

Prescribing in New Zealand general practice: Part 1

– prescribing for people aged 20–44

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ABSTRACT

Aim

To describe patterns of prescribing in New Zealand general practice for patients aged 20–44 years.

Methods

The computerised records of 225 348 consulting patients from 48 general practices from around New Zealand were examined. A subset of 79 916 consulting patients (58.3% were female) aged 20–44 years was selected. General practice prescribing was described in terms of demographic characteristics, Anatomical Therapeutic Classification (ATC) group and health card eligibility.

Results

Sixty-nine per cent of all consulting patients were prescribed one or more medications during the study

period. Patients were prescribed a mean of 4.2 medication items per annum. Females were prescribed to more frequently than males. Community Services Card holders were prescribed to more frequently than non-holders. The most frequently prescribed ATC group was medications for the nervous system (primarily antidepressants).

Conclusions

Prescribing is a frequent outcome of a general practice visit for patients aged 20–44. While prescribing tends to be a reflection of morbidity and the prescribing decisions general practitioners make, the high frequency of prescribing third generation oral contraceptives continues to be of concern and needs to be investigated with more recent datasets.

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Background

Little is known in New Zealand about prescribing in general practice to population subgroups due to the lack of individualised data available. At present the only national source of prescription data in New Zealand is the pharmaceutical information database (Pharmhouse) which is jointly owned by the Ministry of Health and Pharmac. The Pharmhouse contains claim and payment information from pharmacists for subsidised dispensings that have been processed by the HealthPAC General Transaction Processing System. Whilst the data from this warehouse can provide important information on dispensed medications, it lacks individualised patient information (only a third of

dispensings have an NHI attached), and information on medications that fall under the patient co-payment thresholds.

The Dunedin Royal New Zealand College of General Practitioners Research Unit (Dunedin RNZCGP Research Unit) database is a useful source of population-based health information, and provides individualised (but non-identifiable) prescription data which can be linked to age, sex and health card status. Part 1 of this retrospective descriptive study describes prescribing patterns for a population of patients aged 20–44 consulting in general practice in New Zealand over a 12-month period, while Part 2 looks at prescribing for patients aged 45–64 years of age.

Methods

The Royal New Zealand College of General Practitioners (RNZCGP) Dunedin Research Unit collects anonymous health data voluntarily contributed by New Zealand general practitioners. Extraction programmes query data from practice management systems without including names, addresses and other identifying information. Each patient is allocated a unique code which is individuating but non-identifiable. Data are imported into a database (Microsoft Access 2000) at the Research Unit for further analysis.

The data collection period was from 1 January 2000 to 31 December 2000. Practices were selected on the basis of their recording full electronic clinical records. Data relating to each

consulting patient, including demographic details, health card status, consultation records and prescribed medications were included in the study data set. The age for each patient was calculated as at 1 January 2000 and patients aged 20 to 44 were identified. Prescriptions were assigned codes from the Anatomical Therapeutic Classification (ATC) system as used in the New Zealand pharmaceutical schedule. A therapeutic group is defined as a set of pharmaceuticals that are used to treat the same or similar condition(s). The database includes information about some medications that do not receive Ministry of Health subsidies. Over the counter medications are included if they are prescribed by the general practitioner.

Prescribed medication was calculated as a rate (number of prescriptions or medication items/consulting patient per annum) by age, sex, and community services card status. The proportion of consulting patients who received at least one medication item per annum and those who received five, 10 or 20 and more medication items were identified. The five most frequently prescribed therapeutic groups were identified, as were the five most frequently prescribed therapeutic subgroups.

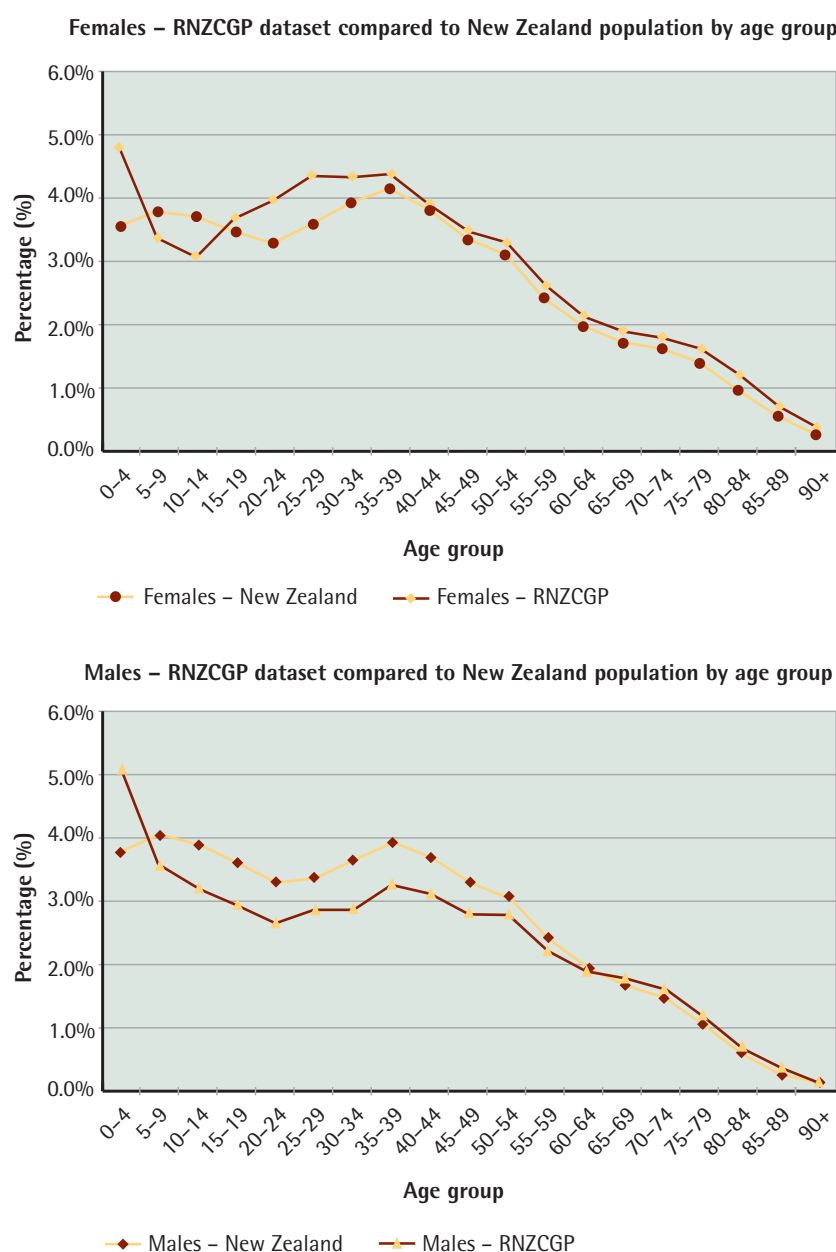
Results

The study population was drawn from 48 general practices (approximately 150 general practitioners) with a total consulting population of 225 348 patients (54.3% were females) for the period 1 January 2000 to 31 December 2000. A Ministry of Health Survey indicates that this would be approximately 80% of the estimated population base that is serviced by these practices¹ (approximately 7.3% of New Zealand's population as at 31 December 2000). Nineteen per cent of the patients are from the Central region, 25.2% from Midland, 23.9% from Northern, and 31.9% from the Southern region. Figure 1 shows that patients are drawn from a population which is reasonably similar in terms

of its age/sex profile to New Zealand as a whole. Females are slightly overrepresented in the study population for some age groups, while males are slightly underrepresented. The NZDep2001 deprivation profile of the study population is a reasonable reflection of the deprivation profile of New Zealand, however, patients living in the most deprived area (NZDep 10) were under-represented in the study population (Figure 2).

Of the 225 348 patients in the database, 79 916 patients aged 20 to 44 were selected (58.2% were female). These patients consulted 319 468 times (4.0 consultations per patient per annum), and were prescribed to 232 606 times (2.9 occasions per patient per annum). They were prescribed 102 175 repeat medications (1.3 per patient per annum) giving a total of 334 781 individual medication items (4.2 items per patient per annum).

Figure 1. Age profile of RNZCGP database population compared to New Zealand population as at 30 June 2000.



Females consulted more frequently than males (4.5 consultations per patient per annum versus 3.3). Females were prescribed more medication items than males (4.8 medication items per patient per annum versus 3.3).

Sixty-nine per cent of all consulting patients aged 20–44 were prescribed to at least once during the year, with 22.0% prescribed five or more medication items per annum, and only 3.5% prescribed 20 or more medication items during the study year.

Of patients aged 20–44, 29.5% were recorded as holding a community services card (CSC). CSC holding decreased with age (38.4% for patients aged 20–24 down to 24.6% for patients aged 40–44). Patients with a CSC were prescribed to more frequently than patients without a CSC (3.8 versus 2.5 scripts per annum), and were prescribed more medication items (5.6 versus 3.6 medication items per annum). Table 1 shows that females were prescribed to more frequently than males (3.4 versus 2.3 scripts per annum), and 4.8 versus 3.3 medication items per annum.

Table 2 shows the most frequently prescribed medication items from the ATC groupings by therapeutic subgroup. Overall, 18.5% of prescribed medications were from the nervous system; 17.0% from the respiratory system; 13.7% for infections; 11.8% from the genito-urinary system; and 9.4% from the alimentary tract and metabolism ATC grouping.

Discussion

This descriptive study examined the prescribing records of 48 New Zealand general practices for consulting patients aged 20–44. This study provides valuable prescribing data for a demographic group for which there is little published New Zealand evidence.

Internationally prescription databases are increasingly recognised as an important source from which inexpensive, population-based drug utilisation can be obtained.^{2,3} There is a limited amount of New Zealand data on prescribing for population groups and subgroups. The RNZCGP Research Unit

Figure 2. Deprivation profile. RNZCGP dataset compared to the New Zealand population.

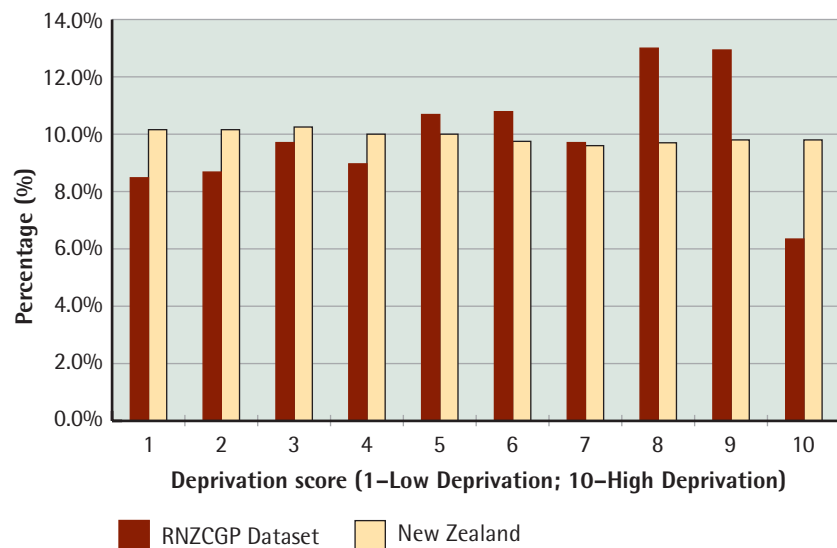


Table 1. Mean number of prescriptions and medication items per consulting patient per annum by age, sex and Community Services Card status (CSC)

Age	Females	Males	CSC	No CSC	All patients
Mean number of prescriptions					
20–24	2.8	1.7	2.9	2.1	2.4
25–29	3.1	1.9	3.5	2.3	2.6
30–34	3.3	2.3	4.0	2.4	2.9
35–39	3.6	2.5	4.4	2.6	3.1
40–44	4.0	3.0	4.9	3.1	3.5
TOTAL	3.4	2.3	3.8	2.5	2.9
Mean number of medication items					
20–24	3.9	2.3	4.0	2.8	3.3
25–29	4.3	2.7	5.0	3.1	3.7
30–34	4.7	3.3	5.8	3.4	4.1
35–39	5.2	3.7	6.5	3.8	4.6
40–44	5.9	4.6	7.5	4.6	5.3
TOTAL	4.8	3.3	5.6	3.6	4.2

has undertaken a series of analyses using its primary care database of prescribing for population subgroups.^{4,5} Elsewhere, a small number of studies have been conducted in New Zealand which look at prescribing to population groups, although primarily on a regional level.^{6,7,8}

The study results indicate that females consult (4.5 versus 3.3 con-

tacts per patient per annum) and are prescribed to more frequently than males (3.4 versus 2.3 prescriptions per patient per annum). Medication use increases with age, there were 2.4 prescriptions and 3.3 medication items per annum for patients aged 20–24 which increased to 3.5 prescriptions and 4.6 medication items per annum for patients aged 40–44.

Table 2. The most frequently prescribed medication items; proportion of therapeutic group by subgroup

Age group	20-24	25-29	30-34	35-39	40-44	Overall
Therapeutic group (n)						
Subgroups (% of therapeutic group)						
Nervous system (n)	6341	9367	12 517	16 674	17 121	62 020
Selective serotonin reuptake inhibitors	24.2	23.3	23.2	20.8	19.2	21.6
Cyclic and related agents	8.8	10.4	11.4	12.5	14.9	12.3
Opioid analgesics	7.3	11.7	11.9	14.4	12.1	12.1
Control of epilepsy	11.2	9.9	10.6	10.2	9.6	10.2
Antipyretics and non-opioid analgesics	11.5	10.7	9.7	8.5	8.1	9.3
All others	37.0	34.0	33.2	33.7	36.0	34.6
Respiratory system and allergies (n)	9741	10 942	11 218	12 913	12 212	57 026
Inhaled beta adrenoceptor agonist MDI low dose	31.7	32.2	31.5	26.3	24.1	28.9
Allergy prophylactics	13.6	15.2	16.0	18.1	20.8	17.0
Inhaled corticosteroids MDI high dose	15.7	15.4	14.4	14.3	13.8	14.7
Inhaled corticosteroids MDI* medium dose	11.4	9.0	8.6	9.0	7.5	9.0
Antihistamines	8.5	7.9	7.6	9.3	9.2	8.6
All others	19.1	20.4	21.8	22.9	24.6	21.9
Infections – agents for systemic use (n)	8287	8782	9460	10 151	9038	45 718
Penicillins	46.7	46.1	47.0	43.9	42.7	45.2
Tetracyclines	15.8	14.4	14.1	15.4	16.4	15.2
Other antibiotics	9.6	10.8	10.5	10.9	10.4	10.5
Macrolides	9.7	8.6	9.2	8.7	9.4	9.1
Urinary tract infections	5.2	4.7	4.8	5.4	5.8	5.2
All others	13.0	15.4	14.4	15.8	15.3	14.8
Genito-urinary system (n)	10 065	10 493	8647	6734	3511	39 450
Combined oral contraceptives	55.1	54.2	50.6	49.3	39.0	51.4
Gynaecological anti-infectives	7.7	8.9	12.4	14.5	22.1	11.5
Progestogen-only contraceptives	6.6	9.9	13.6	12.5	12.0	10.5
Anti-androgen oral contraceptives	14.7	10.2	8.1	8.3	4.5	10.1
Condoms	6.3	7.7	6.7	6.0	4.4	6.5
All others	9.6	9.1	8.5	9.4	18.0	10.0
Alimentary tract and metabolism (n)	3172	5068	6191	7731	9284	31 446
Proton pump inhibitors	12.0	11.7	15.6	17.4	21.7	16.9
H2 antagonists	7.5	7.7	9.8	8.6	10.8	9.2
Agents which reduce motility	9.7	8.9	7.5	7.6	6.5	7.7
Corticosteroids	7.9	7.2	8.6	7.2	4.9	6.8
Oral hypoglycaemic agents	1.2	1.2	3.1	6.5	8.5	5.1
All others	61.7	63.3	55.5	52.7	47.6	54.4
All other medications (n)	11 253	14 343	17 925	23 595	32 005	99 121
All medications (n)	48 859	58 995	65 958	77 798	83 171	334 781

* MDI = Metered dose inhaler

Community Services Card (CSC) holding decreases with age with 38.4% of patients aged 20–24 holding a card, compared to 24.6% of patients aged 40–44. This can be compared to an estimated overall card holding rate of between 39.3%⁹ and 44.7%.¹⁰ CSC holders were prescribed to at a higher rate compared to non-holders which is in accord with evidence that suggests the CSC is a surrogate measure of health need, with holders of CSC cards having increased odds of certain chronic conditions.^{11,12}

The nervous system ATC group made up 18.5% of all prescribed medication items. The most frequently prescribed medications in this therapeutic group were antidepressants (21.6% of all nervous system medications were selective serotonin reuptake inhibitors, and 12.3% were cyclic and related agents). This reflects recent New Zealand data which suggests there is a high proportion of depressive disorders in this demographic group.¹⁴

The next most frequently prescribed therapeutic group was the respiratory system and allergies. Within this group, inhaled corticosteroids and inhaled beta-adrenoceptor agonists were the most frequently prescribed medications. The majority of these medications would be for asthma as conditions such as chronic obstructive airways disease are typically of later onset¹⁵ and reflects high asthma morbidity amongst patients aged 20–44 in New Zealand.¹⁶

However, these prescribing data pre-date the wider access to long-acting beta-adrenoceptor medications and the recently released adult asthma guidelines.¹⁷ The number of patients who were prescribed high-dose inhaled corticosteroids is of concern, and matches previous evidence that inhaled steroids are being prescribed in higher doses than recommended for effective management of asthma

in New Zealand general practice.^{18,19,20,21} More recently, Pharmac has commenced a campaign aimed at achieving the lowest effective dose of inhaled corticosteroids for adults in New Zealand in line with national and international evidence.

The third most frequently prescribed therapeutic group was for infections (13.7% of all medication items). Antibiotics were most frequently prescribed (primarily penicillins) for which there are important considerations in terms of the potential for allergic reactions and antibiotic resistance.²² It is important to note that a proportion of these prescribed medications will not have been dispensed. One study has indicated 95% of general practitioners issued as-needed antibiotic prescriptions on occasions²³ and it can be assumed that a number of these medications will not have been dispensed.²⁴

Prescribing of oral contraceptives dominated the genito-urinary system ATC grouping. Of concern is the extensive use of so-called third generation oral contraceptives despite evidence of increased risk of venous thromboembolism compared to older contraceptives.²⁵ Combined oral contraceptives made up almost three-

quarters of all oral contraceptives prescribed to 20–24 year olds, followed by anti-androgen oral contraceptives which made up almost 20% of all prescribed oral contraceptives. However, it must be noted that the de-

bate over the use of third generation oral contraceptives was still very much active in New Zealand at the time study data was collected and prescribing decisions must be considered in terms of increased risk and potential benefits.²⁶ More recent Pharmac dispensing data reflect a drop in the number of third generation oral contraceptives which reflects these safety concerns.²⁷

The alimentary tract and metabolism was the fifth most frequently prescribed ATC grouping. Proton pump inhibitors (PPIs) were the most frequently prescribed medications from this group. The proportion of PPIs prescribed increased with age from 12.0% of medications for the alimentary tract for patients aged 20–24 up to 21.7% for patients aged 40–44. This reflects a high prevalence of gastrointestinal morbidity such as dyspepsia and gastro-oesophageal reflux with one New Zealand study reporting a combined prevalence of 45.2%.²⁸

The strengths and weaknesses of using databases such as the Dunedin RNZCGP Research Unit Network database have been well documented.^{29,30,31,32} A major strength of the study was the large size of the database used, which could be linked to individualised patient variables such as age, sex and health card status. This database includes prescription data about pharmaceuticals which do not appear in claims databases, such as medications which do not reach the medication subsidy thresholds.

An investigation of potential of bias of data collected by the Dunedin RNZCGP Research Unit revealed that patients within the database displayed similar levels of utilisation and morbidity as those of practices not contributing to the network.³³ In addition, data recording for prescribing and demographic data in practices contributing to the network has been shown to be relatively complete.³⁴ While prescription data reported here is reported by broad therapeutic groups, medication can be described to a level of an individual prescription presentation, its form, quantity prescribed, and indications for use. The study datasets are reasonably reflective of the demographic and deprivation profile of New Zealanders as a whole, but differences must be taken into account in considering possible bias in the non-random sample presented here.

There are limitations in using electronically collected general practice records in New Zealand. Reason for pre-

A major strength of the study was the large size of the database used, which could be linked to individualised patient variables such as age, sex and health card status

scription is not well recorded, with an investigation of clinical coding of consultation records finding only 22.8% of consultation notes were linked to an associated clinical code.⁵ Reason for prescription would have to be derived from free text recording of the consultation, a time-consuming and often difficult task. Secondly, medication utilisation described here is prescribed medication not pharmacy dispensing records and therefore failure to present or pick up a prescription was not measured. Thirdly, the study is cross-sectional,

however longitudinal investigations are possible using internal practice identifiers or the encrypted NHI to track patients over concurrent years. The Dunedin RNZCGP database has concurrent data from 1995 onwards. Fourthly, some patients may see more than one general practitioner over the study period which may lead to missing prescription data.

This study presents important baseline prescribing data for a population of patients aged 20–44. Prescribing is found to be a frequent outcome

of a general practice contact, with females and CSC holders prescribed to most frequently. Data reflect the morbidity of this population and indicate the prescribing decisions general practitioners in New Zealand make.

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