reformulary® GROUP

Opioid Prescribing in Canada and its Potential Contribution to the Opioid Crisis

January 14, 2019

Acknowledgements

I would like to acknowledge the tremendous work done on this analysis by my brilliant colleague, Nasir Keshvani, Director Informatics. I would also like to acknowledge the incredible insight and assistance of Mike Boivin in drafting, reviewing and re-reviewing the report. Mike is a clinical pharmacist consultant and continuing education developer, and founder, CommPharm Consulting. Further, a huge thank you to Dr David Juurlink and Dr Tara Gomes for reviewing and providing comments on the report. David is Professor and Head, Division of Clinical Pharmacology & Toxicology, Sunnybrook Health Sciences Centre, Division Director, Clinical Pharmacology & Toxicology, Department of Medicine, University of Toronto, Senior Scientist, Institute for Clinical Evaluative Sciences, and Medical Toxicologist, Ontario Poison Centre. Tara Gomes is an epidemiologist and Principal Investigator of the Ontario Drug Policy Research Network (ODPRN), scientist in the Li Ka Shing Knowledge Institute of St. Michael's Hospital and the Institute for Clinical Evaluative Sciences, and an assistant professor at University of Toronto.

Helen Stevenson, Founder and CEO, Reformulary Group

About Us

Founded in 2011, Reformulary Group is an expert-led healthcare company focused on helping Canadians make smart drug and medical cannabis choices, and helping companies ensure plan sustainability. The Company's most notable innovation is its proprietary formulary – the Reformulary® – a subscription-based service offered to Canadian employers. The Reformulary is curated based on the trusted advice of an independent panel of doctors and pharmacists. The company's award-winning DrugFinder™ provides trusted information to empower patients to make smart drug choices. Reformulary Group also developed Cannabis Standard, a digital platform that provides guidelines for medical cannabis use based on evidence and expert advice and captures patient-generated outcomes data. For more information visit www.reformulary.com.

Disclaimer

This report has been prepared by Reformulary Group Inc. based on data provided to it by both public and private drug plans. Accordingly, Reformulary Group Inc. is not able to warrant the accuracy or completeness of the data and is not able to assume any liability for the data or any use thereof by the readers of this report.

Key Findings

1. 1 in 5 people took an opioid in 2017, down slightly from 2013

2. The median morphine equivalent dose (MED) and interquartile range (IQR) for chronic opioid use was 38.09 mg (IQR=71.34) in 2013 and 33.14 mg (IQR=53.57) in 2017. Evidence-based guideline committees, governments, and medical associations promote guidelines recommending a rapid decrease in daily opioid dose – the data demonstrates that the rapid decrease in daily opioid dose is not taking place

3. The majority of claimants (approximately 65%) were using opioids acutely (< 30 days)

4. A large portion of the opioid prescriptions were for chronic opioid use (48%, 66% and 40% for private payers, public payers and Reformulary clients, respectively)

5. The number of people using opioids chronically was more than double for claimants covered by public plans compared to those covered by private plans and Reformulary plans

6. The highest MED was among individuals aged 25 to 44 years

7. The average MED increases the longer the patient stays on therapy

8. 8.9% of private claimants and 16.1% of public claimants taking chronic opioid therapy were also taking chronic benzodiazepine therapy

9. 0.7% of public claimants on methadone or suboxone were also taking chronic opioids

10. 7% of all chronic claimants were taking two opioids

Executive Summary

Canada is experiencing an opioid crisis. Opioids are associated with death and harm. Each day in Canada, 11 lives are lost due to opioids.[1] 92% of these deaths were accidental due to an unintentional overdose.[1] An average of 17 Canadians were hospitalized due to opioid poisoning each day in 2017 in Canada.[1] Although most harm is from the use of illicit opioids, a portion was due to prescription opioid use.

Reformulary Group (RG) holds a large dataset comprising prescription claims data for claimants of public and private drug plans from across Canada. We performed an analysis to provide governments, payers, healthcare professionals and the Canadian public with insight on the use of prescription opioids in Canada. We analyzed datasets for public and public payers comprising prescription claims data for claimants from 2013 to 2017.

Approximately 1 in 5 (20%) claimants had received an opioid each year. The median morphine equivalent doses (MED) were relatively consistent from 2013 to 2017. The MED for chronic claimants was higher (35.63) than for acute claimants (32.63) and sub-chronic claimants (18.41). A significant number of chronic opioid claimants are receiving opioid doses significantly above the maximum dose recommended in the *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain* (Guideline).

Approximately one-half to two-thirds of all opioid prescriptions were for chronic opioid use. This was highest for public payers at 65.8% of all opioid claims. Chronic opioids accounted for 48.0% and 39.5% of all opioid prescriptions for private payers and Reformulary clients, respectively.

Claimants aged 25 to 44 years used the highest MED and the second highest group was the 45-to-64-year age group. Average MED was highest among public plan claimants, compared to private plan claimants and Reformulary claimants. This is not surprising, as many of these people with chronic pain have permanent disability from their underlying condition.

As the length of opioid therapy increases, so does the dose of opioids. This could be due to opioid-tolerance and potentially hyperalgesia. Hyperalgesia is a condition where increases in opioid dose lead to an increase in perceived pain. By having clearly set goals at the start of therapy, healthcare professionals can consider tapering and stopping patients using opioids if they are not reaching these goals rather than continually increasing opioid doses.

Between 11.2% and 19% of claimants using opioids at a dose below 50 mg MED increased their dose above this threshold each year. The number of people whose dose is increasing above this threshold is slowing down, but it is still significant.

When analyzing drugs taken at the same time (concurrent therapies), 7.7% to 16.1% of people using chronic opioids were also taking benzodiazepines. A small percentage of patients (0.2% to 0.7%) were using chronic opioids and opioid agonist therapy. Opioid agonist therapy are therapies such as methadone and buprenorphine/naloxone that are used to treat people with an opioid use disorder (addiction to opioid drugs). Further, 7% of all claimants were using two or more opioids chronically.

Conclusion

Opioids are still a commonly used therapy in Canadians. Most people are prescribed opioids for acute use, but a portion of patients will use these therapies chronically. As the length of therapy increases, the dose of opioids also increases. It is important that payers, governments and healthcare professionals look for solutions to reduce the number of patients on opioids and the chronic opioid dose. These solutions should include a partnership with patients to avoid prescribers cutting off opioid in patients. We hope that innovative solutions will be considered to address the Canadian opioid crisis.

Background

Canada and many countries around the world are experiencing an opioid crisis. Opioids have been linked to more than 8,000 deaths in Canada between January 2016 and March 2018. Most of these overdoses were accidental (unintentional).[2] Although overdose deaths are more common in males (77%) and between the ages 30 and 39 years (27%), there are overdose deaths in every part of the country and across all age groups.[2] The majority of these deaths involve illicit opioid use, but prescription opioids still play a role.

Prescription opioids play an important role in overdose and overdose-related deaths. Higher opioid doses are associated with a significant risk of non-fatal and fatal overdose.[4]

A recently published (2018) study evaluated the link between opioid prescriptions and opioid-related deaths in Ontario between January 1, 2013 and December 31, 2016.[5] There were 2,833 opioid-related deaths during the course of the study.[5] Approximately one-third of these people had an active opioid prescription on the date of death.[5] The authors concluded that to address the opioid crisis, government cannot solely focus on the illicit market, as both illicit and prescription opioids contribute to overdose related-deaths and opioid-related harms (e.g. hospitalizations and emergency room visits).

1 IN EVERY 550 CLAIMANTS AGED 15-64 YEARS COVERED BY A PUBLIC PLAN THAT STARTED ON OPIOID THERAPY IN ONTARIO DIED OF OPIOID-RELATED CAUSES A MEDIAN OF 2.6 YEARS FROM HIS/HER FIRST OPIOID PRESCRIPTION; THE PROPORTION WAS AS HIGH AS 1 IN 32 AMONG PATIENTS RECEIVING 200MG MORPHINE EQUIVALENT DOSE (MED) PER DAY OR HIGHER[3]

THE GLOBE AND MAIL REPORTED ON SEPTEMBER 19, 2018 THAT MORE THAN 11 CANADIANS ARE DYING EVERY DAY FROM OVERDOSES.

We, at Reformulary Group, are concerned about the potential role of prescription opioids on overdose and overdose-related deaths and opioid-related harms. We have access to public and private prescription datasets and used this data to analyze how Canadians are being prescribed opioids, and identify if there were significant differences between:

1. Public payers
2. Private payers
3. Reformulary Group clients

With the link between opioid dose and adverse outcomes, we assessed not only the number of people prescribed opioid prescriptions, but also the number of people using chronic opioid therapy and the relative dose. Dosing of opioids was approximated using the milligrams of morphine equivalents (MED) discussed in the *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain*. By using MED, it allows the comparison of multiple opioids and comparison of the relative doses of each of these opioids.

Through this analysis, we hope to work with partners to develop innovative strategies to address the impact of prescription opioids on the health and safety of all Canadians.

Analysis Summary

Reformulary Group (RG) has access to prescription claims data for private and public payers from across the country. The dataset used represents between 6 million and 7 million unique claimants. We also included Reformulary Group clients in the analysis; these are clients from multiple plan administrators that are subscribed to the Reformulary®.

For the analysis, opioid medications commonly used for chronic use were analyzed. Opioids such as injectable opioids and meperidine commonly used for acute conditions were not included in the analysis. Public, private and RG datasets were analyzed separately to compare the similarities and differences in the results.

Key Definitions Utilized for this Report

Morphine Equivalent Dosage

Morphine Equivalent Dose (MED) was utilized throughout this report. This converts the dosage of all opioids to an equivalent dose of morphine. The MED dose conversions listed in the *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain* were utilized **(Table 1)**.[4] The 50 mg MED and 90 mg MED were utilized as these were recommended thresholds in the guideline.[4]

Table 1 – Morphine Equivalent per Dose[4]

Morphine 50 mg		**Morphine 90 mg**	
Codeine	334 mg/day	Codeine	600 mg/day
Hydromorphone	10 mg/day	Hydromorphone	18 mg/day
Morphine	50 mg/day	Morphine	90 mg/day
Oxycodone	33 mg/day	Oxycodone	60 mg/day
Tapentadol	160 mg/day	Tapentadol	300 mg/day
Tramadol	300 mg/day	Tramadol	540 mg/day

Fentanyl 25 mcg/h transdermal patch = 60-134 mg MED

Claimant Classification

Claimants were classified into three separate groups based on the length of time on opioid therapy. The three groups include:

1. **Chronic claimant** - a claimant who took 1 or more opioids continuously for at least 90 days in that year
2. **Acute claimant** - a claimant in a given year classified as a claimant who took 1 or more opioids continuously for less than 30 days, irrespective of the number of such continuous periods less than 30 days in that year
3. **Sub-chronic claimant** - a claimant in a given year is classified as a claimant who took 1 or more opioids continuously for more than 30 days, but less than 90 days, irrespective of the number of such continuous periods less than 90 days in that year

Limitations

There were several limitations to this analysis that could impact the overall results **(Table 2)**.

Table 2 – Potential Limitations to the Analysis

- Data sources utilized:
  - Public payer data consists of populations claiming to the provincial Pharmacare programs in Ontario (ON), Nova Scotia (NS) and Prince Edward Island (PEI)
  - Private payer data consists of sample of populations across Canada covered by employers through private insurers
  - Reformulary Group (RG) data consists of employer plans powered by Reformulary, an evidence-based formulary
- Public payer data for NS for 2017 is limited to the first 6 months. It is assumed that all proportional metrics obtained from the first 6 months of data will reflect the full year
- No age reference is available in public payer data for PEI. For the purpose of this analysis, all patients have been assumed to be in the 65+ age bracket
- Cancer and palliative care patients using opioids for pain management have **not** been excluded from the analysis
- No reference has been made to demographic variations (except age) or socio-economic factors in the analysis when comparing the three different datasets

Opioids in Chronic Non-Cancer Pain

The *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain* (CNCP) published recommendations for the management of chronic non-cancer pain with opioid therapy **(Table 3)**.

The recommendations include the dosage of opioids for chronic pain. In previous guidelines, the dose of 200 mg MED was considered the watchful dose for reassessing further increases, the daily dosage and overall risk.[6] With the 2017 update, the Guideline provided a weak recommendation that people starting an opioid should not exceed a dose of 50 mg MED per day and a strong recommendation to not exceed 90 mg MED per day.[4] A weak recommendation for 50 mg MED was given as the opioid risk increases above this threshold and most people starting on opioids should not exceed this threshold. The strong recommendation of 90 mg MED was given as the risk of opioids above this threshold increases significantly and all patients should ideally be kept below this threshold.

The Guideline also provided a weak recommendation that when a person is using 90 mg MED or more per day, the Guidelines suggest tapering opioids to the lowest effective dose, potentially including discontinuation, rather than making no change in opioid therapy.[4]

WITH OPIOID DOSING HAVING A LARGE IMPACT ON NEGATIVE OUTCOMES AND RISK, **REFORMULARY GROUP** ANALYZED THE DATASETS TO CLASSIFY CLAIMANTS BASED ON OPIOID DOSAGE. THE GOAL WAS TO IDENTIFY POTENTIAL FACTORS ASSOCIATED WITH ELEVATED DOSES (E.G. PAYER, AGE OF PATIENT).

CONCOMITANT USE WITH BENZODIAZEPINES, METHADONE AND OPIOID-AGONISTS SUCH AS BUPRENORPHINE-NALOXONE, AND MULTIPLE OPIOIDS WAS ALSO ASSESSED.

Table 3 – Key Dosing Recommendations for Opioids in Canadian Guideline[4]

- For patients with chronic noncancer pain who are **beginning** long-term opioid therapy:
  - The guidelines recommend restricting the prescribed dose to less 90 mg morphine equivalents daily rather than no upper limit or a higher limit on dosing
  - For patients with chronic noncancer pain who are beginning opioid therapy, the guidelines suggest restricting the prescribed dose to less than 50 mg morphine equivalents daily

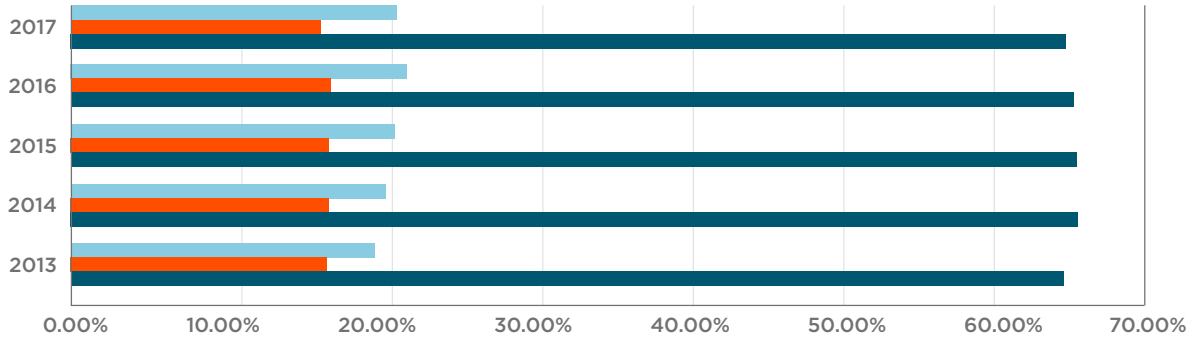
Results

Number and Type of Claimants Prescribed Opioids

Claimants taking at least one opioid as a proportion of ALL claimants observed in the datasets decreased from 18.8% in 2013 to 16.7% in 2017; the reduction is most notable among public plan claimants where the proportion reduced from 22.2% in 2013 to 19.6% in 2017 – a drop of 2.6%.

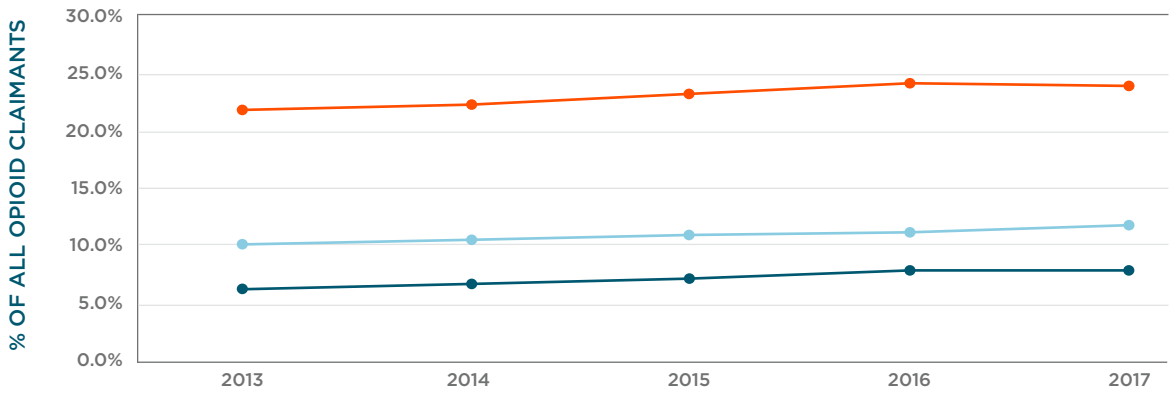
The number of acute, sub-chronic, and chronic groups were assessed **(Figure 1)**. **Figure 2** reviews the difference in acute, sub-chronic, and chronic claimants in the public, private and RG datasets. The public payer dataset had a significantly higher percentage of chronic users than the private and RG datasets.

Figure 1 - Acute, Sub-chronic and Chronic Opioid Use



	2013	2014	2015	2016	2017
Chronic	18.80%	19.70%	20.20%	21.40%	20.50%
Sub-chronic	16.50%	16.80%	16.80%	16.90%	15.80%
Acute	64.60%	65.90%	65.80%	65.30%	64.80%

Figure 2 - Distribution of Chronic Claimants, by Dataset

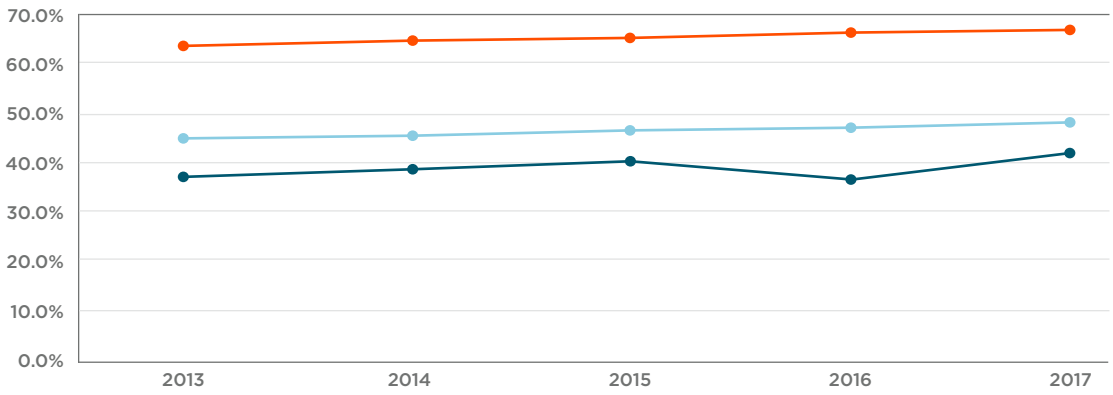


	2013	2014	2015	2016	2017
Private	10.0%	10.2%	10.6%	10.8%	11.3%
Public	22.1%	22.8%	23.2%	24.4%	24.2%
RG	6.1%	6.5%	6.8%	7.6%	7.6%

Chronic Opioid Users Accounted for Many Opioid Prescriptions

Although approximately 65% of all claimants had opioid prescriptions for acute use, a large percentage of opioid prescriptions were for chronic claimants. More specifically, 65.8% of all opioid prescription claims for public payers were for chronic opioids. Chronic opioid use accounted for an average of 48.0% and 39.5% of all opioid claims, for private payers and Reformulary clients, respectively. The percentage of chronic opioid claims has increased from 2013 to 2017 **(Figure 3)**.

Figure 3 - Percentage of Opioid Claims For Chronic Use



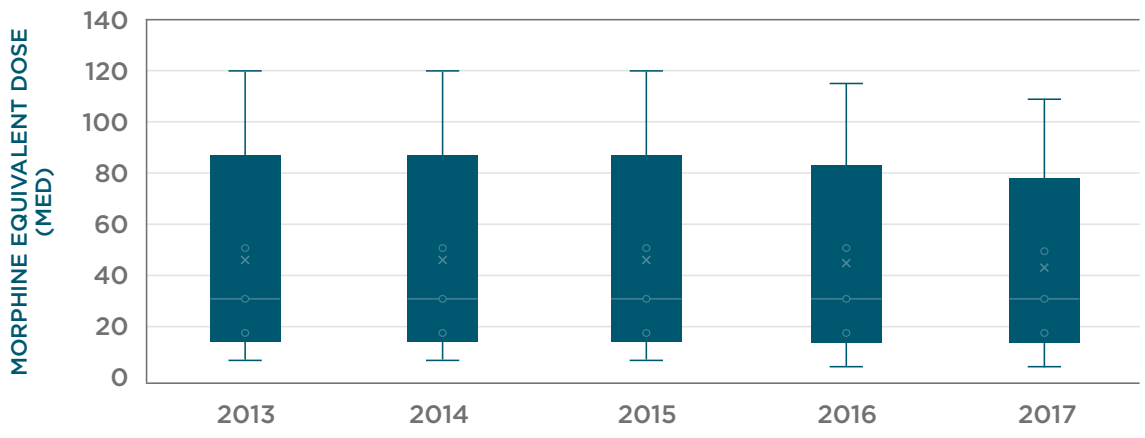
	2013	2014	2015	2016	2017
Private	46.6%	47.0%	47.9%	48.6%	49.7%
Public	63.4%	64.8%	65.8%	67.0%	67.9%
RG	38.3%	39.6%	40.4%	37.8%	41.4%

Median Morphine Equivalent Dose (MED) Dispensed

The median daily MED dispensed across all datasets is relatively consistent at approximately 30 mg MED from 2013 to 2017. The interquartile range was also relatively consistent at approximately 32 mg MED. **(Figure 4)**. Interquartile range (the boxes in Figure 4) demonstrate where the middle 50% of MED; in other words, the difference in median MED between the third and first quartiles.

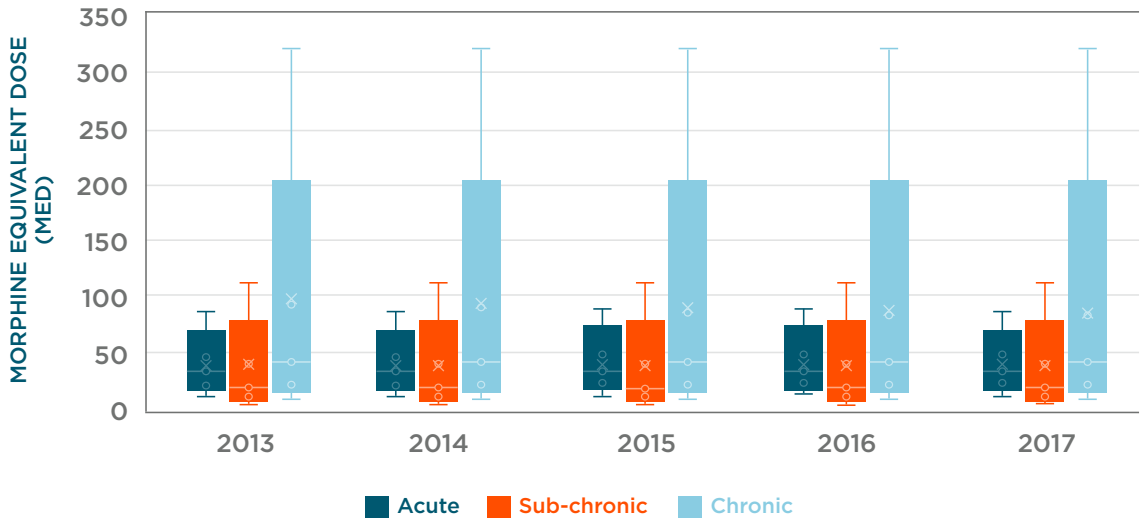
The mean (average) daily MED dispensed across all datasets is also down from 60.35 mg MED in 2013 to 49.54 mg MED in 2017.

Figure 4 - MED for All Claimants



The median MED for chronic users was significantly higher than for acute or sub-chronic claimants **(Figure 5)**. The median MED for all acute, sub-chronic and chronic users were relatively consistent from 2013 to 2017. The MED dose in the top 25% of claims decreased significantly from 2013 to 2017 but remains very high.

Figure 5 - Median Opioid MED for Acute, Sub-Chronic and Chronic Clamaints



Relationship Among Age, Payer, and Morphine Equivalent Dose

There were differences in the MED of chronic opioid claimants depending on claimant age and payer type. Although average MED has decreased, many of these groups are still using higher opioid doses **(Figure 6 & Table 4)**.

Figure 6 – Average MED Based on Age Groups

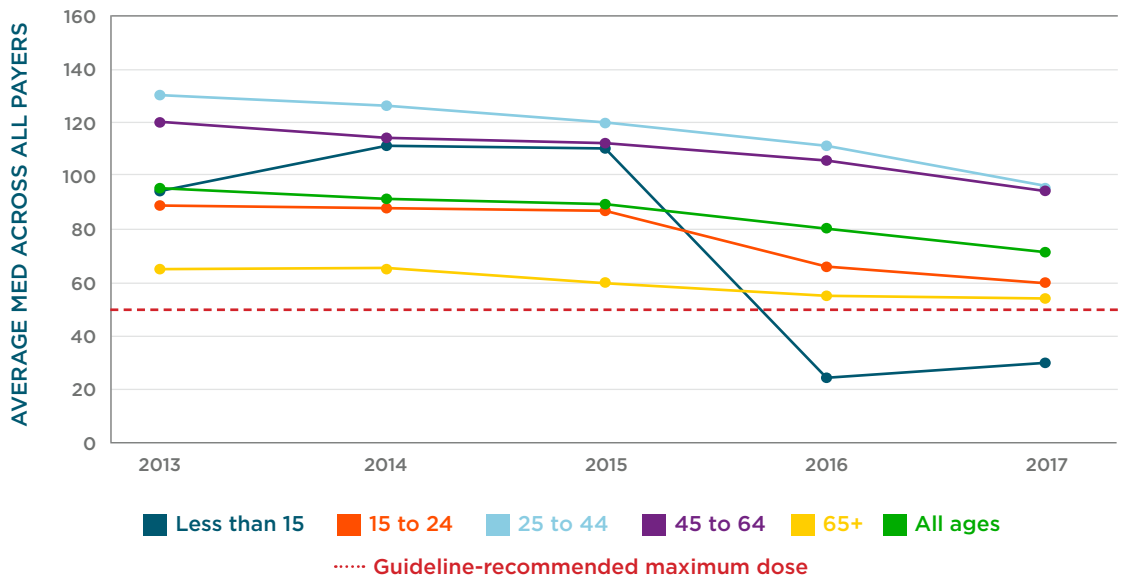


Table 4 – Average MED Based on Age and Payer Type						
Age and Payer	**2013**	**2014**	**2015**	**2016**	**2017**	**Average Daily MED**
Less than 15	93.58	111.59	110.10	23.52	29.94	75.95
Private	152.34	34.68	76.39	11.10	14.98	65.22
Public	80.88	128.76	122.48	36.99	34.31	85.38
Reformulary Group			1.38	1.20	2.24	1.39
15 to 24	88.70	85.37	85.01	66.19	60.22	78.29
Private	70.44	69.91	83.46	58.83	64.73	69.08
Public	93.89	90.44	86.81	69.06	59.42	81.71
Reformulary Group	64.44	35.13	43.79	45.73	22.44	44.32
25 to 44	133.92	125.92	120.40	109.48	94.93	117.51
Private	109.88	105.15	99.52	86.78	80.61	96.40
Public	140.77	132.39	126.82	116.81	99.91	124.16
Reformulary Group	81.74	75.56	86.39	71.97	72.35	77.83
45 to 64	120.12	114.43	112.29	105.80	93.72	109.10
Private	101.63	97.18	94.54	90.54	82.41	92.94
Public	125.78	119.91	117.82	110.54	97.75	114.29
Reformulary Group	123.20	93.30	88.69	88.48	82.55	90.27
65+	63.67	62.26	60.71	56.85	53.39	59.18
Private	69.12	68.94	65.47	64.84	61.48	65.41
Public	63.46	61.98	60.49	56.50	52.89	58.90
Reformulary Group	64.47	109.94	74.91	57.95	59.32	63.30
Grand Total	93.85	89.63	86.98	80.71	72.78	84.58

Impact of Length of Therapy on MED

A durational analysis was performed to better understand the evolution of average daily MED as the number of days on opioid therapy increased **(Figure 7 & Table 5)**. The analysis reveals that while the average daily MED increases as the total length of therapy increases, the most significant increase in average daily MED occurs when therapy exceeds 360 days.

Figure 7 – Length of Therapy and MED

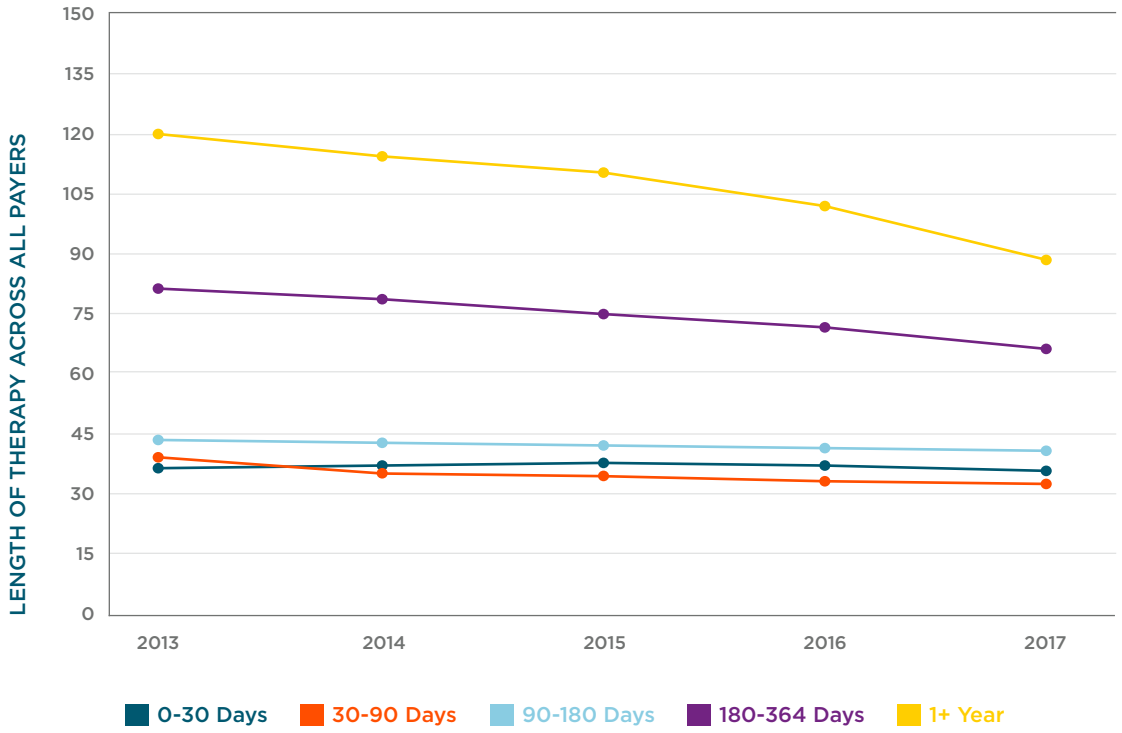


Table 5 – Length of Therapy and MED, Based on Payer Type					
Length of Therapy	**2013**	**2014**	**2015**	**2016**	**2017**
All Payers					
0-30 Days	35.31	35.49	35.78	35.40	34.72
30-90 Days	36.51	34.63	34.03	33.01	32.02
90-180 Days	44.14	42.71	41.27	40.95	39.25
180-364 Days	80.77	77.31	75.13	68.81	64.24
1+ Year	120.73	113.93	109.47	103.68	89.35
Private					
0-30 Days	36.94	37.13	37.59	36.91	36.05
30-90 Days	35.58	36.40	36.95	35.31	33.37
90-180 Days	51.69	51.37	48.24	46.39	44.70
180-364 Days	85.11	84.03	80.64	75.73	71.54
1+ Year	126.16	117.39	112.42	104.86	92.03
Public					
0-30 Days	34.50	34.64	34.95	34.63	33.97
30-90 Days	36.79	34.11	33.25	32.32	31.65
90-180 Days	42.56	40.68	39.68	39.61	37.84
180-364 Days	80.09	76.22	74.23	67.69	62.82
1+ Year	119.84	113.43	109.08	103.56	88.94
Reformulary Group					
0-30 Days	34.92	34.08	33.51	35.33	34.84
30-90 Days	31.95	31.50	27.51	38.17	27.54
90-180 Days	42.11	53.32	45.87	60.68	44.04
180-364 Days	87.26	77.02	79.68	77.67	71.67
1+ Year	183.08	118.98	106.66	86.56	90.01

Increasing from < 50 mg MED to Higher MED

A further analysis was performed to understand the progression in the average daily MED for claimants on opioids **(Figure 8 & Table 6)**. The method employed was to select all opioid claimants who had one or more claims in the first six months of the calendar year, as well as one or more claims in the second six months of the calendar year. In each period, the average daily MED was determined by looking at the duration of greatest length in the six-month period. The average daily MED was then classified into three groups, namely, < 50 MED, between 50 and 90 MED, and greater than 90 MED.

Figure 8 – Percentage of Claimants with Increasing MED

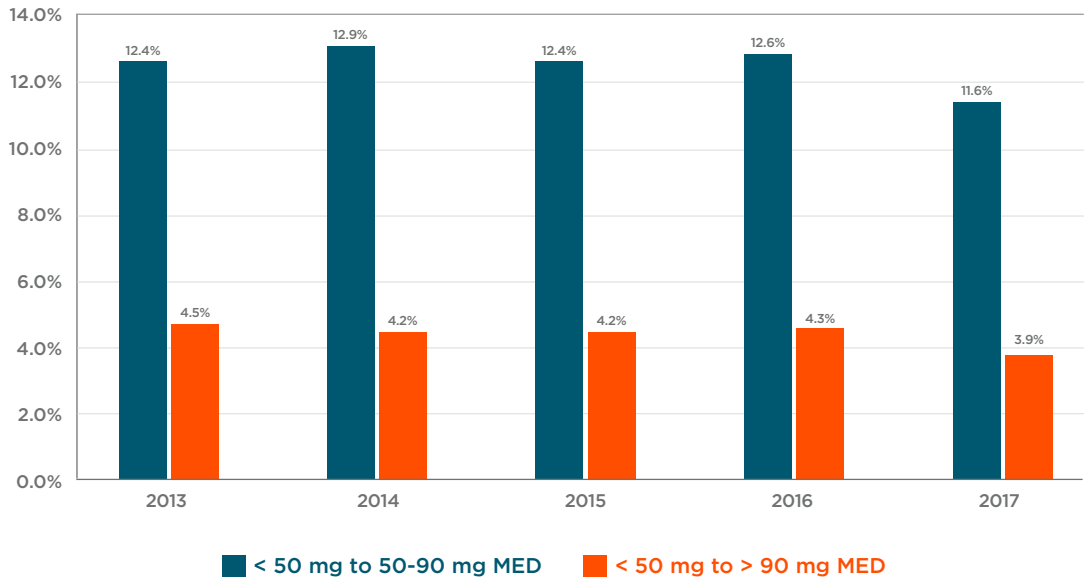


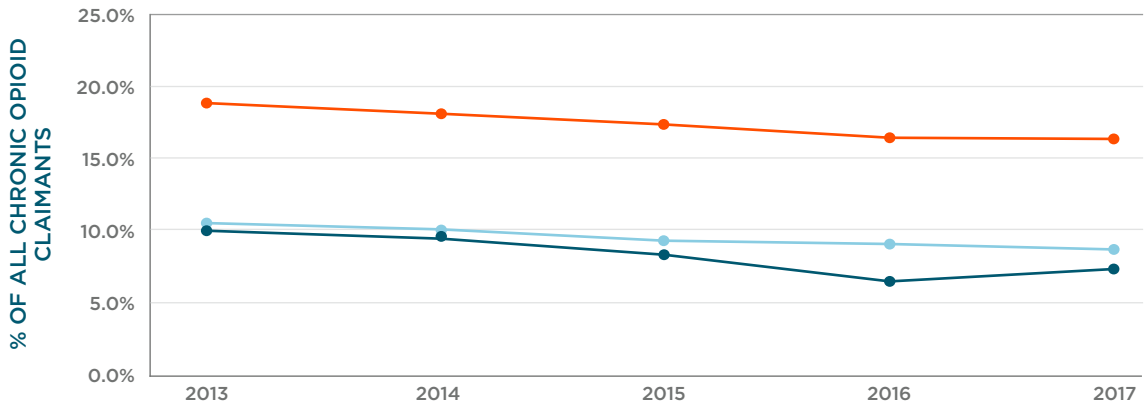
Table 6 – Percentage of Claimants with Increasing MED, Based on Payer Type						
Start Dose	**2nd Dose**	**2013**	**2014**	**2015**	**2016**	**2017**
All Payers						
< 50	50-90	12.4%	12.9%	12.4%	12.6%	11.6%
< 50	> 90	4.5%	4.2%	4.2%	4.3%	3.9%
Private						
< 50	50-90	13.7%	13.7%	13.1%	13.1%	12.4%
< 50	> 90	5.0%	4.9%	4.6%	4.4%	4.0%
Public						
< 50	50-90	9.8%	9.8%	9.7%	9.2%	8.3%
< 50	> 90	3.8%	3.7%	3.6%	3.6%	2.9%
Reformulary Group						
< 50	50-90	13.8%	15.4%	14.4%	15.4%	14.2%
< 50	> 90	4.7%	4.0%	4.4%	4.9%	4.8%

Concomitant Benzodiazepine and Opioid Use

The *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain* states that based on expert opinion, opioids and benzodiazepines should very rarely be prescribed together.[4] This is due to the increased risk of adverse effects, such as cognitive effects, falls, motor vehicle accidents and drug-related death.[4]

Concomitant use of opioids with benzodiazepines continues to be observed in all three datasets **(Figure 9)**, with concomitant use being the highest within public plan dataset, at about 7% of all opioid claimants.

Figure 9 - Chronic Concomitant Claimants of Opioids and Benzodiazepines



	2013	2014	2015	2016	2017
Private	10.8%	10.0%	9.6%	9.2%	8.9%
Public	19.4%	18.5%	17.6%	16.8%	16.1%
RG	10.2%	9.4%	8.5%	6.3%	7.7%

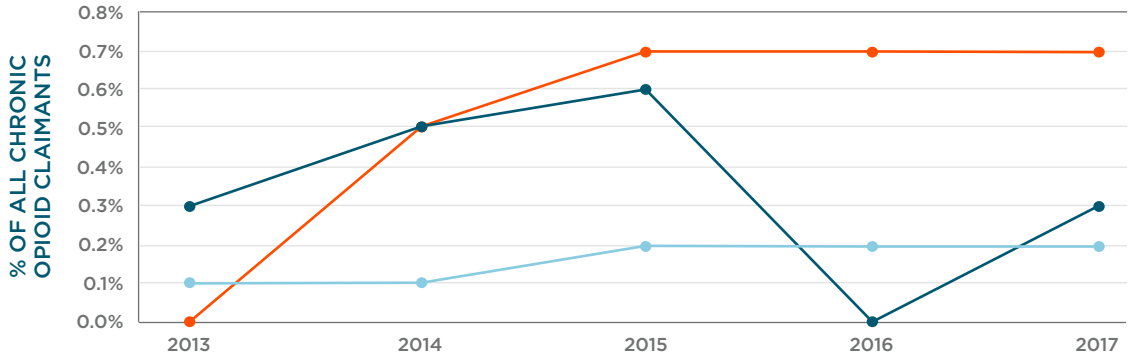
Concomitant Opioid and Opioid Agonist Therapy

The medications methadone and naloxone/buprenorphine are commonly used for the treatment on people with an opioid use disorder – in other words, an addiction. For these patients, opioid agonist therapy (OAT) replaces illicit and prescription opioids to help patients with this disorder. Rarely, if ever, are these treatments used with chronic opioid therapy as they are designed to help patients with chronic opioid use disorder (addiction) to stop taking opioids.

As a proportion of all opioid claimants, concomitant use of other prescription opioids with OAT is relatively small within all three datasets **(Figure 10)**. However, the absolute number of claimants is rising in both public and private payer datasets.

The total number of claimants using opioids and OAT has grown four-fold from 197 in 2013 to 830 in 2017 within the public payer dataset, while it has grown from 37 claimants in 2013 to 89 claimants in 2017 in the private payer dataset. This change could be due to the large increase in the number of people using OAT during this time and the potential overlap when initiating therapy. OAT should not be used with opioids as these are therapies designed to stop opioid use.

Figure 10 - Claimants Using Chronic Prescription Opioids and OAT Concurrently



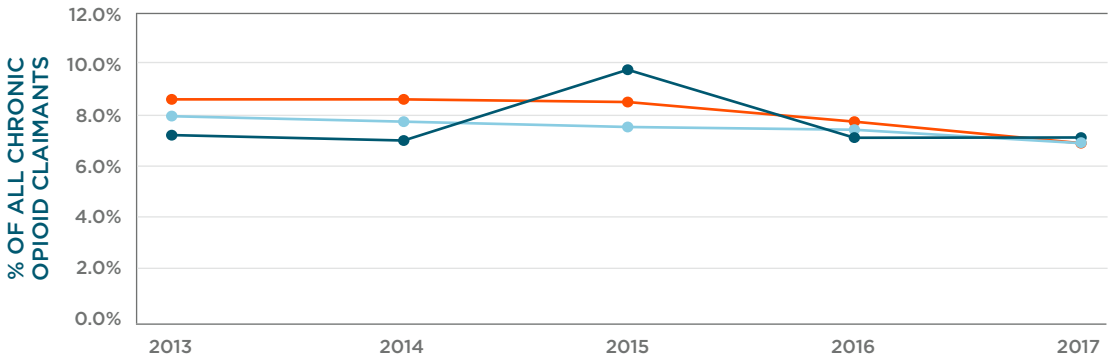
	2013	2014	2015	2016	2017
Private	0.1%	0.1%	0.2%	0.2%	0.2%
Public	0.0%	0.5%	0.7%	0.7%	0.7%
RG	0.3%	0.5%	0.6%	0.0%	0.3%

Chronic Use of Multiple Opioids

Chronic use of multiple opioids can occur when a patient is prescribed a long-acting opioid for baseline pain and short-acting opioids for breakthrough pain. In other cases, this could indicate people who are experiencing opioid use disorder.

Chronic use of multiple opioids at the same time is seen in all three datasets **(Figure 11)**. As a proportion of all chronic claimants taking opioids, the proportion of chronic claimants taking multiple opioids at the same time in 2017 is 7.1% for the private payer and public payer datasets and 7.3% for the Reformulary Group dataset.

Figure 11 - Chronic Opioid Claimants on Multiple Opioids



	2013	2014	2015	2016	2017
Private	8.0%	7.8%	7.7%	7.5%	7.1%
Public	8.4%	8.4%	8.3%	7.7%	7.1%
RG	7.2%	6.9%	9.7%	7.3%	7.3%

Discussion

Canada is experiencing an opioid crisis. This analysis provides some insight into how opioids are used in the public, private, and Reformulary Group claimant datasets. Approximately 16-19% of claimants have received an opioid in any year in the analysis. Approximately two-thirds of claimants are receiving them for less than 30 days, a relatively consistent number of recipients (approximately 16.5% of claimants) receiving them for 30 to 90 days, and approximately 20.1% of claimants using opioids for more than 90 days.

Opioid-related harm (e.g. side effects, overdose, overdose-related deaths) are linked to the dosing of the opioids.[4] By using morphine equivalent dosing (MED), our analysis was able to compare the relative dosing of the most commonly used opioids. There were some positive signs with MED reduction amongst payers in the dataset. The median daily MED in the public, private and Reformulary Group datasets, were relatively consistent in each year in the dataset. There was a decrease in the MED dose in the top 25% of doses from 2013 to 2017. A significant number of chronic opioid claimants are taking higher than the Guideline-recommended 90 mg MED daily.

There were differences in the dosing of opioids between age groups and time on opioid therapy. The highest MED is in the 25-to-44 year age group and second highest was in the 45-to-64 year age group. In both age groups, the average MED was above the 90 mg MED limit recommended in the Canadian Guideline. This high MED in these age groups is a potential concern that could be the target for strategies to reduce opioid use. Of note, public payers have the highest MED among claimant types versus the lowest among Reformulary Group claimants. This finding is not surprising, as some of the public plan claimants may be permanently disabled from their underlying condition.

In the analysis, the length of therapy had an impact on opioid dose. As opioid therapy exceeded six months, but especially when opioid therapy exceeded one year, the average MED increased dramatically across all datasets. This could indicate tolerance to opioid therapy (i.e. requiring same dose to provide similar pain relief), worsening of the underlying condition, and potentially hyperalgesia. A possible way to address this is for the clinician and patient to set goals for therapy, and if these goals are not met with a trial of opioids, then consider tapering slowly rather than continually increasing the dose.

Our analysis found that between 11.2% and 19% of claimants had their MED dose increased from below 50 mg MED to >50 mg MED. Although the percentage of patients with increasing dose is decreasing, there is still a significant number of patients seeing an increase above the 50 mg MED and 90 mg MED levels mentioned in the Guideline.

We also uncovered problematic combinations during the analysis. Although the combination of benzodiazepines and opioids is strongly discouraged, a significant number of claimants (7.7% to 16.1%) were receiving both therapies. It is encouraging that only a very small percentage across all datasets (0.2% to 0.7%) were using opioids with opioid agonist agents. The use of two or more chronic opioids was seen in approximately 7% of claimants in each of the datasets.

Conclusion

Opioids are still a commonly used therapy among Canadians. Most people are prescribed acute opioids, but a portion of patients will use these therapies chronically. As the length of therapy increases, the dose of opioids also increases. It is important that payers, governments and healthcare professionals look for solutions to reduce the number of patients on opioids and decrease the chronic opioid dose. Healthcare is a team sport: these solutions should be centered around a partnership with the patient. We look forward to being part of some innovative solutions to help address the Canadian opioid crisis.

References

1. Health Canada, Canadian Institute for Health Information. *Opioid-Related Harms in Canada*. Ottawa: Government of Canada; 2018. http://publications.gc.ca/collections/collection_2018/sc-hc/HP35-110-2018-eng.pdf. Accessed November 30, 2018.

2. Health Canada. Apparent opioid-related deaths. aem. https://www.canada.ca/en/health-canada/services/substance-use/problematic-prescription-drug-use/opioids/apparent-opioid-related-deaths.html. Published September 14, 2017. Accessed September 18, 2018.

3. Kaplovitch E, Gomes T, Camacho X, Dhalla IA, Mamdani MM, Juurlink DN. Sex Differences in Dose Escalation and Overdose Death during Chronic Opioid Therapy: A Population-Based Cohort Study. *PLOS ONE*. 2015;10(8):e0134550. doi:10.1371/journal.pone.0134550

4. Busse J, ed. The *2017 Canadian Guideline for Opioids for Chronic Non-Cancer Pain*.; 2017. http://nationalpaincentre.mcmaster.ca/documents/Opioid%20GL%20for%20CMAJ_01may2017.pdf. Accessed January 8, 2018.

5. Gomes T, Khuu W, Martins D, et al. Contributions of prescribed and non-prescribed opioids to opioid related deaths: population-based cohort study in Ontario, Canada. *BMJ*. 2018;362:k3207. doi:10.1136/bmj.k3207

6. National Opioid Use Guideline Group. Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain. http://nationalpaincentre.mcmaster.ca/opioid/. Published 2010. Accessed January 8, 2018.

reformulary® GROUP

reformulary.com