Research Report
Research Report Prevalence of Psychotropic
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Prevalence of Psychotropic Medication Prescription among
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Prevalence of Psychotropic Medication Prescription among Federal Offenders Shanna Farrell MacDonald, Leslie-Anne Keown, Harold Boudreau, Renée Gobeil, and Kaitlyn Wardrop Correctional Service of Canada July 2015

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Executive Summary

Key words: psychotropic medication, psychoactive medication, psychopharmaceuticals, prevalence

Psychotropic medications, also sometimes called psychoactive medications or psychopharmaceuticals, are those that can affect the mind, emotions, or behaviour. Such medications are quite commonly prescribed, but prescription rates are not currently available for Canadian federal offenders. Given this fact, together with the relatively high rate of mental disorders among federal offenders, this study aimed to examine the frequency with which these medications are prescribed to offenders incarcerated in Correctional Service of Canada (CSC) institutions. Understanding the rate of prescription of psychotropic medications among federal offenders is important not only for planning purposes but also to facilitate further examinations.

To examine this issue, CSC's National Pharmacist, together with staff in the Health Services Sector, developed a list of all medications recognized as psychotropic. Regional pharmacists then provided a single-day snapshot of all active prescriptions for these medications on September 29, 2014. An in-custody population snapshot of all offenders provided the denominator in all prevalence calculations.

Overall, 30.4% of offenders had an active psychotropic medication prescription. Differences were seen by gender, with considerably more women than men having an active psychotropic medication prescription (45.7% and 29.6%, respectively). In contrast, there were no practical differences in the prevalence of prescriptions for Aboriginal and non-Aboriginal offenders. It was relatively common to have more than one active psychotropic medication prescription. Overall, 17.3% of offenders had an active prescription for one psychotropic medication, 8.2% had two, and 4.9% had three or more.

The most common psychotropic medication prescription category, defined according to the American Hospital Formulary System (AHFS), was antidepressant agents (including antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors), for which 22.6% of offenders had an active prescription. Aboriginal offenders were slightly more likely than their non-Aboriginal counterparts (5.3% vs. 3.1%) to have prescriptions for central nervous system stimulants (including amphetamines, respiratory and central nervous system stimulants, and central nervous system agents).

The prevalence of patients with an active prescription for psychotropic medication was more common in Canadian federal offenders than in the general Canadian population (30.4% vs. about 8.0%); however, it was commensurate with similar correctional jurisdictions (e.g., England, France, the province of Quebec). Additionally, the fact that women offenders were more frequently prescribed a psychotropic medication than men offenders aligned with the higher prevalence of mental health issues in women offenders. However, the relationship between mental illness and prescription practices is a complex one, and more research will be required to understand it fully.

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Introduction

Psychotropic medications, also sometimes called psychoactive medications or psychopharmaceuticals, are those which can affect the mind, emotions, or behaviour. Such medications are quite common, with estimates suggesting that about 7.2% of Canadians are prescribed psychotropic medications – or, about 8.0% when only those of comparable ages to federal offenders are considered (Beck et al., 2005). The same estimates are not currently available for Canadian federal offenders, though data clearly demonstrate that mental health problems are more common among offenders than within the general population (e.g., Gilmour, 2014). A recent study estimated that 68% to 82% of men newly admitted to federal custody had a current mental disorder, with this rate remaining quite high (39% to 47%) even after excluding substance abuse disorder and antisocial personality disorder, which could be argued to represent criminogenic needs rather than mental health needs (Beaudette, Power, & Stewart, 2015). Given this relatively high rate of mental disorders among federal offenders, and the lack of knowledge regarding the prescribing of psychotropic medication, this study aimed to examine the frequency with which these medications are prescribed to offenders incarcerated in the institutions of the Correctional Service of Canada (CSC).

The Broader Debate: Prescribing of Psychotropic Medication in the General Population

Given the potential impacts of psychotropic medications, it is not surprising that the questions of whether or not these medications are over-prescribed in the general population has been debated extensively. To date, however, there is limited consensus. For instance, Spence (2013) recently argued that antidepressants are prescribed too easily and for too long. On the other hand, Reid (2013) argued that prescription practices for antidepressants are appropriate and reflect due caution; indeed, he put forward that the "profound suspicion" (p. 190) of antidepressants in particular, but all psychotropic medications as well, is rooted in lack of recognition and understanding of the prevalence and impact of mental health problems. A number of empirical studies have supported Reid's arguments, failing to detect over-prescription (e.g., Jensen et al., 1999; Simon & VonKorff, 1997). Finally, still others have concluded that prescription practices are context-dependent, with, for instance, elderly individuals in care homes being more likely to receive psychotropic medication prescriptions than their counterparts in the community, even after accounting for differences in their medical conditions (Stroka, 2015).

Blumstein, Benyamini, Shmotkin, and Lerner-Geva (2014) also found that Israeli women's higher rates of prescription of anxiolytics, relative to men, could not be explained by gender differences in the prevalence of anxiety-related diagnoses. These authors concluded that prescription practices were influenced by patient gender. Overall, the lack of consensus regarding the appropriateness of psychotropic medication prescription underscores the importance of empirical examinations.

Psychotropic Medication Prescription in Correctional Populations

Although the use of psychotropic medications has been researched much less extensively in correctional populations than in community or therapeutic populations, some studies exist. Though, as mentioned, national Canadian prevalence data are not available, research in England has determined that 25.2% of offenders are prescribed psychotropic medication (Hassan, Frisher, et al., 2014). Other jurisdictions have found considerably higher rates, with 50% of offenders in France (Fovet, Amad, Adins, & Thomas, 2014) and 40.3% of offenders in the province of Quebec (Lafortune & Vacheret, 2009) being prescribed psychotropic medications. The range of values obtained across different jurisdictions highlights the importance of replicating this research in the Canadian context.

The Current Study

The current investigation, then, aims to achieve two goals. First, the study will provide up-to-date and accurate data regarding the prevalence of psychotropic medication prescriptions among federally-sentenced men and women offenders in Canada. Second, the collected data will allow for further study of the extent of "off-label" usage of psychotropic medications among offenders.

Method

Data

The approach to obtaining data was developed in consultation with CSC's National Pharmacist. CSC's pharmacy records are managed independently in each of the five administrative regions; the National Pharmacist therefore acted both as an expert in developing methodology and as a liaison between the researchers and the regional pharmacists.

The National Pharmacist, together with other staff in CSC's Health Services Sector, developed a list of all medications listed on the CSC National Formulary and recognized as psychotropic. These medications were then separated into five categories according to the American Hospital Formulary System (AHFS, American Society of Health-System Pharamacists, 2015). Appendix A lists all medications by category.

- 1. antipsychotic agents;
- 2. antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors (collectively referred to as antidepressant agents during analyses);
- 3. amphetamines, respiratory and central nervous system stimulants, and central nervous system agents (collectively referred to as CNS stimulants);
- 4. benzodiazepines, hypnotics, anxiolytics, and sedatives (collectively referred to as anxiety/insomnia agents); and,
- 5. antimanic agents.

The regional pharmacists were then contacted in order to request a single-day snapshot of all active prescriptions for the identified medications. Data were requested on September 29, 2014, though given the time- and labour-intensive data retrieval processes necessary in some regions, the provided data spanned from this date until about two weeks later. The five regions provided data in various forms depending on the pharmacy data management program they used.

Procedure

In order to calculate national prevalence statistics, the data from each region were manipulated to allow their combination. The exact process followed depended on the region, but ultimately, a database was produced that included each offender who was prescribed at least one psychotropic medication. For each offender, a series of dichotomous variables were coded as "yes" or "no" according to whether the offender was prescribed each individual medication

considered. In this way, it was possible to determine not only which offenders had an active psychotropic medication prescription, but also how many and what categories of medications were prescribed. Data were also added to this database from CSC's administrative database, the Offender Management System, to reflect the offenders' gender and Aboriginal ancestry.

In addition, a second database was developed from CSC's population management records. This database included all offenders in custody at the time of the pharmacy data extraction¹ – that is, both those with and without active prescriptions. Figures from this database acted as denominators in proportion calculations.

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¹ The week of September 29, 2014, was used for these purposes as it reflected when the largest share of the pharmacy data were provided.

Results

Overall Prevalence

Nationally, 30.4% of offenders in federal custody in late September 2014 had at least one active psychotropic medication prescription. As can be seen in Table 1, this proportion varied by region, with the Ontario region having the highest prevalence and the Atlantic region having the lowest.

Table 1.

Regional Prevalence of Offenders Having at Least One Psychotropic Medication Prescription

Region	Prevalence of Psychotropic Medication Prescription
Atlantic	22.3%
Quebec	30.4%
Ontario	37.4%
Prairie	27.0%
Pacific	30.2%

Differences were also seen by gender, with a considerably higher proportion of women (45.7%) than of men (29.6%) having at least one active psychotropic medication prescription. In contrast, there were no practical differences in the prevalence of prescriptions for Aboriginal (31.3%) and non-Aboriginal (30.1%) offenders.

Number of Prescriptions

It was common to have more than one active psychotropic medication prescription. Within the full offender population (that is, both those with and without active psychotropic medication prescriptions), 17.3% of offenders had a prescription for a single psychotropic medication, 8.2% had two, and 4.9% had three or more (see Table 2). Again, gender differences were apparent, with women more likely to have multiple prescriptions; on the other hand, there were virtually no differences associated with Aboriginal ancestry.²

² For completeness, this and all subsequent analyses were reproduced focusing only on those with active psychotropic medication prescriptions (Appendix B), but results mirror those for the full population.

Table 2.

Number of Active Prescriptions for a Psychotropic Medication

Group -	Number of P	Number of Psychotropic Medication Prescriptions				
	One	Two	Three or More			
Total	17.3%	8.2%	4.9%			
Gender						
Men	17.1%	7.9%	4.6%			
Women	20.3%	14.2%	11.2%			
Aboriginal Ancestry						
Aboriginal	17.5%	8.7%	5.1%			
Non-Aboriginal	17.1%	8.1%	4.9%			

Patterns Relating to Indication Categories

Next, analyses focused on the classification categories corresponding to the psychotropic medications: antidepressant agents, antipsychotic agents, CNS stimulants, anxiety/insomnia agents, and antimanic agents. As can be seen in Table 3, prescriptions for medications in the antidepressant agents category were the most common. The same was the case when analyses were performed separately by gender and by ethnicity. That said, differences were also apparent among the categories by gender and ethnicity. With respect to gender, women were consistently more likely to have prescriptions corresponding to each category except antimanic agents – this is consistent with their overall higher rate of psychotropic medication prescription. The difference was greatest with respect to the anxiety/insomnia agents category, in which about 2.4 times as great a proportion of women as of men had a prescription (relative to a ratio of 0.3 to 1.9 across the other categories). Differences were both more modest in size and less consistent in direction between Aboriginal and non-Aboriginal offenders. The greatest difference was with respect to the CNS stimulants category, where the ratio was 1.7.

³ Antimanic agents were excluded from this analysis due to their relatively low representation.

Table 3.

Categories for Which Prescriptions were Present

		AH	FS Categories		
Group	Anti- depressant Agents	Antipsychotic Agents	Anxiety/ Insomnia Agents	CNS Stimulants	Antimanic Agents
Total	22.6%	9.5%	6.0%	3.6%	0.8%
Gender					
Men	21.9%	9.2%	5.7%	3.6%	0.8%
Women	35.7%	17.2%	13.8%	4.9%	0.2%
Aboriginal Ancestry					
Aboriginal	22.2%	10.4%	6.4%	5.3%	0.6%
Non-Aboriginal	22.7%	9.2%	5.9%	3.1%	0.9%

Note. "Antidepressant agents" = Antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors. "CNS stimulants" = Amphetamines, respiratory and central nervous system stimulants, and central nervous system agents. "Anxiety/insomnia agents" = Benzodiazepines, hypnotics, anxiolytics, and sedatives.

Most offenders had prescriptions corresponding only to one of these AHFS-defined categories (see Table 4), with fewer than half as many offenders having prescriptions related to multiple categories. Again, the greatest difference amongst groups was with respect to gender, with women more likely to have prescriptions corresponding to multiple categories.

Table 4.

Number of AHFS-Defined Categories for Which Prescriptions were Present

Group	Number of AHFS Categories Corresponding to an Active Prescription			
Group	One	Two	Three or More	
Total	20.5%	7.7%	2.2%	
Gender				
Men	20.3%	7.4%	2.0%	
Women	24.8%	15.1%	5.8%	
Aboriginal Ancestry				
Aboriginal	20.5%	8.1%	2.6%	
Non-Aboriginal	20.5%	7.6%	2.0%	

Discussion

The current study, which was the first of its kind in a Canadian federal offender population, facilitates a better understanding of the prevalence of psychotropic medication prescription practices among federally-sentenced men and women offenders. This understanding may also allow for analysis regarding the diagnosis and conditions for which psychotropic medications are prescribed. In addition, this study complements previous examinations focused on the prevalence of mental illness in federally-sentenced offenders (Beaudette, Power, & Stewart, 2015).

Summary of Findings

Psychotropic medication prescriptions were more prevalent for federally-sentenced men and women offenders than for the general Canadian public (30.4% vs. approximately 8.0%, after excluding adolescents; Beck et al., 2005). That said, the prevalence rates obtained for federally-sentenced offenders were comparable to those for correctional populations in Quebec (40.3%; Lafortune & Vacheret, 2009), England (25.2%; Hassan, Frisher, et al., 2014) and France (50%; Fovet et al., 2014).

Women offenders were more often prescribed psychotropic medications than men (45.7% vs. 29.6%). This difference has also been seen in British correctional populations (Hassan, Frisher, et al., 2014). Canadian women offenders were prescribed psychotropic medication at similar rates to their counterparts in England (45.7% vs. 47.9%), though rates were less similar for men (16.9% vs. 29.6%, in England and Canada respectively). A similar gender difference was also seen among provincial offenders in Quebec (Lafortune & Vacheret, 2009).

When examining the American Hospital Formulary System (AHFS) classification categories corresponding to the psychotropic medications being prescribed, the most prevalent category was antidepressant agents, followed by antipsychotic agents, anxiety/insomnia agents, CNS stimulants, and antimanic agents. Though examination of these categories is informative, it is important to recall that prescription of a medication falling into a particular AHFS category

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⁴ Though these labels are used for brevity, it is important to recall that the antidepressant agent category includes antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors; the CNS stimulant category contains amphetamines, respiratory and central nervous system stimulants, and central nervous system agents; and, the anxiety / insomnia agent category includes benzodiazepines, hypnotics, anxiolytics, and sedatives.

does not imply specific diagnoses or indication for use. Medications within each category may have a number of Health Canada indications for use.

Nonetheless, it was noted that women offenders were consistently more likely to have prescriptions corresponding to each category, with the exception of antimanic agents, which is consistent with their overall higher rate of psychotropic medication prescription. It was also found that Aboriginal offenders were slightly more likely to be prescribed CNS stimulants than non-Aboriginal offenders (5.3% vs. 3.1%). CNS stimulants are commonly used to treat attention deficit hyperactivity disorder; however, interpreting this finding is challenging because there is a lack of consensus in the literature on whether attention deficit hyperactivity disorder is more prevalent in this group. Research has shown a higher prevalence of attention deficit hyperactivity disorder symptoms in Aboriginal children in comparison to the general population (Baydala, Sherman, Rasmussen, Wikman, & Janzen, 2006). Conversely, others have found that within the correctional context, Aboriginal men offenders do not exhibit significantly more attention deficit hyperactivity disorder symptoms in comparison to non-Aboriginal men offenders (Usher, Stewart, Wilton & Malek, 2010).

Though direct comparisons with the previous study from England (Hassan, Fisher, et al., 2014) are complicated by the fact that these researchers based their analyses on the British National Formulary and the current study used the American Hospital Formulary System, a simple comparison of results was undertaken. In keeping with the fact that the prevalence of Canadian federally-sentenced offenders' psychotropic medication prescriptions was slightly higher than that of their counterparts in England, the same pattern was found in all of the subcategories except anxiety/insomnia agents, where rates were similar in both jurisdictions (Hassan, Senior, Frisher, Edge, & Shaw, 2014). Whether this pattern is due to the slight differences in drug classification, population differences, or other features is unknown.

Interpretation

Comparison to General Population. Both this study and others in correctional jurisdictions have identified higher rates of psychotropic medication prescriptions among offenders than general populations. However, there are a number of possible reasons for this finding. For instance, the Canadian population estimate reflects a dated survey, with data being collected in 2002. In recent years, there has been a surge in public acceptance of mental illness and better recognition of its symptoms (Schomerus, et al., 2012). If replicated now, this survey

might find a greater number of individuals being prescribed psychotropic medication given that it is more acceptable to seek help for mental health issues. A further concern with this health survey is the data were collected via telephone interview, which is a data collection method that has inherent flaws. Specifically, it fails to reach segments of the population who either do not have home telephones (e.g., the homeless), or who are simply not interested in participating, which could lead to a biased sample. Lastly, this comparison fails to account for the potential differences in healthcare service access there may be between populations. Certain vulnerable segments of the population may struggle to obtain help for mental illness, but once incarcerated these services may be more readily accessible. Research has shown that offenders who are incarcerated consult with a general practitioner 3.8 times more than a demographically equivalent population in the community, and that the second most frequent reason for the visit is psychological (Feron, Paulus, Tonglet, Lorant, & Pestiaux, 2005).

Gender Differences. Women offenders were prescribed psychotropic medication at a higher rate than men offenders, which is in keeping with findings from other jurisdictions (Hassan, Frisher, et al., 2014) and with Canadian community populations (Beck et al., 2005). This may in large part be explained by the fact that research has shown that there are higher rates of mental illness among women offenders compared to men offenders (Correctional Service of Canada, 2009). Indeed, the specific differences between women and men offenders – that is, greater differences with respect to anxiety / insomnia agents and anti-depressant agents – also parallel those found in the Canadian community (Beck et al., 2005).

In addition, however, research has shown that incarceration affects women in a different way than men. Women, for example, are more likely to be the primary caregiver for their children, and while incarcerated often express feelings of anxiety regarding loss of custody and of their children's well-being (Genders & Player, 1990; Robeson Barrett, Allenby, & Taylor, 2010). Moreover, women offenders often have extensive victimization histories, with high rates of physical, sexual, and emotional abuse (Owen & Bloom, 1995). These factors may also contribute to the gender difference observed in this study.

Complex Relationship of Prescriptions with Mental Illness. It has been well established that offenders have higher rates of mental illness than the general population (Boyce, Rotenberg, & Karam, 2015; Gilmour, 2014), but without specifically examining the prevalence of mental illness *in conjunction* with psychotropic medication prescription practices, it is not

possible to make conclusions regarding the appropriateness of psychotropic medication use in Canada's federally-sentenced offenders. The relationship between psychotropic medication practices and the prevalence of mental illness is a complex one. First, not all offenders who suffer from a mental illness will be prescribed psychotropic medication. There are many treatment approaches for mental health issues, including both pharmacological (e.g., psychotropic medication) and non-pharmacological options (e.g., counselling, cognitive-behavioural therapy).

Additionally, not all offenders who are prescribed psychotropic medication may necessarily have a mental illness, as psychotropic medications are used for a variety of reasons, also known as off-label use. More specifically, off-label drug use occurs when medication is prescribed to different populations, and/or for different indications, and/or different dosages than that for which Health Canada has approved the medication (Standing Senate Committee on Social Affairs, Science and Technology, 2014). A recent survey completed in Quebec found that, in a community sample, 11% of all medications were being prescribed for off-label use (Eguale et al., 2012); and, when examining just psychotropic medication, the rate of off-label use jumps to between 40% and 80% (Chen, Wynia, Moloney, & Alexander, 2009). A recent survey of psychotropic medication prescriptions in Britain's correctional population showed that 34.7% of prescriptions did not have associated indicated symptoms of diagnosis (Hassan, Frisher, et al., 2014). This may suggest that the presence of mental illness is not the only purpose psychotropic medications can have. A planned follow-up study using the dataset created for this project will examine "off-label" psychotropic medication prescribing and therefore should shed light on this issue in a Canadian correctional context.

Conclusion

The current study was unique in examining the prescription practices for psychotropic medications in Canadian federally-sentenced offenders. The use of psychotropic medications was more prevalent in Canadian correctional offenders than the general Canadian population; however this is commensurate with similar correctional populations (Fovet, Amad, Adins, & Thomas, 2014; Hassan, Frisher, et al., 2014; Lafortune & Vacheret, 2009). Additionally, it was found that women offenders were more frequently prescribed psychotropic medication than men offenders, which was expected given the greater prevalence of mental health issues in women offenders (Correctional Service of Canada, 2009). The relationship between mental illness and

prescription practices is a complex one, and more research is needed to understand it. The Correctional Service of Canada recognizes offenders' mental health as a key priority; these study findings allow for a better understanding of psychotropic prescription practices, which, in turn contributes to the ongoing understanding of mental illness in the offender population.

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Appendix A: Psychotropic Medications Included in Study

American Hospital Formulary System (AHFS) Category	Medication	
Antipsychotic agents	 Quetiapine Ziprasidone Risperidone Olanzapine Chlorpromazine Flupenthixol Paliperidone Fluphenazine Haloperidol Loxapine Methotrimeprazine 	 Perphenazine Pimozide Pipotiazine Trifluoperazine Zuclopenthixol Aripiprazole Clozapine Asenapine Lurasidone
Antidepressant agents (Including antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors)	 Amitriptyline Bupropion Citalopram Clomipramine Desipramine Doxepin Escitalopram Fluoxetine Fluvoxamine Imipramine Mirtazapine Moclobemide 	 Nortriptyline Paroxetine Phenelzine Sertraline Tranylcypromine Trimipramine Venlafaxine Duloxetine
CNS stimulants (Including amphetamines, respiratory and central nervous system stimulants, and central nervous system agents)	MethylphenidateDextroamphetamine	LisdextroamphetamineAtomoxetine
Anxiety / insomnia agents (Including benzodiazepines, hypnotics, anxiolytics, and sedatives)	 Clonazepam Lorazepam Diazepam Clobazam Midazolam Hydroxyzine 	 Oxazepam Flurazepam Temazepam Trazodone Buspirone
Antimanic agents	• Lithium	

Appendix B: Analyses Restricted to Offenders with Psychotropic Medication Prescriptions

Table B1.

Number of Active Prescriptions for a Psychotropic Medication, Restricted to Those with Prescriptions

Group	Number of Psychotropic Medication Prescriptions			
Group -	One	Two	Three or More	
Total	56.8%	27.1%	16.2%	
Gender				
Men	57.6%	26.8%	15.6%	
Women	44.4%	31.0%	24.5%	
Aboriginal Ancestry				
Aboriginal	55.7%	27.6%	16.6%	
Non-Aboriginal	57.0%	26.9%	16.1%	

Table B2.

Categories for Which Prescriptions were Present, Restricted to Those with Prescriptions

	AHFS Categories				
Group	Anti- depressant agents	Antipsychotic agents	Anxiety/ insomnia agents	CNS stimulants	Antimanic agents
Total	74.3%	31.4%	19.9%	11.9%	2.7%
Gender					
Men	74.0%	31.0%	19.2%	12.0%	2.5%
Women	78.1%	37.6%	30.1%	10.8%	4.6%
Aboriginal Ancestry					
Aboriginal	71.0%	33.2%	20.6%	16.9%	1.9%
Non-Aboriginal	75.4%	30.8%	19.7%	10.2%	3.0%

Note. "Antidepressant agents" = Antidepressants, tricyclics and other norepinephrine-reuptake inhibitors, and monoamine oxidase inhibitors. "CNS stimulants" = Amphetamines, respiratory and central nervous system stimulants, and central nervous system agents. "Anxiety/insomnia agents" = Benzodiazepines, hypnotics, anxiolytics, and sedatives.

Table B3.

Number of AHFS-Defined Categories for Which Prescriptions were Present, Restricted to Those with Prescriptions

Crown	Number of AHFS Categories Corresponding to an Active Prescription			
Group	One	Two	Three or More	
Total	67.5%	25.5%	7.0%	
Gender				
Men	68.5%	25.0%	6.5%	
Women	54.3%	33.0%	12.7%	
Aboriginal Ancestry				
Aboriginal	65.6%	26.0%	8.4%	
Non-Aboriginal	68.2%	25.3%	6.5%	