

A national census of medicines use: a 24-hour snapshot of Australians aged 50 years and older

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MJA 2012; 196: 50–53
doi: 10.5694/mja11.10698

The use of medicines for the treatment of disease is a common health-related action by Australians. Medicines are not only used to treat diagnosed medical conditions but, increasingly, to manage risk factors.¹ Individuals' patterns of medicines use are not well understood, including the combined use of prescription, over-the-counter (OTC) and complementary medicines. Smaller surveys of specific populations' use of medicines have been conducted,^{2,3} but the most recent Australia-wide survey was the 1995 National Health Survey.⁴ A majority of published Australian research on the use of medicines is based on the analysis of dispensing data from the Australian Pharmaceutical Benefits Scheme and the Repatriation Pharmaceutical Benefits Scheme; however, these data sources do not include OTC, complementary and unsubsidised prescription medicines.⁵

Use of and access to medicines is changing. An ageing population is contributing to the national increase in medicine consumption and cost.⁶ The popularity of complementary medicines has led to increased access to these products through conventional sources of non-prescription medicines, such as pharmacies and supermarkets, as well as through complementary medicine practitioners.^{7,8} Our study, a national census of medicines use, aimed to address current knowledge gaps by exploring current use of prescription, OTC and

Abstract

Objective: To explore the current use of conventional and complementary medicines in Australians aged ≥ 50 years.

Design, setting and participants: Cross-sectional postal survey sent to a random sample of 4500 Australians aged ≥ 50 years between June 2009 and February 2010.

Main outcome measures: Prevalence of medicines use, reasons for medicines use and sources of medicines.

Results: Response rate was 37.3%. Medicines use was very common; 87.1% of participants took one or more medicines and 43.3% took five or more in the previous 24 hours. Complementary medicines were used by 46.3% of participants, 87.4% of whom used both conventional and complementary medicines. The most commonly used medicines were antihypertensive agents (43.2% of participants), natural marine and animal products including fish oil and glucosamine (32.4%) and lipid-lowering agents (30.4%). Doctors recommended 79.3% of all medicines and 93.0% of conventional medicines. Pharmacists commonly recommended occasional medicines (ie, as needed), while friends, family and media most often influenced use of complementary medicines.

Conclusions: The use of multiple medicines is common and higher than reported in the 1995 National Health Survey. Today, much medicines use is to prevent future disease by influencing risk factors. High levels of polypharmacy highlight the need to support the safe and effective use of medicines in the community. Although doctors recommend or prescribe most medicines, self-directed medication use is common. This highlights the need for consumer access to accurate information and strategies to improve health literacy about medicines.

complementary medicines, and the patterns and predictors of their use, by Australians aged 50 years and older.

Methods

Our descriptive study used a cross-sectional survey sent to a random sample of 4500 Australians aged 50 years and older. We sent out four mailings between June 2009 and February 2010 (to allow for potential seasonal variation). The survey was developed from pilot work conducted by the University of Melbourne, which compared a medicines diary with at-home pharmacist interviews and found that self-recording of medicines used was valid.⁹

Questionnaire content

A two-section questionnaire collected information on the use of all medicines. An inclusive definition of medi-

cines was provided for participants (Box 1). The questionnaire was supplied only in English.

The first section included a diary to record medicines used in the previous 24 hours and all other medicines used in the previous month. The following information was requested for each medicine: reason for use, whether use was regular or occasional, who prescribed or recommended it, source, cost, and date first started.

The second section included multiple-choice and open-response questions about health status, lifestyle factors, chronic health conditions, how medicines information was obtained, the influence of cost on medicines use, problems with medicines, and basic demographic characteristics.

Sampling and data collection

The Australian Electoral Commission provided a random sample, stratified

1 Definitions

Medicines: Everything taken or used to keep you healthy, or to treat a symptom or an illness. Includes prescription and non-prescription (over-the-counter) medicines, complementary, herbal and alternative medicines, vitamin supplements, homeopathic remedies, eye drops, creams, lotions, patches, suppositories and pessaries.

Complementary medicines: Based on the Therapeutic Goods Administration definition. Includes vitamins, minerals, nutritional supplements and herbal, aromatherapy and homeopathic products.

Conventional medicines: Prescription and over-the-counter medicines not classified as complementary medicines.

Regular medicines: Taken daily or at regular intervals over time.

Occasional medicines: Taken only when needed.

Polypharmacy: Five or more medicines used in 24 hours. ◆

2 Participant characteristics — National Census of Medicines Use (June 2009 – February 2010)

Characteristic	Census proportion*	ABS estimate†
Sex (women)	53.4%	51.9%
Age (years)		
50–54	9.6%	21.1%
55–59	21.4%	19.2%
60–64	20.3%	17.2%
65–69	16.4%	12.8%
70–74	12.7%	10.1%
75–79	8.4%	8.0%
80–84	7.1%	6.3%
85–89	3.3%	3.8%
≥90	0.8%	1.5%

ABS = Australian Bureau of Statistics.
* Unweighted for age and sex. † ABS 2009 estimate for the Australian population.¹¹

by state or territory, of 4500 Australians aged 50 years and older. An invitation postcard was sent to potential participants explaining the study aims, with an opportunity to opt out. Participants were encouraged to take part even if they did not use medicines. Two weeks later, the study questionnaire was sent with an introductory letter. To maximise the response rate, a reminder postcard was sent 3 weeks later, and a reminder letter and second questionnaire were sent to non-responders after another 2 weeks.

Participants were ineligible if they were absent during the study period or unable to complete the questionnaire due to inability to read or write English, illness, disability or death, or if questionnaires were returned because of a change of address.

The study was approved by the University of Melbourne Human Research Ethics Committee.

Coding and analysis

Medicines were grouped by class, adapted from the classification system used by MIMS (*Monthly index of medicinal specialties*; <http://www.mims.com.au>). Up to three active ingredients were coded for each product. The components of multivitamin and multiminerals complexes were not coded individually. The reasons for each medicine's use were classified by the researchers to reflect participants' descriptions. Data from the second section of the questionnaire were scanned into a database and merged

with data from the first. Descriptive analysis was undertaken using SPSS, version 18.0 (SPSS Inc, Chicago, Ill, USA). Bivariate analyses were conducted using the χ^2 test. Poststratification weights were applied using Australian population estimates for age and sex.¹⁰ Data that have not been weighted for age and sex are referred to as unweighted data.

Results

A total of 1608 questionnaires were returned. Of the 4500 potential participants, 191 were ineligible; therefore the response rate was 37.3%.¹¹ Data are reported only for the use of medicines in the previous 24 hours.

Participants' characteristics

Study participants had similar sex and age distributions to those of the Australian population,¹¹ with the exception of people aged 50–54 years, who were significantly underrepresented in unweighted data (Box 2).

Prevalence of medicines use

Most participants had used at least one conventional or complementary medicine in the previous 24 hours (87.1%), with a mean of 4.6 medicines per participant (range, 0–31). Women were more likely to be medicines users than were men (90.3% v 83.9%; $P < 0.001$). Most participants (84.2%) used one or more medicines regularly; 28.2% also used an occasional medicine in the same 24-hour period.

In total, 43.3% of participants reported use of five or more medicines

of any type in the previous 24 hours, and 10.7% reported using 10 or more medicines. Almost a third (30.5%) used five or more conventional medicines, and 5.1% reported using five or more complementary medicines. (The number of medicines used, by age and sex, is shown in Box 3.) Polypharmacy was significantly associated with increasing age (32.2%, 49.4% and 66.0% for ages 50–64, 65–74 and ≥ 75 years, respectively; $P < 0.001$) and being female (50.2% v 35.3%; $P < 0.001$). Participants who self-reported "fair" or "poor" health status were significantly more likely to use more medicines than were those reporting "excellent" or "good" health (72.4% v 36.4%; $P < 0.001$).

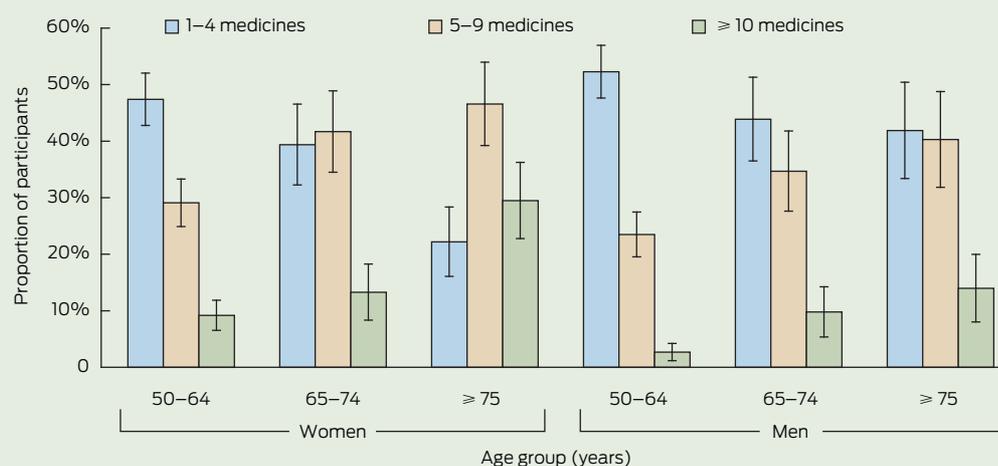
Medicines used

A total of 1400 participants reported 7337 medicines used in the previous 24 hours, of which 89.2% were taken regularly and 10.8% were taken occasionally. Antihypertensive agents, natural marine and animal products and lipid-lowering agents were the most common classes of medicines used (Box 4).

With the exception of antidepressants, use of the most common conventional medicines increased with age. Antidepressant use was lowest among 65–74 year olds. Women were more likely than men to use antidepressants (12.4% v 6.2%; $P < 0.001$) and agents affecting calcium and bone metabolism (21.4% v 4.4%; $P < 0.001$).

The most commonly used active ingredients taken in either single- or

3 Number of medicines used in the previous 24 hours, by age group and sex — National Census of Medicines Use (June 2009 – February 2010)



4 Most commonly used medicine classes in the previous 24 hours, with selected active ingredients, by age group — National Census of Medicines Use (June 2009 – February 2010)

Medicine class and selected active ingredients	All age groups	50–64 years	65–74 years	≥75 years
Antihypertensive agents*	43.2%	29.9%	56.0%	64.5%†
Hydrochlorothiazide	9.3%	6.1%	12.7%	14.3%†
Irbesartan	9.4%	6.3%	11.2%	15.6%†
Natural marine and animal products‡	32.4%	34.0%	33.9%	27.1%§
Omega-3 marine triglycerides (fish oil)	25.2%	26.7%	27.2%	18.9%§
Glucosamine¶	16.8%	18.2%	17.2%	13.4%
Lipid-lowering agents	30.4%	21.5%	41.0%	42.7%†
Atorvastatin	14.5%	11.1%	17.4%	21.8%†
Simvastatin	7.4%	4.3%	9.9%	11.7%†
Anticoagulants, antithrombotics**	25.3%	12.7%	32.9%	51.3%†
Agents for gastric acidity, reflux and ulcers	21.0%	14.2%	26.5%	33.0%†
Simple analgesics and antipyretics**	18.6%	15.6%	16.8%	27.9%†
Multivitamins and minerals (including B-group multivitamins)‡	14.6%	15.3%	14.9%	12.1%
Agents affecting calcium and bone metabolism‡	13.2%	9.4%	11.9%	25.4%†
Calcium	11.6%	10.3%	10.8%	16.2%†
Cholecalciferol (vitamin D)	10.8%	9.2%	9.8%	16.5%†
β-adrenergic blocking agents	12.2%	6.6%	17.0%	22.3%†
Non-steroidal anti-inflammatory agents	10.7%	9.8%	10.9%	13.2%
Antidepressant agents	9.4%	9.4%	7.8%	11.1%

* Excludes β-adrenergic blocking agents. † $P < 0.01$ for trend with age. ‡ Classified as complementary medicines. § $P < 0.05$ for trend with age. ¶ Includes all types of glucosamine. ** Includes aspirin doses ≤ 150 mg. ◆

multicomponent products were omega-3 marine triglycerides (such as fish oils), paracetamol, aspirin and glucosamine. Age differences existed for the use of several of these ingredients (Box 4).

More comprehensive tables of results for medicine components and medicine classes used are available at <http://www.nps.org.au/research/medicinescensus/tables>.

Complementary and conventional medicines

Complementary medicines were used by 46.3% of participants, representing just over half (53.2%) of all medicines users, 87.4% of whom used both conventional and complementary medicines. The mean number of complementary medicines used was 1.2 (range, 0–19). Women used more complementary medicines in the previous 24 hours than did men (1.5 v 0.8; $P < 0.001$). The use of only conventional medicines increased with age, while the use of only complementary medicines decreased (Box 5).

Reasons for medicines use

More than 150 different reasons for medicines use were reported, including 31.1% for cardiovascular conditions, 16.6% for musculoskeletal

conditions (including joint and bone health) and 8.4% for general health and wellbeing (including “energy”, “inner health” and “weight loss”). The most frequent specific reasons for use were hypertension (13.2% of medicines), arthritis (8.5%), general health (8.0%) and lipid lowering (7.2%).

Occasional medicines were most often used for pain relief, including headaches (13.0%), arthritis (7.6%), musculoskeletal pain (including muscle cramps) (7.4%), and general pain (6.2%).

Complementary medicines were commonly used for general health (29.3%), arthritis (20.2%), bone health and disease prevention (6.7%) and joint health and disease prevention (4.7%).

Access to medicines and sources of recommendations

Medicines were purchased from pharmacies (84.8%), supermarkets (7.0%), health food shops (5.4%) and the internet (0.7%). Pharmacies were the main source for conventional (94.7%) and complementary medicines (53.2%). Supermarkets, health food shops and the internet were also sources of complementary medicines (17.6%, 20.2% and 2.7% of complementary medicines, respectively).

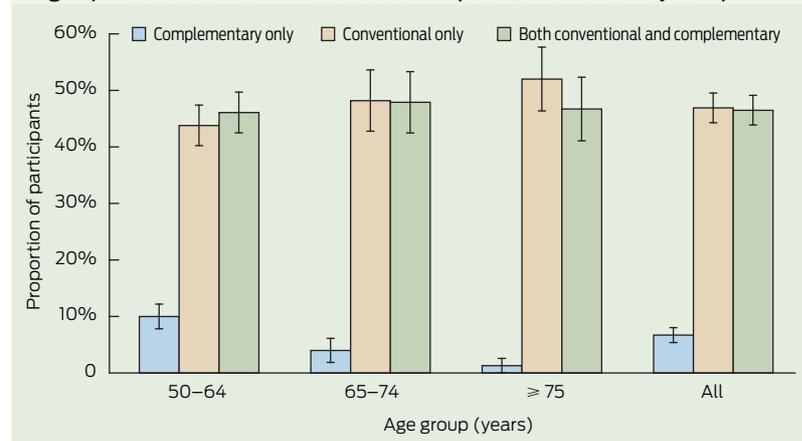
Doctors recommended 79.3% of all medicines and 93.0% of conventional medicines. Compared with regular medicines, more occasional medicines were recommended by pharmacists (10.5% v 2.9%; $P < 0.001$). Complementary medicines were more likely to be recommended by the media or by friends and family than were conventional medicines (media, 18.6% v 1.1%; $P < 0.001$; family and friends, 17.6% v 1.5%; $P < 0.001$).

Discussion

For many older Australians, managing complex medicine regimens is a necessary and challenging part of life.

Our results indicate a high prevalence of medicines use among this sample: 87% had used at least one medicine of any type in the previous

5 Conventional and complementary medicines use in the previous 24 hours, by age group — National Census of Medicines Use (June 2009 – February 2010)



24 hours and, of these, 97% had used one or more regular medicines. Furthermore, polypharmacy was common (42.9%), particularly among participants aged ≥ 75 years (66.0%).

Although medicines can play a pivotal role in the quality of life of older people, polypharmacy can contribute to non-adherence and increase the risk of adverse drug reactions.¹²⁻¹⁴ Many consumers and health professionals may be unaware of the risk of potential interactions with complementary medicines.^{7,15} Although the 1995 National Health Survey provided limited data on medicines use and involved a different recall period from our study (2 weeks compared with 24 hours), a simple comparison indicates that patterns of medicines use have changed over the past 15 years. In this period, the proportion of medicines users taking six or more conventional medicines increased by 13.9% to 39.8%, varying by age group and greatest among people aged ≥ 85 years (16.2% to 56.0%). There was also a substantial increase in the use of some medication classes. In 1995, 4.8% of participants (aged ≥ 45 years) used a lipid-lowering agent, compared with 30.4% in the present study, and the use of antidepressants increased from 3.7% to 9.4%.⁴

Some medicines use is self-directed without professional advice: one in eight medicines was purchased from a supermarket, health food store or the internet and a similar proportion was first recommended by family, friends or the media. This highlights the importance of facilitating both consumer access to accurate medicines information and health literacy.

Medicines are commonly used to modify health risks and improve well-being, rather than to treat symptoms or disease. Hypertension, lipid lowering and general health represented three of the top four reasons for medicines use, with most complementary medicines use relating to general health and wellbeing. This signals a change in behaviour since the 1995 National Health Survey and, possibly, a change in how consumers see the place and purpose of medicines in their lives.

Our response rate may have introduced bias, as use of medicines may differ between responders and non-responders. The proportion of people taking medicines was similar to that found in recent United States studies.^{16,17} The response rate of 37% is reasonable compared with other postal surveys using Australian electoral enrollees.¹⁸ The sample had similar age and sex characteristics to the Australian population, although people aged 50–54 years were underrepresented. This may have been due to higher family or work commitments, or less interest due to lower medication use. To address differences, data were weighted to Australian Bureau of Statistics population estimates for age and sex. The use of a national random sample, a comprehensive and valid questionnaire to measure all medicines use, evidence-based best-practice methods for improving the response rate in postal surveys¹⁹ and the collection of medicines data in different seasons all strengthen the results of this study.

For Australians aged 50 years and older, the prevalence of medicines use is high, and use of multiple medicines is common. This highlights the need to support the safe and effective use of medicines in the community and the need for further research into appropriateness of medicines use.

Increasingly, medicines are being used to prevent illness. This trend may have a long-term positive impact on public health and will likely have cost implications for the Pharmaceutical Benefits Scheme. This also highlights the need for the ongoing promotion of healthy lifestyle changes.

Acknowledgements: This research was funded by the Australian Department of Health and Ageing through the National Prescribing Service and the University of Melbourne. Marie Pirotta is funded by a Primary Health Care Research Evaluation and Development fellowship. We also acknowledge the contribution of Rebecca Coleman and Liane Johnson for their advice during project development, Vinay Prasad for her support in distribution, and Jonathon Dartnell and Lynn Weekes for their thoughtful contribution to editing this article.

Competing interests: No relevant disclosures.

Received 6 Jun 2011, accepted 29 Aug 2011.

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