

# Antidepressant prescribing in New Zealand between 2008 and 2015

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## ABSTRACT

**AIM:** To examine antidepressant prescribing trends in New Zealand adults from 2008–2015.

**METHODS:** Antidepressant prescribing data was sourced via the Ministry of Health. Data were examined by year, type of drug, ethnicity, gender, age and location of district health board.

**RESULTS:** All individuals dispensed an antidepressant in New Zealand were included. In 2015, 12.6% of all New Zealanders were prescribed an antidepressant (16% of females and 9% of males) an increase of 21% from 2008. The largest increase in drug classes were venlafaxine and tetracyclic antidepressants. The largest class of drugs prescribed were SSRIs, which made up 57% of the total. Europeans were the most likely to receive antidepressants at 15.7%, but increases were seen across all ethnic categories. The highest users were older European females at 22.8%.

**CONCLUSIONS:** Antidepressant prescribing rates continue to increase in New Zealand although this rate of increase is slowing. The highest users were European women, particularly those age 65 and older.

In New Zealand, antidepressant prescribing has increased substantially over the past two decades. Similar increases have been reported in other Organisation of Economic Co-operation and Development (OECD) countries. New Zealand is now the 8<sup>th</sup> highest consumer of antidepressants per person in the OECD.<sup>1</sup> Read et al 2014<sup>2</sup> reported that one in nine (11.1%) New Zealand adults received antidepressant medication in 2011/12. This corresponds to 412,631 people and was a 35% increase in users over the previous five years. Exeter et al 2009<sup>3</sup> also reported an increase in antidepressant dispensing in New Zealand adults of 28% between 2004/05 (7.36%) and 2006/07 (9.39%). Since this study there has been no comprehensive study of antidepressant prescribing in New Zealand.

There are a number of potential explanations for this rise, including improved recognition of depression, changes in patient/doctor attitudes and a broadening range of indications treated with antidepressants. Whether this rise in prescribing is a good or bad thing is increasingly subject to debate.<sup>4</sup>

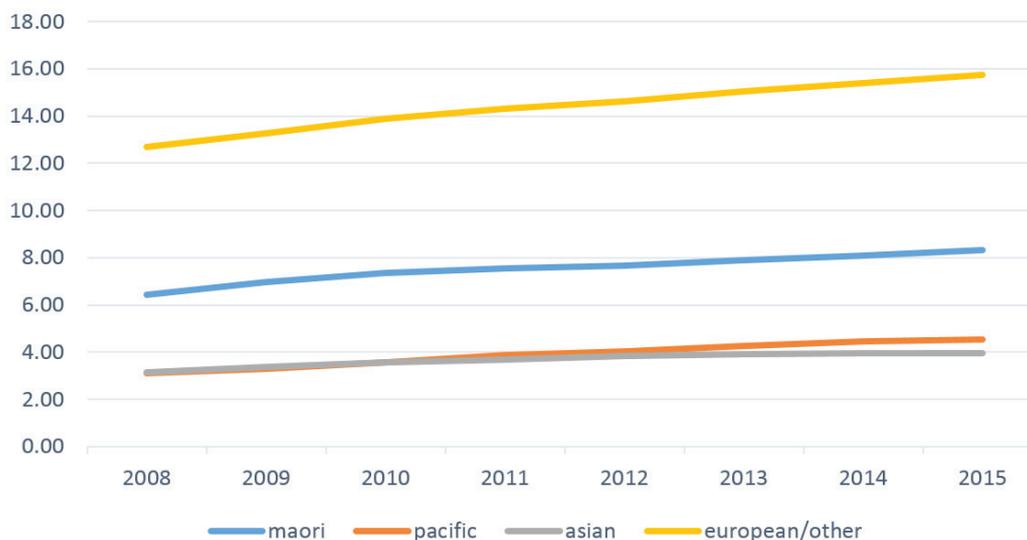
Regardless it is important to continue to monitor antidepressant prescribing trends to help inform health policy.

## Objectives

The objectives of this study were to examine antidepressant prescribing trends in New Zealand adults from 2008 to 2015, by antidepressant type, age, ethnicity, gender and district health board location. Our hypothesis was that antidepressant prescribing rates in New Zealand are continuing to increase in the period studied.

## Method

Antidepressant prescribing data was sourced via the Ministry of Health. The dataset contains every person in New Zealand who had been prescribed antidepressant medication.<sup>5</sup> This data is collected by The Pharmaceutical Management Agency of New Zealand (PHARMAC), via the National Health Index (NHI) number—a unique identifier assigned to every person who uses health services in New Zealand. The number

**Figure 1:** Percentage of New Zealand adults dispensed antidepressants over time, by ethnicity.

of prescriptions with an NHI number rose to 97% in 2008 and to 100% in 2015.

The dataset lists the number of patients collecting prescriptions for antidepressant medication within each district health board (DHB), five-year age bracket, gender and ethnicity (Māori, Pacific, Asian and 'Other'). The 'Other' category includes the following ethnic groups: European, Middle Eastern, Latin American, African and 'Other Ethnicity'. For simplicity we named this category 'European/other'. Data for eight consecutive years—2008 to 2015—was examined by ethnicity.

The prescription rates were broken down by antidepressant class, and into individual drugs within each class. The antidepressant class data were further broken down into individual drugs within each class. The data is presented over the four-year period from 2012 to 2015 because this data is more complete.

For the national prescribing rates, four age brackets were created (15–24, 25–44, 45–64 and 65+). The exception was individual DHB populations, where all ages were included, as only the *total* DHB populations were available.

Population data were obtained from the Ministry of Health to calculate dispensing rates.<sup>6</sup> As age group data was available for each ethnicity, the population aged fifteen

and over could be calculated. The ethnic groups used are based on the ethnic groups from the PHARMAC database.<sup>5</sup>

### Bias

This is a census of all New Zealand prescribing data so there is minimal bias.

### Statistics

Microsoft Excel was used to analyse the data. Data are descriptive and presented as population prevalence.

## Results

### National rates (2008–2015)

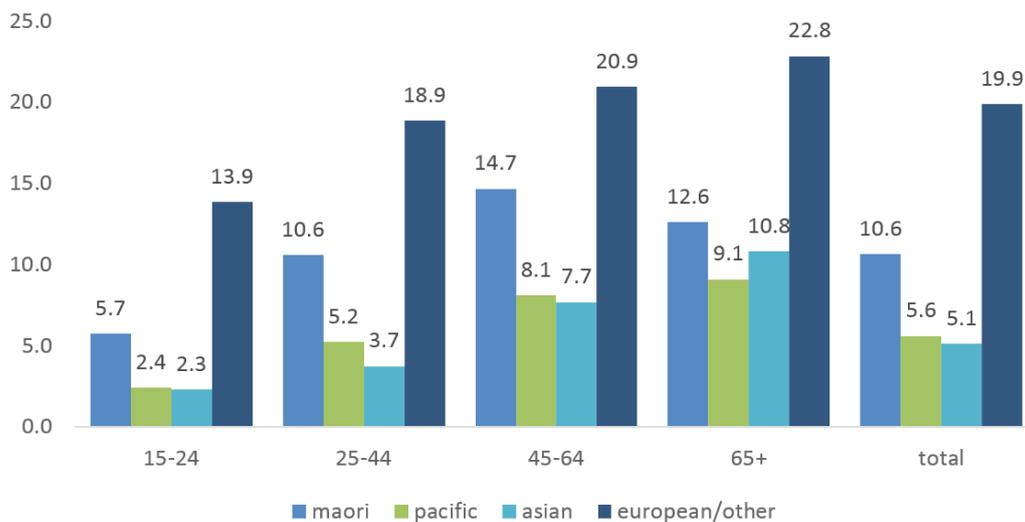
In 2015, 12.6% of all New Zealanders aged 15 and over were prescribed antidepressants (16% of females and 9% of males), an increase of 21% from the 2008 rate of 10.4%.

### Ethnicity

Figure 1 shows the distribution of antidepressant prescribing by ethnicity. 15.7% of the European/other category were prescribed antidepressants in 2015, compared with 8.3% of Māori, 4.5% of Pacific Islanders and 4.0% of Asians.

Since 2008, adult antidepressant prescribing has increased across all ethnicities. Māori rates increased 29%, Pacific rates increased by 46%, Asian rates increased by 25% and European/other rates increased by 24%.

**Figure 2:** Percentage of females dispensed antidepressants in 2015, by age bracket and ethnicity.



**Gender**

Figures 2 and 3 show the distribution of antidepressant prescribing by gender, ethnicity and age. Females had higher antidepressants usage than males across all ethnicities. 19.9% of European/other females, 10.6% of Māori females, 5.6% of Pacific females and 5.1% of Asian females were prescribed antidepressants in 2015.

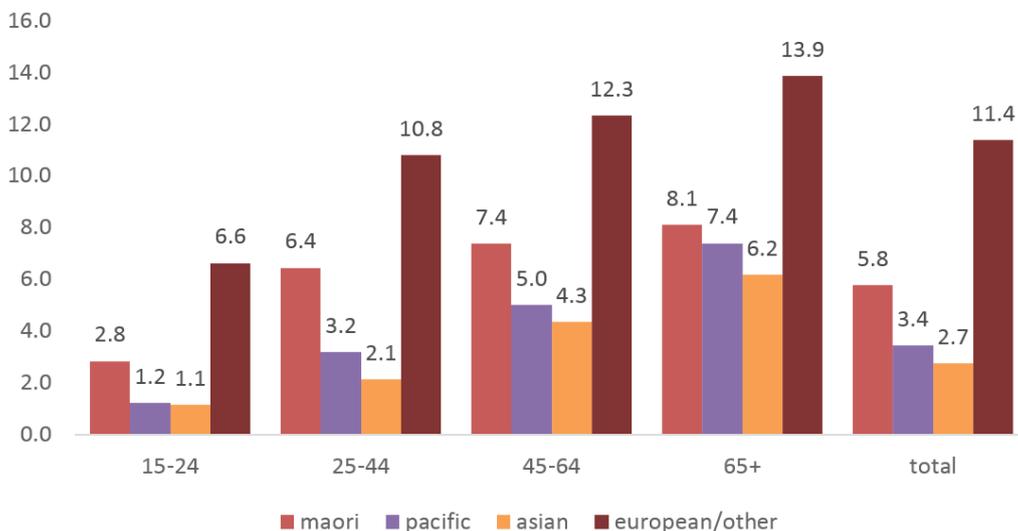
Between 2008 and 2015, dispensing increased 45% for Pacific females, 25% for Māori females and 23% for Asian and European/other females. The total male rate increased 24%, compared to a 19% female rate increase.

**Age**

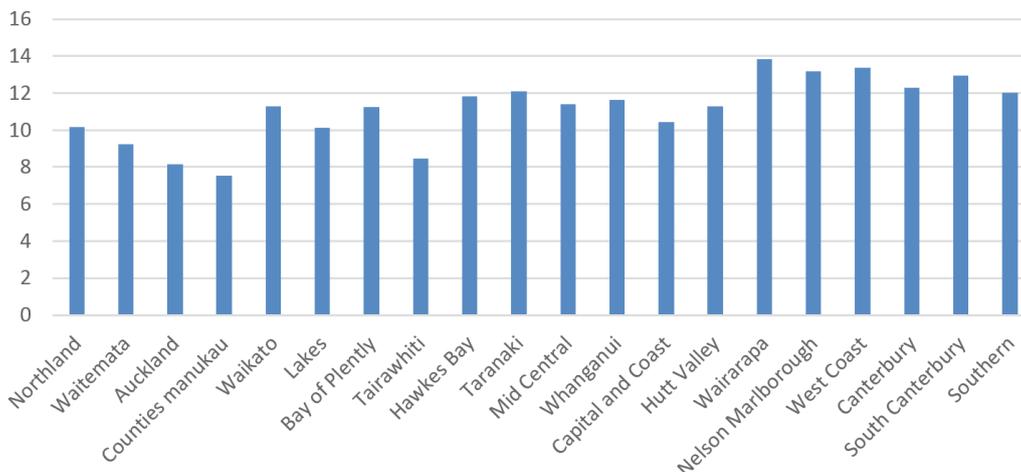
The use of antidepressants rises with age, with the exception of Māori females, where rates decrease in the 65+ age group. Females receive more antidepressants than males in all age groups.

The highest user of antidepressants in 2015 was European/other females aged 65+, at 22.8% (compared to 13.9% of males). This was 1.8, 2.5 and 2.1 times the Māori, Pacific and Asian 65+ female rates, respectively. The next highest user-group was European/other females aged 45–64, with 20.9% receiving scripts in 2015.

**Figure 3:** Percentage of males dispensed antidepressants in 2015, by age bracket and ethnicity.



**Figure 4:** Antidepressant use by DHB in 2015.



Note the all-ages DHB populations were used instead of the 15+ population, so rates are lower.

In 2015, the greatest ethnic differences in dispensing were in the 15–24 age range. European females and males received antidepressants at 6.0 times that of Asian females and males. European/other were prescribed at 5.8 and 5.5 times that of Pacific females and males, respectively, and 2.4 times that of Māori females and males. In the 25–44 age bracket, the European/other dispensing rate was 5.1 times that of Asian females and males.

**Geographic distribution**

Figure 4 shows the distribution of antidepressant prescribing by DHB in 2015. Significant geographic differences were found. The highest dispensing rate (in Wairarapa) was 1.83 times the lowest rate (in Counties Manukau).

**Drug classes**

Figure 5 shows the total prescriptions by antidepressant class in New Zealand over the years 2012 to 2015. The total number of antidepressant prescriptions increased 11.6%, from 1.46 million in 2012 to 1.63 million in 2015. There was a 3.7% increase in tricyclic antidepressants (TCAs), 11% increase in selective serotonin reuptake inhibitors (SSRIs), 41% increase in Venlafaxine and a 45% increase in tetracyclic antidepressant (TeCA) prescriptions (Figure 1). Monoamine oxidase inhibitors (MAOIs) decreased by 17%; this was the only drug class to decrease. Escitalopram and sertraline are the drugs that largely

accounted for the rising prescription of SSRIs; they increased by 260% and 300%, respectively.

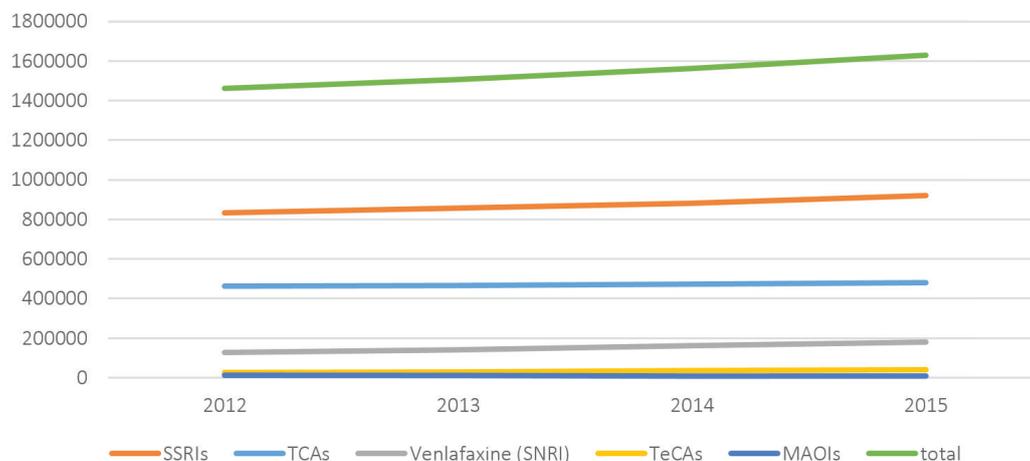
Most antidepressant prescriptions were for SSRIs, TCAs and venlafaxine; accounting for 97% of the 2015 total (57%, 29% and 11%, respectively). Since 2012, TCAs dropped from 31.6% to 29.4% of total scripts, while SSRIs remained relatively constant around 57%. Venlafaxine prescriptions rose from 8.8% to 11.1%, TeCA’s from 1.9% to 2.5%, while MAOI prescriptions dropped from 0.7% to 0.6% of the total.

**Discussion**

**National rates**

This study examined antidepressant use in all adult New Zealanders between 2008 and 2015. One in eight New Zealand adults (12.6%) were dispensed an antidepressant in 2015. There are no directly comparable figures for other countries.

Kantor et al 2015<sup>7</sup> reported a 13% prevalence of antidepressant use from a cross-sectional survey of US adults in 2011–12. The OECD reported pharmaceutical consumption using ‘defined daily dose’ per 1,000 people (ddd). The highest four countries were Iceland (118), Australia (96), Portugal (88) and Canada (85). New Zealand was 8<sup>th</sup>—at 73 ddds per 1,000 adults per day in 2014<sup>1</sup> (the only year the OECD provided data for New Zealand).

**Figure 5:** Total prescriptions by antidepressant class in New Zealand.

Antidepressant medication included: selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants (TCAs), monoamine oxidase inhibitors (MAOIs), tetracyclic antidepressants (TeCAs) and venlafaxine (a serotonin-norepinephrine reuptake inhibitor (SNRI)). SSRIs: citalopram hydrobromide, fluoxetine hydrochloride, escitalopram, sertraline, paroxetine hydrochloride. TCAs: amitriptyline, nortriptyline hydrochloride, clomipramine hydrochloride, dothiepin hydrochloride, doxepin hydrochloride, Imipramine hydrochloride. MAOIs: phenelzine sulphate, tranylcypromine sulphate, moclobemide. TeCAs: maprotiline hydrochloride, mianserin hydrochloride and Mirtazapine. SNRI: venlafaxine.

### Change in rates

The number of New Zealanders taking antidepressant medication has risen 21% since 2008 to 12.6% in 2015. This is 34% higher than Exeter et al's 2009<sup>3</sup> 2006/07 New Zealand rate of 9.39%. Rates increased in all OECD countries over the past 10 years. Between 2011 and 2014, Belgium (7.0%) and Canada (5.7%) had similar rate increases to that of New Zealand (6% from 2011–2014). The countries with the highest defined daily doses were increasing at the highest rates (11.5% increase for Iceland, 13.3% for Australia and 17.6% increase for Portugal, from 2011–2014).

Although antidepressant use continues to rise each year, the *rate* of increase has decreased. From 2004/05–2006/07, the increase was 12–14% per year.<sup>3</sup> In the present study (2008–2015) the rate of increase gradually falls: from 4.6% between 2008 and 2009, to 1.5% between 2014 and 2015. This is consistent with results from Kantor et al's 2015<sup>7</sup> US study which reported that while the use of antidepressants increased from 6.8% in 1999/2000 to 13% in 2011/12, the *rate* of increase slowed after 2004. From 2007–2011 the US prescribing rate increases by around 4% per year—similar to the average annual increase (of

3%) in our study. This may represent a 'ceiling effect' in populations where antidepressant use is already relatively high.

### Ethnicity

Significant ethnic differences were evident. Māori received fewer antidepressants than European/other (8.3% vs 15.7%), though the rate of prescribing for Māori is increasing faster than for the European/other group. 4.5% of Pacific people received antidepressants in 2015, although this was 46% higher than the 2008 rate—the greatest increase in any ethnic group. Asian New Zealanders had the lowest antidepressant use, at 4.0% in 2015.

Similar trends have been documented in other studies. In 2007, in the only other systematic review of New Zealand prescribing patterns, New Zealand European/other people were prescribed antidepressants at between 1.5 and 2.3 times that for Māori, depending on age and gender, and Pacific people received significantly less antidepressants than Māori.<sup>3</sup> Ethnic differences in antidepressant prescribing have been consistently reported in other countries. For example, Olfson et al 2009<sup>8</sup> reported that African Americans had lower rates of antidepressant use: 4.51% compared to 11.96% of 'white' Americans in 2005.

## Gender

Females receive more antidepressant medication than males. 19.9% of European/other females aged 15 and over (one in five) were prescribed an antidepressant in 2015. Females received antidepressants at 1.9, 1.6, 1.8 and 1.9 times that of males in Māori, Pacific, European/other and Asian populations, respectively. This gender ratio has been reported consistently. In 2005, US females had a rate more than double that of males (13.42% vs 6.68%).<sup>8</sup> Spence et al 2014<sup>9</sup> reported that women had heavier antidepressant use than men in England.

## Age

The use of antidepressants rises with age, with the exception of Māori females aged 65+. In Exeter et al's 2009<sup>3</sup> report, rates increased with age for *all* ethnicities, and was highest in European/other females aged 65+ (18%). The highest users of antidepressants in 2015 were European/other females aged 65+, at 22.8%. The next highest user-group was European/other females aged 45–64, with 20.9% receiving scripts. High antidepressant usage in older people was also reported by Spence et al 2014,<sup>9</sup> who found that areas of England with a greater number of people aged over 65 had higher antidepressant dispensing.

The highest female to male ratios were seen in the 15–24 age group: 2.09 for European/other, 2.02 for Asians, 2.01 for Māori and 2.00 for Pacific people.

Young adults have the greatest ethnic differences in dispensing, with Europeans/other aged 15–24 receiving antidepressants at 6.0 and 5.8 times that of Asian females and males, respectively.

## Geographic distribution

Prescribing trends differed geographically. Similar trends are reported in the few studies that have examined prescribing rates. In 2015 the Australian Commission on Safety and Quality in Health Care reported that the number of antidepressant prescriptions was 11.7 times higher in the area with the highest rate compared to the area with the lowest rate.<sup>10</sup> Spence et al 2014<sup>9</sup> examined trends in antidepressant prescribing in England from 1998–2012 and reported large geographical variations in the rates of prescribing. Rates varied from

71 to 331 prescriptions per 1,000 people. They also reported that areas with more white people, more women and more people over the age of 65 had the heaviest use of antidepressants.

## Antidepressant drug classes

The absolute number of prescriptions in New Zealand increased from 1.46 million in 2012 to 1.63 million in 2015, an 11.6% increase in three years.

The proportion of the total prescriptions made up by each drug class is slowly changing. SSRIs have increased from approximately 53% of all antidepressant prescriptions between 2004 and 2007,<sup>3</sup> to 57% in 2015. Escitalopram and sertraline are the two SSRIs that largely account for the increasing numbers, with 260% and 300% increases from 2012–2015, respectively. TCAs have continued to drop, from 42.8% in 2004/05 to 29.4% of the total prescriptions in 2015. Venlafaxine's proportionate share increased from 2.43% in 2004/05 to 11.1% in 2015.

In 2006/07 SSRIs, TCAs and venlafaxine accounted for 98.6% of all antidepressants.<sup>3</sup> In 2015 they accounted for 97% of antidepressants. This change can be accounted for by a 32% increased use of TeCA's; from 1.9% to 2.5%.

## Generalisability

The results of this study are generalisable to New Zealand and most other developed countries, especially those with a colonised native population and other diverse ethnic populations.

## Limitations

Although a patient is prescribed a medication, they may not have ingested it. Some patients may have been prescribed a medication once; not for the entire calendar year. Some of the antidepressants are prescribed for non-psychological reasons such as pain and sleep (eg, TCAs), although this should not significantly affect the results.

## Conclusion

The rate of prescribing antidepressants in New Zealand continues to slowly rise. The overall prevalence and distribution among gender, ethnicity and age of prescribing is similar to other OECD countries. Whether this increase is a good thing is open to

debate. There is no evidence that increased use of antidepressants has been associated with any improvement in community mental health measures such as admissions, reduction in disability benefits, reduction in suicide rates or better mental health in community surveys.<sup>11</sup> This is similar to findings in other English-speaking countries.<sup>12</sup> Antidepressants have significant

side effects and we have limited evidence for long-term efficacy. Perhaps it is time to switch emphasis from a 'treatment gap' to a 'quality gap' so that antidepressant use is targeted more optimally at those who are most likely to benefit. Simply giving more people more antidepressants does not seem to be working.

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#### Competing interests:

Nil.

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