

TPP 20 ALBERTA 21



**TRACKED PRESCRIPTION
PROGRAM OPIOID AND
BENZODIAZEPINE ATLAS**



Alberta’s Tracked Prescription Drug Monitoring Program, TPP Alberta, uses data to optimize safe patient care. Since it was established in 1986, TPP Alberta has been monitoring the use of certain medications prone to misuse.

The mandate of TPP Alberta is to:

- Monitor prescribing, dispensing and utilization practices regarding TPP targeted medications.
- Provide timely and relevant information on TPP targeted drugs to prescribers, dispensers, consumers, regulatory bodies, Member Organizations and stakeholders.
- Work with Member Organizations and stakeholders to enable system level change for appropriate use and stewardship of monitored medications.
- Ensure efficient and effective functioning of TPP Alberta.

Funded primarily by the province of Alberta, TPP Alberta represents a partnership with program administration by the College of Physicians & Surgeons of Alberta (CPSA). The list of partners includes:

- Alberta College of Pharmacy
- College of Dental Surgeons of Alberta
- Alberta Health
- Alberta Health Services
- Alberta Medical Association
- Alberta Pharmacists’ Association
- Alberta Veterinary Medical Association
- College of Registered Nurses of Alberta
- College of Physicians & Surgeons of Alberta
- College of Podiatric Physicians of Alberta
- Nurse Practitioner Association of Alberta

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Executive Summary

In 2021, Alberta saw a continuing decline in overall consumption of opioids, benzodiazepines, and Z-drugs (BDZ/Zs). The number of patients and dosage were both reduced from the previous years for both opioids and BDZ/Zs, although there was a slight increase in the number of BDZ/Z patients over age 65. By 2021 the monthly fluctuations in consumption returned to pre-COVID-19 patterns since the anomalies observed in 2020.

The Socio-Economic Deprivation Index for each geographic area continued to show an association between higher deprivation index and highest consumption of opioids and BDZ/Zs. Areas with lower deprivation scores were also associated with lower levels of consumption.

Rural/Urban status was also consistent with observed associations in the 2020 Atlas. The Suburban category showed lower consumption of opioids and BDZ/Zs than the other three categories.

Opioid and BDZ/Z consumption among patients 65 years of age and older showed no consistent geographic patterns compared to the entire population where strong, consistent patterns are observed over time.

A preliminary analysis of opioid agonist treatment (OAT) products reveals widespread use with many patients receiving care via virtual services as evidenced by large geographical distances between prescriber and pharmacy addresses.

The data presented in the Atlas was analyzed against Equity Stratifiers (Dimensions of Inequity) which examined parameters related to Indigenous populations, recent immigrants, and deprivation index.

- The percentage of the population with Indigenous heritage was weakly correlated with opioid patients but not with other Atlas rate data, and their consumption of prescription opioids was not significantly higher than the overall population. This suggests the use of non-prescription substances and lower-than-needed support for addiction treatment, as evidenced in the tragic outcomes observed in this population.
- Areas with high percentages of recent immigrants show weak correlations with opioid and BDZ/Z patients, but not to any of the consumption level variables. This suggests that this population may be more likely to be patients, but their risk of overconsumption is similar to the overall population.
- There is a correlation between the Deprivation Index and the Atlas rate measures used. The percentage of the population receiving government financial support has a weak correlation with the Atlas rates variables used in this analysis.

- All analyses were done at an aggregated level, and therefore there are suggested associations but no way to confirm these results.

New additions to the 2021 Atlas are:

- a preliminary analysis of prescriber location versus dispense location;
- an expanded breakdown of geographic patterns;
- an analysis using equity stratifiers;
- a new section for Highlights.

Highlights

Opioids

10.3% of the population (457,893 patients) received one or more opioid prescriptions in 2021 compared to 15.4% in 2016 —a drop of almost one third.

In 2016, 3.7% of the population received prescriptions for 90 Oral Milligram Equivalent (OME) per day or more; this dropped to 2.3% of the population in 2021.

Opioid Top Five Ingredients

The top five prescribed opioid ingredients changed from 2016-2021:

- Codeine remained the most prescribed ingredient from 2016 though 2021; the number of prescriptions dropped by just over half in 2021 compared to 2016.
- Oxycodone, the second most prescribed ingredient in 2016, dropped to third in 2021; prescriptions in 2021 were only 62% of those in 2016.
- Tramadol, the third most common ingredient in 2016, rose to second in 2021; there was a slight increase in prescriptions over the six years.
- Hydromorphone was the fourth most common ingredient in 2016 through 2021; prescriptions increased slightly over the six years.
- Morphine, the fifth most common ingredient in 2016, dropped to seventh in 2021; prescriptions increased slightly over the six years.

Prescriptions for opioid use disorder treatment treatment medications (Buprenorphine and Methadone) have increased over the six year time period.

- Buprenorphine, the seventh most common ingredient in 2016, rose to fifth in 2021 (2.7 times higher in 2021).
- Methadone was the sixth most common ingredient in 2016 and 2021, however the number of prescriptions was 1.8 times higher in 2021.

BDZ/Z-drugs

7.4% of the population (327,376 patients) received one or more BDZ/Z prescription in 2021 compared to 9.1% in 2016 — **a drop of almost one fifth.**

There was a small increase in prescriptions and patients consuming two Defined Daily Doses (DDD) per day or more in 2020 relative to 2019; in 2021 both were lower than 2019.

In 2016, 3.5% of the population received prescriptions for two DDDs or more; this dropped to two percent of the population in 2021. As with opioids, higher dosages may mean increased patient risk particularly if the BDZ/Z was used for only a portion of the year. For example, patients who consumed two DDDs (as calculated over a year) actually consumed 4 DDDs during the six month period of use.

- Almost one-third of BDZ/Z patients are 65 years of age or older even though they make up less than 15% of the Alberta population.
- BDZ/Z prescriptions are not recommended for elderly patients, yet more than 16% of Albertans aged 65 or more received these drugs in 2021.
- In the elderly population, 103,977 patients received one or more BDZ/Z prescriptions, i.e., a rate 25% higher than for the whole population.

BDZ/Z Top Five Ingredients

The top four BDZ/Z ingredients (zopiclone, lorazepam, clonazepam and temazepam) remained consistent from 2016 through 2021, and the number of prescriptions were lower for all four in 2021.

- Diazepam was the fifth most common in 2016 and dropped to sixth place in 2021, with fewer prescriptions over time.
- Zolpidem was the fifth most common ingredient in 2021; the number of prescriptions increased slightly since 2016.

Combinations/Concurrent Use

2.1% of the population (90,904 patients) received one or more BDZ/Z prescriptions and one or more opioid prescriptions in the same quarter in 2021 compared to 3.2% in 2016 — **a drop of almost one third.**

Backgrounds and Methods

About the Atlas

The purpose of the Tracked Prescription Program (TPP) Alberta prescription drug monitoring program Atlas is to provide an overview of provincial TPP Alberta medication utilization for the year 2021. As with the 2020 Atlas, provincial utilization will be summarized for two classes of medications: opioids (including codeine-containing and tramadol-containing medications); and BDZ/Zs which include “Z-drugs” such as zopiclone, eszopiclone, and zolpidem. Tramadol was added to the TPP program in 2018 as a monitored drug. The source of information on medication utilization continues to be community pharmacy dispenses extracted from the Pharmaceutical Information Network (PIN), a part of Alberta’s electronic health record (Netcare). Data used in the Atlas analyses were extracted on May 13, 2022.

TPP Alberta Data Source

PIN data were used for the analyses. On January 1, 2013, TPP Alberta officially switched from manual entry of data from hard-copy TPP prescriptions to PIN as the primary data source for prescription monitoring. PIN data consist of dispense records from community pharmacies in Alberta. The primary source for methadone information switched from manual entry to PIN data in August 2015, when it was found that virtually all methadone, which was previously prescribed and dispensed as a compound, switched to commercially available products with Drug Identification Numbers (DINs) captured in PIN. Ongoing gaps within PIN data include dispensing information from inpatient hospital pharmacies and affiliated facilities such as long-term care facilities.

All compounded opioid medications are included in these analyses. Compounded opioid medications and prescriptions for ‘office use’ are not reliably captured in PIN, so manual data entry continues.

All prescriber types authorized to prescribe controlled drugs in Alberta were included in the analyses. In 2021, physicians prescribed 85.2% of all opioid dispenses and 93% of all BDZ/Z dispenses. PIN data do not discriminate between medications actually dispensed from those awaiting release to the patient. As pharmacy records may be modified or reversed before the actual dispense, PIN data are dynamic. In an effort to capture actual dispensing as closely as possible, data for this

2021 Atlas were extracted from PIN on May 13, 2022, by which time most modifications and reversals would have occurred.

Veterinarian prescriptions were not included in overall analyses but are shown for the two analytic drug classes in a separate section.

The data source for veterinarian prescribing is manually entered data available through the TPP Alberta program as animal patients are not captured in PIN.

Dosage information is never available for veterinarian prescriptions because there is no mechanism in place to uniquely identify animal patients.

Pharmacy Local Aggregated Geography

Pharmacy Local Aggregated Geographies (PhLAGs) merge local geographies with neighbouring geographies where their residents are dispensed medications, eliminating previous issues with utilization rates in local geographies being artificially low or high. In this Atlas, drug utilization rates count patients in the numerator in each PhLAG where they received prescription dispenses.

The merging of geographies has primarily occurred in smaller cities such as Red Deer, Lethbridge, Medicine Hat, Grande Prairie, Fort McMurray, Spruce Grove, etc. The total number of geographic units has been reduced from 132 local geographies to 106 pharmacy local aggregated geographies. The methods used to develop PhLAGs are consistent with those used to develop other Alberta geographic aggregations used in the health system, like subzones. Rural PhLAG names include various municipality types, such as County, Planning and Special Area, and Municipal District.

Analytic Drug Class

Analyses of medication utilization were carried out by analytic drug classes, based on the main ingredient of interest within each drug. In the case where a drug had two ingredients of interest, one was chosen as the main ingredient. The two analytic drug classes included in the Atlas are opioids and BDZ/Zs. Opioids consist of all opioids and some non-opioid drugs (with a potential for harm or diversion currently requiring a secure prescription). Consistent with the 2016-2020 Atlases, codeine-containing medications which were dispensed pursuant to a prescription or available over the counter (8 mg codeine per solid dosage form and 20 mg/30 ml for liquid formulations) were included in the opioid analytic class. BDZ/Zs consist of all benzodiazepines and Z-drugs currently monitored by

TPP Alberta. Appendix A shows 2021 prescription details for opioids by main ingredient and route of administration. Appendix B shows 2021 prescription details for BDZ/Zs by main ingredient and route of administration. Appendix C shows rates for all measures for both analytic classes by geographic areas.

Atlas Measures

TPP utilization is presented in this Atlas using population counts and rates. Age and sex standardized rates were calculated using 2021 Alberta PhLAG population estimates. Patient age was calculated at July 1, 2021.

Opioids

For the opioid analytic class, oral morphine equivalents (OME) were used as the standard measure of dose. Drug OME values were obtained primarily from the Centers for Disease Control¹, the previous Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain² and the Compendium of Pharmaceuticals and Specialties³. The OME for compounds within the opioid class cannot be calculated as dose and/or route are unknown. Therefore, compounds do not contribute towards a patient’s total dose of opioids. Compounds are captured in all other quantity measures.

The OME for a specific drug dispense was calculated as follows:

Dispense OME = strength x quantity x drug OME Factor

A patient’s total OME per day was calculated as follows:

Patient OME / day = the sum of the OME for all drug dispenses to the patient in the time period analyzed / days in the time period analyzed⁴

Population utilization of opioids was presented using the three measures below.

Opioid consumption = the sum of all patient OME / day in the time period analyzed / 1000 population

Opioid patients = the number of patients who received at least one opioid prescription in the time period analyzed / 1000 population

High dose opioid patients = the number of patients who received 90 OME / day or greater in the time period analyzed / 1000 population

The 2017 Canadian Guidelines for Opioids for Chronic Non-Cancer Pain set a watchful opioid dose of 50 OME/day⁵. This threshold is congruent with CDC Guidelines published in 2016⁶.

BDZ/Z

The defined daily dose (DDD), as defined by the World Health Organization (WHO), is the assumed average daily maintenance dose for a drug used for its main indication in adults⁷. Drug DDD values were obtained primarily from the WHO DDD/ATC Index⁸.

According to the WHO, “The DDD is a unit of measurement and does not necessarily correspond to the recommended or Prescribed Daily Dose (PDD). Therapeutic doses for individual patients and patient groups will often differ from the DDD as they are based on individual characteristics such as age, weight, ethnic differences, type and severity of disease and pharmacokinetic considerations.

Drug utilization data presented in DDDs give a rough estimate of consumption and not an exact picture of actual use. DDDs provide a fixed unit of measurement independent of price, currencies, package size and strength enabling the researcher to assess trends in drug utilization and to perform comparisons between population groups.”⁹

The BDZ/Z analytic class includes benzodiazepines (BDZ) and benzodiazepine-like drugs (Z-drugs such as zopiclone). The number of DDDs (i.e., the dose in multiples of the DDD) was used as the standard measure of dosing across all drugs and routes of administration within the BDZ/Z analytic class.

The DDD for compounds within the BDZ/Z class cannot be calculated as dose and/or route are unknown. Therefore, compounds do not contribute towards a patient’s total dose of BDZ/Z. Compounds are captured in all other quantity measures.

The DDDs for a specific drug dispense were calculated as follows:

Dispense DDDs = strength x quantity / drug DDD

A patient’s total BDZ/Z consumption per dose was calculated in DDDs per day, as follows:

Patient DDDs per day = the sum of the DDDs for all drug dispenses to the patient in the period analyzed / days in the time period analyzed⁴

A patient receiving a DDD per day of “2” for a year is receiving twice the average maintenance dose.

The DDDs shown in this Atlas are at a population level and combine values for patients who would be receiving more than one DDD per day of therapy with those of patients who receive less than one DDD per day because of differences in size, age, sex, etc.

For example, if every Alberta resident received a dose of one DDD for every day in a single two-week treatment period in a year, the observed rate would be 0.0384 or 38.4 DDDs per day per 1,000 population (14 DDD/365 days).

In 2021, seven percent of the population received BDZ/Z prescriptions. Therefore, if each of those patients received a dose of one DDD for every day in a single two-week treatment period, the observed rate would be 0.0384 per patient but 0.0027 for the whole population (0.0384 x 0.07) and 2.7 DDDs per day per 1,000 population.

Please note that some publications use DDDs without dividing by the days in the time period <https://www.cihi.ca/sites/default/files/document/opioid-prescribing-june2018-en-web.pdf>. To compare the numbers in this Atlas against those publications, please multiply DDDs per day in the Atlas by 365 (366 in leap years) or divide the DDD in the other publication by the same number of days.

Population utilization of BDZ/Zs was presented using the five measures below. Population rates were age and sex standardized for comparison between Pharmacy Local Aggregate Geographies (PhLAGs).

BDZ/Z consumption = the sum of all patient DDDs received in the time period analyzed / 1000 population

BDZ/Z patients = the number of patients who received at least one BDZ/Z prescription in the time period analyzed / 1000 population

High dose BDZ/Z patients = the number of patients who received two DDDs¹⁰ or greater in the time period analyzed / 1000 population

Elderly BDZ/Z patients = the number of patients 65 years and older who received at least one BDZ/Z prescription in the time period analyzed / 1000 elderly population

Concurrent Opioid BDZ/Z patients = patients who received both opioid and BDZ/Z prescriptions within the same quarter / 1000 population. Patients included were dispensed opioid and BDZ/Z prescriptions concurrently in one or more quarters.

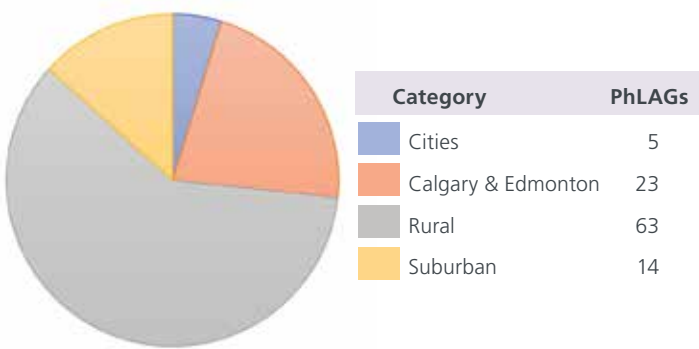
Urban/Rural Categories

An analysis of urban/rural patterns was conducted for the 2021 Atlas and the results were consistent with those observed in the 2020 Atlas. The detailed analysis for each measure were omitted from the 2021 Atlas to allow for other spatial analysis. Please download the 2020 TPP Atlas to view this detailed analysis. The urban/rural category definitions used in the Atlas are adapted from those used by Alberta Health to create Local Geographic Areas (LGAs). LGAs are used to report many types of data in small geographic areas which, when aggregated, match PhLAG boundaries used in the Atlas. For a full discussion about LGAs, visit: <http://aephein.alberta.ca/boundaries/>

The categories are:

- Cities** — Lethbridge, Medicine Hat, Red Deer, Grande Prairie, and Fort McMurray;
- Metropolitan** — the areas within the cities of Edmonton and Calgary;
- Rural** — areas without major urban centres;
- Suburban** — areas surrounding larger urban areas.

Figure 1. Distribution of Geographic Areas by Urban/Rural Categories, 2021



Note: Figure 1 shows the distribution of the number of geographic areas by category. The population of Alberta is concentrated in urban areas but a large percentage of the total area of the province is rural.

Socio-Economic Index

In 2009, Pampalon et al.¹¹ introduced a deprivation index for health data analysis in Canada based on data from Statistics Canada’s “The Census of Canada.” The index was developed for Quebec but has been used extensively in other Canadian provinces since the same data is gathered in all administrative areas of the country. The index measures deprivation, where higher values indicate higher deprivation. There are some challenges in adapting the index to other geographic areas. For example, rural areas show higher than expected deprivation indices because the methodology does not capture greater food and housing security in some of these areas.

Alberta Health Services (AHS) adapted the Pampalon approach using Alberta census data (Khakh, A. 2020).¹² and have assigned an index to each LGA. The AHS team replicated the Material Deprivation Index (based on % without high school or higher education, average personal income, and employment to population ratio) and the Social Deprivation Index (based on % separated/widowed/divorced, % lone parent families, and % living alone). Dr. Khakh highlights that the Material Deprivation Index (MDI) is the better choice in Alberta because rates used were age/sex standardized and linearly normalized.

The socio-economic deprivation index creates five categories, from 1 (least deprived) to 5 (most deprived). These categories were used to evaluate the rates of the selected measures against the MDI. These were also evaluated in context of the urban/rural categories described earlier. Some of these analyses evaluate the aggregated geographic areas that form a category (i.e. “Rural”); these calculations were averages of the included units. Figure 2 shows the aggregation of the MDI to the urban-rural categories.

Figure 2 highlights that the Suburban category shows the lowest deprivation index (2.7) and Rural category the highest (3.6). It is essential to remember that there are areas with high and low values within any of these categories.

The 2020 Atlas introduced an analysis of socio-economic status in context of the observed rates for the selected measures. This was based on census data and more current data will not be available until the 2022 Atlas at the earliest. To view the analysis of socio-economic status for each measure, please download the 2020 TPP Atlas.

Figure 2. Urban/Rural Categories and Associated Socio-Economic Deprivation Index, 2021



¹ National Center for Injury Prevention and Control. CDC compilation of BDZ/Z, muscle relaxants, stimulants, zolpidem, and opioid analgesics with oral morphine milligram equivalent conversion factors, 2016 version. Atlanta, GA: Centers for Disease Control and Prevention; 2016. Available at: <https://www.cdc.gov/drugoverdose/resources/data.html>

² <https://healthsci.mcmaster.ca/npc/opioid-manager>

³ <https://www.e-therapeutics.ca/login.action?language=en>

⁴ “Days in time period analyzed” is used because the “days of supply” information in the dispense record is often inaccurate within PIN data

⁵ 2017 Canadian Guideline for Opioids for Chronic Pain. Available at: https://healthsci.mcmaster.ca/docs/librariesprovider82/2017-opioid-guidelines/opioid-gl-for-cmaj_01may2017.pdf?sfvrsn=1261e66b_6

⁶ Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain – United States, 2016. MMWR Recomm Rep 2016;65(No. RR-1):1-49. DOI: <https://www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6501e1.pdf>

⁷ Norwegian Institute of Public Health. WHOCC – Definition and General Considerations [Internet]. WHO Collaborating Centre for Drug Statistics Methodology. 2009 [cited 2014 Oct 7]. Available from: http://www.whocc.no/ddd/definition_and_general_considera/

⁸ http://www.whocc.no/atc_ddd_index/

⁹ <https://www.who.int/tools/atc-ddd-toolkit/about-ddd>

¹⁰ For the purpose of this Atlas, 2 DDDs was used as the watchful dose of BDZ/Z

¹¹ Pampalon, R, Hamel, D, & Gamache, P. (2009). A deprivation index for health planning in Canada. Chronic Diseases in Canada, 29(4): 178-191

¹² Khakh, A. (2020). How to Use the Pampalon Deprivation Index in Alberta, Research and Innovation, Alberta Health Services

Medication Use – Opioids

Table 1. Utilization of Prescription Opioids in Alberta, 2016-2021

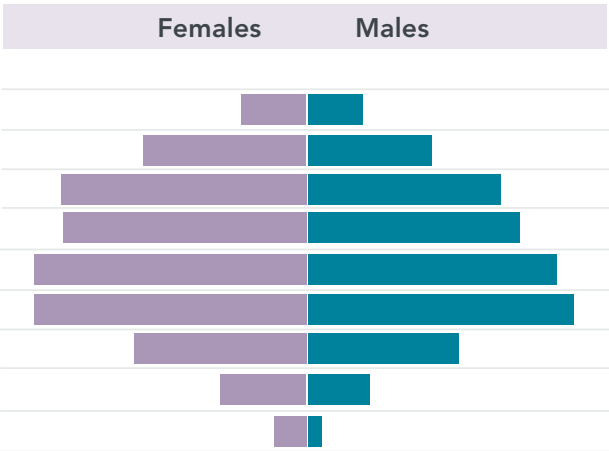
Year	Prescriptions	Patients	Prescribers	Pharmacies	Population	OME per day per 1000 Population	Patients per 1000 Population	Patients ≥90 OME per 1000 Population
2016	2,031,459	654,615	14,789	1,584	4,252,720	1,637	153.9	3.7
2017	1,934,191	634,281	15,330	1,391	4,285,997	1,431	148.0	3.2
2018	1,770,029	597,031	15,213	1,481	4,306,822	1,260	138.6	2.8
2019	1,663,890	573,022	14,906	1,540	4,371,154	1,194	131.1	2.6
2020	1,549,401	489,066	14,902	1,603	4,421,681	1,164	110.6	2.5
2021	1,470,641	457,893	14,913	1,640	4,442,676	1,094	103.1	2.3
6 year trend								

One in 10 people were prescribed an opioid in 2021, and one third fewer patients compared to 2016.

Table 2. Opioid Patients by Age and Sex, 2021*

Age Group	Females	Males	Total Patients
0 - 9	148	181	329
10 - 19	10,198	8,739	18,937
20 - 29	26,035	19,618	45,654
30 - 39	39,258	30,615	69,877
40 - 49	38,759	33,741	72,501
50 - 59	42,933	39,674	82,611
60 - 69	43,209	42,747	85,959
70 - 79	27,473	24,120	51,594
80 - 89	13,750	9,536	23,286
90+	5,044	2,058	7,103
Total	246,807	211,055	457,893

Figure 3. Opioid Patients by Age and Sex, 2021



* 14 female patients of unknown age, 26 male patients of unknown age, 15 patients of unknown sex and two patients of unknown sex or age.

Table 3. Opioid Prescriptions, Patients, and Prescribers by Prescriber Type, 2021

Prescriber Type	Prescriptions	Percent	Patients	Percent	Prescribers	Percent
Physicians	1,240,725	85.2	361,159	73.0	10,444	70.1
Dentists	104,236	7.2	89,529	18.1	551	3.7
Pharmacists	82,874	5.7	34,308	6.9	3,458	23.2
Nurse Practitioners	28,261	1.9	9,503	1.9	456	3.1

Note: Prescriptions sum does not match the summary value in Table 1 because only the four major prescriber groups are shown.
Note: Patients sum does not match the summary values in Table 1 because patients may obtain prescriptions from more than one prescriber type.
Note: Prescriptions from Pharmacist Prescribers include prescription adaptations, renewals and/or emergency prescribing.
Pharmacists with an additional prescribing authorization may also initiate prescriptions and/or manage ongoing therapy.

Figure 4. OME per Day per Patient by Physician Specialty Group, 2021

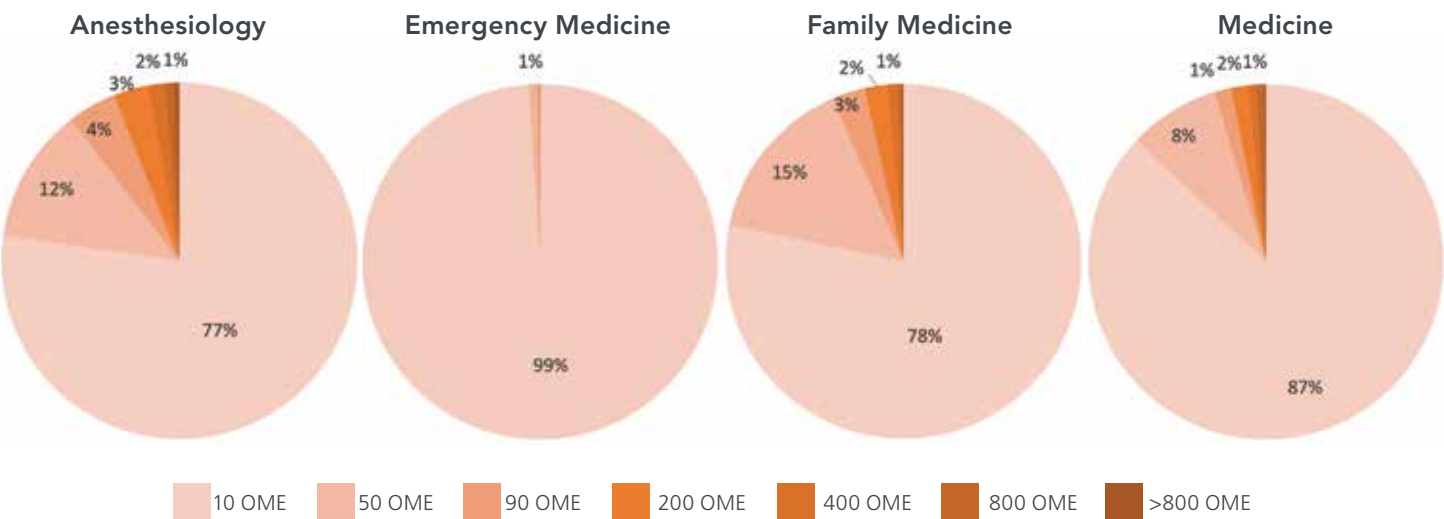


Table 4. Opioid Prescriptions by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Codeine	1,202,617	1,099,254	939,853	850,642	720,191	630,955	<div></div>	<div></div>
Tramadol	216,673	231,975	242,798	237,271	233,368	240,773	<div></div>	<div></div>
Oxycodone	302,931	273,842	240,997	209,037	201,572	189,105	<div></div>	<div></div>
Hydromorphone	120,627	123,092	117,627	118,437	124,232	127,795	<div></div>	<div></div>
Buprenorphine	36,762	54,387	72,828	87,975	94,393	99,539	<div></div>	<div></div>
Methadone	53,292	60,572	69,830	76,995	88,406	95,318	<div></div>	<div></div>
Morphine	65,750	61,065	59,601	59,267	64,297	66,289	<div></div>	<div></div>
Fentanyl	21,505	19,824	17,471	16,342	15,958	15,576	<div></div>	<div></div>
Tapentadol	4,017	3,638	3,365	3,110	2,802	2,435	<div></div>	<div></div>
Butalbital	2,726	2,490	2,273	2,122	2,014	1,759	<div></div>	<div></div>

Table 5. Opioid Patients by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Codeine	503,476	474,187	427,964	398,099	314,637	269,976	<div></div>	<div></div>
Tramadol	127,838	137,718	143,413	145,148	137,861	145,689	<div></div>	<div></div>
Oxycodone	74,039	63,355	54,427	47,597	42,808	40,858	<div></div>	<div></div>
Hydromorphone	29,663	31,268	32,981	34,563	35,612	38,871	<div></div>	<div></div>
Morphine	16,464	15,273	14,523	13,680	13,620	14,326	<div></div>	<div></div>
Buprenorphine	6,673	7,759	9,583	11,546	12,812	14,168	<div></div>	<div></div>
Methadone	5,363	5,702	6,217	6,732	7,539	8,027	<div></div>	<div></div>
Fentanyl	4,743	4,351	3,979	3,662	3,566	3,536	<div></div>	<div></div>
Butalbital	908	830	753	684	634	562	<div></div>	<div></div>
Tapentadol	1,001	886	806	684	604	539	<div></div>	<div></div>

Table 6. Opioid Prescribers by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Codeine	13,544	13,802	13,396	13,017	12,730	12,541	<div></div>	<div></div>
Tramadol	9,022	9,552	9,834	9,855	10,143	10,117	<div></div>	<div></div>
Hydromorphone	5,144	5,491	5,647	5,807	6,376	6,521	<div></div>	<div></div>
Oxycodone	5,941	5,933	5,996	5,689	6,061	6,047	<div></div>	<div></div>
Morphine	4,232	4,234	4,271	4,186	4,407	4,498	<div></div>	<div></div>
Buprenorphine	1,727	1,796	2,080	2,526	3,148	3,453	<div></div>	<div></div>
Fentanyl	2,181	2,057	1,942	1,984	1,963	1,985	<div></div>	<div></div>
Methadone	522	592	722	917	1,357	1,511	<div></div>	<div></div>
Butalbital	698	661	627	579	539	484	<div></div>	<div></div>
Tapentadol	574	517	470	467	444	418	<div></div>	<div></div>

* The ten most commonly prescribed ingredients are displayed. See Appendix A for details on less commonly prescribed ingredients.



Note: Not all clinical specialties were assigned to a Specialty Group. The Specialty to Specialty Group assignments appear at the bottom of Appendix A.

Table 7. Opioid Patients and Associated Prescribers by Dose, 2016-2021

Patients

Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Total Patients	654,615	634,281	597,031	573,022	489,066	457,893		
< 50 OME	628,538	610,633	575,599	552,986	469,568	439,106		
OME 50+	26,077	23,648	21,432	20,036	19,498	18,787		
OME 90+	15,519	13,762	11,952	11,160	10,845	10,309		
OME 200+	7,038	5,947	5,030	4,750	4,639	4,373		
OME 400+	2,694	2,221	1,809	1,840	1,832	1,669		
OME 600+	1,360	1,063	897	914	938	840		
OME 800+	761	582	500	522	539	467		
OME 1000+	490	377	321	346	365	293		
OME 2000+	57	52	32	56	76	61		

Associated Prescribers

Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Total Prescribers	14,789	15,330	15,213	14,906	14,902	14,913		
< 50 OME	6,538	7,440	8,217	8,182	8,140	8,180		
OME 50+	8,251	7,890	6,996	6,724	6,762	6,733		
OME 90+	6,745	6,246	5,337	5,083	5,124	5,100		
OME 200+	4,517	3,914	3,346	3,052	3,017	3,061		
OME 400+	2,421	1,940	1,552	1,473	1,475	1,438		
OME 600+	1,455	1,070	862	826	835	836		
OME 800+	842	630	528	518	518	497		
OME 1000+	562	407	376	367	355	333		
OME 2000+	71	73	52	75	81	57		

* can include prescriptions from multiple prescribers

Figure 5. Patient Dose Proportion, 2021

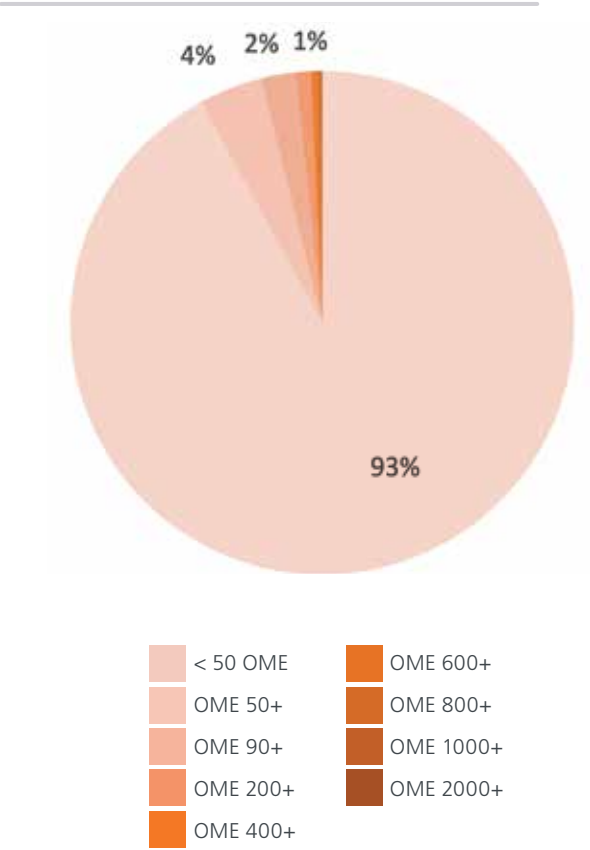
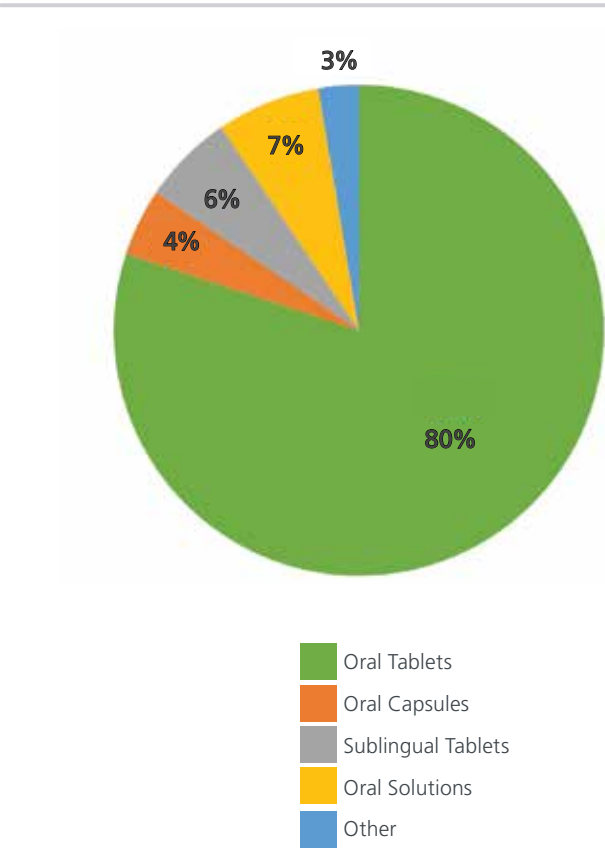


Figure 6. Opioid Prescriptions by Drug Form and Route, 2021



Note: "Other" category includes other Drug Routes: Intramuscular, Intravenous, Nasal, Parenteral, Rectal, Subcutaneous, and Transdermal.

Note: "Other" category includes other Drug Forms: Film, Implant, Patch, Powder/Suppository, and some liquid drug forms, and Unknown Drug Form and Route.

Table 8. Opioid Patients by Number of Ingredients, 2016-2021

Ingredients	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
1+ Ingredients	654,615	634,281	597,031	573,022	489,066	457,893	<div></div>	<div></div>
2+ Ingredients	97,038	90,913	83,434	76,505	68,434	66,357	<div></div>	<div></div>
3+ Ingredients	16,926	14,973	13,060	11,630	10,744	10,586	<div></div>	<div></div>
4+ Ingredients	2,799	2,347	2,052	1,872	1,785	1,709	<div></div>	<div></div>
5+ Ingredients	484	343	300	300	304	277	<div></div>	<div></div>
6+ Ingredients	77	46	38	34	44	48	<div></div>	<div></div>

Table 9. Opioid Patients by Number of Prescribers, 2016-2021

Prescribers	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
1+ Prescribers	654,615	634,281	597,031	573,022	489,066	457,893	<div></div>	<div></div>
2+ Prescribers	200,340	185,748	162,139	148,788	124,970	119,019	<div></div>	<div></div>
3+ Prescribers	85,599	75,893	61,229	54,886	45,226	44,265	<div></div>	<div></div>
4+ Prescribers	43,880	36,936	27,772	24,347	19,612	19,516	<div></div>	<div></div>
5+ Prescribers	25,194	19,718	13,764	11,903	9,387	9,621	<div></div>	<div></div>
6+ Prescribers	15,318	11,212	7,376	6,260	4,806	5,076	<div></div>	<div></div>
7+ Prescribers	9,595	6,692	4,057	3,457	2,561	2,779	<div></div>	<div></div>
8+ Prescribers	6,250	4,109	2,287	1,954	1,390	1,609	<div></div>	<div></div>

Figure 7. Opioid Patient Trends by Month for Patients 0-64 Years, 2016-2021

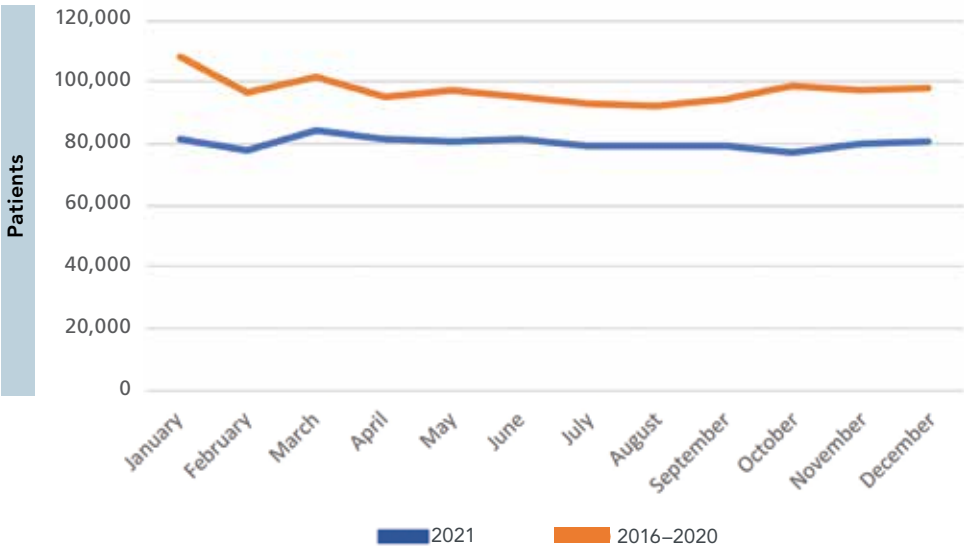


Figure 8. Opioid Patient Trends by Month for Patients 65 Years and Older, 2016-2021

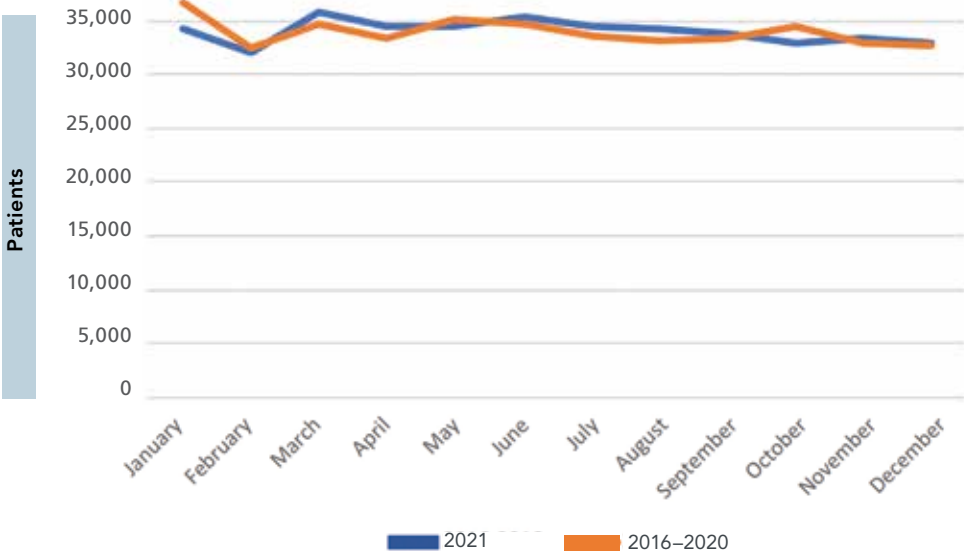


Figure 9. Opioid Prescriptions by Ingredient for Physician Prescribers, 2021

Main Ingredient	Prescriptions	%
Codeine	464,179	37.4
Tramadol	217,241	17.5
Oxycodone	182,319	14.7
Hydromorphone	120,276	9.7
Buprenorphine	90,971	7.3
Other Ingredients	165,742	6.9

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all opioids prescribed by physicians.

Note: Dark blue/grey section shows the proportion of physician opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.

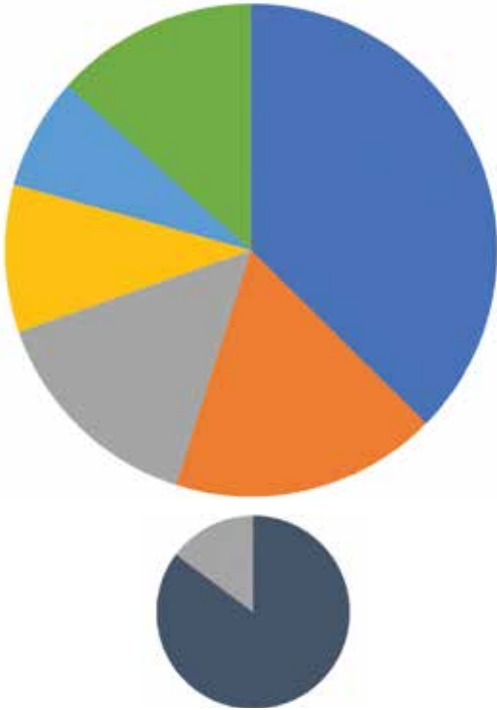


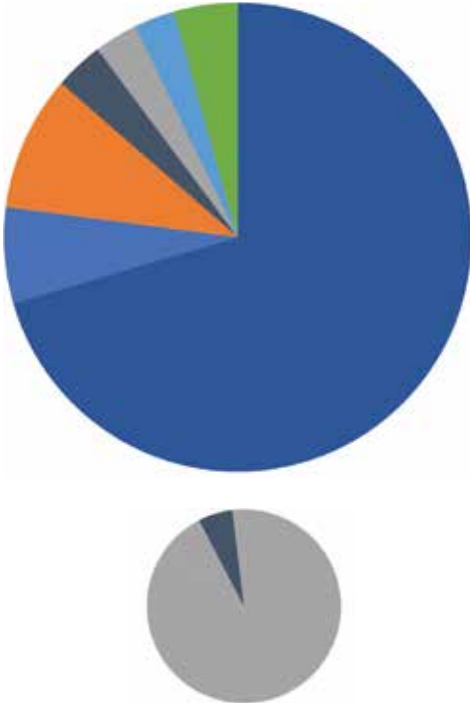
Figure 10. Opioid Prescriptions by Ingredient for Pharmacist Prescribers, 2021

Main Ingredient	Prescriptions	%
Non-Prescription Codeine	58,383	70.4
Prescription Codeine	5,486	6.6
Tramadol	7,731	9.3
Methadone	2,799	3.4
Oxycodone	2,466	3.0
Buprenorphine	2,356	2.8
Other Ingredients	3,653	2.5

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all opioids prescribed by pharmacists.

Note: Opioid Prescriptions from Pharmacist Prescribers include prescription adaptations, renewals and/or emergency prescribing. Pharmacists with an additional prescribing authorization may also initiate prescriptions and/or manage ongoing therapy.

Note: Dark blue/grey section shows the proportion of pharmacist opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.



Veterinarian Prescriptions

Veterinarian prescriptions for animal clients are monitored by TPP Alberta, as there is a potential for misuse by the human owners of the animal patients. Veterinarian prescriptions for animals were not included in the overall analyses.

In 2021, 997 veterinarians in Alberta prescribed 18,435 opioid prescriptions for animal clients.

The five most commonly prescribed ingredients are shown here.

The data source for veterinarian prescriptions of controlled drugs for animals is the TPP Alberta Alberta prescription drug monitoring program, as prescriptions for animal patients are not captured in PIN. Also, specific animal patient and dosage information are not available.

Figure 11. Opioid Prescriptions by Ingredient for Dentist Prescribers, 2021

Main Ingredient	Prescriptions	%	
Codeine	90,317	86.6	<div></div>
Tramadol	11,881	11.4	<div></div>
Oxycodone	1,033	1.0	<div></div>
Morphine	828	0.8	<div></div>
Hydromorphone	151	0.1	<div></div>
Other Ingredients	26	0.0	<div></div>

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all opioids prescribed by dentists.

Note: Dark blue/grey section shows the proportion of dentist opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.

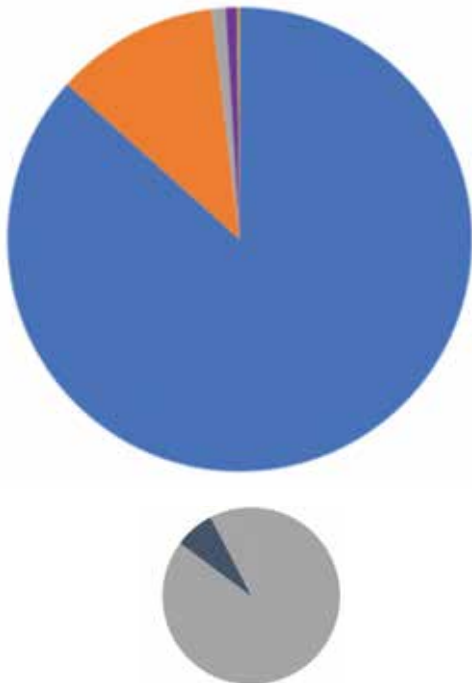


Figure 12. Opioid Prescriptions by Ingredient for Nurse Practitioner Prescribers, 2021

Main Ingredient	Prescriptions	%	
Methadone	6,401	22.6	<div></div>
Buprenorphine	5,531	19.6	<div></div>
Codeine	4,651	16.5	<div></div>
Hydromorphone	4,112	14.6	<div></div>
Morphine	3,234	11.4	<div></div>
Other Ingredients	4,332	7.0	<div></div>

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all opioids prescribed by nurse practitioners.

Note: Dark blue/grey section shows the proportion of nurse practitioner opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.

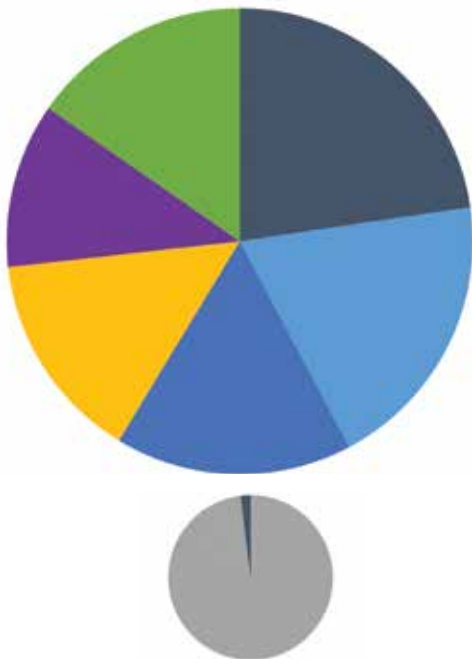
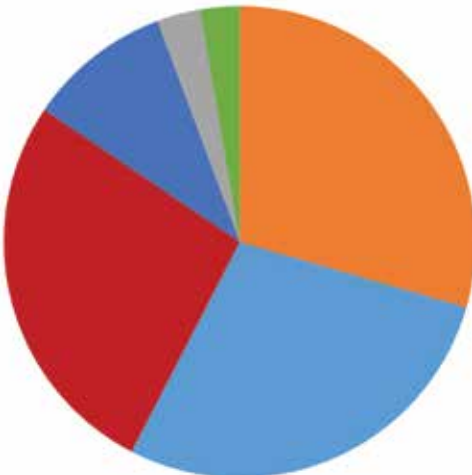


Figure 13. Opioid Prescriptions by Ingredient for Veterinarian Prescribers, 2021

Main Ingredient	Prescriptions	%	
Tramadol	5,435	29.5	<div></div>
Buprenorphine	5,181	28.1	<div></div>
Hydrocodone	4,955	26.9	<div></div>
Codeine	1,816	9.9	<div></div>
Oxycodone	552	3.0	<div></div>
Other Ingredients	496	2.2	<div></div>

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all opioids prescribed by veterinarians.

Note: Proportion of veterinarian opioid prescriptions is not shown because they are available from a different source and for a different set of patients (non human).



Medication Use – BDZ/Zs

Table 10. Utilization of Prescription BDZ/Zs in Alberta, 2016-2021

Year	Prescriptions	Patients	Prescribers	Pharmacies	DDDs per 1000 Population	Patients per 1000 Population	Patients ≥ 2 DDDs	Patients ≥ 2 DDDs per 1000 Population
2016	1,284,641	386,883	12,738	1,419	41.0	91.0	14,728	3.5
2017	1,204,345	369,800	13,151	1,386	36.6	86.3	12,256	2.9
2018	1,127,396	355,831	13,398	1,471	33.5	82.6	10,771	2.5
2019	1,056,883	343,216	13,376	1,538	30.8	78.5	9,813	2.2
2020	1,075,987	330,124	13,772	1,599	29.9	74.7	9,848	2.2
2021	1,037,530	327,376	13,940	1,635	28.7	73.7	9,077	2.0
6 year trend								

Table 11. BDZ/Z Patients by Age and Sex, 2021*

Age Group	Females	Males	Total Patients
0 - 9	499	636	1,135
10 - 19	4,567	2,471	7,038
20 - 29	16,901	8,501	25,403
30 - 39	28,564	16,029	44,594
40 - 49	32,206	18,701	50,909
50 - 59	37,361	22,673	60,035
60 - 69	40,422	25,050	65,474
70 - 79	27,828	16,473	44,302
80 - 89	14,371	7,777	22,148
90+	4,548	1,778	6,326
Total	207,270	120,095	327,376

* Three female patients of unknown age, six male patients of unknown age, eight patients of unknown sex and three patients of unknown sex or age.

Figure 14. BDZ/Z Patients by Age and Sex, 2021

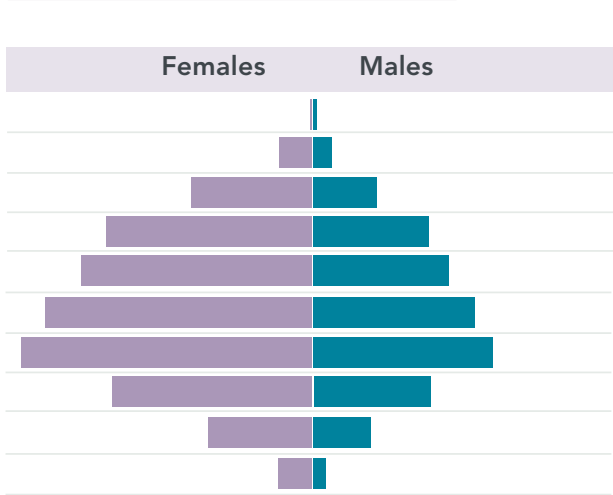


Table 12. BDZ/Z Prescriptions, Patients, and Prescribers by Prescriber Type, 2021

Prescriber Type	Prescriptions	Percent	Patients	Percent	Prescribers	Percent
Physicians	964,598	92.97	317,506	96.99	9,780	70.16
Pharmacists	48,624	4.69	27,181	8.30	3,634	26.07
Nurse Practitioners	9,897	0.95	4,921	1.50	420	3.01
Dentists	6,716	0.65	5,387	1.65	105	0.75

Note: Prescriptions sum does not match the summary value in Table 10 because only the four major prescriber groups are shown.

Note: Patients sum does not match the summary values in Table 10 because patients may obtain prescriptions from more than one prescriber type.

Note: Prescriptions from Pharmacist Prescribers include prescription adaptations, renewals and/or emergency prescribing. Pharmacists with an additional prescribing authorization may also initiate prescriptions and/or manage ongoing therapy.

Figure 15. DDDs per Patient by Physician Specialty Group, 2021

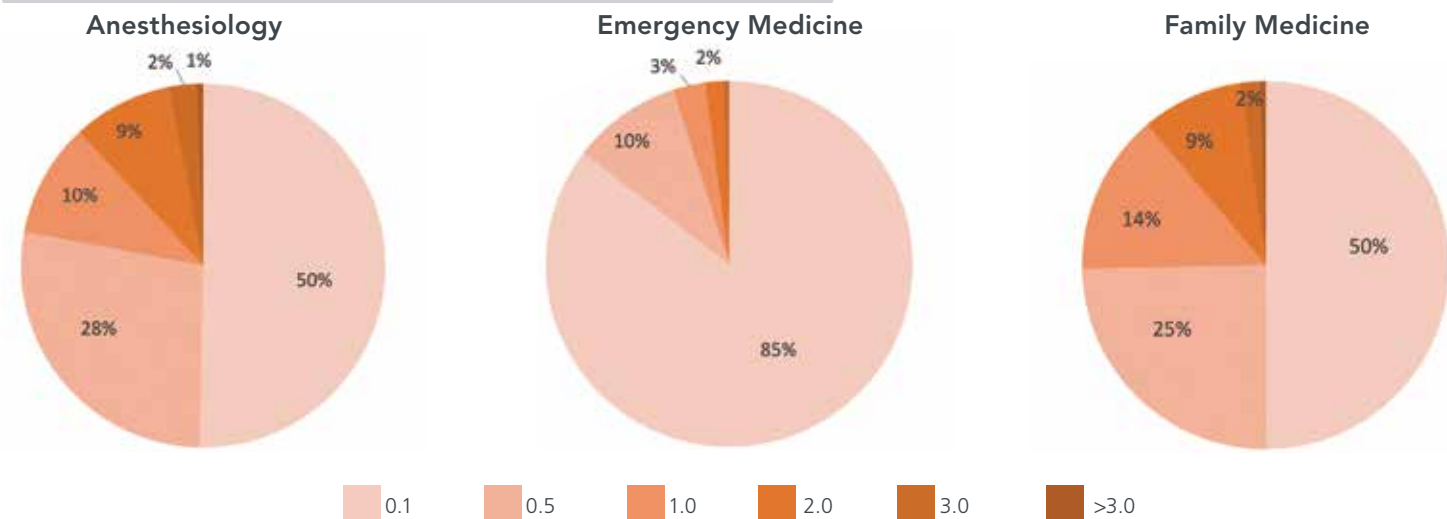


Table 13. BDZ/Z Prescriptions by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Zopiclone	510,096	490,325	462,415	431,311	436,819	411,698	<div></div>	<div></div>
Lorazepam	330,213	308,294	293,752	283,639	289,779	287,972	<div></div>	<div></div>
Clonazepam	172,170	169,388	158,110	148,751	152,801	147,847	<div></div>	<div></div>
Temazepam	86,438	68,678	57,657	49,515	48,507	44,977	<div></div>	<div></div>
Zolpidem	40,274	42,113	42,254	42,010	45,147	44,618	<div></div>	<div></div>
Diazepam	48,233	40,843	36,410	34,652	37,620	36,656	<div></div>	<div></div>
Alprazolam	28,938	26,770	25,011	22,810	22,352	20,351	<div></div>	<div></div>
Clobazam	10,110	10,068	10,008	10,061	10,848	11,301	<div></div>	<div></div>
Bromazepam	21,875	16,668	13,178	10,978	10,233	9,345	<div></div>	<div></div>
Nitrazepam	18,065	14,809	13,429	8,699	7,821	7,466	<div></div>	<div></div>

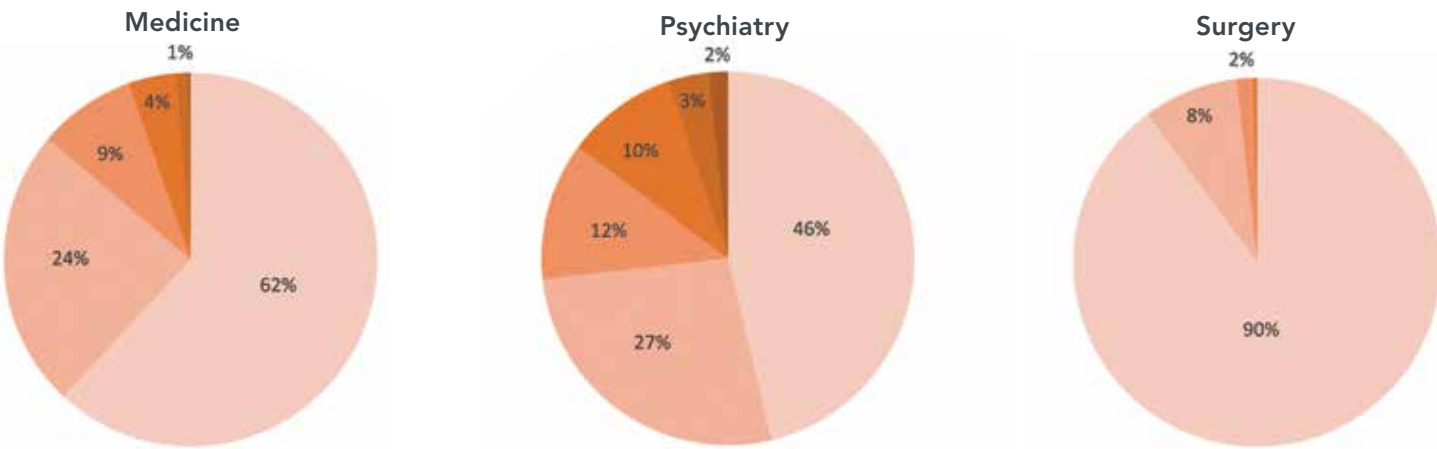
Table 14. BDZ/Z Patients by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Zopiclone	192,225	180,547	169,621	158,730	150,859	145,024	<div></div>	<div></div>
Lorazepam	151,540	144,662	141,591	139,682	134,238	136,468	<div></div>	<div></div>
Clonazepam	53,687	50,204	47,829	45,692	45,028	44,121	<div></div>	<div></div>
Zolpidem	17,645	17,473	17,095	16,889	16,679	16,205	<div></div>	<div></div>
Diazepam	15,965	14,097	12,784	12,346	12,442	12,679	<div></div>	<div></div>
Temazepam	24,094	19,553	16,474	14,131	12,857	11,735	<div></div>	<div></div>
Alprazolam	10,066	9,118	8,280	7,577	7,012	6,515	<div></div>	<div></div>
Clobazam	3,400	3,380	3,473	3,534	3,680	3,834	<div></div>	<div></div>
Triazolam	3,401	3,136	3,149	3,288	3,030	3,048	<div></div>	<div></div>
Midazolam	1,305	1,518	1,561	1,696	1,906	2,071	<div></div>	<div></div>

Table 15. BDZ/Z Prescribers by Top 10 Ingredients, 2016-2021*

Main Ingredient	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Zopiclone	10,885	11,197	11,332	11,289	11,429	11,324	<div></div>	<div></div>
Lorazepam	8,128	8,368	8,579	8,596	9,835	10,103	<div></div>	<div></div>
Clonazepam	5,984	6,157	6,255	6,226	7,387	7,552	<div></div>	<div></div>
Zolpidem	3,774	3,905	4,021	4,053	4,416	4,420	<div></div>	<div></div>
Diazepam	4,074	4,093	4,060	4,077	4,319	4,350	<div></div>	<div></div>
Temazepam	3,949	3,888	3,658	3,500	3,771	3,792	<div></div>	<div></div>
Alprazolam	3,265	3,241	3,198	3,093	3,157	3,088	<div></div>	<div></div>
Clobazam	1,997	2,122	2,199	2,215	2,500	2,670	<div></div>	<div></div>
Bromazepam	1,639	1,530	1,418	1,294	1,313	1,238	<div></div>	<div></div>
Nitrazepam	1,381	1,255	1,099	995	1,003	967	<div></div>	<div></div>

* The 10 most commonly prescribed ingredients are displayed. See Appendix A for details on less commonly prescribed ingredients.



Note: Not all clinical specialties were assigned to a Specialty Group. The Specialty to Specialty Group assignments for BDZ/Z appear at the bottom of Appendix B.

Table 16. BDZ/Z Patients and Associated Prescribers by Dose, 2016-2021

Patients								
Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Total Patients	386,883	369,800	355,831	343,216	330,124	327,376		
< 1 DDD	330,936	319,935	309,784	300,394	287,565	286,722		
1+ DDD	55,947	49,865	46,047	42,822	42,559	40,654		
2+ DDD	14,728	12,256	10,771	9,813	9,848	9,077		
4+ DDD	1,862	1,329	1,105	971	976	826		
6+ DDD	449	301	227	225	220	199		
8+ DDD	122	75	68	61	71	67		
10+ DDD	49	34	28	24	24	23		

Associated Prescribers								
Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Total Prescribers	12,738	13,151	13,398	13,376	13,772	13,940		
< 1 DDD	3,850	4,256	4,401	4,547	4,575	4,884		
1+ DDD	8,888	8,895	8,997	8,829	9,197	9,056		
2+ DDD	5,929	5,615	5,467	5,209	5,491	5,253		
4+ DDD	2,127	1,557	1,296	1,131	1,189	1,071		
6+ DDD	752	434	321	292	324	299		
8+ DDD	266	85	89	76	121	115		
10+ DDD	134	37	39	36	39	41		

* can include prescriptions from multiple prescribers

Figure 16. Proportion of Patients by DDD Category

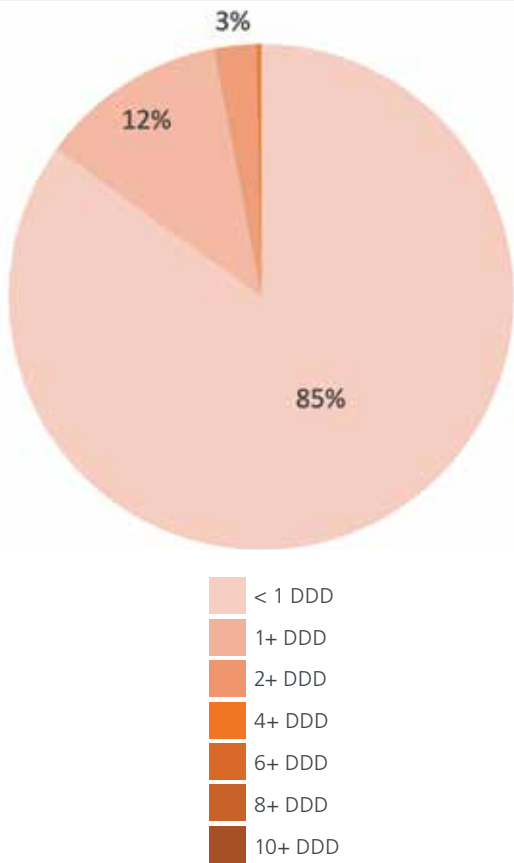
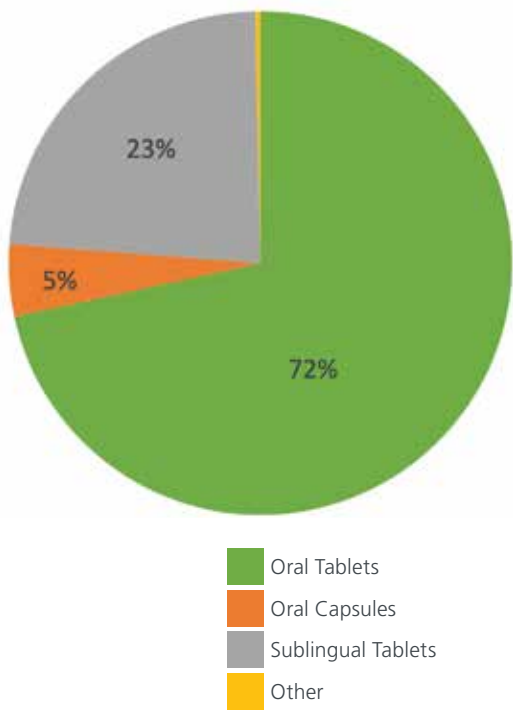


Figure 17. BDZ/Z Prescriptions by Drug Form and Route, 2021



Note: Other category includes Gel, Liquid, Solution, and Unknown Drug Form and Route.

Table 17. BDZ/Z Patients by Number of Ingredients, 2016-2021

Ingredients	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
1+ Ingredients	386,883	369,800	355,831	343,216	330,124	327,376		
2+ Ingredients	80,269	70,270	63,235	57,987	55,015	52,977		
3+ Ingredients	15,051	11,438	9,507	8,301	7,658	7,033		
4+ Ingredients	2,854	1,783	1,381	1,155	1,048	900		
5+ Ingredients	552	274	206	166	154	145		
6+ Ingredients	119	50	37	27	21	22		

Table 18. BDZ/Z Patients by Number of Prescribers, 2016-2021

Prescribers	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
1+ Prescribers	386,883	369,800	355,831	343,216	330,124	327,376		
2+ Prescribers	113,080	102,410	94,746	88,125	85,681	84,672		
3+ Prescribers	39,591	33,886	30,174	27,613	27,127	26,705		
4+ Prescribers	15,877	12,630	10,815	9,761	9,412	9,295		
5+ Prescribers	7,154	5,283	4,374	3,862	3,531	3,552		
6+ Prescribers	3,500	2,402	1,905	1,693	1,518	1,486		
7+ Prescribers	1,905	1,224	956	862	754	709		
8+ Prescribers	1,090	641	552	474	395	373		

Figure 18. BDZ/Z Prescribing Trends by Month for Patients 0-64 Years, 2016-2021

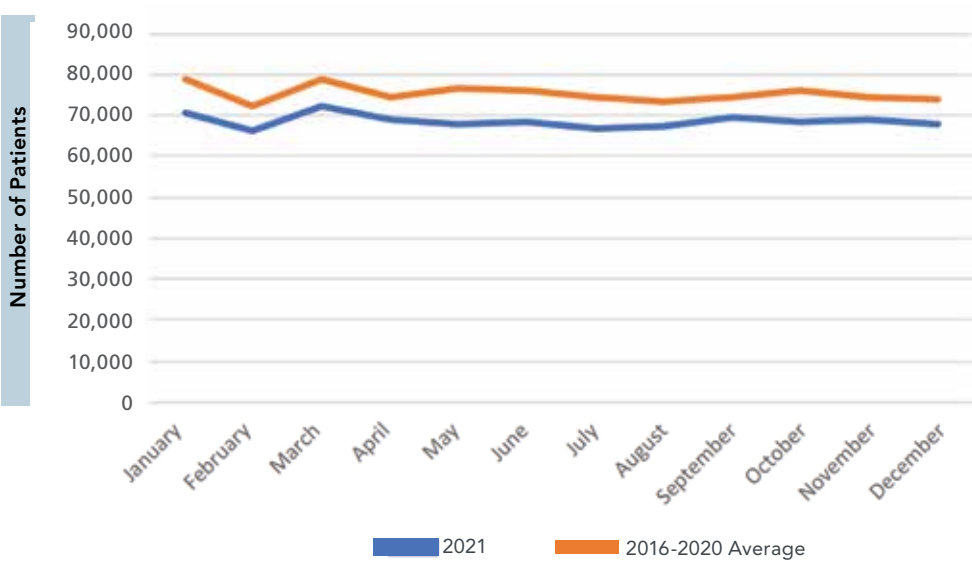


Figure 19. BDZ/Z Prescribing Trends by Month for Patients 65 Years and Older, 2016-2021

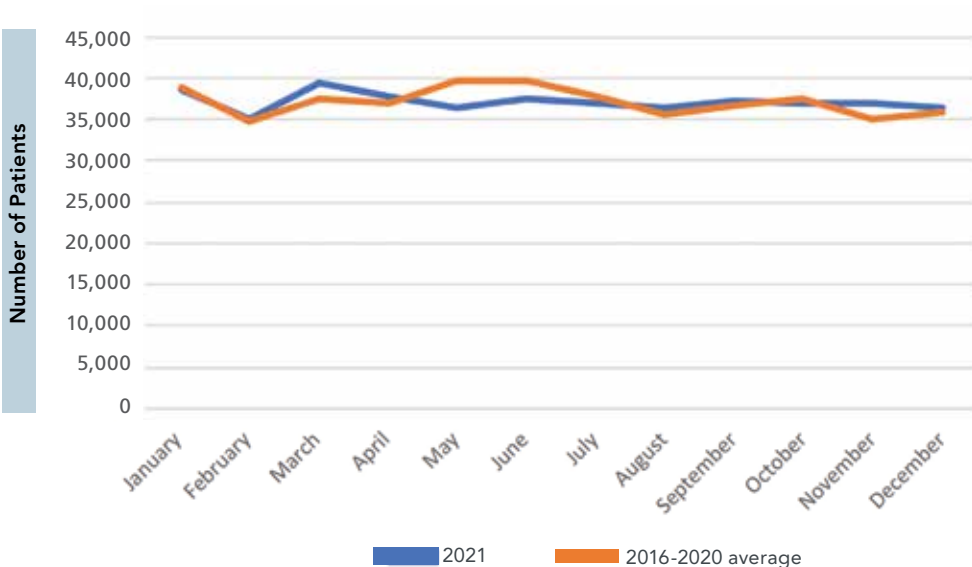
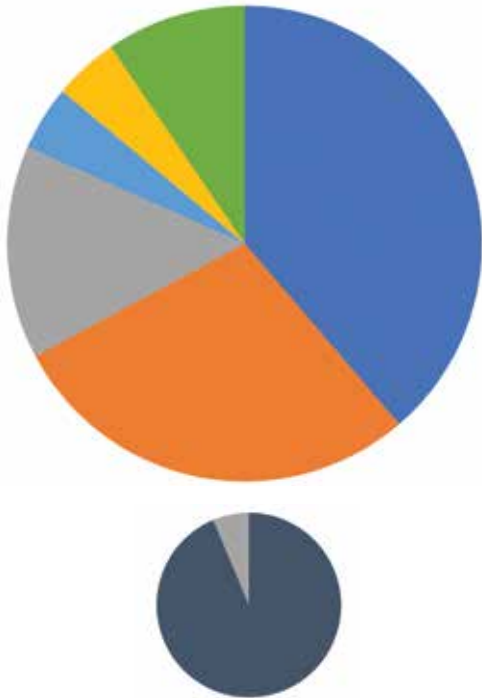


Figure 20. BDZ/Z Prescriptions by Ingredient for Physician Prescribers, 2021

Main Ingredient	Prescriptions	%	
Zopiclone	373,383	38.7	
Lorazepam	274,388	28.4	
Clonazepam	139,835	14.5	
Zolpidem	42,596	4.4	
Temazepam	42,514	4.4	
Other Ingredients	91,884	9.5	

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all BDZ/Z prescribed by physicians.

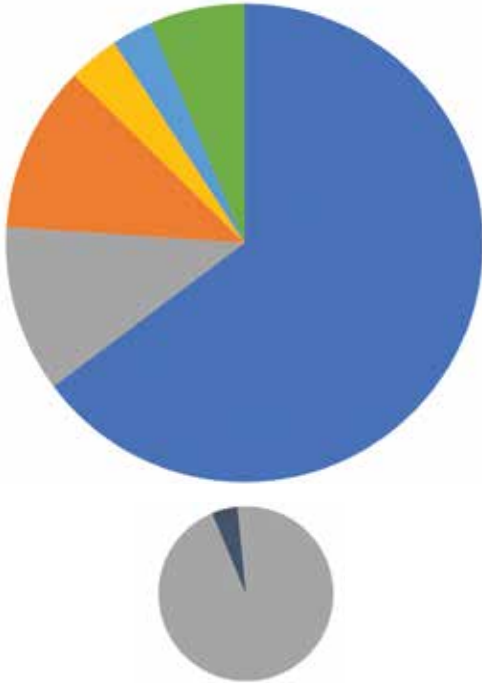


Note: Dark blue/grey section shows the proportion of physician BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.

Figure 21. BDZ/Z Prescriptions by Ingredient for Pharmacist Prescribers, 2021

Main Ingredient	Prescriptions	%	
Zopiclone	31,485	64.8	
Clonazepam	5,502	11.3	
Lorazepam	5,490	11.3	
Temazepam	1,666	3.4	
Zolpidem	1,353	2.8	
Other Ingredients	3,128	6.4	

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all BDZ/Z prescribed by pharmacists.



Note: Dark blue/grey section shows the proportion of pharmacist BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.

Veterinarian Prescriptions

Veterinarian prescriptions for animal clients are monitored by TPP Alberta, as there is a potential for misuse by the human owners of the animal patients. Veterinarian prescriptions for animals were not included in the overall analyses.

In 2021, 499 veterinarians prescribed 1,678 BDZ/Z prescriptions for animal clients.

The five most commonly prescribed ingredients are shown here.

The data source for veterinarian prescriptions of controlled drugs for animals is the TPP Alberta Alberta prescription drug monitoring program, as prescriptions for animal patients are not captured in PIN. Also, specific animal patient and dosage information are not available.

Figure 22. BDZ/Z Prescriptions by Ingredient for Dentist Prescribers, 2021

Main Ingredient	Prescriptions	%	
Lorazepam	3,253	48.4	
Triazolam	2,586	38.5	
Diazepam	586	8.7	
Clonazepam	102	1.5	
Midazolam	69	1.0	
Other Ingredients	120	1.8	

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all BDZ/Z prescribed by dentists.

Note: Dark blue/grey section shows the proportion of dentist BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.

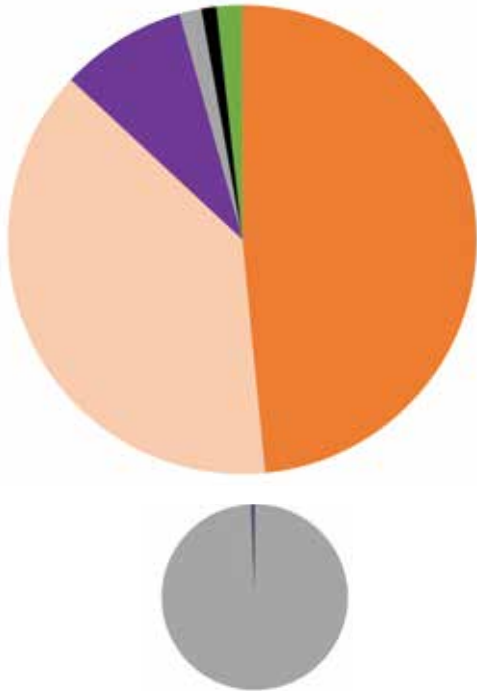


Figure 23. BDZ/Z Prescriptions by Ingredient for Nurse Practitioner Prescribers, 2021

Main Ingredient	Prescriptions	%	
Zopiclone	3,491	35.3	
Lorazepam	2,810	28.4	
Clonazepam	1,258	12.7	
Diazepam	765	7.7	
Temazepam	525	5.3	
Other Ingredients	1,048	10.6	

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all BDZ/Z prescribed by nurse practitioners.

Note: Dark blue/grey section shows the proportion of nurse practitioner BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.

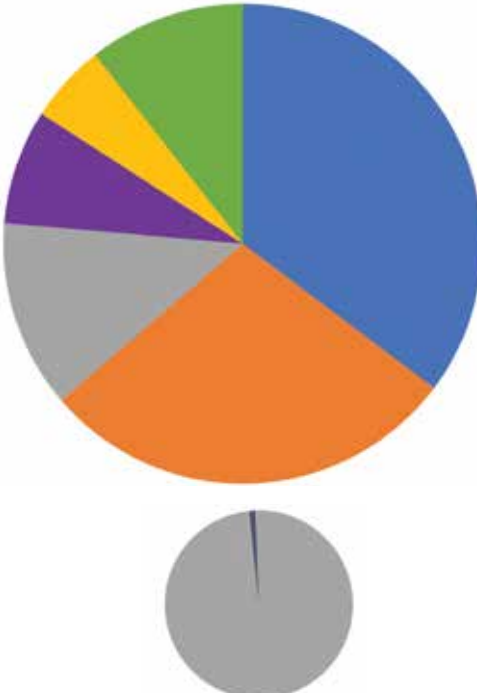
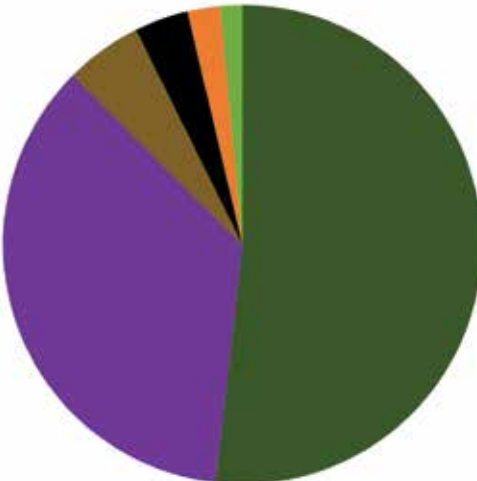


Figure 24. BDZ/Z Prescriptions by Ingredient for Veterinarian Prescribers, 2021

Main Ingredient	Prescriptions	%	
Alprazolam	869	51.8	
Diazepam	599	35.7	
Clorazepate Dipotassium	87	5.2	
Midazolam	61	3.6	
Lorazepam	37	2.2	
Other Ingredients	25	1.5	

Note: The % column represents the number of prescriptions for each main ingredient as a proportion of all BDZ/Z prescribed by veterinarians.

Note: Proportion of veterinarian BDZ/Z prescriptions is not shown because they are available from a different source and for a different set of patients (non human).



Medication Use – BDZ/Zs in Elderly Patients

Table 19. Utilization of Prescription BDZ/Zs in Elderly Patients in Alberta, 2016-2021

Year	Prescriptions	Patients	Prescribers	Pharmacies	Elderly Population	Elderly Patient DDDs	DDDs in Elderly Patients per 1000 Elderly Population	Elderly Patients per 1000 Elderly Population
2016	340,903	108,852	9,017	1,363	506,800	61,187	120.7	214.8
2017	337,183	107,078	9,397	1,354	529,962	57,203	107.9	202.1
2018	328,355	105,555	9,675	1,433	551,546	54,543	98.9	191.4
2019	317,453	103,700	9,694	1,495	580,391	52,680	90.8	178.7
2020	330,926	102,007	10,192	1,574	610,970	52,440	85.8	167.0
2021	330,638	103,927	10,258	1,606	639,123	52,854	82.7	162.6
6 year trend								

Table 20. Elderly BDZ/Z Prescriptions, Patients and Prescribers by Prescriber Type, 2021

Prescriber Type	Prescriptions	Percent	Patients	Percent	Prescribers	Percent
Physicians	307,275	92.9%	101,985	98.1%	7,161	69.8
Pharmacists	18,034	5.5%	10,720	10.3%	2,818	27.5
Nurse Practitioners	2,511	0.8%	1,445	1.4%	264	2.6
Dentists	858	0.3%	684	0.7%	14	0.1

Note: Prescriptions sum does not match the summary value because only the four major prescriber types are shown.

Note: Patients sum does not match the summary values because patients may obtain prescriptions from more than one prescriber type.

Note: Prescriptions from Pharmacist Prescribers include prescription adaptations, renewals and/or emergency prescribing. Pharmacists with an additional prescribing authorization may also initiate prescriptions and/or manage ongoing therapy.

Table 21. Elderly BDZ/Z Patients and Associated Prescribers by Dose, 2016-2021

Elderly Patients								
Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
≥1 DDDs	20,285	18,570	17,632	16,880	17,108	17,041		
≥2 DDDs	3,853	3,295	2,957	2,852	2,878	2,822		
≥4 DDDs	288	182	173	179	184	187		
≥6 DDDs	49	33	23	37	30	34		
≥8 DDDs	10	6	7	10	6	10		
Associated Prescribers								
Patient Dose*	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
≥1 DDDs	5,989	5,947	6,059	6,030	6,289	6,302		
≥2 DDDs	2,961	2,705	2,560	2,452	2,505	2,475		
≥4 DDDs	456	290	262	257	285	278		
≥6 DDDs	84	49	38	62	48	43		
≥8 DDDs	15	9	13	16	9	13		

* can include prescriptions from multiple prescribers

Medication Use – Concurrent Opioids and BDZ/Zs

Table 22. Utilization of Concurrent Prescription Opioids and BDZ/Zs in Alberta, 2016-2021

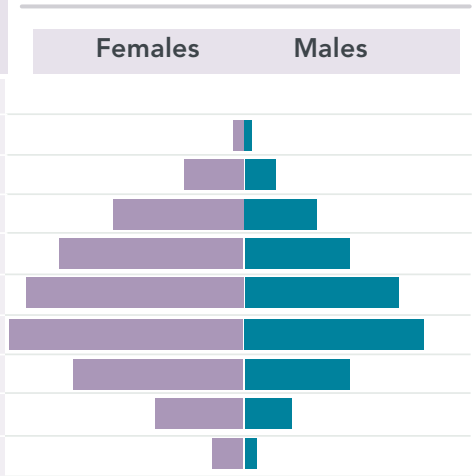
Year	Patients	Patients per 1000 population	Patients ≥ 90 OMEs and ≥ 2 DDDs	Elderly Patients	Elderly Patients per 1000 Elderly Population
2016	134,809	32	47	38,601	76
2017	123,569	29	27	37,245	70
2018	111,887	26	15	34,959	63
2019	103,181	24	15	33,416	58
2020	94,961	22	13	31,616	52
2021	90,904	21	12	31,841	50
6 year trend					

Note: Concurrent Opioid BDZ/Z patients are patients who received both opioid and BDZ/Z prescriptions within the same quarter. Patients included were dispensed opioid and BDZ/Z prescriptions concurrently in one or more quarters.

Table 23. Concurrent Opioid and BDZ/Z Patients by Age and Sex, 2021*

Age Group	Females	Percent	Males	Percent	Total Patients	Percent
0 - 9	11	0.0	17	0.0	28	0.0
10-19	441	0.8	294	0.9	735	0.8
20 - 29	2,726	4.8	1,411	4.1	4,137	4.6
30 - 39	6,267	11.1	3,540	10.3	9,807	10.8
40 - 49	8,781	15.5	5,029	14.7	13,810	15.2
50 - 59	11,747	20.7	7,417	21.7	19,165	21.1
60 - 69	12,851	22.7	8,724	25.5	21,576	23.7
70 - 79	8,180	14.4	5,129	15.0	13,310	14.6
80 - 89	4,162	7.3	2,188	6.4	6,350	7.0
90+	1,482	2.6	501	1.5	1,983	2.2
Total	56,650	100.0	34,250	100.0	90,904	100.0

Figure 25. Concurrent Opioid and BDZ/Z Patients by Age and Sex, 2021



* Two female patients of unknown age, three patients of unknown sex, one patient of unknown age or sex.

Table 24. Concurrent Opioid and BDZ/Z Patients by Prescriber Type in Alberta, 2016-2021

Prescriber Type	2016	2017	2018	2019	2020	2021	2021	6 Year Trend
Physicians	133,151	121,964	110,227	101,514	93,315	89,253		
Pharmacists	30,432	26,510	19,421	15,831	18,216	17,681		
Dentists	12,926	11,849	10,980	10,130	9,296	9,325		
Nurse Practitioners	2,625	2,931	3,212	3,498	3,455	3,651		

Note: Prescriptions from Pharmacist Prescribers include prescription adaptations, renewals and/or emergency prescribing. Pharmacists with an additional prescribing authorization may also initiate prescriptions and/or manage ongoing therapy.

Equity Stratifiers

Equity Stratifiers, also known as Dimensions of Inequality, are used to measure differences in healthcare access, quality, or outcomes. Disaggregated analyses using equity stratifiers can provide useful context for a health system, particularly for disadvantaged populations and vulnerable subgroups. A particular type of behaviour can have a low risk in the overall population, but the impact on health outcomes may be exaggerated for a vulnerable population. By providing insight into health inequalities with potential underpinning in social, behavioural or structural determinants of health, such types of exploration can help identify patterns of concern and focus areas toward greater health equity.

In this Atlas, we provide a preliminary analysis of TPP drug utilization patterns for Indigenous populations, immigrant populations, visible minorities, populations receiving government support, emergency service utilization, and residence in areas with higher deprivation against overall opioid and BDZ/Z use patterns in Alberta.

Data Sources

The data sources used for this analysis include pharmacy dispense data received by TPP Alberta and demographic information available through Alberta Health’s “Alberta Community Profiles”. The Community Profiles document examines census and health data variables to provide a full description of the population of each of the Local Geographic Areas (LGA) in the province¹³. These reports include many variables in the following categories: population health indicators, community mental health, social determinants of health indicators, chronic disease prevalence, maternal and child health, sexually transmitted infections, mortality, emergency service utilization, inpatient service utilization, primary health care indicators, and access to health services.

Data Analysis

There are a large number of variables available in Community Profiles; the variables that were more relevant to the analysis and those with stronger observed correlations were used for the analysis. The correlations among the selected variables appear in Table 25.

The information from Community Profiles described above was analyzed against the variables used to create maps in this report (related to opioid patients and BDZ/Z patients, etc.).

PIN data do not identify patients by Indigenous heritage, visible minority or recent immigration status, therefore consumption rates for each of these population subgroups by geography is not possible. However, an analysis of areas with higher proportions of these subgroups with overall consumption rates for those areas provides some insights for prescription data.

Every pair of variables was compared. The Atlas rates for each geographic area were compared against the relevant population characteristic of the LGA (such as percentage of Indigenous people or the percentage of recent immigrants, etc.) within that geographic area. Consumption rates from geographies with a high percentage of population subgroups (e.g., recent immigrants, Indigenous populations, visible minorities) were compared to areas with lower subgroup percentages.

A Pearson’s correlation analysis was performed for every pair of variables for both the 2016 and 2020 time periods.

Table 25 shows the results of analyses of the correlations between population characteristics and Atlas variables.

Correlations with Atlas Variables

All Atlas variables (opioid patient rates, BDZ/Z patient rates, etc.) had strong correlations with each other.

The percentage of the population with Indigenous heritage status was weakly correlated with opioid patient rates but there were no statistically significant correlations with other Atlas rate data. The percentage of recent immigrants and the percentage of visible minorities in the population had moderate correlations to the Atlas map variables, i.e., stronger correlations than those of the Indigenous heritage subgroup.

ER visits related to substance abuse had weak correlations with several of the Atlas rates variables and moderate correlations with opioids measures and BDZ/Z patient rates. ER visits related to mood and anxiety disorders and ER readmissions within 30 days of discharge had no significant correlations with the opioid

Table 25. Correlation Values Among Selected Geographic Area Population Characteristics and Opioid and BDZ/Z Variables, 2016

The data used to analyze these population characteristics against PIN data are not available at the individual level, therefore all correlations are geographic correlations. All analyses were preformed at the **Local Geographical Area (LGA) level, not PhLAG** ; therefore the geographic areas are similar but not identical to those used elsewhere in the Atlas.

Population Characteristics of Local Geographic Areas (LGAs)

	Opioid Patients Rate	Opioids OME Rate	Opioid Patients with OME ≥ 90 Rate	BDZ/Z Patients Rate	BDZ/Z DDD Rate	BDZ/Z Patients with DDD ≥ 2 Rate
Opioids OME Rate	0.77					
Opioid Patients with OME ≥ 90 Rate	0.69	0.97				
BDZ/Z Patients Rate	0.89	0.85	0.80			
BDZ/Z DDD Rate	0.78	0.89	0.86	0.94		
BDZ/Z Patients with DDD ≥ 2 Rate	0.74	0.88	0.86	0.89	0.99	
Percentage of population - Indigenous Heritage*	0.25	0.10	-0.02	0.12	0.01	0.00
Percentage of population - Visible Minority **	0.32	-0.03	-0.06	0.15	0.01	-0.04
Percentage of population - Recent Immigrants†	0.42	0.12	0.09	0.31	0.17	0.11
Rate - ER visits related to Mood and Anxiety Disorders ‡	0.08	0.12	0.08	0.14	0.12	0.12
Rate - ER visits related to Substance Abuse ‡	0.38	0.28	0.19	0.28	0.19	0.19
Rate - ER Readmissions Within 30 Days of Discharge ‡	0.00	0.10	0.07	0.07	0.11	0.13
Average Canadian Deprivation Index	0.34	0.48	0.48	0.40	0.45	0.45
Percentage of population - Financial Support††	0.35	0.39	0.30	0.30	0.31	0.33

- No Statistically Significant Correlation
- Statistically Significant **Weak** Correlation
- Statistically Significant **Moderate** Correlation
- Statistically Significant **Strong** Correlation

< 0 to 0.18
0.19 to 0.27
0.28 to 0.50
>0.51

All statistically significant correlations are shown with upright and bold text. A value of 1.00 is a perfect correlation. For example:

- The BDZ/Z Patient Rate has a very high correlation with the Opioid Patients Rate (0.89).
- The Percentage of population-Indigenous Heritage characteristic has a weak, but statistically significant correlation with the Opioid Patients Rate.
- The Rate of ER Readmissions within 30 Days of Discharge has no statistically significant correlation with any measure.

* Population percentage of First Nations people with Treaty Status and Inuit

** ‘Visible Minority’ refers to whether a person belongs to a specific visible minority group as defined by the Employment Equity Act. The visible minority population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean and Japanese.

† Recent Immigrant refers to a person who obtained a landed immigrant or permanent resident status up to five years prior to January 1, 2001 through May 10, 2016.

†† Percentage of low-income earners who benefit from the prescriptions drug subsidy under the “Low-Income Health Benefits Program” which is a government-sponsored supplementary health benefit program.

‡ Age Standardized Mortality Rate due to Injuries, 2016-2018. For a complete list of included Injuries, see <https://www.sdrugs.com/?c=icd&s=v01-y98>

‡‡ Rates of types of ER Visits per 100,000 population

Indigenous Population Analysis

There was a weak correlation of the percentage of Indigenous heritage with opioid patient rates, and no statistically significant correlations to the other opioid variables; see Table 25 for the results. According to the aggregated data analysis, areas with higher percentages of Indigenous heritage populations do not show higher levels of consumption (total OME or DDD per 1000 population) of prescribed opioids and BDZ/Zs in comparison to areas with lower percentages of Indigenous populations.

The results of these analyses for 2016 and 2020 were consistent with each other. However, areas with higher proportions of people with Indigenous heritage reported a higher correlation with the rate of opioid patients in 2020 than in 2016. This correlation value was 0.25 in 2016 and rose to 0.39 in 2020, indicating that opioid patients per 1000 population has become more strongly associated with geographies that have a higher indigenous population over time. In the same time period, the correlation between the percentage of Indigenous heritage in the population and BDZ/Z patients rose from 0.12 to 0.13. One potential explanation for the observed patterns could be that efforts to reduce opioid and BDZ/Z use have been less successful in geographies with a higher indigenous population. However, the current analysis is insufficient to make any conclusive deductions on this. Further investigation is warranted to understand the increasing correlation reported in this analysis.

For a full report on opioid consumption in Alberta’s First Nations population, please refer to “Alberta Opioid Response Surveillance Report: First Nations People in Alberta (December 2021)”¹⁴.

Immigrants in the Last Five Years and Visible Minorities

Areas with high percentages of recent immigrants show moderate correlations with opioid and BDZ/Z patient rates but not to any of the consumption level variables. Areas with higher percentages of visible minorities in the population also show moderate correlations to opioid patient rates only; no other statistically significant correlations were found.

All of these patterns were consistent in 2016 and 2020. The immigration information used in this analysis is based on census data, which is only available in time frames of “previous five years.”

Emergency Service Utilization - ER Visit Rates

Emergency service utilization variables in the Alberta Community Profiles information include rates of various types of ER visits per 100,000 population within a geographic area (LGA).

In the results of these analyses, there are moderate correlations with rates of ER Visits for substance abuse and opioid patient rates, opioid OME rates and BDZ/Z patient rates, as well as weak correlations to the other Atlas variables. There were no statistically significant correlations between Atlas variables and the rates of ER visits related to mood or anxiety disorders or with the rates of ER readmissions within 30 days. The results were consistent in 2016 and 2020.

Deprivation Index

There are moderate correlations between the Deprivation Index and all the Atlas rates measures analyzed. This suggests that a population with a higher deprivation index is more likely to have patients who received opioid or BDZ/Z products. These results are consistent with the urban/rural status analysis where suburban areas reported lower Atlas rates. The results were consistent for 2016 and 2020.

Percentage of the Population Who Receive Financial Support

The percentage of the population who receive government financial support had moderate correlations with all Atlas rate variables used in this analysis. The results were consistent in 2016 and 2020.

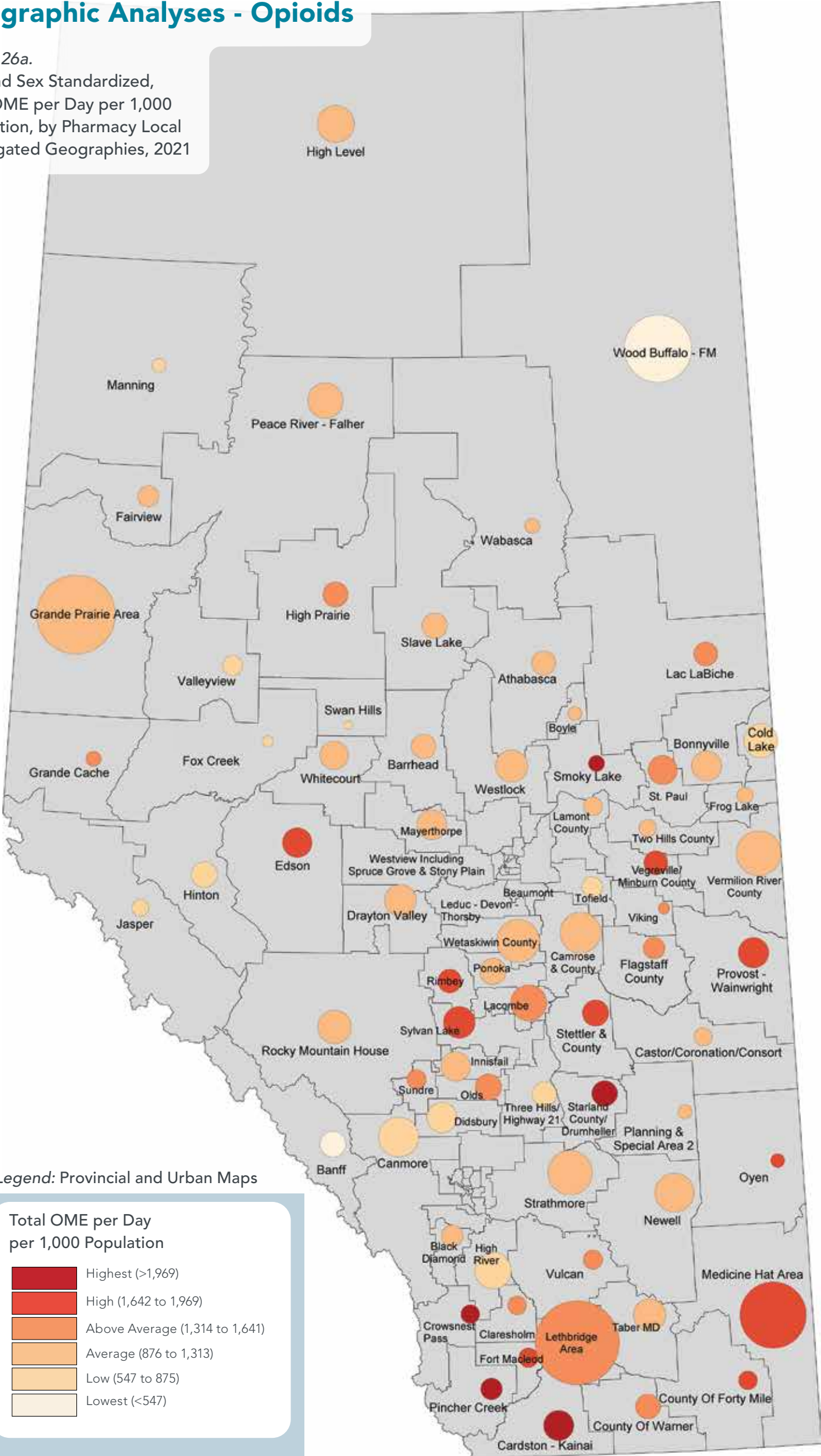
Limitations

All analyses were done by proxy because we do not know the characteristics of any patient beyond the dispense level data available to TPP; all analyses were completed at an aggregated level and therefore there are possible associations but no way to confirm these results. The trends observed may be stronger or weaker at the individual level, but this type of analysis required access to very sensitive data from multiple provincial and national agencies and privacy rules prevent such analysis. We also do not have indication data to ascertain whether differences in disease burden for conditions (e.g., chronic pain, opioid use disorder or anxiety spectrum disorders) relate to higher consumption rates of opioids and/or BDZ.Zs in some area relative to others.

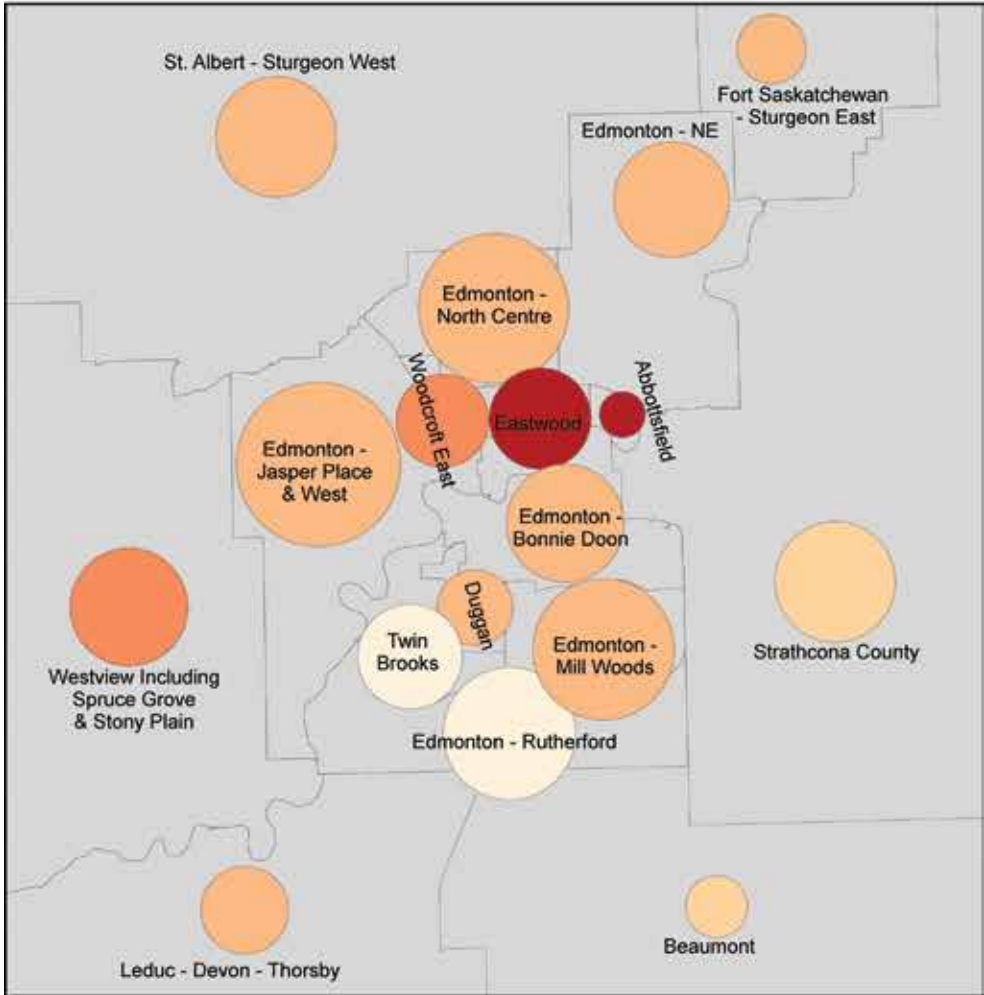
¹³ <https://open.alberta.ca/dataset?q=%22Community+Profiles%22%26%22health+data%22&sort=score+desc>
¹⁴ <https://open.alberta.ca/publications/alberta-opioid-response-surveillance-report-first-nations-people-2021>

Geographic Analyses - Opioids

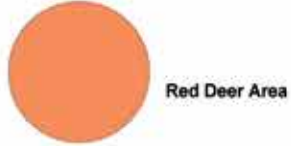
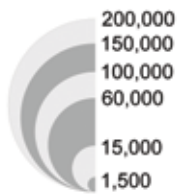
Figure 26a.
Age and Sex Standardized,
Total OME per Day per 1,000
Population, by Pharmacy Local
Aggregated Geographies, 2021



Edmonton



Population



Calgary

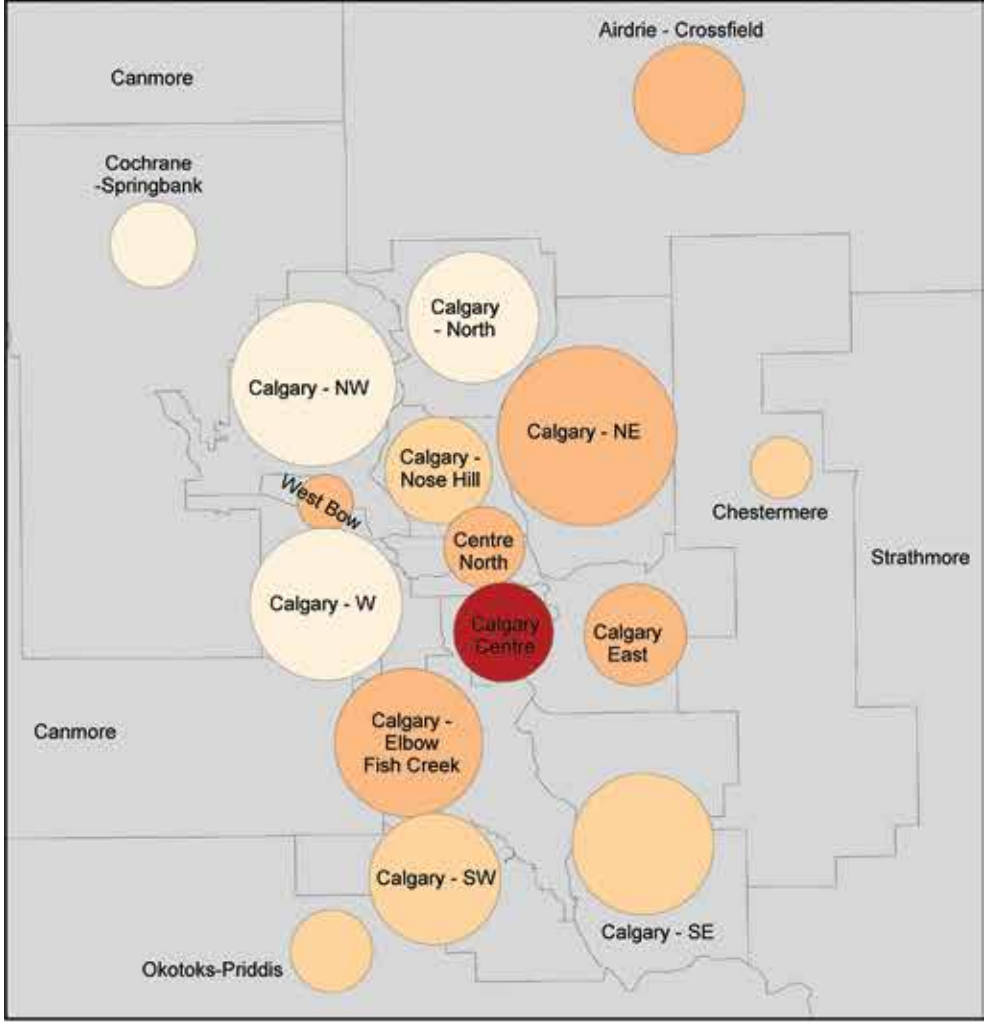


Figure 26b. Age and Sex Standardized, Total OME per Day per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

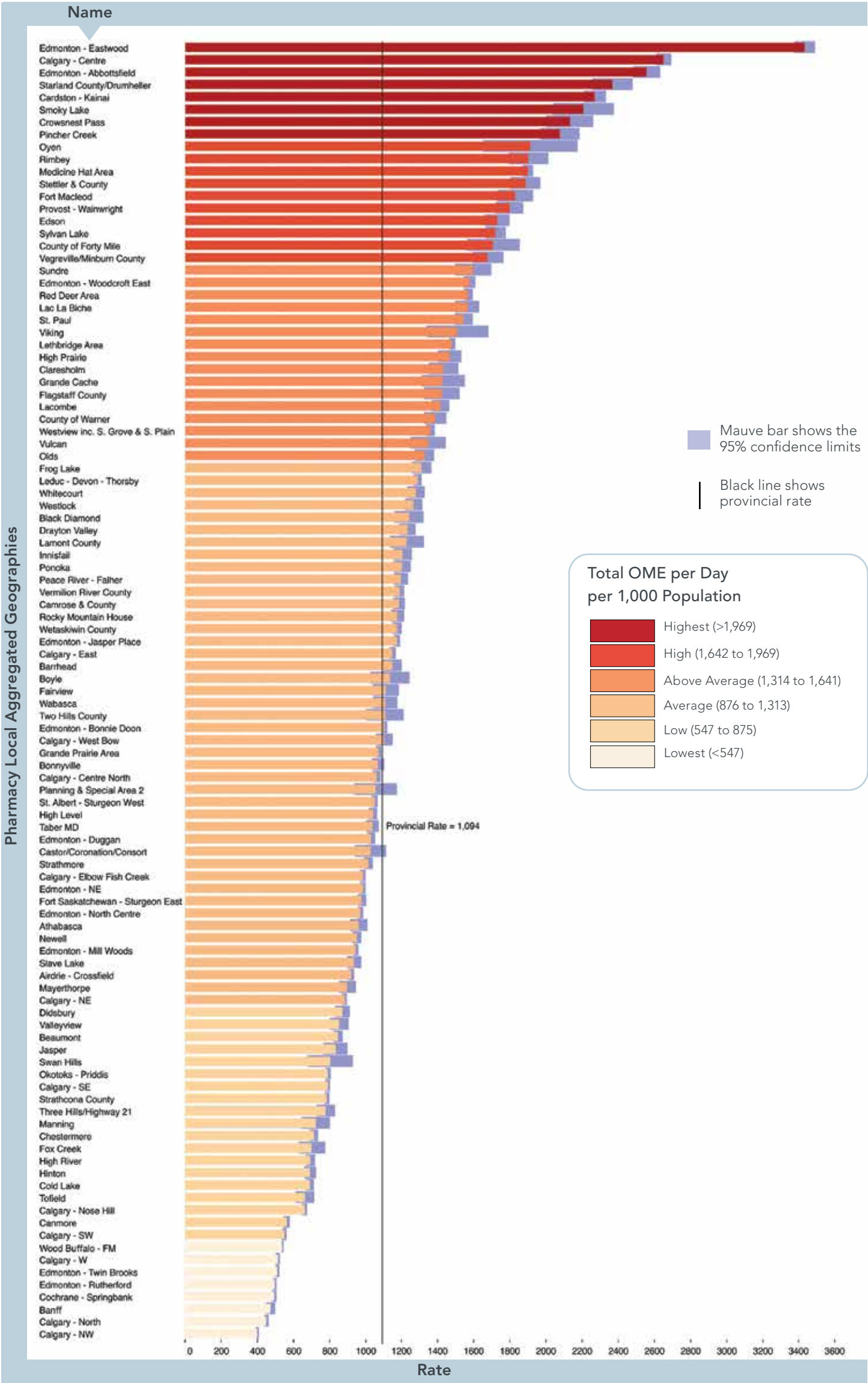
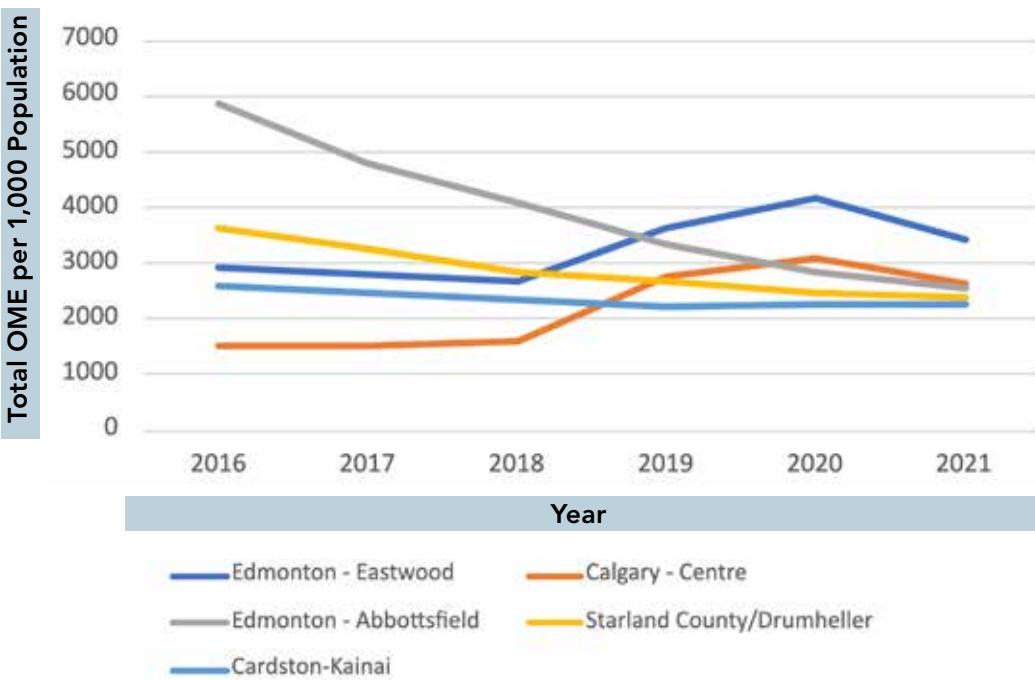


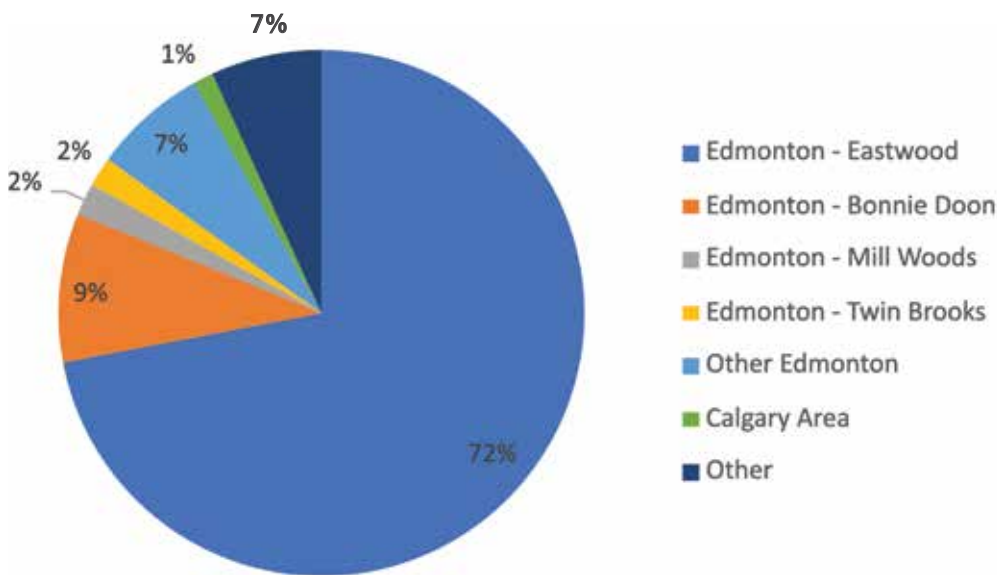
Figure 26c. Six Year Trends of Total OME per Day for the Top Five PhLAGs in 2021, based on 2021 Rates



Edmonton - Abbottsfield has experienced a dramatic decrease in the last six years and its rate has decreased to half of the 2016 rate. Starland County/Drumheller and Cardston-Kanai have also shown consistent decreases. Edmonton - Eastwood and Calgary - Centre had been increasing, but the trend changed in 2021.

Suburban areas consistently reported low OME consumption rates. Cities, Calgary, and Edmonton show a mix of consumption rates from Lowest to Highest. The lowest rates are associated with low levels of deprivation and other rates are associated with an average level of deprivation.

Figure 26d. Opioid Prescriber Locations for Opioid Dispenses in Edmonton Eastwood Pharmacies, 2021



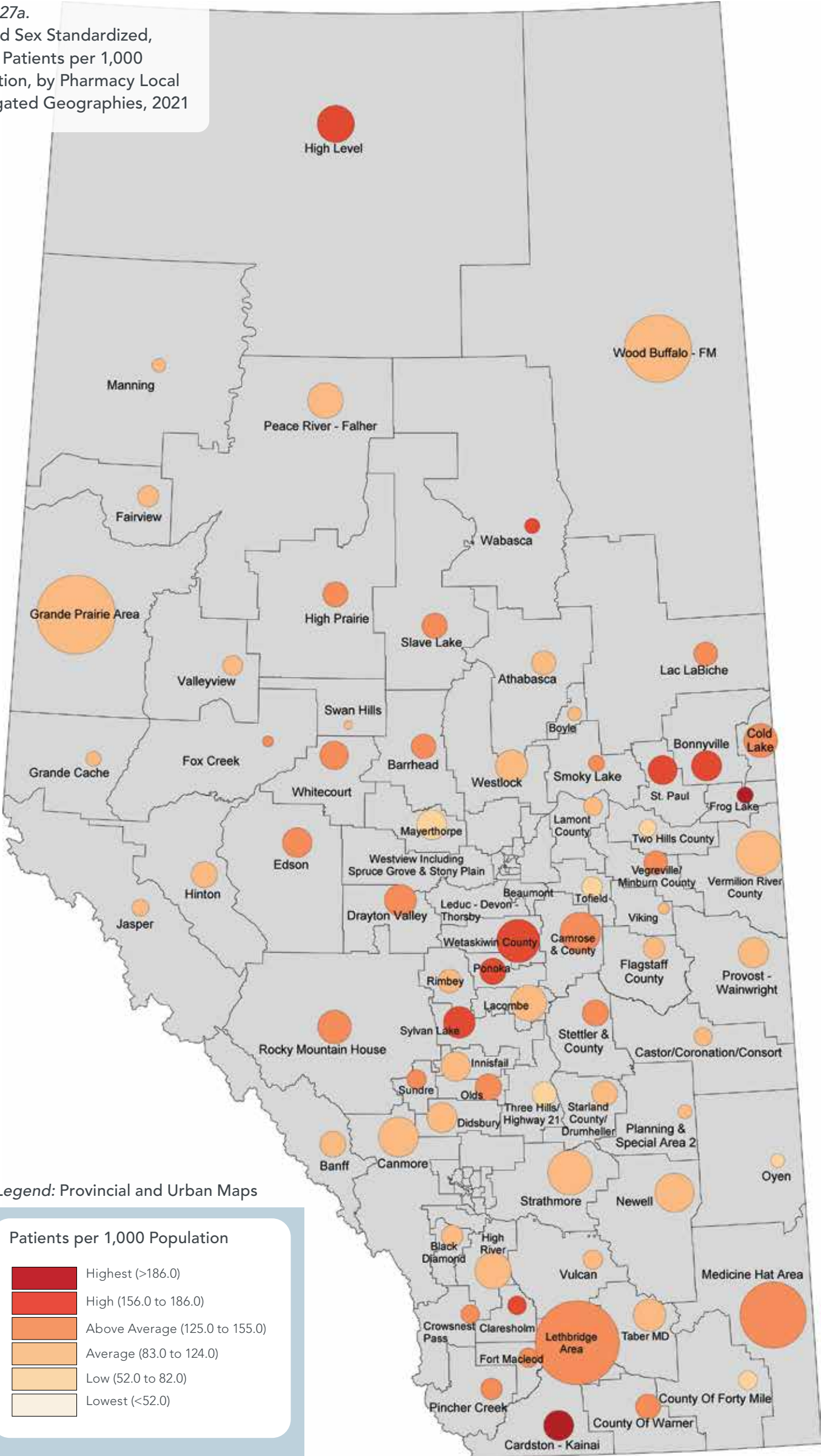
The graph shows the prescriber cities and towns associated with dispenses from Edmonton - Eastwood pharmacies (the area with the highest rate). Many patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: 83% of Opioid Patient prescribers for Edmonton - Eastwood pharmacies are in Edmonton - Eastwood and adjacent PhLAGs in the City of Edmonton.

Note: The number of prescriptions and patients per 1,000 population are similar in Edmonton - Eastwood (EE) and Edmonton - Abbottsfield (EA).

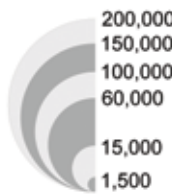
The total number of prescribers is twice as high in Edmonton - Abbottsfield than Edmonton - Eastwood, but the number of dispenses is twice as high in Edmonton - Eastwood than Edmonton - Abbottsfield.

Figure 27a.
Age and Sex Standardized,
Opioid Patients per 1,000
Population, by Pharmacy Local
Aggregated Geographies, 2021



Edmonton

Population



Calgary

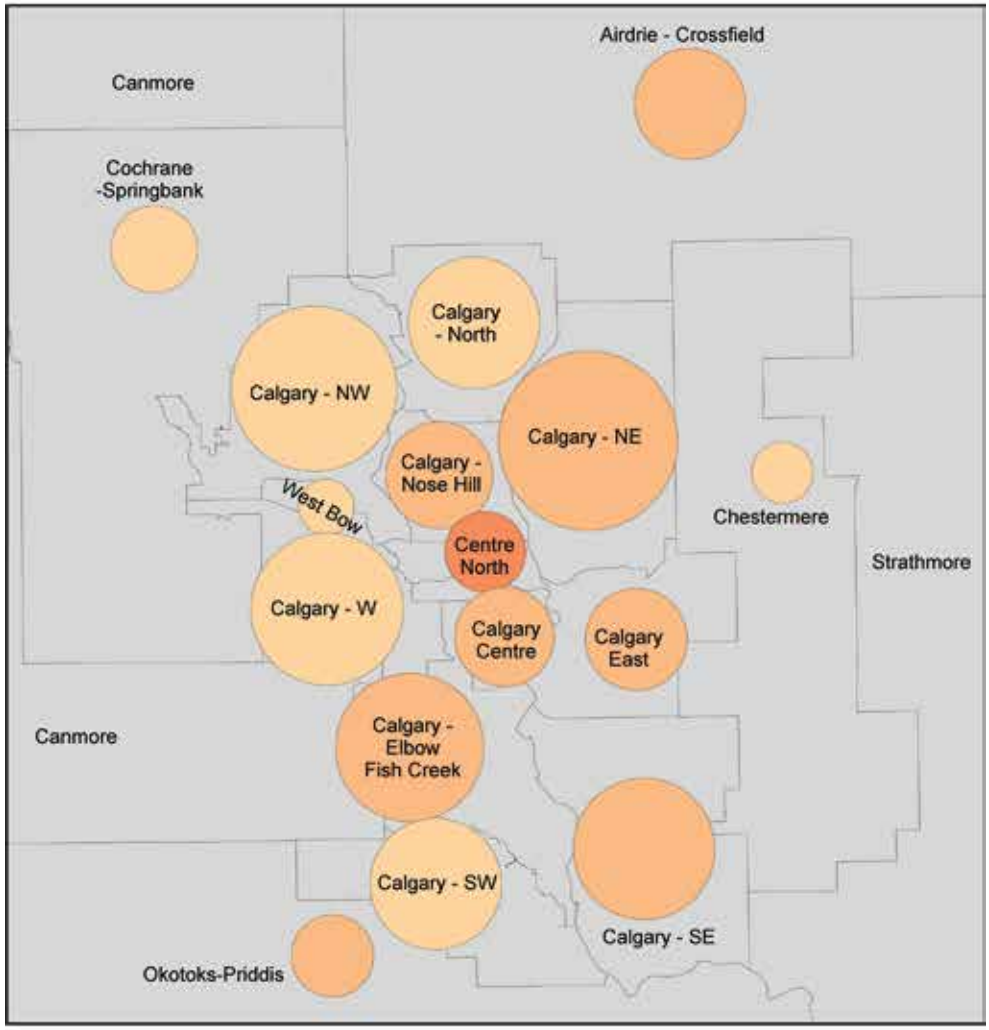
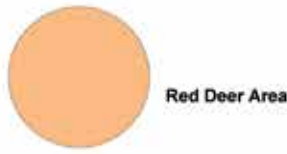
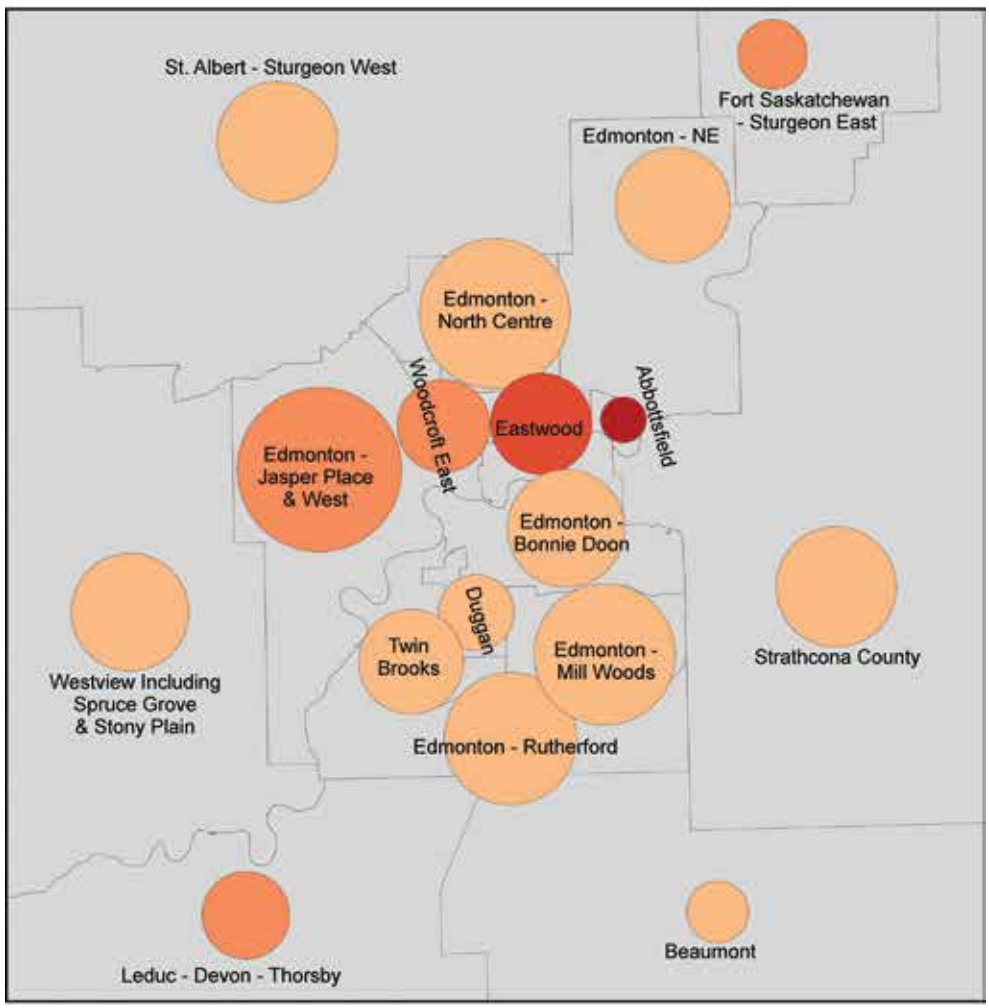


Figure 27b. Age and Sex Standardized, Opioid Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

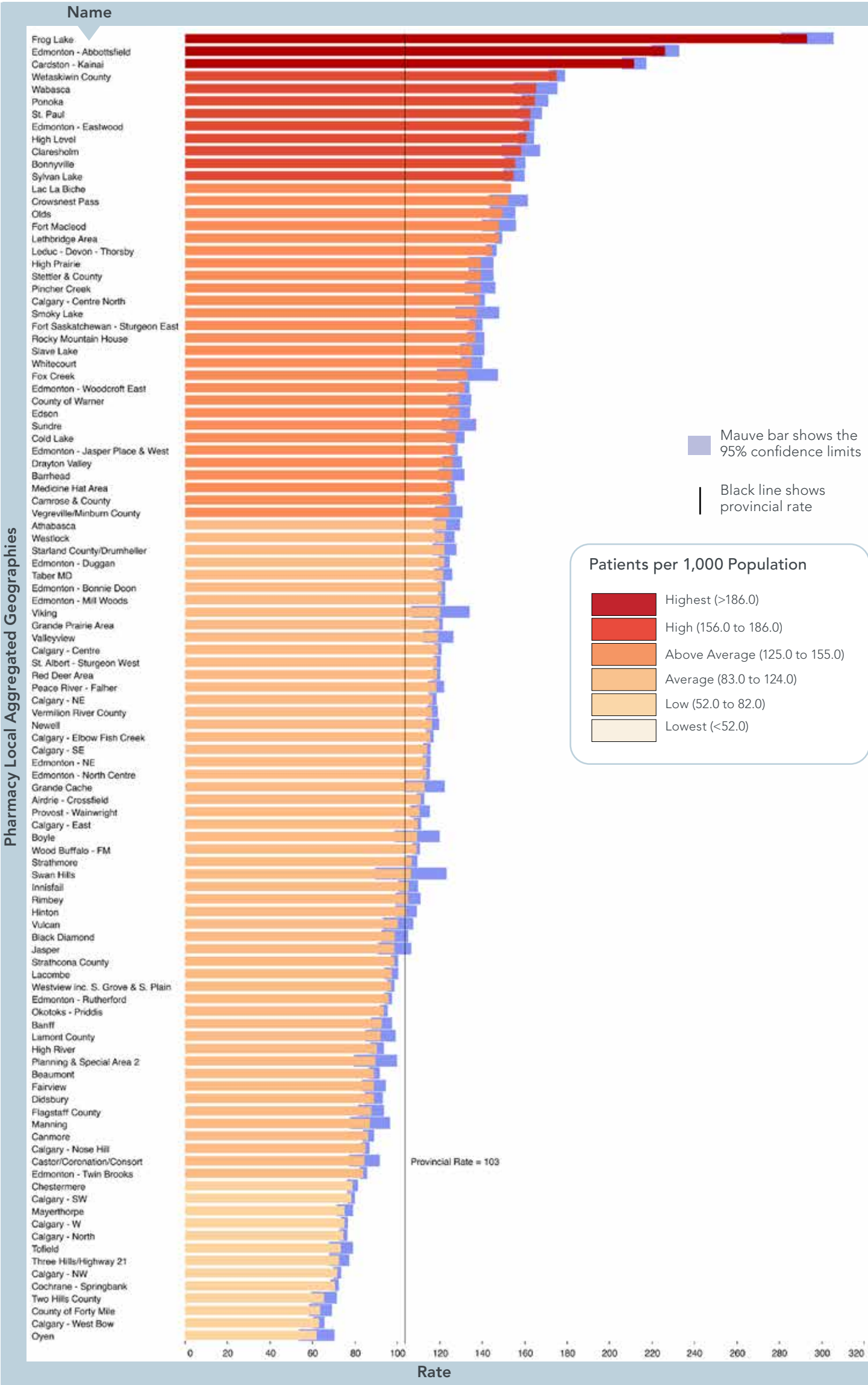
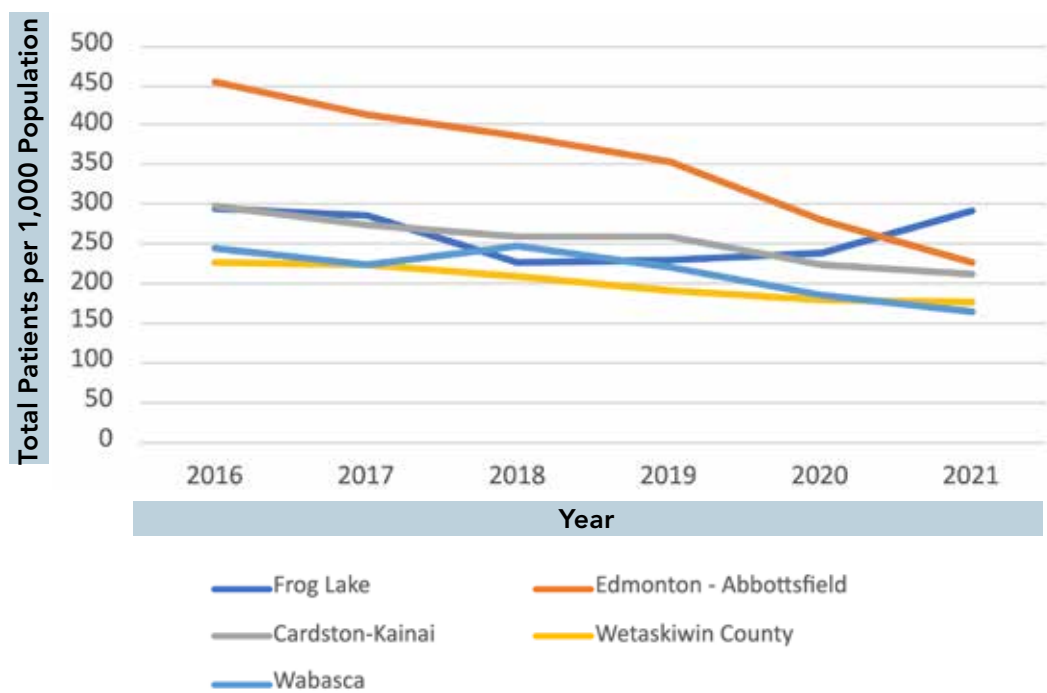


Figure 27c. Six Year Trends of Opioid Patients for the Top Five PhLAGs in 2021, based on 2021 Rates

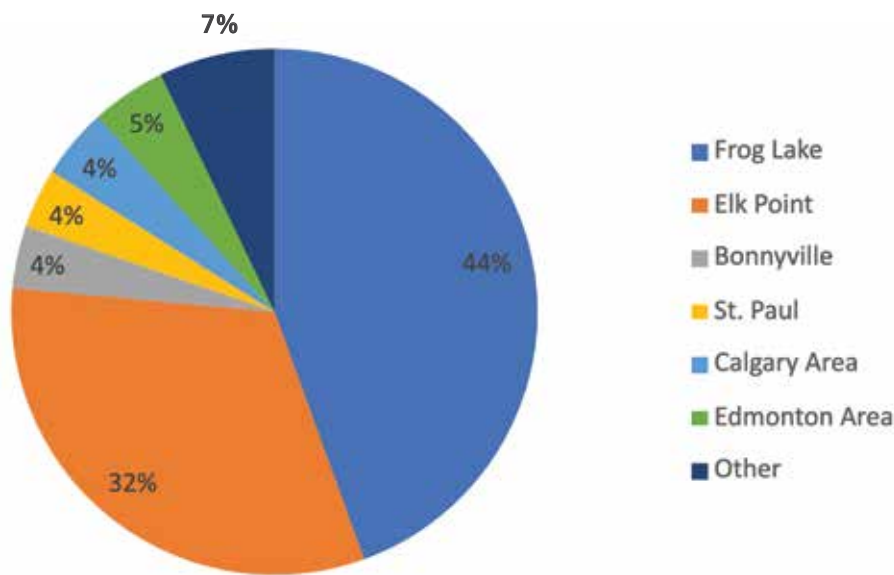


Four geographic areas have shown consistent declines in the observed rates and only Frog Lake has been rising. Edmonton - Abbottsfield has decreased to almost half of the rate of 2016. It is encouraging to see a consistent decrease in all these PhLAGs with the exception of Frog Lake.

Suburban areas consistently reported low rates of patients per 1,000 population. Rural, Calgary and Edmonton show a mix from Low to Highest rates. Cities show Average and Above Average rates.

The lowest rates are observed in areas with the lowest deprivation indices and the highest rates in areas with the highest deprivation.

Figure 27d. Opioid Prescriber Locations for Opioid Dispenses in Frog Lake Pharmacies, 2021

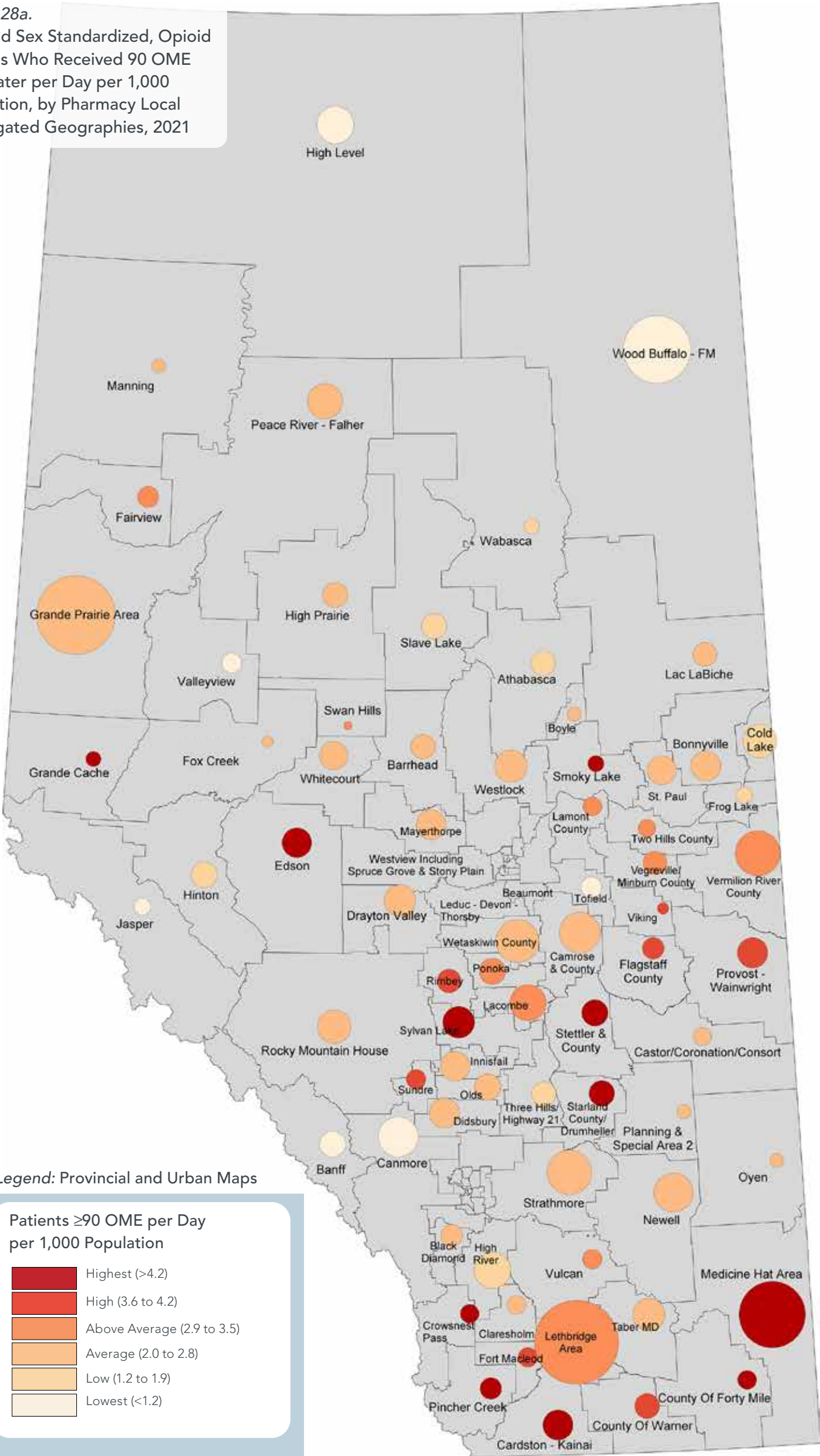


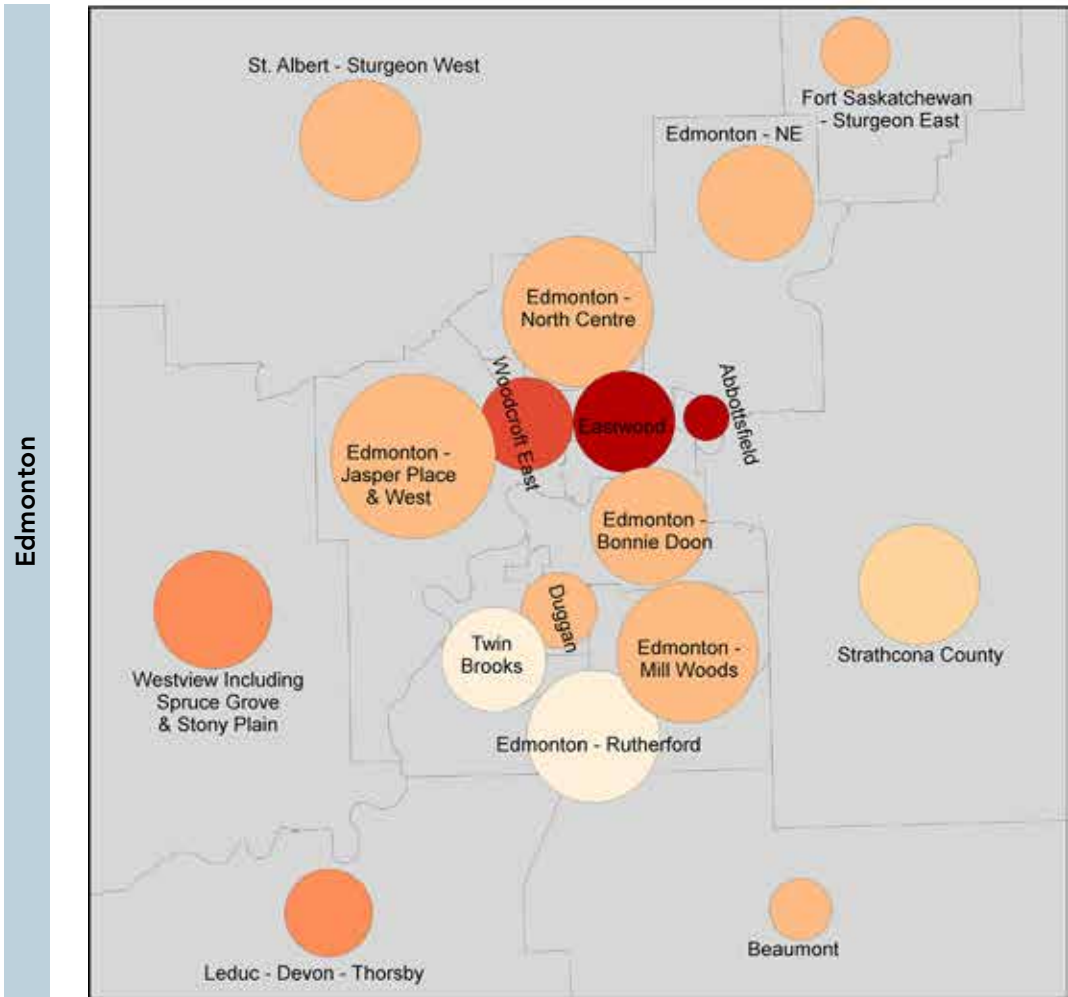
The graph shows the prescriber cities and towns associated with dispenses from Frog Lake pharmacies (the area with the highest rate). Many patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: 84% of Opioid Patient prescribers for Frog Lake pharmacies are in Frog Lake, Elk Point, Bonnyville, and St. Paul.

Note: Frog Lake and Smoky Lake have similar rates of prescribers, prescriptions, and dispenses per population, yet the rate of patients is dramatically higher in Frog lake than in Smoky Lake.

Figure 28a.
 Age and Sex Standardized, Opioid
 Patients Who Received 90 OME
 or Greater per Day per 1,000
 Population, by Pharmacy Local
 Aggregated Geographies, 2021





Population

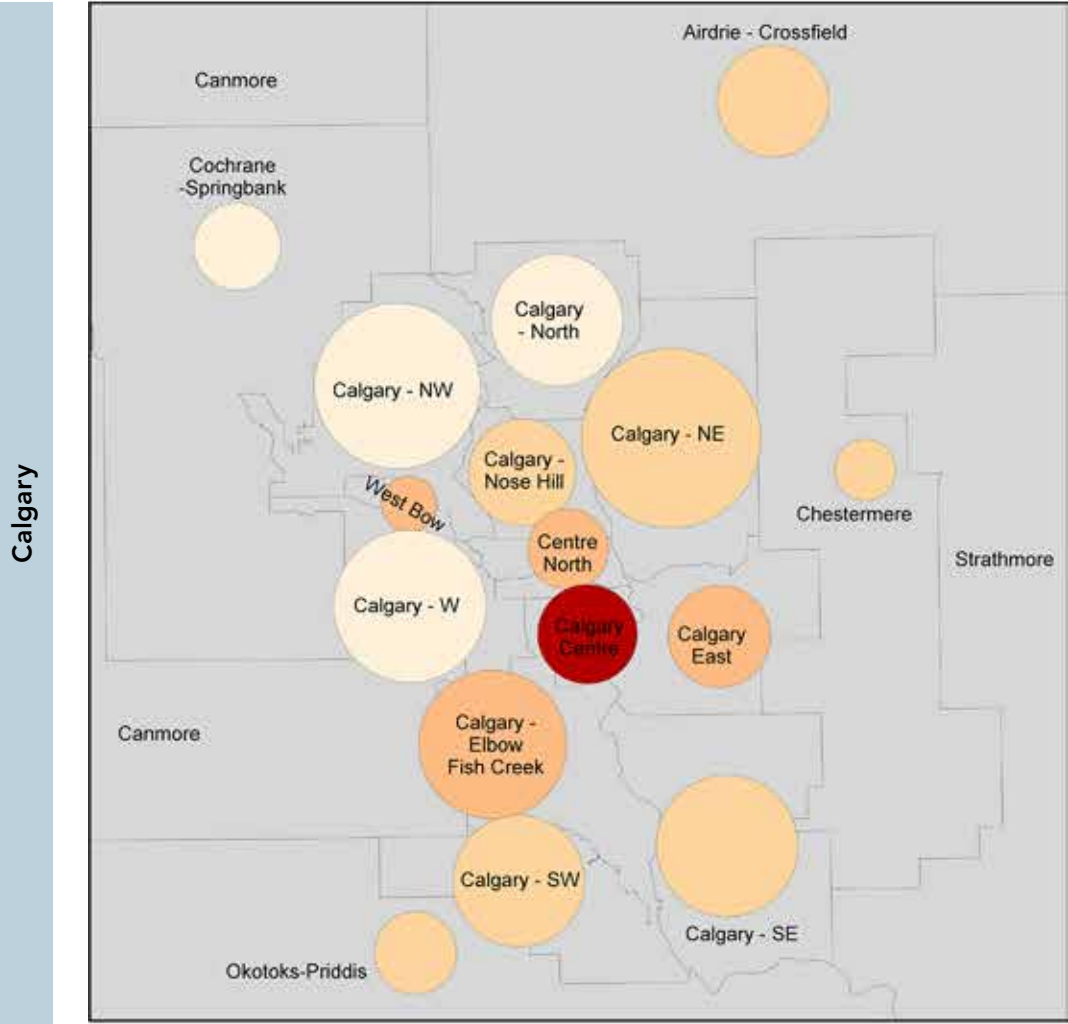
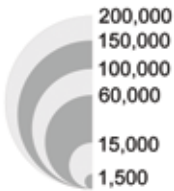


Figure 28b. Age and Sex Standardized, Opioid Patients Who Received 90 OME or Greater per Day per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

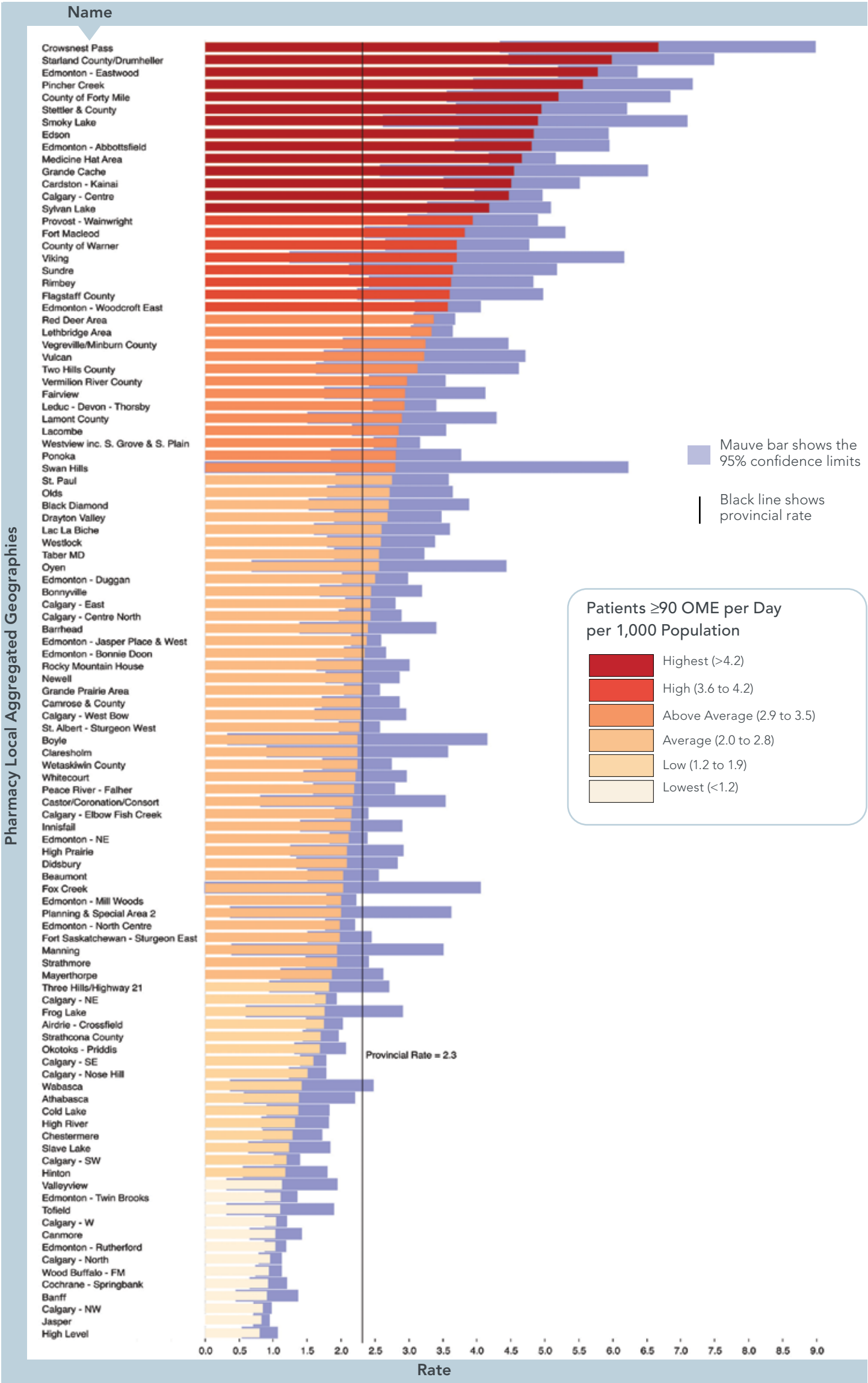
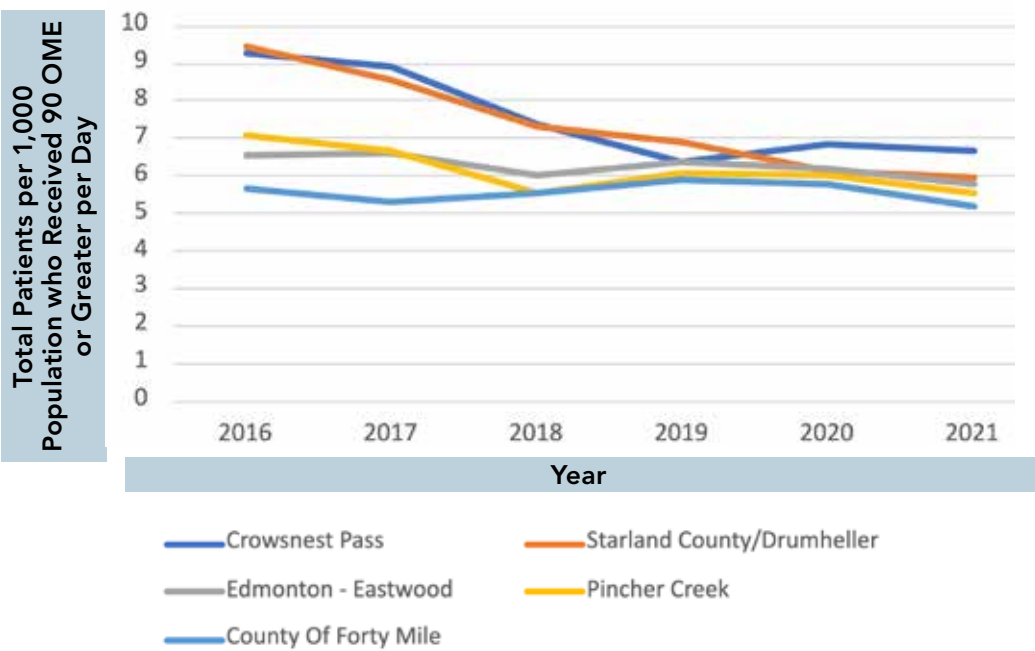


Figure 28c. Six Year Trends for Opioid Patients Who Received 90 OME or Greater per Day for the Top Five PhLAGs in 2021, Based on 2021 Rates

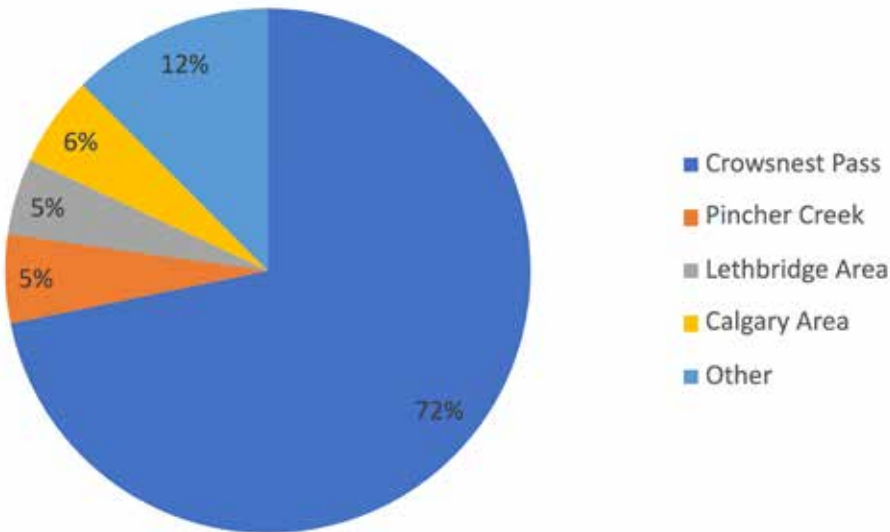


There were decreases in the number of patients consuming larger doses of opioids until 2019, when the trend plateaued, before a slight decrease was observed in 2021. The differences among the top five areas have decreased dramatically over the last six years.

Suburban areas consistently reported low OME consumption rates. Cities, Calgary, Edmonton and Rural areas show a mix from lowest to highest.

There is an association between lower rates and lower deprivation levels. Deprivation levels above Average are associated with a mix of rates from Above Average to Highest; higher deprivation does not result in higher rates.

Figure 28d. Opioid Prescriber Locations for Opioid Dispenses in Crowsnest Pass Pharmacies, 2021



The graph shows the prescriber cities and towns associated with dispenses from Crowsnest Pass pharmacies (the area with the highest rate). Many patients obtain a prescription in one location but have dispenses in a different geographic area.

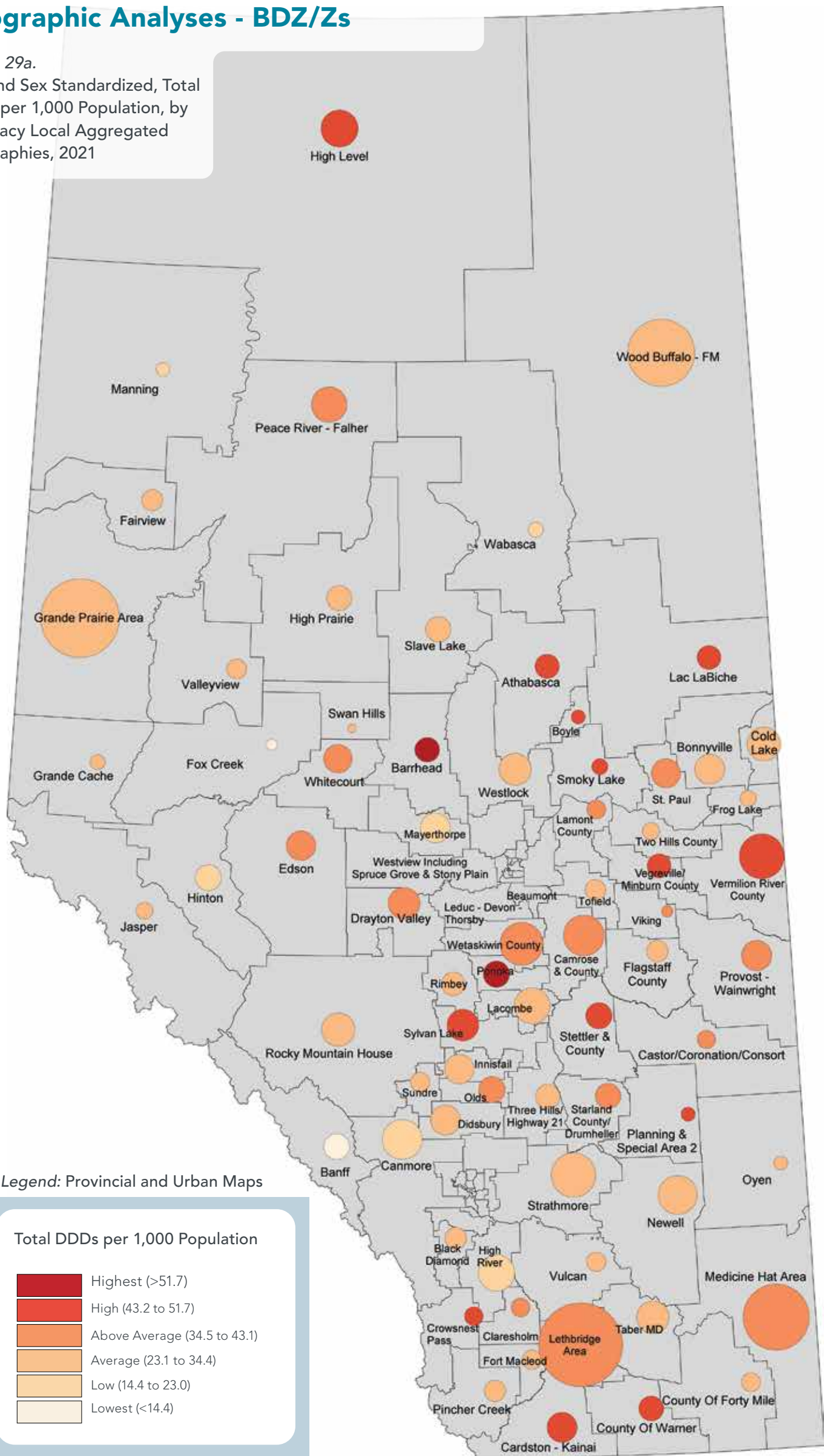
Note: 77% of Opioid Patient prescribers for Crowsnest Pass pharmacies are in Crowsnest Pass and Pincher Creek.

Note: Cardston - Kainai reports dramatically higher rates of prescriptions and dispenses per resident than Crowsnest Pass.

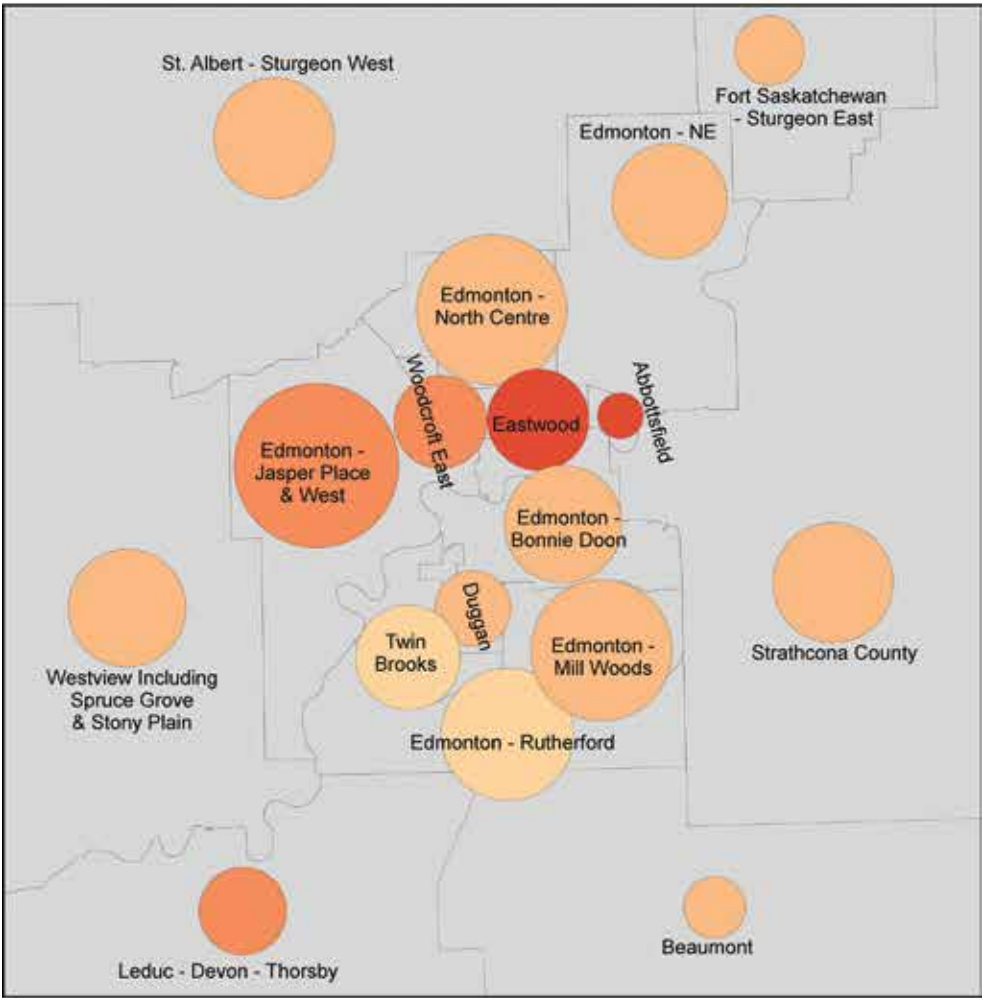
Note: Crowsnest Pass reports twice as many prescribers per resident as Cardston - Kainai and both have similar rates of patients per 1,000 population.

Geographic Analyses - BDZ/Zs

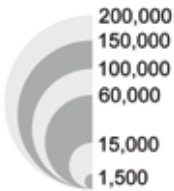
Figure 29a.
Age and Sex Standardized, Total
DDDs per 1,000 Population, by
Pharmacy Local Aggregated
Geographies, 2021



Edmonton



Population



Calgary

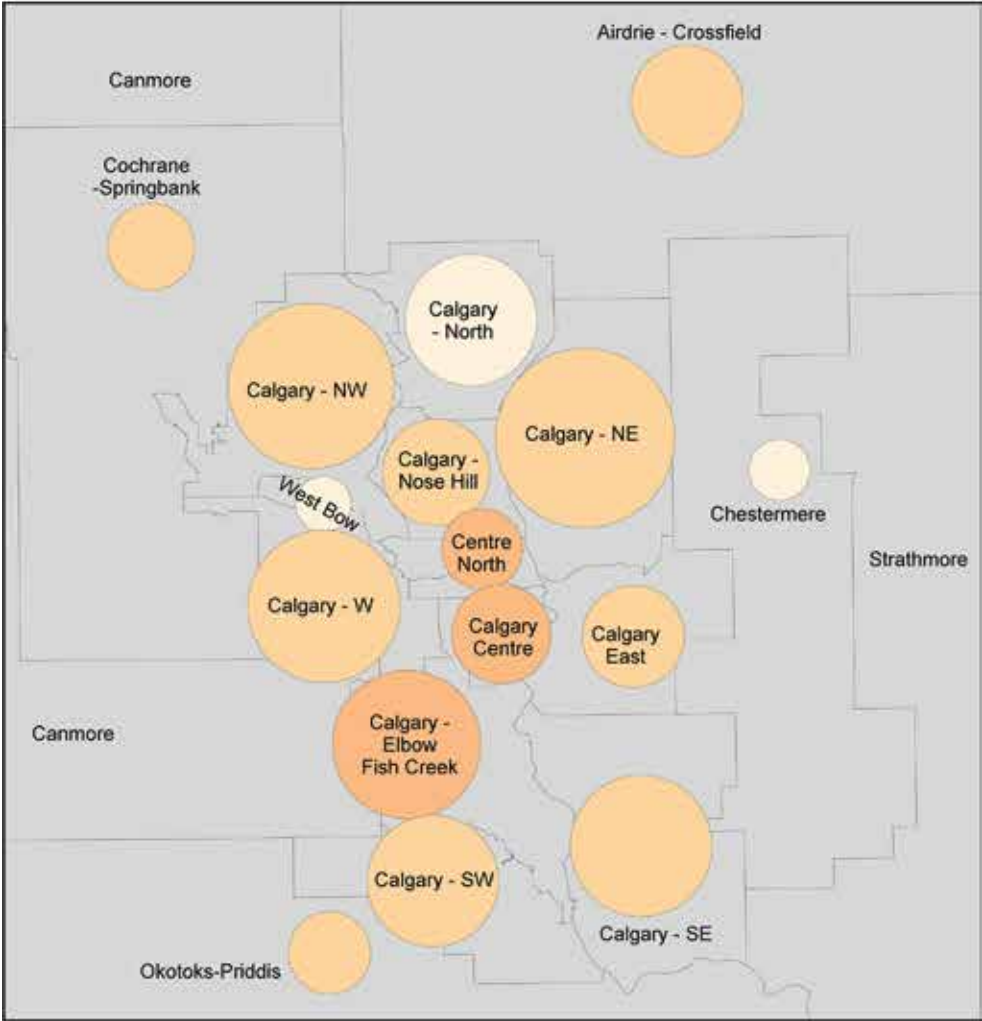


Figure 29b. Age and Sex Standardized, Total DDDs per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

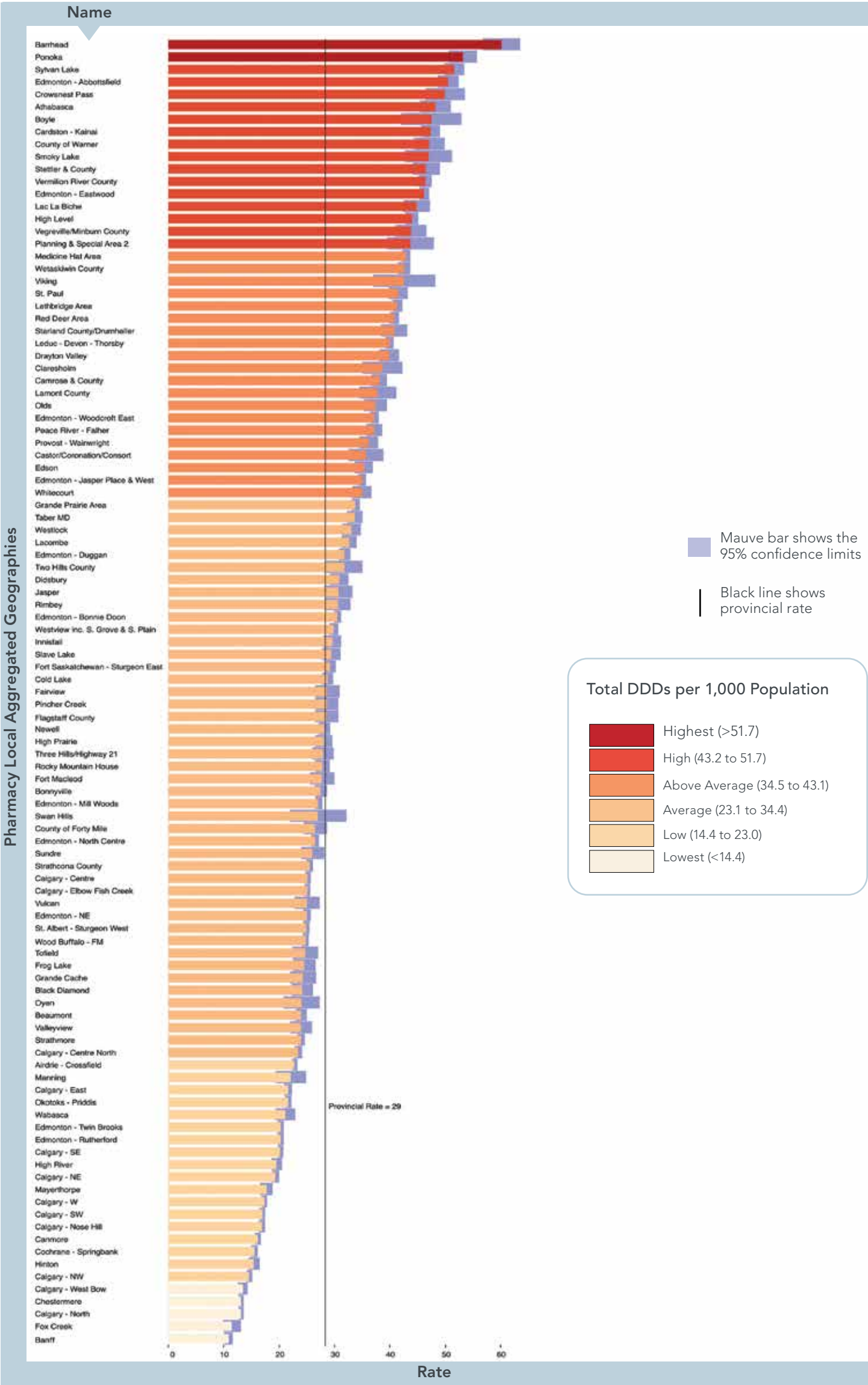
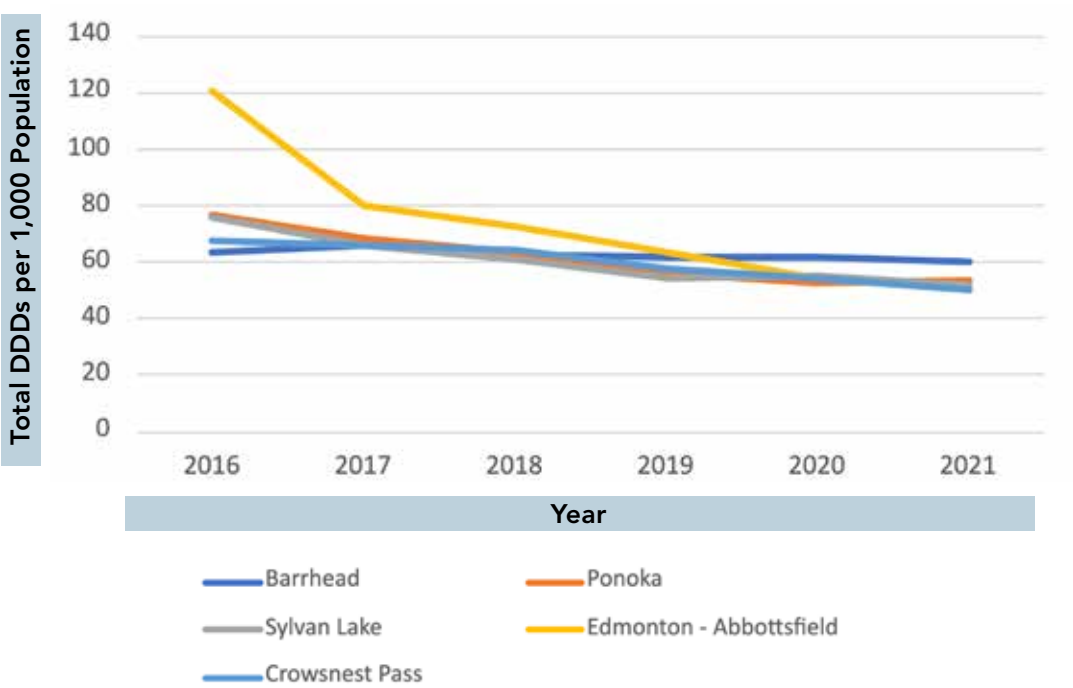


Figure 29c. Six Year Trends of BDZ/Z Patients for the Top Five PhLAGs in 2021, based on 2021 Rates

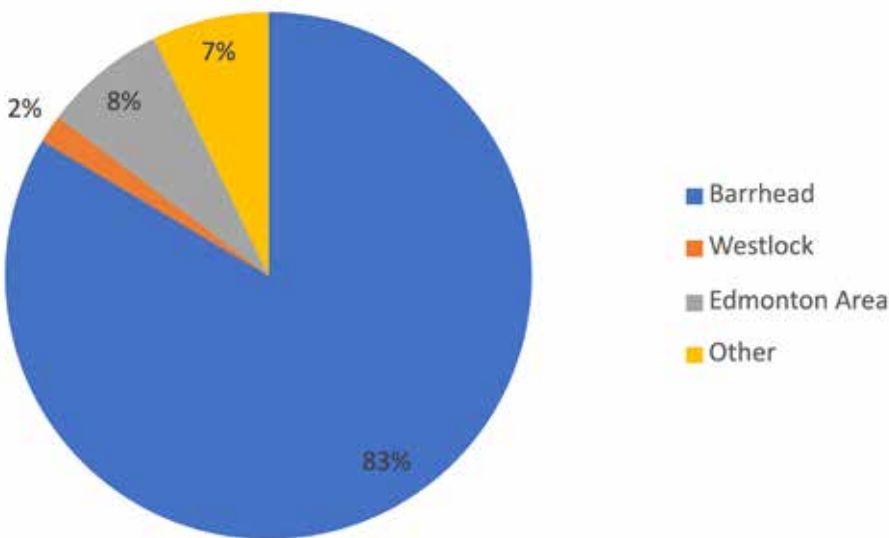


Four geographic areas have shown consistent declines in the observed rates, but one area has been rising slightly and now has the highest observed rate: Barrhead. Two areas which were among the top areas with the highest rates in 2016 have decreased consistently during the past six years, especially Edmonton - Abbotsfield with a rate in 2021 half as high as in 2016.

Suburban areas consistently reported low BDZ/Z consumption rates. Rural, Calgary and Edmonton show a mix from Highest to Lowest. Cities show Average to Above Average rates.

The lowest rates are observed in areas with the lowest deprivation indices and the highest rates in areas with the highest deprivation scores.

Figure 29d. BDZ/Z Prescriber Locations for BDZ/Z Dispenses in Barrhead Pharmacies, 2021

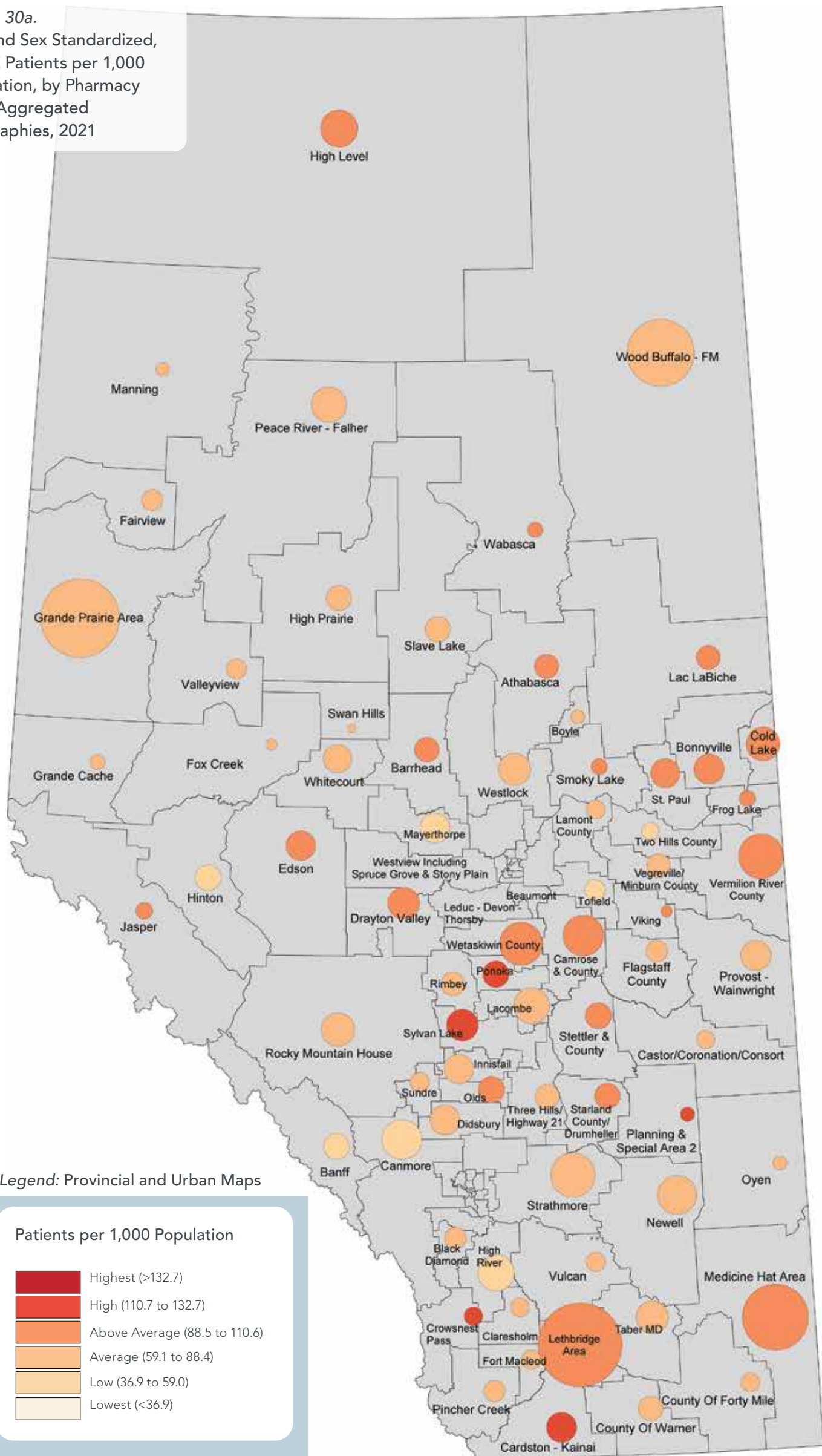


The graph shows the prescriber cities and towns associated with Barrhead dispenses (the area with the highest rate) because many patients obtain a prescription in one location but have dispenses in a different geographic area.

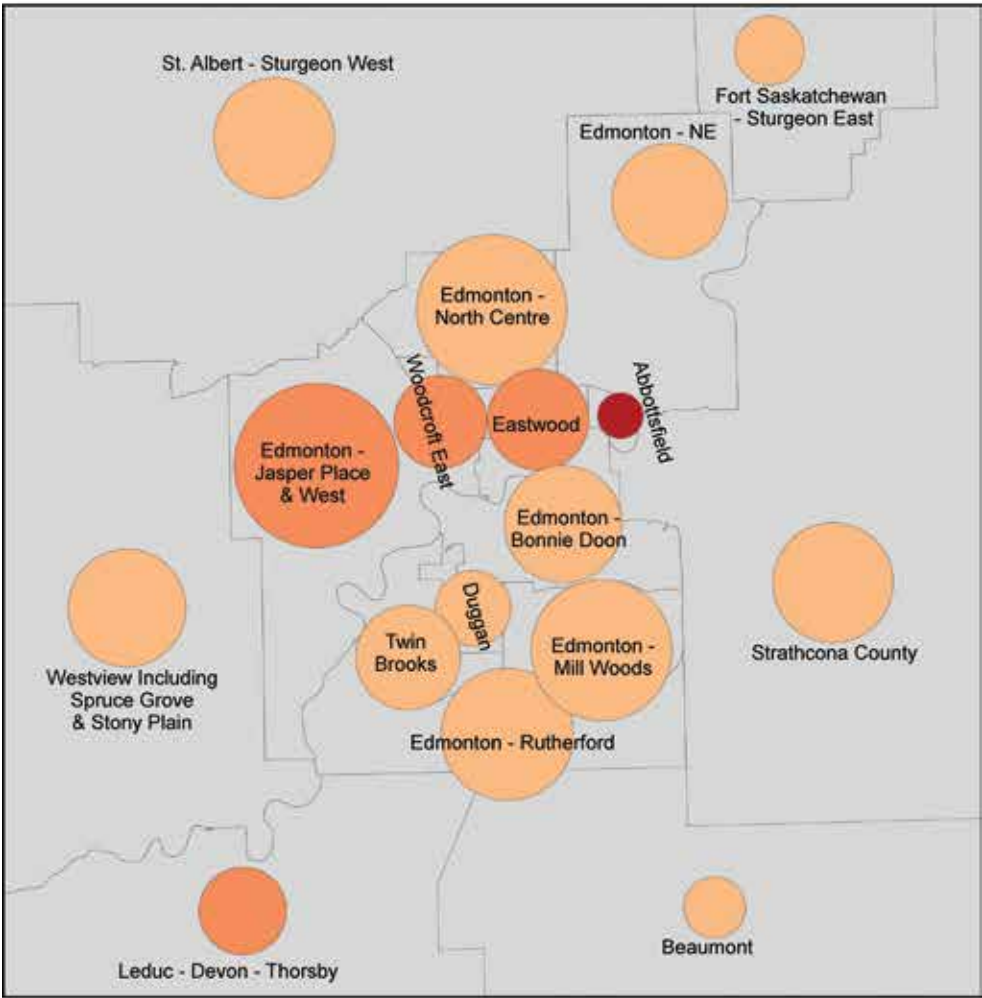
Note: 85% of BDZ/Z Patient prescribers for Barrhead pharmacies are in Barrhead and Westlock.

Note: Despite the fact that Barrhead reports lower rates for prescribers, patients, prescriptions and dispenses per 1,000 population, Barrhead still has the highest DDDs per 1,000 population in the province, possibly due to higher dosages in the given prescriptions.

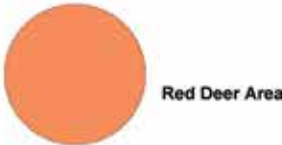
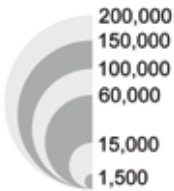
Figure 30a.
Age and Sex Standardized,
BDZ/Z Patients per 1,000
Population, by Pharmacy
Local Aggregated
Geographies, 2021



Edmonton



Population



Calgary

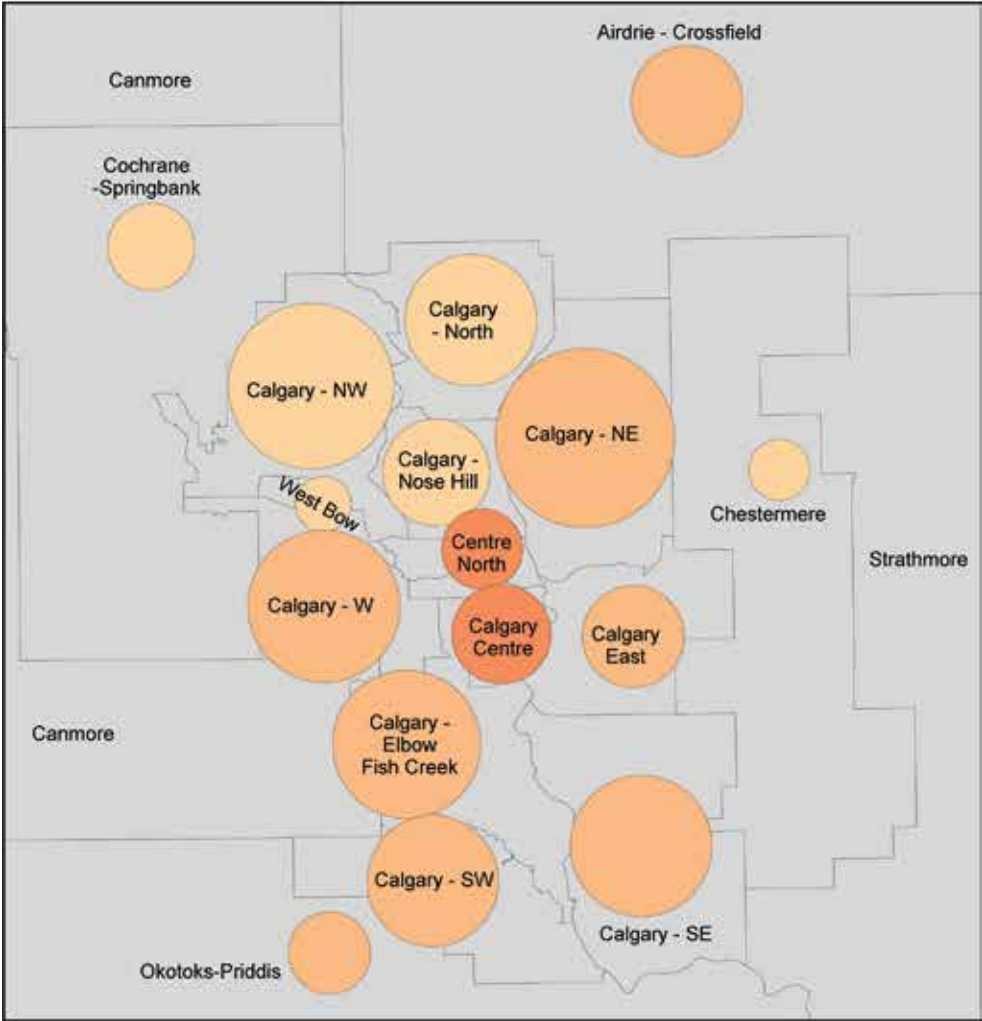


Figure 30b. Age and Sex Standardized, BDZ/Z Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

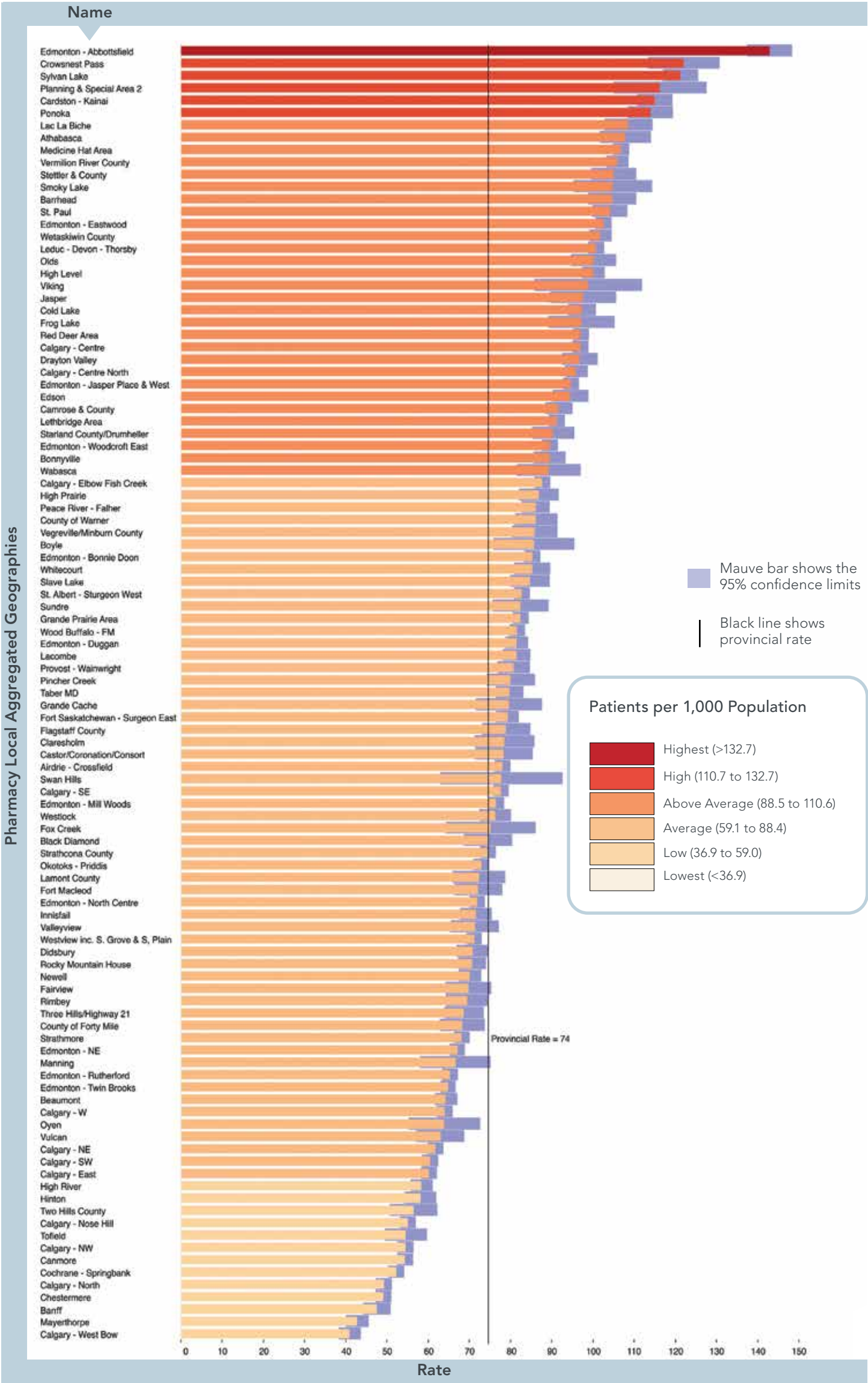
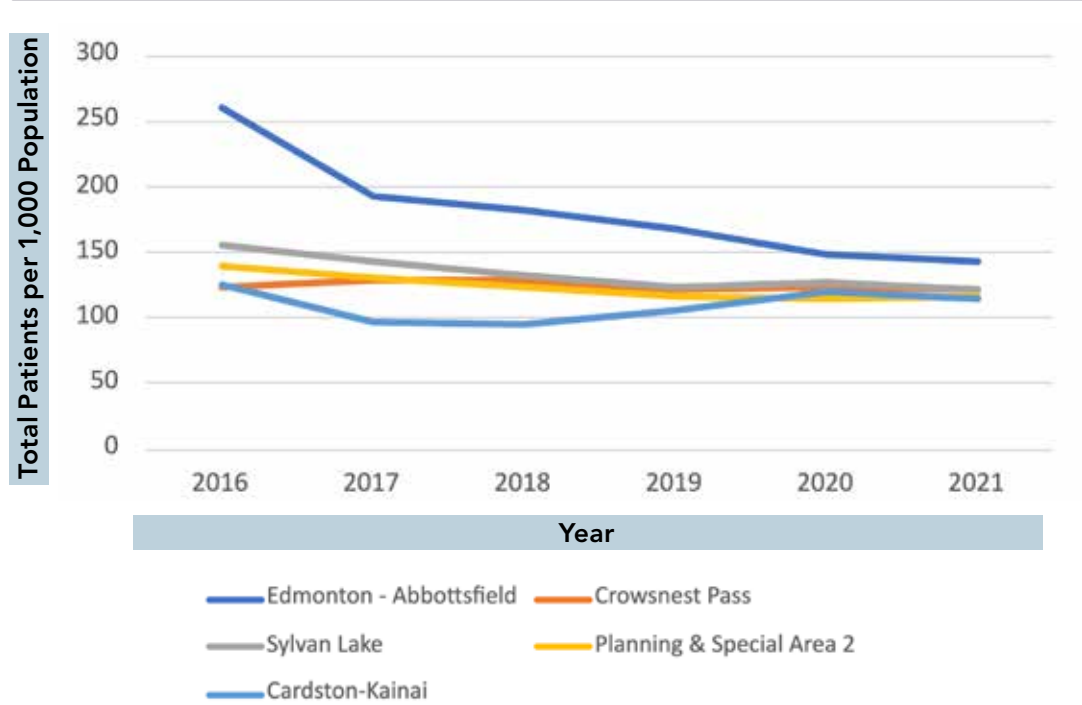


Figure 30c. Six Year Trends of BDZ/Z Patients for the Top Five PhLAGs in 2021, based on 2021 Rates

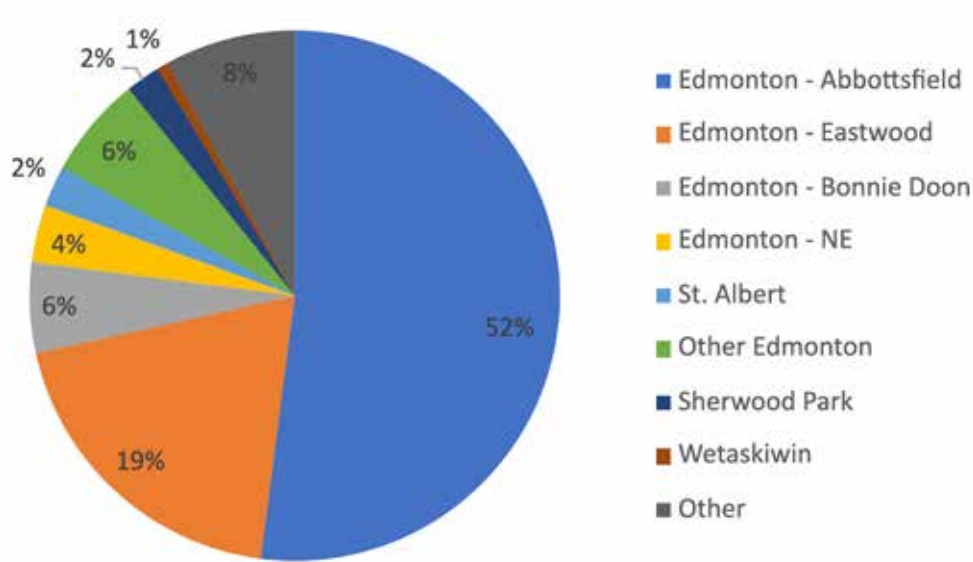


Edmonton - Abbottsfield has shown a remarkable decline over the last six years but remains the area with the highest rate. The rates for the other four PhLAGs have converged and have rates a bit lower than Edmonton - Abbottsfield.

Most Suburban areas report rates in Low to Average categories. Rural and Metro areas show a mix of several categories and Cities show Average to Above Average categories.

The lowest rates are observed in areas with the lowest deprivation indices and the highest rates in areas with the highest deprivation scores.

Figure 30d. BDZ/Z Prescriber Locations for BDZ/Z Dispenses in Edmonton - Abbottsfield Pharmacies, 2021



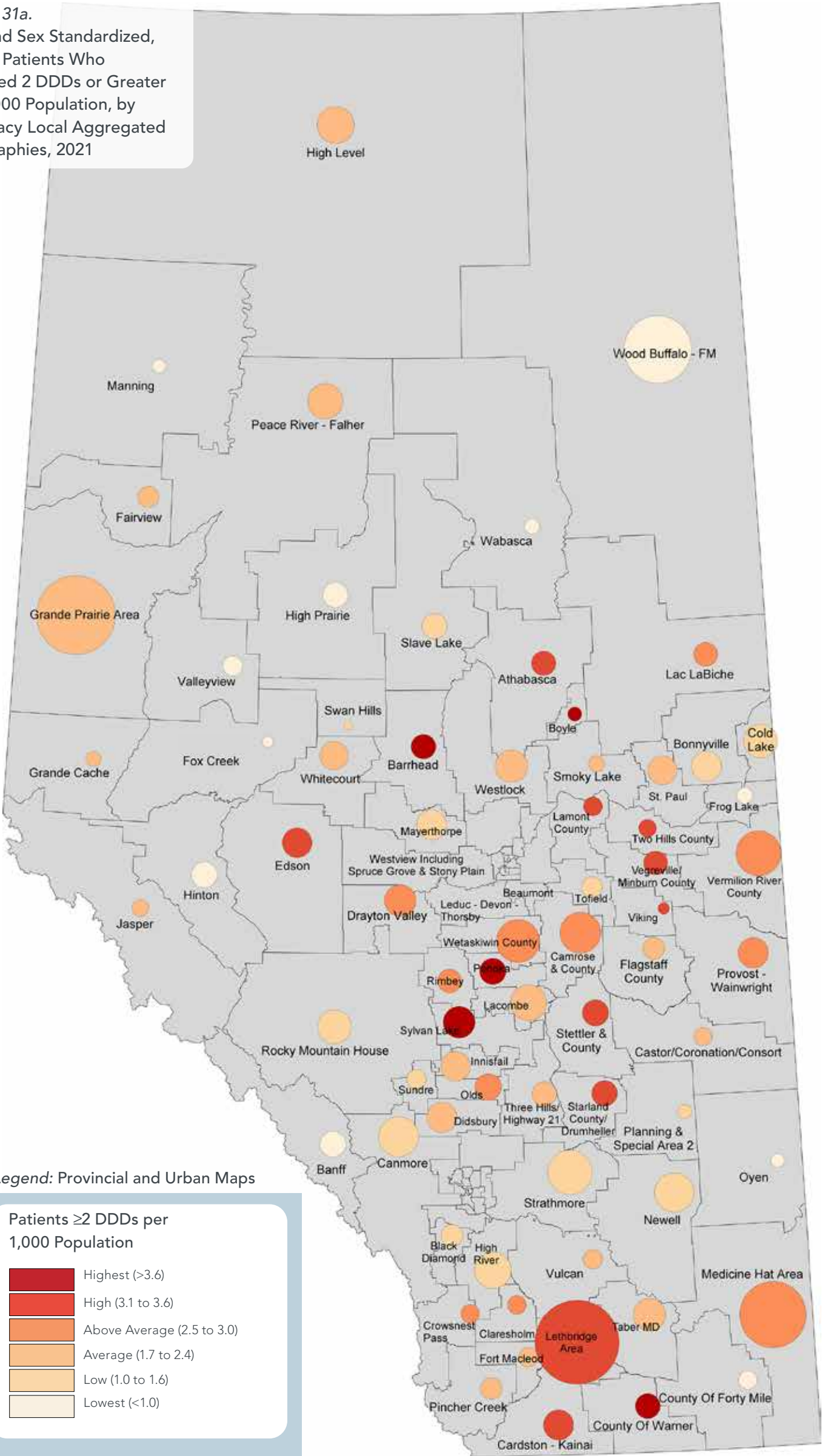
The graph shows the prescriber PhLAGs associated with Edmonton - Abbottsfield dispenses (the area with the highest rate) because many patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: 80% of BDZ/Z Patient prescribers for Edmonton - Abbottsfield pharmacies are in adjacent PhLAGs within the City of Edmonton.

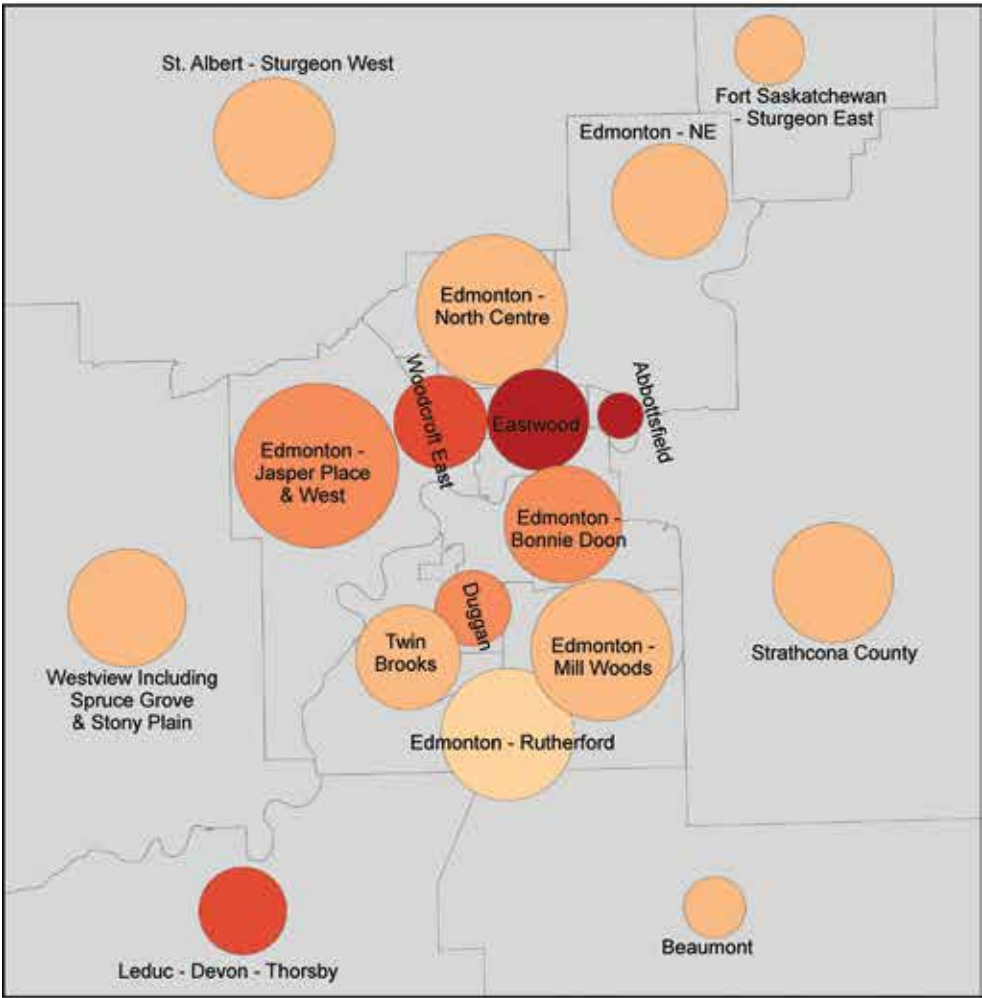
Note: Edmonton - Abbottsfield reports the highest patient rate in the province and higher rates for prescriptions, and prescribers, than Edmonton - Eastwood.

Note: Edmonton - Eastwood has a much higher rate of dispenses per resident than Edmonton - Abbottsfield.

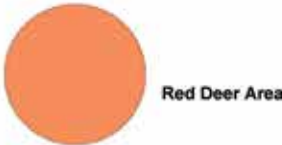
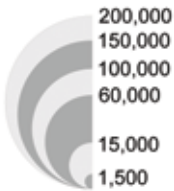
Figure 31a.
Age and Sex Standardized,
BDZ/Z Patients Who
Received 2 DDDs or Greater
per 1,000 Population, by
Pharmacy Local Aggregated
Geographies, 2021



Edmonton



Population



Calgary

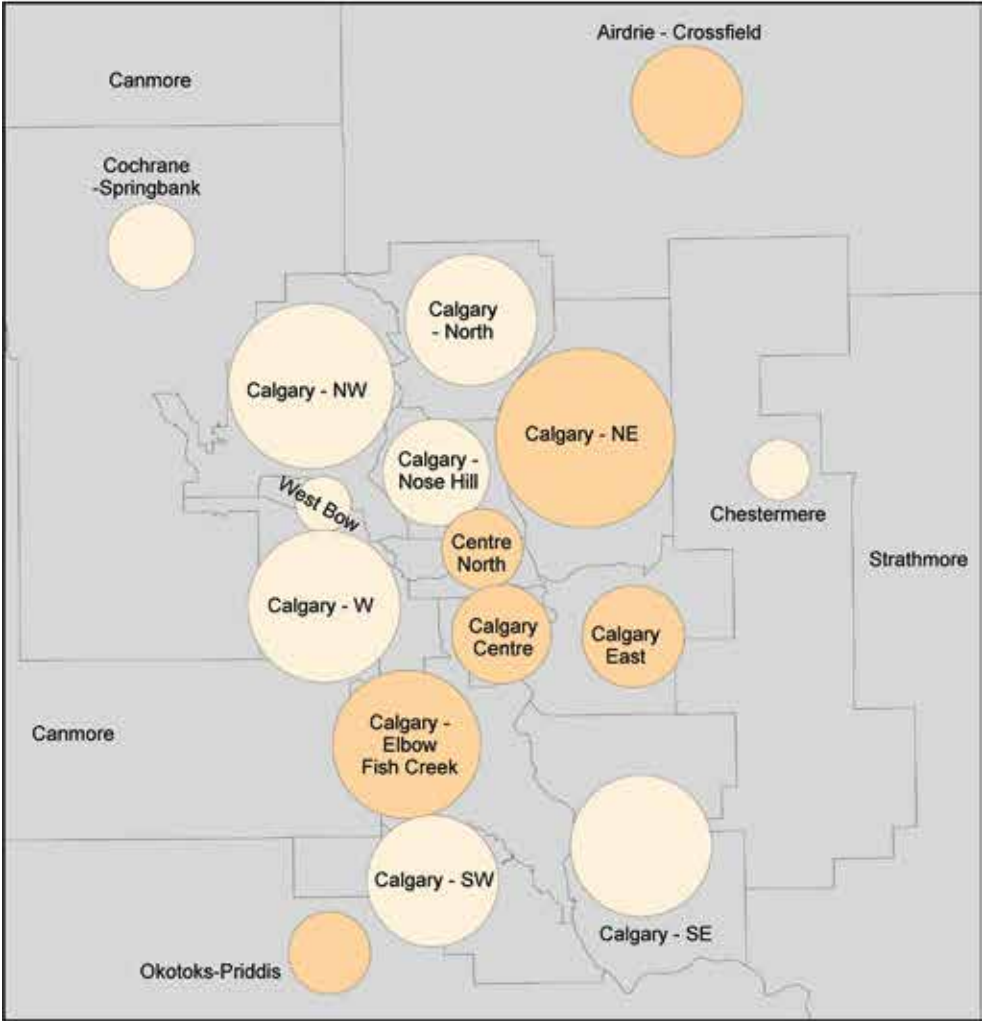


Figure 31b. Age and Sex Standardized, BDZ/Z Patients Who Received 2 DDDs or Greater per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

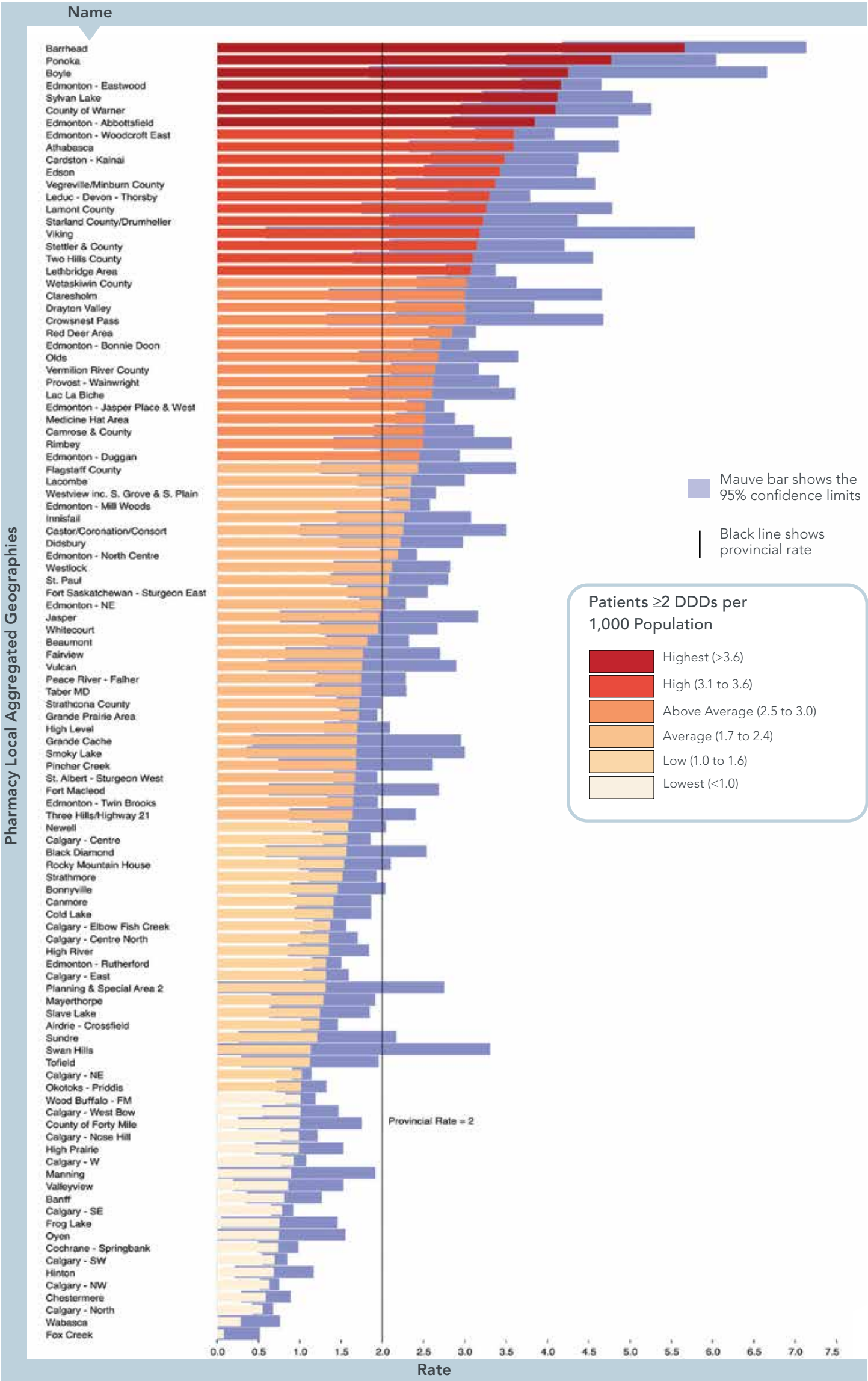
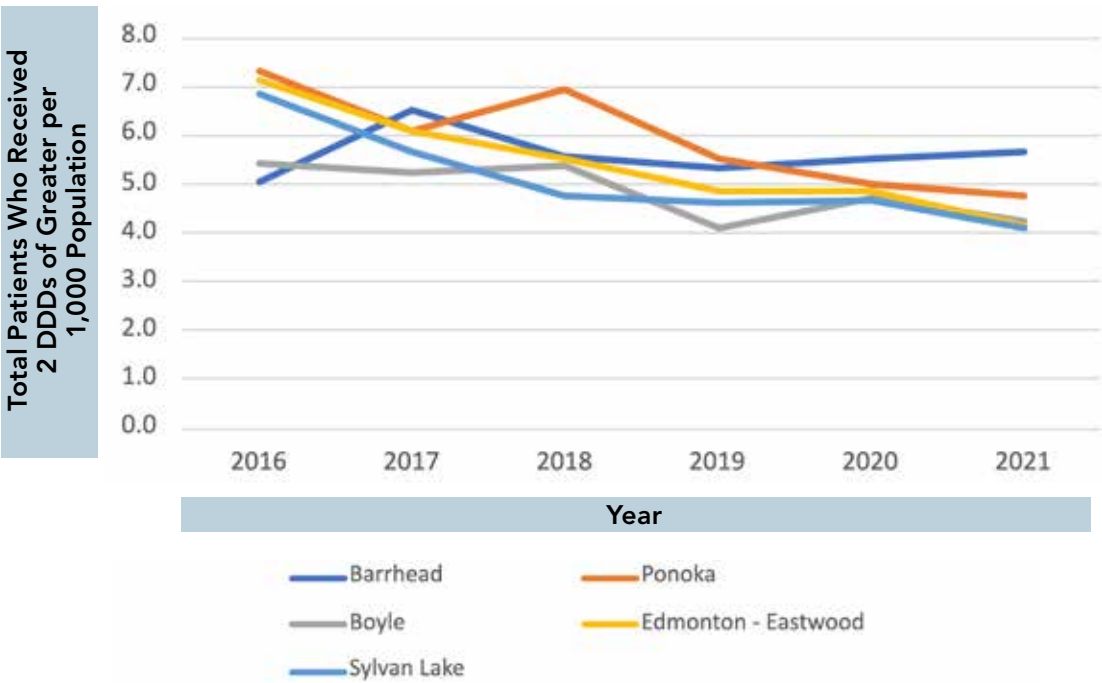


Figure 31c. Six Year Trends of BDZ/Z Patients Who Received 2 DDDs or Greater for the Top Five PhLAGs in 2021, based on 2021 Rates

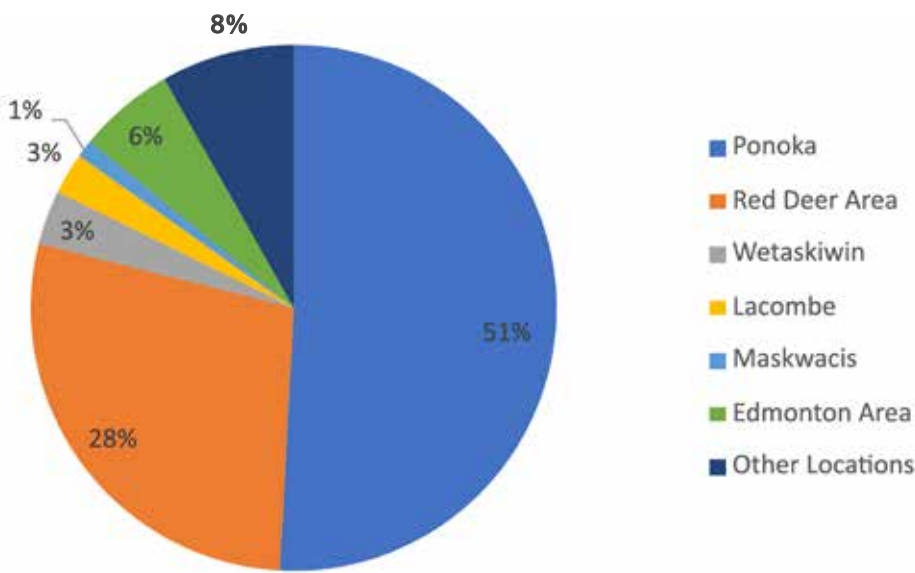


The trends for the areas with the highest rates show an overall decline. In 2016, Edmonton - Abbottsfield and Athabasca reported the two highest rates, and their rates are now lower than the top five in 2021. Viking ceased to be in this group over the last six years.

Urban/Rural categories show very little association with the observed rates of BDZ/Z patients who received 2 DDDs or greater per 1,000 population.

The lowest rates are observed in areas with with the lowest deprivation indices and the highest rates in areas with the highest deprivation scores.

Figure 31d. BDZ/Z Prescriber Locations for BDZ/Z Dispenses in Ponoka Pharmacies, 2021



The graph show the prescriber cities and towns associated with dispenses from Ponoka pharmacies (the area with the second highest rate, as Barrhead dispense details were already examined in Figure 29d). Many patients obtain a prescription in one location but have dispenses in a different geographic area.

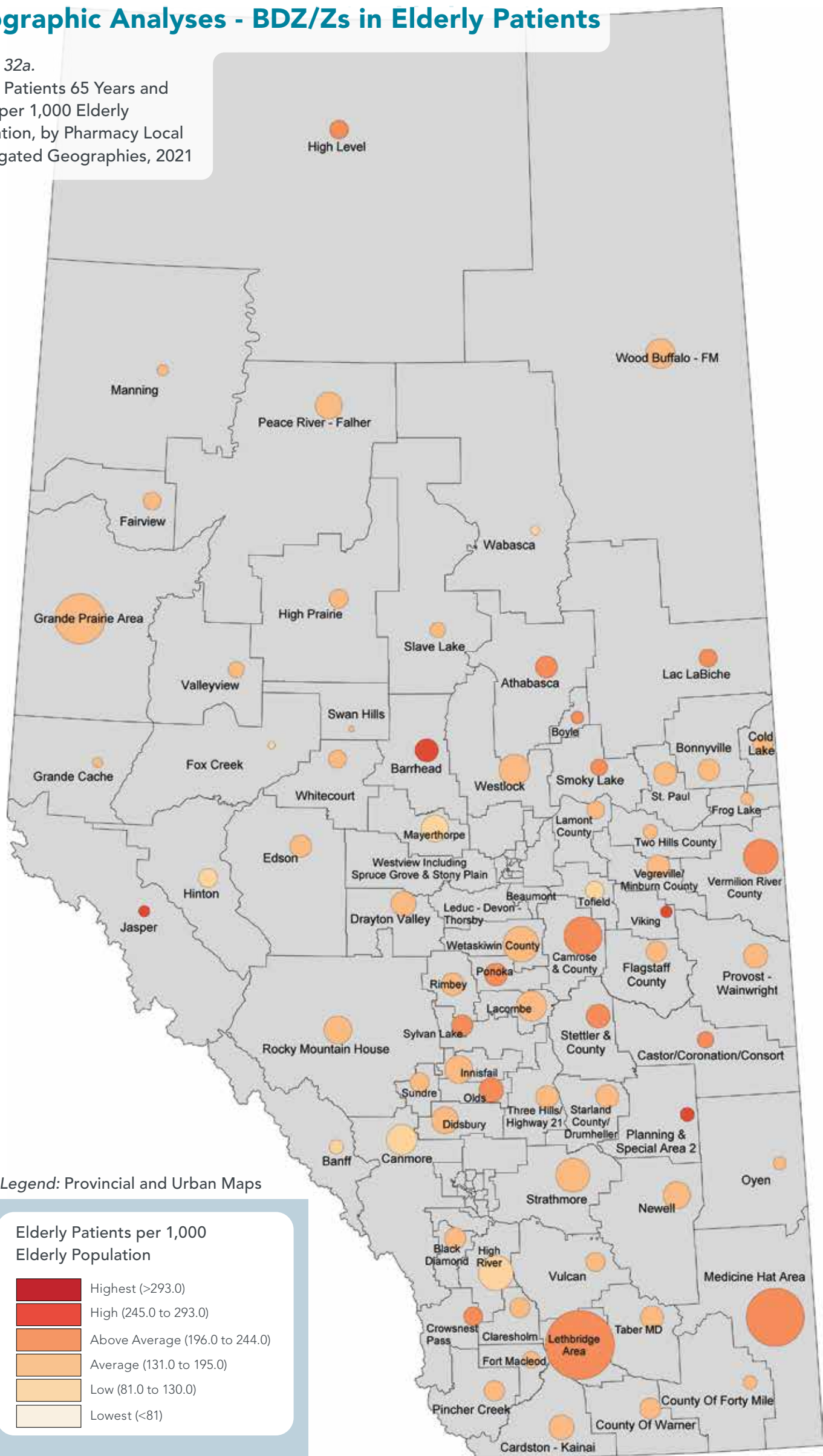
Note: 86% of BDZ/Z Patient prescribers for Ponoka pharmacies are nearby.

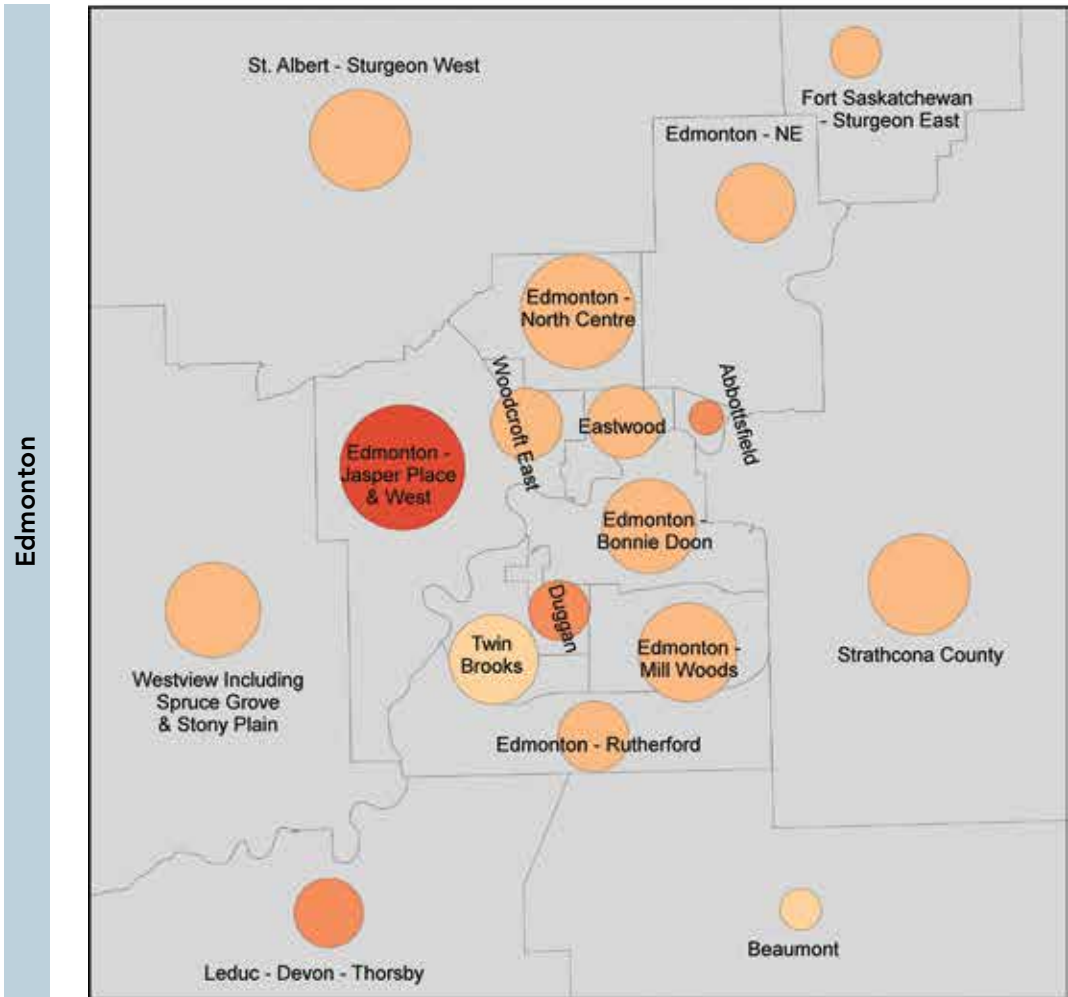
Note: Ponoka has the second highest rate of patients consuming 2 DDDs and more per 1,000 population; Barrhead has the highest rate and is shown in Figure 29d.

Note: Ponoka has similar rates of prescriptions, patients, prescribers and residents as Stettler & County therefore it’s likely that dosages are higher in prescriptions provided by Ponoka prescribers than those in Stettler & County.

Geographic Analyses - BDZ/Zs in Elderly Patients

Figure 32a.
BDZ/Z Patients 65 Years and
Older per 1,000 Elderly
Population, by Pharmacy Local
Aggregated Geographies, 2021





Elderly (65+) Population

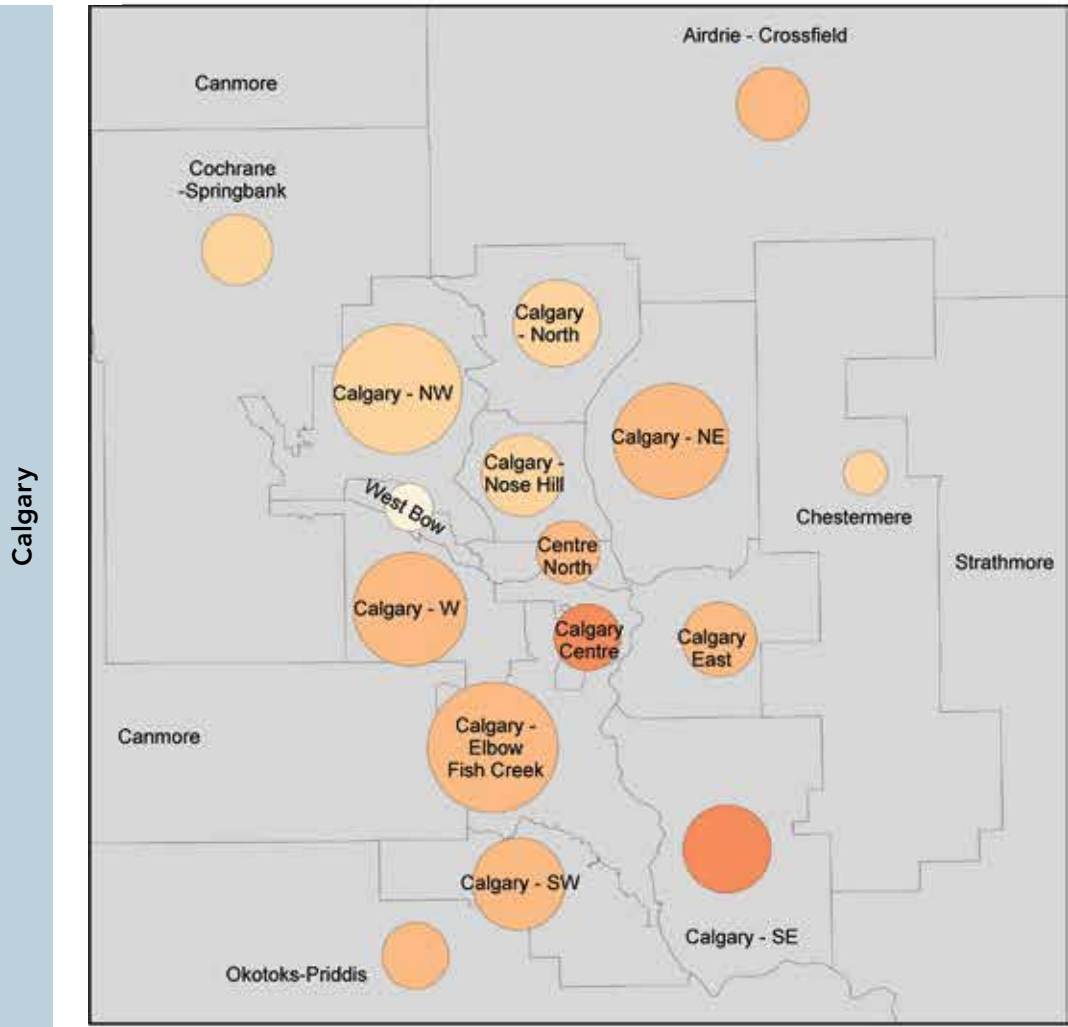
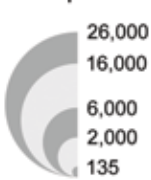


Figure 32b. BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population, by Pharmacy Local Aggregated Geographies, 2021

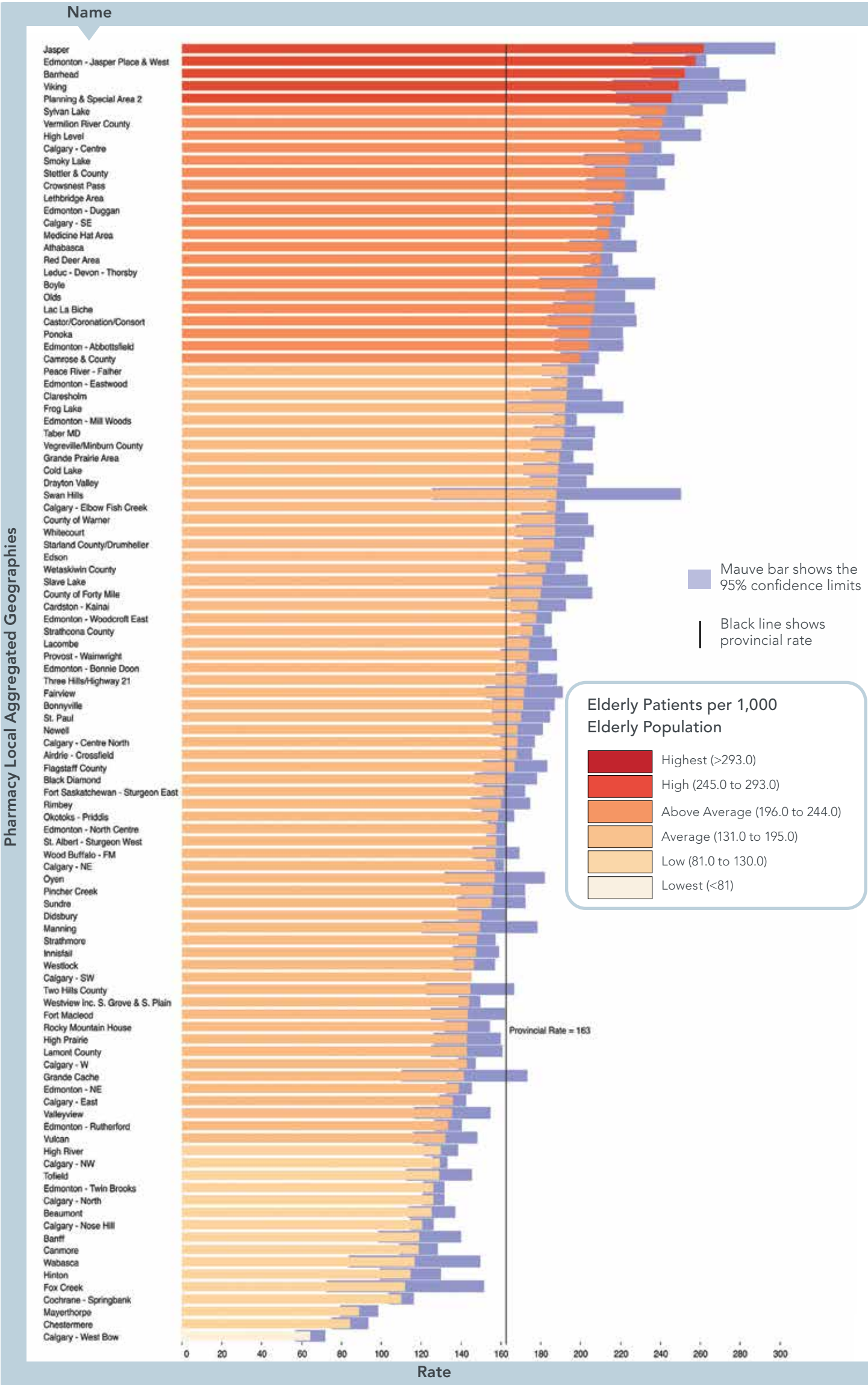
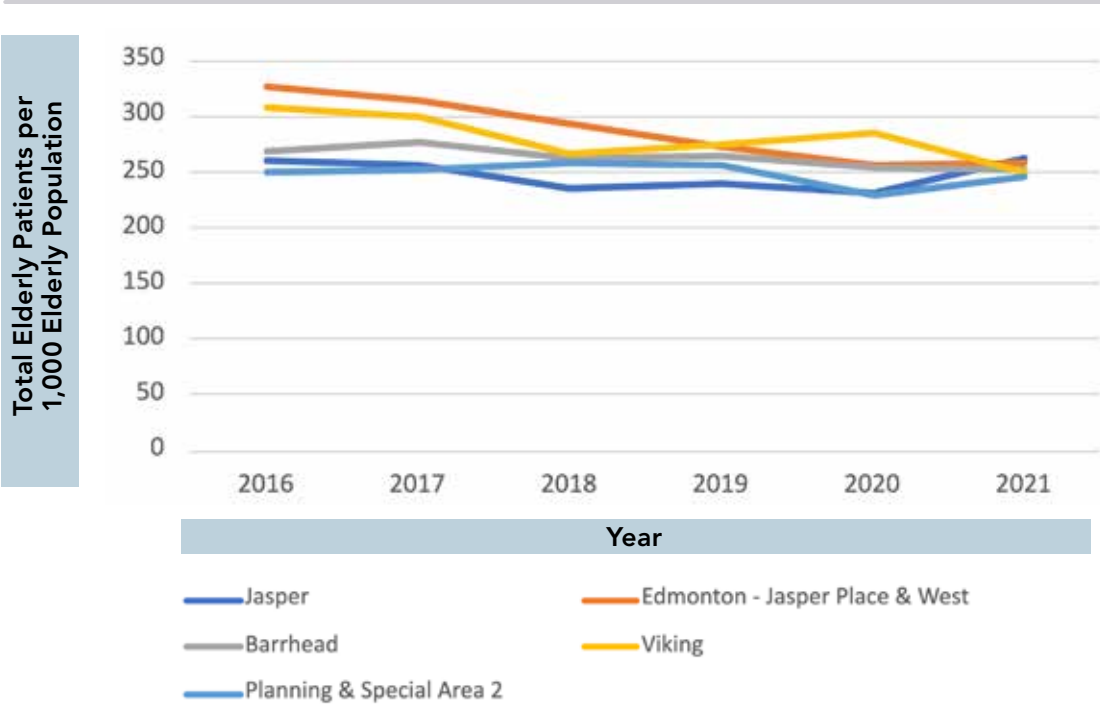


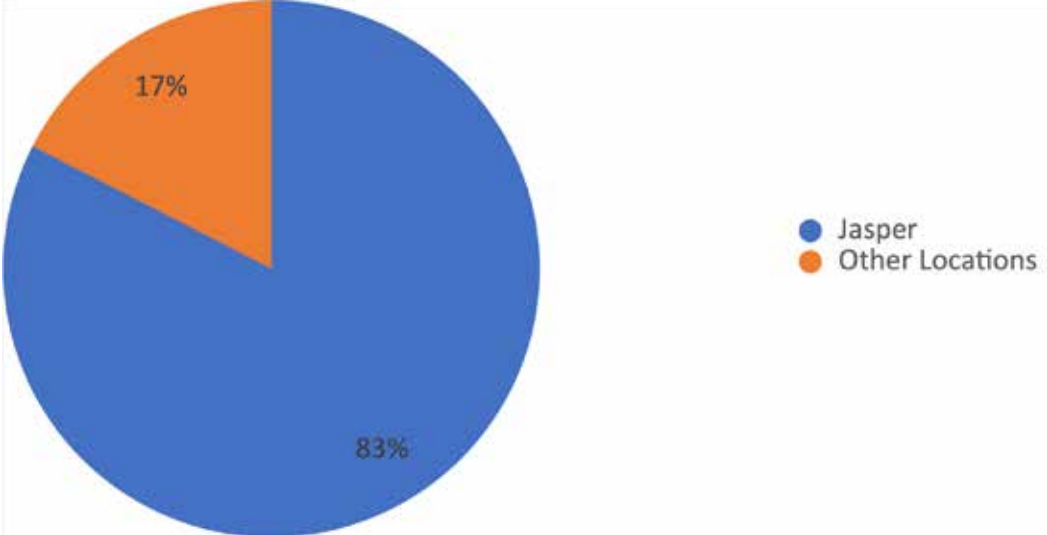
Figure 32c. Six Year Trends of BDZ/Z Elderly Patients for the Top Five PhLAGs in 2021, based on 2021 Rates



The trends for the areas with the highest rates show an overall decline. In 2016, Edmonton - Abbotsfield and Slave Lake reported very high rates; their rates have fallen, and their rates are now lower than the top five in 2021.

The rates for elderly BDZ/Z patients do not show as much geographic variation as other variables and therefore the top 5 can change every year. Deprivation Index also has little or no association with this variable.

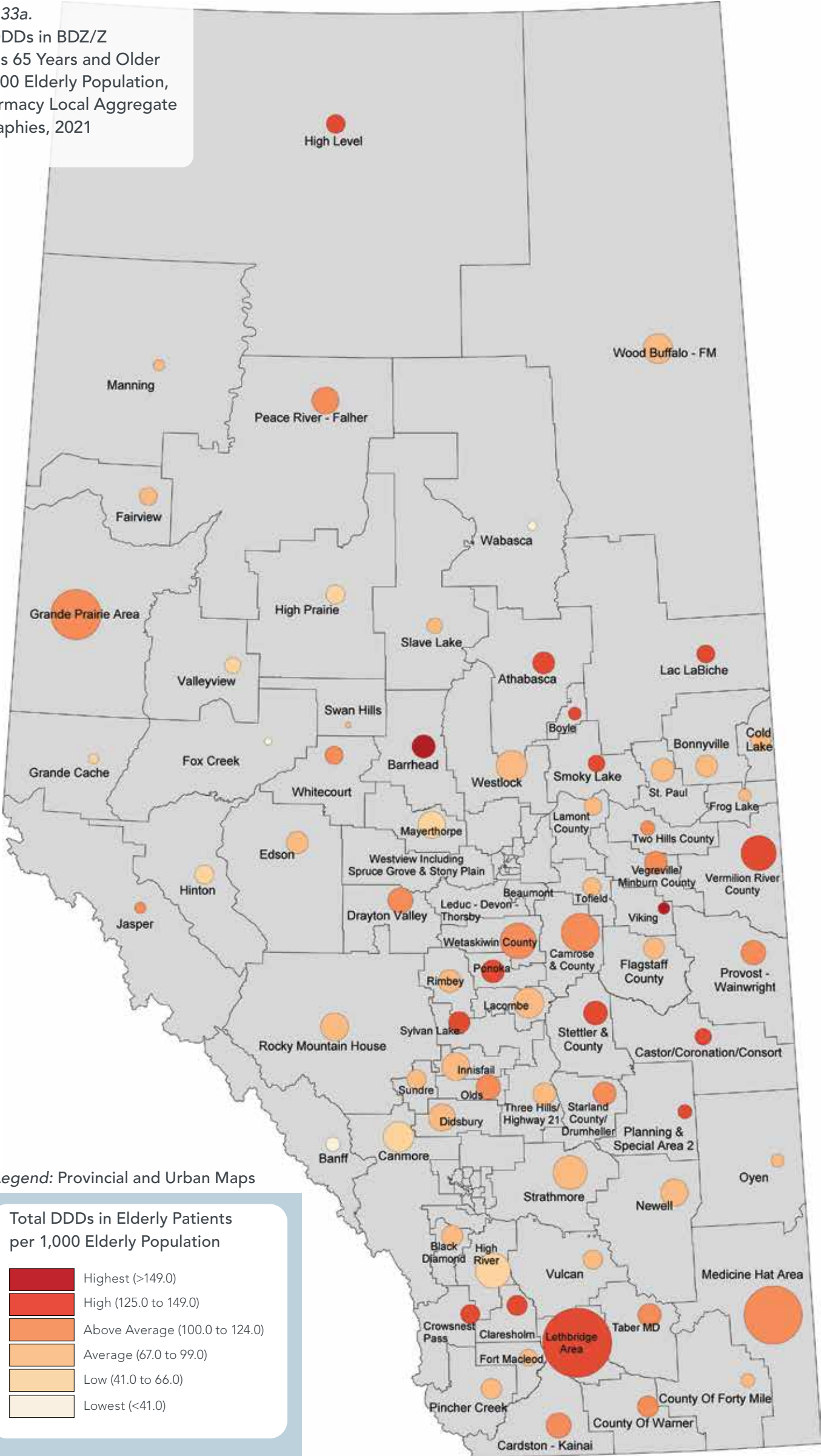
Figure 32d. Elderly BDZ/Z Prescriber Locations for BDZ/Z Dispenses in Jasper Pharmacies, 2021



The graph shows the prescriber cities and towns associated with dispenses from Jasper pharmacies (the area with the highest rate). Some patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: The majority of pharmacy dispenses for elderly BDZ/Z patients in Jasper are from local prescribers (83%).

Figure 33a.
Total DDDs in BDZ/Z
Patients 65 Years and Older
per 1,000 Elderly Population,
by Pharmacy Local Aggregate
Geographies, 2021



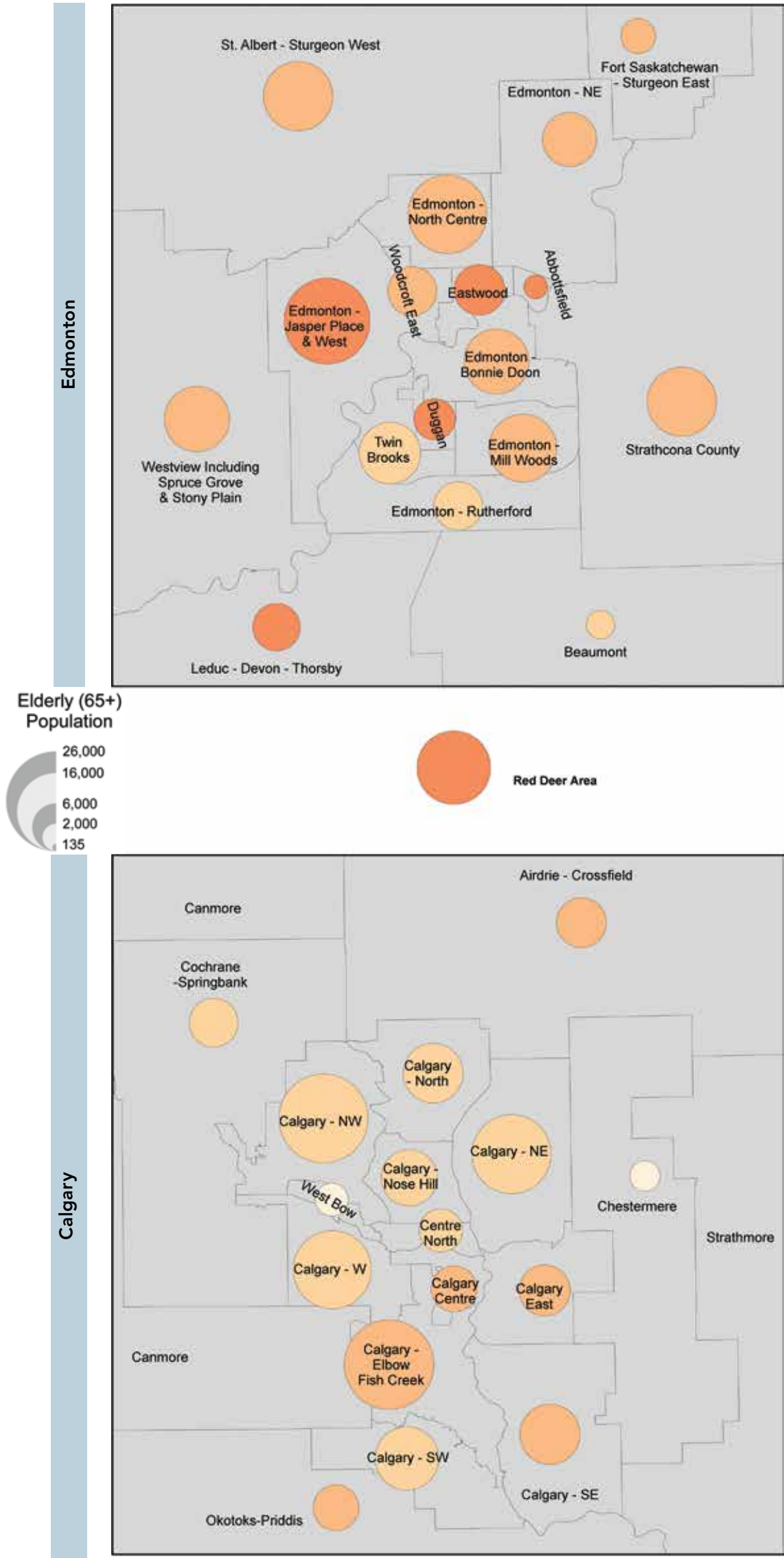


Figure 33b. Total DDDs in BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population, by Pharmacy Local Aggregate Geographies, 2021

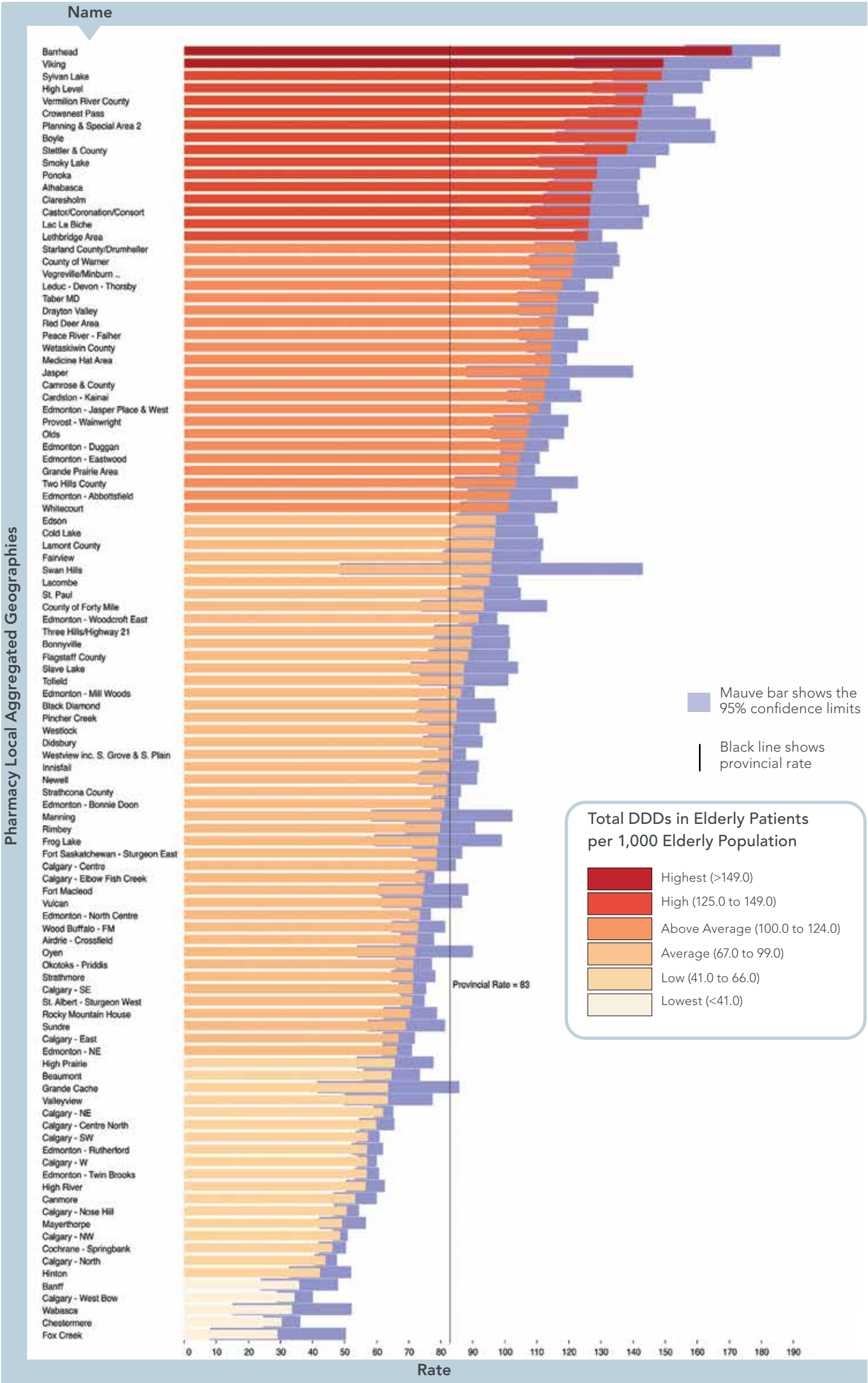
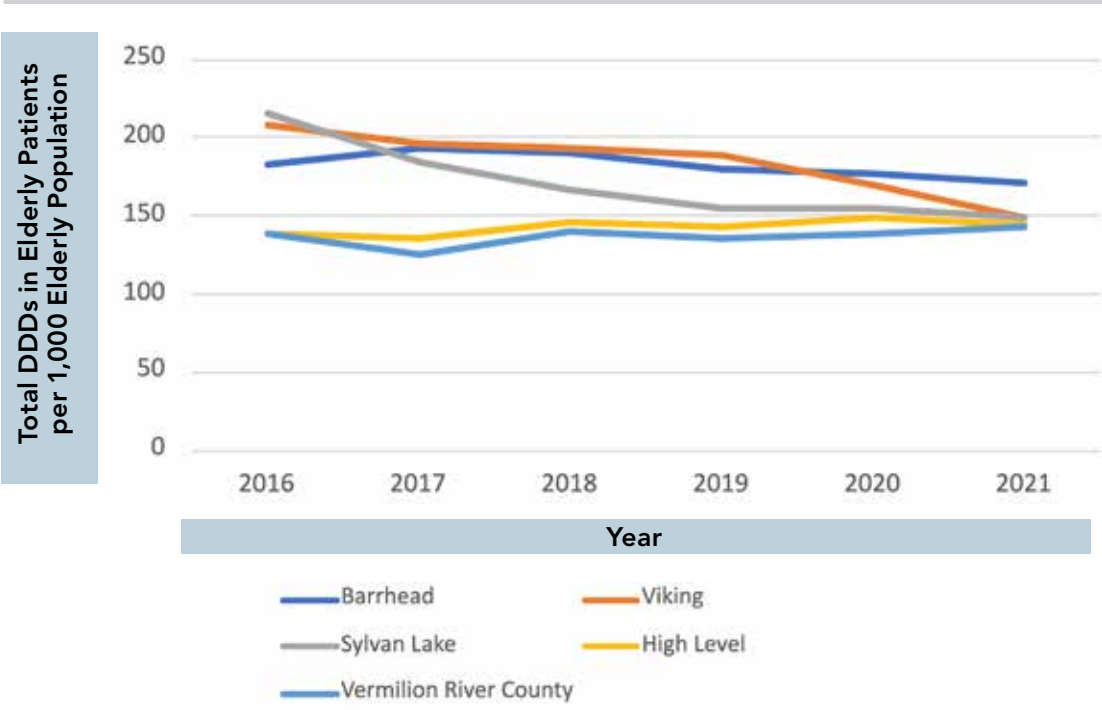


Figure 33c. Six Year Trends of BDZ/Z DDDs in Elderly Patients for the Top Five PhLAGs in 2021, based on 2021 Rates



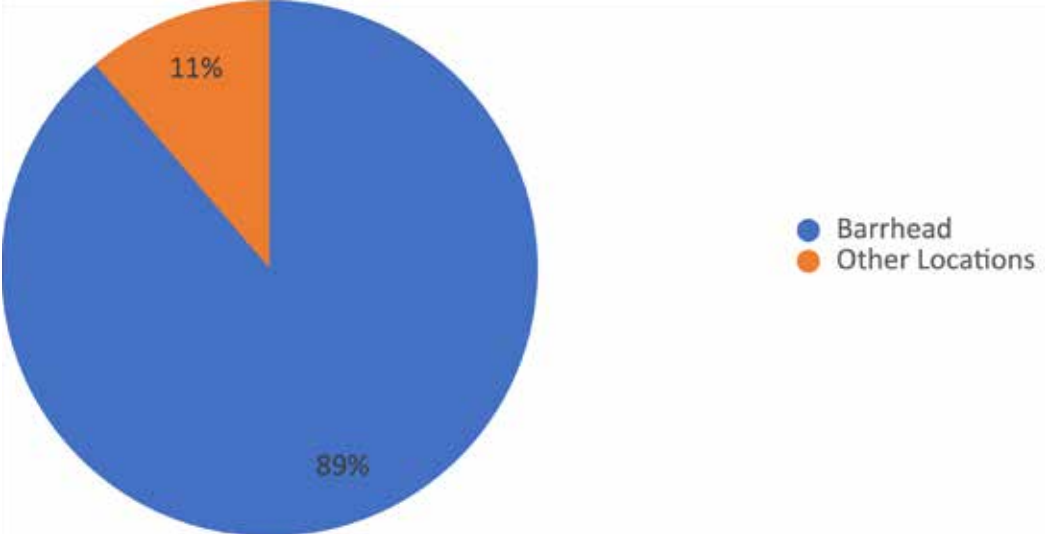
The trends for the PhLAGs with the highest rates show an overall decline. In 2016, Edmonton - Abbottsfield and Ponoka reported very high rates; their rates have fallen, and their rates are now lower than the top five in 2021.

Urban/Rural categories have a low association with the observed rates of Total DDDs in BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population.

Deprivation Index also has little or no association with this variable.

Urban/Rural categories have a low association with observed rates for this variable and Deprivation Index also has little or no association with observed rates for this variable.

Figure 33d. Elderly Patient BDZ/Z Prescriber Locations for BDZ/Z Dispenses in Barrhead Pharmacies, 2021

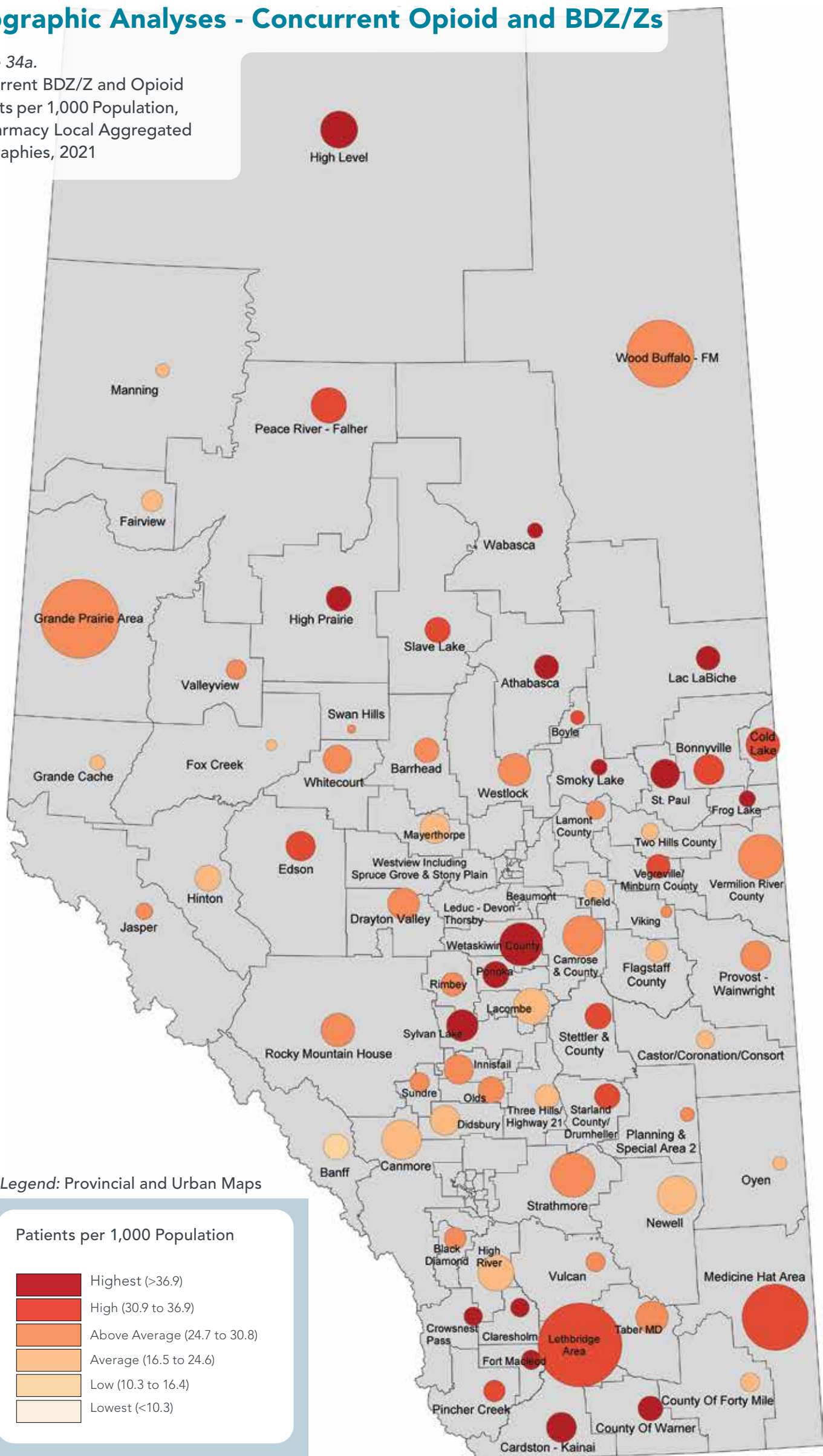


The graph shows the prescriber cities or towns associated with Barrhead dispenses (the area with the highest rate) because many patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: The majority of pharmacy dispenses for elderly BDZ/Z patients in Barrhead are from local prescribers (89%).

Geographic Analyses - Concurrent Opioid and BDZ/Zs

Figure 34a.
Concurrent BDZ/Z and Opioid
Patients per 1,000 Population,
by Pharmacy Local Aggregated
Geographies, 2021



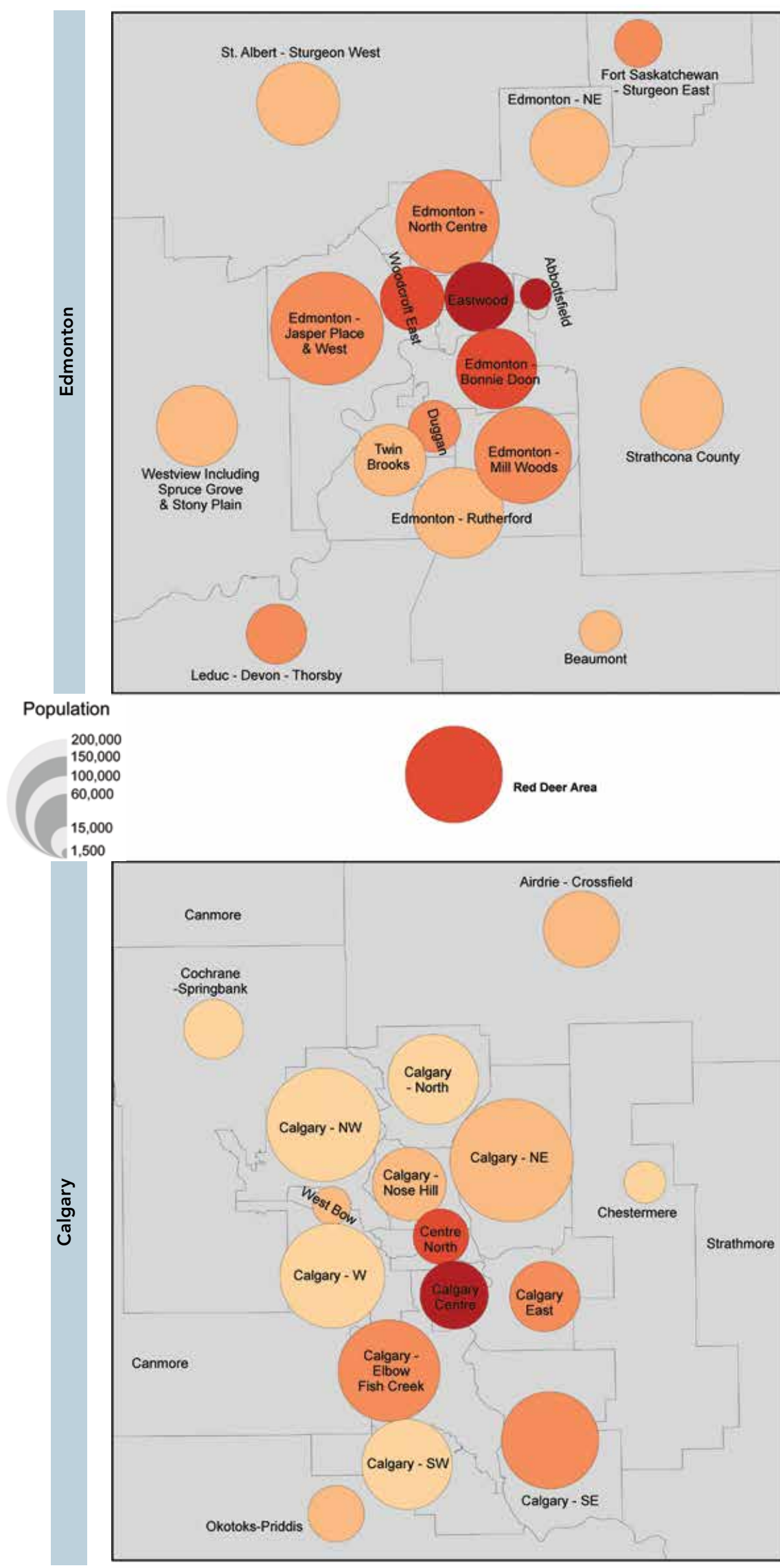


Figure 34b. Concurrent BDZ/Z and Opioid Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2021

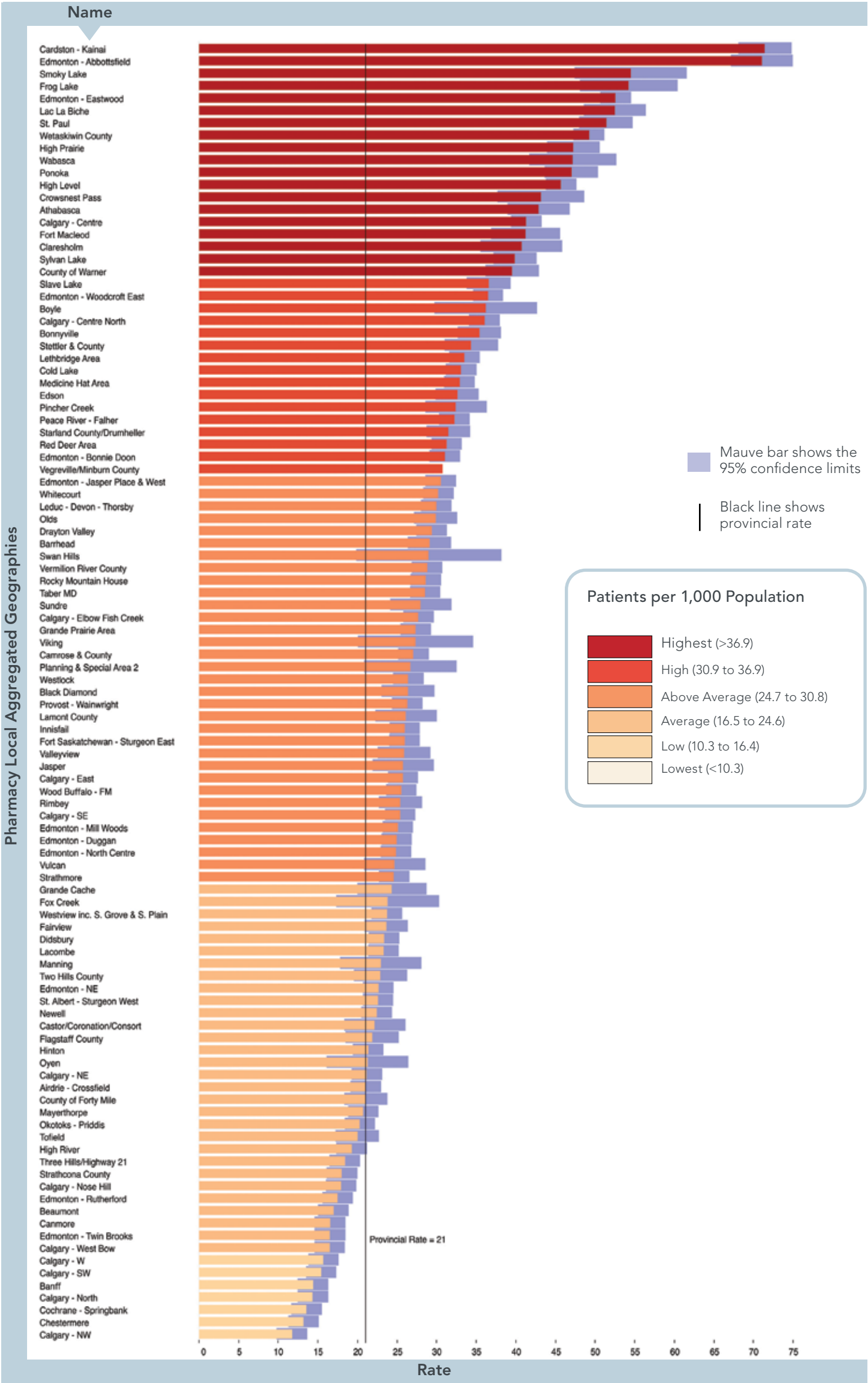
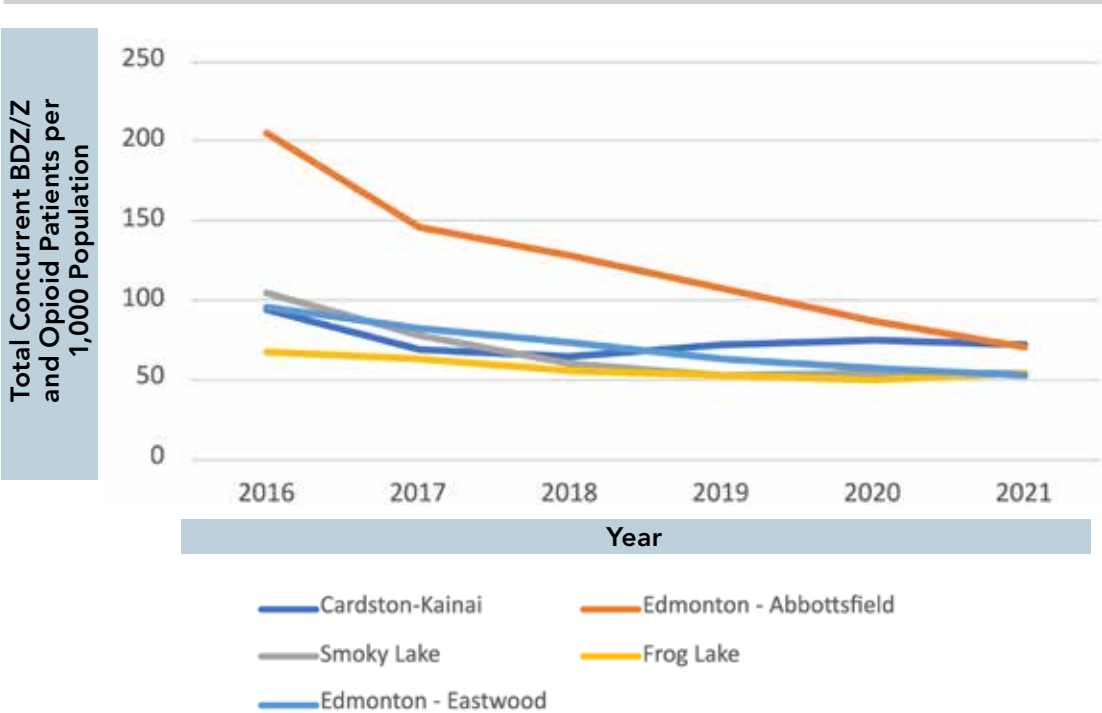


Figure 34c. Six Year Trends of Patients Who Consumed Opioids and BDZ/Zs in the Same Quarter for the Top Five PhLAGs in 2021, based on 2021 Rates

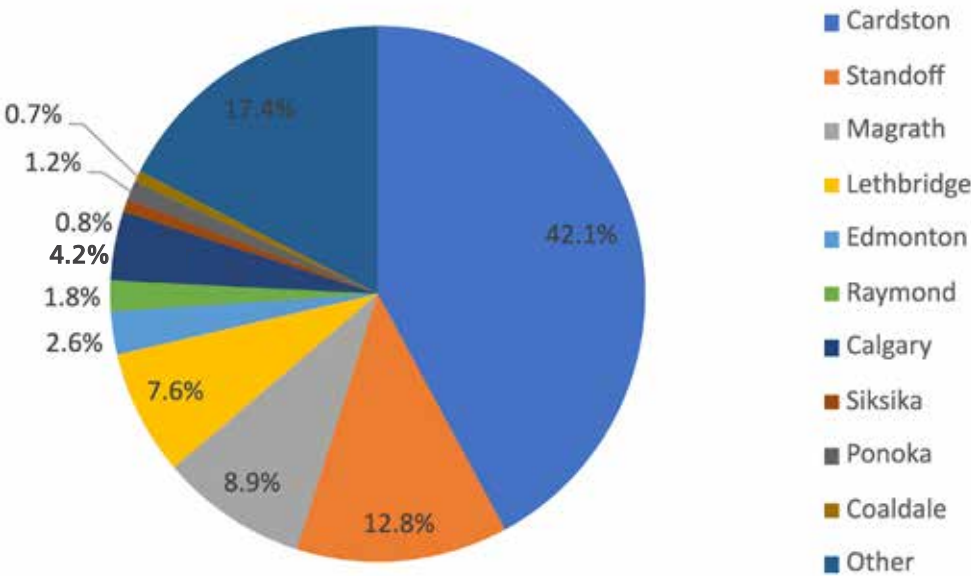


The trends for the areas with the highest rates show an overall decline, except for Cardston - Kainai. In 2016, Lac La Biche reported a high rate, but this has declined, and this area is not part of the top five in 2021. Cardston - Kanai and Edmonton - Abbottsfeld report high rates for opioid and BDZ/Z measures, therefore it’s not surprising that both are included in the top-five rates for concurrent opioid and BDZ/Z patients. Prescribers have dramatically reduced the number of concurrent patients in Edmonton - Abbottsfeld to less than half in six years.

Urban/Rural categories have a low association with the observed rates. The highest rates were observed in Rural, Calgary and Edmonton areas.

Deprivation values are lowest with the Low and Lowest rate categories, but there was no associations as the rate values or deprivation scores increase.

Figure 34d. Concurrent Opioid and BDZ/Z Prescriber Locations for Dispenses in Cardston - Kainai Pharmacies



The graph shows the prescriber cities or towns associated with Cardston - Kainai dispenses (the area with the highest rate) because many patients obtain a prescription in one location but have dispenses in a different geographic area.

Note: 74% of the Combined Opioid & BDZ/Z Patient prescribers for Cardston - Kainai are from Cardston or nearby communities.

Appendix A – Opioid Analytic Class, 2021

Opioid Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, ATC Code and Route of Administration, 2021

Main Ingredient	ATC Code Description	Route	Prescriptions	Patients	Prescribers	Pharmacies
Buprenorphine	N02AE01-BUPRENORPHINE	TRANSDERMAL	9,811	2,922	1,546	968
Buprenorphine	N07BC01-BUPRENORPHINE	SUBCUTANEOUS	1,269	512	89	112
Buprenorphine	N07BC51-BUPRENORPHINE, COMBINATIONS	ORAL	273	93	46	78
Buprenorphine	N07BC51-BUPRENORPHINE, COMBINATIONS	SUBLINGUAL	88,188	11,429	2,677	1,360
Butalbital	N02AA79-CODEINE, COMBINATIONS WITH PSYCHOLEPTICS	ORAL	1,530	474	416	353
Butalbital	N02BA71-ACETYLSALICYLIC ACID, COMB WITH PSYCHOLEPTICS	ORAL	229	95	94	93
Butorphanol	N02AF01-BUTORPHANOL	NASAL	333	68	76	68
Codeine	M03BB53-CHLORZOXAZONE, COMBINATIONS EXCL PSYCHOLEPTICS	ORAL	57	35	23	22
Codeine	N02AA59-CODEINE, COMBINATIONS EXCL. PSYCHOLEPTICS	ORAL	1,579	854	491	434
Codeine	N02AJ06-CODEINE AND PARACETAMOL	ORAL	567,878	248,646	11,919	1,623
Codeine	N02AJ07-CODEINE AND ACETYLSALICYLIC ACID	ORAL	3	3	3	3
Codeine	N02BE51-ACETAMINOPHEN, COMB EXCL PSYCHOLEPTICS	ORAL	3,500	1,728	1,026	514
Codeine	R05DA04-CODEINE	INTRAMUSCULAR	2	2	2	2
Codeine	R05DA04-CODEINE	ORAL	47,786	18,679	5,145	1,507
Codeine	R05DA04-CODEINE	UNKNOWN	9	4	2	4
Codeine	R05DA20-COMBINATIONS	ORAL	5,785	4,236	1,479	1,053
Codeine	R05FA02-OPIMUM DERIVATIVES AND EXPECTORANTS	ORAL	4,359	3,378	1,404	873
Esketamine	N06AX27	NASAL	17	4	4	3
Fentanyl	N01AH01-FENTANYL	INTRAMUSCULAR	1,607	1,006	349	137
Fentanyl	N02AB03-FENTANYL	BUCCAL	37	6	6	6
Fentanyl	N02AB03-FENTANYL	INTRAMUSCULAR	20	18	16	13
Fentanyl	N02AB03-FENTANYL	TRANSDERMAL	13,884	2,704	1,862	933
Fentanyl	N02AB03-FENTANYL	UNKNOWN	28	10	6	2
Hydrocodone	R05DA03-HYDROCODONE	ORAL	117	43	46	45
Hydrocodone	R05DA20-COMBINATIONS	ORAL	4	4	4	4
Hydromorphone	N02AA03-HYDROMORPHONE	INTRAMUSCULAR	7,394	3,388	1,294	371
Hydromorphone	N02AA03-HYDROMORPHONE	ORAL	120,139	37,159	6,453	1,550
Hydromorphone	N02AA03-HYDROMORPHONE	UNKNOWN	262	86	55	19
Ketamine	N01AX03-KETAMINE	INTRAMUSCULAR	126	51	19	30
Ketamine	N01AX03-KETAMINE	UNKNOWN	2	2	1	2
Meperidine	N02AB02-PETHIDINE	INTRAMUSCULAR	338	64	67	60
Meperidine	N02AB02-PETHIDINE	ORAL	95	59	56	70
Meperidine	N02AB02-PETHIDINE	UNKNOWN	3	2	2	2
Methadone	N07BC02-METHADONE	ORAL	94,592	7,894	1,428	1,107
Methadone	N07BC02-METHADONE	UNKNOWN	726	203	152	76
Morphine	N02AA01-MORPHINE	INTRAMUSCULAR	2,387	1,260	678	233
Morphine	N02AA01-MORPHINE	INTRAVENOUS	115	81	71	20
Morphine	N02AA01-MORPHINE	ORAL	63,482	13,337	4,393	1,430
Morphine	N02AA01-MORPHINE	Parenteral	147	77	62	30
Morphine	N02AA01-MORPHINE	RECTAL	100	24	27	26
Morphine	N02AA01-MORPHINE	UNKNOWN	61	35	24	12
Oxycodone	N02AA05-OXYCODONE	ORAL	83,145	15,802	4,429	1,484
Oxycodone	N02AA05-OXYCODONE	RECTAL	63	11	13	12
Oxycodone	N02AA05-OXYCODONE	UNKNOWN	5	1	3	1
Oxycodone	N02AA55-OXYCODONE AND NALOXONE	ORAL	1,009	274	221	223
Oxycodone	N02AJ17-OXYCODONE AND PARACETAMOL	ORAL	104,811	28,417	4,995	1,558
Oxycodone	N02AJ18-OXYCODONE AND ACETYLSALICYLIC ACID	ORAL	72	24	22	19
Pentazocine	N02AD01-PENTAZOCINE	ORAL	59	26	28	27
Sufentanil	N01AH03-SUFENTANIL	INTRAVENOUS	6	6	3	3
Tapentadol	N02AX06-TAPENTADOL	ORAL	2,435	539	418	417
Tramadol	N02AJ13-TRAMADOL AND PARACETAMOL	ORAL	188,459	124,880	9,212	1,601
Tramadol	N02AX02-TRAMADOL	ORAL	52,273	26,168	5,989	1,507
Tramadol	N02AX02-TRAMADOL	UNKNOWN	42	16	20	11

“Unknown” route indicates that the medication format and route were not specified on the prescription.

Opioid Specialty to Specialty Group (as shown in Figure 4) Assignments

“Anesthesiology” includes: Anesthesiology and Family Medicine (Family Practice Anesthesia)

“Emergency Medicine” includes Emergency Medicine and Family Medicine (Emergency Medicine)

“Family Medicine” includes Family Medicine, Family Medicine (Sport and Exercise Medicine) and General Practice

“Medicine” includes Cardiology, Endocrinology & Metabolism, Gastroenterology, General Internal Medicine, Hematology, Internal Medicine, Nephrology, Physical Medicine & Rehabilitation, Respiriology and Rheumatology

“Orthopedic Surgery” includes Orthopedic Surgery

“Psychiatry” includes Psychiatry

“Surgery excl. Orthopedics” includes Cardiovascular & Thoracic Surgery, General Surgery, Neurosurgery, Obstetrics & Gynecology, Ophthalmology, Otolaryngology - Head and Neck Surgery, Plastic Surgery, Thoracic Surgery, Urology and Vascular Surgery

Appendix B – BDZ/Z Analytic Class, 2021

BDZ/Z Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, ATC code and Route of Administration, 2021

Main Ingredient	ATC Code Description	Route	Prescriptions	Patients	Prescribers	Pharmacies
Alprazolam	N05BA12-ALPRAZOLAM	ORAL	20,351	6,515	3,088	1,349
Bromazepam	N05BA08-BROMAZEPAM	ORAL	9,345	1,814	1,238	821
Chlordiazepoxide	N05BA02-CHLORDIAZEPOXIDE	ORAL	2,204	1,032	631	539
Clobazam	N05BA09-CLOBAZAM	ORAL	11,124	3,769	2,646	1,148
Clobazam	N05BA09-CLOBAZAM	UNKNOWN	177	75	68	42
Clonazepam	N03AE01-CLONAZEPAM	ORAL	147,743	44,084	7,544	1,597
Clonazepam	N03AE01-CLONAZEPAM	UNKNOWN	104	49	50	22
Clorazepate Dipotassium	N05BA05-CLORAZEPATE POTASSIUM	ORAL	134	52	66	54
Diazepam	N05BA01-DIAZEPAM	INTRAMUSCULAR	29	23	23	20
Diazepam	N05BA01-DIAZEPAM	ORAL	36,484	12,560	4,297	1,486
Diazepam	N05BA01-DIAZEPAM	RECTAL	113	89	57	71
Diazepam	N05BA01-DIAZEPAM	UNKNOWN	30	22	13	16
Eszopiclone	N05CF04-ESZOPICLONE	ORAL	1,589	960	481	492
Flurazepam	N05CD01-FLURAZEPAM	ORAL	656	227	216	203
Lorazepam	N05BA06-LORAZEPAM	INTRAMUSCULAR	219	186	139	36
Lorazepam	N05BA06-LORAZEPAM	ORAL	88,779	40,507	6,952	1,550
Lorazepam	N05BA06-LORAZEPAM	SUBLINGUAL	198,976	103,045	9,047	1,608
Lorazepam	N05BA06-LORAZEPAM	UNKNOWN	33	22	19	8
Midazolam	N05CD08-MIDAZOLAM	INTRAMUSCULAR	2,598	2,064	531	230
Midazolam	N05CD08-MIDAZOLAM	UNKNOWN	22	15	11	5
Nitrazepam	N05CD02-NITRAZEPAM	ORAL	7,460	1,564	963	707
Nitrazepam	N05CD02-NITRAZEPAM	UNKNOWN	6	2	5	2
Oxazepam	N05BA04-OXAZEPAM	ORAL	3,295	1,106	961	654
Temazepam	N05CD07-TEMAZEPAM	ORAL	44,966	11,732	3,790	1,399
Temazepam	N05CD07-TEMAZEPAM	UNKNOWN	11	8	8	5
Triazolam	N05CD05-TRIAZOLAM	ORAL	4,803	3,048	592	881
Zolpidem	N05CF02-ZOLPIDEM	SUBLINGUAL	44,618	16,205	4,420	1,434
Zopiclone	N05CF01-ZOPICLONE	ORAL	411,672	145,021	11,324	1,620
Zopiclone	N05CF01-ZOPICLONE	UNKNOWN	26	7	8	2

“Unknown” route indicates that the medication format and route were not specified on the prescription.

BDZ/Z Specialty to Specialty Group (as shown in Figure 15) Assignments

“Anesthesiology” includes Anesthesiology and Family Medicine (Family Practice Anesthesia)

“Emergency Medicine” includes Emergency Medicine and Family Medicine (Emergency Medicine)

“Family Medicine” includes Family Medicine, Family Medicine (Care of the Elderly), Family Medicine (Sport and Exercise Medicine) and General Practice

“Medicine” includes Cardiology, Clinical Immunology & Allergy, Dermatology, Endocrinology & Metabolism, Gastroenterology, General Internal Medicine, Hematology, Infectious Diseases, Internal Medicine, Nephrology, Physical Medicine & Rehabilitation, Respiriology, Rheumatology

“Psychiatry” includes Psychiatry

“Surgery” includes Cardiac Surgery, Cardiovascular & Thoracic Surgery, Colorectal Surgery, General Surgery, Neurosurgery, Obstetrics & Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology - Head and Neck Surgery, Plastic Surgery and Urology

Appendix C – Rates for All Measures, 2021

PhLAG Name	Urban/ Rural	Opioid Patients	Opioid Patients 90 OMEs	Opioid OMEs	BDZ/Z Patients	BDZ/Z DDDs	BDZ/Z Patients 2 DDDs	BDZ/Z Elderly Patients	BDZ/Z Elderly DDDs	Concurrent Opioid/BDZ/Z Patients
Airdrie - Crossfield	S	111.0	1.7	921.0	78.0	22.8	1.2	168.0	72.6	21.0
Athabasca	R	123.1	1.4	962.3	107.8	48.3	3.6	210.9	127.4	42.9
Banff	R	92.5	0.9	473.2	47.6	10.9	0.8	119.1	35.9	14.4
Barrhead	R	125.6	2.4	1146.9	104.7	60.1	5.7	252.4	170.9	29.1
Beaumont	S	88.9	2.0	848.9	64.3	24.0	1.8	125.3	64.7	17.0
Black Diamond	S	98.7	2.7	1241.2	74.6	24.2	1.6	162.4	84.9	26.4
Bonnyville	R	155.4	2.4	1068.5	89.5	27.5	1.5	171.2	89.6	35.4
Boyle	R	109.3	2.2	1134.7	85.6	47.5	4.3	208.3	140.7	36.2
Calgary - Centre	M	119.1	4.5	2649.8	96.9	25.2	1.6	231.2	78.8	41.3
Calgary - Centre North	M	138.7	2.4	1062.3	96.0	23.4	1.4	168.3	59.9	36.0
Calgary - East	M	109.5	2.4	1147.7	60.1	21.6	1.3	135.7	66.9	25.7
Calgary - Elbow Fish Creek	M	115.3	2.2	985.0	87.7	25.1	1.4	187.7	75.0	27.7
Calgary - NE	M	116.6	1.8	883.6	61.7	19.4	1.0	157.0	62.1	21.2
Calgary - North	M	74.6	1.0	450.8	49.2	13.1	0.6	126.1	44.1	14.4
Calgary - Nose Hill	M	85.1	1.5	663.5	55.1	16.9	1.0	120.5	50.6	17.9
Calgary - NW	M	71.7	0.8	401.0	54.5	14.6	0.6	129.3	48.6	11.7
Calgary - SE	M	113.8	1.6	789.8	77.7	20.2	0.8	215.4	71.2	25.4
Calgary - SW	M	78.2	1.2	549.3	60.4	17.0	0.7	145.3	57.2	15.4
Calgary - W	M	75.0	1.0	514.8	64.0	17.4	0.9	142.9	57.0	15.7
Calgary - West Bow	M	63.0	2.3	1101.8	40.9	13.4	1.0	64.4	34.5	16.5
Camrose & County	R	124.5	2.3	1185.2	91.7	38.1	2.5	199.6	112.7	27.1
Canmore	S	86.2	1.0	562.8	54.3	16.2	1.4	118.6	53.2	16.5
Cardston - Kainai	R	211.6	4.5	2269.9	115.0	47.3	3.5	178.6	112.2	71.4
Castor/Coronation/Consort	R	84.5	2.2	1027.4	78.4	35.7	2.3	205.6	126.5	22.2
Chestermere	S	78.8	1.3	713.3	49.0	13.1	0.6	84.3	30.4	13.2
Claresholm	R	158.3	2.2	1433.2	78.5	38.7	3.0	193.2	126.8	40.7
Cochrane - Springbank	S	70.4	0.9	495.2	52.2	15.5	0.7	110.0	46.1	13.6
Cold Lake	R	127.5	1.4	691.1	97.3	28.7	1.4	188.7	97.1	33.1
County of Forty Mile	R	63.8	5.2	1707.5	68.3	26.5	1.0	180.0	93.4	21.0
County of Warner	R	129.2	3.7	1386.6	86.1	47.1	4.1	187.0	121.6	39.5
Crowsnest Pass	R	152.3	6.7	2132.1	122.0	50.0	3.0	222.4	142.7	43.2
Didsbury	R	88.8	2.1	870.8	70.7	30.8	2.2	150.4	83.8	23.4
Drayton Valley	R	125.9	2.7	1231.3	96.8	39.9	3.0	188.6	116.1	29.4
Edmonton - Abbottsfield	M	226.2	4.8	2558.6	142.8	50.6	3.8	204.1	101.6	71.1
Edmonton - Bonnie Doon	M	120.9	2.4	1104.9	85.3	30.5	2.7	173.0	81.3	31.0
Edmonton - Duggan	M	122.1	2.5	1030.5	81.5	31.8	2.5	216.6	106.1	24.9
Edmonton - Eastwood	M	162.1	5.8	3432.3	102.6	46.2	4.2	193.3	104.7	52.6
Edmn. - Jasper Place & West	M	126.7	2.4	1173.8	94.6	35.0	2.5	257.7	110.6	30.5
Edmonton - Mill Woods	M	120.8	2.0	945.4	76.4	27.1	2.3	192.1	86.3	25.1
Edmonton - NE	M	113.6	2.1	984.2	67.0	25.0	2.0	139.1	66.3	22.6
Edmonton - North Centre	M	113.6	2.0	971.9	71.9	26.5	2.2	157.9	73.5	24.8
Edmonton - Rutherford	M	95.8	1.0	496.1	65.2	20.3	1.3	133.6	57.0	17.5
Edmonton - Twin Brooks	M	84.0	1.1	511.9	64.8	20.3	1.6	126.2	57.0	16.5
Edmonton - Woodcroft East	M	131.5	3.6	1574.8	89.5	37.2	3.6	177.7	91.7	36.5
Edson	R	129.2	4.8	1728.5	94.4	35.3	3.4	184.9	97.2	32.6
Fairview	R	88.9	2.9	1112.0	69.7	28.7	1.8	171.6	96.0	23.6
Flagstaff County	R	87.5	3.6	1423.0	78.9	28.6	2.4	166.9	88.6	21.8
Fort Macleod	R	147.8	3.8	1828.3	72.1	27.7	1.7	143.4	74.6	41.2
Fort Sask. - Sturgeon East	S	136.9	2.0	979.8	79.2	29.2	2.1	161.5	78.8	25.9
Fox Creek	R	133.0	2.0	702.3	75.2	11.5	0.0	112.0	29.2	23.8
Frog Lake	R	293.0	1.8	1309.9	97.2	24.6	0.8	192.3	79.2	54.2
Grande Cache	R	112.8	4.5	1429.6	79.6	24.3	1.7	141.6	63.6	24.3
Grande Prairie Area	C	119.7	2.3	1072.2	82.4	33.8	1.7	189.3	103.9	27.3
High Level	R	160.7	0.8	1040.6	100.0	44.0	1.7	239.6	144.5	45.7
High Prairie	R	139.4	2.1	1466.3	86.8	28.1	1.0	143.0	65.8	47.2
High River	S	90.4	1.3	695.3	58.4	19.6	1.4	129.8	56.4	19.3
Hinton	R	104.1	1.2	692.7	58.1	15.5	0.7	114.7	42.3	21.3
Innisfail	R	105.1	2.1	1205.2	71.6	29.6	2.3	147.6	82.8	25.9
Jasper	R	98.6	0.8	833.5	97.6	30.7	2.0	261.8	114.1	25.8
Lac La Biche	R	153.6	2.6	1564.3	108.5	44.8	2.6	206.6	126.1	52.5
Lacombe	R	97.2	2.9	1415.9	81.4	32.6	2.4	174.3	95.2	23.3
Lamont County	R	92.1	2.9	1228.0	72.3	37.8	3.3	143.0	96.7	26.1
Leduc - Devon - Thorsby	S	144.3	2.9	1288.9	100.7	39.9	3.3	210.3	118.1	30.0
Lethbridge Area	C	147.8	3.3	1478.4	91.2	41.4	3.1	221.5	125.9	33.5
Manning	R	87.0	1.9	723.5	66.6	22.1	0.9	149.5	80.3	23.0
Mayerthorpe	R	75.1	1.9	899.6	42.7	17.7	1.3	88.9	49.3	20.7
Medicine Hat Area	C	125.3	4.7	1899.6	106.9	42.9	2.5	214.0	114.4	32.9
Newell	R	116.3	2.3	951.6	70.1	28.2	1.6	168.4	82.2	22.4
Okotoks - Priddis	S	93.5	1.7	789.8	72.8	21.6	1.0	158.6	71.5	20.3
Olds	R	149.7	2.7	1327.2	100.1	37.4	2.7	207.2	107.0	29.9
Oyen	R	62.0	2.6	1912.5	63.9	24.0	0.8	156.9	72.0	21.3
Peace River - Falher	R	118.3	2.2	1196.2	86.2	37.2	1.7	193.7	115.1	32.3
Pincher Creek	R	139.1	5.6	2076.9	80.0	28.6	1.7	155.9	84.9	32.4
Planning & Special Area 2	R	89.7	2.0	1055.8	116.2	43.8	1.3	245.8	141.4	26.7
Ponoka	R	164.8	2.8	1203.4	114.0	53.2	4.8	204.8	128.6	47.0
Provost - Wainwright	R	110.6	3.9	1798.3	80.7	36.2	2.6	174.0	108.1	26.3
Red Deer Area	C	118.5	3.4	1569.4	97.0	40.8	2.9	210.4	115.3	31.3
Rimbey	R	104.9	3.6	1901.7	69.5	30.6	2.5	159.9	79.8	25.4
Rocky Mountain House	R	136.8	2.3	1176.7	70.7	27.8	1.5	143.2	70.4	28.6
Slave Lake	R	135.2	1.2	935.9	84.7	29.4	1.2	180.8	87.3	36.6
Smoky Lake	R	137.7	4.9	2207.1	104.8	47.0	1.7	224.3	128.9	54.5
St. Albert - Sturgeon West	S	118.7	2.3	1050.2	82.7	24.9	1.7	157.7	71.1	22.6
St. Paul	R	162.7	2.7	1543.7	104.1	41.5	2.1	170.1	93.5	51.4
Starland County/Drumheller	R	122.2	6.0	2368.0	90.2	40.8	3.2	186.6	122.1	31.5
Stettler & County	R	139.4	5.0	1884.7	104.9	46.6	3.1	222.4	138.0	34.4
Strathcona County	S	98.6	1.7	785.8	74.5	25.5	1.7	175.9	82.0	18.0
Strathmore	S	106.7	1.9	1014.1	68.1	24.0	1.5	148.0	71.4	24.6
Sundre	R	128.9	3.6	1597.1	82.4	26.0	1.2	155.2	69.2	28.0
Swan Hills	R	106.4	2.8	804.7	77.7	27.0	1.1	187.9	95.8	29.0
Sylvan Lake	R	154.8	4.2	1720.2	121.2	51.6	4.1	243.0	148.9	39.9
Taber MD	R	121.5	2.6	1038.9	79.7	33.7	1.7	191.8	116.6	28.5
Three Hills/Highway 21	R	72.6	1.8	778.3	68.6	27.9	1.6	172.9	89.7	18.4
Tofield	R	73.4	1.1	664.8	54.5	24.7	1.1	128.9	87.1	20.0
Two Hills County	R	65.5	3.1	1107.1	56.5	31.8	3.1	144.6	103.6	22.9
Valleyview	R	119.3	1.1	854.7	71.3	24.0	0.9	135.6	63.6	25.9
Vegreville/Minburn County	R	124.4	3.2	1677.2	85.8	43.8	3.4	190.5	120.9	30.8
Vermilion River County	R	116.4	3.0	1187.1	105.9	46.5	2.6	241.1	143.4	28.8
Viking	R	120.2	3.7	1508.4	98.8	42.6	3.2	249.2	149.4	27.3
Vulcan	R	100.2	3.2	1347.8	62.9	25.0	1.8	132.3	74.1	24.7
Wabasca	R	165.3	1.4	1108.8	89.2	21.2	0.3	116.7	33.6	47.2
Westlock	R	122.3	2.6	1264.3	76.3	33.0	2.1	146.6	84.1	26.4
Westview inc. S. Grove S. Plain	S	96.9	2.8	1358.2	71.2	29.9	2.3	144.1	83.7	23.7
Wetaskiwin County	R	175.2	2.2	1176.2	101.8	42.6	3.0	182.5	114.7	49.2
Whitecourt	R	135.0	2.2	1278.9	85.3	34.9	2.0	187.0	101.1	30.2
Wood Buffalo - FM	C	108.9	0.9	538.9	81.6	24.8	1.0	157.6	73.0	25.5

Appendix D – Opioid Prescriptions, Patients, Prescribers, Pharmacies and Population by PhLAG

PhLAG Name	Prescriptions	Patients	Prescribers	Pharmacies	Population	Elderly Population
Airdrie - Crossfield	22,641	8,942	2,094	32	85,062	9,080
Athabasca	4,366	1,466	267	4	10,629	2,195
Banff	1,999	1,131	166	3	12,034	915
Barrhead	3,772	1,452	261	5	10,937	2,421
Beaumont	5,237	2,239	784	7	26,417	2,954
Black Diamond	2,987	990	325	4	8,740	2,100
Bonnyville	6,461	2,540	344	5	16,476	2,184
Boyle	1,568	439	122	1	3,528	749
Calgary - Centre	40,680	8,494	1,980	42	67,602	7,634
Calgary - Centre North	21,176	6,667	2,038	28	44,747	6,808
Calgary - East	28,676	8,272	2,006	30	71,699	9,566
Calgary - Elbow Fish Creek	53,858	19,417	3,126	64	151,166	29,215
Calgary - NE	65,877	23,697	3,163	76	220,991	22,832
Calgary - North	19,811	8,516	2,214	20	119,085	12,986
Calgary - Nose Hill	20,746	7,064	2,031	28	78,883	11,551
Calgary - NW	30,162	14,074	2,718	45	187,684	28,831
Calgary - SE	33,669	13,827	2,604	32	137,915	13,286
Calgary - SW	23,107	9,361	2,056	29	118,711	14,703
Calgary - W	32,241	12,401	2,543	39	159,389	22,191
Calgary - West Bow	4,765	1,464	850	7	21,425	3,944
Camrose & County	9,831	4,093	606	12	30,187	6,623
Canmore	7,713	2,599	567	11	28,807	4,172
Cardston - Kainai	19,027	3,141	302	6	16,373	2,866
Castor/Coronation/Consort	2,028	572	116	3	6,055	1,245
Chestermere	4,954	2,033	834	6	25,871	3,334
Claresholm	3,825	1,122	281	2	6,357	1,869
Cochrane - Springbank	9,258	3,781	1,262	11	51,802	8,691
Cold Lake	5,209	2,406	348	6	20,575	1,892
County of Forty Mile	1,058	357	86	1	6,384	839
County of Warner	5,238	1,381	179	3	11,183	2,032
Crowsnest Pass	4,540	1,123	224	3	6,269	1,673
Didsbury	4,524	1,573	553	6	16,502	3,311
Drayton Valley	6,679	2,390	494	8	18,082	2,842
Edmonton - Abbottsfield	14,469	3,246	981	11	14,409	2,063
Edmonton - Bonnie Doon	40,060	12,347	2,462	47	95,301	15,458
Edmonton - Duggan	11,485	4,945	1,297	17	39,351	6,177
Edmonton - Eastwood	66,408	12,399	2,184	61	70,394	9,323
Edmonton - Jasper Place & West	67,516	24,404	3,463	69	185,773	26,861
Edmonton - Mill Woods	39,888	15,824	2,459	47	137,242	16,836
Edmonton - NE	26,644	10,019	2,025	32	91,799	10,692
Edmonton - North Centre	48,203	17,646	2,518	55	154,561	22,532
Edmonton - Rutherford	19,470	9,912	2,080	32	120,386	8,564
Edmonton - Twin Brooks	14,787	6,688	1,720	21	75,415	13,714
Edmonton - Woodcroft East	31,533	8,356	1,912	35	59,769	8,786
Edson	6,044	2,093	305	6	15,729	2,218
Fairview	2,003	704	153	3	8,037	1,428
Flagstaff County	2,616	854	183	5	8,400	1,995
Fort Macleod	3,430	947	237	4	6,846	1,332
Fort Saskatchewan - Sturgeon East	12,064	4,512	1,087	15	33,153	4,451
Fox Creek	673	293	78	1	2,145	241
Frog Lake	3,889	1,324	171	3	4,778	702
Grande Cache	1,519	459	84	2	4,083	466
Grande Prairie Area	37,483	12,613	794	28	112,258	11,368
High Level	7,841	2,824	180	3	24,877	1,594
High Prairie	5,913	1,532	226	4	11,443	1,629
High River	7,066	2,409	703	11	24,010	5,556
Hinton	3,184	1,290	230	5	12,108	1,622
Innisfail	5,071	1,853	422	7	15,851	3,530
Jasper	1,226	529	100	3	5,138	573
Lac La Biche	5,189	1,574	245	4	10,272	1,481
Lacombe	6,453	2,406	517	8	23,522	4,199
Lamont County	2,254	678	270	4	6,414	1,441
Leduc - Devon - Thorsby	19,872	7,736	1,504	22	52,768	8,195
Lethbridge Area	66,032	19,281	1,145	52	127,225	21,648
Manning	630	297	64	1	3,298	582
Mayerthorpe	4,401	1,377	436	5	16,039	3,339
Medicine Hat Area	33,715	10,766	755	33	79,451	15,350
Newell	8,754	3,076	432	10	27,609	3,396
Okotoks - Priddis	11,696	4,592	1,231	15	46,621	7,669
Olds	4,746	2,026	507	6	12,604	2,780
Oyen	790	255	46	1	3,446	784
Peace River - Falher	7,264	2,644	350	12	22,695	3,299
Pincher Creek	4,917	1,222	236	5	8,366	1,905
Planning & Special Area 2	1,296	394	123	4	3,589	899
Ponoka	6,125	2,061	409	5	12,368	2,353
Provost - Wainwright	4,663	1,899	270	7	16,709	2,720
Red Deer Area	51,445	16,464	1,553	56	135,930	19,569
Rimbey	3,308	1,176	293	4	10,073	2,326
Rocky Mountain House	8,080	2,823	537	7	20,324	3,540
Slave Lake	3,447	1,463	323	6	11,591	1,084
Smoky Lake	3,614	764	177	3	4,684	1,284
St. Albert - Sturgeon West	31,232	12,481	2,010	38	100,116	17,494
St. Paul	8,045	2,362	418	7	15,265	2,452
Starland County/Drumheller	5,396	1,571	313	6	11,722	2,417
Stettler & County	4,878	1,842	342	5	12,443	2,590
Strathcona County	26,484	10,677	1,980	32	99,755	17,559
Strathmore	12,327	3,867	953	14	35,791	5,264
Sundre	3,217	998	282	4	6,755	1,669
Swan Hills	460	136	58	1	1,272	149
Sylvan Lake	7,338	2,721	544	6	18,104	2,095
Taber MD	5,241	2,078	258	5	19,102	2,450
Three Hills/Highway 21	3,120	878	297	5	10,799	2,336
Tofield	1,774	641	224	2	7,777	1,559
Two Hills County	915	331	99	1	5,541	961
Valleyview	2,145	850	175	2	7,172	1,195
Vegreville/Minburn County	4,348	1,462	389	6	10,329	2,415
Vermilion River County	12,114	4,332	452	14	36,618	5,591
Viking	855	328	71	1	2,378	630
Vulcan	2,449	760	218	3	6,812	1,671
Wabasca	1,983	571	142	1	4,130	360
Westlock	6,752	2,552	530	8	18,950	4,372
Westview inc. S. Grove S. Plain	29,601	9,602	1,773	33	95,319	15,474
Wetaskiwin County	20,588	5,641	815	15	33,518	5,846
Whitecourt	4,835	1,924	306	6	14,623	1,492
Wood Buffalo - FM	21,000	8,250	733	20	81,964	3,996

Appendix E – BDZ/Z Prescriptions, Patients, Prescribers, Pharmacies and Population by PhLAG, 2021

PhLAG Name	Prescriptions	Patients	Prescribers	Pharmacies	Population	Elderly Population
Airdrie - Crossfield	16,797	6,216	1,600	32	85,062	9,080
Athabasca	3,788	1,298	208	4	10,629	2,195
Banff	1,299	517	118	3	12,034	915
Barrhead	3,558	1,303	175	5	10,937	2,421
Beaumont	4,010	1,605	598	7	26,417	2,954
Black Diamond	2,014	784	221	4	8,740	2,100
Bonnyville	4,240	1,459	240	5	16,476	2,184
Boyle	1,223	354	86	1	3,528	749
Calgary - Centre	19,466	6,704	1,912	43	67,602	7,634
Calgary - Centre North	12,640	4,656	1,755	28	44,747	6,808
Calgary - East	15,352	4,505	1,408	29	71,699	9,566
Calgary - Elbow Fish Creek	41,800	15,173	2,866	64	151,166	29,215
Calgary - NE	36,916	12,114	2,445	76	220,991	22,832
Calgary - North	14,181	5,586	1,719	20	119,085	12,986
Calgary - Nose Hill	12,820	4,616	1,678	28	78,883	11,551
Calgary - NW	26,467	10,870	2,332	46	187,684	28,831
Calgary - SE	23,680	9,424	2,156	32	137,915	13,286
Calgary - SW	19,227	7,257	1,664	29	118,711	14,703
Calgary - W	29,810	10,729	2,320	39	159,389	22,191
Calgary - West Bow	2,995	972	595	7	21,425	3,944
Camrose & County	9,817	3,196	530	12	30,187	6,623
Canmore	4,537	1,649	402	11	28,807	4,172
Cardston - Kainai	6,940	1,758	199	6	16,373	2,866
Castor/Coronation/Consort	1,902	548	95	3	6,055	1,245
Chestermere	3,095	1,273	544	6	25,871	3,334
Claresholm	2,165	678	144	2	6,357	1,869
Cochrane - Springbank	7,423	2,893	893	11	51,802	8,691
Cold Lake	4,380	1,840	306	6	20,575	1,892
County of Forty Mile	796	381	66	1	6,384	839
County of Warner	3,445	967	117	3	11,183	2,032
Crowsnest Pass	3,086	944	156	3	6,269	1,673
Didsbury	3,600	1,301	360	6	16,502	3,311
Drayton Valley	5,115	1,830	306	8	18,082	2,842
Edmonton - Abbottsfield	9,118	2,042	689	11	14,409	2,063
Edmonton - Bonnie Doon	28,234	8,797	2,134	45	95,301	15,458
Edmonton - Duggan	9,847	3,393	1,104	16	39,351	6,177
Edmonton - Eastwood	32,902	7,689	1,955	60	70,394	9,323
Edmonton - Jasper Place & West	56,821	18,516	3,039	68	185,773	26,861
Edmonton - Mill Woods	28,380	9,962	1,984	47	137,242	16,836
Edmonton - NE	17,482	5,892	1,563	30	91,799	10,692
Edmonton - North Centre	35,466	11,343	2,056	55	154,561	22,532
Edmonton - Rutherford	16,598	6,637	1,754	32	120,386	8,564
Edmonton - Twin Brooks	14,283	5,285	1,434	21	75,415	13,714
Edmonton - Woodcroft East	22,063	5,756	1,619	35	59,769	8,786
Edson	4,352	1,520	185	7	15,729	2,218
Fairview	1,639	583	100	3	8,037	1,428
Flagstaff County	2,094	776	135	5	8,400	1,995
Fort Macleod	1,479	503	165	4	6,846	1,332
Fort Saskatchewan - Sturgeon East	7,883	2,611	792	15	33,153	4,451
Fox Creek	331	159	39	1	2,145	241
Frog Lake	1,309	449	107	3	4,778	702
Grande Cache	815	312	49	2	4,083	466
Grande Prairie Area	25,548	8,454	720	28	112,258	11,368
High Level	5,374	1,684	161	3	24,877	1,594
High Prairie	3,059	941	154	4	11,443	1,629
High River	4,952	1,652	477	11	24,010	5,556
Hinton	1,829	710	143	5	12,108	1,622
Innisfail	3,689	1,310	296	7	15,851	3,530
Jasper	1,599	500	75	3	5,138	573
Lac La Biche	3,747	1,111	173	4	10,272	1,481
Lacombe	5,507	2,055	358	8	23,522	4,199
Lamont County	1,970	534	172	4	6,414	1,441
Leduc - Devon - Thorsby	14,637	5,454	1,176	22	52,768	8,195
Lethbridge Area	36,517	12,220	980	52	127,225	21,648
Manning	580	233	43	1	3,298	582
Mayerthorpe	2,576	799	285	5	16,039	3,339
Medicine Hat Area	27,616	9,341	604	33	79,451	15,350
Newell	5,193	1,825	275	10	27,609	3,396
Okotoks - Priddis	9,046	3,621	944	15	46,621	7,669
Olds	3,811	1,448	348	6	12,604	2,780
Oyen	908	261	39	1	3,446	784
Peace River - Falher	5,220	1,939	294	12	22,695	3,299
Pincher Creek	2,024	756	163	5	8,366	1,905
Planning & Special Area 2	1,553	504	94	4	3,589	899
Ponoka	4,460	1,490	282	5	12,368	2,353
Provost - Wainwright	3,725	1,416	197	7	16,709	2,720
Red Deer Area	41,055	13,579	1,272	57	135,930	19,569
Rimbey	2,223	842	202	4	10,073	2,326
Rocky Mountain House	3,796	1,514	382	7	20,324	3,540
Slave Lake	2,423	886	207	6	11,591	1,084
Smoky Lake	2,890	616	131	3	4,684	1,284
St. Albert - Sturgeon West	24,021	8,817	1,654	38	100,116	17,494
St. Paul	5,402	1,537	315	7	15,265	2,452
Starland County/Drumheller	3,798	1,204	236	6	11,722	2,417
Stettler & County	4,700	1,465	251	5	12,443	2,590
Strathcona County	21,826	8,094	1,606	32	99,755	17,559
Strathmore	7,367	2,493	607	14	35,791	5,264
Sundre	1,827	653	191	4	6,755	1,669
Swan Hills	310	104	44	1	1,272	149
Sylvan Lake	5,658	2,134	417	6	18,104	2,095
Taber MD	3,412	1,358	201	5	19,102	2,450
Three Hills/Highway 21	2,723	864	241	5	10,799	2,336
Tofield	1,581	486	188	2	7,777	1,559
Two Hills County	951	300	73	1	5,541	961
Valleyview	1,349	509	102	2	7,172	1,195
Vegreville/Minburn County	3,446	1,064	285	6	10,329	2,415
Vermilion River County	11,761	3,981	322	14	36,618	5,591
Viking	938	297	50	1	2,378	630
Vulcan	1,554	492	128	3	6,812	1,671
Wabasca	826	303	99	1	4,130	360
Westlock	5,396	1,666	365	8	18,950	4,372
Westview inc. S. Grove S. Plain	22,248	7,109	1,368	33	95,319	15,474
Wetaskiwin County	13,751	3,414	602	15	33,518	5,846
Whitcourt	2,907	1,173	168	6	14,623	1,492
Wood Buffalo - FM	17,327	5,972	617	19	81,964	3,996

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