

**TPP** 20  
ALBERTA 20

**PRESCRIPTION  
DRUG  
MONITORING  
PROGRAM 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 targeted medications;
- To provide timely and relevant information on targeted medications to prescribers, dispensers, consumers, regulatory bodies and stakeholders;
- To work with stakeholders to enable system level change to ensure appropriate use of targeted medications;
- To 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

Alberta Dental Association and College

Alberta Health

Alberta Health Services

Alberta Medical Association

Alberta Pharmacists' Association

Alberta Veterinary Medical Association

College and Association of Registered Nurses of Alberta

College of Physicians & Surgeons of Alberta

College of Podiatric Physicians of Alberta

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## Executive Summary

There has been a continuing decline in the number of patients and dosage consumed for both opioids and benzodiazepines (BDZ) and BDZ-type drugs (zopiclone, zolpidem, etc.) collectively referred to as BDZ/Z drugs. The number of prescriptions for BDZ/Z drugs increased very slightly from 2019 to 2020. A dramatic difference in monthly patterns was noted between the previous four years and 2020 for both opioids and BDZ/Z drugs which is likely reflective of the impact of COVID-19. These changes are discussed in the corresponding sections of this Atlas.

Urban/Rural status and the Socio-Economic Deprivation Index for each geographic area showed an association between higher deprivation index and highest consumption of opioids and BDZ/Z. Areas with lower deprivation scores were also associated with lower levels of consumption. The suburban category of Urban/Rural status showed an association with lower consumption of opioids and BDZ/Z. Opioid and BZD/Z consumption among elderly patients was similar regardless of Urban/Rural status or deprivation scores.

A global outbreak of COVID-19 required Alberta to declare a local state of public health emergency on March 17. On March 27 many non-essential businesses were closed and gatherings limited to 15 people. These events had an impact on the consumption of opioids and BDZ/Z where consumption of these products was lower than the historical average in April and higher than the historical average in June.

Other events of the pandemic (e.g., decreased in-person access to prescribers, etc.) also likely contributed to changes in numbers of prescriptions for opioid and BDZ/Z drugs, as well as other drugs.

Some changes in proportions of substances prescribed by prescriber type were also observed, likely as a result of the Section 56 exemptions issued by Health Canada in March 19, 2020. The exemptions allow pharmacists (authorized under the laws of Alberta) to extend and renew prescriptions for the purpose of facilitating continuation of treatment that the patient was already receiving.

A preliminary analysis of opioid addiction treatment products (OAT) revealed that a large proportion of total prescriptions were associated with OATs in many areas. The PhLAGs with the highest proportion of OAT prescriptions or patients include Calgary Centre, Fort MacLeod, Cardston-Kainai, Edmonton Eastwood, Edmonton Bonnie Doon, Calgary Centre North and Starland County/Drumheller.

New additions to the 2020 Atlas are:

- a comparison of rates by socio-economic status;
- an analysis of urban/rural status;
- impact of COVID 19 on prescribing trends;
- an expanded exploration of consumption of BDZ/Z drugs by patients 65 years and older;
- an expanded exploration of trends for the top five geographic areas with the highest rates;
- an investigation of drug form and route;
- an exploration of dosage by specialty group;
- a redesign of the large two-page graph spread to provide more information; and,
- legal size format.

## 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 2020. As with the 2019 Atlas, provincial utilization will be summarized for two classes of medications: opioids (including codeine-containing and tramadol-containing medications); and, BDZ/Z, which includes "Z" drugs such as zopiclone, eszopiclone, and zolpidem. An overview for antibiotics is provided in a separate publication. 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 21, 2021.

### TPP Alberta Data Source

2020 PIN data were used for the analyses. On January 1, 2013, TPP Alberta officially switched from physical triplicate 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. Compounded opioid medications and prescriptions for 'office use' are not reliably captured in PIN. Veterinarian prescription details were obtained from the TPP Alberta Prescription Drug Monitoring database since PIN only includes human patients.

All prescriber types authorized to prescribe controlled drugs in Alberta and monitored via TPP Alberta were included in the analyses. In 2020, physicians prescribed 85.6% of all opioid dispenses (including codeine and tramadol) and 93.7% 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 2020 Atlas were extracted from PIN on May 21, 2021, 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 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 because there is no mechanism in-place to uniquely identify animal patients.

### Pharmacy Local Aggregated Geography

Pharmacy Local Aggregated Geographies (PhLAG) 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/Z drugs. 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 2015-2019 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/Z drugs consist of all benzodiazepine

and Z drugs currently monitored by TPP Alberta. Appendix A shows 2020 prescriptions for opioids by main ingredient and route of administration. Appendix B shows 2020 prescriptions for BDZ/Z 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 2020 Alberta PhLAG population estimates. Patient age was calculated at July 1, 2020.

#### 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 Control<sup>1</sup>, the previous Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain<sup>2</sup> and the Compendium of Pharmaceuticals and Specialties<sup>3</sup>. 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:

$$\text{Dispense OME} = \text{strength} \times \text{quantity} \times \text{drug OME}$$

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

$$\text{Patient OME / day} = \frac{\text{the sum of the OME for all drug dispenses to the patient in the time period analyzed}}{\text{days in the time period analyzed}}^4$$

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

$$\text{Opioid consumption} = \frac{\text{the sum of all patient OME / day in the time period analyzed}}{1000 \text{ population}}$$

$$\text{Opioid patients} = \frac{\text{the number of patients who received at least one opioid prescription in the time period analyzed}}{1000 \text{ population}}$$

$$\text{High dose opioid patients} = \frac{\text{the number of patients who received 90 OME / day or greater in the time period analyzed}}{1000 \text{ population}}$$

The 2017 Canadian Guidelines for Opioids for Chronic Non-Cancer Pain set a watchful opioid dose of 50 OME/day<sup>5</sup>. This threshold is congruent with CDC Guidelines published in 2016<sup>6</sup>.

## BDZ/Z

The BDZ/Z analytic class includes benzodiazepines (BDZ) and benzodiazepine-like drugs (Z-drugs). 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 adults<sup>7</sup>. Drug DDD values were obtained primarily from the WHO DDD/ATC Index<sup>8</sup>. 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:

$$\text{Dispense DDDs} = \text{strength} \times \text{quantity} / \text{drug DDD}$$

A patient's total DDDs were calculated as follows:

$$\text{Patient DDDs} = \frac{\text{the sum of the DDDs for all drug dispenses to the patient in the time period analyzed}}{\text{days in the time period analyzed}}^4$$

Population utilization of BDZ/Z was presented using the five measures below. Population rates were age and sex standardized for comparison between pharmacy local aggregate geographies.

$$\text{BDZ/Z consumption} = \frac{\text{the sum of all patient DDDs received in the time period analyzed}}{1000 \text{ population}}$$

$$\text{BDZ/Z patients} = \frac{\text{the number of patients who received at least one BDZ/Z prescription in the time period analyzed}}{1000 \text{ population}}$$

$$\text{High dose BDZ/Z patients} = \frac{\text{the number of patients who received 2 DDDs}^9 \text{ or greater in the time period analyzed}}{1000 \text{ population}}$$

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

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

## Urban-Rural Categories

This 2020 Atlas introduces some analyses at the urban/rural level. The urban/rural category definitions used in the Atlas are adapted from those used by Alberta Health to 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://aepin.alberta.ca/boundaries/>

The categories are:

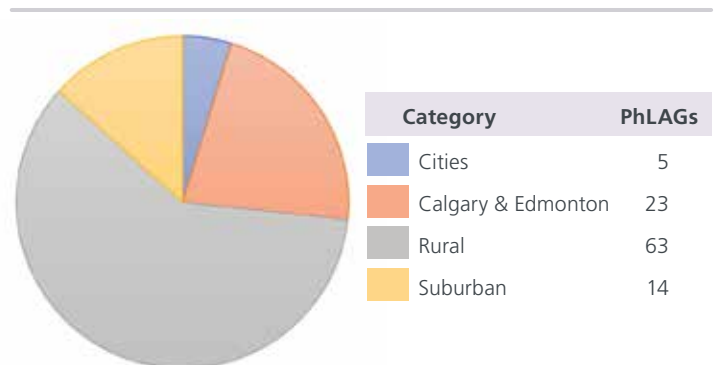
**Cities** — Lethbridge, Medicine Hat, Red Deer, Grande Prairie, and Fort McMurray;

**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, 2020



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

This year also introduces an analysis of socio-economic status in context of the observed rates for the selected measures. In 2009, Pampalon et al.<sup>10</sup> 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).<sup>11</sup> 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 Suburban areas show the lowest deprivation index (2.7) and rural areas the highest (3.6). It is essential to remember that there are areas with high and low values within any of these categories.

**Figure 2. Urban/Rural Categories and Associated Socio-Economic Deprivation Index, 2020**



<sup>1</sup> 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>

<sup>2</sup> <https://healthsci.mcmaster.ca/npc/How-We-Help/opioid-manager>

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

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

<sup>5</sup> 2017 Canadian Guideline for Opioids for Chronic Pain. Available at: <http://nationalpaincentre.mcmaster.ca/guidelines.html>

<sup>6</sup> 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>

<sup>7</sup> 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/](http://www.whocc.no/ddd/definition_and_general_considera/)

<sup>8</sup> [http://www.whocc.no/atc\\_ddd\\_index/](http://www.whocc.no/atc_ddd_index/)

<sup>9</sup> For the purpose of this Atlas, 2 DDDs was used as the watchful dose of BDZ/Z

<sup>10</sup> Pampalon, R, Hamel, D, & Gamache, P. (2009). A deprivation index for health planning in Canada. *Chronic Diseases in Canada*, 29(4): 178-191

<sup>11</sup> 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, 2016-2020

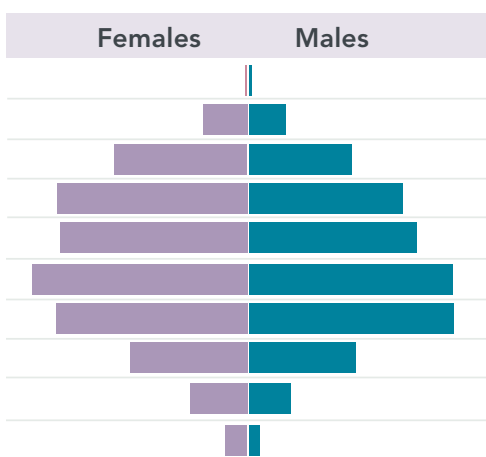
| Year | Prescriptions | Patients | Prescribers | Pharmacies | Population | OME per day per 1000 Population | Patients per 1000 Population | Patients ≥90 OME per 1000 Population |
|------|---------------|----------|-------------|------------|------------|---------------------------------|------------------------------|--------------------------------------|
| 2016 | 2,031,459     | 654,615  | 14,789      | 1,584      | 4,252,720  | 1,637                           | 153.9                        | 3.7                                  |
| 2017 | 1,934,191     | 634,288  | 15,330      | 1,388      | 4,285,997  | 1,431                           | 148.0                        | 3.2                                  |
| 2018 | 1,770,015     | 597,034  | 15,214      | 1,479      | 4,306,822  | 1,260                           | 138.6                        | 2.8                                  |
| 2019 | 1,664,056     | 573,037  | 14,906      | 1,536      | 4,371,154  | 1,195                           | 131.1                        | 2.6                                  |
| 2020 | 1,548,787     | 489,126  | 14,902      | 1,596      | 4,421,681  | 1,164                           | 110.6                        | 2.5                                  |

5 year trend

Table 2. Opioid Patients by Age and Sex, 2020\*

| Age Group | Females | Males   | Total Patients |
|-----------|---------|---------|----------------|
| 0 - 9     | 193     | 221     | 414            |
| 10 - 19   | 9,997   | 8,331   | 18,328         |
| 20 - 29   | 28,733  | 22,195  | 50,928         |
| 30 - 39   | 43,678  | 33,925  | 77,603         |
| 40 - 49   | 43,262  | 37,360  | 80,622         |
| 50 - 59   | 47,521  | 43,974  | 91,495         |
| 60 - 69   | 44,486  | 44,128  | 88,614         |
| 70 - 79   | 27,096  | 23,845  | 50,941         |
| 80 - 89   | 13,687  | 9,549   | 23,236         |
| 90+       | 4,858   | 2,028   | 6,886          |
| Total     | 263,528 | 225,582 | 489,111        |

Figure 3. Opioid Patients by Age and Sex, 2020



\* 17 female patients of unknown age, 26 male patients of unknown age, 15 patients of unknown sex and 1 patient of unknown sex or age

Table 3. Opioid Prescriptions, Patients, and Prescribers by Prescriber Type, 2020

| Prescriber Type     | Prescriptions | Percent | Patients | Percent | Prescribers | Percent |
|---------------------|---------------|---------|----------|---------|-------------|---------|
| All Prescribers     | 1,548,787     | 100.0   | 489,126  | 100.0   | 14,902      | 100.0   |
| Physicians          | 1,326,482     | 85.6    | 398,385  | 81.4    | 10,622      | 71.3    |
| Dentists            | 96,454        | 6.2     | 81,956   | 16.8    | 470         | 3.2     |
| Pharmacists         | 87,867        | 5.7     | 37,566   | 7.7     | 3,390       | 22.7    |
| Nurse Practitioners | 25,821        | 1.7     | 8,799    | 1.8     | 420         | 2.8     |

Note: Prescription sum does not match the summary value because only the four major prescriber groups are shown.  
 Note: Patient sum does not match the summary values because patients may obtain prescription from more than one prescriber type.

Figure 4. OME per Day per Patient by Specialty Group, 2020

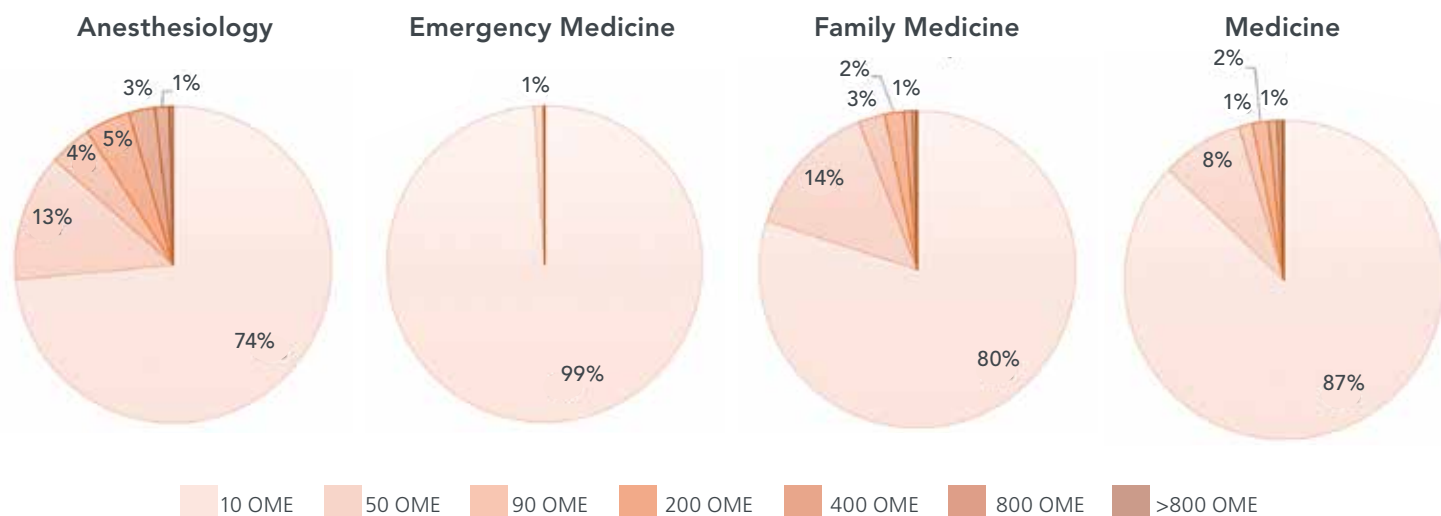




Table 4. Opioid Prescriptions by Top 10 Ingredients, 2016-2020\*

| Main Ingredient | 2016      | 2017      | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|-----------------|-----------|-----------|---------|---------|---------|------|--------------|
| Codeine         | 1,202,617 | 1,099,269 | 939,861 | 850,685 | 719,667 |      |              |
| Tramadol        | 216,673   | 231,957   | 242,786 | 237,280 | 233,297 |      |              |
| Oxycodone       | 302,931   | 273,842   | 240,979 | 209,035 | 201,506 |      |              |
| Hydromorphone   | 120,627   | 123,094   | 117,631 | 118,476 | 124,489 |      |              |
| Buprenorphine   | 36,762    | 54,388    | 72,828  | 87,980  | 94,305  |      |              |
| Methadone       | 53,292    | 60,572    | 69,830  | 76,994  | 88,017  |      |              |
| Morphine        | 65,750    | 61,065    | 59,602  | 59,273  | 64,331  |      |              |
| Fentanyl        | 21,505    | 19,823    | 17,472  | 16,408  | 16,194  |      |              |
| Tapentadol      | 4,017     | 3,638     | 3,365   | 3,110   | 2,802   |      |              |
| Butalbital      | 2,726     | 2,490     | 2,273   | 2,122   | 2,014   |      |              |

Table 5. Opioid Patients by Top 10 Ingredient, 2016-2020\*

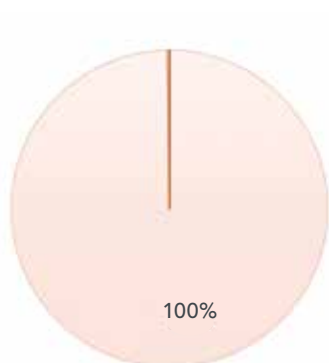
| Main Ingredient | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|-----------------|---------|---------|---------|---------|---------|------|--------------|
| Codeine         | 503,476 | 474,195 | 427,966 | 398,108 | 314,616 |      |              |
| Tramadol        | 127,838 | 137,718 | 143,413 | 145,152 | 137,859 |      |              |
| Oxycodone       | 74,039  | 63,355  | 54,428  | 47,597  | 42,807  |      |              |
| Hydromorphone   | 29,663  | 31,268  | 32,982  | 34,570  | 35,713  |      |              |
| Morphine        | 16,464  | 15,273  | 14,523  | 13,680  | 13,639  |      |              |
| Buprenorphine   | 6,673   | 7,759   | 9,583   | 11,546  | 12,812  |      |              |
| Methadone       | 5,363   | 5,702   | 6,217   | 6,733   | 7,545   |      |              |
| Fentanyl        | 4,743   | 4,350   | 3,980   | 3,700   | 3,725   |      |              |
| Butalbital      | 908     | 830     | 753     | 684     | 634     |      |              |
| Tapentadol      | 1,001   | 886     | 806     | 684     | 604     |      |              |

Table 6. Opioid Prescribers by Top 10 Ingredient, 2016-2020\*

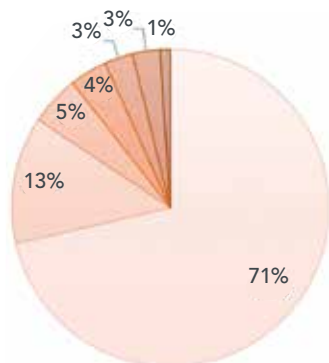
| Main Ingredient | 2016   | 2017   | 2018   | 2019   | 2020   | 2020 | 5 Year Trend |
|-----------------|--------|--------|--------|--------|--------|------|--------------|
| Codeine         | 13,544 | 13,802 | 13,397 | 13,017 | 12,730 |      |              |
| Tramadol        | 9,022  | 9,552  | 9,834  | 9,855  | 10,144 |      |              |
| Hydromorphone   | 5,144  | 5,491  | 5,648  | 5,808  | 6,376  |      |              |
| Oxycodone       | 5,941  | 5,933  | 5,996  | 5,691  | 6,060  |      |              |
| Morphine        | 4,232  | 4,234  | 4,271  | 4,186  | 4,406  |      |              |
| Buprenorphine   | 1,727  | 1,796  | 2,080  | 2,526  | 3,148  |      |              |
| Fentanyl        | 2,181  | 2,057  | 1,943  | 1,984  | 1,965  |      |              |
| Methadone       | 522    | 592    | 722    | 917    | 1,357  |      |              |
| Butalbital      | 698    | 661    | 627    | 579    | 539    |      |              |
| Tapentadol      | 574    | 517    | 470    | 467    | 444    |      |              |

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

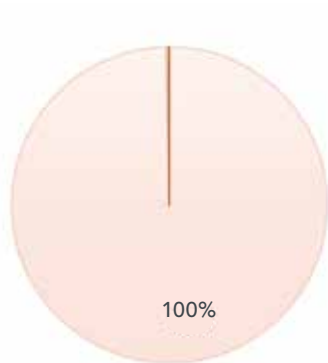
Orthopedic Surgery



Psychiatry



Surgery Excluding Orthopedics



Note: Not all clinical specialties were assigned to a Specialty Group. The Specialty to Specialty Group assignments appear at the bottom of Appendix A. 50 OME is the watchful dose.

**Table 7. Opioid Patients and Associated Prescribers by Dose, 2016-2020**

| <b>Patients</b> |         |         |         |         |         |      |              |
|-----------------|---------|---------|---------|---------|---------|------|--------------|
| Patient Dose*   | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
| Total Patients  | 654,615 | 634,288 | 597,034 | 573,037 | 489,126 |      |              |
| < 50 OME        | 628,538 | 610,640 | 575,602 | 553,001 | 469,629 |      |              |
| OME 50+         | 26,077  | 23,648  | 21,432  | 20,036  | 19,497  |      |              |
| OME 90+         | 15,519  | 13,763  | 11,952  | 11,165  | 10,845  |      |              |
| OME 200+        | 7,038   | 5,947   | 5,030   | 4,752   | 4,637   |      |              |
| OME 400+        | 2,694   | 2,221   | 1,809   | 1,840   | 1,832   |      |              |
| OME 600+        | 1,360   | 1,063   | 897     | 914     | 938     |      |              |
| OME 800+        | 761     | 582     | 500     | 522     | 539     |      |              |
| OME 1000+       | 490     | 377     | 321     | 347     | 365     |      |              |
| OME 2000+       | 57      | 52      | 32      | 56      | 76      |      |              |

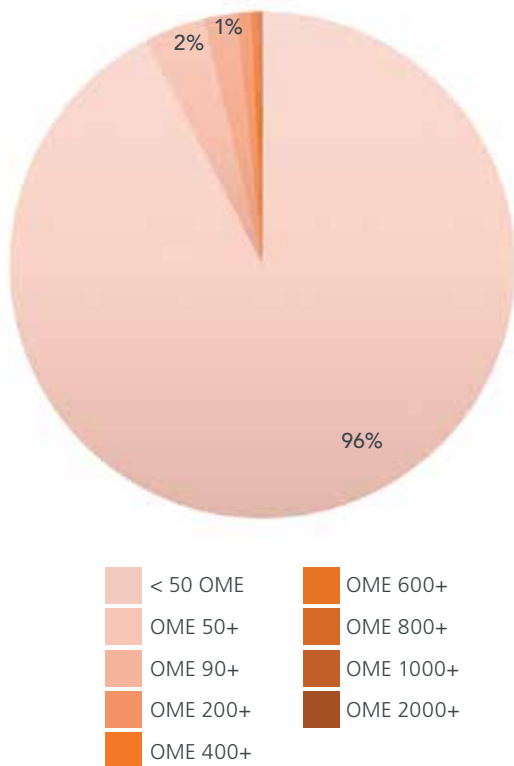
Note: Of 489,126 patients who received opioids in 2020, 469,629 (96%) received < 50 OME/day. No bar is shown for < 50 OME to highlight differences at higher dosages.

| <b>Associated Prescribers</b> |        |        |        |        |        |      |              |
|-------------------------------|--------|--------|--------|--------|--------|------|--------------|
| Patient Dose*                 | 2016   | 2017   | 2018   | 2019   | 2020   | 2020 | 5 Year Trend |
| Total Prescribers             | 14,789 | 15,330 | 15,214 | 14,906 | 14,902 |      |              |
| < 50 OME                      | 6,538  | 7,440  | 8,218  | 8,181  | 8,135  |      |              |
| OME 50+                       | 8,251  | 7,890  | 6,996  | 6,725  | 6,767  |      |              |
| OME 90+                       | 6,745  | 6,246  | 5,338  | 5,085  | 5,125  |      |              |
| OME 200+                      | 4,517  | 3,914  | 3,346  | 3,055  | 3,016  |      |              |
| OME 400+                      | 2,421  | 1,940  | 1,552  | 1,473  | 1,475  |      |              |
| OME 600+                      | 1,455  | 1,070  | 862    | 826    | 835    |      |              |
| OME 800+                      | 842    | 630    | 528    | 518    | 518    |      |              |
| OME 1000+                     | 562    | 407    | 376    | 368    | 355    |      |              |
| OME 2000+                     | 71     | 73     | 52     | 75     | 81     |      |              |

\* can include prescriptions from multiple prescribers

Note: Of 14,902 prescribers in 2020, 8,135 (54.6%) prescribed < 50 OME/day. No bar is shown for < 50 OME to highlight differences at higher dosages.

**Figure 5. Patient Dose Proportion, 2020**



**Figure 6. Opioid Prescriptions by Drug Form and Route, 2020**

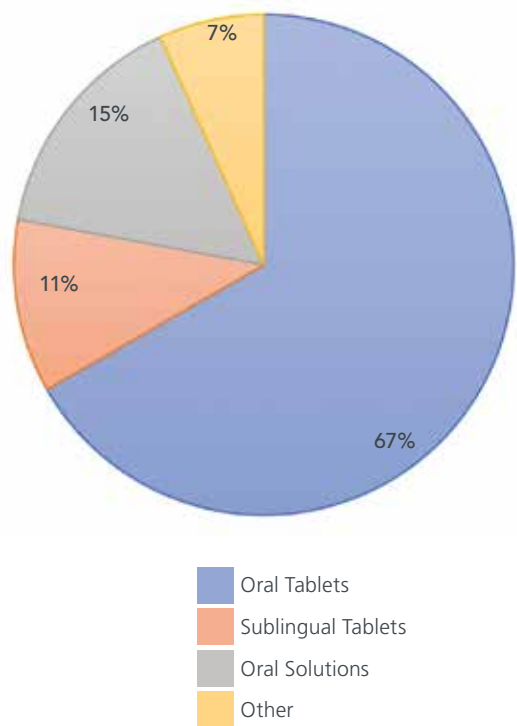


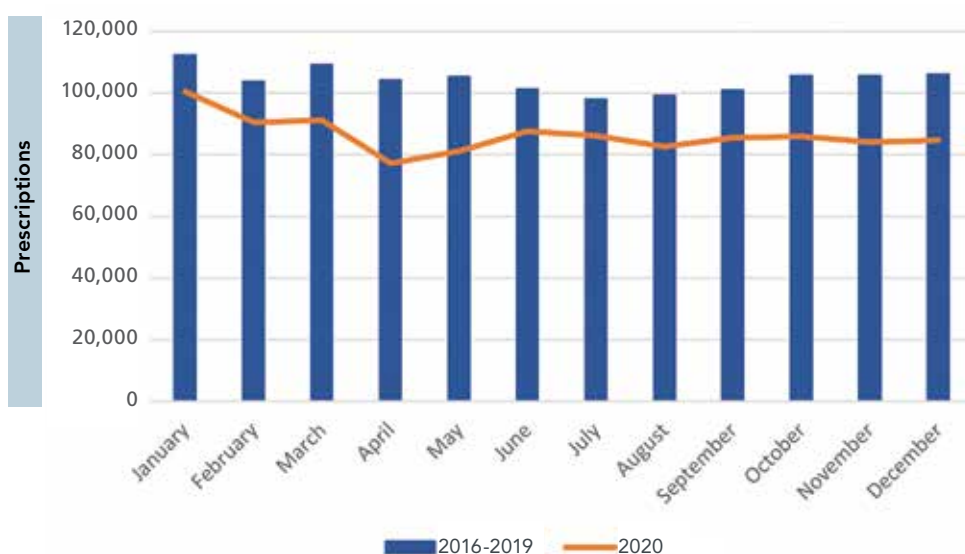
Table 8. Opioid Patients by Number of Ingredients, 2016-2020

| Ingredients    | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|----------------|---------|---------|---------|---------|---------|------|--------------|
| 1+ Ingredients | 654,615 | 634,288 | 597,034 | 573,037 | 489,126 |      |              |
| 2+ Ingredients | 97,038  | 90,914  | 83,435  | 76,534  | 68,555  |      |              |
| 3+ Ingredients | 16,926  | 14,973  | 13,061  | 11,641  | 10,800  |      |              |
| 4+ Ingredients | 2,799   | 2,347   | 2,053   | 1,875   | 1,806   |      |              |
| 5+ Ingredients | 484     | 343     | 300     | 301     | 308     |      |              |
| 6+ Ingredients | 77      | 46      | 38      | 34      | 44      |      |              |

Table 9. Opioid Patients by Number of Prescribers, 2016-2020

| Prescribers    | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|----------------|---------|---------|---------|---------|---------|------|--------------|
| 1+ Prescribers | 654,615 | 634,288 | 597,034 | 573,037 | 489,126 |      |              |
| 2+ Prescribers | 200,340 | 185,752 | 162,140 | 148,797 | 124,997 |      |              |
| 3+ Prescribers | 85,599  | 75,893  | 61,229  | 54,892  | 45,250  |      |              |
| 4+ Prescribers | 43,880  | 36,938  | 27,773  | 24,348  | 19,626  |      |              |
| 5+ Prescribers | 25,194  | 19,718  | 13,765  | 11,908  | 9,390   |      |              |
| 6+ Prescribers | 15,318  | 11,212  | 7,376   | 6,261   | 4,813   |      |              |
| 7+ Prescribers | 9,595   | 6,692   | 4,058   | 3,460   | 2,561   |      |              |
| 8+ Prescribers | 6,250   | 4,109   | 2,287   | 1,955   | 1,393   |      |              |

Figure 7. Opioid Prescribing Trends by Month for Patients 0-64 Years, 2016-2020



Note: Alberta declared a local state of public health emergency on March 17. On March 27, many non-essential businesses were closed and gatherings limited to 15 people.

Figure 8. Opioid Prescribing Trends by Month for Patients 65 Years and Older, 2016-2020

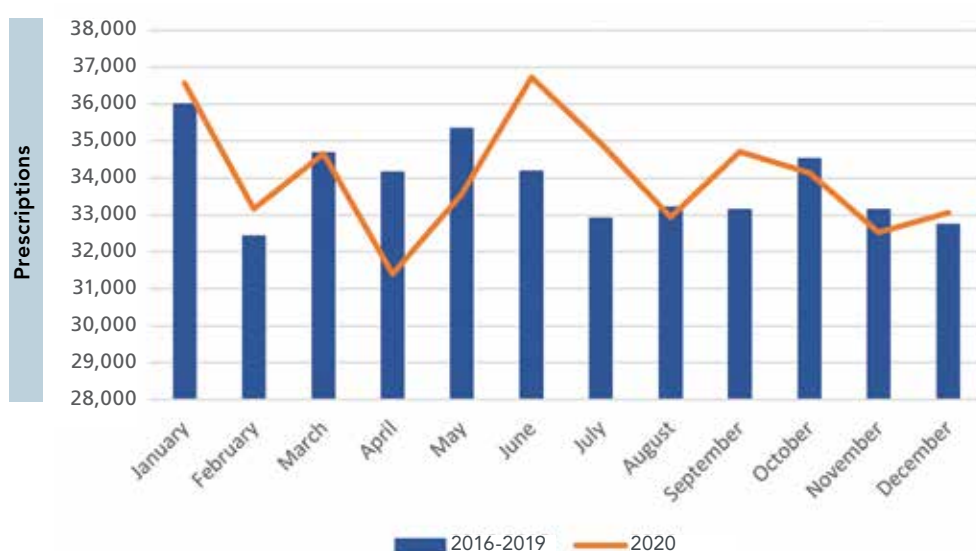
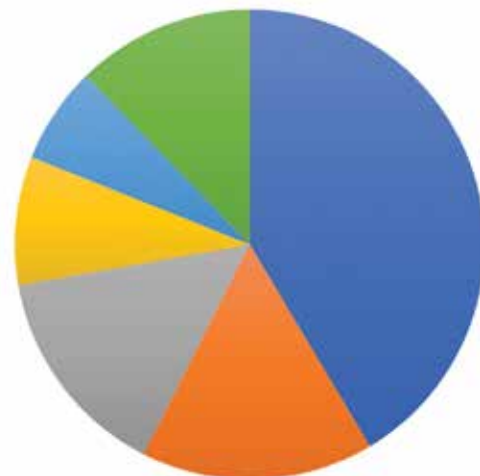


Figure 9. Opioid Prescriptions by Ingredient for Physician Prescribers, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Codeine           | 549,747       | 41.4 |
| Tramadol          | 212,422       | 16.0 |
| Oxycodone         | 195,743       | 14.8 |
| Hydromorphone     | 117,359       | 8.8  |
| Buprenorphine     | 88,596        | 6.7  |
| Other Ingredients | 162,618       | 12.3 |

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



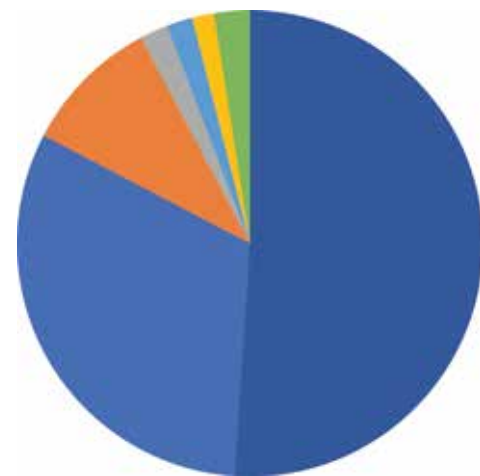
Note: Dark grey section shows the proportion of physician opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.



Figure 10. Opioid Prescriptions by Ingredient for Pharmacist Prescribers, 2020

| Main Ingredient          | Prescriptions | %    |
|--------------------------|---------------|------|
| Non-Prescription Codeine | 45,691        | 52.0 |
| Prescription Codeine     | 26,959        | 30.7 |
| Tramadol                 | 8,399         | 9.6  |
| Oxycodone                | 1,720         | 2.0  |
| Buprenorphine            | 1,582         | 1.8  |
| Hydromorphone            | 1,330         | 1.5  |
| Other Ingredients        | 2,186         | 2.5  |

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



Note: Dark 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 2020, 945 veterinarians in Alberta prescribed 16,581 opioid prescriptions for animal clients.

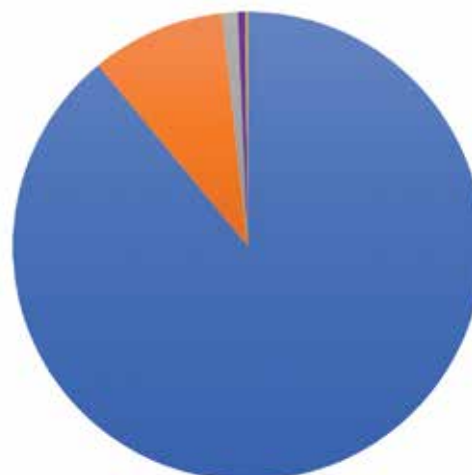
The five most commonly prescribed ingredients are shown here.

The data source for veterinarian prescriptions of controlled drugs for animals is the TPP Alberta 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, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Codeine           | 85,864        | 89.0 |
| Tramadol          | 8,884         | 9.2  |
| Oxycodone         | 1,055         | 1.1  |
| Morphine          | 508           | 0.5  |
| Hydromorphone     | 107           | 0.1  |
| Other Ingredients | 36            | 0.0  |

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



Note: Dark 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, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Codeine           | 5,233         | 20.3 |
| Methadone         | 4,920         | 19.1 |
| Hydromorphone     | 4,697         | 18.2 |
| Buprenorphine     | 3,527         | 13.7 |
| Morphine          | 3,310         | 12.8 |
| Other Ingredients | 4,134         | 16.0 |

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



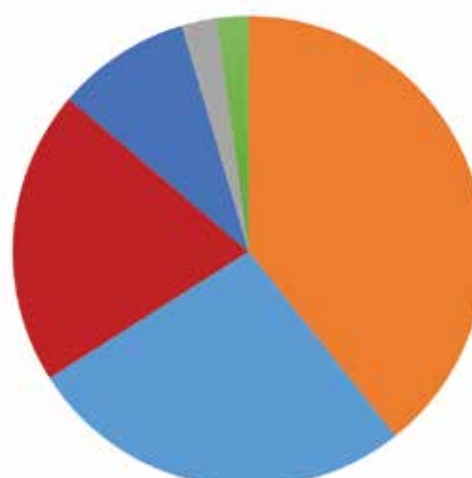
Note: Dark grey section shows the proportion of nurse practitioner opioid prescriptions relative to total opioid prescriptions by all prescriber types. See Table 3.



Figure 13. Opioid Prescriptions by Ingredient for Veterinarian Prescribers, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Tramadol          | 6,515         | 39.3 |
| Buprenorphine     | 4,426         | 26.7 |
| Hydrocodone       | 3,355         | 20.2 |
| Codeine           | 1,525         | 9.2  |
| Oxycodone         | 398           | 2.4  |
| Other Ingredients | 362           | 2.2  |

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/Z

Table 10. Utilization of Prescription BDZ/Z in Alberta, 2016-2020

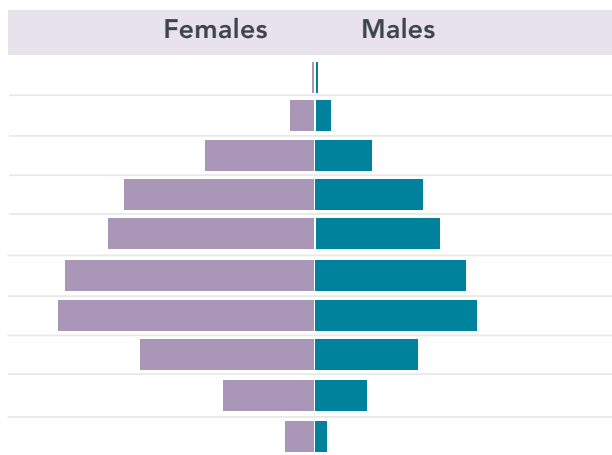
| Year | Prescriptions | Patients | Prescribers | Pharmacies | DDDs per 1000 Population | Patients per 1000 Population | Patients ≥ 2 DDDs | Patients ≥ 2 DDDs per 1000 Population |
|------|---------------|----------|-------------|------------|--------------------------|------------------------------|-------------------|---------------------------------------|
| 2016 | 1,284,641     | 386,883  | 12,738      | 1,419      | 41.0                     | 91.0                         | 14,728            | 3.5                                   |
| 2017 | 1,204,351     | 369,801  | 13,151      | 1,385      | 36.6                     | 86.3                         | 12,257            | 2.9                                   |
| 2018 | 1,127,409     | 355,832  | 13,398      | 1,469      | 33.5                     | 82.6                         | 10,771            | 2.5                                   |
| 2019 | 1,056,933     | 343,228  | 13,377      | 1,533      | 30.8                     | 78.5                         | 9,815             | 2.2                                   |
| 2020 | 1,075,501     | 330,163  | 13,770      | 1,592      | 29.9                     | 74.7                         | 9,822             | 2.2                                   |

5 year trend

Table 11. BDZ/Z Patients by Age and Sex, 2020\*

| Age Group | Females | Males   | Total Patients |
|-----------|---------|---------|----------------|
| 0 - 9     | 407     | 545     | 952            |
| 10 - 19   | 3,969   | 2,256   | 6,225          |
| 20 - 29   | 17,184  | 8,711   | 25,895         |
| 30 - 39   | 29,586  | 16,666  | 46,252         |
| 40 - 49   | 32,291  | 19,039  | 51,330         |
| 50 - 59   | 39,084  | 23,595  | 62,679         |
| 60 - 69   | 40,106  | 25,135  | 65,241         |
| 70 - 79   | 27,035  | 16,106  | 43,141         |
| 80 - 89   | 14,247  | 7,861   | 22,108         |
| 90+       | 4,587   | 1,734   | 6,321          |
| Total     | 208,498 | 121,654 | 330,153        |

Figure 14. BDZ/Z Patients by Age and Sex, 2020



\* 2 female patients of unknown age, 6 male patients of unknown age, 10 patients of unknown sex and 1 patient of unknown sex or age

Table 12. BDZ/Z Prescriptions, Patients, and Prescribers by Prescriber Type, 2020

| Prescriber Type     | Prescriptions | Percent | Patients | Percent | Prescribers | Percent |
|---------------------|---------------|---------|----------|---------|-------------|---------|
| All Prescribers     | 1,075,501     | 100.0   | 330,163  | 100.0   | 13,770      | 100.0   |
| Physicians          | 1,007,334     | 93.7    | 320,581  | 97.1    | 9,834       | 71.4    |
| Pharmacists         | 46,180        | 4.3     | 26,722   | 8.1     | 3,453       | 25.1    |
| Nurse Practitioners | 9,323         | 0.9     | 4,535    | 1.4     | 401         | 2.9     |
| Dentists            | 6,619         | 0.6     | 5,394    | 1.6     | 81          | 0.6     |

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

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

Figure 15. DDDs per Patient by Specialty Group, 2020

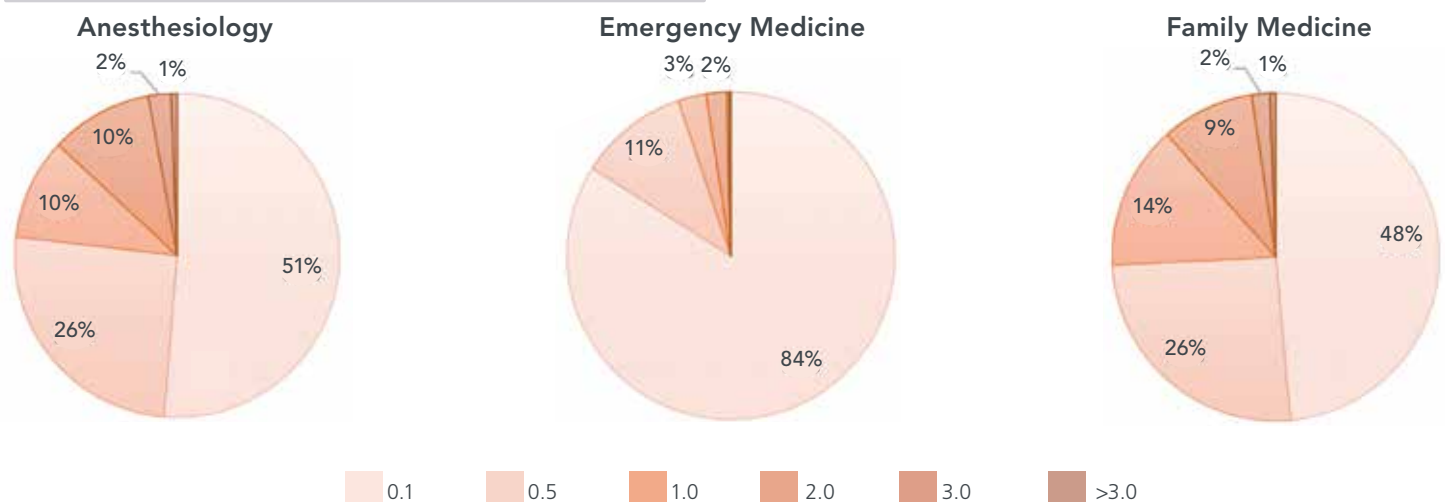


Table 13. BDZ/Z Prescriptions by Top 10 Ingredients, 2016-2020\*

| Main Ingredient | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|-----------------|---------|---------|---------|---------|---------|------|--------------|
| Zopiclone       | 510,096 | 490,331 | 462,420 | 431,329 | 436,528 |      |              |
| Lorazepam       | 330,213 | 308,295 | 293,754 | 283,645 | 289,643 |      |              |
| Clonazepam      | 172,170 | 169,387 | 158,111 | 148,752 | 152,692 |      |              |
| Temazepam       | 86,438  | 68,679  | 57,658  | 49,516  | 48,483  |      |              |
| Zolpidem        | 40,274  | 42,113  | 42,257  | 42,012  | 45,140  |      |              |
| Diazepam        | 48,233  | 40,843  | 36,412  | 34,654  | 37,563  |      |              |
| Alprazolam      | 28,938  | 26,770  | 25,011  | 22,811  | 22,342  |      |              |
| Clobazam        | 10,110  | 10,068  | 10,008  | 10,064  | 10,845  |      |              |
| Bromazepam      | 21,875  | 16,668  | 13,177  | 10,977  | 10,232  |      |              |
| Nitrazepam      | 18,065  | 14,809  | 13,429  | 8,700   | 7,818   |      |              |

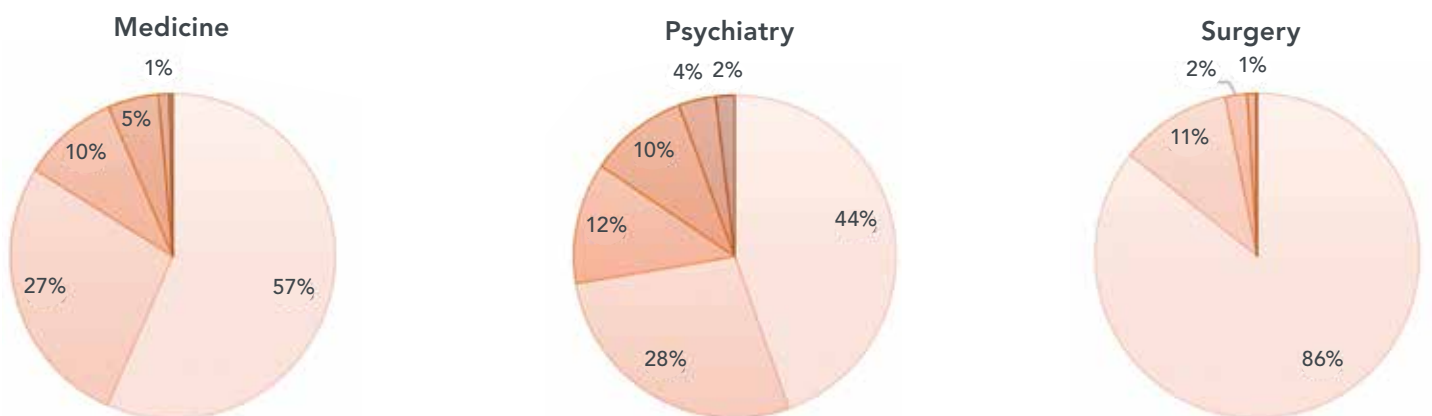
Table 14. BDZ/Z Patients by Top 10 Ingredient, 2016-2020\*

| Main Ingredient | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|-----------------|---------|---------|---------|---------|---------|------|--------------|
| Zopiclone       | 192,225 | 180,546 | 169,622 | 158,734 | 150,862 |      |              |
| Lorazepam       | 151,540 | 144,662 | 141,591 | 139,683 | 134,233 |      |              |
| Clonazepam      | 53,687  | 50,206  | 47,830  | 45,693  | 45,027  |      |              |
| Zolpidem        | 17,645  | 17,473  | 17,095  | 16,889  | 16,680  |      |              |
| Temazepam       | 24,094  | 19,553  | 16,474  | 14,131  | 12,857  |      |              |
| Diazepam        | 15,965  | 14,097  | 12,785  | 12,347  | 12,425  |      |              |
| Alprazolam      | 10,066  | 9,118   | 8,280   | 7,577   | 7,012   |      |              |
| Clobazam        | 3,400   | 3,380   | 3,473   | 3,534   | 3,679   |      |              |
| Triazolam       | 3,400   | 3,136   | 3,149   | 3,288   | 3,030   |      |              |
| Bromazepam      | 4,147   | 3,254   | 2,703   | 2,310   | 2,043   |      |              |

Table 15. BDZ/Z Prescribers by Top 10 Ingredient, 2016-2020\*

| Main Ingredient | 2016   | 2017   | 2018   | 2019   | 2020   | 2020 | 5 Year Trend |
|-----------------|--------|--------|--------|--------|--------|------|--------------|
| Zopiclone       | 10,855 | 11,197 | 11,332 | 11,290 | 11,426 |      |              |
| Lorazepam       | 8,128  | 8,368  | 8,579  | 8,596  | 9,836  |      |              |
| Clonazepam      | 5,984  | 6,157  | 6,255  | 6,226  | 7,386  |      |              |
| Zolpidem        | 3,774  | 3,905  | 4,021  | 4,053  | 4,417  |      |              |
| Diazepam        | 4,074  | 4,093  | 4,060  | 4,079  | 4,318  |      |              |
| Temazepam       | 3,949  | 3,888  | 3,658  | 3,500  | 3,771  |      |              |
| Alprazolam      | 3,265  | 3,241  | 3,198  | 3,093  | 3,157  |      |              |
| Clobazam        | 1,997  | 2,122  | 2,199  | 2,217  | 2,500  |      |              |
| Bromazepam      | 1,639  | 1,530  | 1,418  | 1,294  | 1,313  |      |              |
| Oxazepam        | 1,501  | 1,340  | 1,228  | 1,143  | 1,050  |      |              |

\* The ten most commonly prescribed ingredients are displayed. See Appendix B 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 B.

Table 16. BDZ/Z Patients and Associated Prescribers by Dose, 2016-2020

| <b>Patients</b> |         |         |         |         |         |      |              |
|-----------------|---------|---------|---------|---------|---------|------|--------------|
| Patient Dose*   | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
| Total Patients  | 386,883 | 369,801 | 355,832 | 343,228 | 330,163 |      |              |
| < 1 DDD         | 330,936 | 319,936 | 309,782 | 300,404 | 287,628 |      |              |
| 1+ DDD          | 55,947  | 49,865  | 46,050  | 42,824  | 42,535  |      |              |
| 2+ DDD          | 14,728  | 12,257  | 10,771  | 9,815   | 9,822   |      |              |
| 4+ DDD          | 1,862   | 1,329   | 1,105   | 971     | 972     |      |              |
| 6+ DDD          | 449     | 301     | 227     | 225     | 218     |      |              |
| 8+ DDD          | 122     | 75      | 68      | 61      | 70      |      |              |
| 10+ DDD         | 49      | 34      | 28      | 24      | 24      |      |              |

Note: 87.1% of BDZ/Z patients received less than 1 DDD. The bar graph for < 1 DDD is not shown to enhance readability of higher dosage amounts.

| <b>Associated Prescribers</b> |        |        |        |        |        |      |              |
|-------------------------------|--------|--------|--------|--------|--------|------|--------------|
| Patient Dose*                 | 2016   | 2017   | 2018   | 2019   | 2020   | 2020 | 5 Year Trend |
| All                           | 12,738 | 13,151 | 13,398 | 13,377 | 13,770 |      |              |
| < 1 DDD                       | 3,850  | 4,256  | 4,401  | 4,547  | 4,576  |      |              |
| 1+ DDD                        | 8,888  | 8,895  | 8,997  | 8,830  | 9,194  |      |              |
| 2+ DDD                        | 5,929  | 5,615  | 5,467  | 5,209  | 5,486  |      |              |
| 4+ DDD                        | 2,127  | 1,557  | 1,296  | 1,131  | 1,186  |      |              |
| 6+ DDD                        | 752    | 434    | 321    | 292    | 318    |      |              |
| 8+ DDD                        | 266    | 85     | 89     | 76     | 116    |      |              |
| 10+ DDD                       | 134    | 37     | 39     | 36     | 39     |      |              |

\* can include prescriptions from multiple prescribers

Note: A dosage of < 1 DDD was prescribed by 33.2% of prescribers. The bar graph for < 1 DDD is not shown to highlight differences at higher dosages.

Figure 16. Proportion of Patients by DDD Category

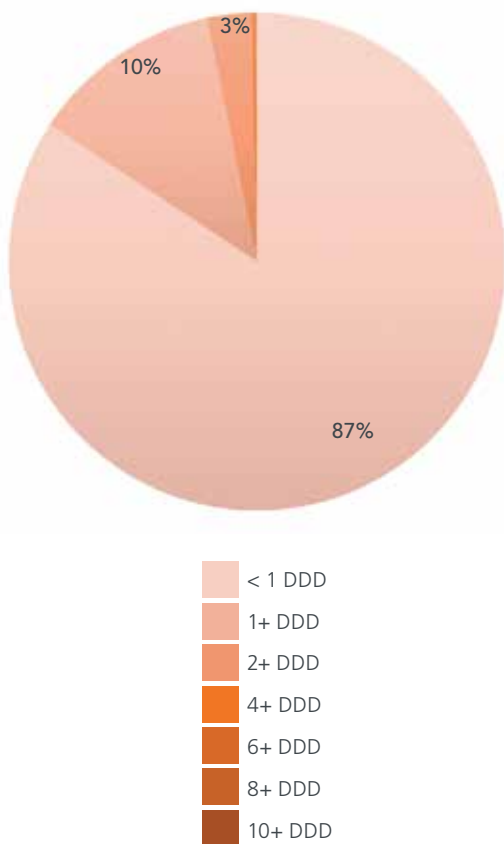


Figure 17. BDZ/Z Prescriptions by Drug Form and Route, 2020

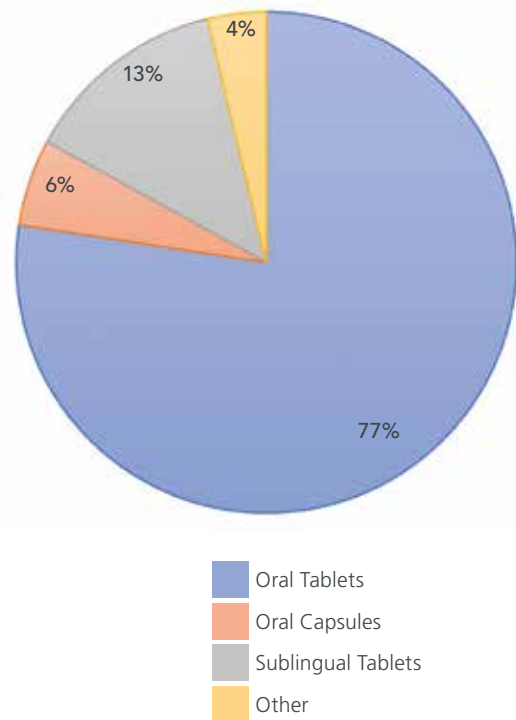




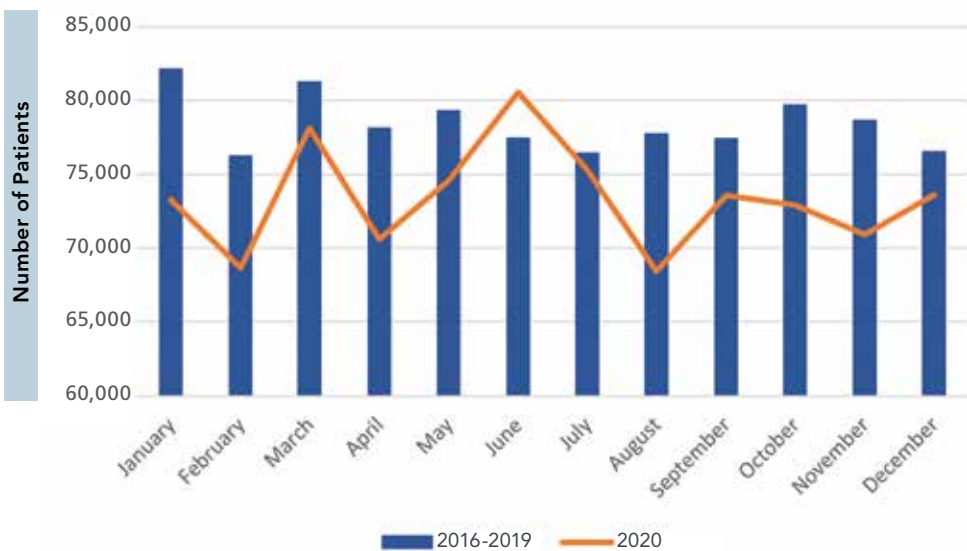
Table 17. BDZ/Z Patients by Number of Ingredients, 2016-2020

| Ingredients    | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|----------------|---------|---------|---------|---------|---------|------|--------------|
| 1+ Ingredients | 386,883 | 369,801 | 355,832 | 343,228 | 330,163 |      |              |
| 2+ Ingredients | 80,269  | 70,269  | 63,237  | 57,989  | 55,062  |      |              |
| 3+ Ingredients | 15,051  | 11,439  | 9,507   | 8,302   | 7,675   |      |              |
| 4+ Ingredients | 2,854   | 1,783   | 1,381   | 1,155   | 1,048   |      |              |
| 5+ Ingredients | 552     | 274     | 206     | 166     | 155     |      |              |
| 6+ Ingredients | 119     | 50      | 37      | 27      | 21      |      |              |

Table 18. BDZ/Z Patients by Number of Prescribers, 2016-2020

| Prescribers    | 2016    | 2017    | 2018    | 2019    | 2020    | 2020 | 5 Year Trend |
|----------------|---------|---------|---------|---------|---------|------|--------------|
| 1+ Prescribers | 386,883 | 369,801 | 355,832 | 343,228 | 330,163 |      |              |
| 2+ Prescribers | 113,080 | 102,410 | 94,750  | 88,129  | 85,696  |      |              |
| 3+ Prescribers | 39,591  | 33,888  | 30,174  | 27,622  | 27,136  |      |              |
| 4+ Prescribers | 15,877  | 12,631  | 10,815  | 9,763   | 9,408   |      |              |
| 5+ Prescribers | 7,154   | 5,283   | 4,374   | 3,864   | 3,530   |      |              |
| 6+ Prescribers | 3,500   | 2,402   | 1,905   | 1,693   | 1,518   |      |              |
| 7+ Prescribers | 1,905   | 1,224   | 956     | 862     | 752     |      |              |
| 8+ Prescribers | 1,090   | 641     | 552     | 474     | 396     |      |              |

Figure 18. BDZ/Z Prescribing Trends by Month for Patients 0-64 Years, 2016-2020



Note: Alberta declared a local state of public health emergency on March 17 due to a COVID-19 outbreak. On March 27 many non-essential businesses were closed and gatherings limited to 15 people.

Figure 19. BDZ/Z Prescribing Trends by Month for Patients 65 Years and Older, 2016-2020

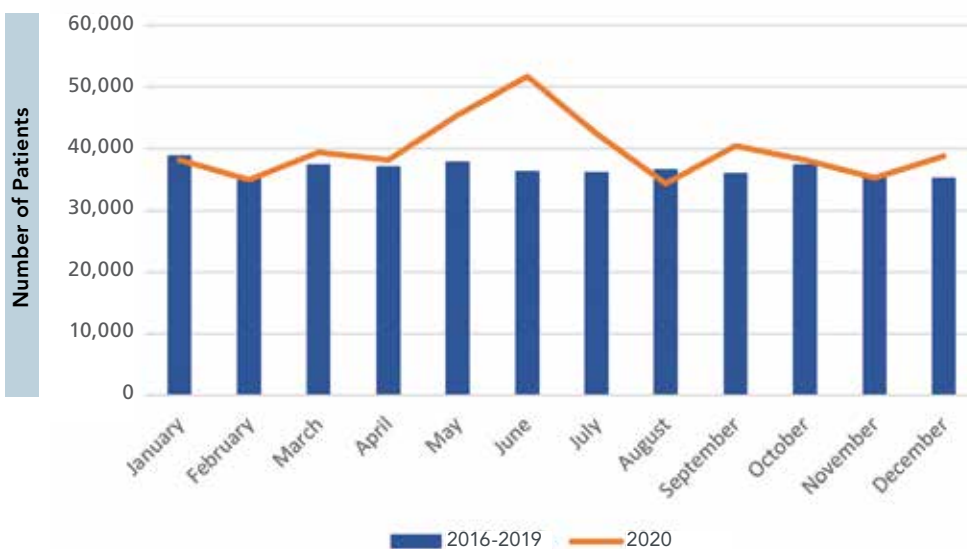
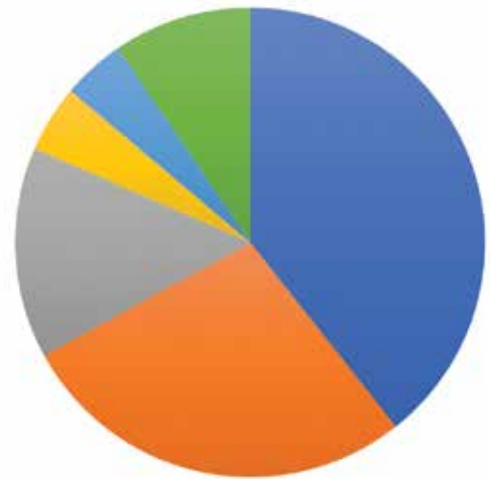


Figure 20. BDZ/Z Prescriptions by Ingredient for Physician Prescribers, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Zopiclone         | 396,535       | 39.4 |
| Lorazepam         | 278,206       | 27.6 |
| Clonazepam        | 146,694       | 14.6 |
| Temazepam         | 46,540        | 4.6  |
| Zolpidem          | 43,512        | 4.3  |
| Other Ingredients | 95,853        | 9.5  |

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



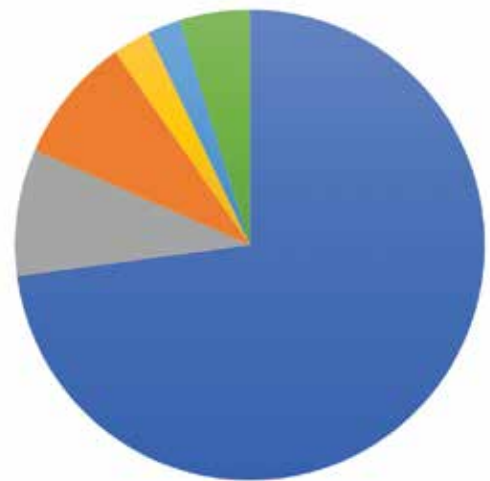
Note: Dark grey section shows the proportion of physician BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.



Figure 21. BDZ/Z Prescriptions by Ingredient for Pharmacist Prescribers, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Zopiclone         | 33,656        | 72.9 |
| Clonazepam        | 4,019         | 8.7  |
| Lorazepam         | 4,017         | 8.7  |
| Temazepam         | 1,206         | 2.6  |
| Zolpidem          | 1,049         | 2.3  |
| Other Ingredients | 2,233         | 4.8  |

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



Note: Dark 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 2020, 413 veterinarians prescribed 1,277 BDZ/Z prescriptions for animal clients.

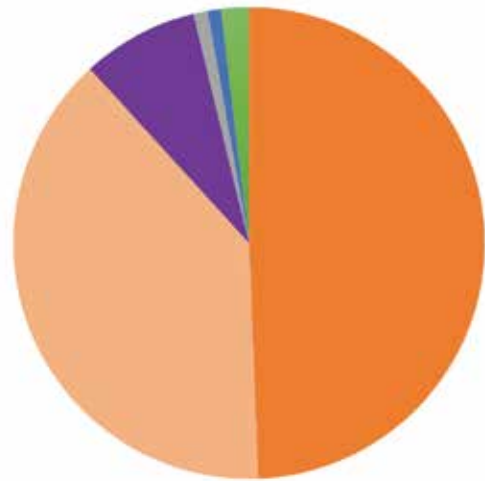
The five most commonly prescribed ingredients are shown here.

The data source for veterinarian prescriptions of controlled drugs for animals is the TPP Alberta 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, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Lorazepam         | 3,269         | 49.4 |
| Triazolam         | 2,570         | 38.8 |
| Diazepam          | 528           | 8.0  |
| Clonazepam        | 66            | 1.0  |
| Zopiclone         | 60            | 0.9  |
| Other Ingredients | 126           | 1.9  |

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



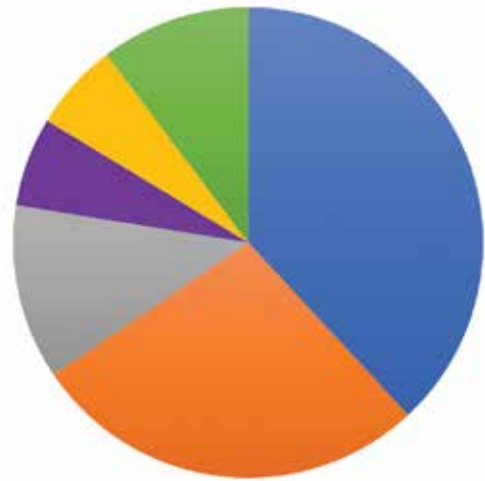
Note: Dark grey section shows the proportion of dentist BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.



Figure 23. BDZ/Z Prescriptions by Ingredient for Nurse Practitioner Prescribers, 2020

| Main Ingredient   | Prescriptions | %    |
|-------------------|---------------|------|
| Zopiclone         | 3,551         | 38.1 |
| Lorazepam         | 2,555         | 27.4 |
| Clonazepam        | 1,123         | 12.0 |
| Diazepam          | 571           | 6.1  |
| Temazepam         | 563           | 6.0  |
| Other Ingredients | 960           | 10.3 |

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



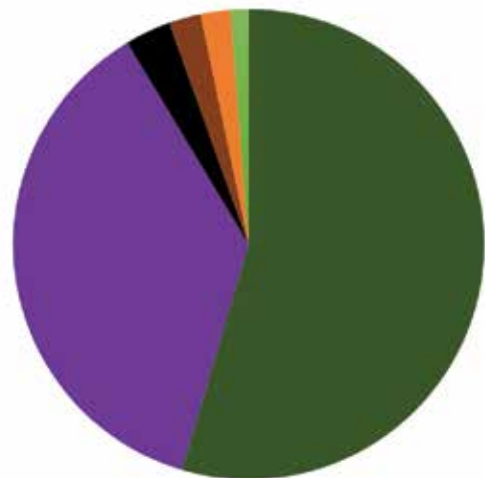
Note: Dark grey section shows the proportion of nurse practitioner BDZ/Z prescriptions relative to total BDZ/Z prescriptions by all prescriber types. See Table 12.



Figure 24. BDZ/Z Prescriptions by Ingredient for Veterinarian Prescribers, 2020

| Main Ingredient         | Prescriptions | %    |
|-------------------------|---------------|------|
| Alprazolam              | 697           | 54.6 |
| Diazepam                | 470           | 36.8 |
| Midazolam               | 40            | 3.1  |
| Clorazepate Dipotassium | 28            | 2.2  |
| Lorazepam               | 26            | 2.0  |
| Other Ingredients       | 16            | 1.3  |

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/Z in Elderly Patients

Table 19. Utilization of Prescription BDZ/Z in Elderly Patients in Alberta, 2016-2020

| Year | Prescriptions | Patients | Prescribers | Pharmacies | Elderly Population | Elderly Patient DDDs | Elderly Patients DDDs per 1000 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 | 337,185       | 107,079  | 9,397       | 1,353      | 529,962            | 57,204               | 107.9                                     | 202.1                                        |
| 2018 | 328,362       | 105,555  | 9,675       | 1,432      | 551,546            | 54,546               | 98.9                                      | 191.4                                        |
| 2019 | 317,474       | 103,704  | 9,695       | 1,490      | 580,391            | 52,683               | 90.8                                      | 178.7                                        |
| 2020 | 330,876       | 102,069  | 10,192      | 1,567      | 610,970            | 52,416               | 85.8                                      | 167.1                                        |

5 year trend

Table 20. Elderly BDZ/Z Patients, Prescriptions and Prescribers by Prescriber Type, 2020

| Prescriber Type     | Prescriptions | Percent | Patients | Percent | Prescribers | Percent |
|---------------------|---------------|---------|----------|---------|-------------|---------|
| All Prescribers     | 330,876       | 100.0   | 102,069  | 100.0   | 10,192      | 100.0   |
| Physicians          | 309,000       | 93.4    | 100,362  | 98.3    | 7,204       | 70.7    |
| Pharmacists         | 17,532        | 5.3     | 10,650   | 10.4    | 2,723       | 26.7    |
| Nurse Practitioners | 2,304         | 0.7     | 1,345    | 1.3     | 255         | 2.5     |
| Dentists            | 673           | 0.2     | 545      | 0.5     | 10          | 0.1     |

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

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

Table 21. Elderly BDZ/Z Patients and Associated Prescribers by Dose, 2016-2020

### Elderly Patients

| Patient Dose*         | 2016           | 2017           | 2018           | 2019           | 2020           | 2020 | 5 Year Trend |
|-----------------------|----------------|----------------|----------------|----------------|----------------|------|--------------|
| <b>Total Patients</b> | <b>108,852</b> | <b>107,079</b> | <b>105,555</b> | <b>103,704</b> | <b>102,069</b> |      |              |
| ≥ 1 DDDs              | 20,285         | 18,570         | 17,635         | 16,881         | 17,093         |      |              |
| ≥ 2 DDDs              | 3,853          | 3,296          | 2,957          | 2,853          | 2,872          |      |              |
| ≥ 4 DDDs              | 288            | 182            | 173            | 179            | 183            |      |              |
| ≥ 6 DDDs              | 49             | 33             | 23             | 37             | 30             |      |              |
| ≥ 8 DDDs              | 10             | 6              | 7              | 10             | 6              |      |              |

### Associated Prescribers

| Patient Dose*            | 2016         | 2017         | 2018         | 2019         | 2020          | 2020 | 5 Year Trend |
|--------------------------|--------------|--------------|--------------|--------------|---------------|------|--------------|
| <b>Total Prescribers</b> | <b>9,017</b> | <b>9,397</b> | <b>9,675</b> | <b>9,695</b> | <b>10,192</b> |      |              |
| ≥ 1 DDDs                 | 5,989        | 5,947        | 6,059        | 6,032        | 6,285         |      |              |
| ≥ 2 DDDs                 | 2,961        | 2,705        | 2,560        | 2,452        | 2,502         |      |              |
| ≥ 4 DDDs                 | 456          | 290          | 262          | 257          | 283           |      |              |
| ≥ 6 DDDs                 | 84           | 49           | 38           | 62           | 48            |      |              |
| ≥ 8 DDDs                 | 15           | 9            | 13           | 16           | 9             |      |              |

\* can include prescriptions from multiple prescribers

## Medication Use – Concurrent Opioids and BDZ/Z

Table 22. Utilization of Concurrent Prescription Opioids and BDZ/Z in Alberta, 2016-2020

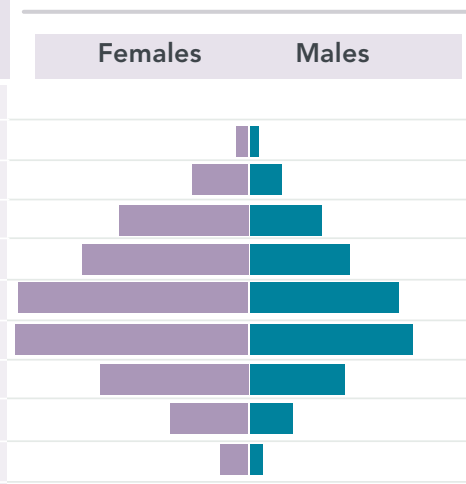
| Year         | Patients | Patients per 1000 population | Patients ≥ 90 OMEs and ≥ 2 DDDs | Elderly Patients | Elderly Patients per 1000 Elderly Population |
|--------------|----------|------------------------------|---------------------------------|------------------|----------------------------------------------|
| 2016         | 134,809  | 32                           | 47                              | 38,601           | 76                                           |
| 2017         | 123,572  | 29                           | 27                              | 37,245           | 70                                           |
| 2018         | 111,889  | 26                           | 15                              | 34,959           | 63                                           |
| 2019         | 103,195  | 24                           | 15                              | 33,424           | 58                                           |
| 2020         | 95,065   | 22                           | 13                              | 31,716           | 52                                           |
| 5 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, 2020\*

| Age Group | Females | Percent | Males  | Percent | Total Patients | Percent |
|-----------|---------|---------|--------|---------|----------------|---------|
| 0 - 9     | 18      | 0.0     | 10     | 0.0     | 28             | 0.0     |
| 10-19     | 471     | 0.8     | 274    | 0.8     | 745            | 0.8     |
| 20 - 29   | 2,958   | 5.0     | 1,538  | 4.3     | 4,496          | 4.7     |
| 30 - 39   | 7,060   | 12.0    | 3,867  | 10.7    | 10,927         | 11.5    |
| 40 - 49   | 9,211   | 15.6    | 5,333  | 14.8    | 14,544         | 15.3    |
| 50 - 59   | 12,701  | 21.5    | 8,164  | 22.6    | 20,865         | 21.9    |
| 60 - 69   | 12,880  | 21.8    | 8,903  | 24.7    | 21,783         | 22.9    |
| 70 - 79   | 8,086   | 13.7    | 5,156  | 14.3    | 13,242         | 13.9    |
| 80 - 89   | 4,171   | 7.1     | 2,297  | 6.4     | 6,468          | 6.8     |
| 90+       | 1,453   | 2.5     | 507    | 1.4     | 1,960          | 2.1     |
| Total     | 59,010  | 100.0   | 36,052 | 100.0   | 95,061         | 100.0   |

Figure 25. Concurrent Opioid and BDZ/Z Patients by Age and Sex, 2020



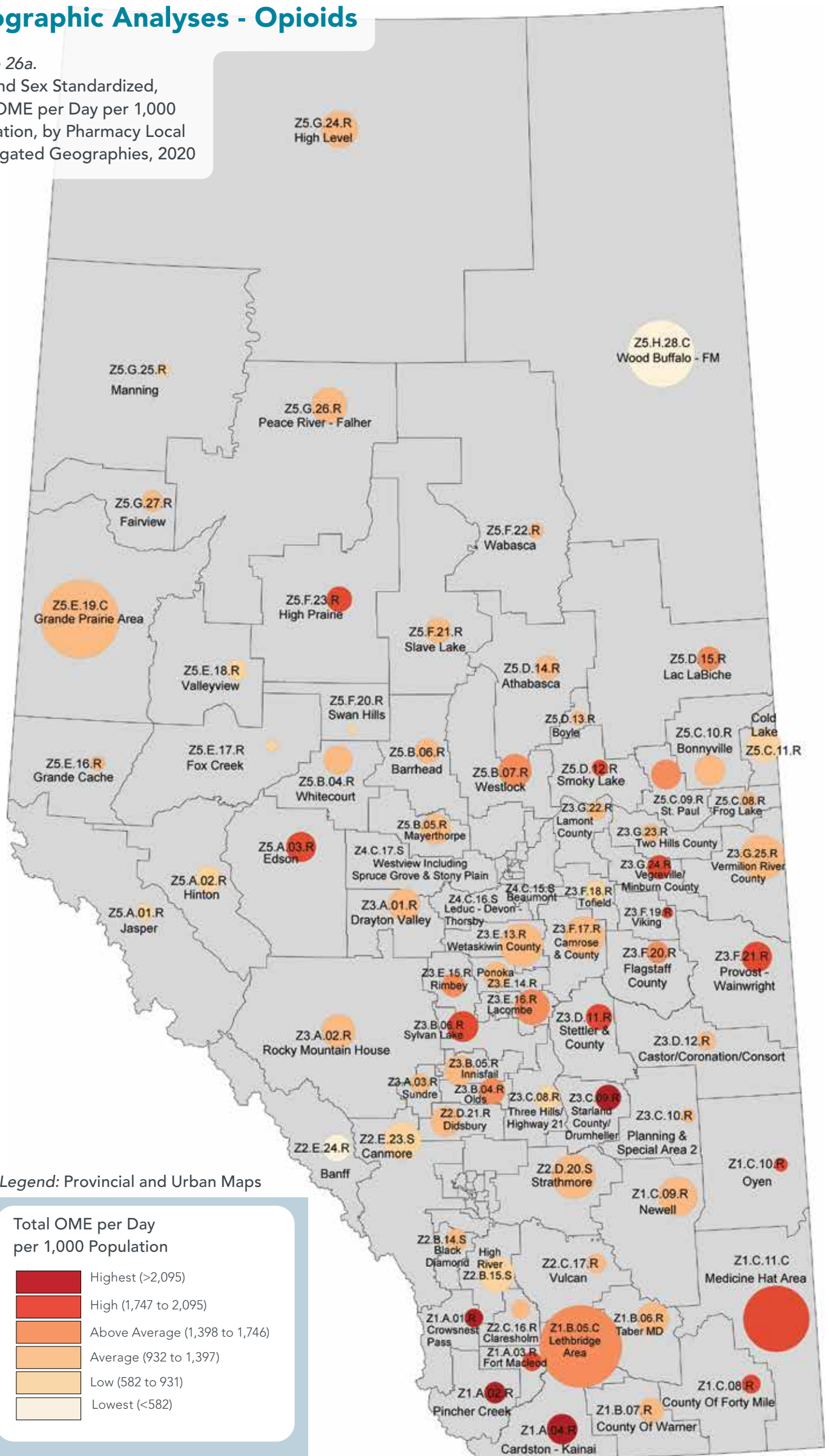
\*1 female patient of unknown age, 3 male patients of unknown age, 3 patients of unknown sex.

Table 24. Concurrent Opioid and BDZ/Z Patients by Prescriber Type in Alberta, 2016-2020

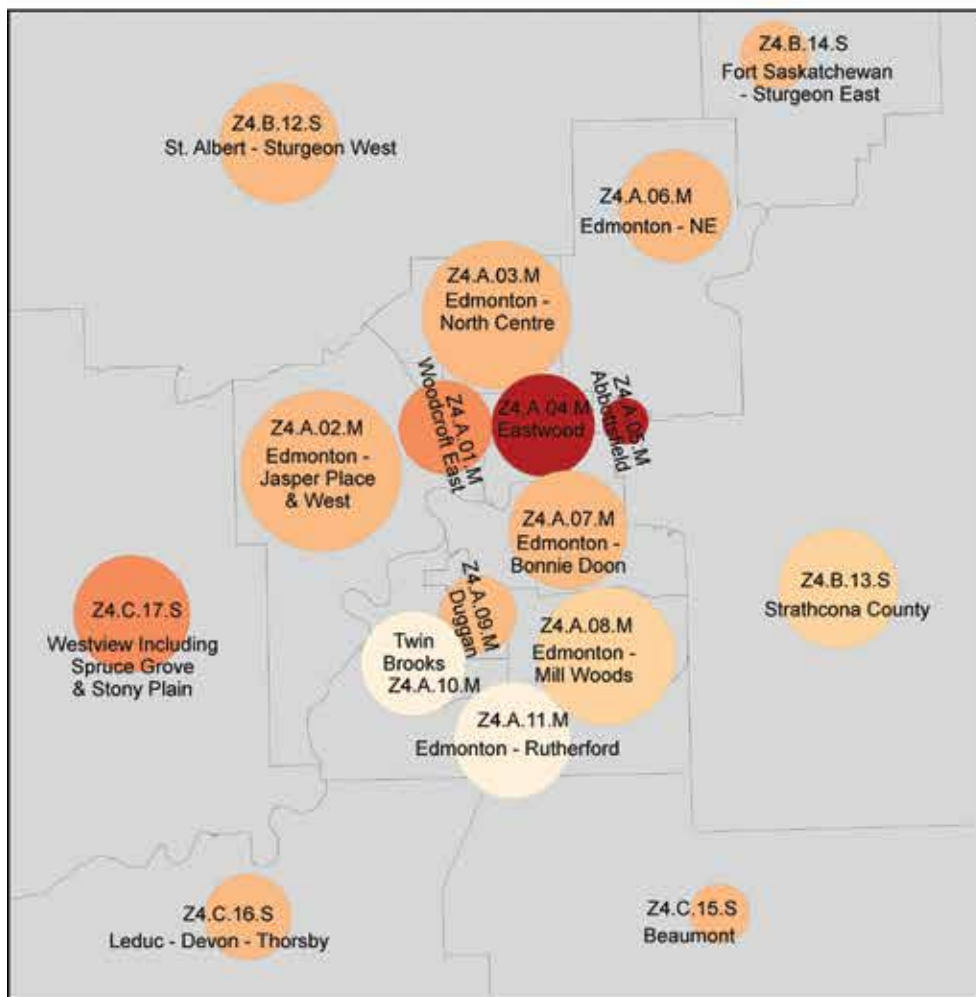
| Prescriber Type     | 2015    | 2016    | 2017    | 2018    | 2019   | 2019 | 5 Year Trend |
|---------------------|---------|---------|---------|---------|--------|------|--------------|
| Physicians          | 133,151 | 121,967 | 110,229 | 101,528 | 93,419 |      |              |
| Pharmacists         | 30,432  | 26,511  | 19,423  | 15,835  | 18,216 |      |              |
| Dentists            | 12,926  | 11,849  | 10,980  | 10,132  | 9,294  |      |              |
| Nurse Practitioners | 2,625   | 2,931   | 3,212   | 3,499   | 3,454  |      |              |

# Geographic Analyses - Opioids

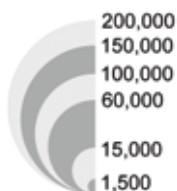
Figure 26a.  
Age and Sex Standardized,  
Total OME per Day per 1,000  
Population, by Pharmacy Local  
Aggregated Geographies, 2020



Edmonton



Population



Calgary

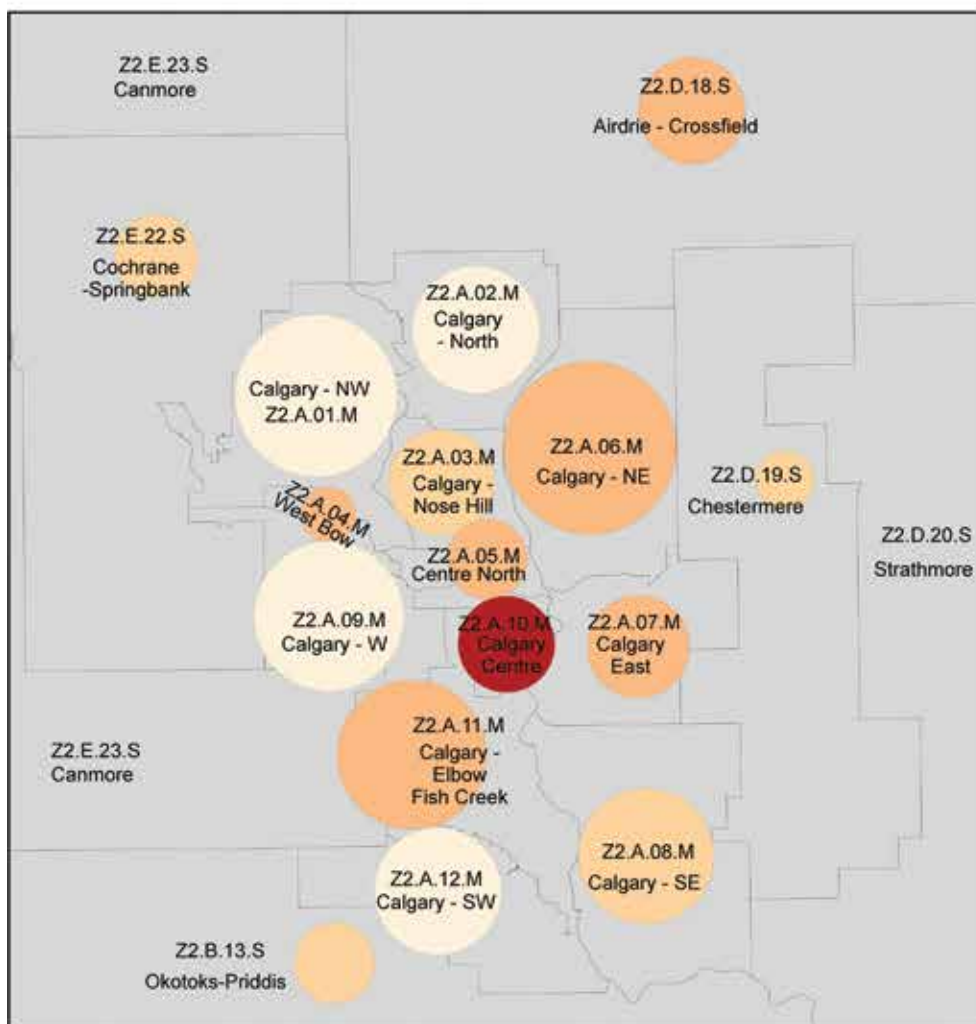


Figure 26b. Age and Sex Standardized, Total OME per Day per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020

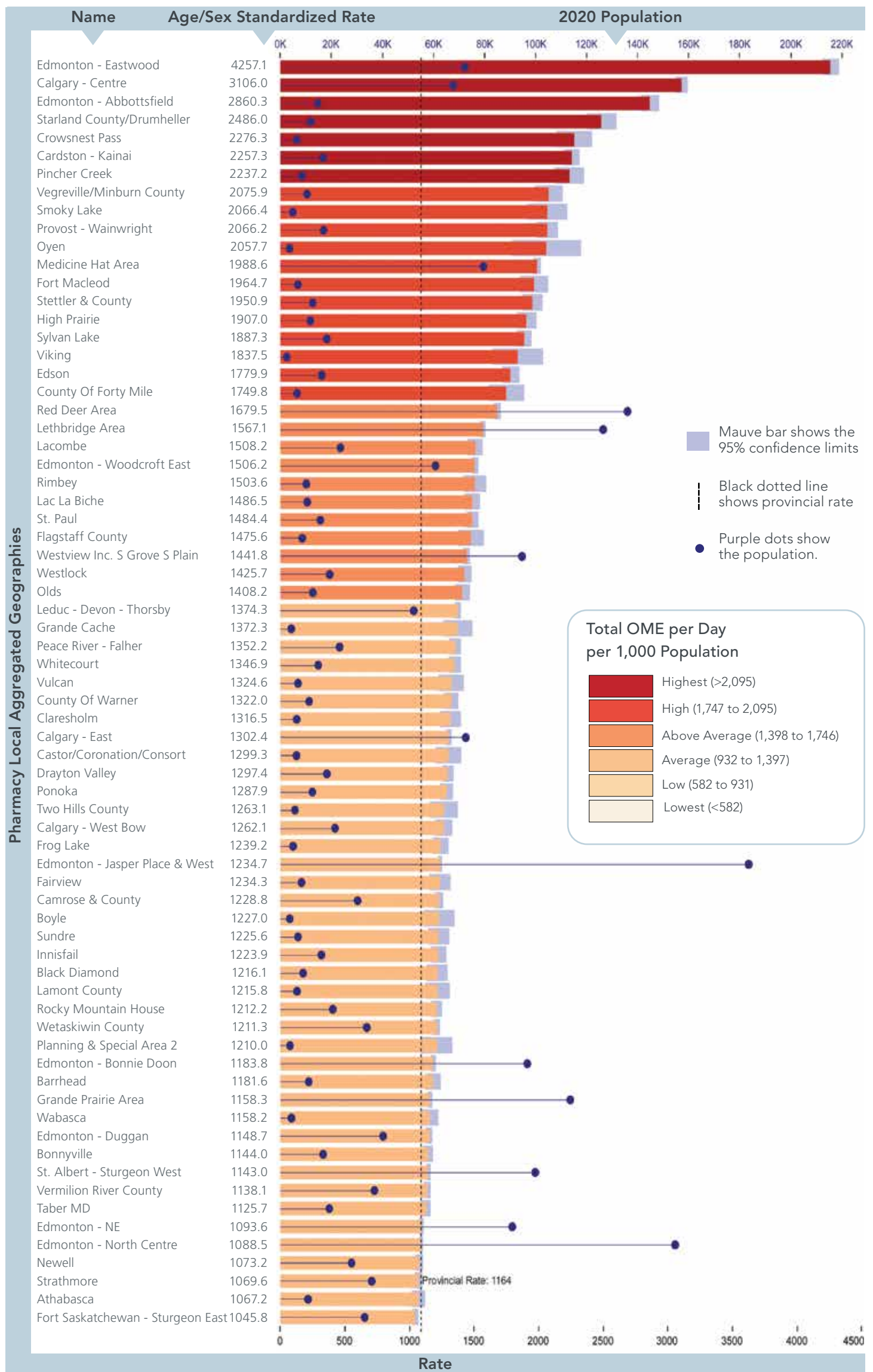
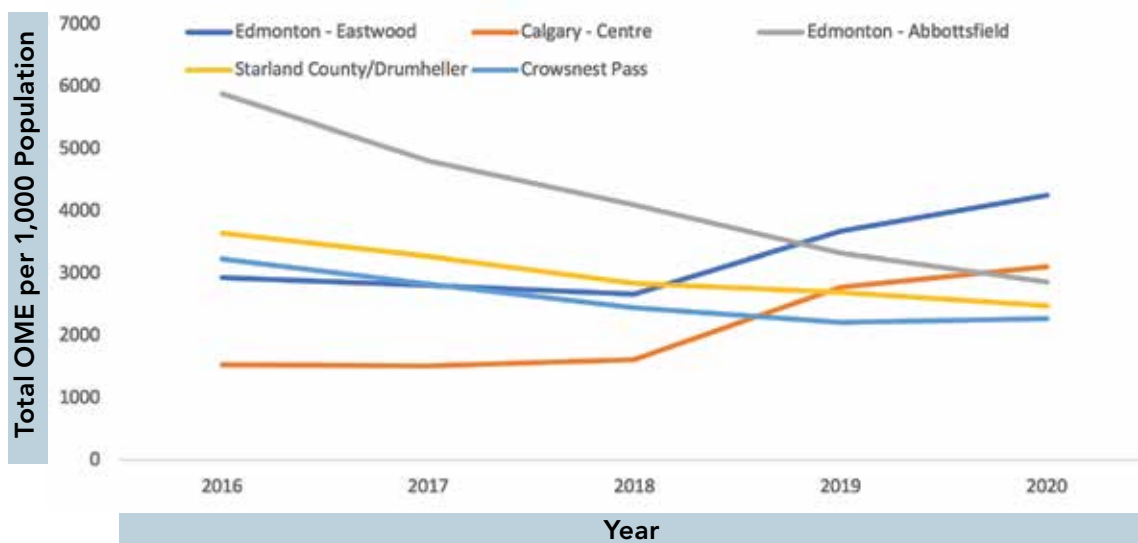


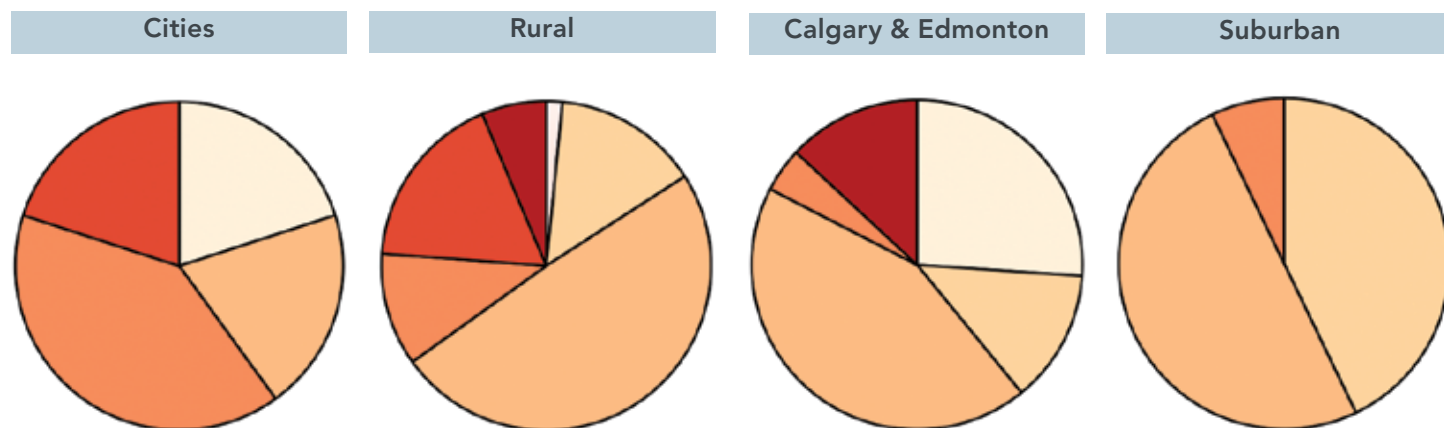


Figure 26c. Five Year Total OME per Day Trends for the Top Five PhLAGs in 2020 Based on 2020 Rates



Three geographic areas have shown consistent declines in the observed rates, but two areas have been rising and now show the two highest rates in the province: Edmonton - Eastwood and Calgary Centre. Two areas which were among the top areas with the highest rates in 2016 have decreased consistently during the past five years: Vegreville/Minburn County and Medicine Hat Area. Opioid prescriptions in Edmonton Eastwood, Calgary Centre and Starland County/Drumheller included a substantial proportion of opioid addiction treatment prescriptions which implies that rates will decline further in these areas.

Figure 26d. Urban/Rural Distribution of Total OME per Day per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

Suburban areas consistently reported low OME consumption rates. Cities, Rural and Metro areas show a mix of from Lowest to Highest.

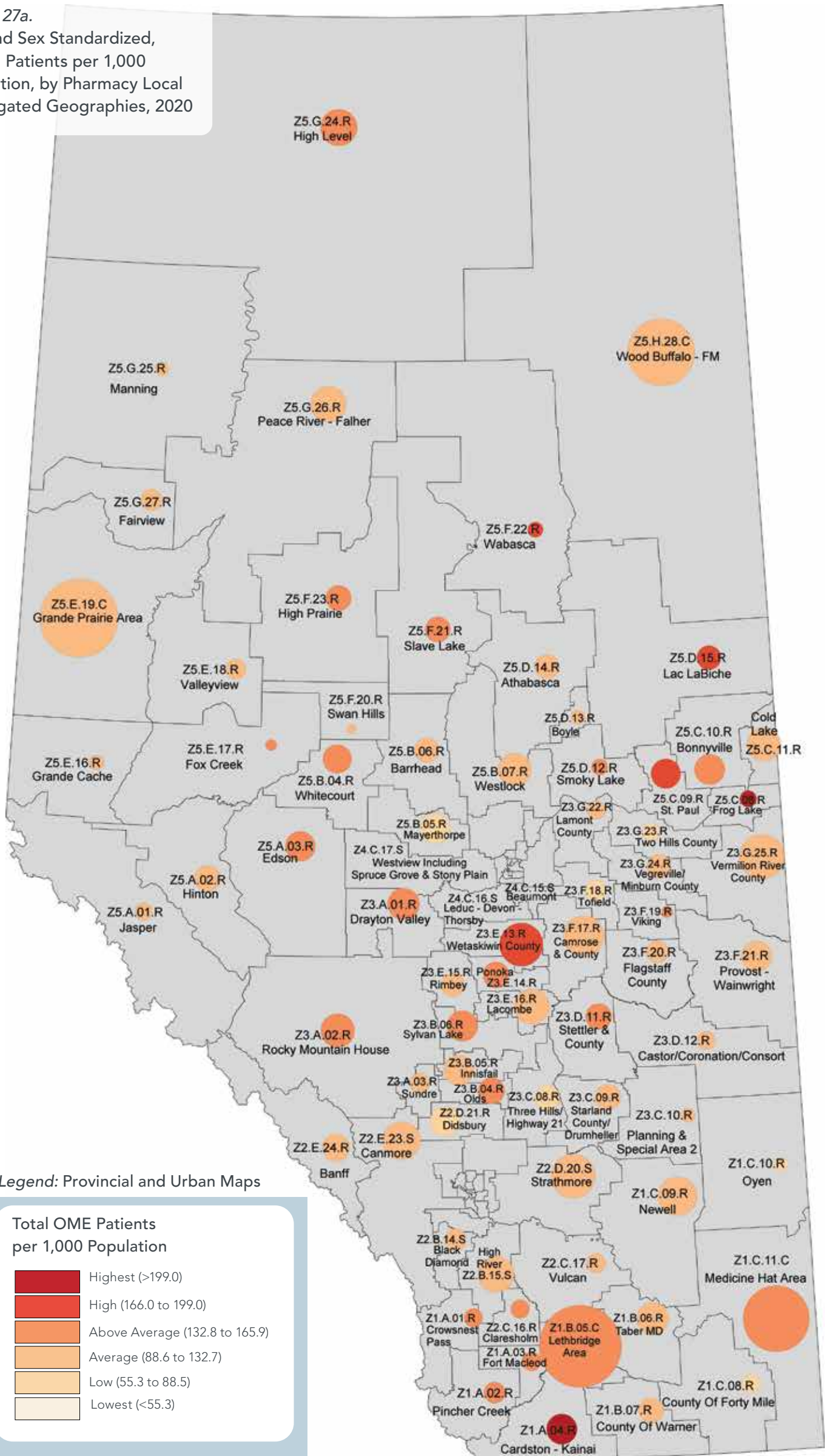
Figure 26e. Opioid OME Mapping Categories and Socio-Economic Categories

| Map Category  | Socio-Economic Deprivation Index |                     |   |   |   |   |
|---------------|----------------------------------|---------------------|---|---|---|---|
|               | 0                                | 1                   | 2 | 3 | 4 | 5 |
| Highest       | 3.4                              | [Bar from 0 to 3.4] |   |   |   |   |
| High          | 3.5                              | [Bar from 0 to 3.5] |   |   |   |   |
| Above Average | 3.5                              | [Bar from 0 to 3.5] |   |   |   |   |
| Average       | 3.5                              | [Bar from 0 to 3.5] |   |   |   |   |
| Low           | 2.9                              | [Bar from 0 to 2.9] |   |   |   |   |
| Lowest        | 2.3                              | [Bar from 0 to 2.3] |   |   |   |   |

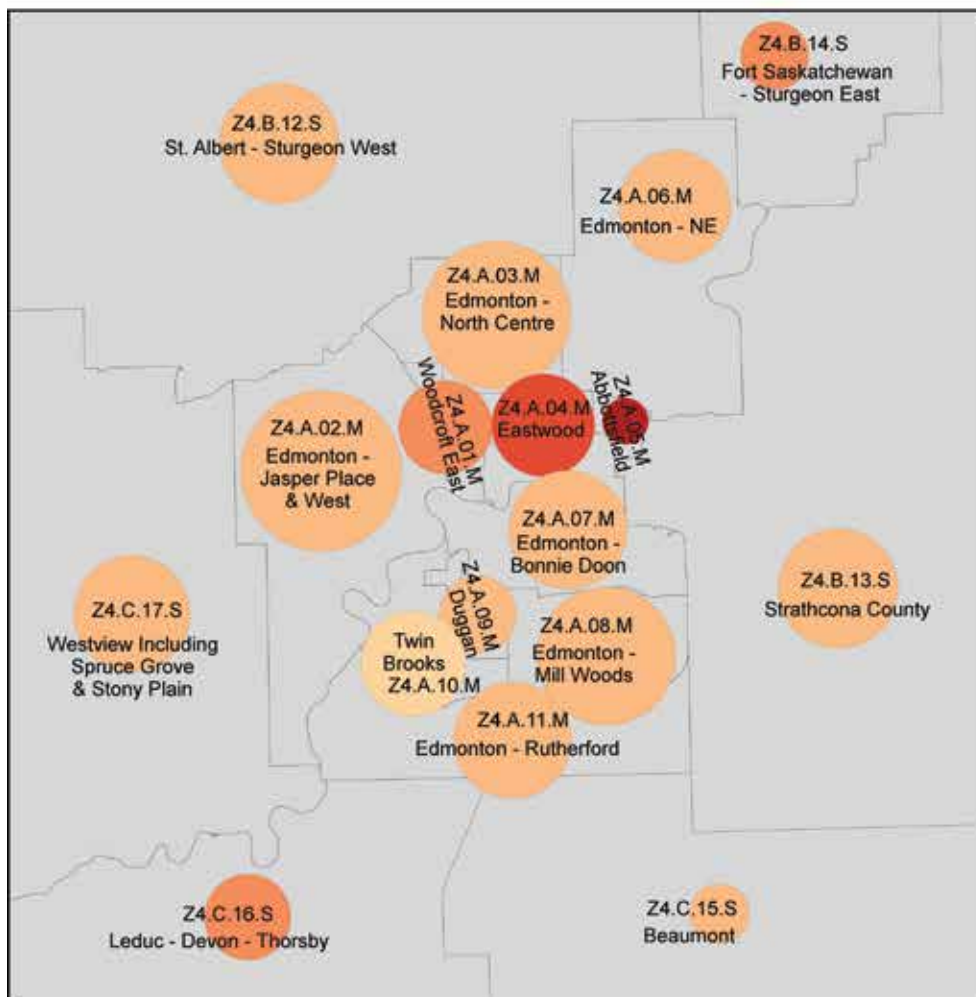
This graphic compares the Total OME per Day per 1,000 population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

The lowest rates (Lowest and Low) are associated with low levels of deprivation (2.3 and 2.9). Areas with rates Average or higher show consistent deprivation levels (3.4 or 3.5).

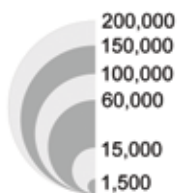
Figure 27a.  
Age and Sex Standardized,  
Opioid Patients per 1,000  
Population, by Pharmacy Local  
Aggregated Geographies, 2020



Edmonton



Population



Calgary

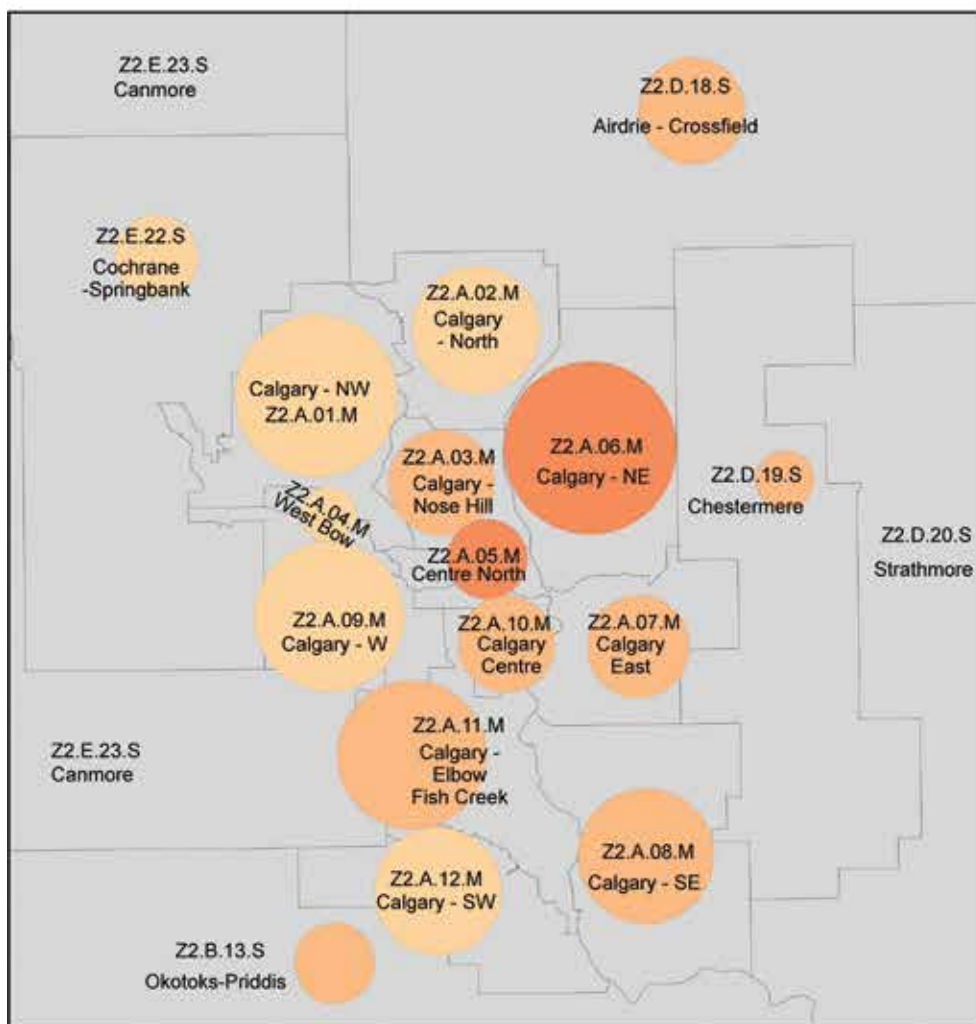


Figure 27b. Age and Sex Standardized, Opioid Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020

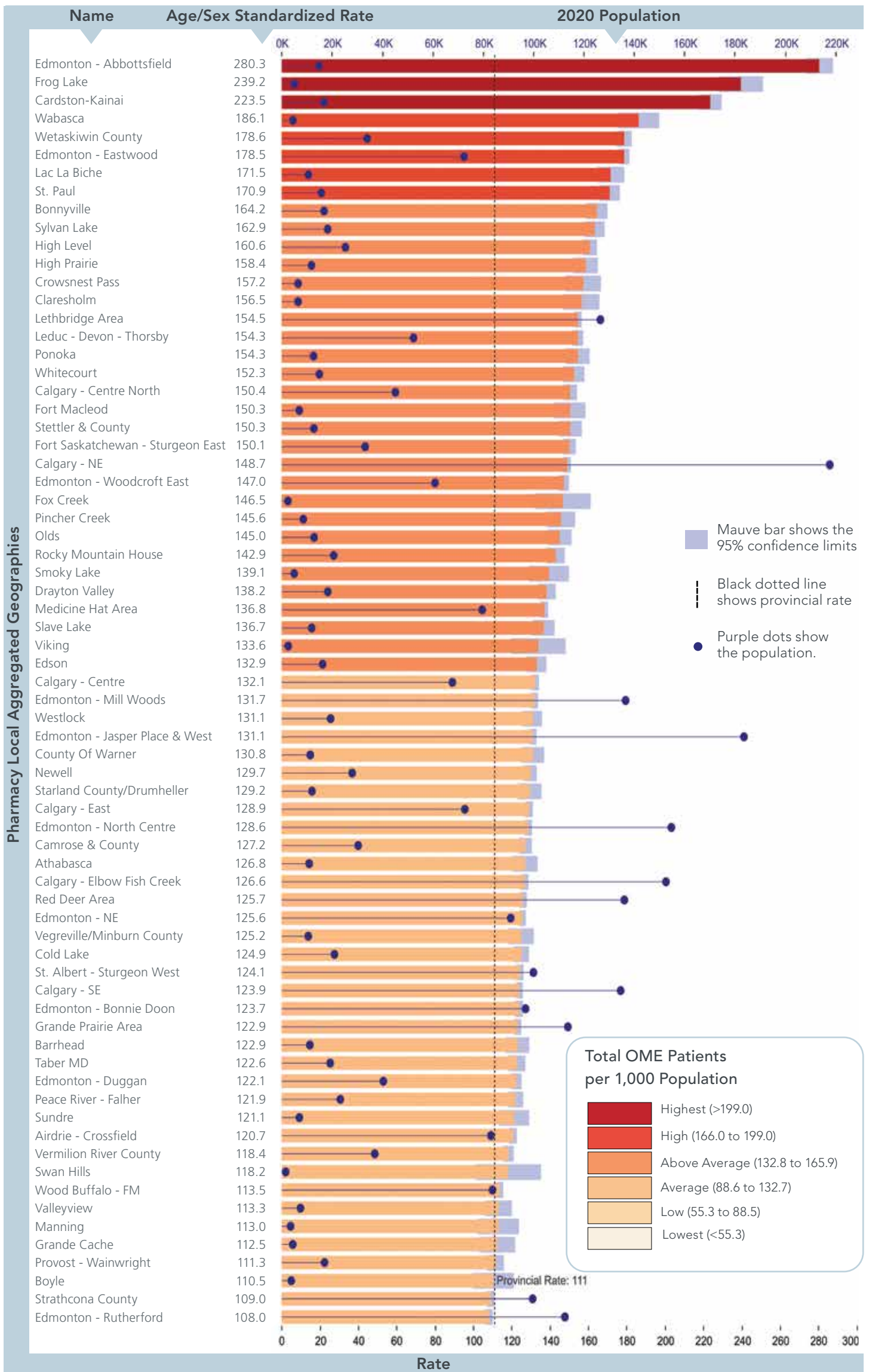
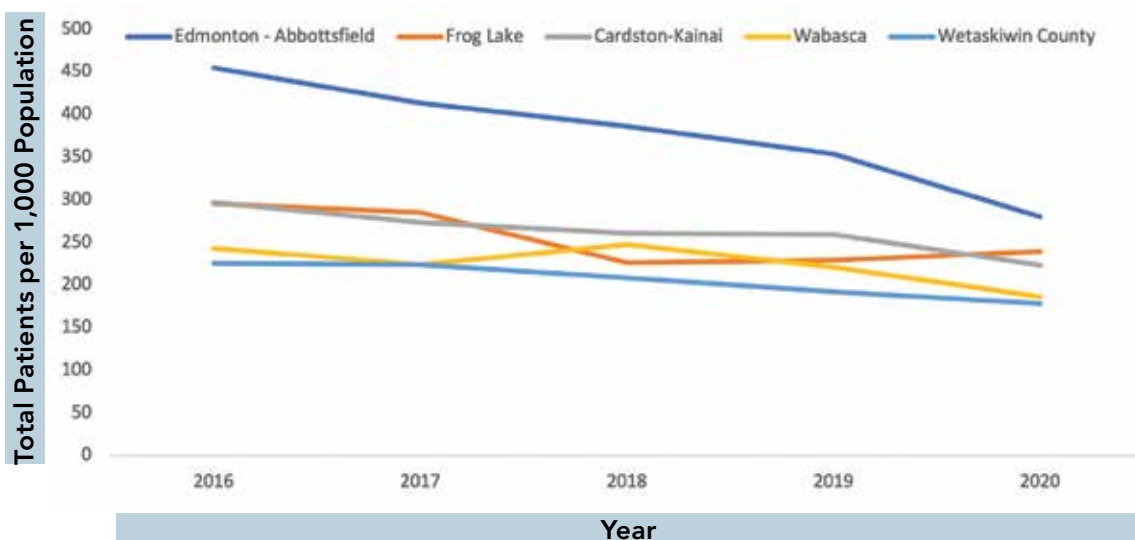
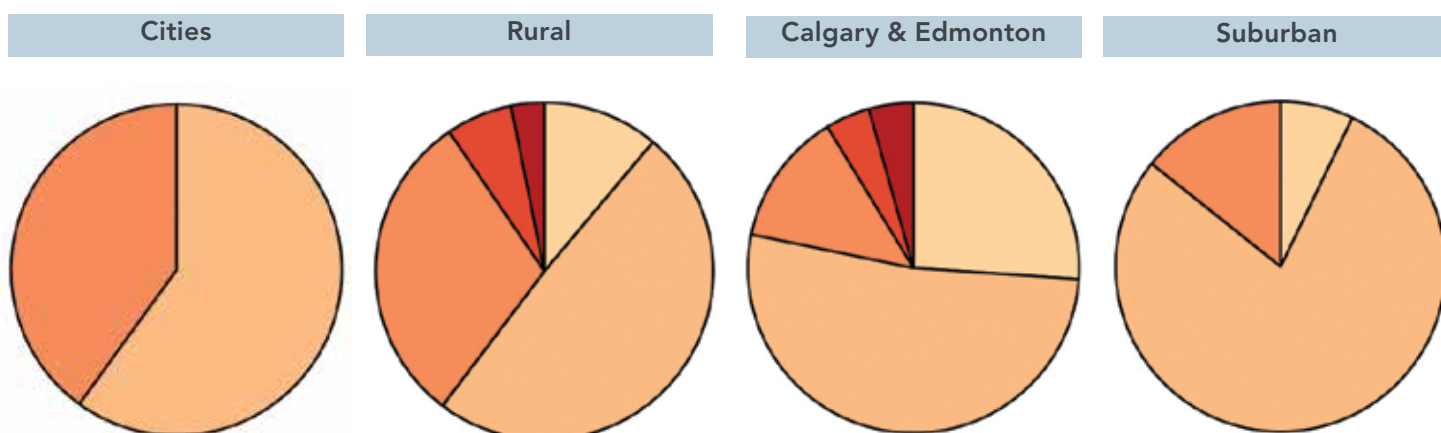


Figure 27c. Five Year Opioid Patient Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



Four geographic areas have shown consistent declines in the observed rates and only Frog Lake has been rising. Two areas which were among the top areas with the highest rates in 2016 have decreased consistently during the past five years: St. Paul and Lac La Biche. Cardston-Kainai reported a large proportion of opioid addiction treatment prescriptions which implies an even larger decrease in potentially-harmful prescriptions and patients in this area.

Figure 27d. Urban/Rural Distribution of Opioid Patients per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

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

Figure 27e. Opioid Patient Mapping Categories and Socio-Economic Categories

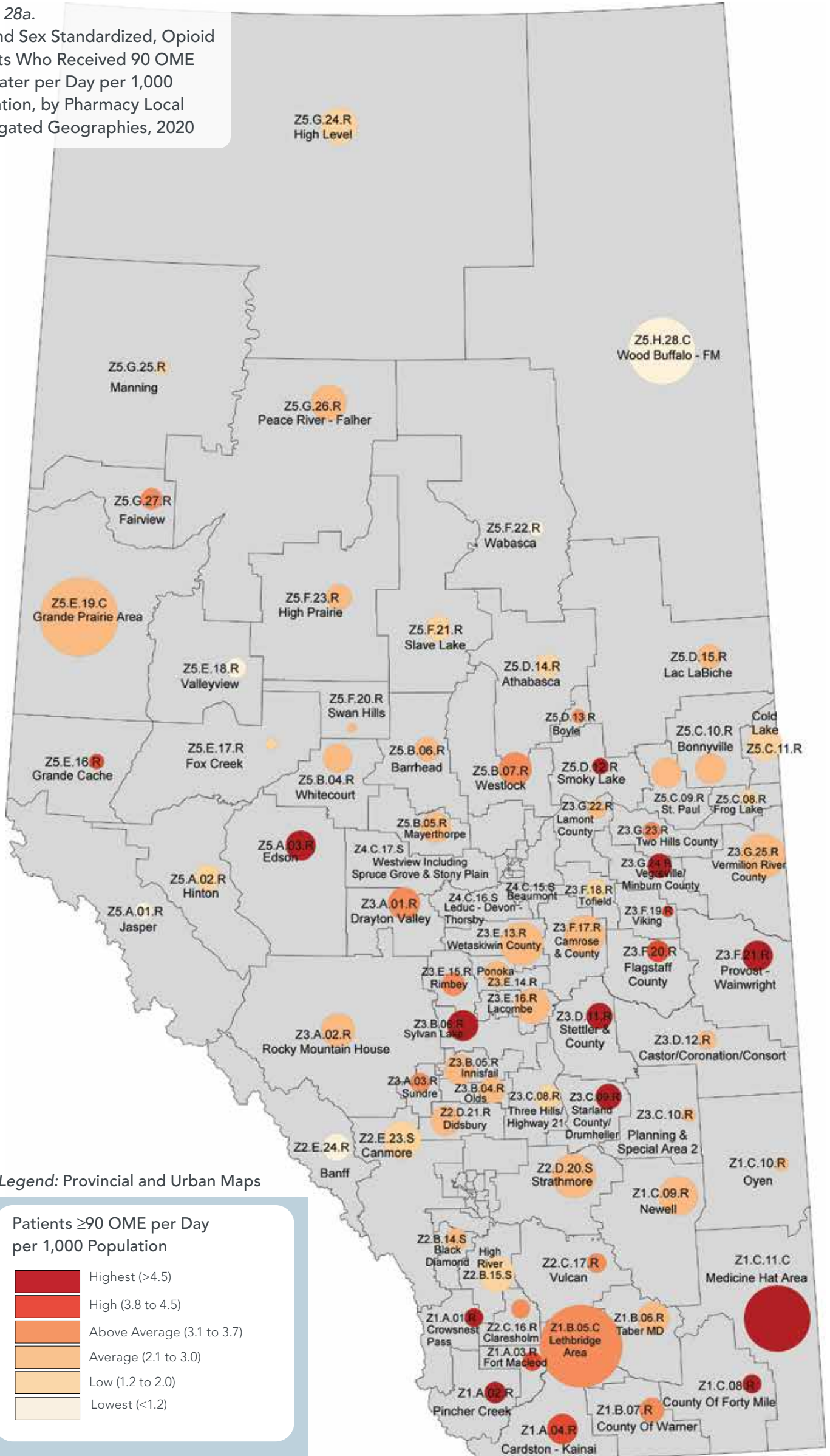
| Map Category  | Socio-Economic Deprivation Index |                                         |   |   |   |   |
|---------------|----------------------------------|-----------------------------------------|---|---|---|---|
|               | 0                                | 1                                       | 2 | 3 | 4 | 5 |
| Highest       | 4.1                              | [Bar extending to 4.1 on the 0-5 scale] |   |   |   |   |
| High          | 4.0                              | [Bar extending to 4.0 on the 0-5 scale] |   |   |   |   |
| Above Average | 3.5                              | [Bar extending to 3.5 on the 0-5 scale] |   |   |   |   |
| Average       | 3.2                              | [Bar extending to 3.2 on the 0-5 scale] |   |   |   |   |
| Low           | 3.0                              | [Bar extending to 3.0 on the 0-5 scale] |   |   |   |   |

This graphic compares the Opioid Patients per 1,000 Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

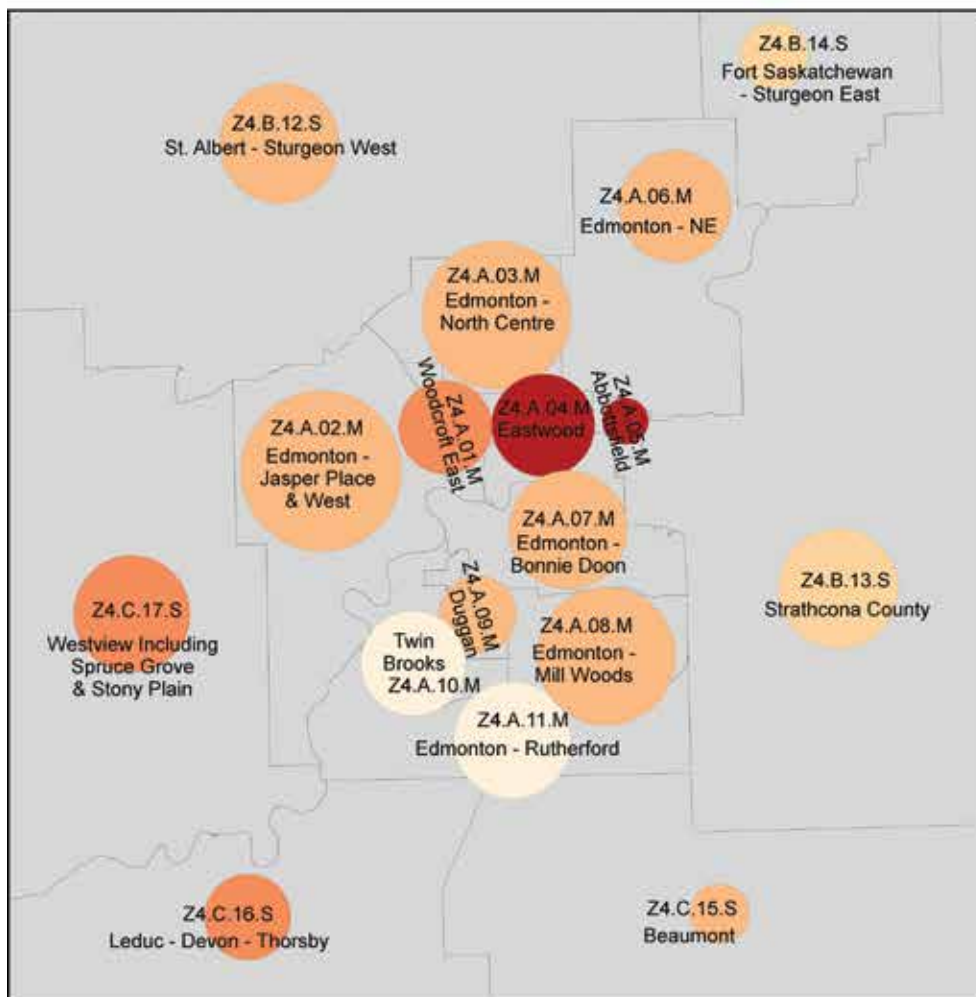
The lowest rates are observed in areas with the lowest deprivation indices and the highest rates in areas with the highest deprivation.

Figure 28a.

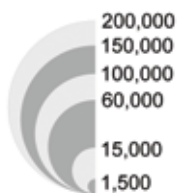
Age and Sex Standardized, Opioid Patients Who Received 90 OME or Greater per Day per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020



Edmonton



Population



Calgary

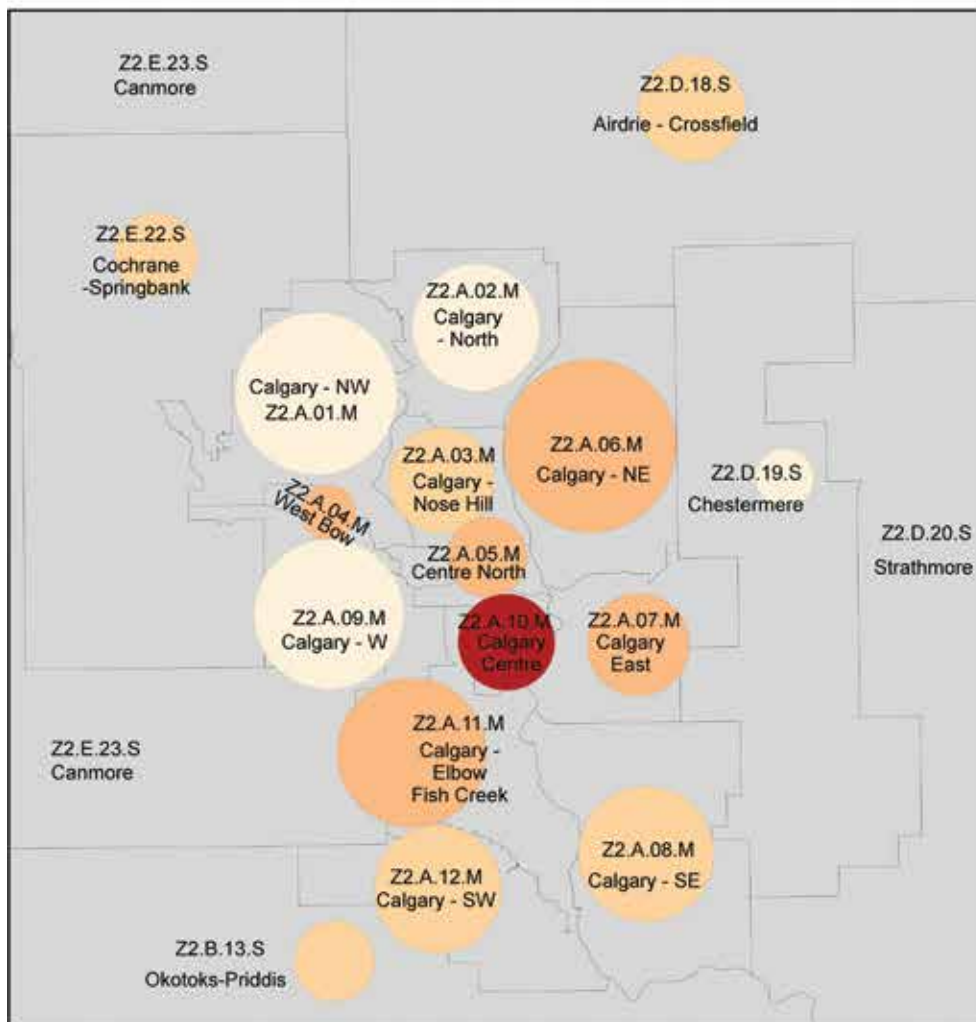


Figure 28b. Age and Sex Standardized, Opioid Patients Who Received 90 OME or Greater per Day per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020

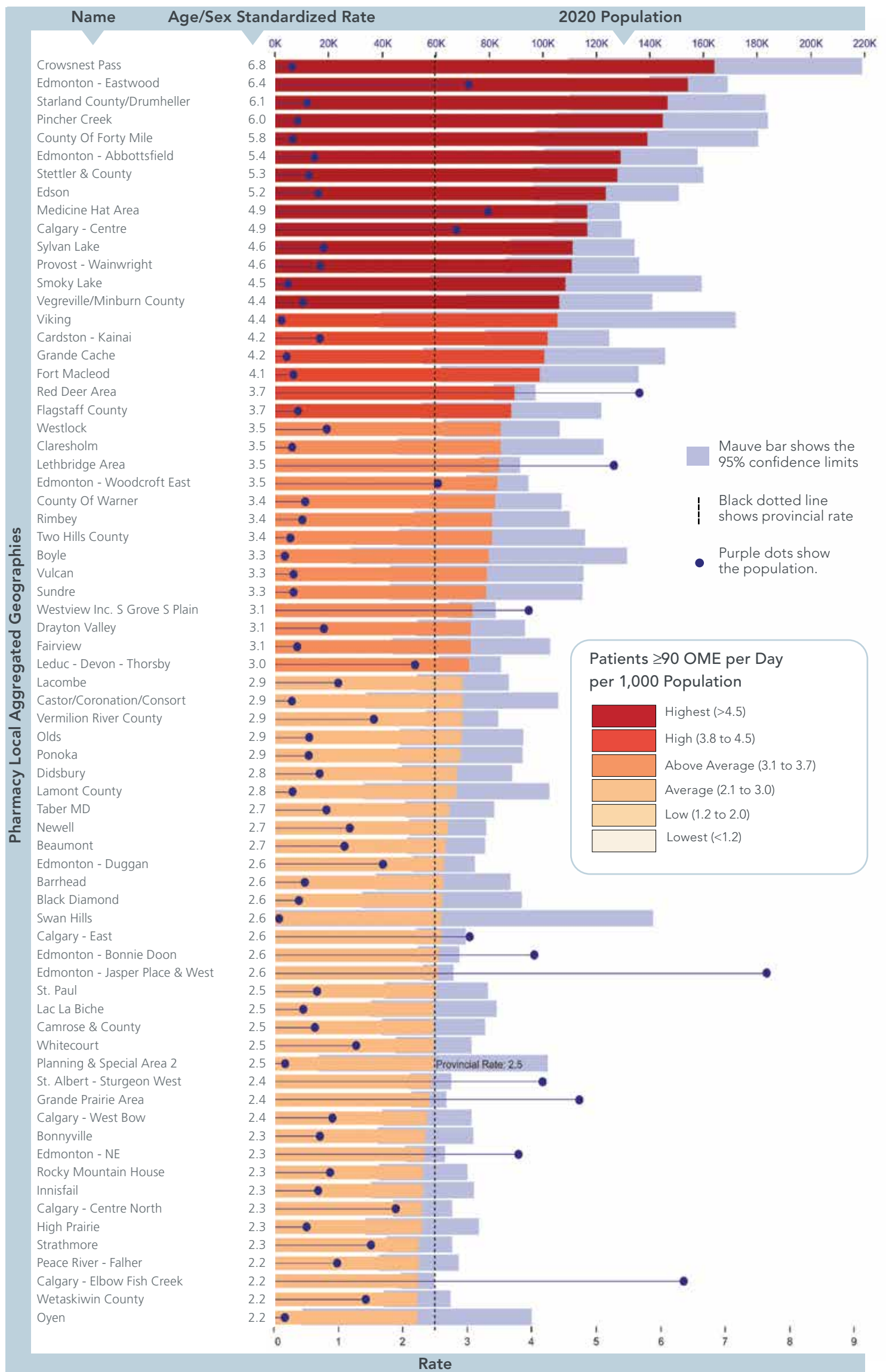
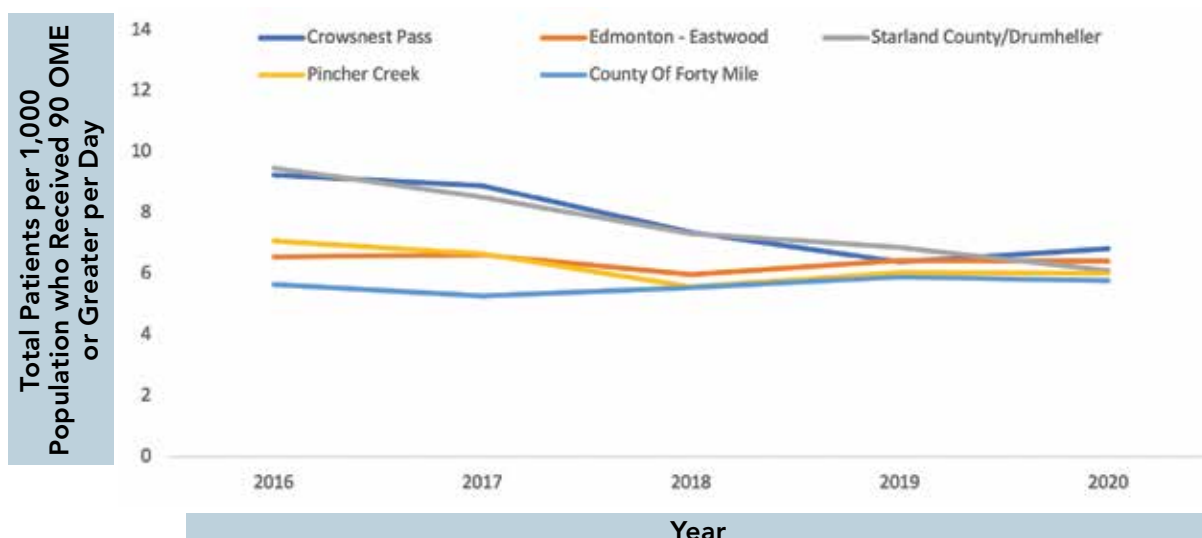


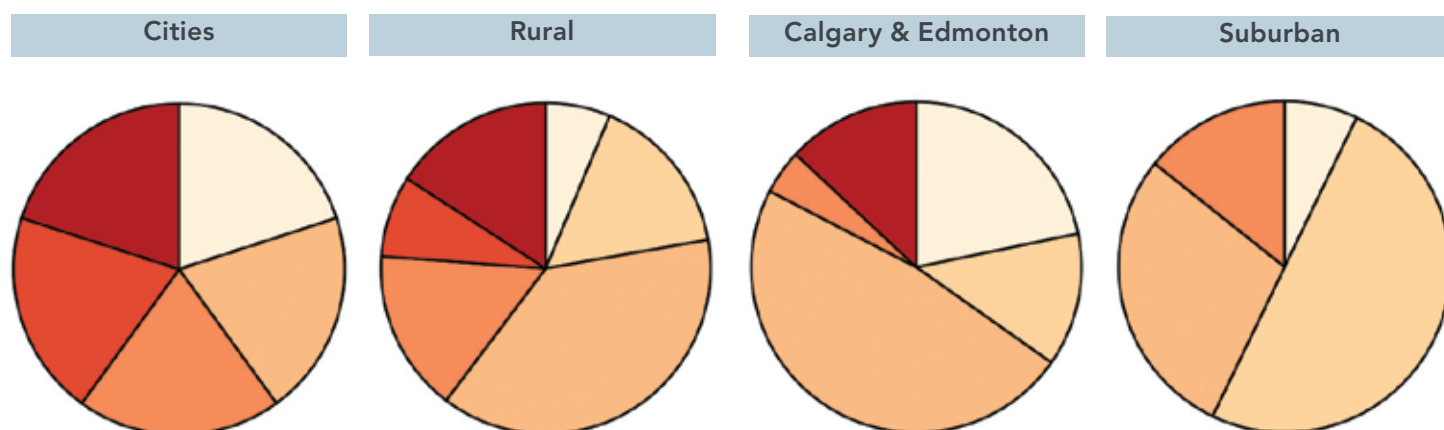


Figure 28c. Five Year Opioid Patient Who Received 90 OME or Greater per Day Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



Three geographic areas have shown consistent declines in the observed rates, but two areas have been rising and now show the two highest rates in the province: Edmonton - Eastwood and County of Forty Mile. Two areas which were among the top areas with the highest rates in 2016 have decreased consistently during the past five years: Vegreville/Minburn County and Medicine Hat Area. Opioid prescriptions in Edmonton Eastwood, Starland County/Drumheller and Pincher Creek included a large proportion of opioid addiction treatment prescriptions which implies that these areas are expected to show declines in the future.

Figure 28d. Urban/Rural Distribution of Opioid Patients Who Received 90 OME or Greater per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

Suburban areas consistently reported low OME consumption rates. Cities, Rural and Metro areas show a mix of Lowest to Highest.

Figure 28e. Opioid Patients Who Received 90 OME or More by Map Categories and Socio-Economic Categories

| Map Category  | Socio-Economic Deprivation Index |                     |   |   |   |   |
|---------------|----------------------------------|---------------------|---|---|---|---|
|               | 0                                | 1                   | 2 | 3 | 4 | 5 |
| Highest       | 3.4                              | [Bar from 0 to 3.4] |   |   |   |   |
| High          | 3.5                              | [Bar from 0 to 3.5] |   |   |   |   |
| Above Average | 3.8                              | [Bar from 0 to 3.8] |   |   |   |   |
| Average       | 3.4                              | [Bar from 0 to 3.4] |   |   |   |   |
| Low           | 3.0                              | [Bar from 0 to 3.0] |   |   |   |   |
| Lowest        | 2.7                              | [Bar from 0 to 2.7] |   |   |   |   |

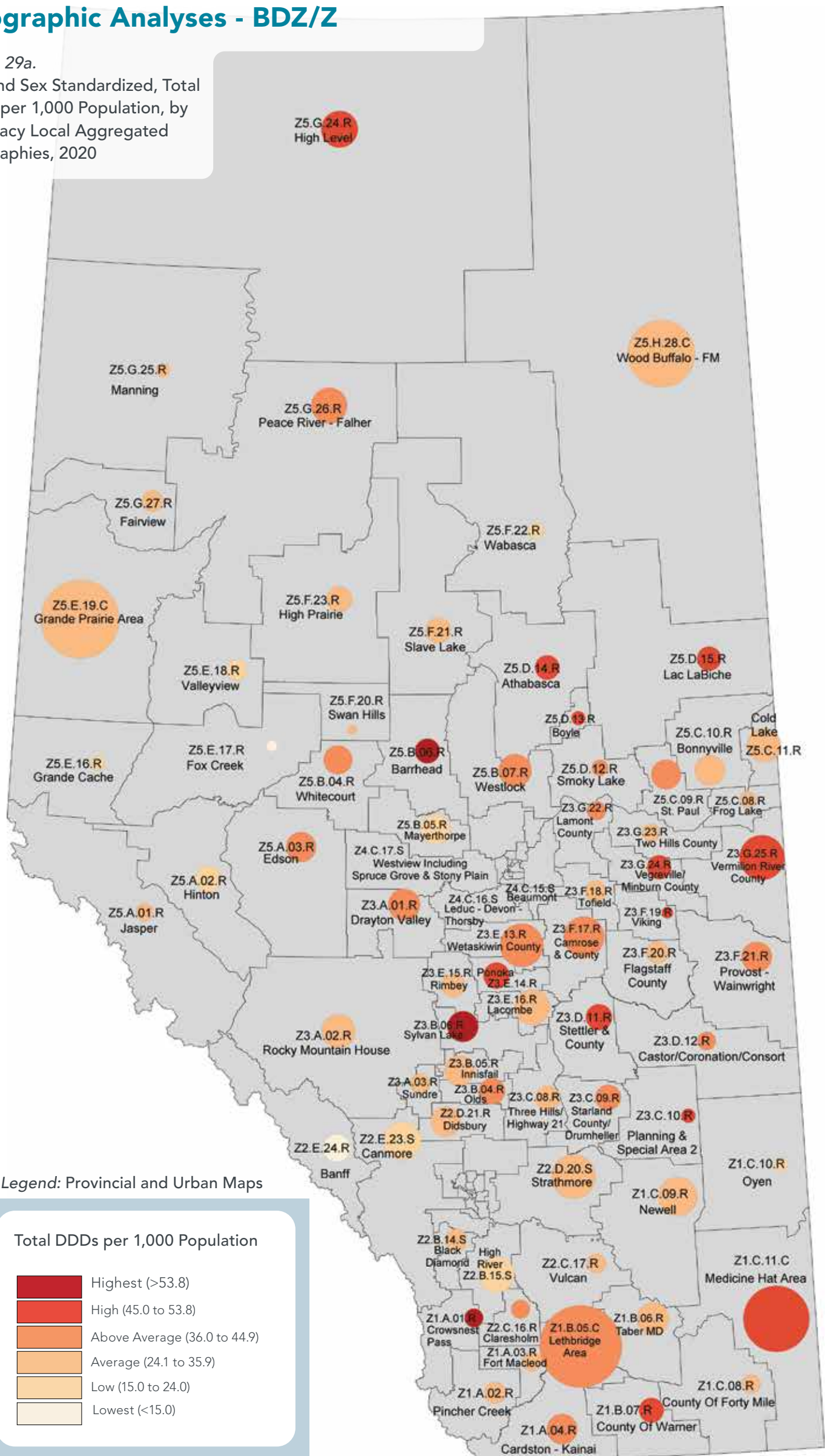
This graphic compares the Opioid Patients Who Received 90 OME or Greater per Day per 1,000 population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

There is an association between lower rates and lower deprivation scores until the Above Average category is reached.

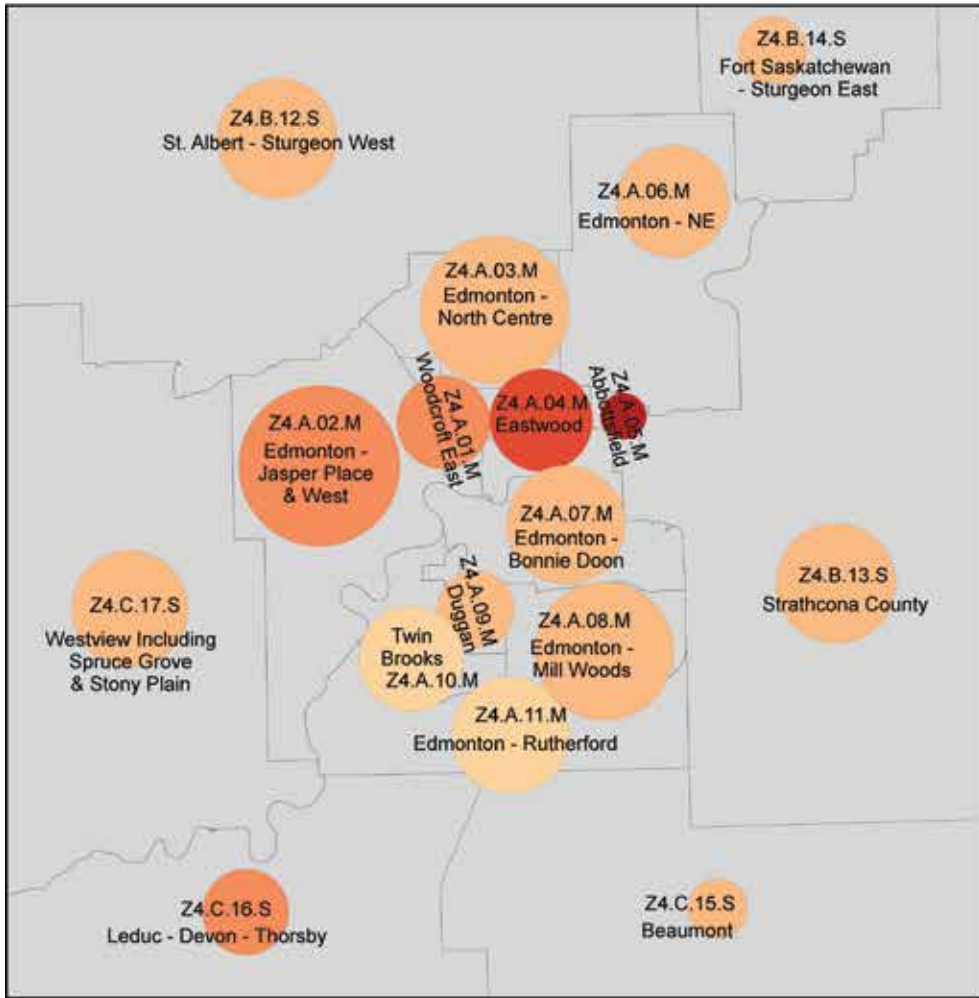
# Geographic Analyses - BDZ/Z

Figure 29a.

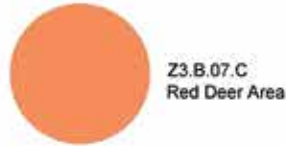
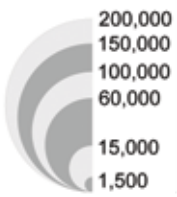
Age and Sex Standardized, Total DDDs per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020



Edmonton



Population



Calgary

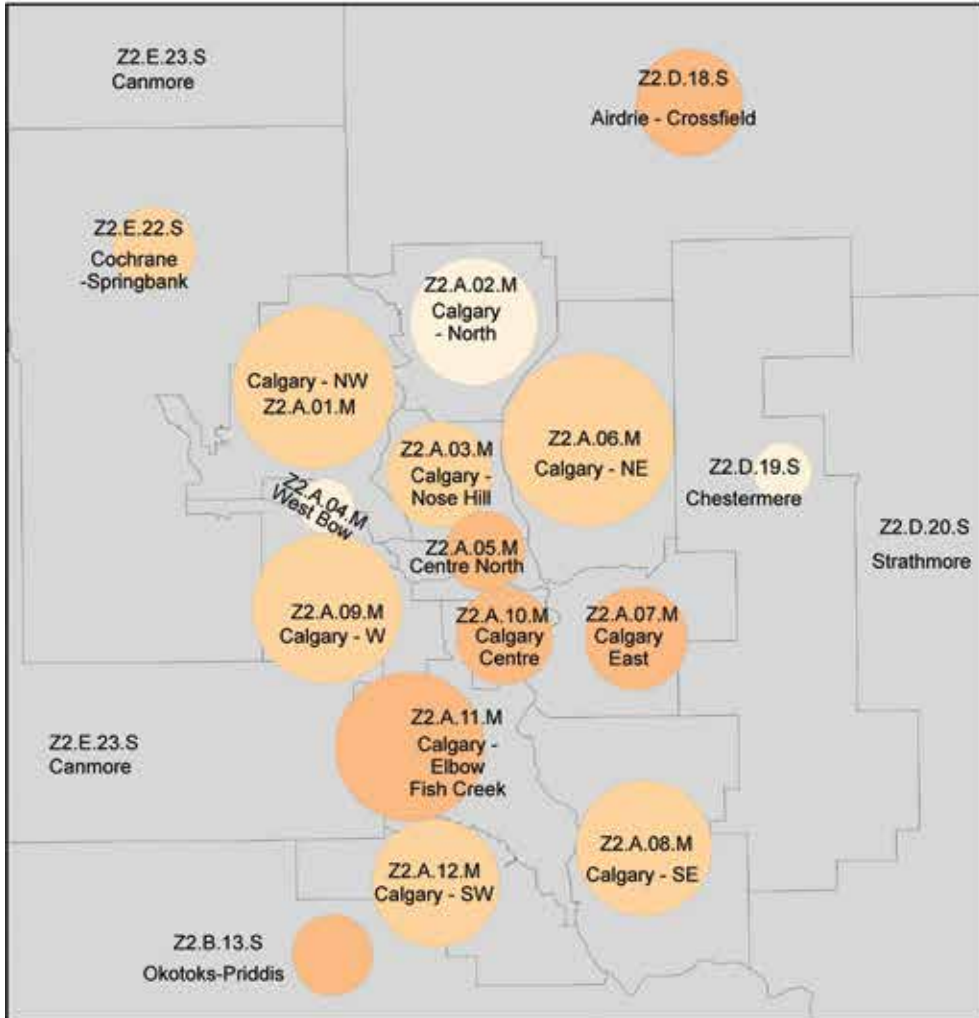


Figure 29b. Age and Sex Standardized, Total DDDs per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020

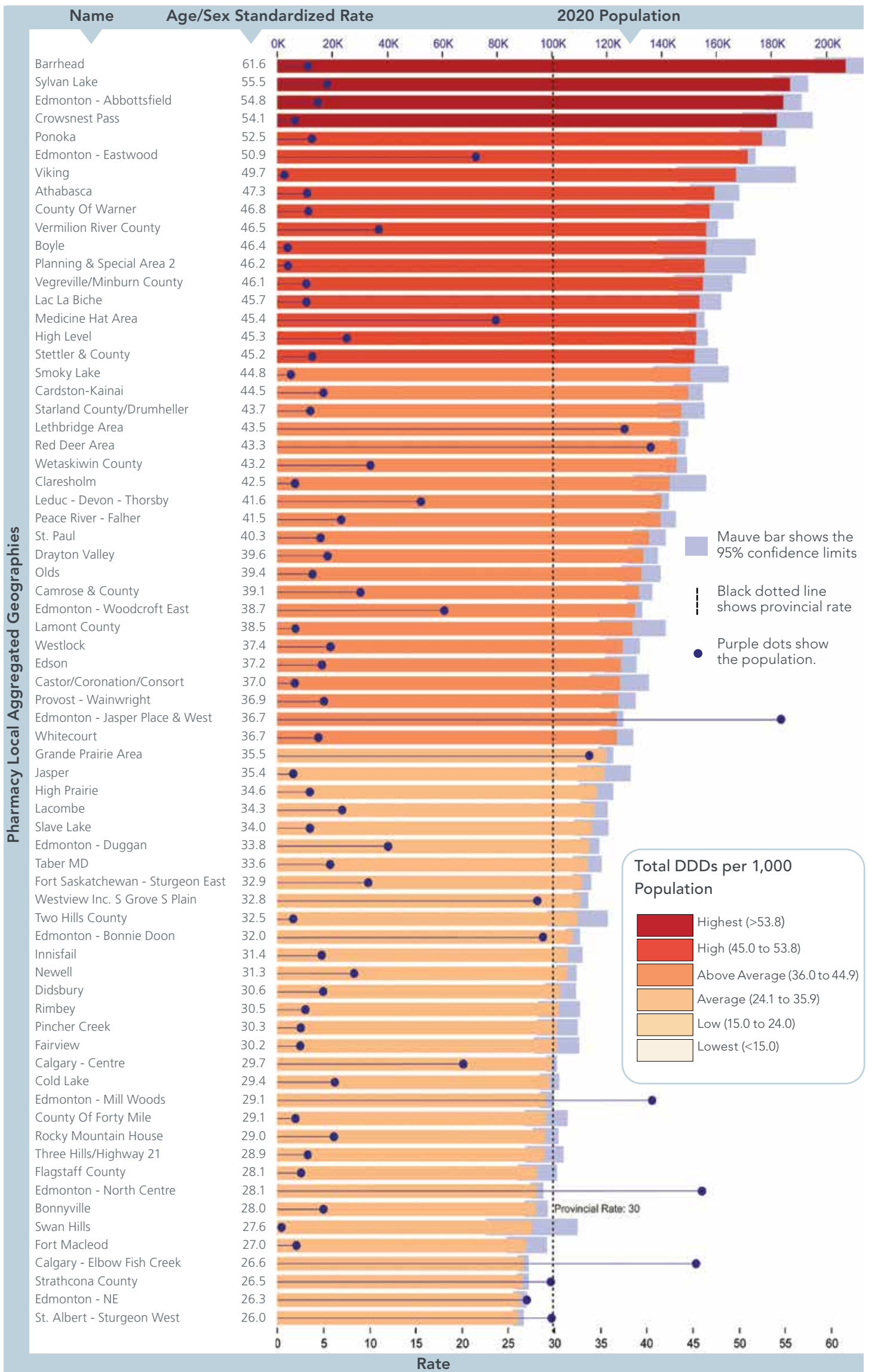
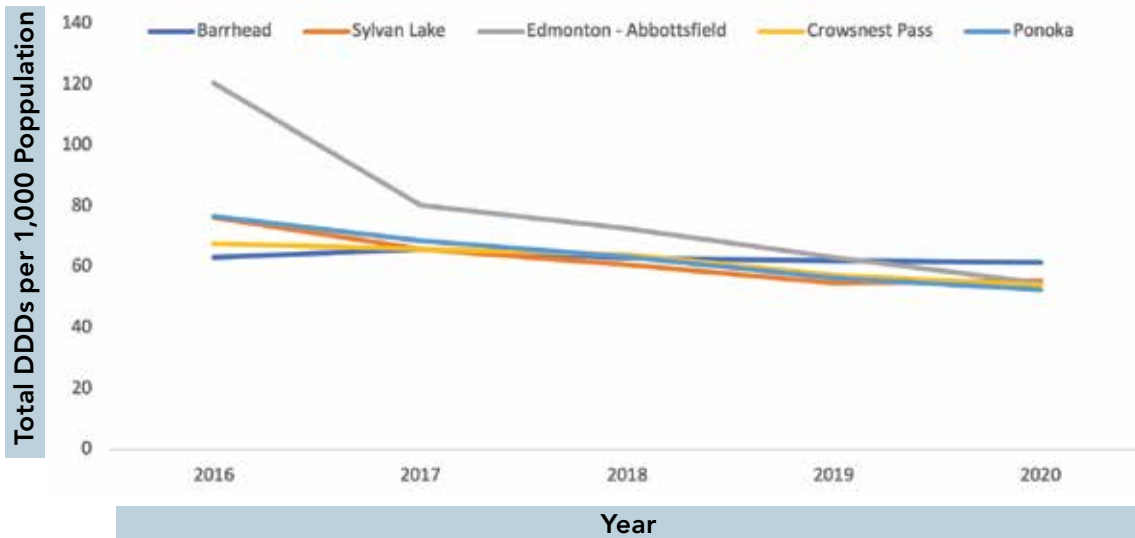
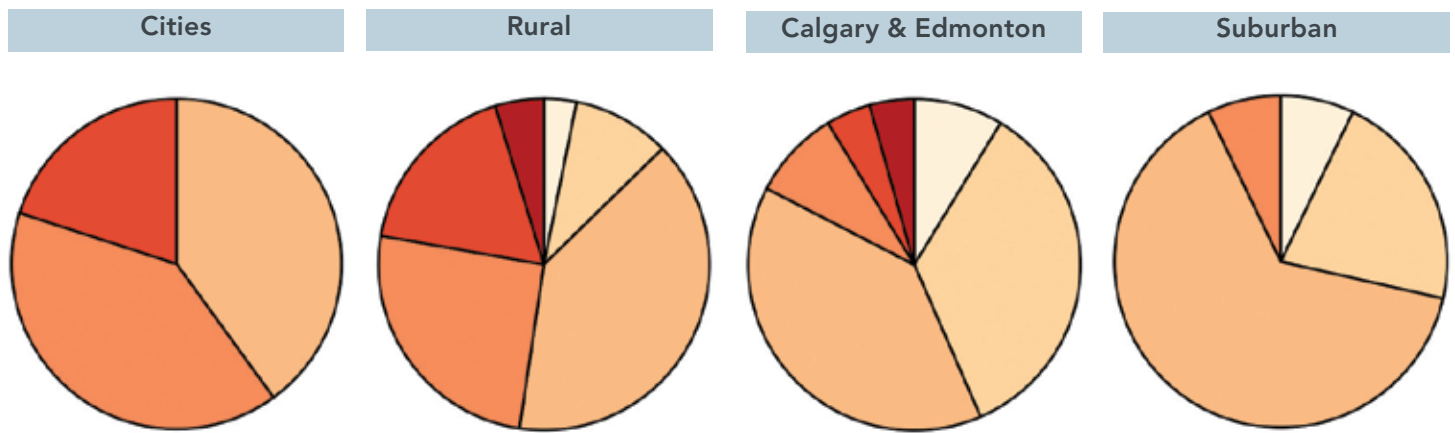


Figure 29c. Five Year BDZ/Z DDD Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



Four geographic areas have shown consistent declines in the observed rates, but one area has been rising 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 five years: Smoky Lake and Edmonton - Eastwood.

Figure 29d. Urban/Rural Distribution of DDDs per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

Suburban areas consistently reported low BDZ/Z consumption rates. Rural and Metro areas show a mix of from Low to Highest and Cities show Average to High rates.

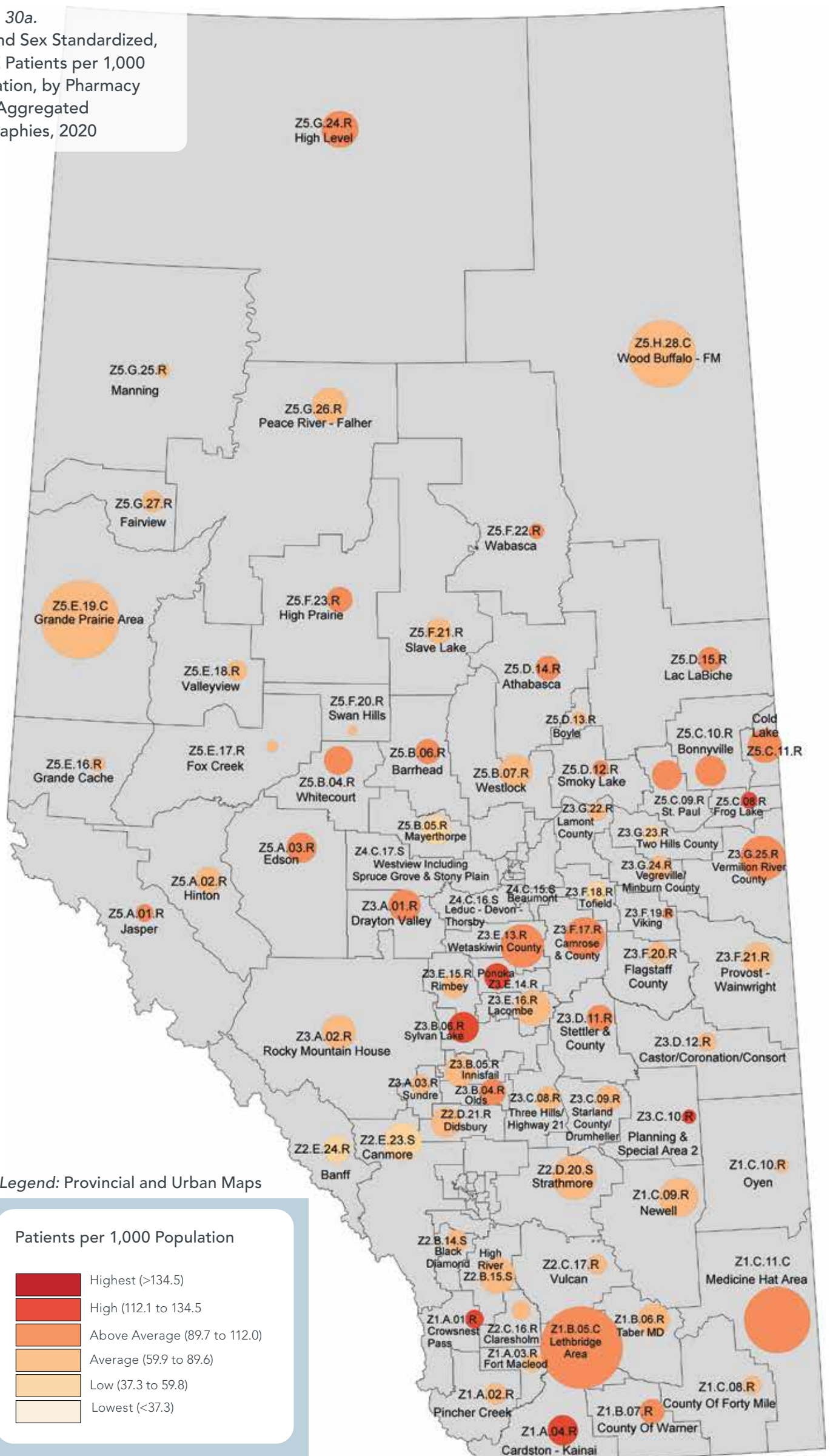
Figure 29e. BDZ/Z DDDs Mapping Categories and Socio-Economic Categories

| Map Category  | Socio-Economic Deprivation Index |   |   |   |   |   |
|---------------|----------------------------------|---|---|---|---|---|
|               | 0                                | 1 | 2 | 3 | 4 | 5 |
| Highest       | [Bar extending to 3.4]           |   |   |   |   |   |
| High          | [Bar extending to 3.5]           |   |   |   |   |   |
| Above Average | [Bar extending to 3.5]           |   |   |   |   |   |
| Average       | [Bar extending to 3.5]           |   |   |   |   |   |
| Low           | [Bar extending to 2.9]           |   |   |   |   |   |
| Lowest        | [Bar extending to 2.3]           |   |   |   |   |   |

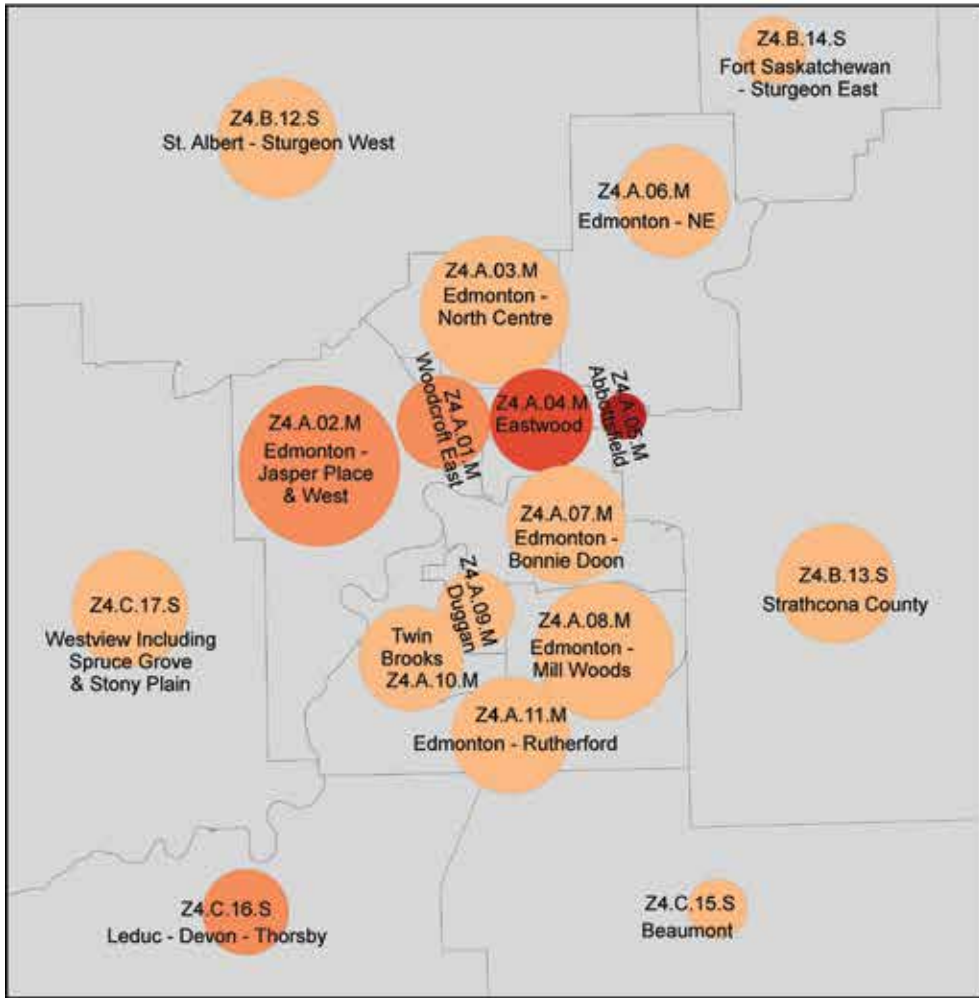
This graphic compares the Total DDDs per 1,000 Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

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

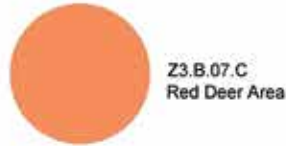
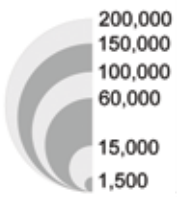
Figure 30a.  
 Age and Sex Standardized,  
 BDZ/Z Patients per 1,000  
 Population, by Pharmacy  
 Local Aggregated  
 Geographies, 2020



Edmonton



Population



Calgary

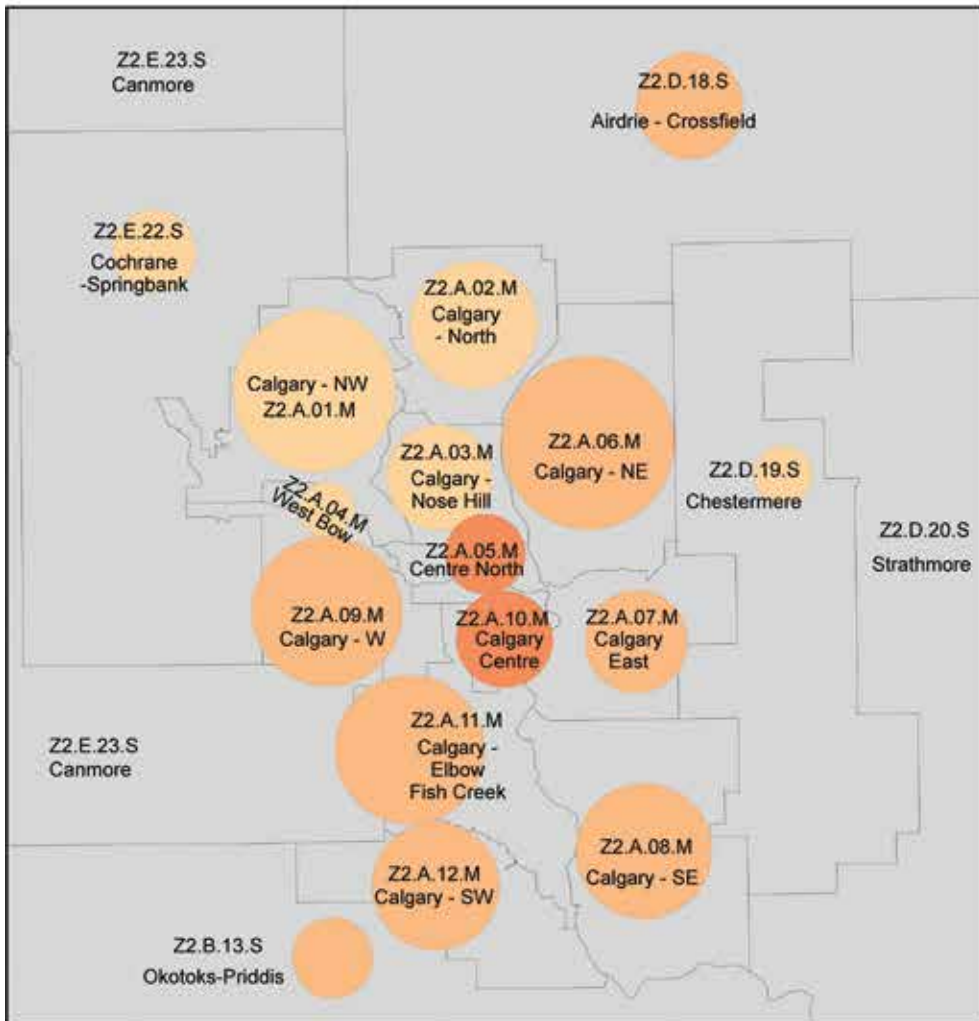


Figure 30b. Age and Sex Standardized, BDZ/Z Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2019

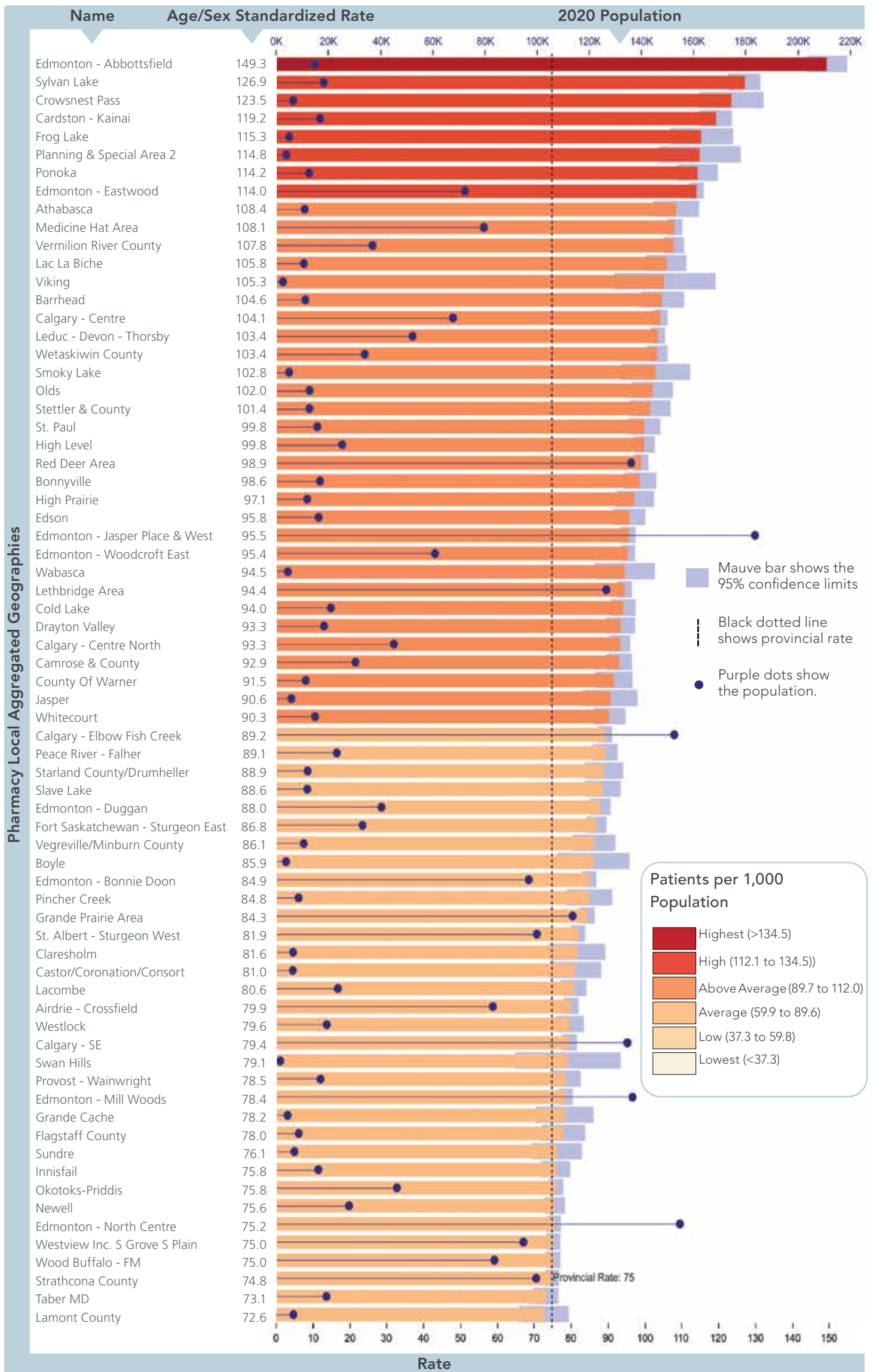
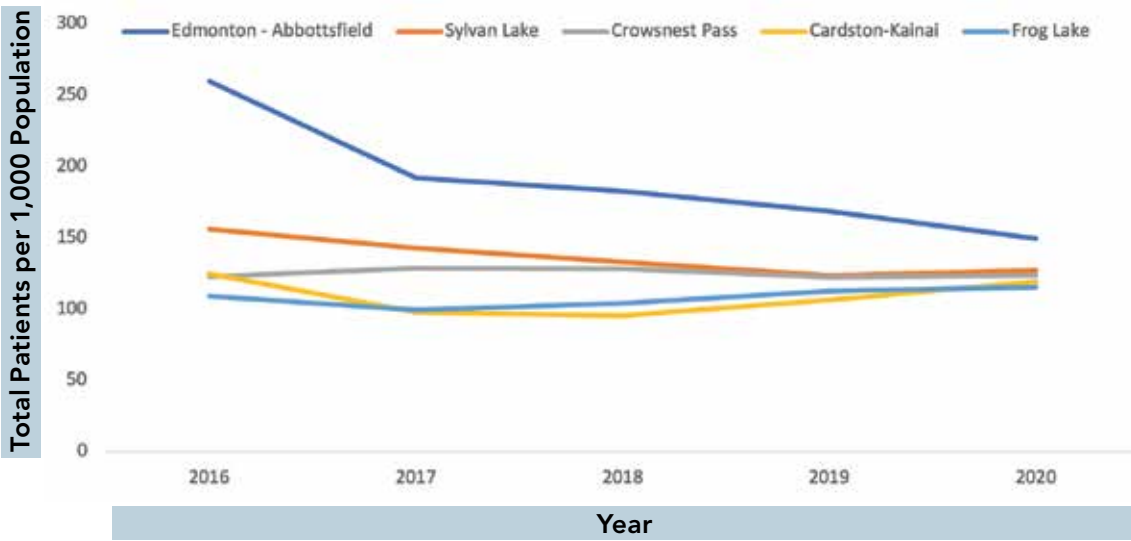


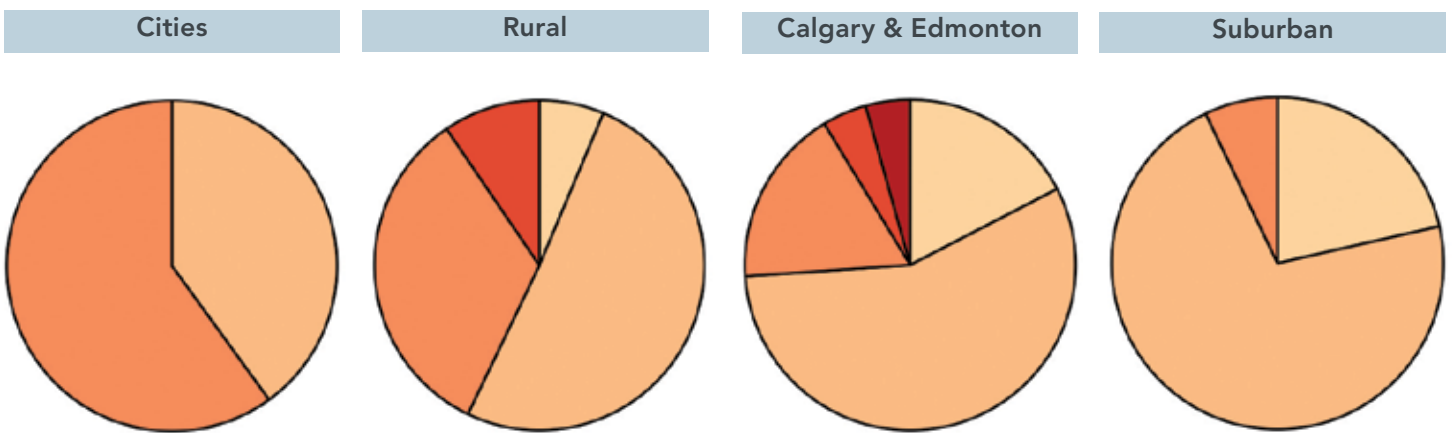


Figure 30c. Five Year BDZ/Z Patient Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



Edmonton - Abbottsfield has shown a remarkable decline over the last five years but remains the area with the highest rate. Three areas which were among the top areas with the highest rates in 2016 have decreased consistently during the past five years: Smoky Lake, Ponoka, and Edmonton - Eastwood.

Figure 30d. Urban/Rural Distribution of BDZ/Z Patients per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

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.

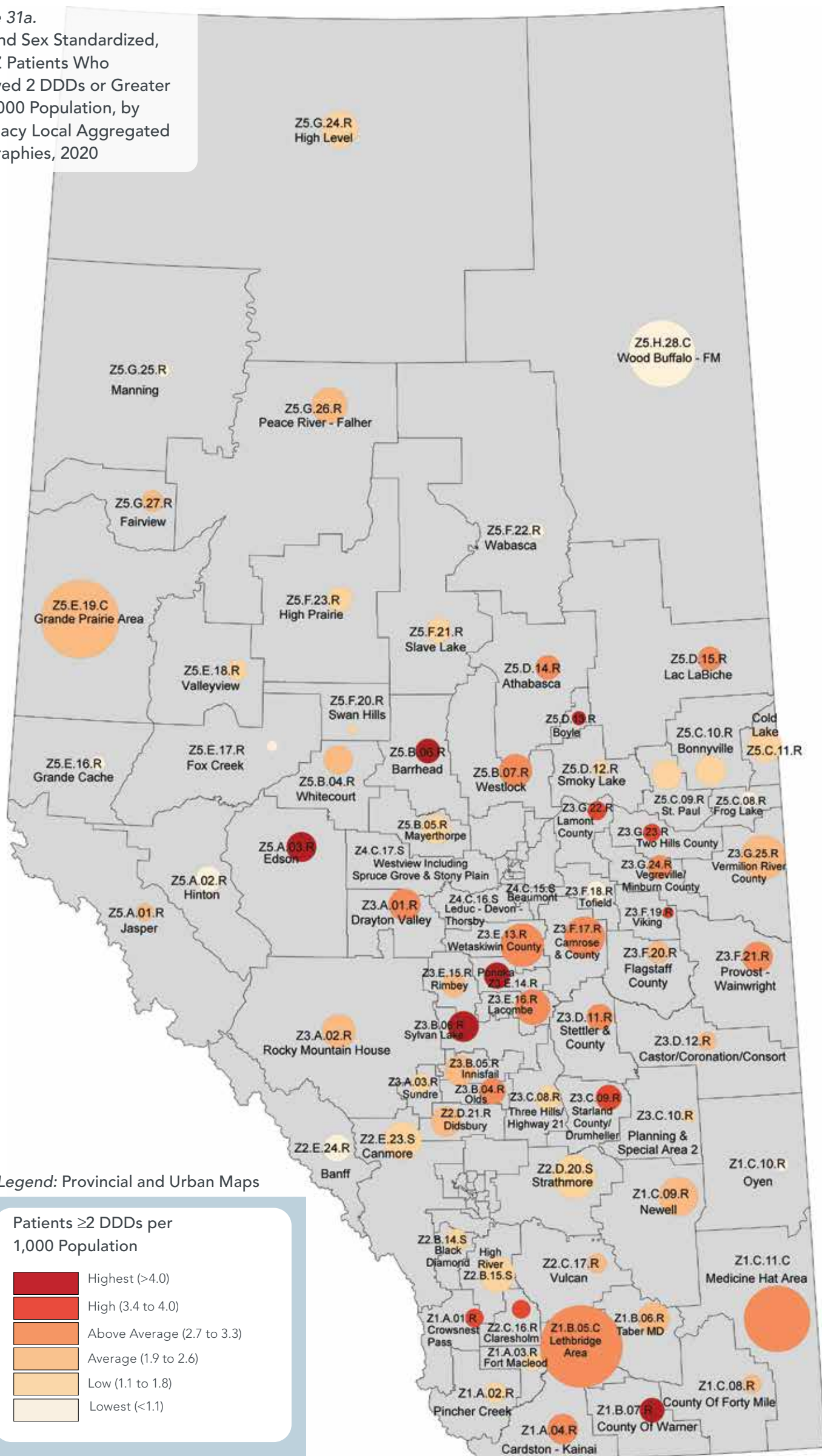
Figure 30e. BDZ/Z Patients Mapping Categories and Socio-Economic Categories

| Map Category  | Socio-Economic Deprivation Index |                                           |   |   |   |   |
|---------------|----------------------------------|-------------------------------------------|---|---|---|---|
|               | 0                                | 1                                         | 2 | 3 | 4 | 5 |
| Highest       | 4.3                              | [Bar extending to 4.3 on the index scale] |   |   |   |   |
| High          | 3.5                              | [Bar extending to 3.5 on the index scale] |   |   |   |   |
| Above Average | 3.4                              | [Bar extending to 3.4 on the index scale] |   |   |   |   |
| Average       | 3.3                              | [Bar extending to 3.3 on the index scale] |   |   |   |   |
| Low           | 2.9                              | [Bar extending to 2.9 on the index scale] |   |   |   |   |

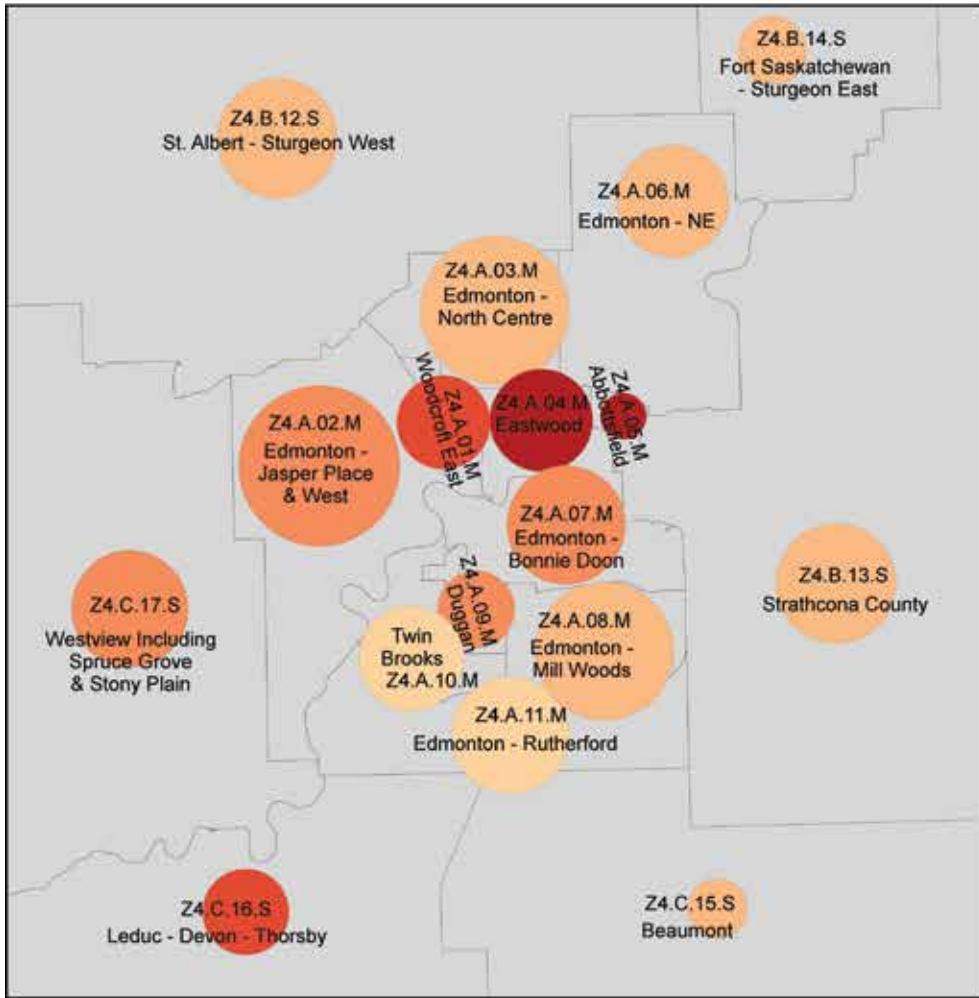
This graphic compares the BDZ/Z Patients per 1,000 Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

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

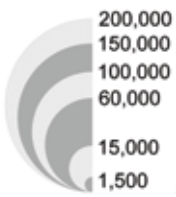
Figure 31a.  
 Age and Sex Standardized,  
 BDZ/Z Patients Who  
 Received 2 DDDs or Greater  
 per 1,000 Population, by  
 Pharmacy Local Aggregated  
 Geographies, 2020



Edmonton



Population



Calgary

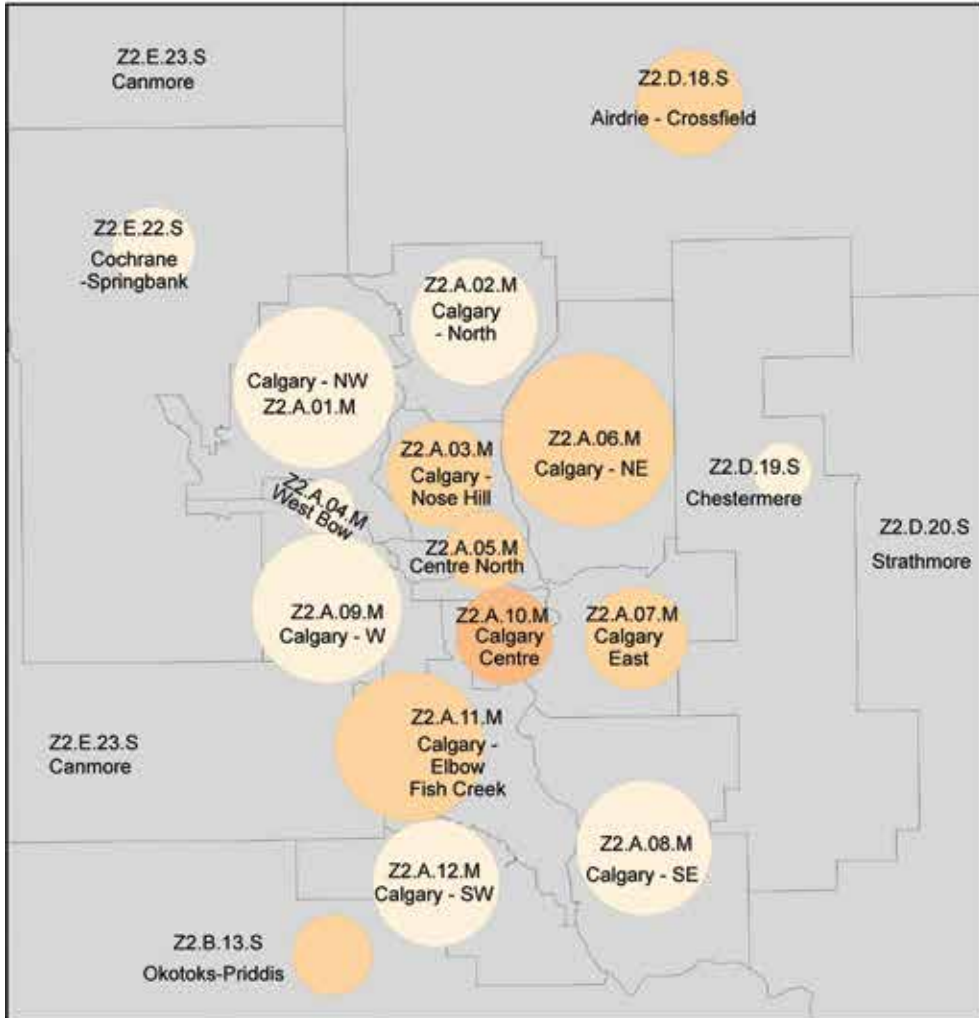


Figure 31b. Age and Sex Standardized, BDZ/Z Patients Who Received 2 DDDs or Greater per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2019

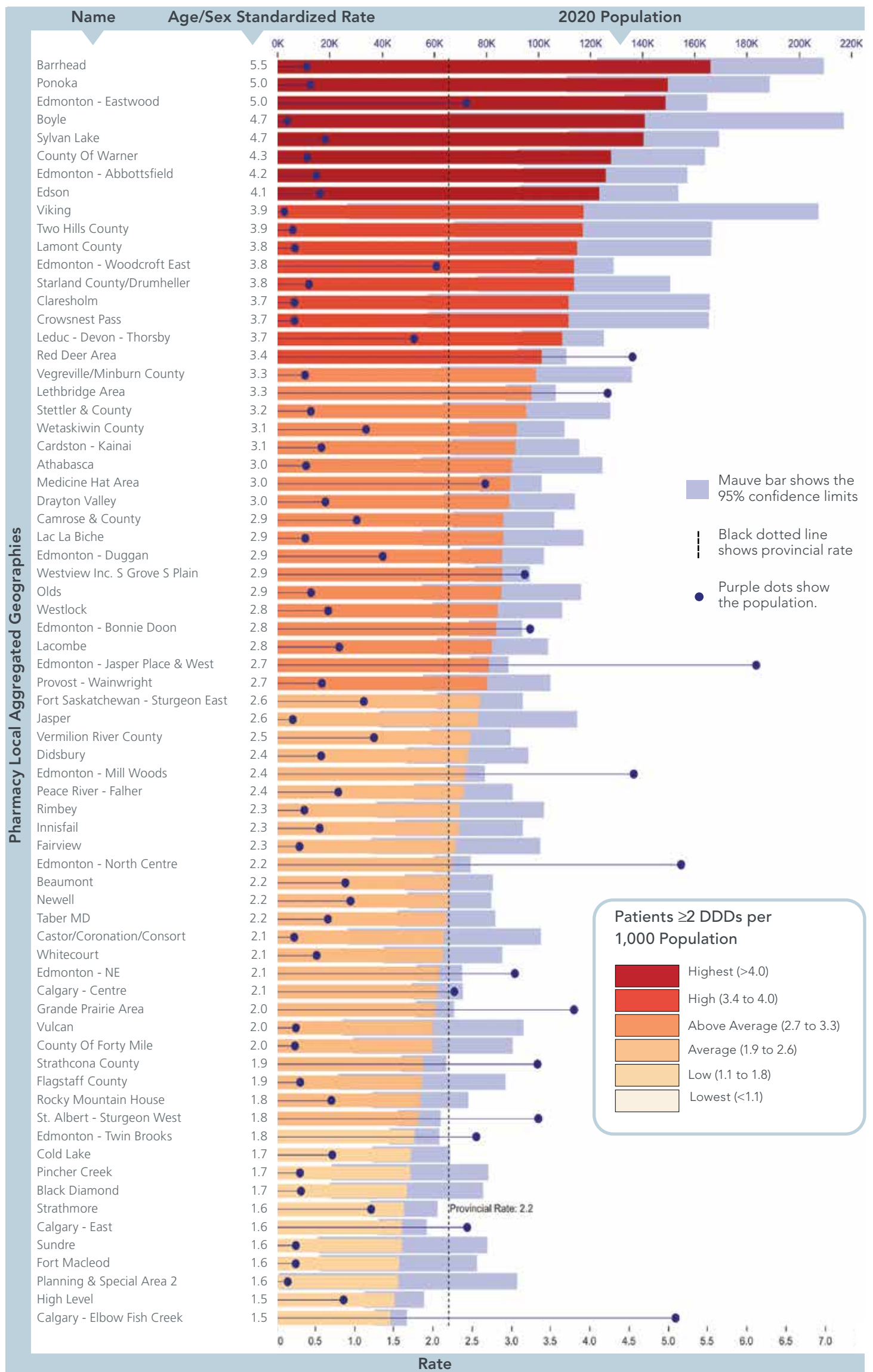
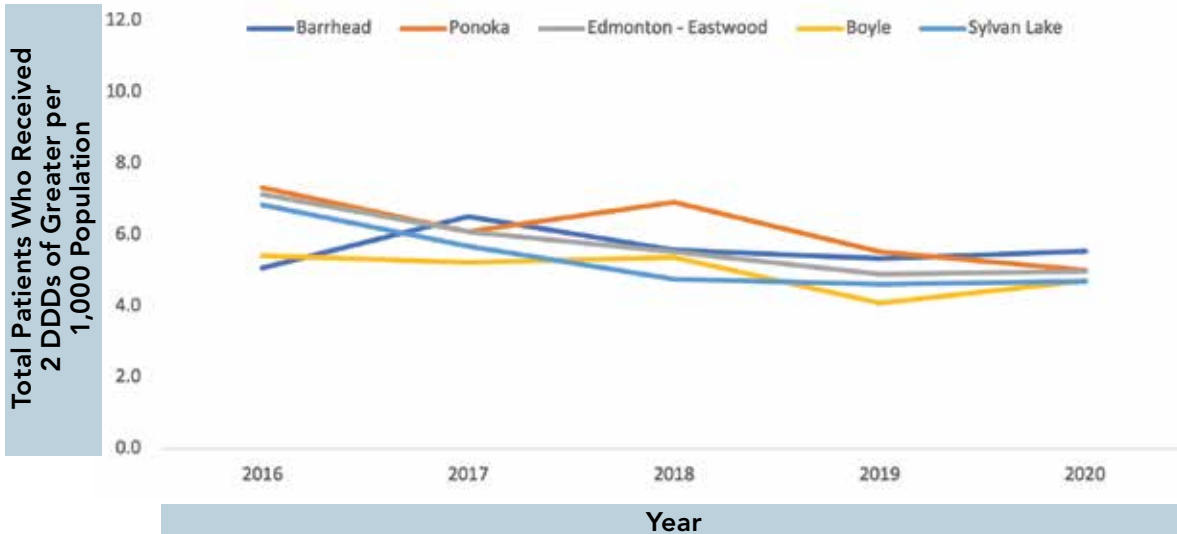
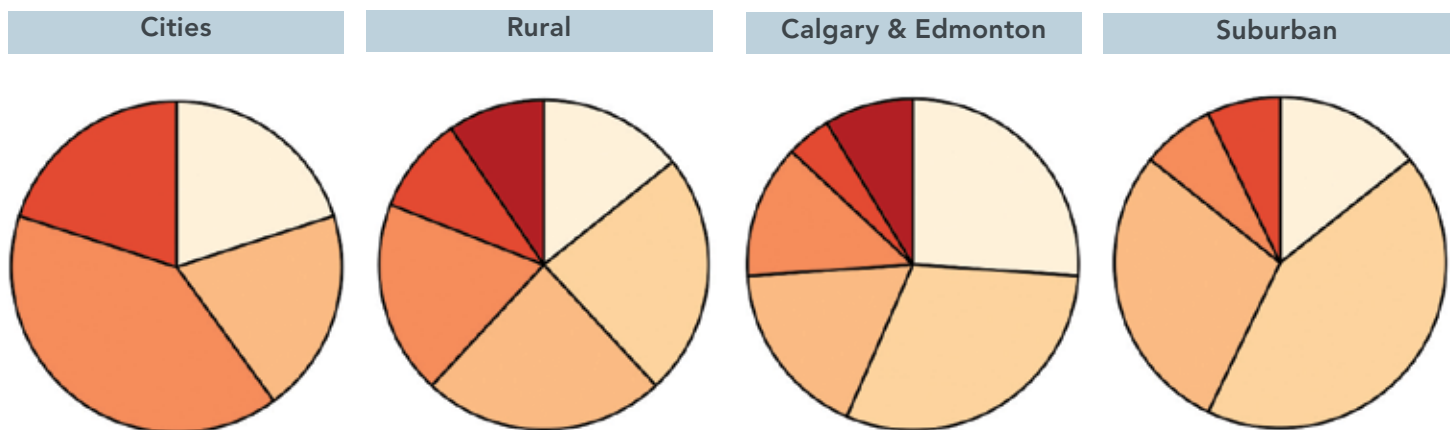


Figure 31c. Five Year BDZ/Z Patients Who Received 2 DDDs or Greater Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



The trends for the areas with the highest rates show an overall decline. In 2016, Edmonton - Abbotsfield and Athabasca reported the two highest rates, and their rates are now lower than the top five in 2020. Viking also ceased to be in this group over the last five years.

Figure 31d. Urban/Rural Distribution of BDZ/Z Patients Who Received 2 or More DDDs per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

Urban/Rural categories show very little association with observed rates for this variable.

Figure 31e. BDZ/Z Patients Who Received 2 or More DDDs Mapping Categories and Socio-Economic Categories

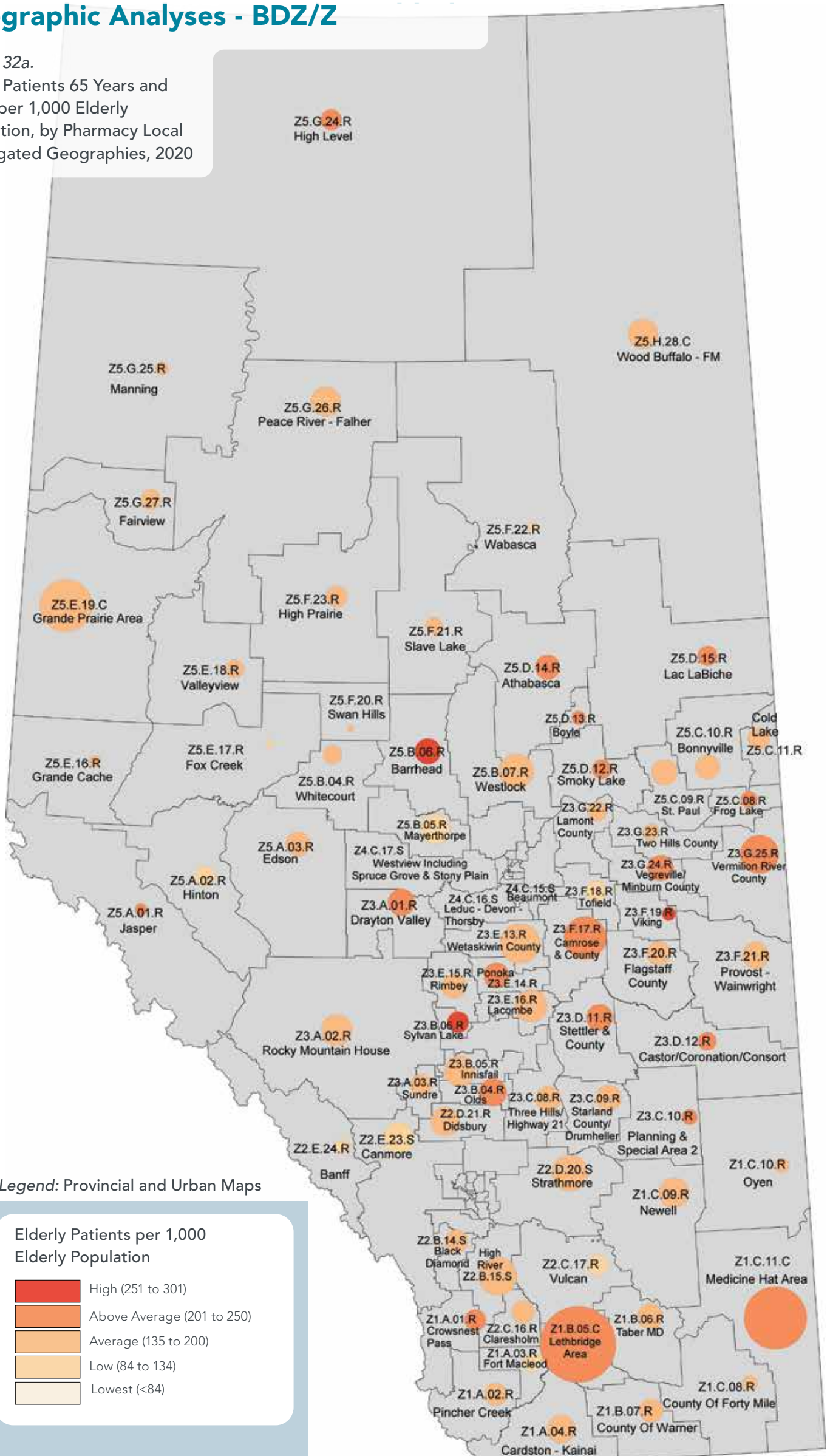


This graphic compares the BDZ/Z Patients Who Received 2 DDDs or Greater per 1,000 Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

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

# Geographic Analyses - BDZ/Z

Figure 32a.  
BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population, by Pharmacy Local Aggregated Geographies, 2020

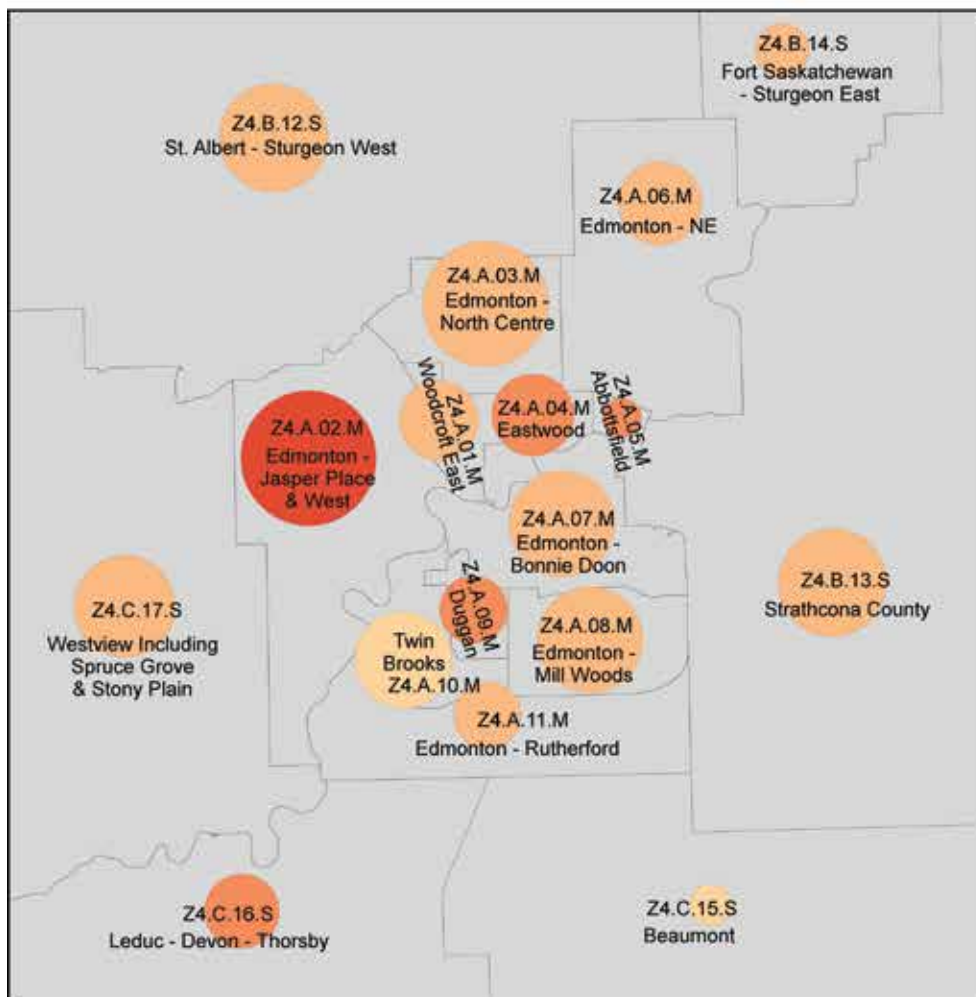


Legend: Provincial and Urban Maps

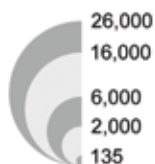
Elderly Patients per 1,000 Elderly Population

- High (251 to 301)
- Above Average (201 to 250)
- Average (135 to 200)
- Low (84 to 134)
- Lowest (<84)

Edmonton



Elderly (65+) Population



Z3.B.07.C  
Red Deer Area

Calgary

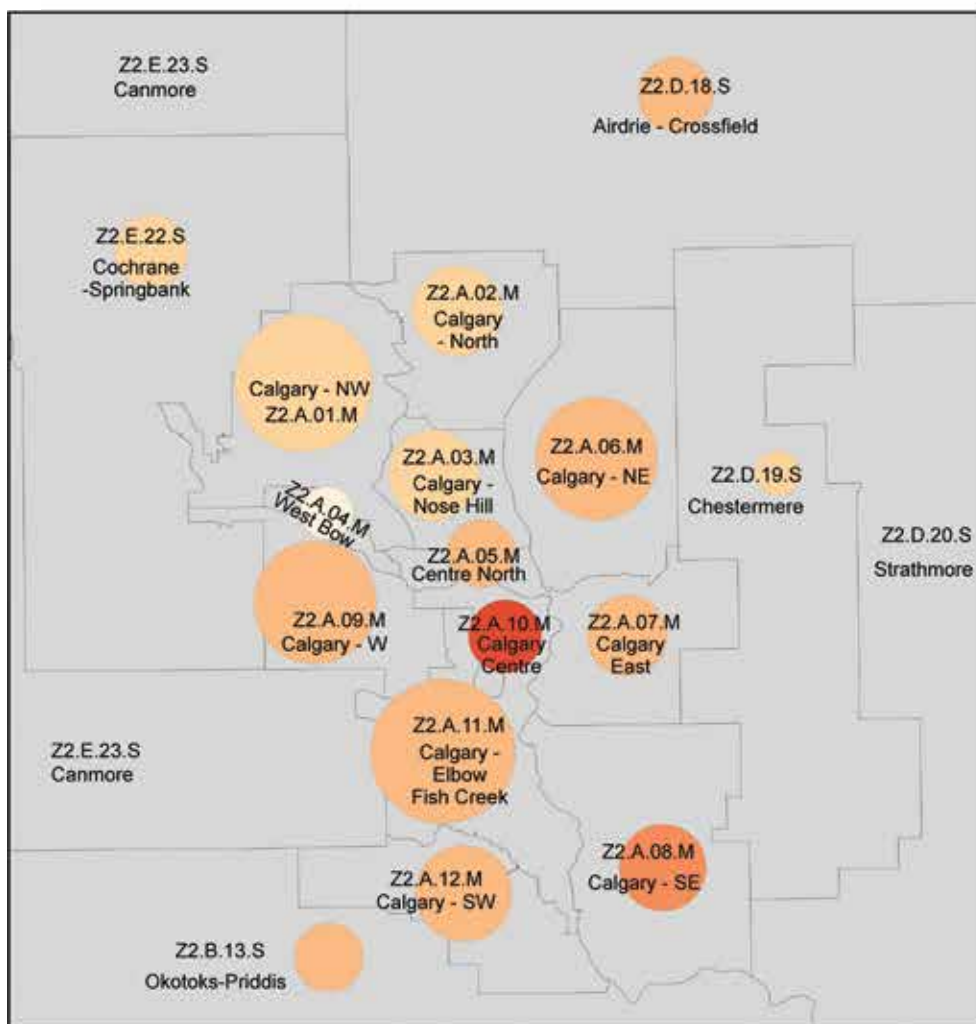


Figure 32b. BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population, by Pharmacy Local Aggregated Geographies, 2020

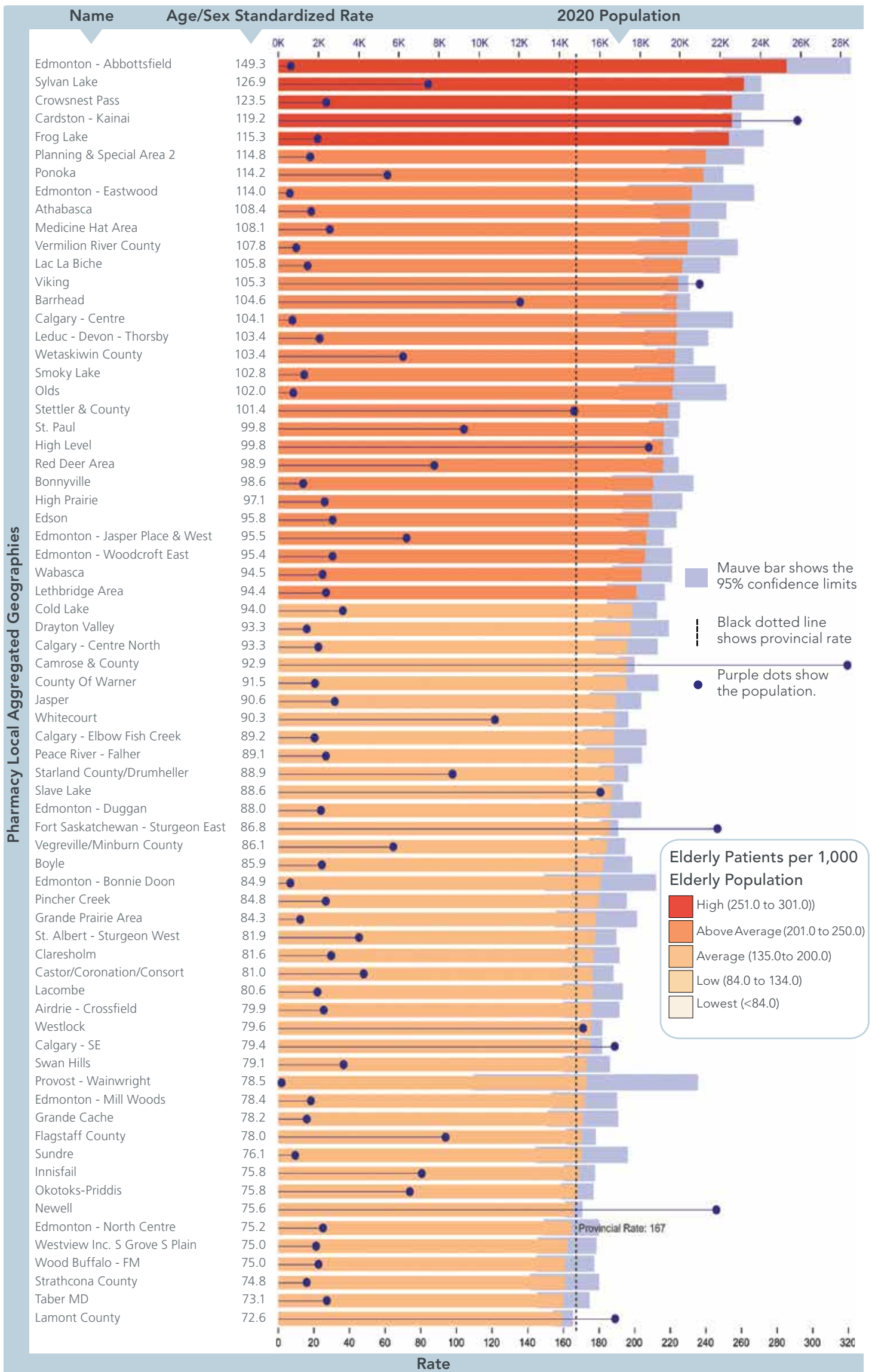
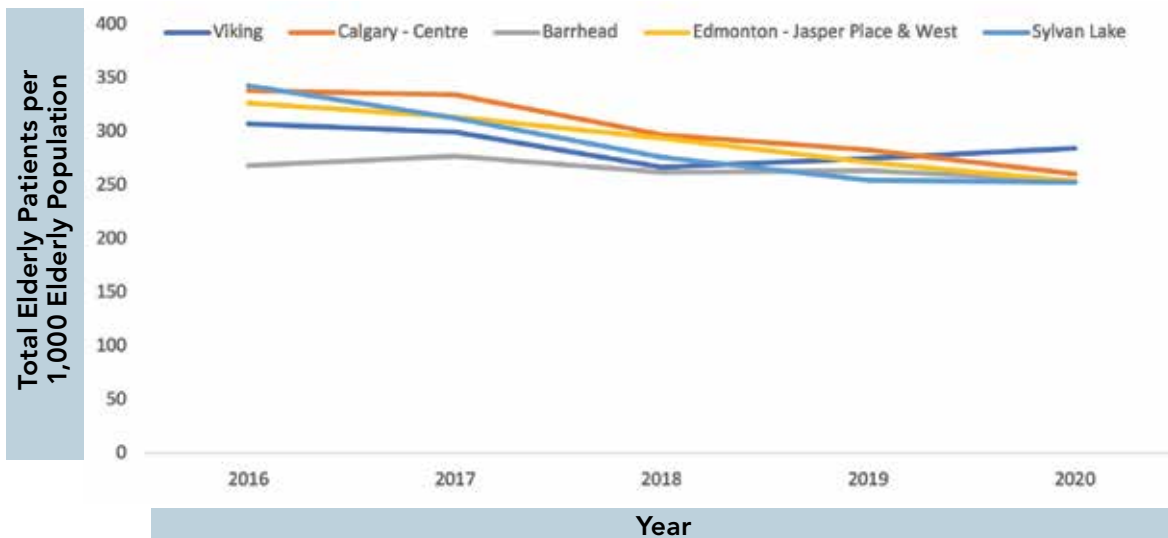


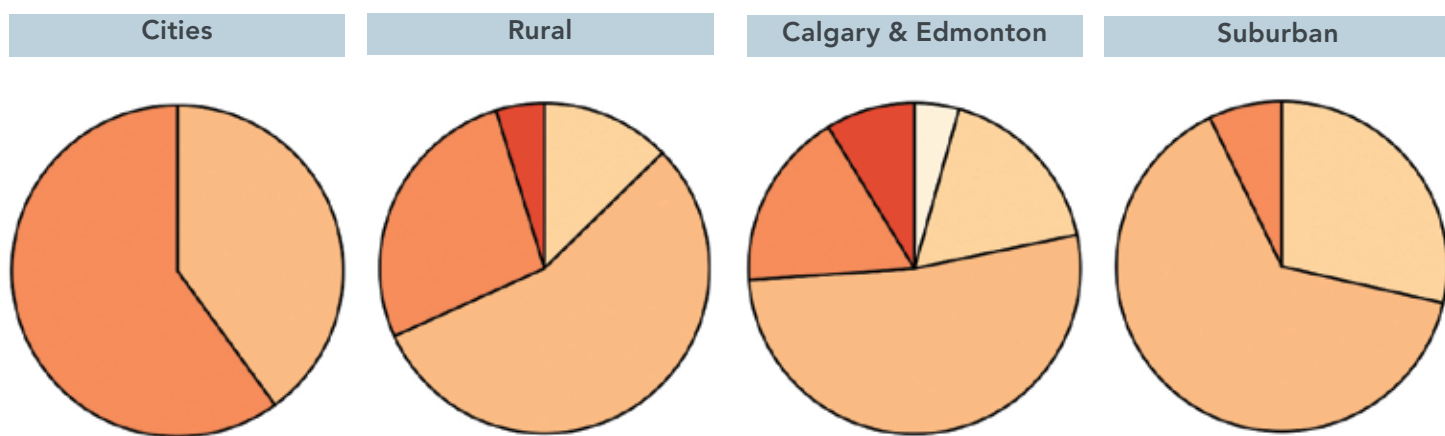


Figure 32c. Five Year BDZ/Z Elderly Patient Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



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 2020.

Figure 32d. Urban/Rural Distribution of BDZ/Z Patients 65 Years or Older per 1,000 Elderly Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

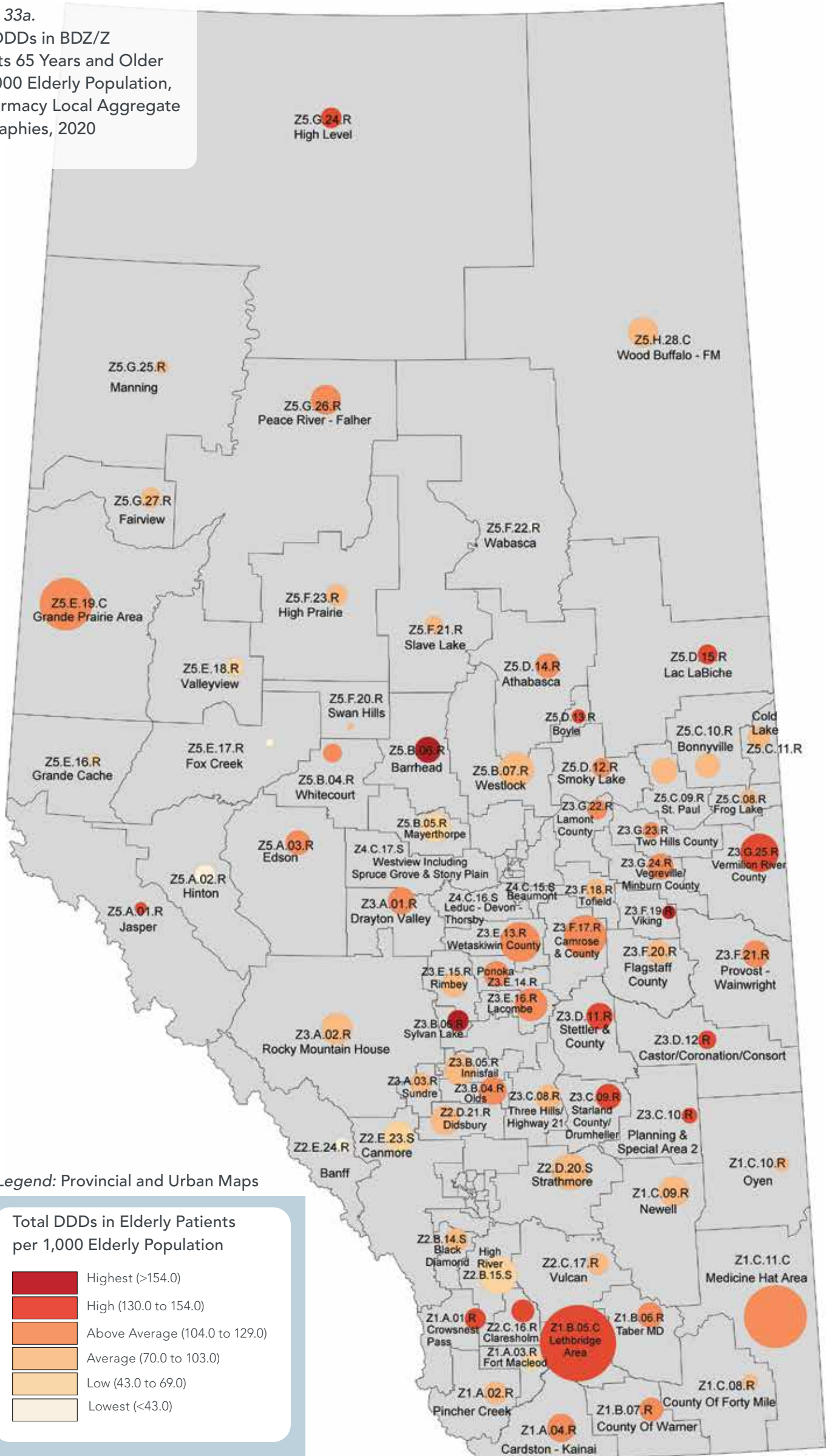
Urban/Rural categories have a low association with observed rates for this variable and Deprivation Index also has little or no association with observed rates for this variable.

Figure 32e. BDZ/Z Elderly Patients Mapping Categories and Socio-Economic Categories

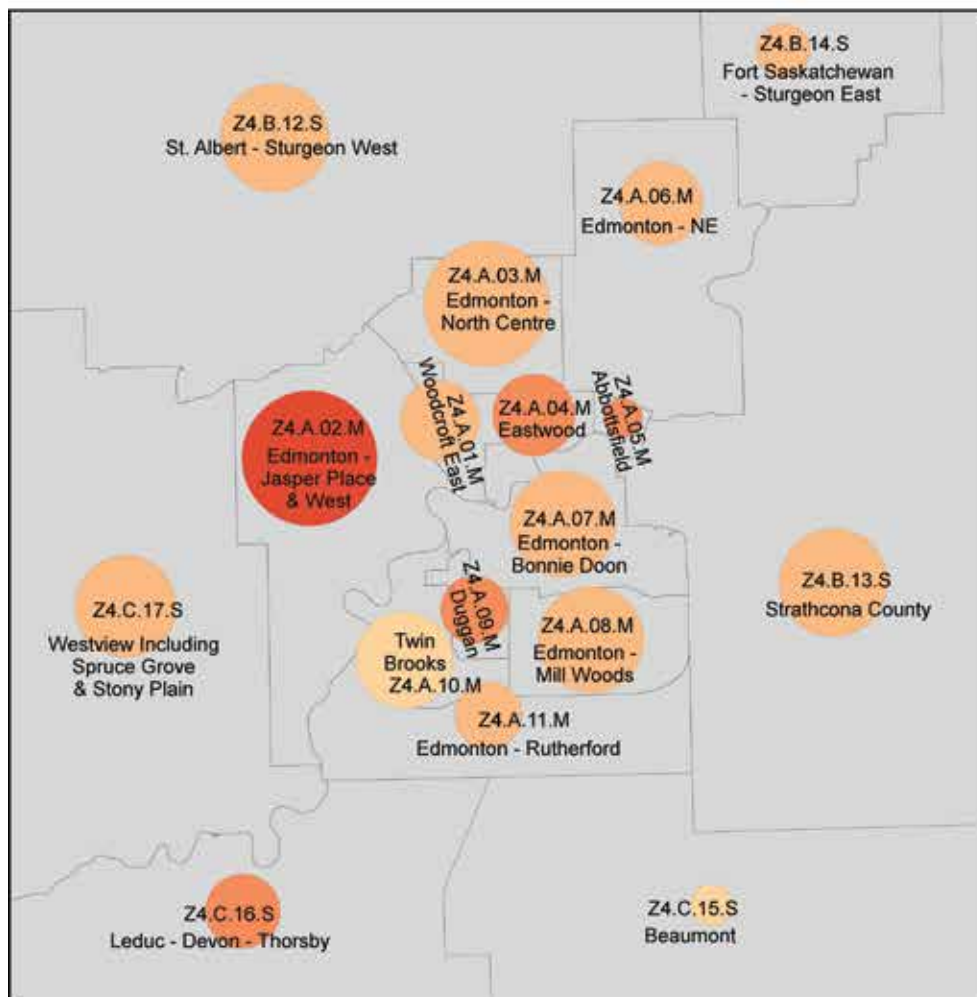
| Map Category  | Socio-Economic Deprivation Index |                        |   |   |   |   |
|---------------|----------------------------------|------------------------|---|---|---|---|
|               | 0                                | 1                      | 2 | 3 | 4 | 5 |
| High          | 3.0                              | [Bar extending to 3.0] |   |   |   |   |
| Above Average | 3.4                              | [Bar extending to 3.4] |   |   |   |   |
| Average       | 3.4                              | [Bar extending to 3.4] |   |   |   |   |
| Low           | 3.0                              | [Bar extending to 3.0] |   |   |   |   |
| Lowest        | 3.0                              | [Bar extending to 3.0] |   |   |   |   |

This graphic compares the BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

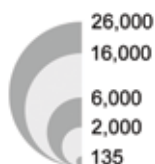
Figure 33a.  
 Total DDDs in BDZ/Z  
 Patients 65 Years and Older  
 per 1,000 Elderly Population,  
 by Pharmacy Local Aggregate  
 Geographies, 2020



Edmonton



Elderly (65+) Population



Calgary

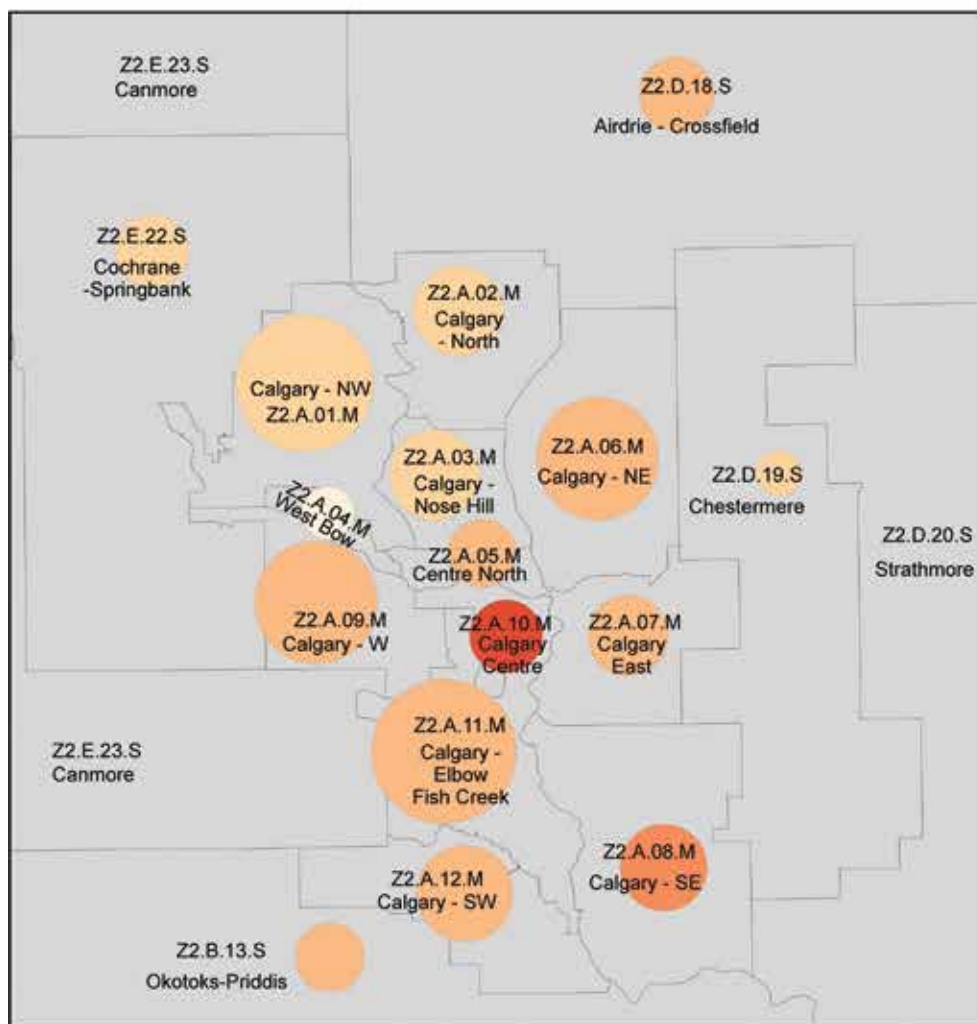


Figure 33b. Total DDDs in BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population, by Pharmacy Local Aggregate Geographies, 2020

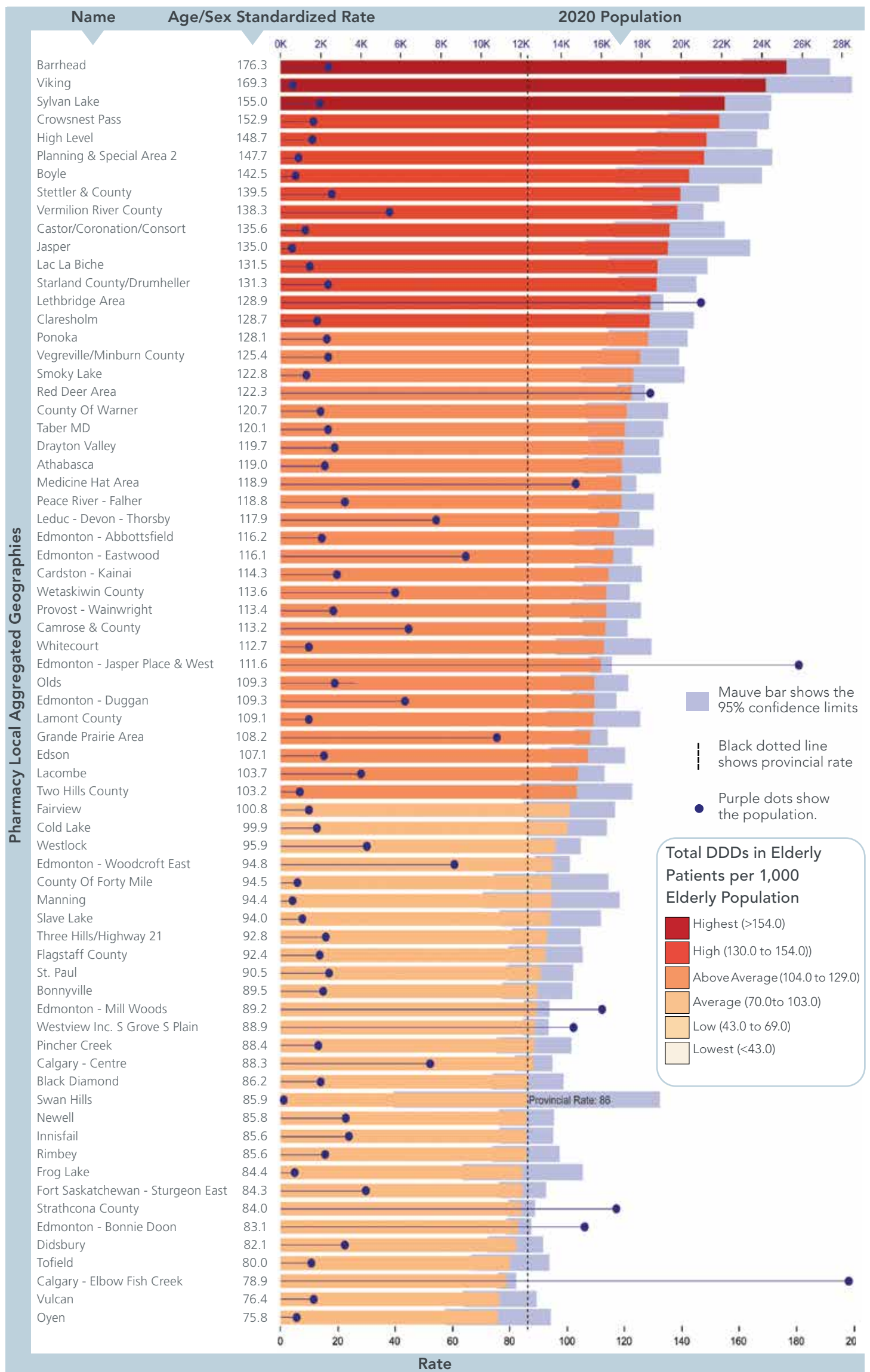
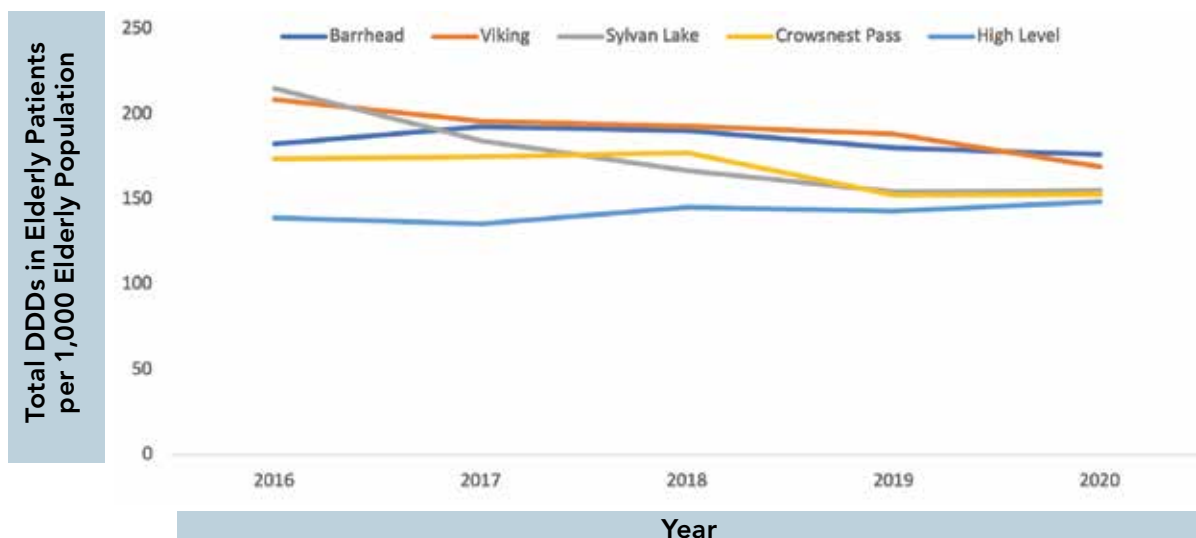
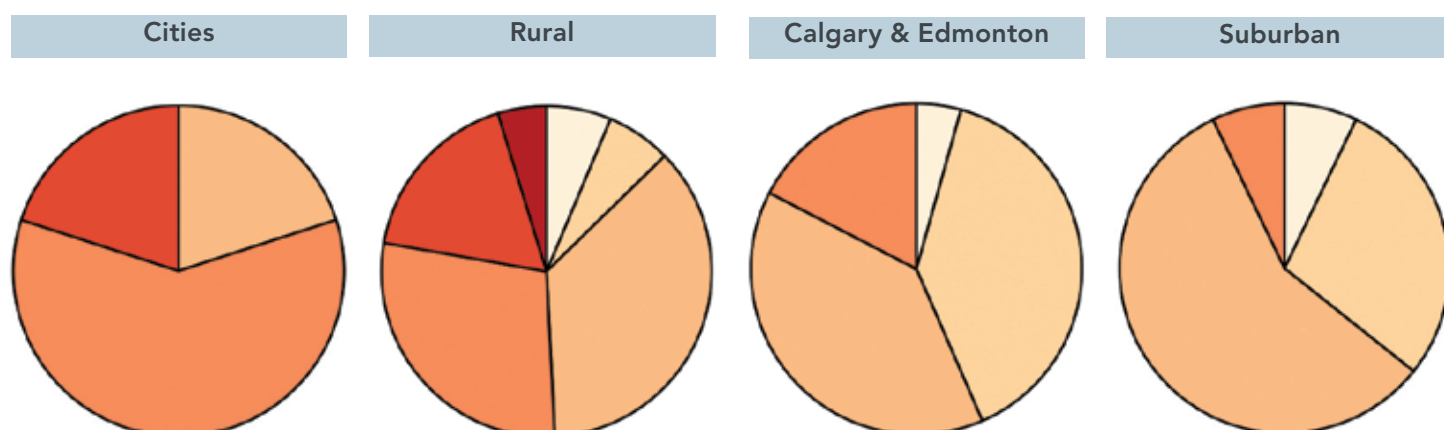


Figure 33c. Five Year BDZ/Z DDDs in Elderly Patients Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



The trends for the areas with the highest rates show an overall decline. In 2016, Edmonton - Abbotsfield, and Ponoka reported very high rates; their rates have fallen, and their rates are now lower than the top five in 2020.

Figure 33d. Urban/Rural Distribution of DDDs in Patients 65 Years or Older per 1,000 Elderly Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

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.

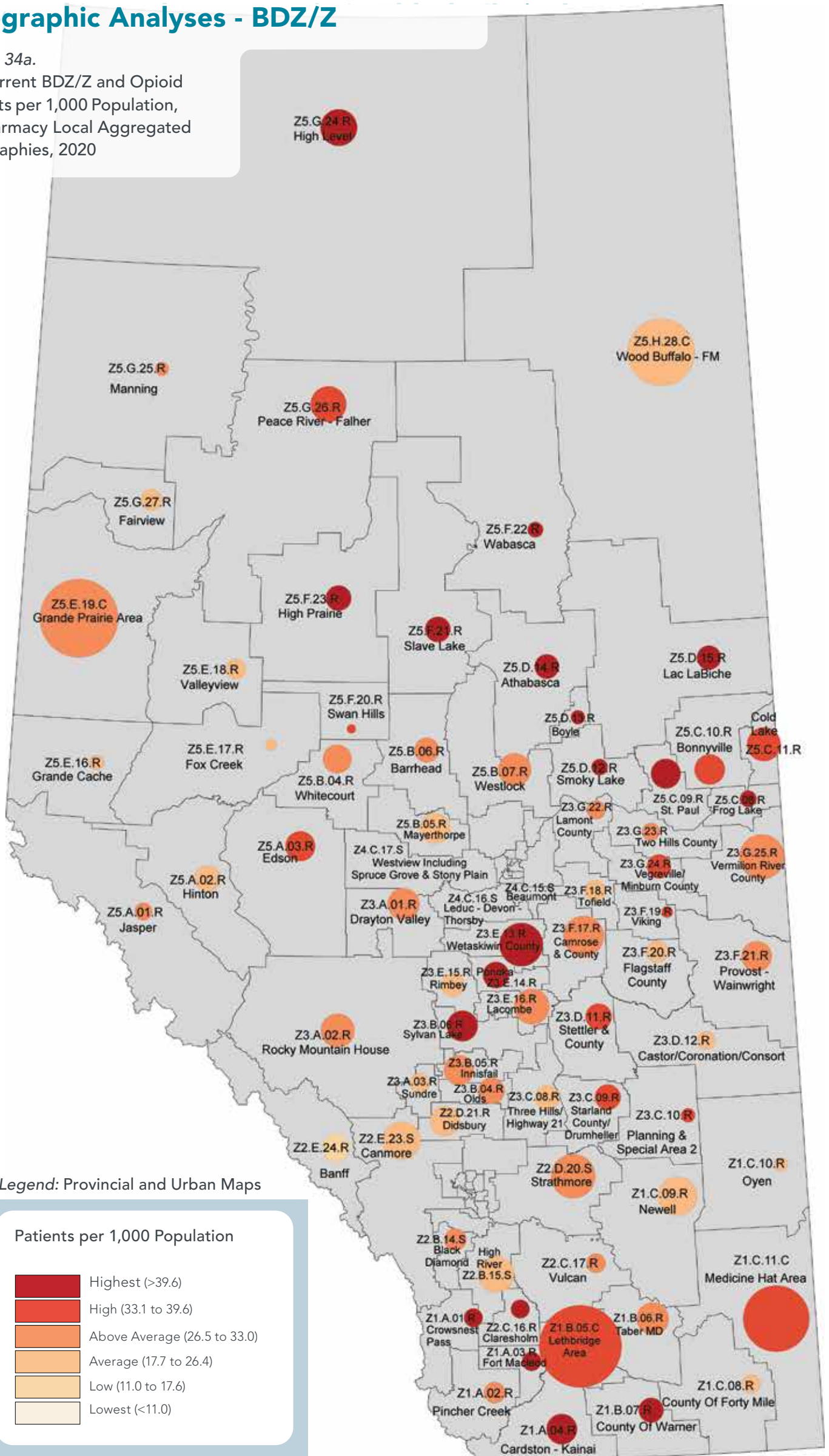
Figure 33e. BDZ/Z Elderly DDDs Mapping Categories and Socio-Economic Categories



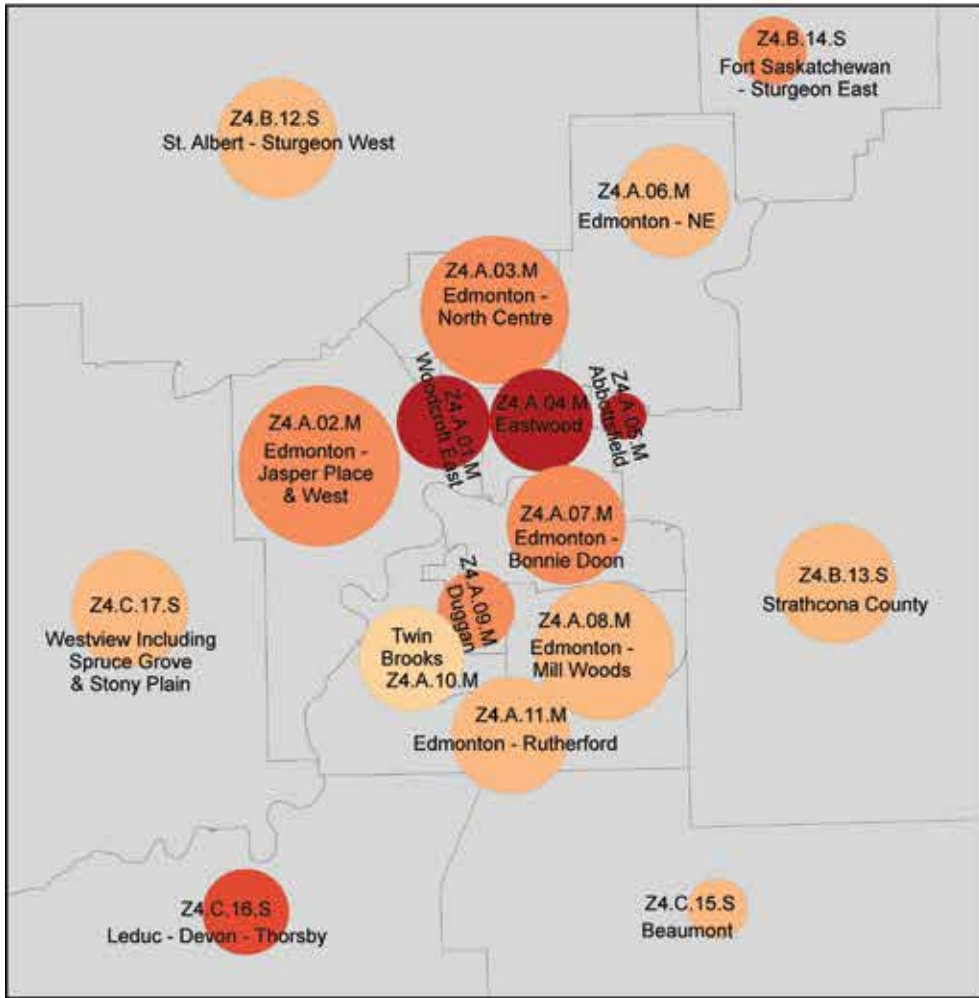
This graphic compares the Total DDDs in BDZ/Z Patients 65 Years and Older per 1,000 Elderly Population against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

# Geographic Analyses - BDZ/Z

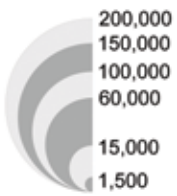
Figure 34a.  
Concurrent BDZ/Z and Opioid  
Patients per 1,000 Population,  
by Pharmacy Local Aggregated  
Geographies, 2020



Edmonton



Population



Calgary

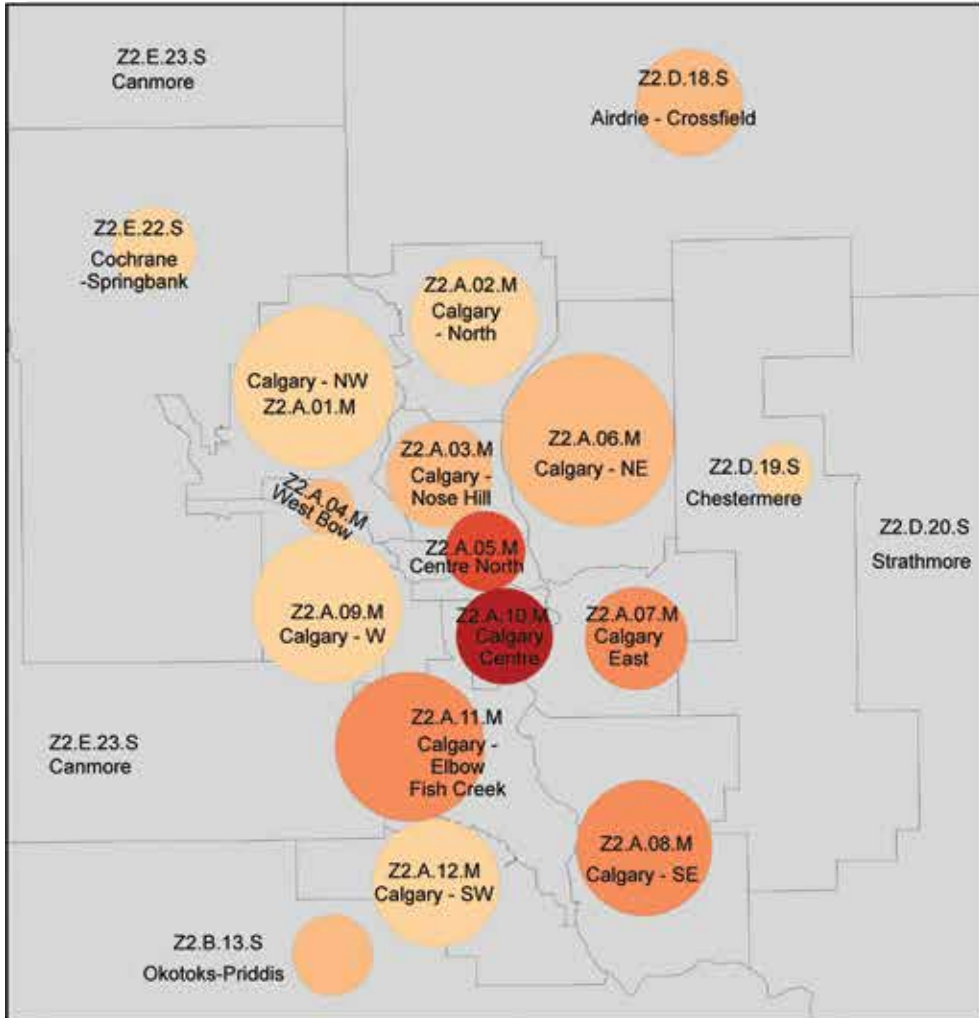


Figure 34b. Concurrent BDZ/Z and Opioid Patients per 1,000 Population, by Pharmacy Local Aggregated Geographies, 2020

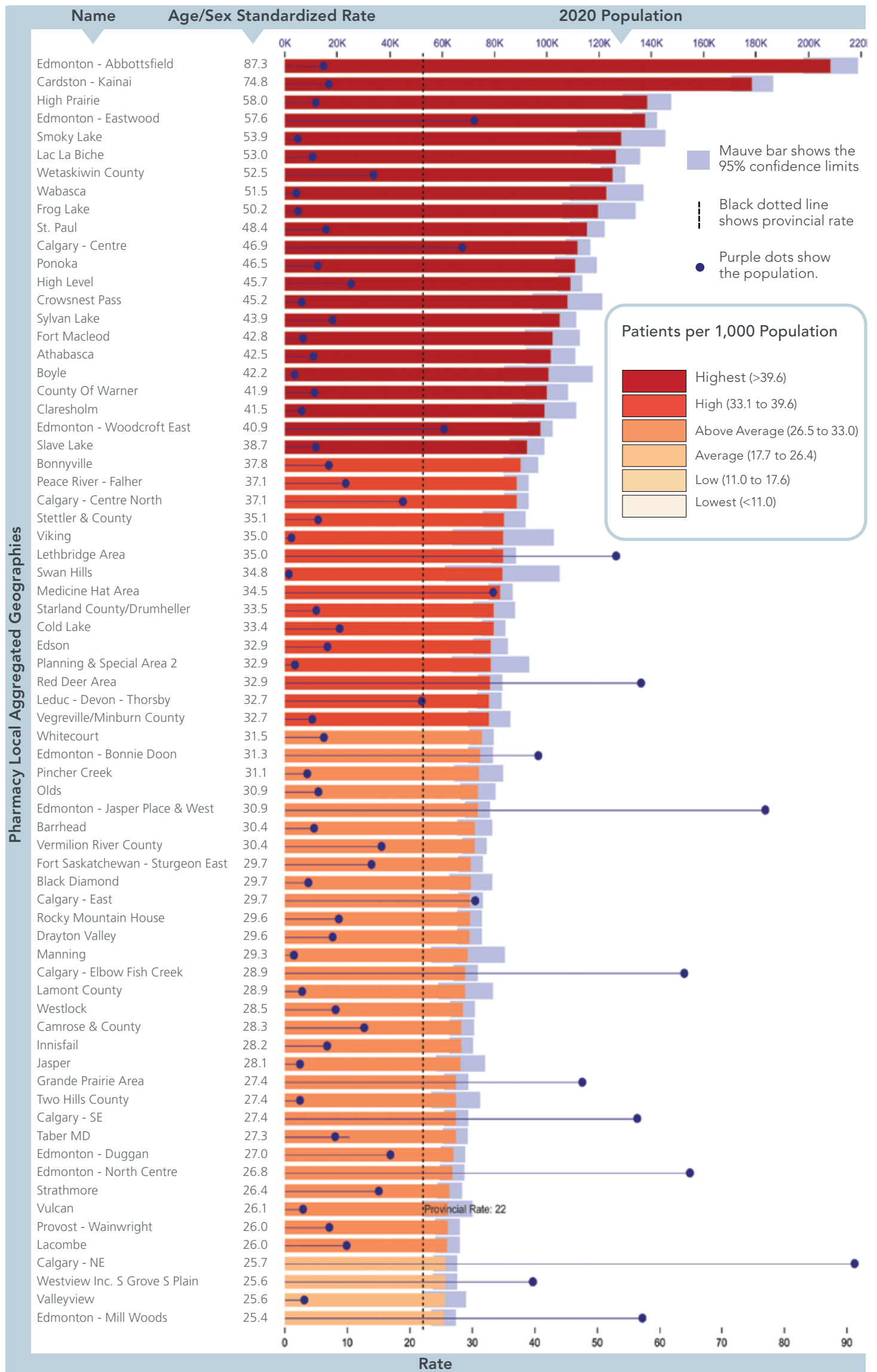
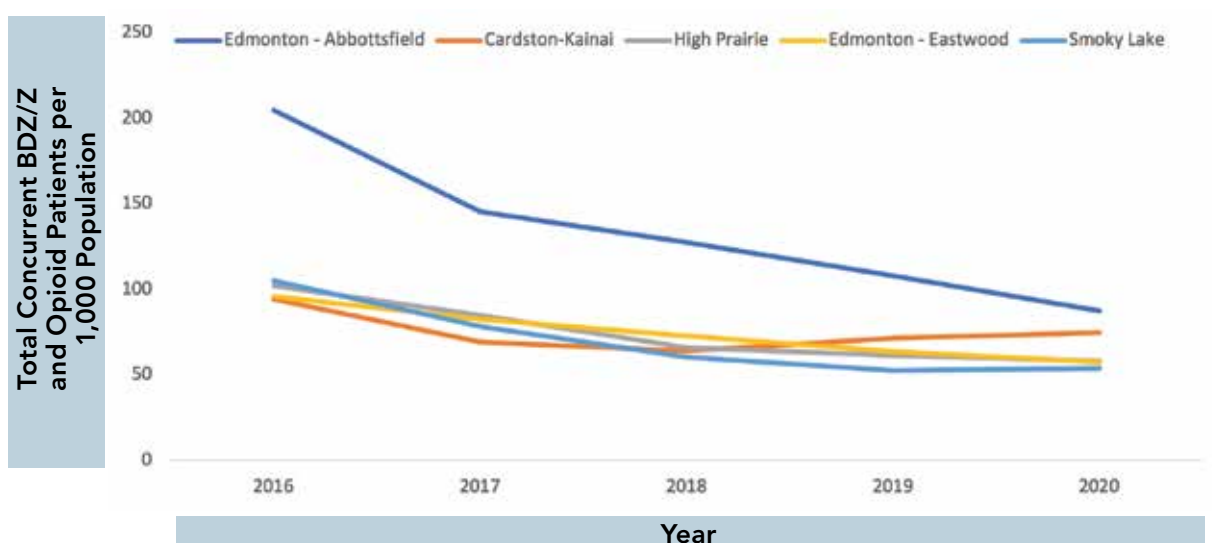


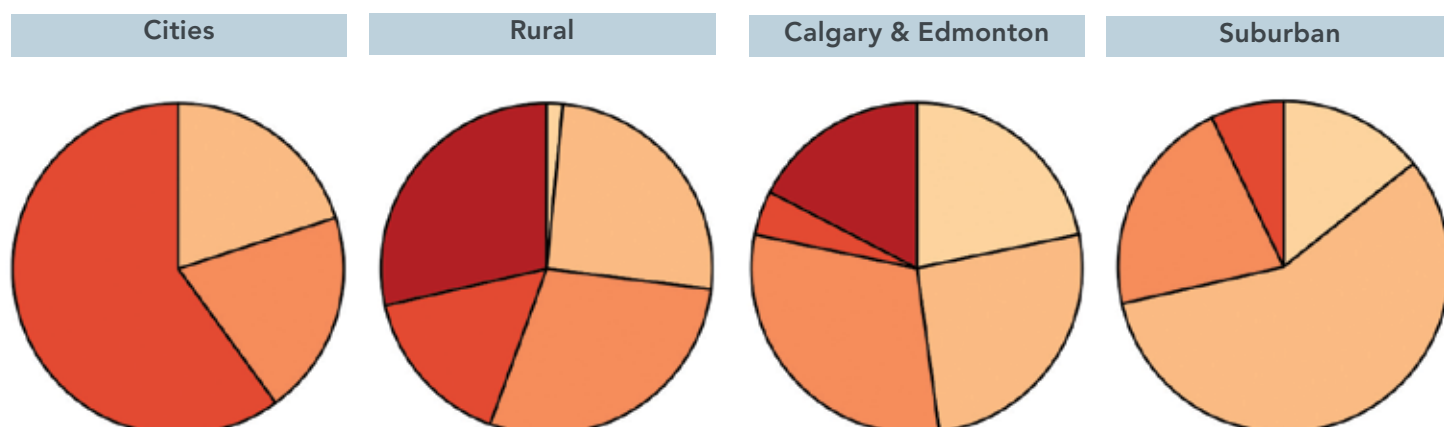


Figure 34c. Five Year Patients Who Consumed Opioids and BDZ/Z in the Same Quarter Trends for the Top Five PhLAGs in 2020, based on 2020 Rates



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 2020.

Figure 34d. Urban/Rural Distribution of Concurrent BDZ/Z and Opioid Patients per 1,000 Population by Category, 2020



Pie charts show the proportions of Pharmacy Local Aggregated Geographies corresponding to each of the mapped categories for each urban class. Comparing the size of the slice for a category (i.e. Lowest) across all four charts provides its context for its urban/rural association. The colours in the sections represent the categories shown in the legend on the opposing page.

Urban/Rural categories have a low association with observed rates for this variable. The highest rates were found in rural areas and Calgary & Edmonton.

Figure 34e. Concurrent BDZ/Z and Opioid Patients Mapping Categories and Socio-Economic Categories

| Map Category  | Socio-Economic Deprivation Index |                        |   |   |   |   |
|---------------|----------------------------------|------------------------|---|---|---|---|
|               | 0                                | 1                      | 2 | 3 | 4 | 5 |
| Highest       | 3.7                              | [Bar extending to 3.7] |   |   |   |   |
| High          | 3.3                              | [Bar extending to 3.3] |   |   |   |   |
| Above Average | 3.4                              | [Bar extending to 3.4] |   |   |   |   |
| Average       | 3.2                              | [Bar extending to 3.2] |   |   |   |   |
| Low           | 2.4                              | [Bar extending to 2.4] |   |   |   |   |

This graphic compares the Concurrent BDZ/Z and Opioid Patients per 1,000 Population categories against the Socio-Economic Deprivation Index. Each bar corresponds to one of the mapping categories and uses consistent colour and labels as the legend, map, and other graphics. The length of the bar shows the calculated score for all the PhLAGs (geographic areas) within each of the corresponding categories.

Deprivation Index values are lowest with the Low rate category but there is no association as the rate values climb.

# Appendix A – Opioid Analytic Class, 2020

**Table 25. Opioid Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, ATC Code and Route of Administration, 2020**

| Main Ingredient | ATC Code Description                                  | Route         | Prescriptions | Patients | Prescribers | Pharmacies |
|-----------------|-------------------------------------------------------|---------------|---------------|----------|-------------|------------|
| Buprenorphine   | N02AE01-BUPRENORPHINE                                 | Transdermal   | 9,517         | 2,783    | 1,414       | 925        |
| Buprenorphine   | N07BC01-BUPRENORPHINE                                 | Subcutaneous  | 261           | 138      | 35          | 27         |
| Buprenorphine   | N07BC51-BUPRENORPHINE, COMBINATIONS                   | Sublingual    | 84,527        | 10,237   | 2,434       | 1,299      |
| Butalbital      | N02AA79-CODEIN, COMBINATIONS WITH PSYCHOLEPTICS       | Oral          | 1,738         | 530      | 454         | 390        |
| Butalbital      | N02BA71-ACETYSALICYLIC ACID, COMB WITH PSYCHOLEPTICS  | Oral          | 276           | 124      | 125         | 111        |
| Butorphanol     | N02AF01-BUTORPHANOL                                   | Nasal         | 363           | 79       | 81          | 87         |
| Codeine         | M03BB53-CHLORZOAZONE, COMBINATIONS EXCL PSYCHOLEPTICS | Oral          | 45            | 24       | 24          | 17         |
| Codeine         | N02AA59-CODEINE, COMBINATIONS EXCL. PSYCHOLEPTICS     | Oral          | 2,722         | 1,338    | 766         | 566        |
| Codeine         | N02AJ06-CODEINE AND PARACETAMOL                       | Oral          | 601,777       | 256,336  | 11,958      | 1,582      |
| Codeine         | N02AJ07-CODEINE AND ACETYSALICYLIC ACID               | Oral          | 3             | 3        | 3           | 3          |
| Codeine         | N02BE51-ACETAMINOPHEN, COMB EXCL PSYCHOLEPTICS        | Oral          | 4,401         | 2,156    | 1,183       | 582        |
| Codeine         | R05DA04-CODEINE                                       | Intramuscular | 4             | 2        | 4           | 2          |
| Codeine         | R05DA04-CODEINE                                       | Oral          | 52,295        | 21,094   | 5,329       | 1,472      |
| Codeine         | R05DA04-CODEINE                                       | Unknown       | 66            | 59       | 24          | 18         |
| Codeine         | R05DA20-COMBINATIONS                                  | Oral          | 43,176        | 35,822   | 2,878       | 1,376      |
| Codeine         | R05FA02-OPIUM DERIVATIVES AND EXPECTORANTS            | Oral          | 15,183        | 13,042   | 2,653       | 1,193      |
| Fentanyl        | N01AH01-FENTANYL                                      | Intramuscular | 1,696         | 1,099    | 343         | 148        |
| Fentanyl        | N01AH01-FENTANYL                                      | Parenteral    | 1             | 1        | 1           | 1          |
| Fentanyl        | N02AB03-FENTANYL                                      | Buccal        | 19            | 8        | 8           | 8          |
| Fentanyl        | N02AB03-FENTANYL                                      | Intramuscular | 29            | 25       | 24          | 19         |
| Fentanyl        | N02AB03-FENTANYL                                      | Transdermal   | 14,421        | 2,852    | 1,838       | 939        |
| Fentanyl        | N02AB03-FENTANYL                                      | Unknown       | 28            | 13       | 8           | 3          |
| Hydrocodone     | R05DA03-HYDROCODONE                                   | Oral          | 106           | 38       | 37          | 37         |
| Hydrocodone     | R05DA20-COMBINATIONS                                  | Oral          | 163           | 113      | 108         | 90         |
| Hydromorphone   | N02AA03-HYDROMORPHONE                                 | Intramuscular | 7,813         | 3,168    | 1,097       | 334        |
| Hydromorphone   | N02AA03-HYDROMORPHONE                                 | Oral          | 116,662       | 34,252   | 6,321       | 1,504      |
| Hydromorphone   | N02AA03-HYDROMORPHONE                                 | Unknown       | 14            | 9        | 7           | 6          |
| Ketamine        | N01AX03-KETAMINE                                      | Intramuscular | 134           | 43       | 21          | 30         |
| Ketamine        | N01AX03-KETAMINE                                      | Unknown       | 9             | 2        | 2           | 2          |
| Meperidine      | N02AB02-PETHIDINE                                     | Intramuscular | 304           | 70       | 72          | 67         |
| Meperidine      | N02AB02-PETHIDINE                                     | Oral          | 939           | 322      | 284         | 295        |
| Meperidine      | N02AB02-PETHIDINE                                     | Unknown       | 9             | 4        | 4           | 4          |
| Methadone       | N07BC02-METHADONE                                     | Oral          | 86,602        | 7,405    | 1,269       | 1,086      |
| Methadone       | N07BC02-METHADONE                                     | Unknown       | 1,415         | 291      | 141         | 73         |
| Morphine        | N02AA01-MORPHINE                                      | Intramuscular | 2,347         | 1,252    | 672         | 250        |
| Morphine        | N02AA01-MORPHINE                                      | Intravenous   | 101           | 74       | 71          | 28         |
| Morphine        | N02AA01-MORPHINE                                      | Oral          | 61,588        | 12,655   | 4,290       | 1,387      |
| Morphine        | N02AA01-MORPHINE                                      | Parenteral    | 135           | 98       | 74          | 28         |
| Morphine        | N02AA01-MORPHINE                                      | Rectal        | 132           | 32       | 30          | 37         |
| Morphine        | N02AA01-MORPHINE                                      | Unknown       | 32            | 24       | 19          | 11         |
| Normethadone    | R05DA20-COMBINATIONS                                  | Oral          | 5             | 5        | 5           | 5          |
| Oxycodone       | N02AA05-OXYCODONE                                     | Oral          | 89,505        | 16,480   | 4,394       | 1,444      |
| Oxycodone       | N02AA05-OXYCODONE                                     | Rectal        | 55            | 10       | 11          | 12         |
| Oxycodone       | N02AA05-OXYCODONE                                     | Unknown       | 7             | 1        | 2           | 2          |
| Oxycodone       | N02AA55-OXYCODONE AND NALOXONE                        | Oral          | 1,173         | 307      | 264         | 245        |
| Oxycodone       | N02AJ17-OXYCODONE AND PARACETAMOL                     | Oral          | 110,670       | 29,890   | 5,085       | 1,497      |
| Oxycodone       | N02AJ18-OXYCODONE AND ACETYSALICYLIC ACID             | Oral          | 96            | 19       | 23          | 19         |
| Pentazocine     | N02AD01-PENTAZOCINE                                   | Oral          | 127           | 31       | 32          | 34         |
| Remifentanyl    | N01AH06-REMIFENTANIL                                  | Intravenous   | 1             | 1        | 1           | 1          |
| Sufentanyl      | N01AH03-SUFENTANIL                                    | Intravenous   | 8             | 8        | 4           | 2          |
| Tapentadol      | N02AX06-TAPENTADOL                                    | Oral          | 2,802         | 604      | 444         | 438        |
| Tramadol        | N02AJ13-TRAMADOL AND PARACETAMOL                      | Oral          | 182,949       | 118,736  | 9,258       | 1,550      |
| Tramadol        | N02AX02-TRAMADOL                                      | Oral          | 50,324        | 24,340   | 5,938       | 1,455      |
| Tramadol        | N02AX02-TRAMADOL                                      | Unknown       | 24            | 13       | 13          | 10         |

“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

“Opioid 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, 2020

Table 26. BDZ/Z Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, ATC code and Route of Administration, 2020

| Main Ingredient         | ATC Code Description          | Route         | Prescriptions | Patients | Prescribers | Pharmacies |
|-------------------------|-------------------------------|---------------|---------------|----------|-------------|------------|
| Alprazolam              | N05BA12-ALPRAZOLAM            | Oral          | 22,342        | 7,012    | 3,157       | 1,323      |
| Bromazepam              | N05BA08-BROMAZEPAM            | Oral          | 10,232        | 2,043    | 1,313       | 859        |
| Chlordiazepoxide        | N05BA02-CHLORDIAZEPOXIDE      | Oral          | 2,178         | 1,044    | 649         | 565        |
| Clobazam                | N05BA09-CLOBAZAM              | Oral          | 10,620        | 3,608    | 2,456       | 1,114      |
| Clobazam                | N05BA09-CLOBAZAM              | Unknown       | 226           | 92       | 96          | 58         |
| Clonazepam              | N03AE01-CLONAZEPAM            | Oral          | 152,594       | 44,992   | 7,378       | 1,553      |
| Clonazepam              | N03AE01-CLONAZEPAM            | Unknown       | 99            | 46       | 44          | 30         |
| Clorazepate Dipotassium | N05BA05-CLORAZEPATE POTASSIUM | Oral          | 178           | 60       | 71          | 60         |
| Diazepam                | N05BA01-DIAZEPAM              | Intramuscular | 32            | 26       | 27          | 23         |
| Diazepam                | N05BA01-DIAZEPAM              | Oral          | 37,410        | 12,322   | 4,271       | 1,452      |
| Diazepam                | N05BA01-DIAZEPAM              | Rectal        | 99            | 70       | 46          | 60         |
| Diazepam                | N05BA01-DIAZEPAM              | Unknown       | 22            | 18       | 14          | 17         |
| Eszopiclone             | N05CF04-ESZOPICLONE           | Oral          | 13            | 13       | 11          | 12         |
| Flurazepam              | N05CD01-FLURAZEPAM            | Oral          | 726           | 240      | 229         | 220        |
| Lorazepam               | N05BA06-LORAZEPAM             | Intramuscular | 207           | 177      | 129         | 39         |
| Lorazepam               | N05BA06-LORAZEPAM             | Oral          | 91,174        | 40,401   | 6,857       | 1,515      |
| Lorazepam               | N05BA06-LORAZEPAM             | Sublingual    | 198,229       | 100,895  | 8,839       | 1,571      |
| Lorazepam               | N05BA06-LORAZEPAM             | Unknown       | 60            | 34       | 32          | 13         |
| Midazolam               | N05CD08-MIDAZOLAM             | Intramuscular | 2,475         | 2,019    | 461         | 237        |
| Midazolam               | N05CD08-MIDAZOLAM             | Unknown       | 53            | 33       | 18          | 9          |
| Nitrazepam              | N05CD02-NITRAZEPAM            | Oral          | 7,802         | 1,638    | 996         | 747        |
| Nitrazepam              | N05CD02-NITRAZEPAM            | Unknown       | 16            | 7        | 10          | 6          |
| Oxazepam                | N05BA04-OXAZEPAM              | Oral          | 3,818         | 1,249    | 1,050       | 697        |
| Temazepam               | N05CD07-TEMAZEPAM             | Oral          | 48,470        | 12,854   | 3,770       | 1,385      |
| Temazepam               | N05CD07-TEMAZEPAM             | Unknown       | 13            | 5        | 5           | 5          |
| Triazolam               | N05CD05-TRIAZOLAM             | Oral          | 4,780         | 3,030    | 592         | 839        |
| Zolpidem                | N05CF02-ZOLPIDEM              | Sublingual    | 45,139        | 16,680   | 4,417       | 1,405      |
| Zolpidem                | N05CF02-ZOLPIDEM              | Unknown       | 1             | 1        | 1           | 1          |
| Zopiclone               | N05CF01-ZOPICLONE             | Oral          | 436,497       | 150,855  | 11,425      | 1,581      |
| Zopiclone               | N05CF01-ZOPICLONE             | Unknown       | 31            | 13       | 9           | 7          |

"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



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