

How much do we spend on prescription medicines? Out-of-pocket costs for patients in Australia and other OECD countries

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Abstract

Objectives. To determine changes in out-of-pocket expenditure on prescription medicines for Australian patients, and how patient expenditure compares with other Organisation for Economic Co-operation and Development (OECD) countries.

Methods. We examined out-of-pocket expenditure on prescription medicines by patients in Australia between 1970 and 2007, and between Australia and 15 other OECD countries (Canada, Czech Republic, Denmark, Finland, France, Germany, Japan, Republic of Korea (South Korea), Luxembourg, Poland, Slovak Republic, Spain, Sweden, Switzerland and the United States) in 2005.

Findings. Spending on publicly subsidised medicines by Australian patients increased from \$16 per person in 1971 to \$62 in 2007. Patient expenditure on all prescription medicines had risen to \$134 per person in 2007. Out-of-pocket expenditure for Australian patients ranked 4th of 14 OECD countries with universal pharmaceutical subsidies. Australian patients pay 28% of national pharmaceutical expenditure; more than patients in South Korea (27%), Slovak Republic (26%), Sweden (22%), France, Luxembourg, Japan and Switzerland (17%), Germany (15%), Czech Republic (11%) and Spain (6%), but less than patients in Finland (36%), Denmark (33%) and Poland (34%).

Conclusions. Compared to other OECD countries, Australian out-of-pocket costs are now in the mid to upper range. Further increases have the potential to significantly affect access to care.

What is known about the topic? In Australia and internationally, increases in the portion of prescription medicines paid by patients have been associated with falls in utilisation. Despite the pharmaceutical subsidies patients receive under the Australian Pharmaceutical Benefits Scheme, prescription medicine costs are a barrier to access for many low income, elderly and other vulnerable patients.

What does this paper add? The findings demonstrate that the prescription medicine expenditure of Australian patients has increased substantially over recent years, and is double that indicated by benefit-paid data alone. Out-of-pocket expenditure in Australia is moderate-to-high by international standards.

What are the implications for practitioners? Patient out-of-pocket expenditure for prescription medicines in Australia has increased in recent decades, accounting for higher proportions of household and national medicine expenditure. Lack of patient involvement in treatment decisions is associated with patients forgoing medicines due to costs. Practitioners are encouraged to discuss treatment decisions, cost-barriers and possible strategies to overcome cost-barriers with their patients.

Additional keywords: international comparison, pharmaceutical expenditure, private expenditure.

Background

Across industrialised countries, pharmaceutical expenditures have increased rapidly over recent decades.^{1–3} These increases have been attributed to ageing populations, the development of new and expensive drugs, and the increasing use of pharmaceuticals in managing chronic disease.^{4,5} In Australia, public expenditure under the Pharmaceutical Benefits Scheme (PBS) rose by ~11% per annum throughout the late 1990s and 2000s, reaching AU\$7 billion in 2007–08.⁶ There has been much public discussion about whether this scheme is becoming too expensive and how to best ensure that the scheme remains affordable for the community, and less about out-of-pocket costs for individual patients and whether these costs are affordable.^{7–9} In recent years, a series of PBS policy changes has increased the proportion of medicine costs borne by patients. Patient co-payments^A were increased by 24% in January 2005 and the safety-net threshold^B has increased by the equivalent of eight prescriptions since January 2006. The 2006 introduction of the safety net ‘20-day rule’^{10,C} has reduced the number of patients eligible for cheaper medicines towards the end of the calendar year.¹¹ There is growing evidence that many Australian patients are struggling to afford their prescribed medicines.^{3,11,12}

Comparisons are often made with other Organisation for Economic Co-operation and Development (OECD) countries when determining whether public and patient medicine expenditure in Australia is sustainable.^{5,13,14} Patients’ out-of-pocket spending (‘private expenditure’) on prescription medicines is affected by the pharmaceutical subsidy systems which provide coverage. Subsidy arrangements vary considerably between countries, with public, private and mixed systems operating across OECD nations. Despite the large differences in national wealth across OECD countries, all have special pharmaceuticals subsidy arrangements in place for their low income and other vulnerable populations (Table 1).

This study examines private expenditure on prescription medicines in Australia over the previous three decades, and compares the current out-of-pocket prescription medicine expenditure of Australian patients with that in other OECD countries.

Method

Data sources

Data were sourced from: (i) the Australian Institute of Health and Welfare (AIHW) data cubes¹⁵; (ii) annual reports from the AIHW’s ‘Health Expenditure Australia’ series^{13,14,16}; and (iii) the 2008 release of the OECD’s Health Data statistics.¹⁷ The AIHW data cubes contain Australian public and private health expenditure statistics dating back to 1960. These data do not capture private expenditure for all prescription medicines in Australia, only publicly subsidised prescription medicines. Public subsidies are paid for PBS-listed medicines which cost

more than the patient contribution (co-payment) for a given beneficiary group; currently \$5.40 for concessional beneficiaries and \$33.30 for general beneficiaries.¹⁸ PBS medicines priced below these co-payments are not subsidised, and the expenditure data related to these prescriptions are not captured in the ‘benefit-paid’ data. The completeness of these data have changed over time as the general co-payment amount, and the number of patients eligible for concessional benefits, has changed.⁵ Prior to 1986, the co-payment for general beneficiaries was sufficiently low that virtually all prescriptions were subsidised and therefore captured in the benefit-paid data.¹⁹ In November 1986 the general co-payment was doubled from \$5 to \$10. Following this, and all subsequent co-payment increases, some PBS medicines were no longer captured in the benefit-paid data.¹⁹ Between 1990 and 2007 the benefit-paid statistics have only captured an average of 81% of the PBS prescriptions dispensed nationally.^{20–23}

The AIHW data also provide statistics on ‘other’ pharmaceuticals, which is an aggregate expenditure for over-the-counter (non-prescription) medicines and private (non-PBS) prescriptions as well as prescription medicines below the PBS co-payments.¹⁵ Annual AIHW reports provide expenditure estimates specifically for under co-payment and private prescriptions. These reports allow total private expenditure to be calculated for all prescription medicines dispensed in Australia for the years 2004–07.^{13,14,16}

The 2008 OECD Health Data statistics include health system, healthcare consumption and economic indicators for the 30 OECD member countries. Data are intermittent for the years 1960–70 but were collected annually from 1971. Some data are not available for all countries in all years. The primary indicator of interest in this study was private expenditure on prescription medicines. These data are not collected in all countries, and some countries’ records do not distinguish between private expenditure on prescription and over-the-counter medicines.

Analysis

We examined changes in public and private expenditure on prescription medicines in Australia between 1971 and 2007. To adjust for changes in population size and inflation, we compared per capita real expenditure converted to 2007–08 gross domestic product (GDP) price levels.¹⁵ We calculated the proportion of all national prescription medicine expenditure paid privately, and the proportion of household expenditure directed towards prescription medicines between 1971 and 2007.

We compared private expenditure on prescription medicines in Australia with that in 15 other OECD countries; Canada, Czech Republic, Denmark, Finland, France, Germany, Japan, Republic of Korea (South Korea), Luxembourg, Poland, Slovak Republic, Spain, Sweden, Switzerland and the United States (US) in 2005,

^APatient contribution toward the cost of each prescription.

^BOnce an annual threshold has been spent on PBS medicines, a ‘safety net’ comes into effect, whereby subsequent prescriptions for the calendar year are dispensed for a reduced co-payment to general beneficiaries and free to concessional beneficiaries.

^CThe normal supply of repeat PBS medicines is for 30 days of treatment.

Table 1. Characteristics of pharmaceutical subsidy schemes across Organisation for Economic Co-operation and Development (OECD) countries

Country	GDP per capita US\$ ¹⁷	Universal pharmaceutical subsidy	Patient contributions
Australia	\$35 952	Yes	<ul style="list-style-type: none"> • Fixed co-payments • Co-payment up to \$21 per item, with contributions reduced to \$3.30^A per item after \$732 is spent annually¹⁸ • Low income patients, aged pensioners and social security recipients pay up to \$3.30 per item, with a cost ceiling of \$187 annually¹⁸
Canada	\$36 814	No ³⁰	<ul style="list-style-type: none"> • Co-payments, cost ceilings and special subsidy groups vary by province and private insurer³⁰
Czech Republic	\$22 042	Yes	<ul style="list-style-type: none"> • At least one drug for each condition is fully subsidised (often a generic or the lowest-cost branded item) • For more expensive items, patients pay the difference between the subsidised-item cost and the prescription cost³¹
Denmark	\$35 218	Yes	<ul style="list-style-type: none"> • Capped proportional co-payments • Patients pay all prescription costs up to \$59 annually, then 50% of costs between \$59 and \$140, 25% of costs between \$140 and \$326, and 15% of costs between \$326 and \$420. Medicines are free after costs exceed \$420 annually³²
Finland	\$32 728	Yes	<ul style="list-style-type: none"> • Fixed and proportional co-payments • Patients pay the fixed amount of \$9.70 for most chronic disease medicines^{33,34} • Patients pay \$9.70 plus 50% of the remaining cost for other medications³³
France	\$31 048	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Medications for life-threatening conditions and chronic diseases are free^{35–37} • Patients pay 35% of cost for most other drugs^{35,37}
Germany	\$31 949	Yes	<ul style="list-style-type: none"> • Capped proportional co-payments • Patients pay 10% of medicine cost, with minimum charge of \$5.70 and maximum of \$11.40.³⁸ The annual cost ceiling is 2% of the patient's gross income. • Low income patients and the chronically ill have costs capped at \$94 annually³⁸
Japan	\$32 002	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Patients pay 30% of medicine cost • Children and the elderly pay 10–20% of medicine cost³⁶
Republic of Korea (South Korea)	\$23 038	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Patients pay 30% of all pharmaceutical and medical costs up to \$3937 annually
Luxembourg	\$59 176	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Medicines for serious or chronic illnesses are free³⁹ • Patients pay 20% of cost for most other drugs³⁹
Poland	\$14 674	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Patients pay either 0, 50, 70 and 100% of the medicine cost depending on the therapeutic class • Essential medicines are fixed at US\$1.30⁴⁰ • War veterans and the chronically ill have additional subsidies or free medicines
Slovak Republic	\$17 584	Yes	<ul style="list-style-type: none"> • Free dispensing of essential medicines (generally cheapest available in therapeutic class) • Partial reimbursement of essential medicines which are priced higher than reference meds capped at 20% of cost, or full cost for discretionary treatments
Spain	\$29 383	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Patients pay 10% of the costs for chronic disease medicines • Patients pay 40% of the cost for most other medications • The elderly and social security recipients are exempt from co-payments • The chronically ill have a cap of \$3.50 per prescription⁴¹
Sweden	\$34 870	Yes	<ul style="list-style-type: none"> • Capped proportional co-payments • Patients pay all medicine costs up to \$120 annually, then between 10–50% of costs to a maximum of \$240, after which medicines are free.^{36,41,42}
Switzerland	\$38 119	Yes	<ul style="list-style-type: none"> • Proportional co-payments • Patients pay 10% of drug costs
United States	\$43 864	No	<ul style="list-style-type: none"> • Varies by state and private insurer (Centers for Medicare and Medicaid Services, US Department of Health and Human Services, see http://www.cms.hhs.gov/, accessed 25 July 2011) • Some low income earners eligible for Medicaid. • Medicare D offers a range of schemes with varying co-payments and ceilings (http://www.cms.hhs.gov/) • End-stage renal patients are eligible for Medicare (http://www.cms.hhs.gov/)

^AAll prices in \$US using purchasing power parities for 2005.

the most recent year when data from all countries were available. To allow comparison between currencies, per capita expenditure on prescription medicines were converted into \$US using the OECD's purchasing power parity (PPP) exchange rates.²⁴ PPPs account for price differences across a range of goods and services between countries and are more reliable and stable than exchange rate conversions.²⁴ The OECD caution that PPPs are constructs rather than exact values²⁵ and that small differences in per capita expenditure between countries should not be interpreted as economically or statistically significant. They recommend that countries be grouped according to their per capita wealth rather than strictly ranked.²⁵ Consistent with OECD recommendations on groupings, we compared the per capita prescription medicine expenditure of high income (Luxembourg, Switzerland and the US), high-middle income (Australia, Canada, Denmark, Finland, France, Germany, Japan and Sweden), low-middle income (Czech Republic, South Korea and Spain), and low income countries (Poland and the Slovak Republic).²⁵

We also compared private expenditure on prescription medicines in Australia with 15 other countries as a proportion of total national prescription medicine expenditure and as a proportion of household consumption expenditure in 2005. Household consumption expenditure literally refers to total household spending of goods and services and is included in the OECD Health Statistics.¹⁷

Results

Private expenditure in Australia

Prescription medicine expenditure in Australia has increased substantially over the past three decades, even after accounting for inflation and population growth (Fig. 1). Private spending on benefit-paid prescription medicines increased steadily in real terms throughout the 1970s and 1980s, but has tripled since 1991, rising from an average of AU\$19 to \$62 per person in 2007.

Private spending on all prescription medicines reached \$134 per person by 2007.

Patient spending accounted for ~22% of benefit-paid expenditure in the 1970s and 1980s and ~16% through the 1990s and 2000s (Fig. 2). These data do not capture all PBS medicines after 1986, when some medicines began falling below the general co-payment. When expenditure on private prescriptions and those under co-payment is included, patient contributions account for 28% of national prescription expenditure. Fig. 3 shows private expenditure on prescription medicines as a proportion of household consumption expenditure, in 2007 GDP prices. In the 1970s and 80s Australian patients used ~0.1% of their household expenditure for benefit-paid medicines. This proportion increased rapidly after the late 80s, despite some medicines falling out of data-capture during this time, and by 2006 reached 0.2%. In 2006, the total proportion of household expenditure used for all prescription medicines in Australia was 0.43%.

Private expenditure across OECD countries

We compared private per capita expenditure on prescription medicines in Australia with 15 OECD countries (see Fig. 4). In 2005, Australian patients spent US\$84 per capita on prescription medicines. This positioned Australia as equal 6th highest of 16 OECD countries with available private expenditure data. Per capita private expenditure was higher for patients in the United States (\$487), Canada (\$262), Finland (\$120), France (\$103) and the Slovak Republic (\$95), compared with Australia.

We compared the proportion of national prescription medicine expenditure paid by patients in each of the countries with available data (Fig. 5). More than one quarter (28%) of prescription medicine costs in Australia are privately financed, placing Australia in the middle of the 16 OECD countries and 4th highest of the countries with universal pharmaceutical subsidies. Australian patients pay for a higher proportion of national pharmaceutical expenditure than patients in South Korea (27%),

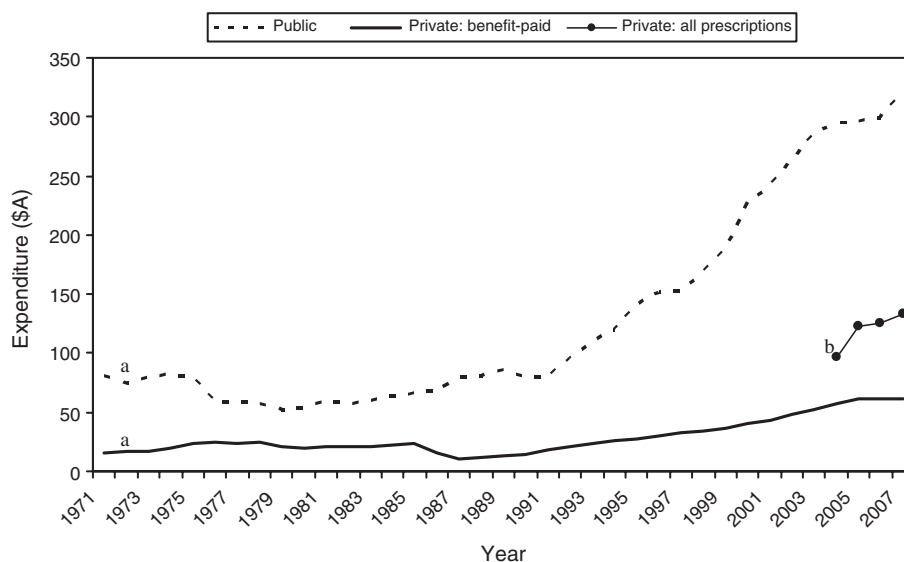


Fig. 1. Public and private expenditure per capita on prescription medicines in Australia (2007 GDP price levels). (a) Data sourced from the Australian Institute of Health and Welfare (AIHW) data cubes.¹⁵ (b) Data sourced from the AIHW's 'Health Expenditure Australia' reports.^{13,14,16}

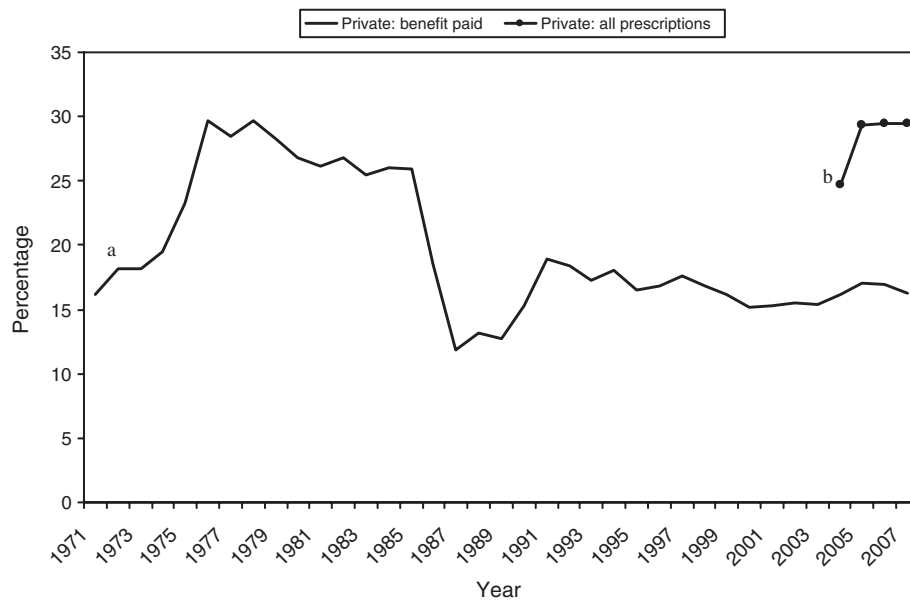


Fig. 2. Percentage of total prescription medicine expenditure paid privately in Australia (2007 GDP price levels). (a) Data sourced from the Australian Institute of Health and Welfare (AIHW) data cubes.¹⁵ (b) Data sourced from the AIHW’s ‘Health Expenditure Australia’ reports.^{13,14,16}

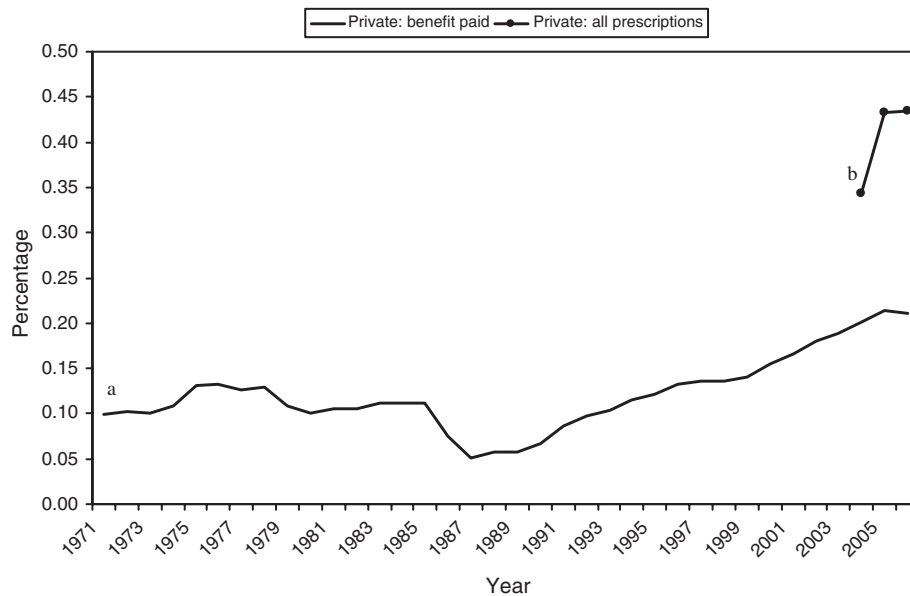


Fig. 3. Percentage of household consumption expenditure used for prescription medicines in Australia, 1971–2006. (a) Data sourced from the Australian Institute of Health and Welfare (AIHW) data cubes.¹⁵ (b) Data sourced from the AIHW’s ‘Health Expenditure Australia’ reports.^{13,14,16}

Slovak Republic (26%), Sweden (22%), France, Luxembourg, Japan and Switzerland (17%), Germany (15%), Czech Republic (11%) and Spain (6%), but less than patients in Finland (36%), Denmark (33%) and Poland (34%).

Compared to other high–middle income countries, Australians spend a moderate proportion of their household income on prescription medicines (0.4%) (Fig. 6). This proportion is

consistent with the proportions of income spent in Denmark, Japan and Sweden. Proportionate to household income, spending was twice as high for patients in Finland (0.8%) and more than three times as high in Canada (1.4) and the US (1.7%). However, substantially lower portions of national expenditure were incurred by patients in the Czech Republic (0.3%), Germany (0.3%) and Spain (0.2%).

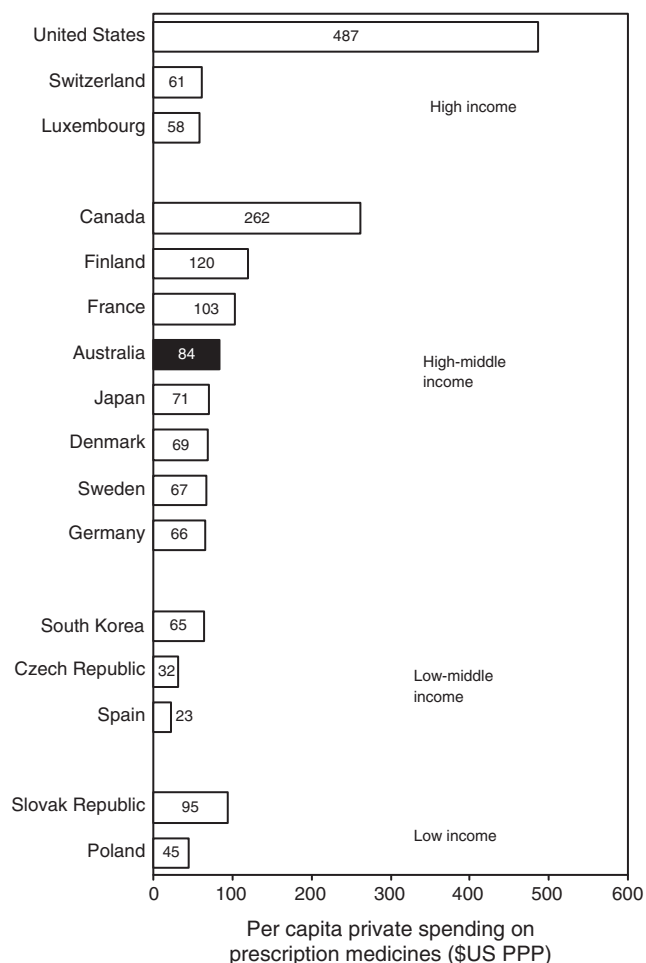


Fig. 4. Private expenditure on prescription medicines per capita across OECD countries with different national incomes, 2005. Data was sourced from the OECD¹⁷ for all countries except Australia, with data sourced from the AIHW.¹³

Discussion

Patient spending on prescription medicines has increased substantially in Australia over the past three decades. Private expenditure on benefit-paid medicines tripled between 1991 and 2007. During the same period, expenditure on other essentials, such as food and electricity and gas, increased by much smaller margins (66 and 121% respectively).²⁶ Although the benefit-paid statistics are available for every year in Australia since 1971, these data are not complete and underestimate patient expenditure after 1986. Many high-volume medicine groups, including antibiotics, antidepressants, anxiety medications, metformin and oral contraceptives are priced below the general beneficiary co-payment, and are not captured in the benefit-paid statistics.²⁷ This represents a critical gap in data availability over the past 24 years. Although the benefit-paid component of private spending showed little increase after the January 2005 co-payment increase, private expenditure on all prescription medicines actually increased from \$97 to \$123 per person in that year. From 2004 to 2006, the proportion of all prescription medicine

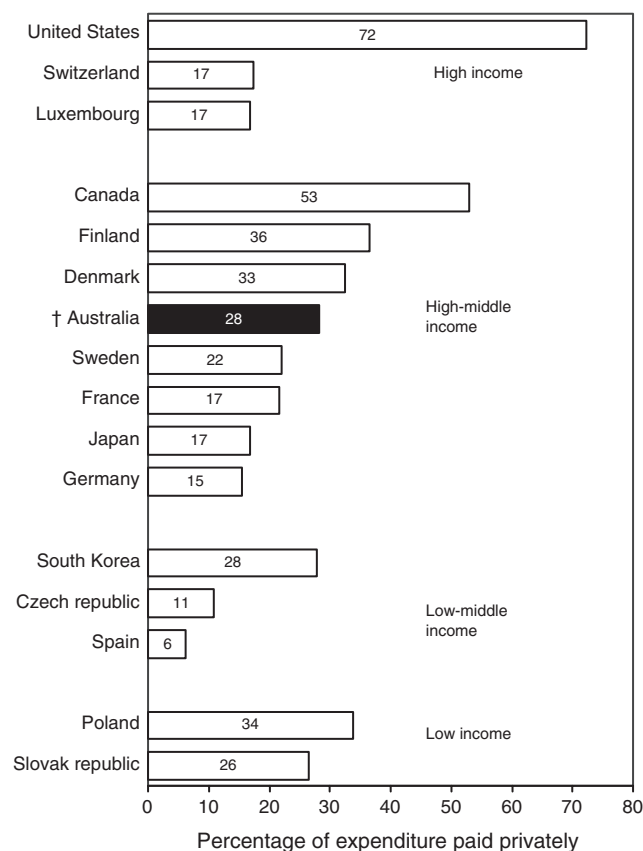


Fig. 5. Percentage of national prescription medicine expenditure paid privately across OECD countries with different national incomes, 2005. Data were sourced from the OECD¹⁷ for all countries except Australia, with data sourced from the AIHW.¹³

expenditure borne by patients increased from 25 to 28%, and the proportion of household expenditure used for medicines rose from 0.34 to 0.43%.

The international data suggest that patient out-of-pocket expenditure in Australia is now moderate to high. Australia ranks in the middle (6th of 16) of the OECD countries in terms of patient expenditure, and 4th of 14 countries with universal pharmaceutical subsidies. It is unsurprising that per capita private spending would be substantially higher in the US and Canada given their largely private pharmaceutical insurance systems. Although Canada's GDP/per capita is similar to Australia's, the lack of universal pharmaceutical cover in Canada likely accounts for why Canadian patients pay almost twice as much towards their national medicine costs compared to Australian patients (53 v. 28%).

Australian patients do not face the highest prescription costs in the OECD, but their expenditure is in the mid to upper range for countries with universal pharmaceutical coverage. Recent data suggests that many Australian patients are at the limit of what they can afford to pay for medicines. Two international surveys have reported that in 2007, 13%³ of Australian adults, and in 2008, 20%²⁸ of Australian adults in poor health, reported recently skipping doses of medicines or not filling a prescription

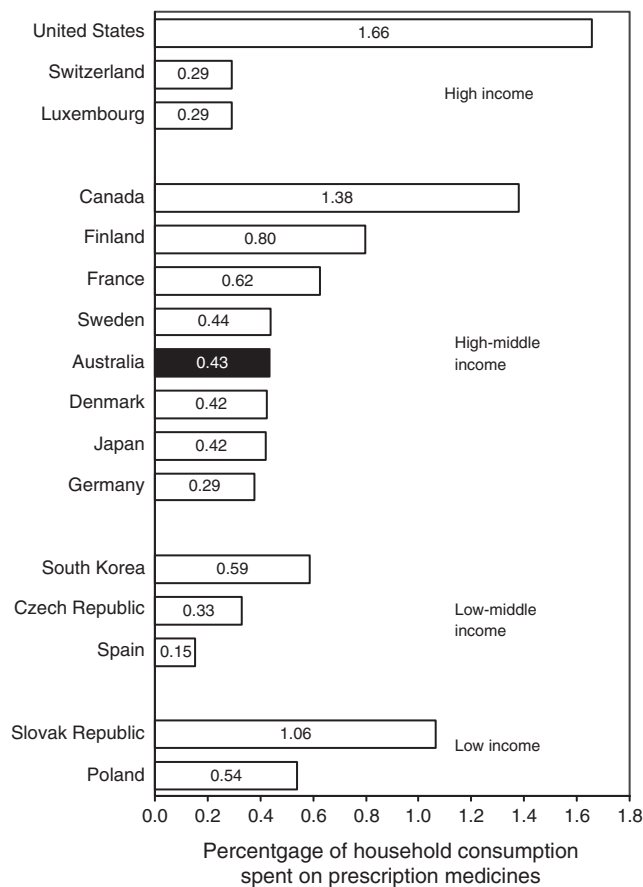


Fig. 6. Proportion of household consumption directed towards prescription medicines across OECD countries with different national income. Data were sourced from the OECD¹⁷ for all countries except Australia, with data sourced from the AIHW.¹³

because of cost (Fig. 7). The rates of underuse due to cost reported by Australian patients in these studies were only second to those reported by US patients and higher than those in Canada,^{3,28} France²⁸ and Germany.^{3,28} Australian studies have reported that dispensings of selected essential medicines including statins, proton-pump inhibitors, non-aspirin antiplatelets and osteoporosis treatments have decreased significantly following the 2005 co-payments increase and subsequent safety net policy changes.^{11,29}

Limitations

The expenditures reported here are national-level and therefore represent estimated per capita expenditure for the ‘average’ patient. Clearly, prescription medicine expenditure will vary according to the health status, comorbidities and socio-economic status of individual patients. Some patients will face higher cost burdens than are reflected by these national estimates. There are also limitations with the use of PPPs to compare pharmaceutical expenditure across countries. Although PPPs are preferable to volatile exchange rates, they are based on the price of a range of goods and services.²⁵ Healthcare or pharmaceuticals specific PPPs would be a more accurate unit of exchange. These

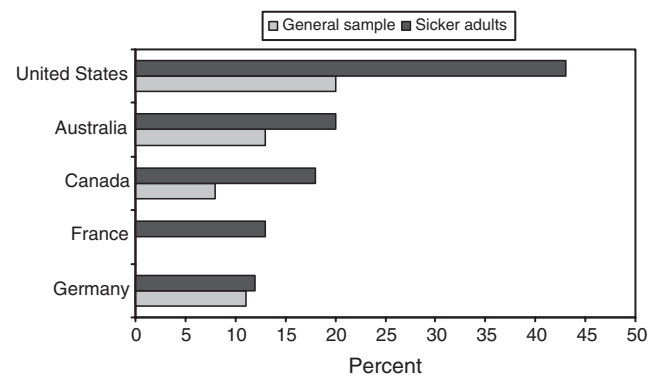


Fig. 7. The proportion of adults reporting they had recently skipped doses of medicine or not filled a prescription because of cost in five OECD countries.^{3,28}

conversion rates are currently under development by the OECD.²⁵ A further limitation is the incompleteness of the OECD database. Data on private prescription medicine expenditure were not available from the countries with national wealth and public subsidy systems most similar to Australia (i.e. Italy, Iceland, the Netherlands, New Zealand and the United Kingdom).

Our analysis has not accounted for patient expenditure on non-prescription medicines. Available data indicated that Australians spent \$146 per person on non-prescription medicines in 2005; however, these data do not differentiate between spending on over-the-counter medicines and medical non-durables (i.e. bandages and condoms).^{13,17} Cross-country comparisons of non-prescription medicine expenditure are also difficult due to differences in the way non-prescription medicines data are captured and defined.² Given these data limitations, we have not reported non-prescription medicine expenditure. However, we acknowledge that the true cost burden of medicines is likely to be much higher than indicated by our analyses of prescription medicines alone. The burden of prescriptions would also be higher for many patients if the PBS safety net was not in place.

The cross-country data discussed here are based on current (2005) expenditures, and the relative ranking of countries may change in the future. Of the 16 countries we examined, 4 have fully proportional systems (Japan, South Korea, Spain and Switzerland), 4 have capped proportional co-payments (Denmark, Finland, Germany and Sweden,), 5 have proportional co-payments in conjunction with ‘free lists’ (Czech Republic, France, Luxembourg, Poland and Slovak Republic), 1 has fixed co-payments (Australia) and 2 have mixed systems (Canada and the US). These systems may respond differently to future increases in medicines expenditures, and the effects on patient expenditures across countries may be varied.

Conclusion

The findings from this study indicate that Australian patients have faced increasing prescription medicines costs over recent years and that patient expenditure is now in the middle to upper range with comparable countries. Further large increases in the portion of medicine costs borne by patients have the potential to

substantially affect access to and use of prescribed medicines, with potential risks to patient health and wellbeing. Policy makers should consider the ongoing affordability of medicine to patients, as well as to the wider community, when reviewing pharmaceutical reimbursement policy.

Competing interests

The authors declare that no conflicts of interest exist.

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References

- Allan GM, Lexchin J, Wiebe N. Physician awareness of drug cost: a systematic review. *PLoS Med* 2007; 4(9): e283. doi:10.1371/journal.pmed.0040283
- Steinman MA, Sands LP, Covinsky KE. Self-restriction of medications due to cost in seniors without prescription coverage. *J Gen Intern Med* 2001; 16: 793–9. doi:10.1046/j.1525-1497.2001.10412.x
- Schoen C, Osborn R, Doty MM, Bishop M, Peugh J, Murukutla N. Toward higher-performance health systems: adults' health care experiences in seven countries, 2007. *Health Aff* 2007; 26(6): w717–34. doi:10.1377/hlthaff.26.6.w717
- Ess SM, Schneeweiss S, Szucs TD. European healthcare policies for controlling drug expenditure. *Pharmacoeconomics* 2003; 21(2): 89–103. doi:10.2165/00019053-200321020-00002
- Rickard M. The Pharmaceutical Benefits Scheme: options for cost control. Canberra: Social Policy Group, Parliamentary Library; 2002. Current Issues Brief number 12 2001–02.
- Expenditure and prescriptions twelve months to 30 June 2008. Canberra: Australian Government Department of Health and Ageing; 2008.
- Doran E, Henry DA. The PBS community awareness campaign: how helpful is blaming patients? *Med J Aust* 2003; 179(10): 544–5.
- Doran E, Henry D. Pharmaceutical benefits scheme policy: confused and tough on patients. *Intern Med J* 2006; 36: 211–3. doi:10.1111/j.1445-5994.2006.01050.x
- Harvey K. Securing the future of the Pharmaceutical Benefits Scheme? Australian Review 2002. Available at <http://www.australianreview.net/digest/2002/06/harvey.html> [verified 8 April 2010].
- Schedule of Pharmaceutical Benefits, 31 July. Australian Government Department of Health and Ageing; 2010. Available at <http://www.pbs.gov.au/html/healthpro/publication/view?date=20100401&type=FlashPaper&name=general-schedule> [verified 8 April 2010].
- Hynd A, Roughead E, Preen DB, Glover J, Bulsara M, Semmens J. The impact of co-payment changes on dispensings of government-subsidised medicines in Australia. *Pharmacoepidemiol Drug Saf* 2008; 17: 1091–9. doi:10.1002/pds.1670
- Doran E, Robertson J, Rolfe I, Henry D. Patient co-payments and use of prescription medicines. *Aust N Z J Public Health* 2004; 28(1): 62–7. doi:10.1111/j.1467-842X.2004.tb00634.x
- Health expenditure Australia 2004–05. Canberra: Australian Institute of Health and Welfare; 2006.
- Health expenditure Australia 2006–07. Canberra: Australian Institute of Health and Welfare; 2008.
- Interactive expenditure data. Canberra: Australian Institute of Health and Welfare; 2009. Available at <http://www.aihw.gov.au/expenditure/databases/index.cfm> [verified 8 April 2010].
- Health expenditure Australia 2002–03. Canberra: Australian Institute of Health and Welfare; 2004.
- OECD Health Data 2011. Organisation for Economic Co-operation and Development; 2011. Available at <http://www.oecd.org/health/healthdata> [verified 25 July 2011].
- Past copayments and Safety Net thresholds. Department of Health and Ageing; 2010. Available at <http://www.aodgp.gov.au/internet/main/publishing.nsf/Content/health-pbs-general-pbs-copayment.htm> [verified 8 April 2010].
- Johnston M. The price elasticity of demand for pharmaceuticals. In: Smith CS, editor. *Economics and health 1990: proceedings of the Twelfth Australian Conference of Health Economists*. Melbourne: Monash University and Fairfield Hospital; 1990: 22–43.
- Australia's health 1994. Canberra: AGPS, Australian Institute of Health and Welfare; 1994. Available at <http://www.aihw.gov.au/publications/aus/ah94/ah94.pdf> [verified 8 April 2010].
- Australian Statistics on Medicines 1997. Canberra: Commonwealth Department of Health and Family Services, Drug Utilisation Sub Committee; 1998.
- Australia's Health 2008. Canberra: Australian Institute of Health and Welfare; 2008.
- Australian Statistics on Medicines 2007. Canberra: Department of Health and Ageing, Drug Utilisation Sub Committee; 2009.
- Purchasing power parities for GDP and related indicators. Organisation for Economic Co-operation and Development; 2011. Available at <http://stats.oecd.org/Index.aspx?DataSetCode=PPPGDP> [verified 25 July 2011].
- New GDP comparisons based on Purchasing Power Parities for the year 2002. Paris: Organisation for Economic Co-operation and Development; 2005. Available at <http://www.oecd.org/dataoecd/32/62/34256773.pdf> [verified 8 April 2010].
- 5206.0 – Australian National Accounts: National Income, Expenditure and Product, Mar 2011. Canberra: Australian Bureau of Statistics; 2011. <http://www.abs.gov.au/Ausstats/abs@.nsf/mf/5206.0> [verified 8 April 2010].
- PBS Statistics. Canberra: Medicare Australia; 2009. Available at https://www.medicareaustralia.gov.au/statistics/pbs_item.shtml [verified 13 February 2009].
- Schoen C, Osborn R, How SKH, Doty MM, Peugh J. In chronic condition: experiences of patients with complex health care needs, in eight countries, 2008. *Health Aff* 2009; 28(1): w1–16. doi:10.1377/hlthaff.28.1.w1
- Hynd A, Roughead E, Preen DB, Glover J, Bulsara M, Semmens J. Increased patient co-payments and changes in subsidised prescription medicines dispensed in Western Australia. *Aust N Z J Public Health* 2009; 33(3): 246–52. doi:10.1111/j.1753-6405.2009.00383.x
- Paris V, Docteur E. Pharmaceutical pricing and reimbursement policies in Canada: Directorate for Employment, Labour and Social Affairs Health Committee; 2006.
- Davidova J, Praznovcova L, Lundborg CS. Pricing and reimbursement of pharmaceuticals in the Czech Republic and Sweden. *Pharm World Sci* 2008; 30(1): 57–64. [Published online ahead of print 23 June 2007]. doi:org/10.1007/s11096-007-9141-z
- Strandberg-Larsen M, Knudsen MS. ISPOR global health care systems road map: Denmark – Pharmaceuticals. International Society for Pharmacoeconomics and Outcomes Research; 2009. Available at <http://www.ispor.org/htaroadmaps/denmark.asp> [verified 25 July 2011].
- Rinta S. Pharmaceutical pricing and reimbursement in Finland. *Eur J Health Econ* 2001; 2(3): 128–35. doi:10.1007/s101980100072
- Review of NHS prescription charges and exemption arrangements in Scotland: consultation. Edinburgh: Scottish Executive; 2006. Available at <http://www.scotland.gov.uk/Resource/Doc/90909/0021837.pdf> [verified 8 April 2010].

- 35 le Polain M, Franken M, Koopmanschap M, Cleemput I. Drug reimbursement systems: international comparison and policy recommendations. Health Services Research (HSR), KCE Reports 147C. D/2010/10.273/90. Brussels: Belgian Healthcare Knowledge Centre (KCE); 2010.
- 36 The OECD Health Project: Private health insurance in OECD countries. Paris: Organisation for Economic Co-operation and Development; 2004.
- 37 Sandier S, Paris V, Polton D, Thomson S, Mossialos E. Health care systems in transition: France. European Observatory on Health Care Systems; 2004. Available at <http://www.euro.who.int/document/e83126.pdf> [verified 8 April 2010].
- 38 Health insurance and the electronic health card. Federal German Ministry for Health; 2005. Available at <http://www.beyondpoverty.re.kr/share/download.jsp?bbsid=3&seq=270&fseq=1> [verified 8 April 2010].
- 39 Health care systems in transition. Luxembourg: European Observatory on Health Care Systems; 1999. Available at <http://www.euro.who.int/document/e67498.pdf> [verified 8 April 2010].
- 40 Kuszewski K, Gericke C. Health Systems in Transition: Poland. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies; 2005. Available at http://www.euro.who.int/__data/assets/pdf_file/0011/95159/E88670.pdf [verified 25 July 2011].
- 41 Review of prescription charges in Western Europe, North American and Australasia. Edinburgh: Scottish Executive; 2006. Available at <http://www.scotland.gov.uk/Resource/Doc/92240/0022048.pdf> [verified 8 April 2010].
- 42 Moise P, Docteur E. Pharmaceutical pricing and reimbursement policies in Sweden. Directorate for Employment, Labour and Social Affairs Health Committee; 2007.

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