Australian dispensing doctors' prescribing: quantitative and qualitative analysis

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ABSTRACT

Objective: To evaluate the prescribing practices of Australian dispensing doctors (DDs) and to explore their interpretations of the findings.

Design, participants and setting: Sequential explanatory mixed methods. The quantitative phase comprised analysis of Pharmaceutical Benefits Scheme (PBS) claims data of DDs and non-DDs, 1 July 2005 – 30 June 2007. The qualitative phase involved semi-structured interviews with DDs in rural and remote general practice across Australian states, August 2009 – February 2010.

Main outcome measures: The number of PBS prescriptions per 1000 patients and use of Regulation 24 of the *National Health (Pharmaceutical Benefits) Regulations 1960* (r. 24); DDs' interpretation of the findings.

Results: 72 DDs' and 1080 non-DDs' PBS claims data were analysed quantitatively. DDs issued fewer prescriptions per 1000 patients (9452 v 15 057; $P = 0.003$), even with a similar proportion of concessional patients and patients aged > 65 years in their populations. DDs issued significantly more r. 24 prescriptions per 1000 prescriptions than non-DDs (314 v 67; $P = 0.008$). Interviews with 22 DDs explained that the fewer prescriptions were due to perceived expectation from their peers regarding prescribing norms and the need to generate less administrative paperwork in small practices.

Conclusions: Contrary to overseas findings, we found no evidence that Australian DDs overprescribed because of their additional dispensing role.

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Across some 80 sites in rural and remote Australia, there exists a unique model of general practice in which general practitioners, as part of their routine medical practice, both prescribe and dispense medicines to their patients. These dispensing doctors (DDs) are licensed to dispense pharmaceuticals subsidised by the Pharmaceutical Benefit Scheme (PBS) because there is no local access to a community pharmacy.[1]

A recent systematic review on DD practices overseas found that DDs tended to prescribe more pharmaceutical items, incurred higher pharmaceutical costs, and were less likely to prescribe generic medicines than their non-dispensing counterparts.[2] There was also some evidence to suggest DDs prescribed antibiotics less judiciously.[2]

The aim of this study was to evaluate the prescribing by Australian DDs using PBS claims data, and to gain insight into DDs' rationales for their prescribing habits.

METHODS

A sequential explanatory mixed-methods design was used. The quantitative phase of the study comprised a retrospective evaluation of DDs' prescribing and examined specific aspects of prescribing distilled from the systematic review.[2]

The qualitative phase of the study used an iterative descriptive method[3] to identify aspects of DDs' routine practice, thereby amplifying the quantitative findings.

Ethics approval was obtained from the Curtin University Human Research Ethics Committee.

Exclusion criteria

For this study, we excluded GPs who, on average, prescribed fewer than 10 PBS pharmaceuticals items or had fewer than 13 Medicare Benefits Schedule consultations per month for the index period.[4]

Quantitative data collection

An extract of PBS claims data for the index period, 1 July 2005 to 30 June 2007, was used for this study. Each claim represented an episode of supply of a PBS pharmaceutical benefit (a "prescription"). For this study, the Australian Government Department of Health and Ageing (the "Department") summarised these data on the basis of the date of dispensing, the pharmaceutical Anatomical Therapeutic Chemical Classification and recipient (general, concession, and/or > 65 years old). Data were extracted using the unique individual prescriber number. The extracted data were de-identified by the Department so that reverse identification of any individual prescriber was not possible.

The de-identified data were then pooled by the Department into two categories: "rural" (prescribers in Rural, Remote and Metropolitan Areas [RRMA] categories 4 and 5) and "remote" (RRMA categories 6 and 7) before being released for subsequent analysis in July 2008. These data were then amalgamated for this report. The two cohorts (DDs and non-DDs) were matched by RRMA.

Regulation 24 of the *National Health (Pharmaceutical Benefits) Regulations 1960* (r. 24) allows prescribers to direct the supply on the one occasion the maximum quantity of a pharmaceutical benefit (original and all repeats) prescribed. The Department corrected for the number of prescriptions for each service of r. 24 in the data provided.

Quantitative data analysis

The primary outcome indicator of the study was the number of PBS prescriptions per 1000 patients. This was a population study of all DDs who were in practice in the 2 fiscal years studied. Seventy-two DDs and 1080 non-DDs in rural and remote Australia gave a power of 100% to detect a 5% difference in the PBS prescribing data at a significance level of 0.01 (99% CI). This calculation was based on two studies from the United Kingdom, which reported a mean difference of 1.23–1.80 items (SD, 0.42) prescribed per patient.[5,6]

Data were analysed using SPSS, version 17.0 (SPSS Inc, Chicago, Ill, USA). Syntax used has been described elsewhere.[7] The predetermined outcome variables (volume and prescribing indicators were distilled from the systematic review.[2] For the comparison of differences, the Student *t* test was employed. $P < 0.01$ was considered statistically significant.

Recruitment of dispensing doctors for qualitative analysis

A purposive sample of DDs who had dispensed in the 2005–07 financial years was recruited through the Divisions of General Practice network. Maximum variation sampling was used to include:

- GPs from all states of Australia;
- rural and remote GPs;
- men and women; and
- GPs who had obtained their medical graduation in Australia and overseas.

Respondents were not offered any remuneration for their participation in this study.

Qualitative data collection

In-depth face-to-face and telephone interviews were conducted between August 2009 and February 2010. The semi-structured, open-ended interview questions were framed by the quantitative findings and sought the DDs' interpretation for the observed quantitative results in the context of their routine practice. Questions asked included:

- How do you perceive your prescribing compares with non-DDs?
- When would you use r. 24?

Qualitative data analysis

The interviews were audiotaped and transcribed verbatim before being imported into NVivo, version 8 (QSR International, Southport, UK) for data management. We used a combination of processes grounded in pragmatism[8] using qualitative content analysis[9] and constant comparison[10] to analyse the interview transcript thematically. Member checking was used to validate the findings.

RESULTS

Characteristics of participating dispensing doctors

PBS claims data of all 72 DDs and 1080 non-DDs for the index period were analysed quantitatively.

Twenty-five DDs consented to participate in the qualitative study, of whom 22 were interviewed (10 face-to-face and 12 telephone interviews). Demographic data of the respondents are not provided, as DDs are a very small but prominent and potentially identifiable group. Nevertheless, the respondents practised across all states of Australia. Nine respondents (41%) were classified as remote and 13 (59%) were rural. This concurred with the distribution of DD practices in Australia, of which 42% were classified as rural and 58% as remote.[11] Six respondents were women (27%), consistent with a similar study.[11] Nine respondents (41%) completed their medical qualification outside Australia; consistent with a similar report.[12] Four respondents (18%) were no longer dispensing as at the time of the interview — two had recently retired and two had lost their dispensing rights because a community pharmacy had opened in their catchments. Saturation of data was reached with the 22 interviews.

1 Comparison of dispensing and non-dispensing doctor Pharmaceutical Benefits Scheme patients and prescriptions mean (SD) data

	Dispensing doctors	Non-dispensing doctors	*P*
Patients per doctor	1137 (143)	1718 (72)	< 0.001
Concessional patients per 1000 patients	711 (41)	680 (39)	0.08
> 65-year-old patients per 1000 patients	285 (48)	293 (23)	0.60
Prescriptions per doctor	11 691 (5757)	24 888 (6603)	< 0.001
Prescriptions per 1000 patients	9452 (4863)	15 057 (2669)	0.003
Concessional prescriptions per 1000 concessional patients	10 939 (5334)	16 190 (3706)	0.11
Use of r. 24 per 1000 prescriptions	314 (265)	67 (4)	0.008

r. 24 = Regulation 24 of the *National Health (Pharmaceutical Benefits) Regulations 1960*. ◆

Characteristics of dispensing doctors' and non-dispensing doctors' patients

The mean (SD) values for patients per doctor are presented in Box 1. DDs prescribed to significantly fewer patients than non-DDs (1137 v 1718; $P < 0.001$). There was no significant difference between DDs and non-DDs in the proportions of concessional patients (711 v 680; $P = 0.08$) and patients aged > 65 years (285 v 293; $P = 0.60$).

All respondents reported that they had fewer patients "on the books" than their neighbouring non-dispensing counterparts with a pharmacy in town. Most respondents (18; 82%) did not think that their patient demographic distribution was different to their non-dispensing peers; they made this comparison based on their reading of the National Prescribing Service prescriber feedback and Medicare's Practice Incentives Payment statement, which GPs routinely receive. However, four respondents (18%) stated that they might have fewer chronically ill patients on their patient list because patients who required more intensive care tended to "ship out early" to bigger towns with more health services.

All respondents reported that their communities were generally more isolated and smaller when compared with their non-dispensing counterparts. In terms of distance, respondents indicated that the nearest neighbouring community pharmacy ranged from 50 to 200 km (median, 70 km) away from their practice. Therefore, respondents universally acknowledged that the sole reason for them to dispense was for the convenience and benefits of their patients and to ensure continuity of care.

Volume indicators

DDs prescribed fewer PBS items per doctor (11 691 v 24 888; $P < 0.001$) and fewer PBS prescriptions per 1000 patients than non-DDs (9452 v 15 057; $P = 0.003$). There was no statistically significant difference in the prescribing of PBS concessional items per 1000 concessional patients between DDs and non-DDs (10 939 v 16 190; $P = 0.11$).

Two respondents (9%) indicated they intentionally prescribed less so they would generate less "paperwork", as "the more you prescribed the more you have to dispense". According to all respondents, there were significant amounts of administrative paperwork associated with PBS dispensing; this was in addition to their usual medical practice and was an issue in a small practice.

All respondents maintained there was a widely held view that DDs dispensed for profit, and that their practices were thus associated with poorer-quality use of medicines. The respondents reported various degrees of peer pressure and hostility from those against doctor dispensing, including pharmacist groups, non-DDs and, in some instances, their own patients. All respondents reported the consequent need to be particularly vigilant in monitoring their own

2 Comparison of dispensing and non-dispensing doctor mean (SD) prescribing indicators per 1000 prescriptions

	Dispensing doctors	Non-dispensing doctors	*P*
Cardiovascular drugs			
β-blockers	35.34 (3.12)	35.05 (0.52)	0.80
Antithrombotic agents	32.65 (2.44)	34.53 (2.24)	0.10
Cardiac glycosides	2.41 (0.24)	2.62 (0.32)	0.12
Statins (HMG-CoA reductase inhibitors)	111.51 (13.94)	108.58 (9.74)	0.61
Frusemide diuretics	8.29 (0.62)	8.32 (1.04)	0.92
Hypoglycaemic agents			
Insulin	3.45 (1.45)	3.58 (0.66)	0.81
Oral	34.24 (5.40)	31.88 (3.55)	0.29
Analgesics			
Non-steroidal anti-inflammatory drugs	45.41 (3.78)	39.08 (3.37)	0.001
Opioids	45.32 (8.45)	41.12 (2.36)	0.19
Antidepressants	64.43 (8.84)	69.10 (6.29)	0.21
Respiratory drugs			
Adrenergic inhalants	44.36 (3.09)	40.44 (2.79)	0.01
Glucocorticoid inhalants	15.88 (1.51)	16.20 (0.80)	0.59
Theophylline	1.80 (0.59)	1.34 (0.33)	0.06
Antibiotics			
Total	67.22 (13.06)	58.05 (1.35)	0.07
Fluoroquinolones	1.53 (0.43)	1.58 (0.28)	0.77
Penicillins	33.39 (2.25)	23.47 (1.56)	< 0.001
Cephalosporins	15.32 (3.85)	13.06 (1.82)	0.14

prescribing: "If I am a bad doctor the whole region knows about it. Dispensing doctors are already susceptible and other people are watching you."

We found that DDs prescribed significantly more r. 24 prescriptions per 1000 prescriptions than non-DDs (314 v 67; $P = 0.008$).

All respondents were aware of the legislative requirements for r. 24. Furthermore, all respondents indicated that they only used r. 24 for eligible patients with:

- stable chronic conditions;
- pharmacotherapy that does not require regular monitoring; and
- those whom the respondents could "trust" to manage their medical treatment/s.

One respondent expressed concern over the use of r. 24, since having all repeats and original pharmaceuticals dispensed to the individual patient at one time meant that the patient had to bear the cost of paying for all pharmaceuticals at once. Consequently this respondent imposed a further caveat to r. 24 (ie, ability to pay).

Nine respondents (41%; six rural, three remote) expressed a preference for using r. 24 as that would mean less travel for their patients. Three respondents (14%; two rural, one remote) stated that for eligible patients, use of r. 24 meant that they were able to increase pharmaceutical stock turnover despite losing out on dispensing fees associated with dispensing repeats.

Prescribing indicators

Box 2 summarises the values of the prescribing indicators tested in this study. There were no statistical differences observed between DDs' and non-DDs' prescribing with the exception of more non-steroidal anti-inflammatory drugs (NSAIDs) (45 v 39 items per 1000 prescriptions; $P = 0.001$), adrenergic inhalants (44 v 40 items per 1000 prescriptions; $P = 0.01$), and penicillin-type antibiotics (33 v 23 items per 1000 prescriptions; $P < 0.001$).

Sixteen respondents (73%) indicated that they were not allowed to dispense pharmacist-only pharmaceuticals (Schedule 3) due to state legislation. Therefore, they had to prescribe and dispense everything under the PBS. This could potentially lead to bias and overestimation on rates of cheaper pharmaceuticals that are below the PBS general copayment. For instance, the respondents could not provide short-acting β_2-adrenergic (salbutamol) inhalants or NSAIDs as pharmacist-only medication, so the doctors prescribed them as PBS-subsidised pharmaceutical benefits and hence these data are captured by the PBS.

DISCUSSION

In this first census study of Australian DDs' prescribing, we found that DDs prescribed significantly fewer PBS prescriptions per 1000 patients than non-DDs despite similar proportions of concessional and older patients; they also made significantly more use of r. 24. In most other respects, DDs had similar prescribing rates and patterns to their non-dispensing peers; these findings are at variance with overseas data.

Variations in health care systems internationally may contribute to this finding. For instance, the ability of Australian DDs to dispense is subjected to state and federal legislative requirements and PBS monitoring. In Australia, DDs are only permitted to dispense PBS pharmaceutical benefits where there is no reasonable pharmacy coverage. The granting of such a PBS dispensing licence to a doctor is intended to improve rural community access to medicines. A population catchment of approximately 3000 is required to sustain a rural community pharmacy.[13] Our findings, therefore, support the government policy considerations in granting a dispensing licence to rural GPs, as the rural community in which a DD practises is often too small to sustain a viable community pharmacy.[14] DDs' licence to dispense PBS-subsidised medicines means that small rural communities are not disadvantaged by lack of continuity in pharmaceutical care and the ability to combine income from two otherwise unviable practices (medical and dispensary) may be self-sustainable.

A reason for the similar prescribing rates and patterns may be DDs' self-perceived peer pressure not to overservice their patients for profit. The DDs' desire to limit any accusation of inappropriate prescribing encourages DDs to self-correct their prescribing practices. Prescribing feedback data helps DDs achieve this. A further manifestation of this self-perceived peer pressure could be seen in the additional caveats that some DDs imposed upon themselves before the use of r. 24.

We acknowledge the following limitations of this study. Firstly, the PBS dataset accessed for this research does not capture indication for use.[15] Secondly, the data analysed above were based on claims made

to the PBS. Thus, for payments for prescriptions that are less than the stipulated copayments, all data may not have been captured. It is, however, expected that all data for concessional patients would be captured. Despite limitations with administrative datasets, PBS claims data remain an important source of information on medication use, as about 90% of all community pharmaceutical prescriptions in Australia are dispensed under this scheme.[16] Analyses of PBS datasets are used widely to evaluate trends and patterns of pharmaceutical use.[4,16,17] Thirdly, the breadth of our analysis was limited by what the Department released due to privacy concerns, hence only aggregated data were provided. Pooling of data may decrease the sensitivity of analysis to detect small area variations, such as access to services. The analysis of aggregated data is a compromise — the coarser the level of analysis, the less an individual doctor's prescribing would affect the overall picture. Lastly, accounts for the quantitative differences were only sought from the DDs. Further study as to what influences DDs' prescribing and dispensing would provide more insight into this alternate model of general practice in rural and remote Australia.

DDs are a small but important component of rural health provision. They provide an otherwise unmet dispensing service to small rural and remote communities. Results of this study did not support overseas inference that Australian DDs overprescribed.

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COMPETING INTERESTS

None relevant to this article declared (ICMJE disclosure forms completed).

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