 103	No use N = 248
Community nurse/nurse practitioner	24 (16)	21 (17)	9 (8.7)	29 (12)
Chiropractor	21 (14)	31 (26)	17 (17)	48 (19)
Osteopath	8 (5.3)	10 (8.3)	4 (3.9)	19 (7.7)
Massage therapist	54 (36)	53 (44)	52 (50)	119 (48)
Acupuncturist	11 (7.3)	10 (8.3)	6 (5.8)	20 (8.1)
Naturopath/Herbalist	22 (15)	26 (21)	15 (15)	48 (19)
Other alternative health practitioner	21 (14)	13 (11)	8 (7.8)	36 (15)

Table D-3 b: Characteristics of Mid-age women with different claim patterns for antidepressant medication

Characteristic at Survey 4 (unless indicated)		Continued Use N = 401	Uptake N = 130	Cessation N = 107	No use N = 129
Area of residence:	Urban	165 (41)	48 (37)	44 (41)	52 (40)
	Rural	222 (55)	78 (60)	60 (56)	71 (55)
	Remote	14 (3.5)	4 (3.1)	3 (2.8)	6 (4.7)
Education	Primary	64 (16)	19 (15)	15 (14)	15 (12)
	School/Higher school certificate	181 (46)	63 (48)	49 (46)	68 (53)
	Trade/Apprentice/Certificate/Dip	90 (23)	24 (18)	20 (19)	25 (19)
	University/Higher degree	60 (15)	24 (18)	23 (21)	21 (16)
Marital Status:	Married/defacto	259 (65)	97 (76)	68 (64)	89 (70)
	Widowed	21 (5.3)	7 (5.5)	8 (7.5)	3 (2.3)
	Divorced/separated	96 (24)	20 (16)	27 (25)	33 (26)
	Never Married	20 (5.1)	4 (3.1)	3 (2.8)	3 (2.3)
Current Smoker (S2)		72 (18)	23 (18)	17 (16)	20 (16)
BMI (Overweight/Obese)		270 (73)	86 (70)	55 (54)	64 (57)
Alcohol (S3):					
	None/rare/less than once/wk	222 (56)	72 (56)	50 (48)	69 (55)
	1-2 times/wk	46 (12)	21 (16)	19 (18)	21 (17)
	3 or more times/wk	127 (32)	35 (27)	35 (34)	36 (29)
Difficult managing on income		103 (26)	31 (24)	21 (20)	28 (22)
Caring for someone:	Lives with me	38 (9.5)	12 (9.3)	11 (10)	14 (11)
	Lives elsewhere	98 (25)	31 (24)	29 (27)	27 (21)
Comorbidity (Two or more conditions)		239 (60)	80 (62)	52 (49)	67 (52)
Common comorbid conditions:					
	Arthritis	161 (40)	48 (37)	31 (29)	41 (32)
	Heart Disease	18 (4.5)	7 (5.4)	6 (5.6)	7 (5.4)
	Diabetes	38 (9.5)	8 (6.2)	6 (5.6)	5 (3.9)
	Asthma/Bronchitis	107 (27)	30 (23)	12 (11)	21 (16)
	Depression	401 (100)	130 (100)	107 (100)	129 (100)
Back pain		246 (63)	70 (56)	64 (62)	83 (66)
Self-rated health					
	Excellent/very good/good	270 (67)	88 (68)	77 (73)	104 (81)
	Fair/poor	131 (33)	41 (32)	29 (27)	24 (19)
Health Care Use:					
	Consult GP/12 month: At most 4	162 (41)	52 (40)	52 (49)	72 (57)
	5-12 times	100 (25)	28 (22)	20 (19)	29 (23)
	13 or more	136 (34)	50 (38)	34 (32)	26 (20)
	Specialist visit/12 month	264 (66)	88 (69)	57 (54)	76 (60)
	Consult Hospital Doctor/ 12 month	89 (22)	36 (28)	19 (18)	28 (22)
	Private health Cover-hospital	235 (59)	87 (67)	68 (64)	76 (59)
Health consult:	Dentist	242 (61)	74 (57)	66 (62)	81 (63)
	Physiotherapist	111 (28)	30 (23)	30 (28)	26 (20)

Characteristic at Survey 4 (unless indicated)	Continued Use N = 401	Uptake N = 130	Cessation N = 107	No use N = 129
Counsellor/Psychiatrist/Social worker	98 (25)	39 (30)	28 (26)	39 (30)
Pharmacist	311 (78)	96 (74)	71 (67)	89 (69)
Optician	230 (58)	64 (49)	61 (58)	63 (49)
Dietician	43 (11)	8 (6.2)	8 (7.5)	6 (4.7)
Naturopath/Herbalist	47 (12)	21 (16)	17 (16)	25 (19)
Acupuncturist	21 (5.3)	15 (12)	10 (9.4)	7 (5.4)
Podiatrist	55 (14)	21 (16)	17 (16)	20 (16)
Chiropractor	60 (15)	24 (18)	20 (19)	22 (17)
Osteopath	16 (4)	4 (3.1)	2 (1.9)	6 (4.7)
Massage therapist	87 (22)	33 (25)	34 (32)	44 (34)
Other alternative practitioner	27 (6.8)	11 (8.5)	12 (11)	9 (7)

Table D-3 c: Characteristics of Older women with different claim patterns for antidepressant medication

Characteristic at Survey 4 (unless indicated)		Continued Use N = 244	Uptake N = 69	Cessation N = 46	No use N = 81
Area of residence:	Urban	108 (46)	4 (6)	16 (36)	24 (32)
	Rural	124 (53)	33 (48)	28 (64)	49 (66)
	Remote	2 (0.9)	0	0	1 (1.4)
Education	Primary	70 (31)	59 (86)	12 (27)	19 (26)
	School/Higher school certificate	125 (55)	22 (33)	20 (45)	39 (53)
	Trade/Apprentice/Certificate/Dip	24 (10)	32 (48)	9 (20)	12 (16)
	University/Higher degree	10 (4.4)	9 (13)	3 (6.8)	4 (5.4)
Marital Status:	Married/defacto	83 (34)	4 (6)	12 (26)	20 (25)
	Widowed	138 (57)	18 (26)	33 (72)	50 (63)
	Divorced/separated	17 (7)	39 (57)	0	5 (6.3)
	Never Married	4 (1.7)	6 (8.7)	1 (2.2)	4 (5.1)
Current Smoker (S2)		12 (5.3)	63 (94)	3 (7.1)	4 (5.5)
BMI (Overweight/Obese)		96 (44)	31 (49)	23 (61)	24 (36)
Alcohol (S3):					
None/rare/less than once/wk		156 (66)	6 (8.7)	28 (68)	37 (47)
1-2 times/wk		13 (5.5)	51 (75)	4 (9.8)	13 (16)
3 or more times/wk		66 (28)	2 (2.9)	9 (22)	29 (37)
Difficult managing on income		16 (6.6)	15 (22)	4 (8.7)	11 (14)
Caring for someone:	Lives with me	32 (14)	63 (95)	3 (7.3)	7 (9.7)
	Lives elsewhere	28 (12)	53 (80)	3 (7.3)	14 (19)
Health Care Use:					
Consult GP/12 month: At most 4		49 (20)	64 (93)	8 (19)	21 (26)
5-12 times		128 (53)	5 (7.5)	28 (65)	38 (47)
13 or more		63 (26)	36 (54)	7 (16)	22 (27)
Specialist visit/12 month		148 (76)	26 (39)	25 (71)	44 (67)
Consult Hospital Doctor/ 12 month		55 (23)	13 (20)	13 (29)	24 (30)
Private health Cover-hospital		92 (38)	47 (68)	16 (36)	30 (37)
Comorbidity (Two or more conditions)		202 (83)	9 (13)	40 (87)	71 (88)
Common comorbid conditions:					
Arthritis		140 (58)	10 (14)	25 (54)	46 (57)
Heart Disease		75 (31)	56 (81)	18 (39)	37 (46)
Diabetes		33 (14)	44 (64)	10 (22)	7 (8.6)
Asthma/Bronchitis		43 (18)	19 (29)	8 (17)	13 (16)
Depression		173 (71)	51 (74)	16 (35)	52 (64)
Back pain		182 (78)	29 (42)	33 (75)	59 (77)
Self-rated health					
Excellent/very good/good		117 (48)	54 (78)	25 (56)	42 (52)
Fair/poor		126 (52)	34 (50)	20 (44)	39 (48)
Health Care Use:					
Consult GP/12 month: At most 4		49 (20)	64 (93)	8 (19)	21 (26)

Characteristic at Survey 4 (unless indicated)	Continued Use N = 244	Uptake N = 69	Cessation N = 46	No use N = 81
5-12 times	128 (53)	5 (7.5)	28 (65)	38 (47)
13 or more	63 (26)	36 (54)	7 (16)	22 (27)
Specialist visit/12 month	148 (76)	26 (39)	25 (71)	44 (67)
Consult Hospital Doctor/ 12 month	55 (23)	13 (20)	13 (29)	24 (30)
Private health Cover-hospital	92 (38)	47 (68)	16 (36)	30 (37)
Health consult: Optician	130 (54)	24 (35)	23 (51)	52 (64)
Dentist	116 (48)	36 (52)	18 (40)	37 (46)
Physiotherapist	66 (28)	55 (80)	8 (18)	21 (26)
Podiatrist	119 (50)	35 (51)	21 (47)	37 (46)
Alternative health practitioner	27 (11)	58 (84)	4 (8.9)	14 (17)

Appendix E. Additional Tables for Section 4: Medication use for common priority health conditions

E.1 Arthritis medications

Table E-1 Medications for arthritis

Drug Class	Examples of specific medications	ATC code
ANTI-INFLAMMATORY AND ANTI-RHEUMATIC PRODUCTS, NON-STERIODS		M01
Anti-inflammatory and anti-rheumatic products, non-steroids (includes NSAIDS)		M01A
Butylpyrazolidines	phenylbutazone	M01AA
Acetic acid derivatives and related substances	diclofenac indometacin ketorolac sulindac	M01AB
Oxicams	piroxicam meloxicam	M01AC
Propionic acid derivatives	ibuprofen ketoprofen naproxen	M01AE
Fenamates	tolfenamic acid mefenamic acid	M01AG
Coxibs	rofecoxib celecoxib lumiracoxib parecoxib	M01AH
Other anti-inflammatory and anti-rheumatic products, non-steroids	Glucosamine	M01AX
Anti-inflammatory/Anti-rheumatic agent in combination		M01B
Anti-inflammatory/Anti-rheumatic agent in combination with corticosteroids	phenylbutazone and corticosteroids	M01BA
Other anti-inflammatory/Anti-rheumatic agent in combination with other drugs	eg, glucosamine sulphate or chondroitin	M01BX
Specific Anti-rheumatic agents		M01C
Quinolines	Oxycinchophen	M01CA
Gold preparations	auranofin aurothiomalate	M01CB
Penicillamine and similar agents	Penicillamine	M01CC
Other specific anti-rheumatic agents		M01CX
Other DMARDS	Classed under specific anti- rheumatic agents	
<i>Aminosalicylic acid and similar agents</i>	methotrexate sulphasalazine leflunamide etc	A07EC
<i>Folic acid analogues</i>	methotrexate raltitrexed pemetrexed	L01BA
<i>Selective</i>	adalimumab anakinra etanercept infliximab	L04AA

<i>immunosuppressive agents</i>		
<i>Other immunosuppressive agents</i>	azathioprine cyclosporin leflunomide methotrexate	LO4AX
<i>Aminoquinolines</i>	sulfasalazine hydroxychloroquine	P01BA
TOPICAL PRODUCTS FOR JOINT AND MUSCULAR PAIN		M02
Anti-inflammatory preparations, non-steroids for topical use	phenylbutazone	M02AA
Capsicum preparations and similar agents	Capsaicin	M02AB
Preparations with salicylic acid derivatives		M02AC
Other topical products for joint and muscular pain	Tolazaline	M02AX
OTHER DRUGS FOR THE TREATMENT OF DISORDERS OF THE MUSCULOSKELETAL SYSTEM		M09
Other drugs for the disorders of the musculoskeletal system	hyaluronic acid injection	M09AX
ANALGESICS		N02
Opioids		N02A
Natural Opium Alkaloids	hydromorphone codeine morphine oxycodone	N02AA N02AB
Phenylpiperidine derivatives	pethidine, fentanyl	
Diphenylpropylamine derivatives	dextropropoxyphene	N02AC
Bezomorphan derivatives		N03AD
Oropavine derivatives	Buprenorphine	N02AE
Other opioids	Tramadol	N02AG
Other analgesics and antipyretics		N02B
Salicylic acid and derivatives	Acetylsalicylic acid Aloxiprin Choline salicylate Sodium salicylate Salicylamide Salsalate Ethenzamide Morpholine salicylate Dipyrrocetyl Benorilate Diflunisal Potassium salicylate Guacetisal Carbasalate calcium Imidazole salicylate + combinations	N02BA
Pyrazalones	Phenazone Metamizole sodium Aminophenazone Propyphenazone Nifenazone +combinations	N02BB
Anilides (paracetamol combinations)	Paracetamol	N02BE
Other analgesics and antipyretics	Rimazolium	N02BG
CORTICOSTEROIDS FOR SYSTEMIC USE		H02
Corticosteroids for systemic use, plain		H02A
Mineralocorticoids	Aldosterone Fludrocortisone Desoxycortone	H02AA

Glucocorticoids	Betamethasone Dexamethasone Fluocortolone	H02AB
	Methylprednisolone Paramethasone Prednisolone	
	Prednisone Triamcinolone Hydrocortisone Cortisone	
	Prednylidene Rimexolone Deflazacort Cloprednol	
	Meprednisone Cortivazol	
Corticosteroids for systemic use, combinations		H02B
Corticosteroids for systemic use, combinations	Methylprednisolone, combinations	H02BX

E.2 Explanatory tables

Table E-2 Number and proportion of mid-age and older women prescribed medications for arthritis in 2005

	Medication Sub-group	Medication ATC Code	Self-reported diagnosis of arthritis	
			Ever	Never
Mid-age women				
Anti-inflammatory and anti-rheumatic products, non-steroids		M01A		
	Coxibs	M01AH	239 (10)	82 (1.8)
	Oxicams	M01AC	261 (11)	108 (2.3)
	Acetic acid derivatives and related substances	M01AB	78 (3.4)	50 (1.1)
	Propionic acid derivatives	M01AE	96 (4.2)	43 (0.9)
	Other NSAIDs: Butylpyrazolidines, Fenamates	M01AA M01AG	NA	NA
	Glucosamine	In M01AX	19 (0.8)	4 (0.1)
	Other anti-inflammatory and anti-rheumatic products, non-steroids	M01AX	0	0
Anti-inflammatory/Anti-rheumatic agent in combination		M01B	0	0
Specific Anti-rheumatic agents (includes DMARDS)	M01C A07EC L01BA L04AA LO4AX	109 (4.8)	36 (0.8)	
TOPICAL PRODUCTS FOR JOINT AND MUSCULAR PAIN		M02	0 (0)	1 (0)
Other drugs for the disorders of the musculoskeletal system		M09AX	0	0
Opioids		N02A	186 (8.1)	127 (2.8)
Salicyclic acid and derivatives		N02BA	8 (0.3)	8 (0.2)
Anilides (paracetamol combinations)		N02BE	286 (12)	157 (3.4)
Other analgesics and antipyretics	N02BB N02BG	0	0	
CORTICOSTEROIDS FOR SYSTEMIC USE		H02A, H02B	111 (4.8)	82 (1.8)
Older women				
Anti-inflammatory and anti-rheumatic products, non-steroids				
	Coxibs	M01AH	335 (11)	58 (3.2)
	Oxicams	M01AC	404 (14)	85 (4.8)
	Acetic acid derivatives and related substances	M01AB	217 (7.4)	46 (2.6)
	Propionic acid derivatives	M01AE	155 (5.3)	47 (2.6)
	Other NSAIDs: Butylpyrazolidines, Fenamates	M01AA M01AG	0 (0)	1 (0.1)
	Glucosamine	In M01AX	13 (0.4)	0 (0)
	Other anti-inflammatory and anti-rheumatic products, non-steroids	M01AX	NA	NA

Medication Sub-group	Medication ATC Code	Self-reported diagnosis of arthritis	
		Ever	Never
Anti-inflammatory/Anti-rheumatic agent in combination	M01B	0	0
Specific Anti-rheumatic agents (includes DMARDS)	M01C A07EC L01BA L04AA LO4AX	98 (3.3)	13 (0.7)
TOPICAL PRODUCTS FOR JOINT AND MUSCULAR PAIN	M02	6 (0.2)	1 (0.1)
Other drugs for disorders of the musculoskeletal system	M09AX	0	0
Opioids	N02A	513 (18)	128 (7.2)
Salicyclic acid and derivatives	N02BA	140 (4.8)	70 (3.9)
Anilides (paracetamol combinations)	N02BE	1,474 (50)	421 (24)
Other analgesics and antipyretics	N02BB N02BG	6 (0.2)	4 (0.2)
CORTICOSTEROIDS FOR SYSTEMIC USE	H02A, H02B	387 (13)	140 (7.8)

Appendix F. Additional Tables for Section 6: Impact of new health care items

Table F-1 SF-36 Physical Function sub-scale means and confidence intervals after adjusting for time, education, smoking, urban/non-urban area of residence and BMI: Women with no major conditions (n=2,222)

No Health Assessment			One Health Assessment			More than One Health Assessment		
Time	Est	CI	Time	Est	CI	Time	Est	CI
1996	75.8	(73.2, 78.3)	1996	73.0	(69.9, 76.2)	1996	73.0	(70.4, 75.6)
1999	73.3	(70.8, 75.9)	1999	70.3	(67.2, 73.4)	1999	70.4	(67.9, 73.0)
2002	69.8	(67.3, 72.4)	2002	65.4	(62.3, 68.5)	2002	66.6	(64.0, 69.2)
2005	62.8	(60.2, 65.3)	2005	58.4	(55.3, 61.5)	2005	60.0	(57.4, 62.6)

Table F-2 SF-36 Physical Function sub-scale means and confidence intervals after adjusting for time, education, smoking, urban/non-urban area of residence and BMI: Women with heart disease, cancer, diabetes or asthma/bronchitis (n=1,694)

No Health Assessment			One Health Assessment			More than One Health Assessment		
Time	Est	CI	Time	Est	CI	Time	Est	CI
1996	67.3	(64.0, 70.6)	1996	66.9	(63.1, 70.7)	1996	66.3	(63.0, 69.7)
1999	65.3	(62.0, 68.6)	1999	64.2	(60.4, 68.0)	1999	64.4	(61.1, 67.8)
2002	59.4	(56.1, 62.7)	2002	58.6	(54.8, 62.4)	2002	59.3	(56.0, 62.7)
2005	53.6	(50.3, 56.9)	2005	51.5	(47.6, 55.3)	2005	51.8	(48.5, 55.2)

Table F-3 SF-36 Mental Health sub-scale means and confidence intervals after adjusting for time, education, smoking, urban/non-urban area of residence and BMI: Women with no major morbidity (n=2,222)

No Health Assessment			Healthy Women with One Health Assessment			More than One Health Assessment		
Time	Est	CI	Time	Est	CI	Time	Est	CI
1996	80.9	(79.3, 82.4)	1996	80.0	(78.1, 81.9)	1996	81.0	(79.4, 82.6)
1999	81.6	(80.1, 83.2)	1999	81.4	(79.5, 83.3)	1999	80.6	(79.0, 82.1)
2002	80.9	(79.3, 82.4)	2002	80.2	(78.3, 82.2)	2002	80.6	(79.0, 82.2)
2005	80.9	(79.4, 82.5)	2005	80.3	(78.4, 82.3)	2005	80.3	(78.7, 81.9)

Table F-4 SF-36 Mental Health sub-scale means and confidence intervals after adjusting for time, education, smoking, urban/non-urban area of residence and BMI: Women with heart disease, cancer, diabetes, asthma/bronchitis (n=1,694)

No Health Assessment			Healthy Women with One Health Assessment			More than One Health Assessment		
Time	Est	CI	Time	Est	CI	Time	Est	CI
1996	77.8	(75.5, 80.0)	1996	79.0	(77.0, 81.0)	1996	80.0	(78.1, 82.0)
1999	79.5	(77.2, 81.8)	1999	79.6	(77.6, 81.6)	1999	80.2	(78.3, 82.2)
2002	77.4	(75.2, 79.7)	2002	79.4	(77.4, 81.4)	2002	80.1	(78.2, 82.1)
2005	78.0	(75.7, 80.3)	2005	77.7	(75.7, 79.7)	2005	78.9	(77.0, 80.9)



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A teal-colored brushstroke graphic located at the bottom of the logo, appearing as a horizontal, slightly wavy line.