



Effects of the new prescribing standards in British Columbia on consumption of opioids and benzodiazepines and z drugs

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Abstract

Objective To evaluate the effects of the 2016 College of Physicians and Surgeons of British Columbia's (CPSBC's) opioid and benzodiazepine and z drug prescribing standards on the use of these medications in British Columbia.

Design Interrupted time-series analysis of community-prescribing records over a 30-month period: January 2015 to June 2017.

Setting British Columbia.

Participants Random sample of British Columbia residents with filled prescriptions during the study period.

Intervention Introduction of CPSBC's opioid and benzodiazepine and z drug prescribing standards on June 1, 2016.

Main outcome measures Total weekly consumption of opioids (measured in morphine equivalents) and benzodiazepines and z drugs (measured in diazepam equivalents); and total monthly users of each class of medication.

Results Total consumption of both medication classes began to decline in late 2015, and the rate of decrease did not statistically significantly change following the implementation of the CPSBC standards in June 2016. In contrast, introduction of the standards was associated with an immediate 2% decrease in the number of monthly users of opioids for pain ($P < .001$), culminating in a 9% decrease over the course of the following year ($P < .001$). This trend was driven largely by a decrease in the number of continuing users; minimal change was seen in the number of new users during the study period. Trends in monthly users of benzodiazepines and z drugs mirrored those seen for opioids for pain.

Conclusion Implementation of the 2016 CPSBC standards did not change a pre-existing downward trend in consumption of opioids or benzodiazepines and z drugs that began 6 months earlier. However, the standards did have a small effect on the number of monthly users of these medications, with a decrease in opioid prescribing among continuing users. Given the risk of destabilization of patients who are discontinued from opioid therapy, future research should assess how patient health outcomes are related to changing prescribing practices.

Editor's key points

▶ In June 2016, the College of Physicians and Surgeons of British Columbia (CPSBC) released prescribing standards for opioids and benzodiazepines and z drugs. This study found that consumption of these medications in British Columbia was already starting to decline at the end of 2015. While CPSBC's release of the 2016 standards was not associated with any additional reduction in consumption at the population level, it led to an approximate 10% decrease in the number of monthly users of both medication types.

▶ The most important observed change associated with the CPSBC standards was in the decline in the number of continuing users of opioids for pain per month. This measure includes both patients who use opioids as continuous therapy and those who use them intermittently on an ongoing basis. The relationship between the decreasing trend in overall consumption of opioids and the number of users might potentially be explained by dose tapering of patients continuing opioids before standards implementation and possible discontinuation thereafter. In June 2018, the CPSBC issued a revised set of standards for its members, which includes clarification of physicians' roles in the care of patients using opioid therapy for chronic pain.



Points de repère du rédacteur

► En juin 2016, le Collège des médecins et chirurgiens de la Colombie-Britannique (CMCCB) établissait des normes de prescription pour les opioïdes, de même que pour les benzodiazépines et les drogues Z. Cette étude a permis de constater que l'utilisation de ces médicaments avait déjà commencé à diminuer à la fin de 2015. Bien que la publication des normes par le CMCCB en 2016 n'ait pas été associée à une réduction supplémentaire de la consommation à l'échelle de la population, elle a entraîné une réduction d'environ 10 % du nombre mensuel d'utilisateurs de ces 2 types de médicaments.

► Le changement le plus important observé en lien avec les normes du CMCCB résidait dans la diminution du nombre des utilisateurs d'opioïdes de manière continue contre la douleur, par mois. Cette mesure incluait à la fois les patients qui ont recours aux opioïdes comme thérapie continue et ceux qui les utilisent de manière intermittente sur une base continue. La relation entre cette tendance à la baisse dans la consommation d'opioïdes en général et dans le nombre d'utilisateurs pourrait s'expliquer par la diminution progressive des doses chez les patients qui continuaient d'utiliser des opioïdes avant la mise en œuvre des normes et leur discontinuation possible par la suite. En juin 2018, le CMCCB a publié une série de normes révisée à l'intention de ses membres, qui comporte des précisions quant aux rôles des médecins dans les soins aux patients traités avec des opioïdes contre la douleur chronique.

Effets des nouvelles normes de prescription en Colombie-Britannique sur la consommation d'opioïdes, de même que de benzodiazépines et de drogues Z

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Résumé

Objectif Évaluer les effets des normes de prescription d'opioïdes, de même que de benzodiazépines et de drogues Z, établies en 2016 par le Collège des médecins et chirurgiens de la Colombie-Britannique (CMCCB) sur l'utilisation de ces médicaments dans la province.

Type d'étude Une analyse de séries chronologiques interrompues de dossiers de prescription dans la communauté pendant une période de 30 mois, soit de janvier 2015 à juin 2017.

Contexte Colombie-Britannique.

Participants Échantillon aléatoire de résidents de la Colombie Britannique ayant fait remplir des ordonnances durant la période à l'étude.

Intervention Instauration par le CMCCB de normes de prescription d'opioïdes, de même que de benzodiazépines et de drogues Z, à compter du 1^{er} juin 2016.

Principaux paramètres à l'étude Consommation hebdomadaire totale d'opioïdes (mesurée en équivalents de morphine), de même que de benzodiazépines et de drogues Z (mesurée en équivalents de diazépam); et nombre mensuel total d'utilisateurs de chaque classe de médicaments.

Résultats La consommation totale des 2 classes de médicament a commencé à diminuer à la fin de 2015, et le taux de réduction n'a pas changé de manière statistiquement significative à la suite de la mise en vigueur des normes du CMCCB, en juin 2016. En revanche, l'instauration des normes a été associée à une réduction immédiate de 2% dans le nombre mensuel d'utilisateurs d'opioïdes contre la douleur ($p < ,001$), pour atteindre une diminution de 9% au cours l'année qui a suivi ($p < ,001$). Cette tendance a largement été alimentée par une baisse du nombre des utilisateurs sur une base continue; un changement minime a été observé dans le nombre des nouveaux utilisateurs durant la période à l'étude. Les tendances dans le nombre mensuel d'utilisateurs de benzodiazépines et de drogues Z ont été semblables à celles observées avec les opioïdes contre la douleur.

Conclusion La mise en œuvre des normes du CMCCB, en 2016, n'a pas eu d'effet sur la tendance à la baisse préexistante dans la consommation d'opioïdes, ou de benzodiazépines et de drogues Z, qui s'était amorcée 6 mois plus tôt. Par ailleurs, les normes ont effectivement eu une légère influence sur le nombre mensuel des utilisateurs de ces médicaments, notamment une baisse des prescriptions d'opioïdes chez les utilisateurs sur une base continue. Compte tenu du risque de déstabilisation des patients qui cessent une thérapie aux opioïdes, les recherches futures devraient évaluer les relations entre les résultats sur le plan de la santé des patients et les changements dans les pratiques de prescription.

Beginning in the 1990s in North America, opioid medication prescriptions and opioid-related mortality mirrored each other in dramatic upward trends.¹⁻⁴ In response to this increasing mortality, physician professional organizations have taken measures to reduce opioid prescribing.⁵⁻⁷ Shortly after the announcement of a public health emergency in British Columbia (BC) in April 2016 related to a rising number of illicit drug overdose deaths in the province,⁸ the College of Physicians and Surgeons of British Columbia (CPSBC) released a new set of professional standards and guidelines, mandating a number of restrictions on prescribing of stimulants, benzodiazepines, sedative hypnotics (a class consisting primarily of z drugs such as zopiclone and zaleplon), and opioids (including a strong suggestion to trial tapering doses for patients taking long-term opioid therapy).^{9,10}

In Canada and the United States, opioid overdose deaths have continued to climb even as prescribing rates have decreased since 2012 in response to increased awareness of the potential harms of opioids, new warning labels on the medications, and prescription drug monitoring programs.¹¹⁻¹³ While studies have reported a statistically significant association between opioid prescribing and opioid-related mortality,^{14,15} prescribing rates do not fully account for the variability and magnitude of opioid-related deaths. This is partly because illegal opioids make up a large—and increasing—proportion of opioid overdose deaths¹⁶; adulteration, market pressures toward increased potency, and a lack of standardized dosing in illegal drugs increase the risk of overdose.¹⁷ Patient advocates and researchers have cautioned that people who are prescribed opioids on a long-term basis might transition to the illegal market should they lose access to prescription medications if no other pain-relieving therapies are available.^{11,18}

To investigate the effect of CPSBC's standards on physician-prescribing practices for opioids and benzodiazepines and z drugs in BC, we conducted a time-series analysis of population-level trends in consumption of and population exposure to these drugs before and after the 2016 CPSBC standards came into effect.

— Methods —

Data sources

We examined data on filled prescriptions in a 20% random sample of individuals who were registered as BC residents between January 1, 2015, and November 30, 2016 (N=1 006 000). Information about prescription dispensations came from PharmaNet, a comprehensive database of every prescription filled outside of a hospital setting in BC. Prescription data were available from January 1, 2015, until June 30, 2017.

As this analysis was conducted as part of the surveillance mandate of the BC Centre for Disease Control, ethics review was not required per organizational policy.

Outcome measures

Consumption of opioids was measured using total weekly morphine equivalents dispensed,¹⁹ a measure that takes into account both the number of prescriptions dispensed and the relative strength of those prescriptions. We limited our analysis to oral formulations of opioid medications used for pain control and excluded drugs indicated for cough suppression and substance use disorder. Consumption of benzodiazepines and z drugs was measured in a similar manner using diazepam equivalents.²⁰ For the control group, we calculated defined daily doses of medications for peptic ulcers and gastroesophageal reflux disease (primarily proton pump inhibitors and H₂ receptor antagonists), referred to subsequently as *gastric medications*. A list of included medications in each class is available at **CFPlus**.*

We also examined trends in the number of users, defined as individuals who have filled at least 1 prescription during a given month, to assess the effect of CPSBC standards on the level of population exposure to opioids and benzodiazepines and z drugs. New users were defined as those individuals with a filled prescription in a given month who had no filled prescriptions for the same class of medication in the preceding 6 months; continuing users were those with a filled prescription who had any previous prescription for the same medication class filled within the preceding 6 months.

Statistical analyses

We performed interrupted time-series analysis to measure changes in weekly consumption and monthly number of users of opioids, benzodiazepines, z drugs, and gastric medications before and after the release of the CPSBC standards. The best-fitting models were seasonally adjusted, autoregressive moving-average processes. We also performed joinpoint regression to identify any time points with statistically significant changes in trends during the study period. We used 2-sided tests at a 5% significance level to determine statistically significant differences in slope change and performed all analyses using R, version 3.4.1.

— Results —

Over the 30-month study period of January 2015 to June 2017, 954 514 opioid and 1510 809 benzodiazepine and z drug prescriptions were dispensed in BC to 116 247 and 134 302 individuals, respectively. Stratification of prescriptions by specialty showed that, of the total volume of opioids for pain and benzodiazepines and z drugs dispensed at community pharmacies during the study period, only 7% and 14%, respectively, were prescribed by specialists.

*A list of included medications in each class is available at www.cfp.ca. Go to the full text of the article online and click on the **CFPlus** tab.

Time-series analysis showed that the introduction of CPSBC's standards was not associated with any changes in trends in consumption of opioids for pain or benzodiazepines and z drugs. Joinpoint analysis identified an inflection point at the end of November 2015, before which the consumption of opioids and benzodiazepines and z drugs in BC was unchanged, and after which consumption of these medications started to decline. From the inflection point until the end of May 2016 (before the introduction of CPSBC's standards), total weekly consumption fell by 10% for opioids and 15% for benzodiazepines and z drugs (Figure 1). Although consumption of opioids and benzodiazepines and z drugs continued to decrease following the release of the CPSBC standards in June 2016, the rate of decline did not significantly change ($P=.052$ for opioids; $P=.17$ for benzodiazepines and z drugs). From the end of November 2015 to the end of June 2017, the overall reduction in consumption of opioids and benzodiazepines and z drugs was 28% and 25%, respectively. There were no significant changes in consumption of gastric medications during the study period. The peaks and valleys observed each December and January in Figure 1 are known

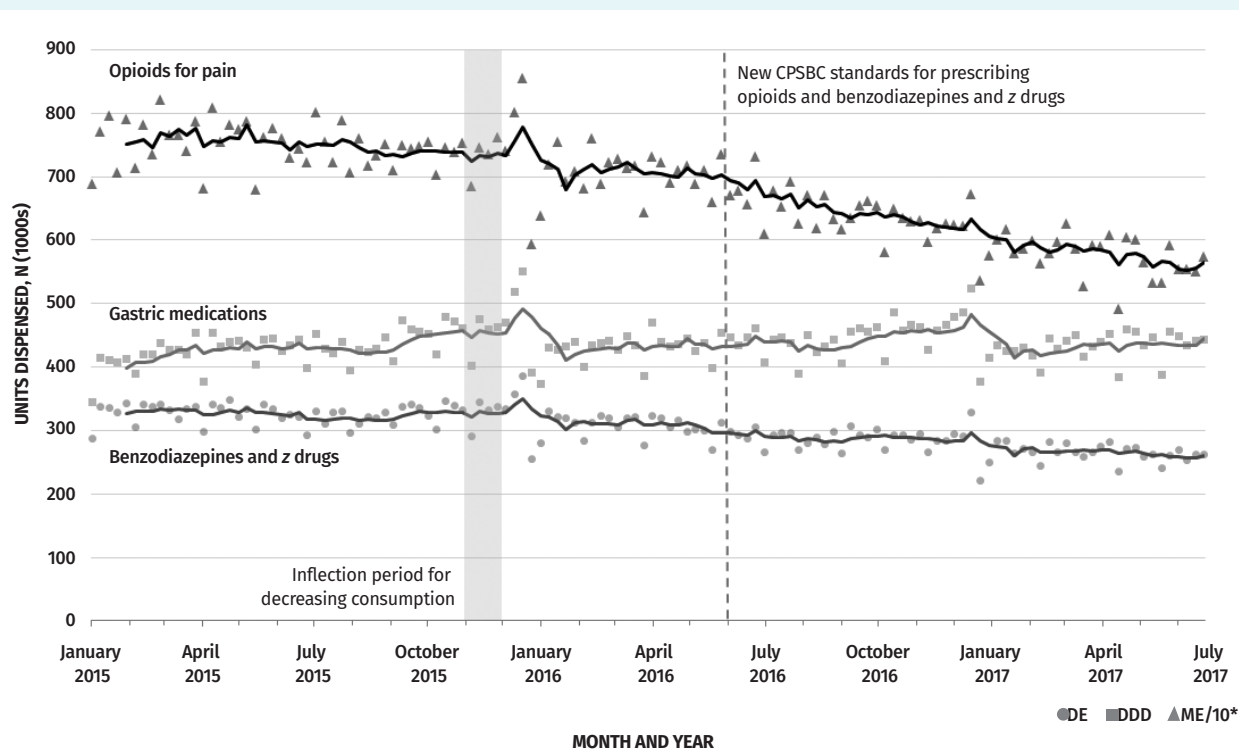
seasonal phenomena associated with prevacation prescription filling.

By contrast with total consumption, the number and rate of change of individuals using opioids decreased significantly following the introduction of the CPSBC standards ($P<.001$). Time-series analysis shows an immediate 2% decrease in the number of users per month of opioids for pain associated with the CPSBC standard implementation ($P<.001$), with a further sustained decline thereafter leading to an overall decrease of 9% from May 2016 to June 2017 ($P<.001$).

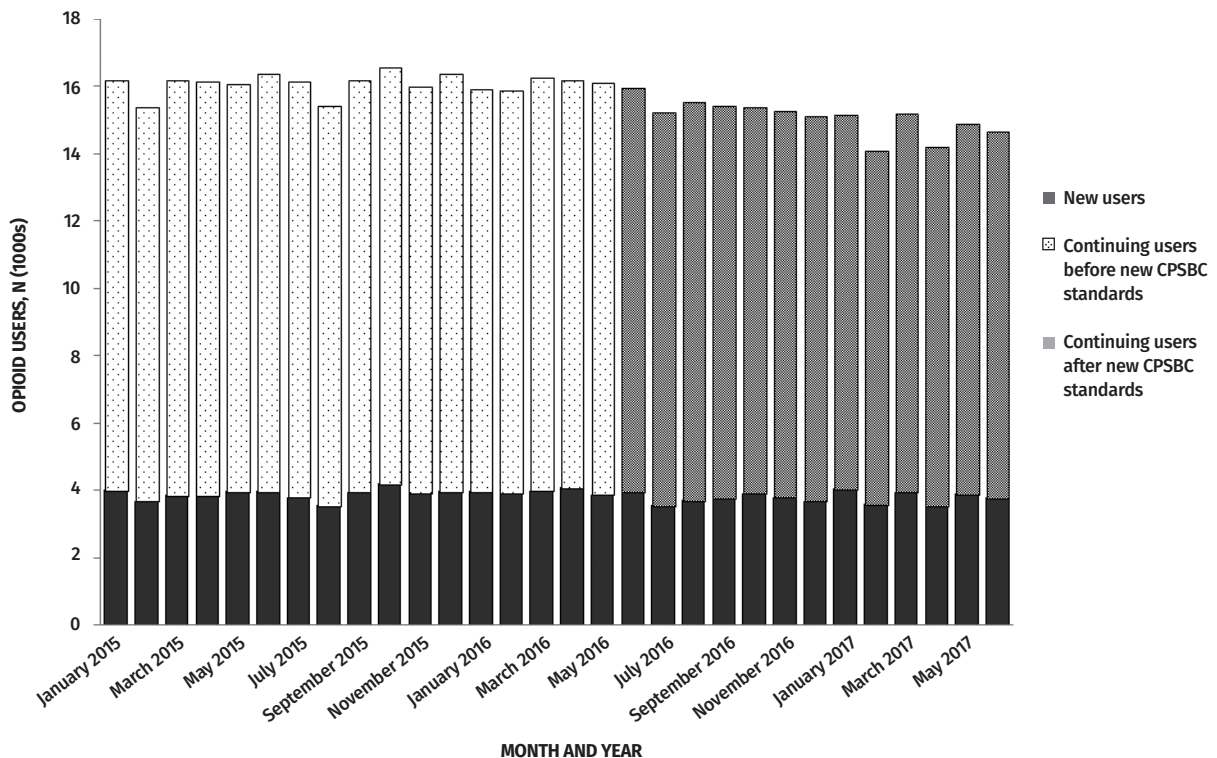
When opioid users were categorized as new users or continuing users, the declining trend in the number of users was driven primarily by decreases in the number of continuing users, with minimal changes in the number of new users (Figure 2). The number of continuing users fell by 11% from May 2016 to June 2017 ($P<.001$), while the number of new users remained unchanged ($P=.17$).

The trend in the monthly number of benzodiazepine users mirrored that seen in users of opioids for pain, with an 11% decrease ($P<.001$) observed from May 2016 to June 2017. There were no significant changes in the number of users of gastric medications.

Figure 1. Total units dispensed per week of opioids for pain (in ME/10) and benzodiazepines and z drugs (in DE), and gastric medications (in DDD) in British Columbia between January 2015 and June 2017: Lines represent 5-period moving average and symbols represent individual data points.



CPSBC—College of Physicians and Surgeons of British Columbia, DDD—defined daily doses, DE—diazepam equivalents, ME—morphine equivalents. *Morphine equivalents are divided by 10 so they are on the same scale as DE.

Figure 2. Total number of users, continuing users, and new users of opioids for pain in British Columbia between January 2015 and June 2017

CPSBC—College of Physicians and Surgeons of British Columbia.

— Discussion —

This study shows that consumption of opioids for pain and benzodiazepines and z drugs in BC started to decline at the end of 2015. While the release of CPSBC's standards in June 2016 was not associated with any additional reduction in consumption at the population level, it led to a decline of 9% and 11% in the monthly number of users of opioids and benzodiazepines and z drugs, respectively. The decrease in opioid use for pain was primarily driven by the reduction in the number of continuing users.

The findings suggest a modest effect of regulatory interventions in influencing prescribing patterns of health care providers, with observed decreases in the number of existing users of opioids and benzodiazepines and z drugs but little effect on overall consumption at the population level. Our results are in keeping with previous studies of initiatives to change prescribing patterns, in which clinical guidelines alone have generally shown no²¹ or modest²² effect on opioid and benzodiazepine or z drug prescribing, while initiatives involving considerable

educational supports for prescribers²³ or enforceable standards supported by legislative changes^{24,25} have been associated with more substantial effects.

The observed pattern of declining level of prescribing since late 2015 might be related to greater physician awareness of the increased number of deaths from illegal opioids in BC in 2015,²⁶ which led to extensive media coverage and ultimately the declaration of a public health emergency in April 2016⁸; knowledge of similar trends in the United States might also have contributed. Alternatively, physicians who were aware of the forthcoming changes to CPSBC policies might have changed their prescribing patterns before the standards came into effect. The release of the Centers for Disease Control and Prevention prescribing guidelines for the use of opioids in chronic pain in March 2016, which were endorsed by the CPSBC in an e-mail to members, might have further contributed to observed trends.²⁷

The most important observed change associated with the CPSBC standards is in the decline in the number of continuing users of opioids for pain per month. This measure includes both patients who use opioids as

continuous therapy and those who use them intermittently on an ongoing basis. The relationship between the decreasing trend in overall consumption of opioids and the number of users might potentially be explained by dose tapering of patients continuing opioids before standards implementation and possible discontinuation thereafter. The finding that the numbers of new users of opioids per month did not change to any appreciable level is potentially owing to the appropriateness of prescribing for short-term, acute pain. Our results are consistent with findings from Ontario, where the number of new patients started on prescription opioids remained largely stable between 2013 and 2016, with only a 2% decline over a 4-year period.²⁸

Limitations

This study has a number of limitations. The CPSBC standards do not apply to use of opioids and benzodiazepines or z drugs in the context of cancer or end-of-life care, but we were unable to exclude cancer and palliative care patients owing to lack of diagnostic data for the full study period. However, any resulting bias is likely to be relatively small and consistent over time, and would not affect observed trends and relative slope changes. In addition, we were only able to assess dispensed medications from community pharmacies, therefore excluding prescriptions that were written but not filled and medications dispensed in hospitals. Not all dispensed medications are necessarily consumed, and we might have slightly overestimated the level of consumption. Finally, we were unable to assess the clinical context of opioid and benzodiazepine or z drug prescriptions, including appropriateness of prescriptions and reasons for discontinuation of long-term therapy.

Conclusion

While the population-level effects of the CPSBC standards appear modest, unintended consequences of more stringent prescribing standards might be important but difficult to measure. In particular, risk of transitioning to illegal opioids, as well as subsequent overdose risk, has been suggested to be concentrated among patients taking chronic opioid therapy whose medication is discontinued.¹¹ Risk of suicidal thoughts and suicidal self-directed violence might also be increased among people whose therapy for chronic pain is discontinued.²⁹ In June 2018, the CPSBC issued a revised set of standards for its members, which clarifies that physicians have a responsibility to provide care to patients following existing regimens of chronic opioid therapy, that tapering of opioids should be suggested to such patients but is not mandated, and that abrupt discontinuation of therapy for patients taking chronic therapy is not appropriate.³⁰ Future research that includes patient-level factors such as demographic characteristics, comorbidities, and coprescribing should focus on assessing the effects of opioid therapy discontinuation

on subsequent health outcomes such as overdoses and opioid-related mortality. 

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Contributors

Drs Crabtree and **Smolina** designed the study. Data preparation and analysis were conducted by **Dr Rose** and **Ms Chong**. All authors contributed to interpretation of the data and to drafting and revision of the manuscript.

Competing interests

None declared

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