

# Use of prescribed medications in a South Australian community sample

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There has been increasing recognition of the need to monitor the use of prescribed medications in the community to ensure the optimum use of finite resources.<sup>1,2</sup> The Drug Utilisation Subcommittee of the Pharmaceutical Benefits Advisory Committee compiles a database containing information about the number of prescriptions dispensed by pharmacists under the Pharmaceutical Benefits Scheme.<sup>3</sup> Similarly, the Bettering the Evaluation and Care of Health (BEACH) program,<sup>4</sup> an annual survey of general practice activity, provides data on the rate and type of medications prescribed to patients.

However, patient self-report data are not routinely collated. Indeed, the most recent Australia-wide survey of medication use was conducted in the 1995 National Health Survey.<sup>5</sup> There have been surveys of medication use in nursing homes,<sup>6-8</sup> and a recent survey of an Australian Capital Territory community sample reported the use of prescription, complementary and alternative medicines for the treatment of depression and anxiety.<sup>9</sup> But we are unaware of other Australian community surveys examining self-reported use of prescribed medications.

We report here the results of a survey of current self-reported use of prescribed medication in a random, representative sample of the South Australian population aged 15 years and over.

## METHODS

Data were collected between March and June 2004 using a Health Omnibus Survey of both metropolitan and rural South Australians at least 15 years of age. The Health Omnibus Survey is a user-pays survey for health organisations.<sup>10</sup>

The metropolitan sample was based on the collectors' districts used by the Australian Bureau of Statistics in the 2001 census.<sup>11</sup> Ten dwellings were chosen in each district by selecting every fourth household from a

## ABSTRACT

**Objective:** To determine the extent of self-reported use of prescription medications in an Australian community sample.

**Design, setting and participants:** Face-to-face interviews with a random, representative sample of the South Australian population (aged  $\geq 15$  years) living in metropolitan and rural areas. The study, a Health Omnibus Survey, was conducted between March and June 2004.

**Main outcome measures:** Reported number of prescribed medications used per person, most common categories of medication, and use by individuals of multiple medications for the same body system.

**Results:** From 4700 households selected, 3015 participants were interviewed (65.9% response rate). Of respondents, 46.8% were using prescribed medications; 171 respondents (5.7%) were taking six or more medications, and four were taking 16 or more; 23.2% were using medications for the cardiovascular system, with 11.9% using agents acting on the renin-angiotensin system. Prescription medication use increased with age, with over 10% of respondents aged  $\geq 55$  years using six or more medications.

**Conclusions:** Use of multiple prescribed medications was common, with the potential for significant drug interactions. Assuming a similar pattern of medication use Australia-wide, reducing the number of prescribed medications by one for people taking six or more medications would save the federal government about \$380 million a year.

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random starting point. One face-to-face interview was conducted per household (when more than one person aged 15 or over resided in a household, the respondent was the person who last had a birthday).

The rural sample automatically included all towns with a population of 10 000 or more in the 2001 census, with the balance selected from towns with a population of over 1000. The methodology is described in more detail elsewhere.<sup>12</sup>

The survey was conducted by experienced health interviewers. For reliability purposes, re-interviews for selected questions were conducted on a random 10% of each interviewer's work. Data were weighted according to benchmarks derived from the 2001 census and 2002 estimated resident population<sup>13</sup> to provide estimates that would represent the SA population in terms of age, sex and region (metropolitan, non-metropolitan).

Interviewers asked respondents whether they were currently using any medications

prescribed by a general practitioner or medical specialist, including tablets, creams, sprays and prescribed vitamins. Any non-doctor prescribed preparations were excluded from the analysis, as were oral contraceptives, as they are usually not prescribed for ill health. Interviewers collected demographic data and recorded the number of prescribed medications reportedly taken by individual respondents, but did not examine medication containers or medicine cabinets.

Medication data were categorised using the therapeutic index of the Pharmaceutical Benefits Schedule.<sup>14</sup> Use by individuals of multiple medications for the same body system was also examined.

## RESULTS

Of the 4700 households selected, 127 were found to be vacant dwellings. From the remaining dwellings, 3015 interviews were conducted (65.9% response rate). Reasons for non-response were refusal to participate ( $n=945$ ), inability to establish contact after six visits ( $n=366$ ), language barrier ( $n=82$ ), the selected respondent being absent for the duration of the survey ( $n=58$ ), illness ( $n=62$ ), inability to gain access to the dwelling ( $n=39$ ) and termination of the interview ( $n=6$ ).

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**1 Number (%) of participants using medications, by age group**

Number of medications	Age (years)							All ages (n = 3015)
	15-24 (n = 496)	25-34 (n = 494)	35-44 (n = 551)	45-54 (n = 521)	55-64 (n = 399)	65-74 (n = 280)	≥ 75 (n = 274)	
0	372 (75.0%)	369 (74.7%)	405 (73.6%)	280 (53.7%)	109 (27.3%)	46 (16.4%)	23 (8.4%)	1604 (53.2%)
1	68 (13.7%)	84 (17.0%)	77 (13.9%)	104 (20.0%)	100 (25.1%)	38 (13.6%)	34 (12.4%)	505 (16.7%)
2	38 (7.7%)	23 (4.7%)	44 (8.0%)	63 (12.1%)	60 (15.0%)	44 (15.7%)	44 (16.1%)	316 (10.5%)
3	12 (2.4%)	12 (2.4%)	16 (2.9%)	25 (4.8%)	45 (11.3%)	45 (16.1%)	41 (15.0%)	196 (6.5%)
4 or 5	6 (1.2%)	4 (0.8%)	4 (0.7%)	26 (5.0%)	42 (10.5%)	62 (22.1%)	79 (28.8%)	223 (7.4%)
6-9	0	2 (0.4%)	4 (0.7%)	19 (3.6%)	37 (9.3%)	38 (13.6%)	46 (16.8%)	146 (4.8%)
≥ 10	0	0	1 (0.2%)	4 (0.8%)	6 (1.5%)	7 (2.5%)	7 (2.6%)	25 (0.9%)

Of the 3015 respondents (49.1% male; mean age, 45.3 years [SD, 18.9 years]), 1411 (46.8%) were taking one or more prescribed medications (Box 1). The maximum number of prescribed medications taken by any one respondent was 19, and three others were taking 16 prescribed medications. The use of multiple prescribed medications increased with age.

The 10 most commonly reported categories of prescribed medication taken are shown in Box 2.

The four body systems for which multiple medication use was most common are shown in Box 3. In addition to taking

medications from multiple classes of cardiovascular system medications, five respondents were prescribed two different renin-angiotensin system medications; seven were taking two lipid-reducing agents; one was taking two calcium-channel blockers; one was taking two β-blockers; eight were taking two diuretics (and three were taking three). Of the respondents prescribed psychotropic medications, three were taking two different antidepressants. The number of respondents using antidepressants included 111 (3.7%) taking selective serotonin reuptake inhibitors, 54 (1.8%) taking tricyclic antidepressants, 25 (0.8%) taking venlafaxine and 14 (0.5%) taking other medications. There were 54 (1.8%) people prescribed anxiolytics and 44 (1.5%) prescribed hypnotics.

**2 Most commonly reported categories of prescribed medications**

Class of medication	Number (%) of participants (n = 3015)
Agents acting on the renin-angiotensin system	358 (11.9%)
Serum-lipid reducing agents	301 (10.0%)
Anti-inflammatory and anti-rheumatic agents	263 (8.7%)
Alimentary tract — drugs for acid-related disorders	252 (8.4%)
Antithrombotic agents	231 (7.7%)
Drugs for obstructive airway disease	220 (7.3%)
Antidepressants	201 (6.7%)
β-blocking agents	159 (5.3%)
Calcium-channel blockers	158 (5.2%)
Diuretics	151 (5.0%)

**DISCUSSION**

It is difficult to compare the few surveys that have been conducted on self-reported use of prescription medications because of inter-study differences in delineating the nature of the prescribed medications, their classification, and the time periods and subgroups examined. For example, the 1995 National Health Survey<sup>5</sup> results were based on a 2-week period of medication use in all age groups, including those under 15 years; another survey<sup>9</sup> analysed data from three 5-year age groups (20-24, 40-44 and 60-64 years) according to use in the previous month. We utilised a point prevalence of current use of prescribed medication among people aged 15 years and older.

Notwithstanding these differences, our results are consistent with the previous sur-

veys, particularly the 1995 National Health Survey,<sup>5</sup> which reported similar figures for the number of medications used in the different age groups.

Multiple medication use (polypharmacy) was particularly apparent for the cardiovascular and psychotropic medication groups. However, it cannot necessarily be assumed that any prescribing is inappropriate, as we do not have clinical information about the indications for prescription of individual medications. Indeed, these figures highlight the fact that the need for multiple medications increases with age. Thus, in the 55-64-years age group, only a quarter of respondents were not taking any prescribed medication, and 14.8% of people aged 55 years and over were taking six or more prescribed medications.

Nevertheless, bearing in mind the data presented here, it is not surprising that there have been community concerns about the safe and effective use of medications and that the federal government has responded with programs such as the Home Medicines Review, initiated in 2001.<sup>15</sup> The program was designed to review medications in people who were regularly taking five or more medications a day. It involves GPs and community pharmacists working together to promote safe and effective medication use. The program was introduced into the Medicare Benefits Schedule, but its uptake has been slow.<sup>15</sup> Our data suggest that there is room for greater use of this initiative.

The large number of medications taken by a minority of respondents in our study is of concern, not only with regard to appropriate prescribing, but also in relation to potential drug interactions. The list of medications used by one of the three respondents who reported taking 16 prescribed medications a day was as follows: conjugated oestrogen; mycostatin; three psychotropics (venlafaxine, chlorpromazine and oxazepam); one anti-inflammatory (diclofenac); four analgesics (two different brands of oxycodone, tramadol and paracetamol); and six medications for the gastrointestinal system (pantoprazole, docusate, atropine with diphenoxylate, sorbitol, hyoscine and prochlorperazine). It is quite probable that significant drug interactions and drug-related symptoms would be occurring in this person.

Such findings raise the ethical issue of whether or not some form of intervention should be offered in studies of this nature. In preparing for this survey we had considered and planned for managing any distress

**3 Number (%) of participants using multiple medications for four different body systems (n = 3015)**

Number of medications	Cardiovascular	Psychotropic	Respiratory	Musculoskeletal
1	279 (9.3%)	246 (8.2%)	115 (3.8%)	241 (8.0%)
2	213 (7.0%)	41 (1.4%)	73 (2.4%)	21 (0.7%)
3	110 (3.6%)	9 (0.3%)	25 (0.8%)	1 (0.0%)
4	67 (2.2%)	0	5 (0.2%)	0
5	20 (0.7%)	1 (0.0%)	2 (0.1%)	0
6	9 (0.4%)	0	0	0

associated with the data gathering, but had not anticipated being confronted with such extreme findings. Clearly, raising concerns about polypharmacy would need to be done sensitively, with due consideration of the respondent and his or her medical attendants.

It is pertinent to address the important issue of the use of finite resources, particularly in view of a recent government initiative to reduce the price paid for medicines under the Pharmaceutical Benefits Scheme. The Prime Minister is reported to have stated that such a plan would save taxpayers about \$740 million over 4 years.<sup>2</sup> In our study, 171 out of 3015 respondents were taking six or more prescribed medications, with an average of 7.8 medications per person. If this was reduced by one prescribed medication per person (and if we assume that a prescription for each medication is issued once a month at an average cost to the government of \$35.84,<sup>16</sup> and that our SA results can be extrapolated to all Australians aged ≥ 15 years), about \$390 million could be saved nationally each year. Although we can not necessarily assume from a study of this nature that any medications are being inappropriately prescribed, it is likely that at least some rationalisation and reduction of prescribed medication use could be achieved. Indeed, bearing in mind that the above figure is only the government cost, and does not include an individual's copayment, the potential savings to the community would be far greater than present government proposals are likely to achieve.

A limitation of our study was that there was only a 65.9% response rate, and it may well be that those who agreed to participate were more compliant with medication use and had a greater familiarity with responses to personal questions, thereby inflating the figures we obtained. On the other hand, respondents may not have reported all med-

ications used. Furthermore, nursing homes and other residential care facilities, which have a high use of medications,<sup>7,8</sup> were not included in our survey. Non-English speakers were also excluded — potential medication-related problems of people from non-English speaking backgrounds have been referred to in other Australian studies.<sup>17</sup>

Notwithstanding these caveats, our survey not only demonstrates substantial prescribed medication use in the community, but also raises the possibility of significant drug interactions. Furthermore, it provides a basis for future comparisons, particularly with regard to the potential for significant cost savings by rationalising the number of prescribed medications.

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**COMPETING INTERESTS**

Robert Goldney is on a psychotropic drug advisory board for Wyeth Australia and Lundbeck Australia, and the study was supported by the companies noted in the acknowledgements. He has also received travel assistance from Sanofi-Synthelabo Australia and speaker fees from several of the companies named in the acknowledgements. Laura Fisher has received part-salary/funding for data analysis from the companies noted in the acknowledgements.

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