

**Determining the influence of the Workers Compensation Board of
Manitoba's opioid policy had on prescription opioid use amongst WCB
recipients.**

Short Title: Influence of WCB opioid policy on use of opioid medications.

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Abstract

Background: Opioid medications are commonly used amongst Workers Compensation Board (WCB) claimants following workplace injuries. The purpose of this study is to describe the impact of an opioid management policy on opioid prescriptions amongst a WCB covered population compared to changes in the use of these medications in the general population of a Canadian province.

Methods: We linked WCB claims data from 2006-2016 (13,155 claims, 11,905 individuals) to the provincial health records and compared the opioid use amongst this group to 478,606 individuals age 18-65. Linear regression was performed to examine the change over time in number of individuals being prescribed opioids for various durations and dosages of ≥ 50 and ≥ 120 morphine equivalents (ME)/day for both the WCB and Manitoba population.

Results: WCB claimants totaled 2.5% of Manitoba residents age 18-65 prescribed opioids for non-cancer pain. After the introduction of the opioid use policy amongst the WCB population in November 2011, the number of people prescribed opioids declined 49.4% in the WCB group, while increasing 10.8% in the province as a whole. The number of individuals using ≥ 50 ME/day declined 43.1% in the WCB group and increased 5.8% in the province.

Conclusions: Opioid management programs organized by a compensation board can lead to a substantial reduction in the prescription of opioid medications to a WCB client population including individuals who were prescribed higher doses of these medications when compared to general trend in the community.

Introduction:

The use of prescription opioid medications is a major public health issue in Canada and the United States (1, 2). This class of medication has been the subject of a number of reviews in the management of chronic non-cancer pain as the level of benefit has been questioned and long term use has been associated with side effects, addiction and death (3, 4). Up to one third of individuals on chronic opioid therapy may become dependent or addicted to these medications. (5). Workers Compensation Board (WCB) claimants are commonly prescribed opioids following workplace injuries (6, 7). The dosage of prescribed opioids escalates as WCB claims mature (8). Amongst WCB claimants higher doses of opioids have been associated with excess deaths (9) and claims cost of > \$100,000 (10) in adjusted analyses. Fatal opioid related overdoses are higher in workers employed in industries and occupations known to have high rates of work-related injuries (11). Given that injured workers covered by WCB are frequently prescribed opioids, attempts have been made to manage the use of these medications (12-14). Recent studies have shown that an opioid management system has led to a reduction in opioid prescriptions (15, 16). However, these researchers were not able to compare the decrease in the use of opioids in the WCB injured population compared to the trend taking place in the general community.

In previous work (6), we demonstrated that the WCB of Manitoba pays for approximately 4% of the opioids prescribed in the province. Additionally, WCB recipients account for just over 2% of Manitobans prescribed opioids and, were approximately twice as likely to be prescribed greater than 120 morphine equivalents per day (6). Due to growing concerns regarding possible excessive use of opioid medications and its responsibility to ensure that the treatments WCB recipients receive are appropriate, the WCB of Manitoba instituted an opioid medication policy on November 1, 2011(14) which was consistent with recent Canadian opioid prescribing guidelines(17). The purpose of this study is to assess the impact that this policy may have had on opioid prescriptions amongst the WCB covered population of the province, by comparing changes in opioid medication use amongst WCB recipients to that amongst other Manitobans.

Materials and Methods:

Setting: Manitoba, Canada has a population nearing 1,400,000 and a diverse economy. The WCB of Manitoba covers about 70% of the provincial workforce. WCB benefits include medical and prescription costs and wage replacement (18). Injured workers are managed under the general medical system by the worker's regular physicians and consultants and not by a special list of WCB sanctioned physicians.

The WCB of Manitoba opioid policy states (14) that the WCB will pay for opioid medication during the acute phase of an injury for up to 14 days or during the acute, post-operative phase. Following the acute phase, the WCB may pay for the minimum dose of opioid medication that supports a documented improvement in the injured worker's functional ability. To authorize or continue payment for opioid medication beyond the acute phase, the WCB must be satisfied that the physician has followed best practices adopted by the WCB, including utilization of outcome measures acceptable to the WCB such as improved function. After the initial 14 day period, payment for opioid medication may be provided by the WCB for as long as necessary, at the minimum dosage level that attains the maximum functional improvement, with prior authorization from the WCB. During this period, documented evidence must show that the prescribed opioid medication does not form the first line of treatment, that it is prescribed by one provider using a single pharmacy, that there is a written treatment agreement made between the injured worker and the prescribing physician, that the agreement is received in a form acceptable to the WCB, and that the benefits regarding the improvement in function outweigh the side-effects and risks from the opioid (14).

The program was operationalized as follows. A special fee tariff for completion of an opioid management report was developed which physicians in the province could bill the WCB. This completed form was required for continuation of coverage by the WCB for opioid prescriptions. The form addressed activities of daily living, adverse effects, analgesia and adverse opioid related factors. In the initial years of the program, the form was reviewed by physician consultants to the WCB. Subsequently, a nurse consultant to the WCB has also been doing reviews.

If after review, the medical consultant to WCB had concerns about the appropriateness of continuing the opioid prescription, the prescribing physician was contacted. Following interaction with the prescribing physician, a management plan to continue payment for the opioids, wean the opioids, or stop payment was put in place.

In Manitoba, the government-funded health care system covers nearly all provincial residents. The administrative data Manitoba Health collects contains amongst other information, comprehensive out-patient prescription pharmacy data since April 1, 1997. We linked the WCB claim data to de-identified health data which were collected by Manitoba Health and housed at the Manitoba Centre for Health Policy (MCHP). MCHP data have been extensively validated and utilized in a wide variety of studies (19-21).

Participants: We identified a list of opioid medications paid for by the WCB, including codeine ≥ 15 mg/tablet, meperidine, morphine, oxycodone, hydromorphone, tramadol, methadone and fentanyl. A list of all claims started or on-going between 2006 to 2016 in which the WCB paid for at least one prescription of these medication, was identified. Information on 13,155 claims, (11,905 individuals) was linked, 95.4% successfully, to the MCHP database by Manitoba Health. Some of the unlinked claims are due to the fact that 2% of all WCBs claims are for out of province residents who are not covered by the provincial health care plan (personal communication WCB of Manitoba, 2020).

All prescriptions from January 1, 2006 to December 31, 2016 for individuals age 18-65 ($n = 478,606$) for the same list of medications were identified in the MCHP database. The WCB and MCHP lists of prescriptions were matched based on a unique anonymized identifier, date of dispensing, and drug identification number (DIN). Where potential matches were uncertain (e.g., WCB and MCHP dates that were within two weeks but not exactly the same), number of pills was used to confirm matches. We successfully linked 90.1% of the WCB prescriptions to a corresponding record in the MCHP database. Prescriptions were eliminated if they did not list the dose or the number of pills, unless the matching prescription in the other dataset gave data which could be used.

Extreme outliers in which the number of pills prescribed was impossible were also removed, unless the number of pills for the matching prescription in the other dataset was reasonable. As buccal, rectal, and intravenous formulations of opioid medications are rarely used for the management of chronic pain in Manitoba's WCB population, these prescriptions were excluded. Due to inconsistency in recording either the concentration or the amount prescribed, liquids were also excluded. As morphine dose equivalence have not been clearly established for Tramadol and methadone, these drugs were also excluded (22). Prescriptions for persons over age 65 and those for non-Manitoba residents were also excluded. Individuals with invasive cancer, identified by linking with the provincial cancer registry, were excluded.

The Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain morphine equivalency table was used to calculate Morphine equivalents (ME) for each prescription (22). ME for each filled prescription were calculated by multiplying the morphine equivalent of the prescribed drug by the dose prescribed and the number of tablets/patches included. The average number of ME/day over each calendar month was determined by totaling the number of ME for all prescriptions prescribed in a calendar month divided by the number of days in the month. For prescriptions that covered two or more calendar months, the ME were prorated.

Longer duration of opioid use was identified when ME had been prescribed without a break for longer than one month and one year. For purposes of calculating duration of opioid use, an incidence of opioid use was considered to be continuous if there was not a break of two calendar months or more. The study covered the period from January 1, 2006 until December 31, 2016.

Study design: We performed a descriptive study of opioid prescription over time with emphasis on new starts of opioid, duration of usage and average daily dosages exceeding both 50 and 120 ME/day for both the WCB and Manitoba population. Linear regression was performed to examine the change over time in number of individuals being prescribed (i) any opioids, (ii) any continuous opioids for > 1 month, (iii) any continuous opioids for ≥ 1 year, and (iv) high-dose opioids, defined as ≥ 50 and ≥ 120 ME/day. In regression modeling, we included two time terms, the first months since January, 2006 and the second months since November, 2011 to identify changes in the various outcomes being investigated and the start of the WCB opioid program. To explore the impact of the WCB opioid program on the opioid prescription outcomes described above, we focused on the regression coefficient for months since November, 2011. To evaluate whether the change in prescription trends may have occurred with or without the WCB opioid program, we compared the regression coefficients between the WCB and Manitoba population groups. In previous work we had identified that approximately 90% of opioid claims were time loss claims (23). In order to partially adjust for claim volume, we compared the number of new starts of opioids in a given year to the number of time loss claims in that year.

Outcome measures: Linear regression coefficients were reported with p-values (Wald statistic) < 0.05 being considered statistically significant. Comparisons of proportions were done with 2-sided chi square testing. All data were analyzed using SAS version 9.4 (Cary, NC, USA).

Ethics: This research proposal was approved by the Research Ethics Board of the University of Manitoba (HS14817 (H2012:010)) and the Health Information Privacy Committee of the Manitoba Government (HIPC 2012/2013-01).

Results: WCB claimants totaled 2.5% of Manitoba residents age 18-65 prescribed opioids for non-cancer pain. After the introduction of the opioid use policy amongst the WCB population, opioid use declined. Figure 1 describes the percentage of time loss claims that were started on opioids that year. Time loss claims fell from 17,142 in 2006 to 15,144 in the transition year 2011 (12%) and to 14,167 in 2016, a 6% decline from 2011. In contrast, the number of new opioid starts during the year fell from 1,624 in 2006 to 1,209 in the transition year (26%) and a further 50% to 601 in 2016. The percentage of time loss claimants started on opioids fell from 9% in 2006 to 8% in 2011 ($p < 0.0001$, chi-square) and further to 4% in 2016 ($p < 0.0001$, chi-square). The later significant decline in opioid starts shows that fewer individuals were being started on these medications after an injury following the initiation of the program.

For 2006, the average monthly number of individuals prescribed opioids in the WCB cohort was 645 and 619 for 2011, a 4% decline (average over Jan – Oct as program started in November 2011) and falling a further 49% to 313 in 2016. For the province as a whole, the number of individuals prescribed opioids rose 23% between 2006 and 2011 and rose a further 11% by 2016. For 2006, the average number of individuals prescribed opioids for over one year in the WCB cohort was 234 going up to 327 for 2011, an increase of 40%, and falling 39% to 198 by 2016. For the province as a whole, the numbers rose 57% between 2006 and 2011 and a further 17% by 2016. Figures 2 and 3 show a clear downward trend in the number of people prescribed any opioids and opioids for over one year in the WCB group vs the province as a whole. Some decline was observed in the WCB group pre Nov 2011, which may have been partially due to the decrease in WCB time loss claims. Similar results were observed when the analysis was limited to individuals prescribed opioids for one month or longer.

Time trends in the use of higher doses of opioids defined as ≥ 50 and ≥ 120 ME/day were also determined (Figures 4 and 5). Between 2006 and 2011 the number of individuals prescribed ≥ 50 ME /day increased 33.3% amongst the WCB group and 55.1% in the province. From 2011 to 2016, the number fell 43.1% in the WCB group and rose 5.8% in the province. Between 2006 and 2011 the number of individuals prescribed ≥ 120 ME /day increased 40.6% amongst the

WCB group and 54.0% in the province. From 2011 to 2016 the number fell 44.4% in the WCB group and 4.7% in the province.

The table describes the results of a series of linear regressions examining the association of time both since the start of the study and the institution of the WCB opioid policy, and the number of individuals prescribed opioid medications. In all cases, the coefficient for months since November 2011, a measure of the potential effect of the program, was negative, meaning a decline or slower increase in number of people prescribed opioids. In the WCB group, the sum of the coefficients for months since 2006 and months since November 2011 was always negative, meaning a decline in number of people prescribed opioids. By contrast, in the non-WCB population of Manitoba, other than the number of individuals prescribed ≥ 120 ME/day, for all of the measures studied, opioid use continued to increase between 2011 and 2016.

In 2010, the last full year of data before the program was instituted, 680 WCB recipients who were new opioid starts were prescribed opioids for at least one month. Of these, 217 (31.9%) were still being prescribed opioids at three months and 51 (7.5%) at one year. By 2015 only 300 WCB recipients who were new starts on opioids were prescribed opioids for at least one month, a decline of 56% from 2010. Of these, 20% were still being prescribed opioids at three months ($p = 0.0001$) and 10 individuals (3.3%) at one year ($p=0.001$). In comparison, for the province as a whole, 32.5% of individuals who were new starts on opioids who were prescribed opioids for one month in 2010, were still being prescribed these medications at 3 months and 11.3% at one year. In 2015 both the absolute numbers and percentages did not change. Approximately 32.7% of individuals who were prescribed opioids for one month were still being prescribed these medications at 3 months and 12.4% at one year.

Discussion: Our results show that WCB of Manitoba claimants were prescribed less opioid medications after the institution of an opioid management program. The decline was associated with two factors, a decrease in the number of injured workers and the management program itself. The change was not related to changes in the general prescription pattern of opioids as for all reported measures of opioid prescription with the exception of the number of people on ≥ 120 ME/day, the number of people prescribed opioids in the province increased between 2011 and 2016. Further, even amongst people on ≥ 120 ME/day, the fall was sharper amongst WCB recipients than non-WCB recipients. The number of people prescribed opioids declined by under 5% in the general population who were prescribed more than 120 ME/day. The use of opioids by the adult population of the province grew quicker than the population growth of 4.4% between 2006 and 2011 and 4.9% between 2011 and 2016 (24), consistent with increased prescribing of these medications in the province.

The data showed that a lower percentage of individuals prescribed opioids for more than one month were still taking these medications at one year for the WCB group compared to the province as a whole prior to the institution of the program. Overall there was a decline of over 80% in the number of individuals who were new starts that were continued on opioids covered by the WCB for over one year when 2010 and 2015 were compared. By comparison, there was no substantial change in the longer-duration use in the province as a whole. Thus, it appears that the WCB program was successful in preventing transition to chronic opioid usage in the population it serves.

The 14 day limit prior to institution of the program, although part of the Manitoba program, is not part of the general Canadian opioid guidelines (3, 17). Although the opioid program only begins after 2 weeks of usage, the presence of the program may have influenced the decision to start an injured claimant on these medications as similar trends for the prescription of any opioids and for opioids of greater than one month duration were observed. Our results are consistent with other studies and show that a program that monitors the use of opioid medications by WCB recipients can lead to decreased prescribing of these medications in this population (7, 15).

Our study has a number of limitations. We cannot be certain that the medications that were dispensed to the individuals evaluated in the study were actually used by them. Although the WCB programs states that it monitors for functional improvement, we were not able to independently evaluate how the individuals prescribed opioids by the WCB function changed with varying doses of opioid medications. We also did not study whether individuals actually stopped being prescribed opioids from other sources when the WCB stopped covering the cost. (25). As we limited our study to individuals age 65 and under, we cannot comment on the effect the program had on individuals who may have aged out of the cohort and had been on high dose opioids prior to its institution. Finally, as this study took place in a Canadian province, the results cannot be generalized to other jurisdictions with differing health and social systems.

The main strength of our study was our ability to compare use of opioid medication amongst WCB claimants and non-WCB claimants in the same geographic population. This allowed us to assess whether changes in opioid use were likely associated with the WCB policy or not.

Conclusion: In summary, in spite of the limitations listed above, our results show that an opioid program organized by a compensation board can lead to a substantial reduction in the prescription of opioid medications to a WCB client population including individuals who were prescribed higher doses of these medications.

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Table 1 Results of linear regression modelling of number of individuals using opioids over time.

Group	Variable	WCB		Province of Manitoba	
		Coefficient (95% C.I.)	P value ¹	Coefficient (95% C.I.)	P value ¹
Any Opioid use	Intercept	693.79 (678.02, 709.57)	<0.001	23527 (23250, 23805)	<0.001
	Months since January 2006	-1.10 (-1.44, -0.77)	<0.001	93.12 (87.22, 99.03)	<0.001
	Months since November 2011	-4.75 (-5.40, -4.09)	<0.001	-62.23 (-73.74, -50.72)	<0.001
Opioid use > 1 month	Intercept	532.1 (518.1, 546.1)	<0.001	15085 (14875, 15295)	<0.001
	Months since January 2006	-0.29 (-0.59, 0.00)	0.053	98.45 (93.97, 102.91)	<0.001
	Months since November 2011	-4.65 (-5.23, -4.07)	<0.001	-63.57 (-72.29, -54.86)	<0.001
Opioid use > 1 year	Intercept	243.60 (236.86, 250.34)	<0.001	7697 (7596, 7797)	<0.001
	Months since January 2006	1.42 (1.27, 1.56)	<0.001	88.48 (86.33, 90.62)	<0.001
	Months since November 2011	-4.18 (-4.46, -3.90)	<0.001	-56.74 (-60.92, -52.56)	<0.001
Opioid use ≥ 50 ME/day	Intercept	92.58 (88.74, 96.41)	<0.001	2145 (2107, 2183)	<0.001
	Months since January 2006	0.41 (0.32, 0.49)	<0.001	21.8 (21.00, 22.63)	<0.001
	Months since November 2011	-1.43 (-1.59, -1.27)	<0.001	-20.5 (-22.13, -18.94)	<0.001
Opioid use ≥ > 120 ME/day	Intercept	38.16 (35.74, 40.58)	<0.001	1044 (1024, 1063)	<0.001
	Months since January 2006	0.18 (0.13, 0.23)	<0.001	9.77 (9.35, 10.18)	<0.001
	Months since November 2011	-0.67 (-0.77, -0.57)	<0.001	-12.27 (-13.08, -11.46)	<0.001

¹Wald Test

Figure 1 Relationships of Workers Compensation Board accepted time loss claims and new opioid starts in WCB claimants 2006-2016.

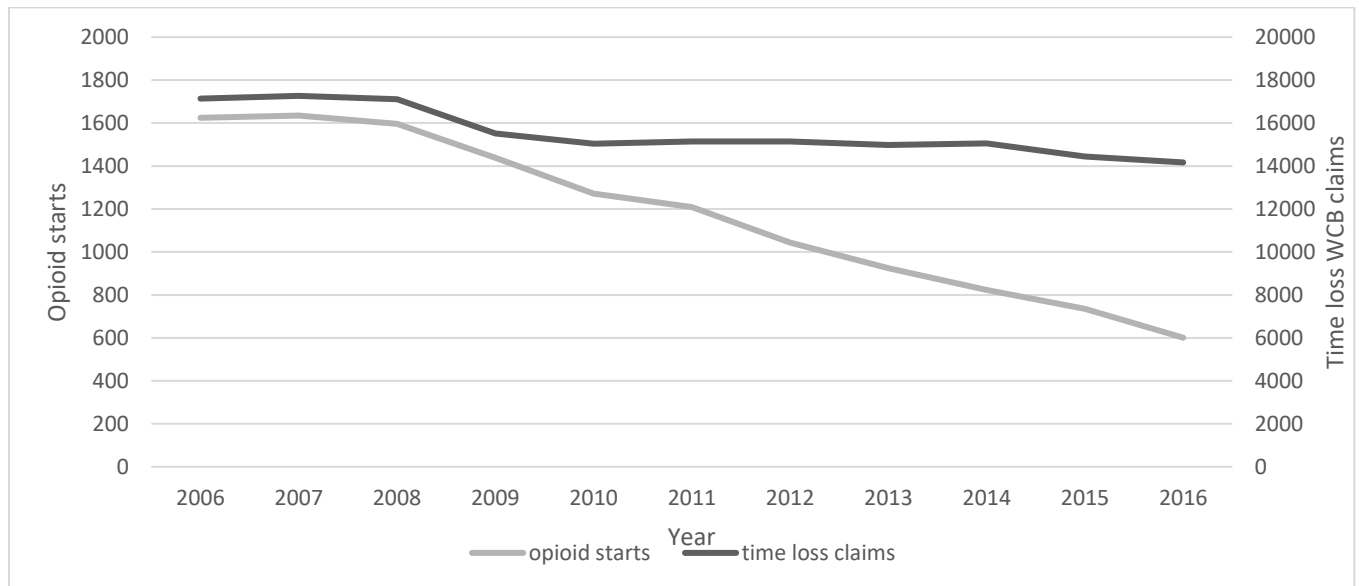


Figure 2 Number of individuals age 18-65 prescribed opioids paid for by the WCB compared to other Manitobans 2006-2016.

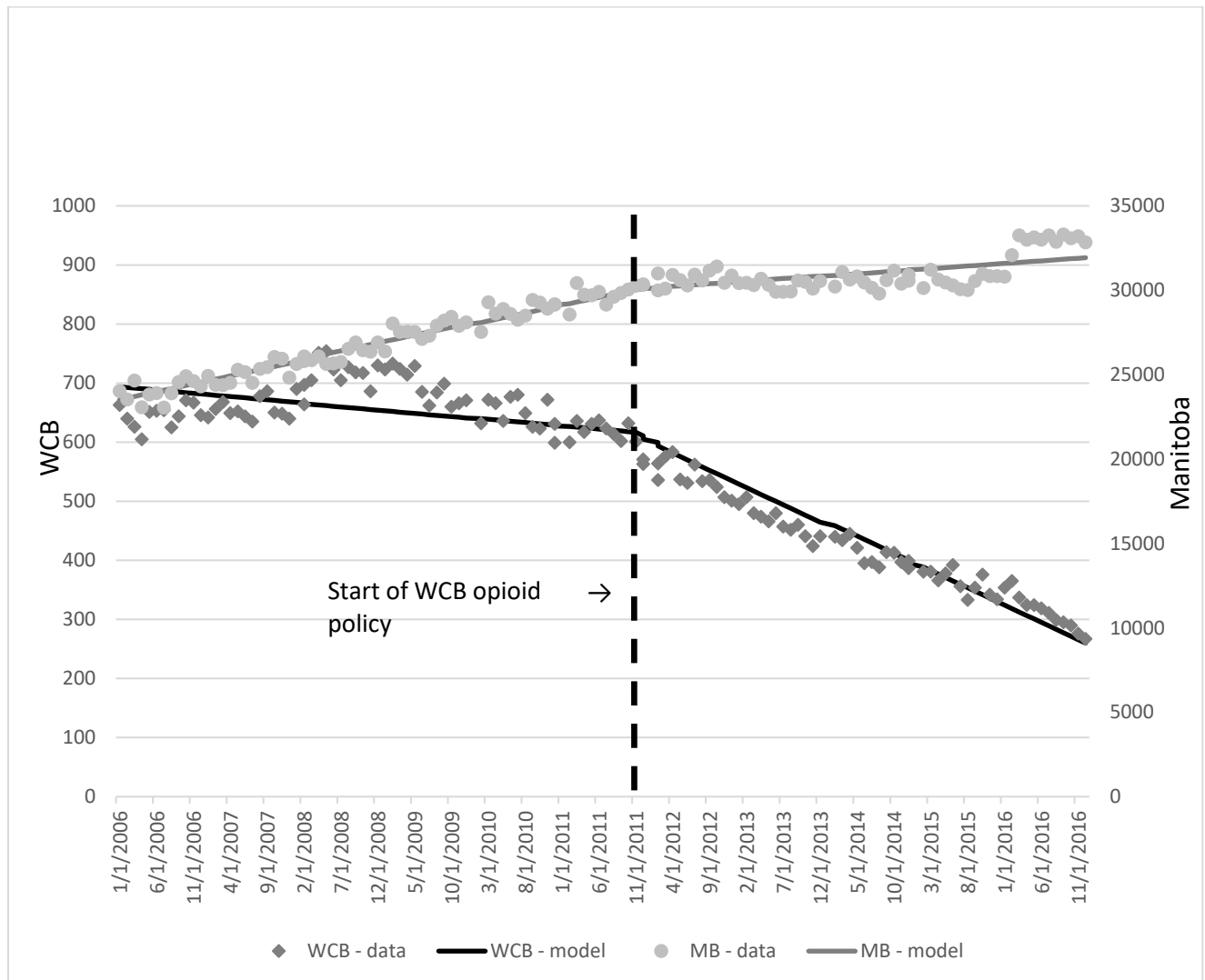


Figure 3 Number of individuals prescribed opioids for more than one year paid for by the WCB compared to all Manitobans age 18-65 2006-2016.

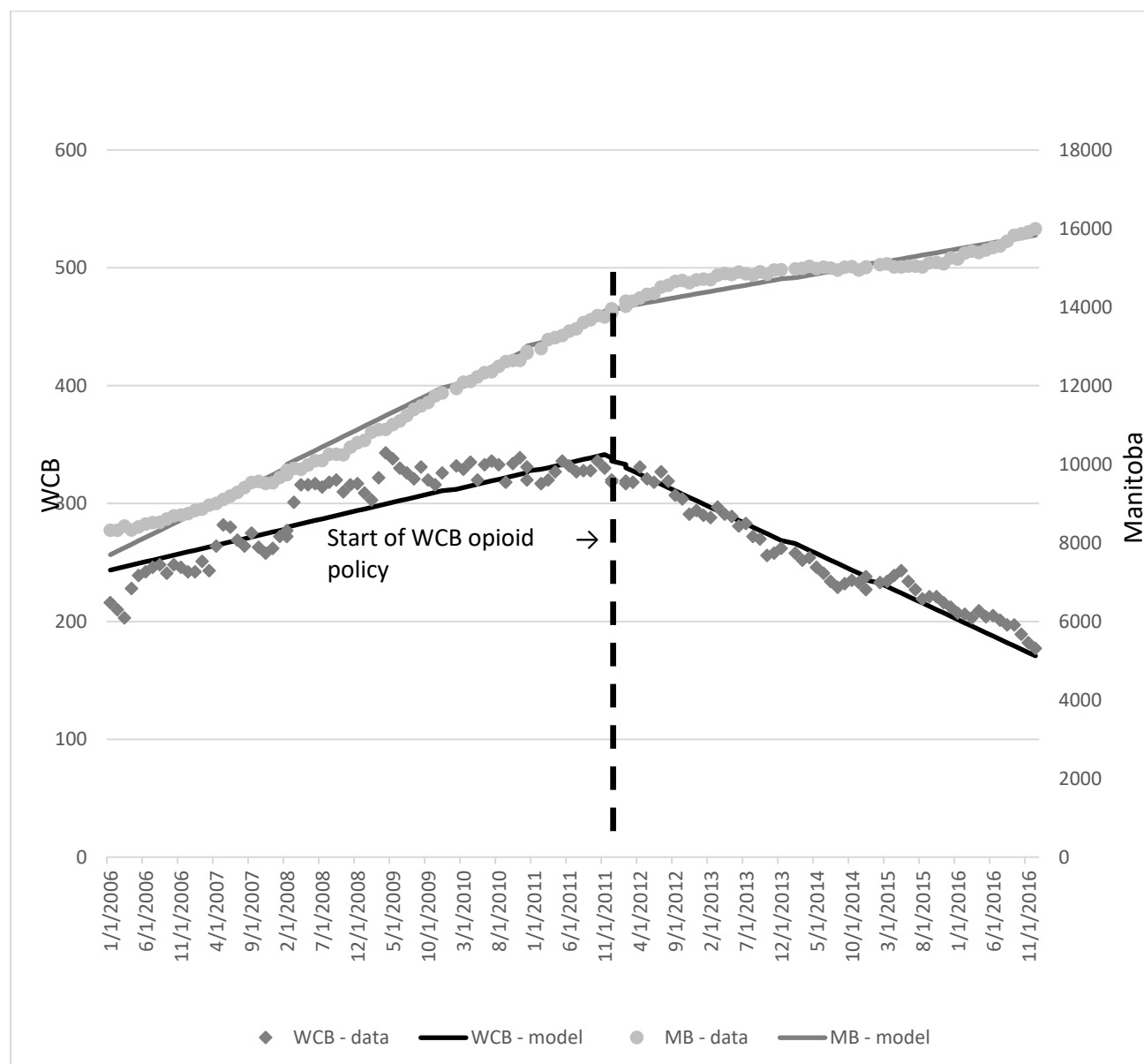


Figure 4. Number of individuals prescribed > 50 ME/day paid for by the WCB compared to other Manitobans age 18-65 2006-2016.

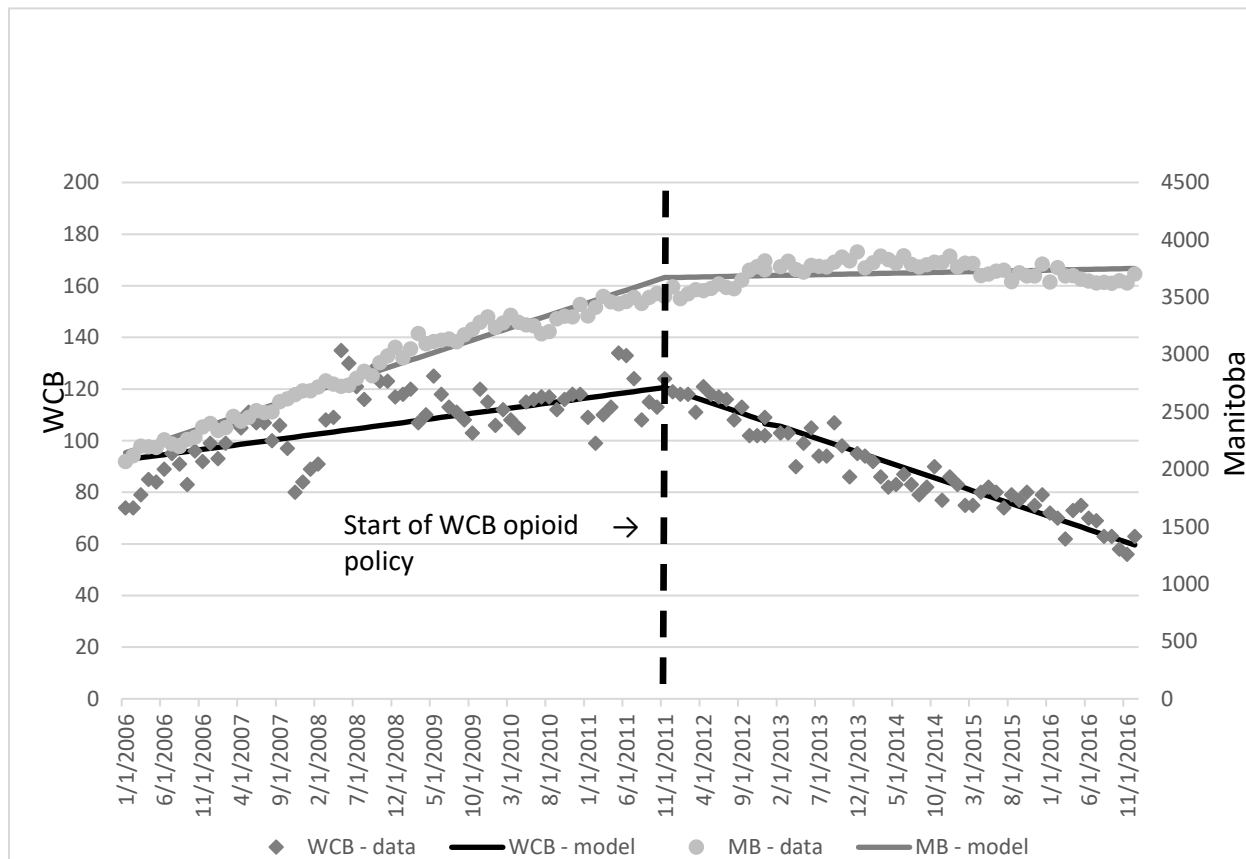
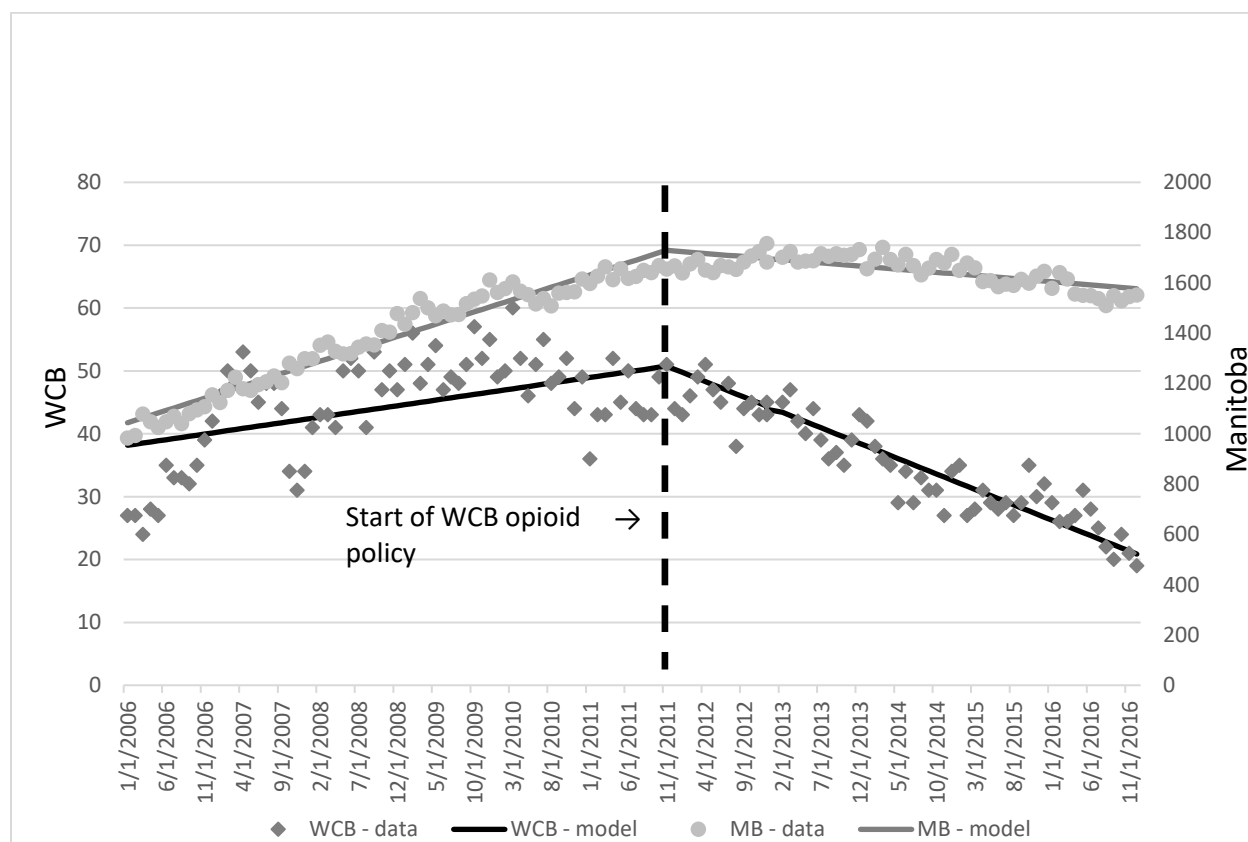


Figure 5 Number of individuals prescribed > 120 ME/day paid for by the WCB compared to other Manitobans 2006-2016.



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