

2016

TRIPLICATE PRESCRIPTION PROGRAM ATLAS



The Alberta Triplicate Prescription Program (TPP) was established in 1986 to monitor the use of certain medications prone to misuse and abuse.

The mandate of the TPP 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 the TPP program.

Funded primarily by the province of Alberta, the TPP is a partnership administered by the College of Physicians & Surgeons of Alberta. The complete list of partners includes:

Alberta College of Pharmacists

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

Yukon Medical Council

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Background

About the Atlas

The purpose of this Triplicate Prescription Program (TPP) Atlas is to provide an overview of provincial TPP medication utilization for the year 2016. As with the 2015 Atlas, provincial utilization will be summarized for two analytic classes of medications: opioids and benzodiazepines. Codeine containing medications are included in the opioid class and zopiclone and zolpidem (“z-drugs”) are included in the benzodiazepine class. The source of information on medication utilization continues to be dispenses from community pharmacies found within Alberta’s Pharmaceutical Information Network (PIN).

Atlas Geography

The 2016 Atlas uses local geographies, which have a minimum population of 5,000. Appendix A provides an explanation of the maps and graphs used to present prescription drug utilization data at the local geography level. TPP prescriptions and their corresponding patients were assigned to a specific local geography based on the location of the pharmacy where the prescriptions were dispensed. Patients who were dispensed prescriptions from pharmacies in more than one local geography were counted in each local geography where they received prescription dispenses.

TPP Data Source

2016 PIN data were used for the analyses. On January 1, 2013, the TPP officially switched from physical triplicate prescriptions to PIN as the primary data source for prescription monitoring. The only exceptions were compounded opioid medications that were not reliably captured in PIN. PIN data consist of dispense records from community pharmacies in Alberta. PIN data prior to 2013 are limited by less complete levels of record submission. The primary source for methadone information switched from triplicate prescriptions to PIN data in August 2015, when it was found that virtually all methadone, which was previously prescribed as a compound, switched to Methadose™, a pre-compounded liquid with a Drug Identification Number (DIN) captured in PIN. Ongoing gaps within PIN data include dispensing information from hospital pharmacies and facilities such as hospices. All prescriber types are included in the analyses. In 2016, physicians prescribed 80.8% of all opioid prescriptions (including codeine) and 97.2% of all benzodiazepine prescriptions (including z-drugs).

As PIN records consist of dispenses (not prescriptions), prescriptions were determined using the unique combination of pharmacy license and prescription numbers. PIN prescription numbers were used for missing pharmacy numbers. PIN data

does 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 is dynamic. In an effort to capture actual dispensing as closely as possible, data were analyzed several months after the end of the year, by which time most modifications and reversals would have occurred.

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 benzodiazepines. Opioids consist of all opioids and some non-opioid drugs (with a potential for misuse or harm) currently requiring a triplicate prescription. Consistent with the 2015 Atlas, codeine-containing medications which were dispensed from a regular prescription or available over the counter (8 mg codeine formulations) were included in the opioid analytic class. Benzodiazepines consist of all benzodiazepines and z-drugs currently monitored by TPP but not requiring a triplicate prescription. Appendix B shows 2016 TPP prescriptions for opioids by main ingredient and route of administration. Appendix C shows 2016 TPP prescriptions for benzodiazepines by main ingredient and route of administration.

Atlas Measures

TPP utilization is presented in this Atlas using population counts and rates. Rates were calculated using age and sex specific population estimates at the local geography level, obtained from Alberta Health. Population rates, used for comparison, were directly standardized using the 2016 Alberta population. Patient age was calculated at July 1, 2016.

Opioids

For the opioid analytic class, oral morphine equivalents (OME) were used as the standard measure of dose. Drug OME values were obtained primarily from the Centers for Disease Control¹, Canadian Opioid Guideline² and the Compendium of Pharmaceuticals³. Some drugs within the opioid analytic class have an OME of zero (i.e., they do not contribute towards a patient’s total measured dose of opioids). These include compound drugs (because dose and route were unknown), methadone (used for treatment of opioid dependence), buprenorphine (used for treatment of opioid dependence), naloxone (used for treatment of opioid overdose), and other drugs for which the OME was unknown. Drugs with an OME of zero still contribute to measures examining use of multiple ingredients.

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

Dispense OME = strength x quantity x drug OME

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

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

Population utilization of opioids was presented using the three measures below. Population rates were age and sex standardized to allow comparison between local geographies.

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

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

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

Published in 2017, new Canadian Guidelines for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain set a watchful opioid dose of 90 OME/day⁵. This threshold is congruent with CDC guidelines published in 2016⁶, and replaces the previous Canadian Guideline threshold of 200 OME/day⁷ (published in 2010).

Benzodiazepines

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 adults⁸. Drug DDD values were obtained primarily from the WHO DDD/ATC Index⁹. 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 benzodiazepines (BDZ) analytic class.

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

Dispense DDDs = strength x quantity / drug DDD

A patient’s total DDDs was calculated as follows:

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

Population utilization of BDZ was presented using the four measures below. Population rates were age and sex standardized for comparison between local geographies.

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

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

High dose BDZ patients = the number of patients who received 2 DDDs¹⁰ or greater in the time period analyzed / 1000 population

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

¹ National Center for Injury Prevention and Control. CDC compilation of benzodiazepines, 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: http://www.pdmpassist.org/pdf/BJA_performance_measure_aid_MME_conversion.pdf.

² http://nationalpaincentre.mcmaster.ca/opioid/cgop_b_app_b08.html

³ <https://222.e-therapeutics.ca/login.action?language=en>

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

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

⁶ Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain – United States, 2016. MMWR Recomm Rep 2016;65(No. RR-1):1-49. DOI: <http://dx.doi.org/10.15585/mmwr.rr6501e1>

⁷ <https://www.nationalpaincentre.mcmaster.ca/opioid>

⁸ 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/

⁹ http://www.whocc.no/atc_ddd_index/

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

Medication Use – Opioids

Table 1. Utilization of Prescription Opioids in Alberta, 2013-2016

Year	Prescriptions	Patients	Prescribers	Pharmacies	OME per day per 1000 population*	Patients per 1000 population*	Patients ≥90 OME per day per 1000 population*
2013	1,708,867	547,910	12,027	1,247	1,537	137.2	3.5
2014	1,731,284	559,668	12,605	1,226	1,535	136.0	3.5
2015	1,750,826	563,565	13,298	1,231	1,515	134.3	3.5
2016	1,808,946	576,485	14,177	1,357	1,467	135.2	3.4

* Standardized to the 2016 Alberta population

Table 2. Opioid Patients by Age and Sex, 2016

Age Group	Females	Percent	Males	Percent	Total Patients	Percent	Unknown Sex
0-9	891	0.3	1,087	0.4	1,978	0.3	
10-19	14,359	4.7	12,871	4.8	27,230	4.7	
20-29	40,879	13.3	32,332	12.0	73,211	12.7	6
30-39	53,973	17.5	44,552	16.6	98,525	17.1	6
40-49	52,365	17.0	46,483	17.3	98,848	17.1	6
50-59	58,163	18.9	55,010	20.5	113,173	19.6	1
60-69	44,606	14.5	43,194	16.1	87,800	15.2	
70-79	24,832	8.1	21,803	8.1	46,635	8.1	1
80-89	13,936	4.5	9,584	3.6	23,520	4.1	
90+	3,963	1.3	1,517	0.6	5,480	1.0	
Total	307,981	100.0	268,477	100.0	576,458	100.0	

14 female patients of unknown age, 44 male patients of unknown age

Figure 1. Opioid Patients by Age Group, 2016

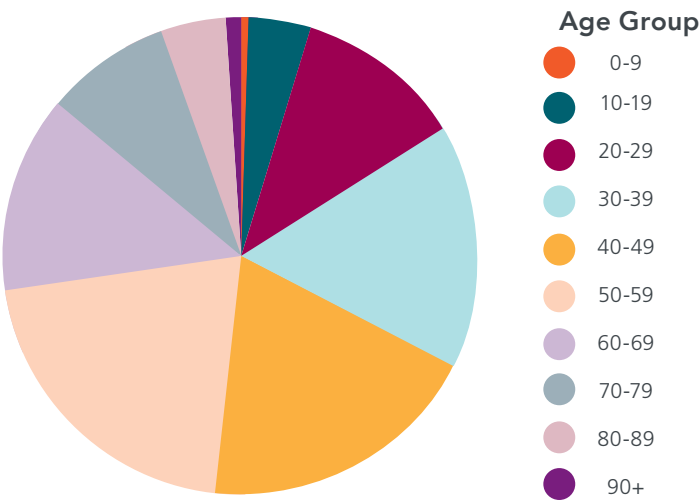


Table 3. Opioid Prescriptions by Prescriber Type, 2016

Prescriber Type	Prescriptions	Patients	Prescribers	Pharmacies
Physician	1,448,181	457,676	10,255	1,356
Pharmacist	240,153	90,403	3,461	1,193
Dentist	96,448	80,214	361	1,247
Nurse Practitioner	7,963	4,312	100	644

Table 4. Opioid Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, 2016

Ingredient	Prescriptions	Percent	Patients	Prescribers	Pharmacies
Codeine	1,198,871	66.3	502,126	13,544	1,347
Oxycodone	302,023	16.7	73,914	5,948	1,321
Hydromorphone	120,308	6.7	29,629	5,145	1,270
Morphine	65,501	3.6	16,427	4,222	1,223
Methadone	52,964	2.9	5,361	456	820
Buprenorphine	36,539	2.0	6,662	1,731	1,044
Fentanyl	21,455	1.2	4,746	2,178	982
Tapentadol	4,013	0.2	1,002	575	514
Meperidine	2,828	0.2	862	617	543
Butalbital	2,720	0.2	909	698	521
Hydrocodone	945	0.1	707	386	355
Butorphanol	436	0.0	99	122	115
Pentazocine	267	0.0	65	69	67
Ketamine	53	0.0	13	19	18
Normethadone	32	0.0	26	18	24
Sufentanil	9	0.0	3	5	4
Remifentanil	1	0.0	1	1	1
Total	1,808,965	100.0			

Table 5. Opioid Patients and Associated Prescribers by Dose, 2013-2016

Patients

Patient Dose*	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
≥ 90 OME/day	13,670	2.5	14,249	2.5	14,498	2.6	14,638	2.5
≥ 100 OME/day	12,487	2.3	13,012	2.3	13,206	2.3	13,284	2.3
≥ 200 OME/day	6,457	1.2	6,606	1.2	6,631	1.2	6,485	1.1
≥ 400 OME/day	2,590	0.5	2,580	0.5	2,529	0.4	2,370	0.4
≥ 600 OME/day	1,274	0.2	1,269	0.2	1,228	0.2	1,138	0.2
≥ 1,000 OME/day	470	0.1	488	0.1	430	0.1	371	0.1
≥ 2,000 OME/day	84	0.0	74	0.0	67	0.0	48	0.0
Total	547,910		559,668		563,565		576,485	

Prescribers

Patient Dose*	2013		2014		2015		2016	
	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent
≥ 90 OME/day	6,196	51.5	6,177	49.0	6,225	46.8	6,488	45.8
≥ 100 OME/day	5,969	49.6	5,909	46.9	5,979	45.0	6,200	43.7
≥ 200 OME/day	4,351	36.2	4,312	34.2	4,264	32.1	4,325	30.5
≥ 400 OME/day	2,493	20.7	2,413	19.1	2,344	17.6	2,251	15.9
≥ 600 OME/day	1,439	12.0	1,454	11.5	1,388	10.4	1,310	9.2
≥ 1,000 OME/day	582	4.8	652	5.2	513	3.9	484	3.4
≥ 2,000 OME/day	109	0.9	98	0.8	74	0.6	53	0.4
Total	12,027		12,605		13,298		14,177	

* can include prescriptions from multiple prescribers

Table 6. Opioid Patients and Associated Prescribers by Number of Ingredients, 2013-2016

Patients

Ingredients	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
2+	49,352	9.0	51,985	9.3	54,398	9.7	56,337	9.8
3+	7,487	1.4	7,730	1.4	8,125	1.4	8,152	1.4
4+	1,400	0.3	1,356	0.2	1,401	0.2	1,347	0.2
5+	243	0.0	236	0.0	220	0.0	214	0.0
6+	39	0.0	36	0.0	20	0.0	23	0.0
Total	547,910		559,668		563,565		576,485	

Prescribers

Ingredients	2013		2014		2015		2016	
	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent
2+	9,152	76.1	9,561	75.9	10,126	76.1	10,735	75.7
3+	6,294	52.3	6,352	50.4	6,752	50.8	6,945	49.0
4+	2,870	23.9	2,871	22.8	2,904	21.8	3,061	21.6
5+	774	6.4	694	5.5	777	5.8	780	5.5
6+	149	1.2	125	1.0	90	0.7	99	0.7
Total	12,027		12,605		13,298		14,177	

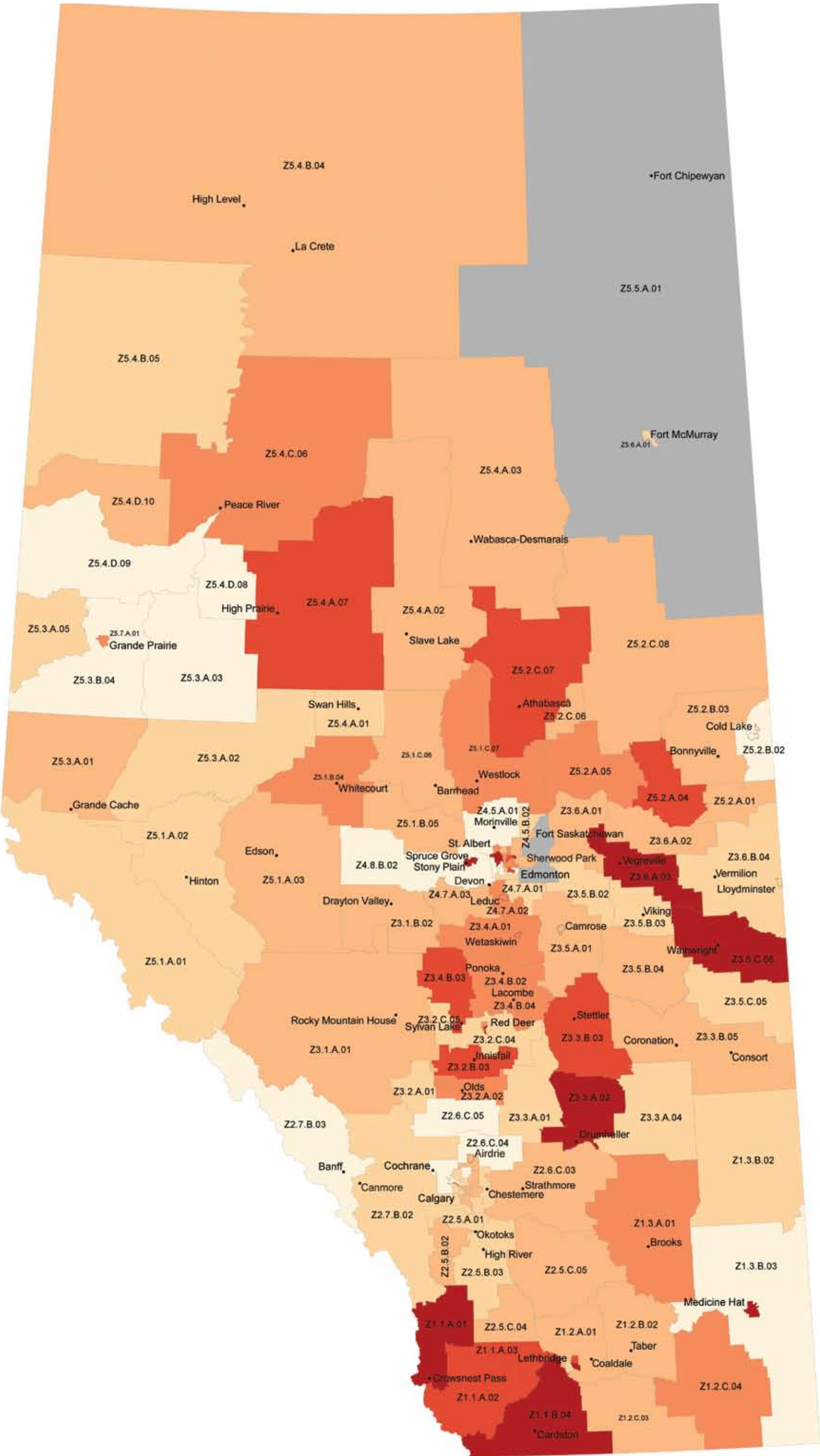
Table 7. Opioid Patients by Number of Prescribers, 2013-2016

Number of Prescribers	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
2+	157,017	28.7	162,189	29.0	163,632	29.0	167,643	29.1
3+	70,531	12.9	72,154	12.9	72,440	12.9	72,681	12.6
4+	40,211	7.3	40,059	7.2	39,525	7.0	38,475	6.7
5+	26,121	4.8	24,980	4.5	24,086	4.3	22,680	3.9
6+	18,054	3.3	16,647	3.0	15,373	2.7	13,986	2.4
7+	12,921	2.4	11,486	2.1	10,165	1.8	8,878	1.5
8+	9,511	1.7	8,097	1.4	6,845	1.2	5,783	1.0
Total	547,910		559,668		563,565		576,485	

Table 8. Methadone and Buprenorphine Patients by Ingredient and Year, 2013-2016

Ingredient(s)	2013	2014	2015	2016
Buprenorphine	3,105	3,533	4,183	4,327
Buprenorphine, Naloxone	643	941	1,472	2,417
Methadone Hydrochloride	4,427	4,691	5,026	5,361
Total				

Figure 2a. Age and Sex Standardized, Total OME per Day per 1,000 Population, by Local Geography, 2016



Legend: Provincial and Urban Maps

Total OME per Day per 1,000 Population

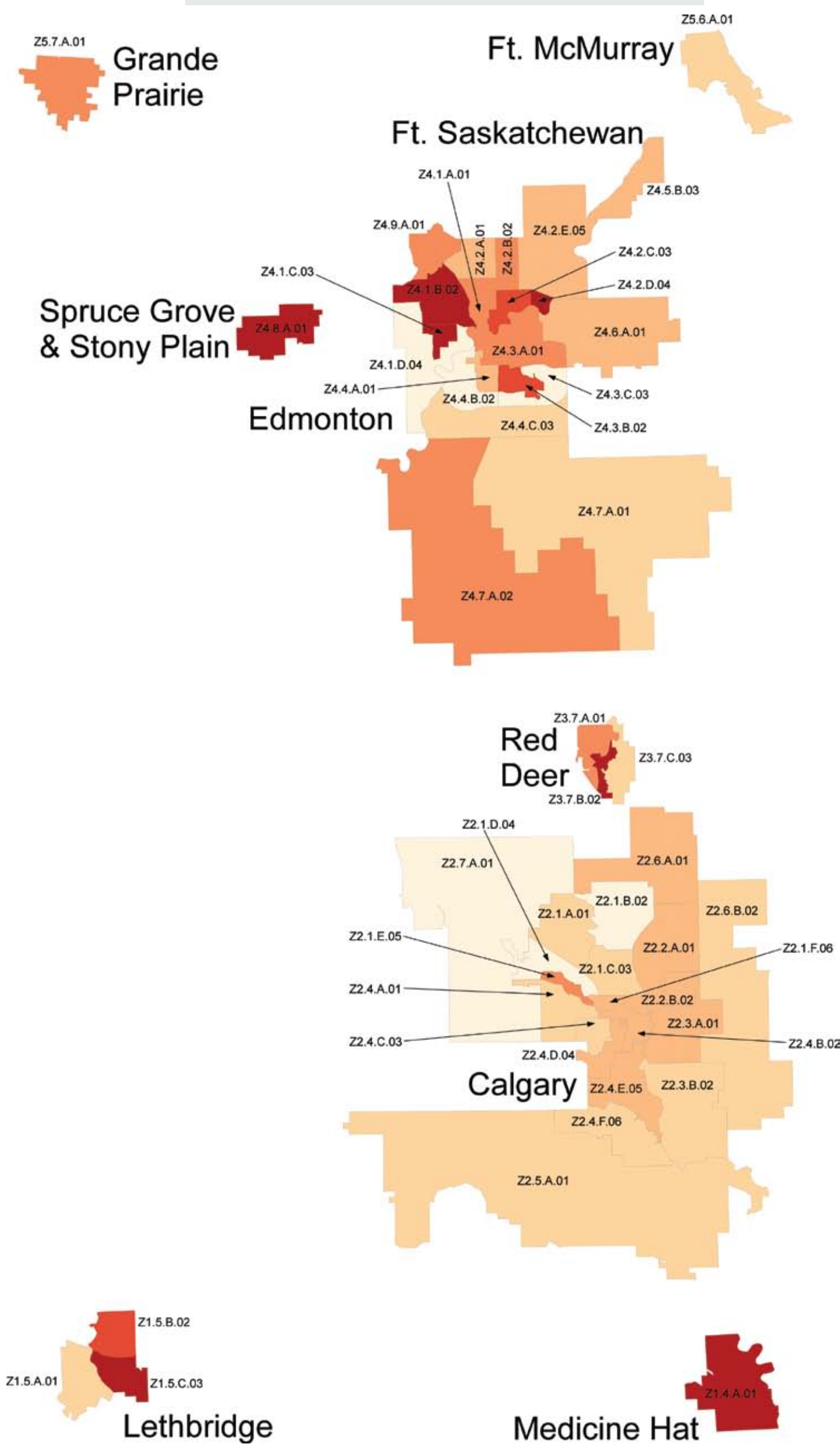
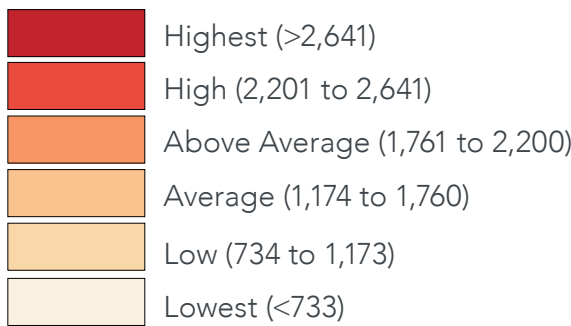
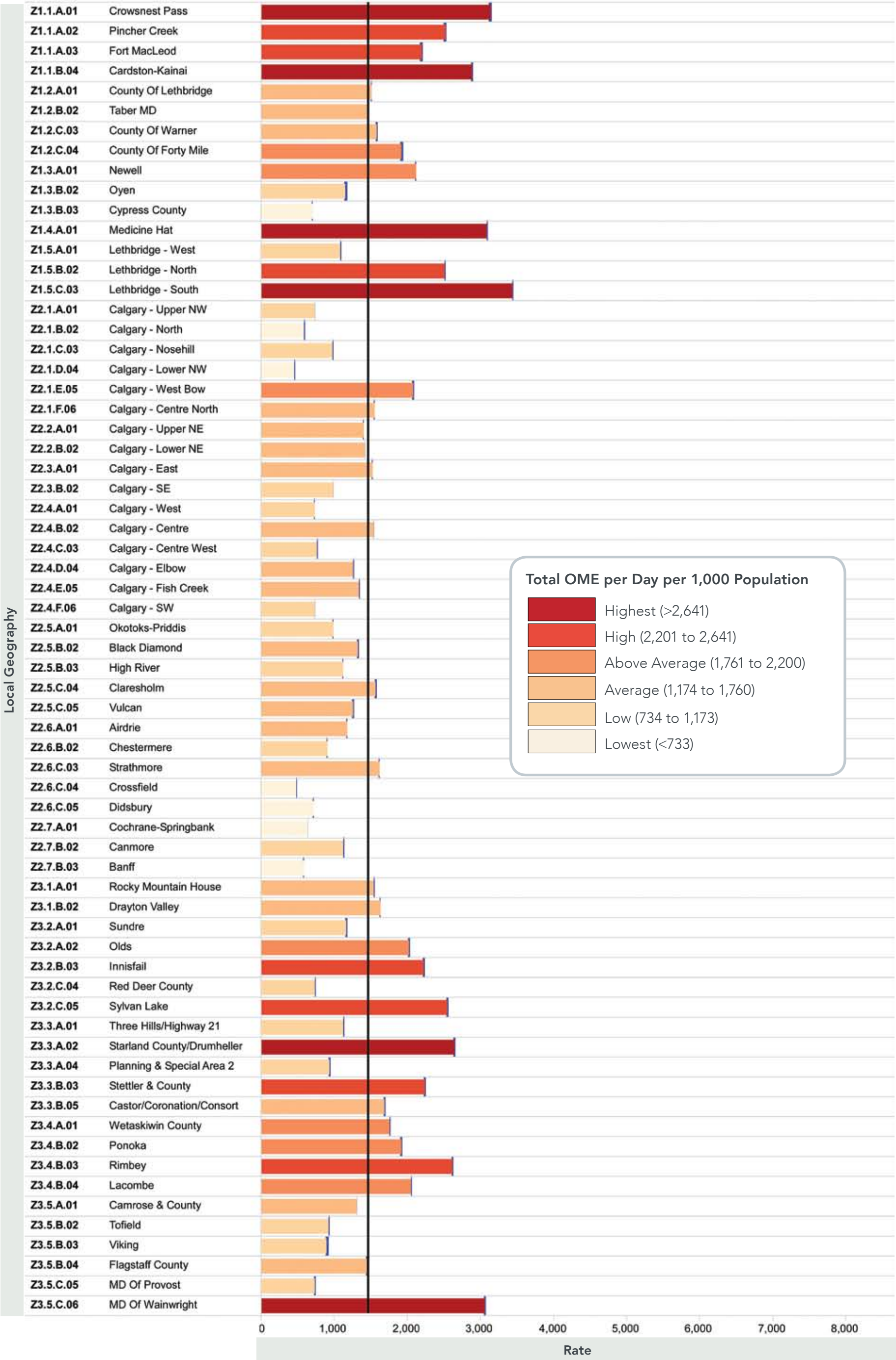
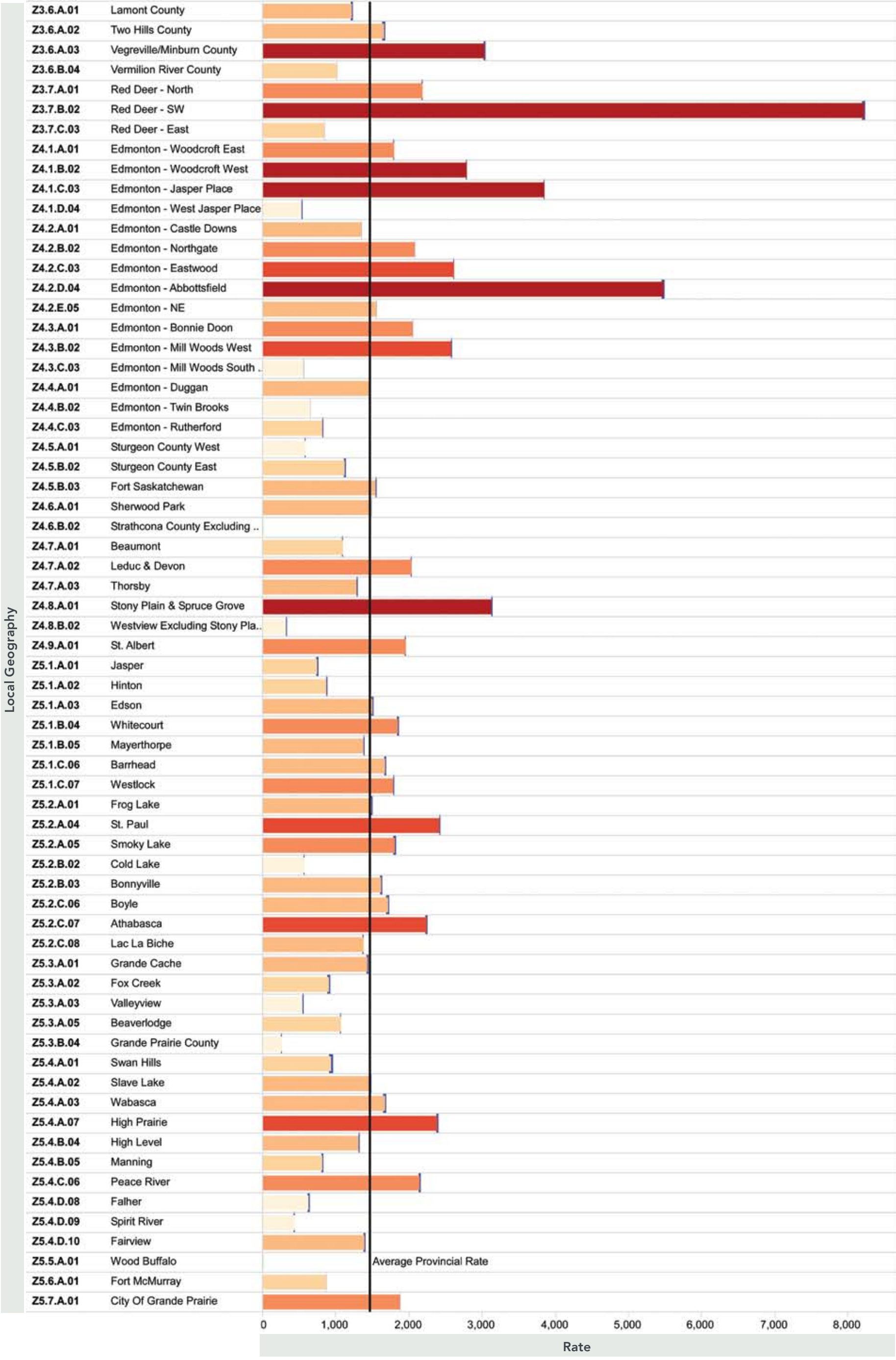


Figure 2b. Age and Sex Standardized, Total OME per Day per 1,000 Population, by Local Geography, 2016





Legend: Provincial and Urban Maps

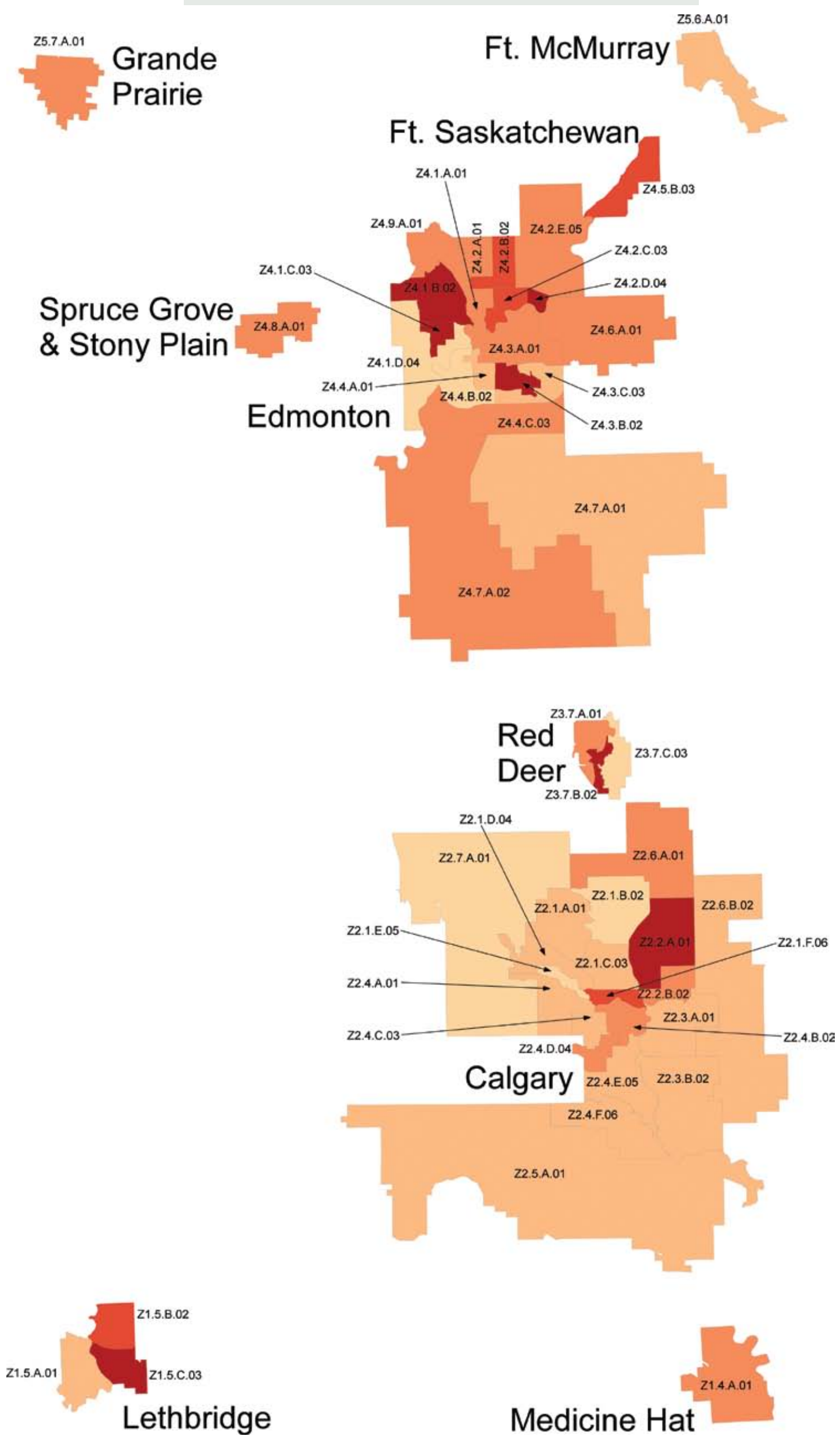
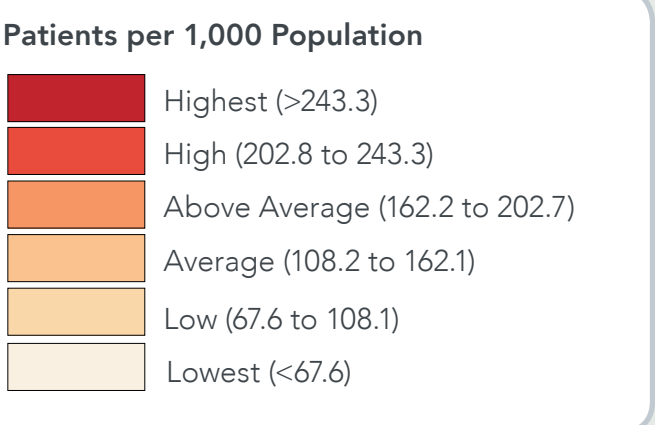
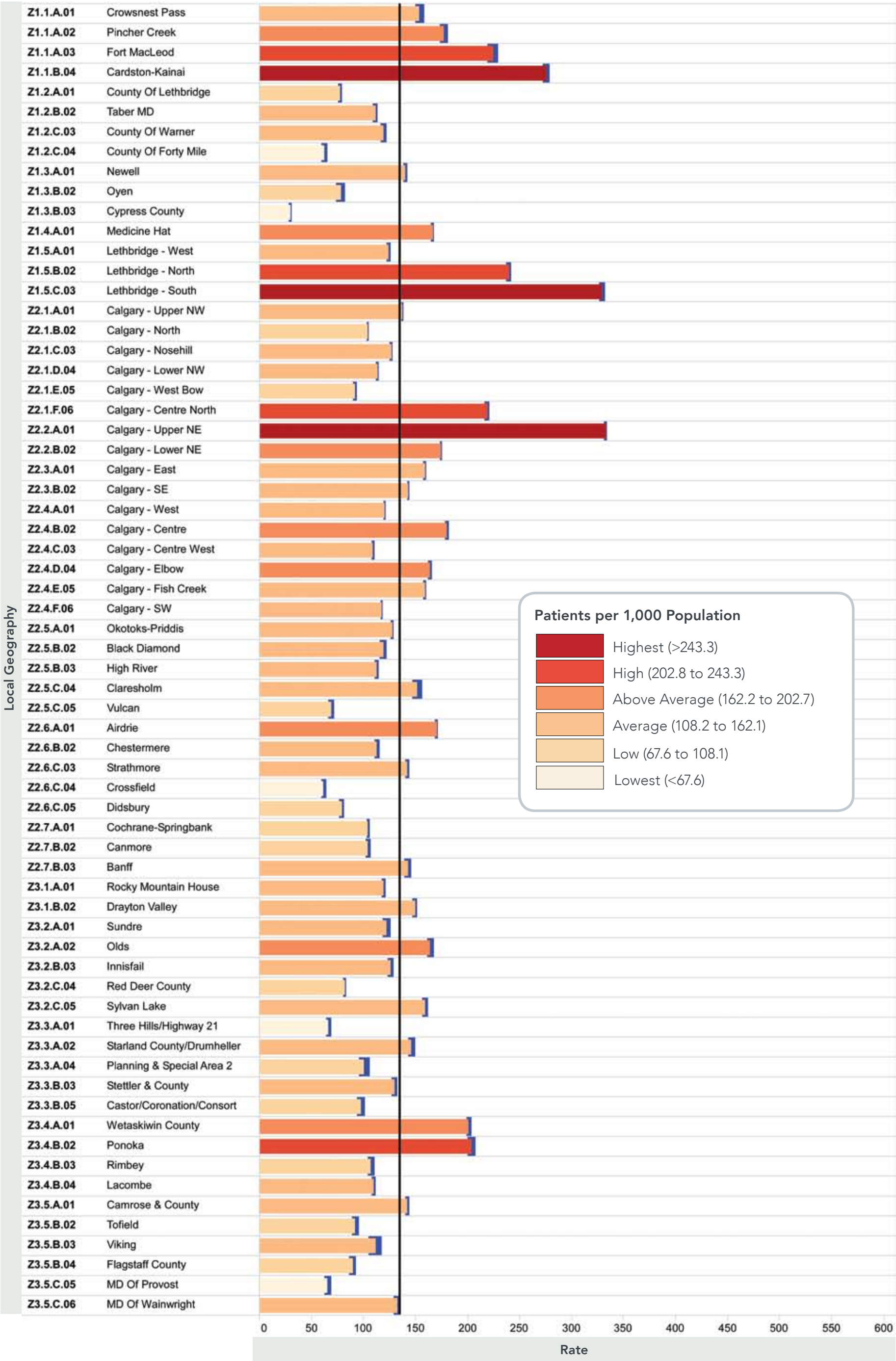


Figure 3b. Age and Sex Standardized, Opioid Patients per 1,000 Population, by Local Geography, 2016



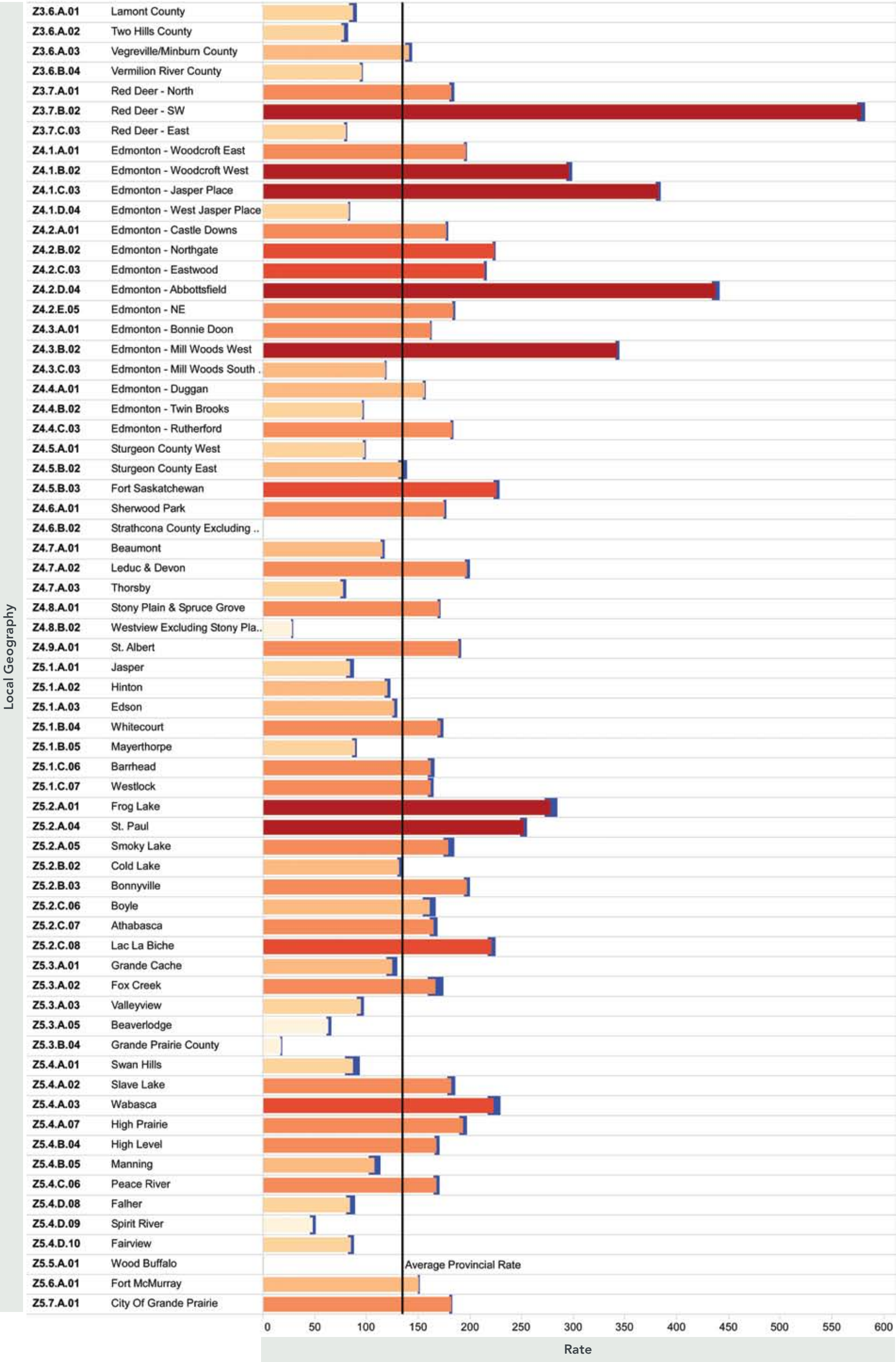
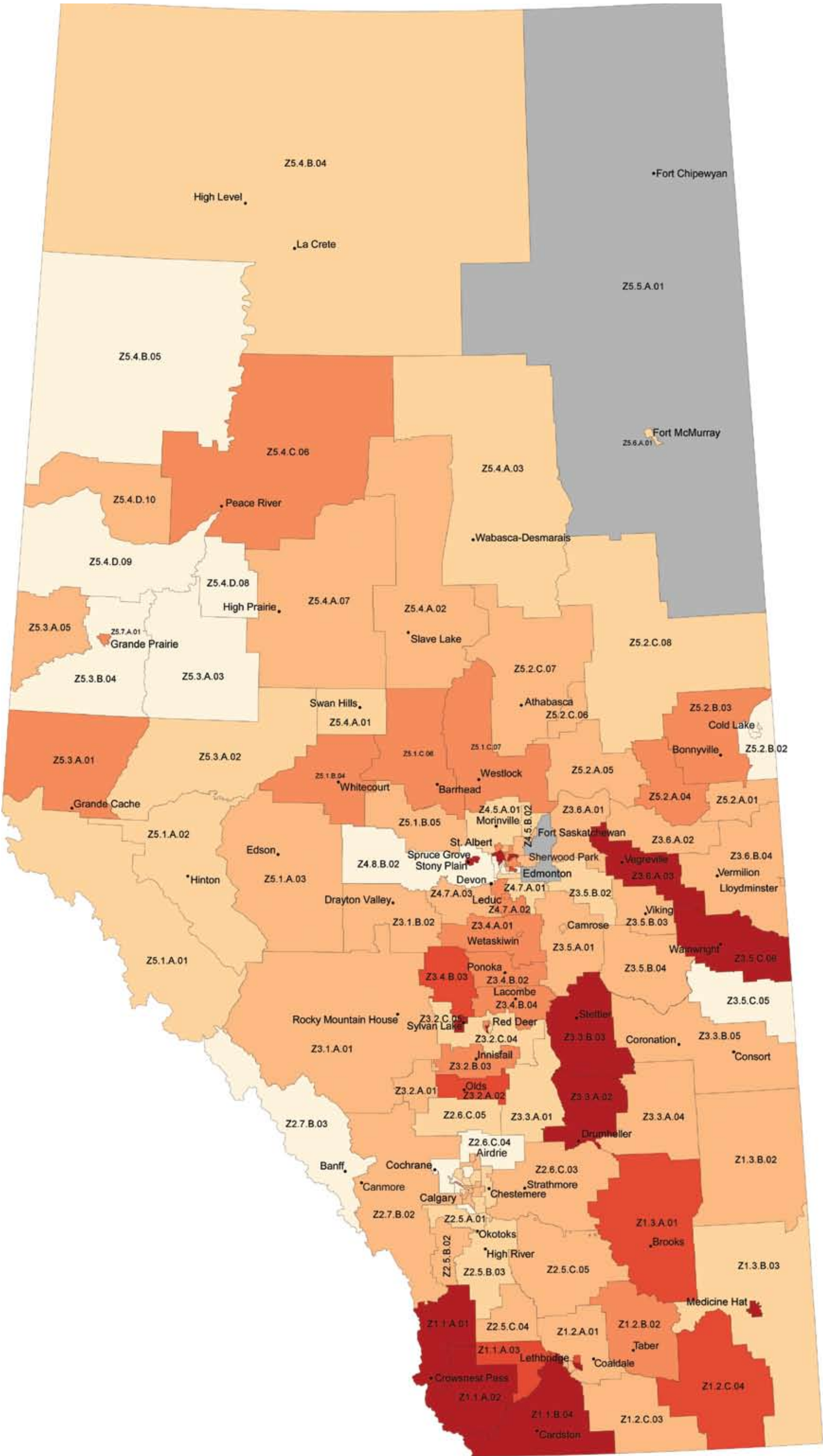


Figure 4a. Age and Sex Standardized, Opioid Patients Who Received 90 OME per Day or Greater per 1,000 population, by Local Geography, 2016



Legend: Provincial and Urban Maps

Patients ≥90 OME per Day per 1,000 Population

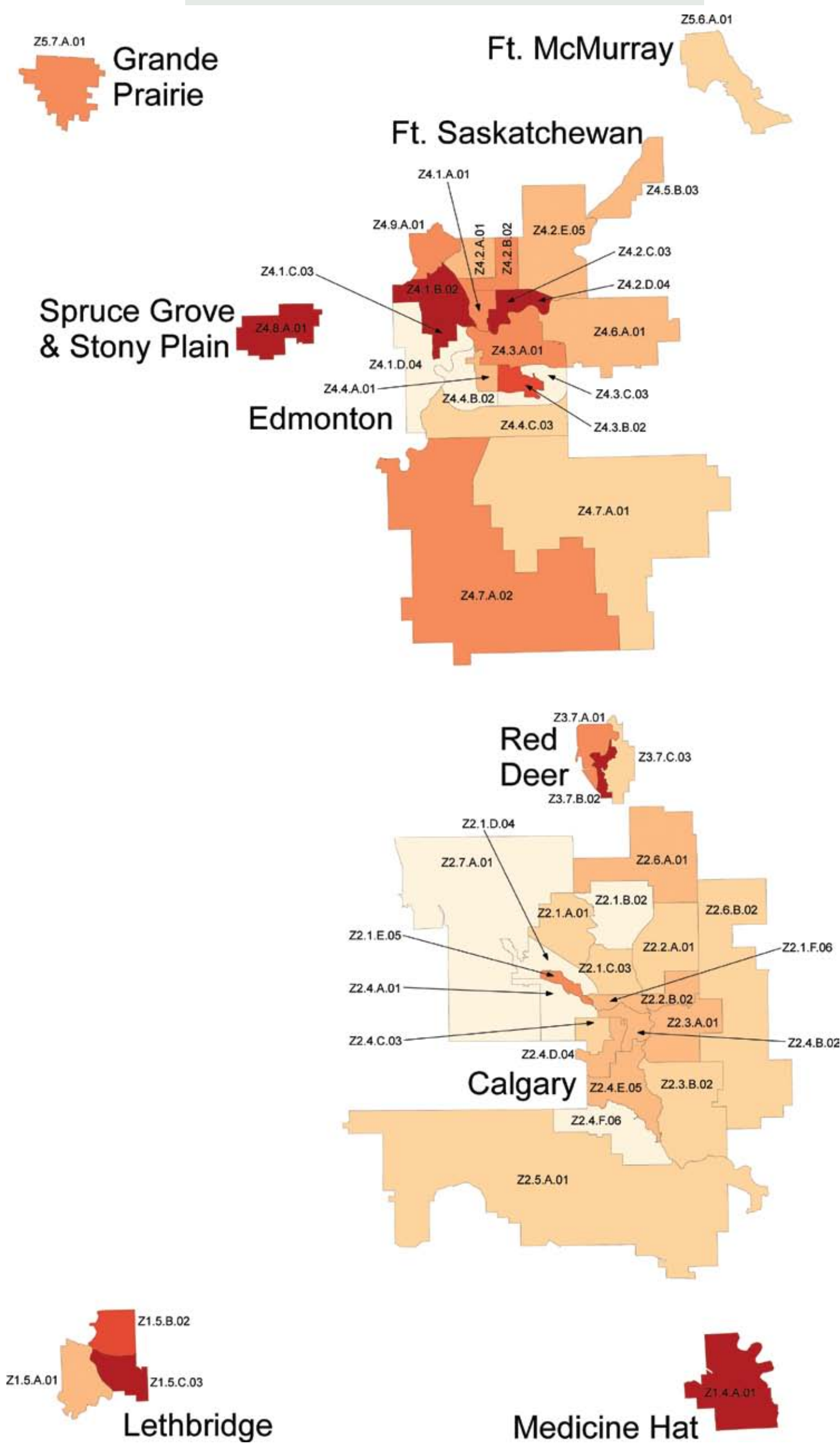
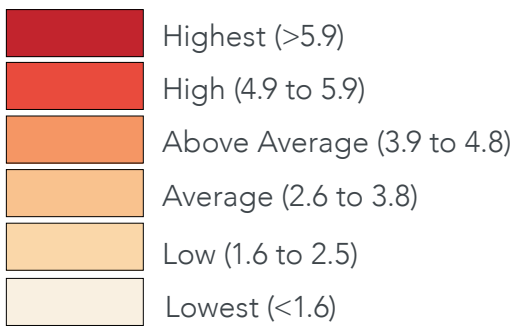
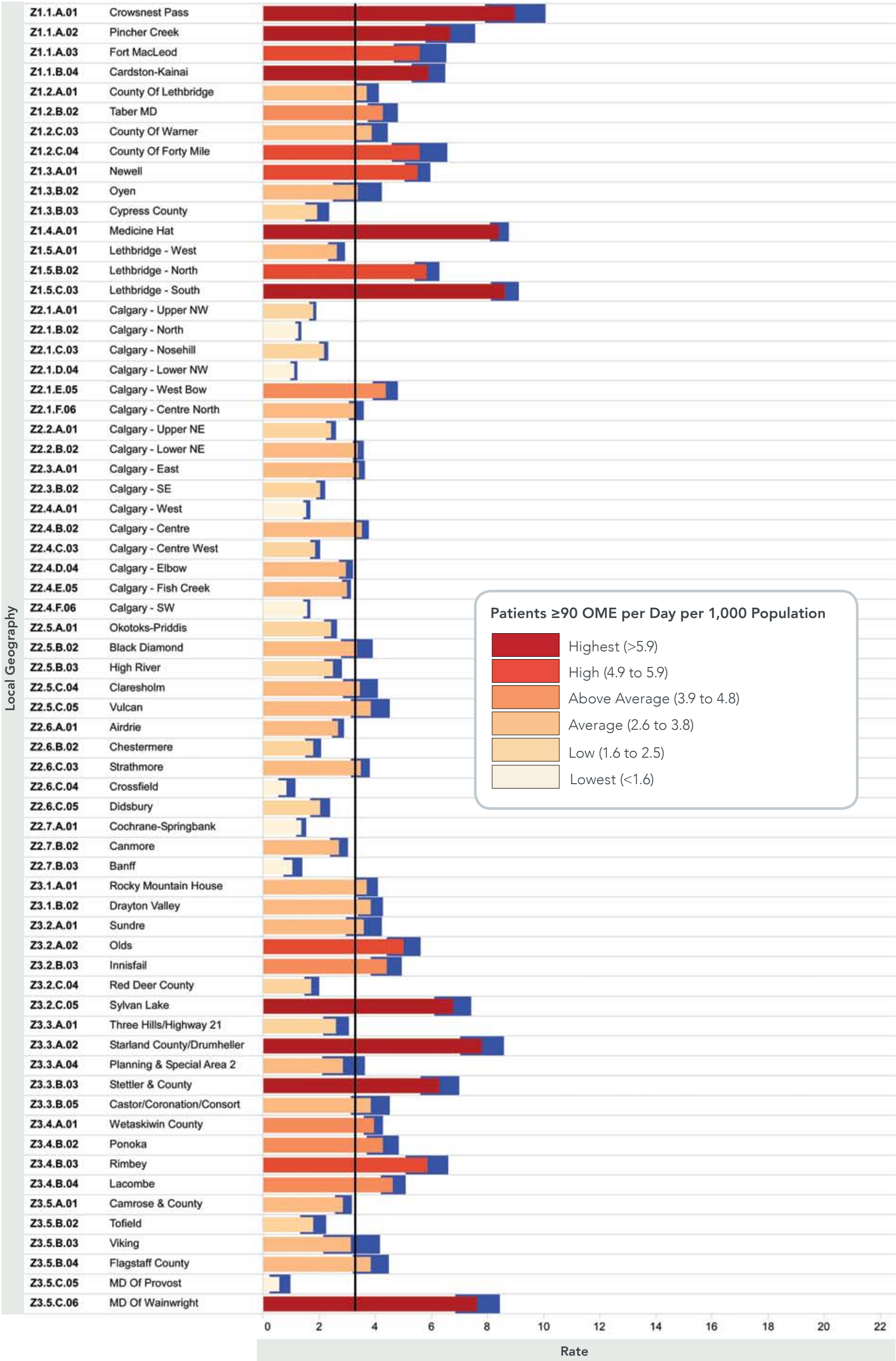
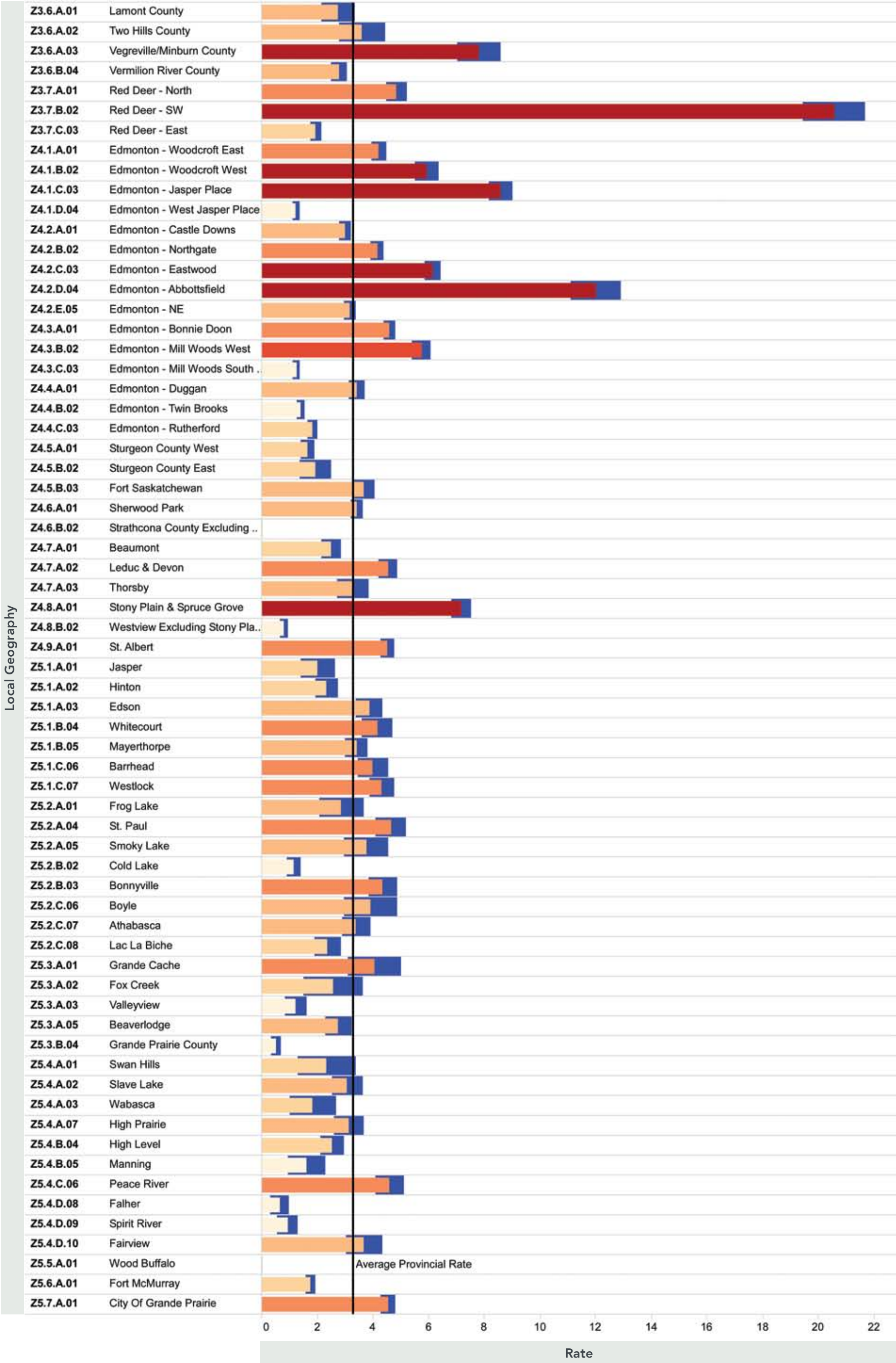


Figure 4b. Age and Sex Standardized, Opioid Patients Who Received 90 OME per Day or Greater per 1,000 population, by Local Geography, 2016



MEDICATION USE – Opioids



Medication Use – Benzodiazepines

Table 9. Utilization of Prescription Benzodiazepines in Alberta, 2013-2016

Year	Prescriptions	Patients	Prescribers	Pharmacies	DDDs per 1000 population*	Patients per 1000 population*	Patients ≥ 2 DDDs per 1000 population	Elderly patients per 1000 elderly population*
2013	1,102,815	341,318	10,784	1,060	42.3	86.3	13.5	218.3
2014	1,168,180	357,805	11,351	1,154	42.5	87.6	13.6	217.1
2015	1,219,339	373,852	12,019	1,199	41.9	89.4	13.5	216.3
2016	1,280,986	386,416	12,738	1,356	40.8	90.7	13.1	214.2

* Standardized to the 2016 Alberta population

Table 10. Benzodiazepine Patients by Age and Sex, 2016

Age Group	Females	Percent	Males	Percent	Total Patients	Percent	Unknown Sex
0-9	433	0.2	518	0.4	907	0.2	
10-19	4,651	1.9	2,569	1.8	6,588	1.8	
20-29	22,133	9.2	11,751	8.1	32,001	8.6	1
30-39	33,176	13.7	20,543	14.2	50,689	13.6	1
40-49	37,664	15.6	23,502	16.3	59,617	15.9	4
50-59	50,915	21.0	30,931	21.4	81,595	21.8	2
60-69	43,491	18.0	27,417	19.0	67,769	18.1	
70-79	27,511	11.4	16,431	11.4	42,311	11.3	
80-89	16,945	7.0	9,025	6.2	25,872	6.9	
90+	4,951	2.0	1,810	1.3	6,619	1.8	
Total	241,885	100.0	144,522	100.0	374,010	100.0	

15 female patients of unknown age, 25 male patients of unknown age

Figure 5. Benzodiazepine Patients by Age Group, 2016

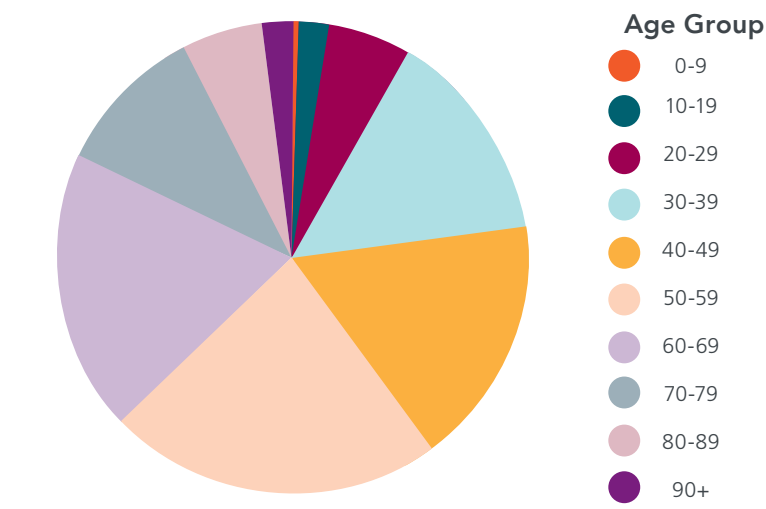


Table 11. Benzodiazepine Prescriptions by Prescriber Type, 2016

Prescriber Type	Prescriptions	Patients	Prescribers	Pharmacies
Physician	1,234,522	377,170	9,757	1,355
Pharmacist	21,033	14,406	2,819	1,177
Dentist	8,408	6,619	76	980
Nurse Practitioner	6,194	3,302	85	552

Table 12. Benzodiazepine Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient, 2016

Ingredient	Prescriptions	Percent	Patients	Prescribers	Pharmacies
Zopiclone	508,653	39.7	192,010	10,849	1,345
Lorazepam	329,224	25.7	151,262	8,123	1,336
Clonazepam	171,651	13.4	53,645	5,987	1,313
Temazepam	86,217	6.7	24,069	3,951	1,250
Diazepam	48,085	3.8	15,938	4,072	1,228
Zolpidem	40,198	3.1	17,628	3,772	1,190
Alprazolam	28,868	2.3	10,048	3,263	1,178
Bromazepam	21,812	1.7	4,140	1,636	915
Nitrazepam	18,015	1.4	3,800	1,383	866
Clobazam	10,075	0.8	3,401	2,000	973
Oxazepam	6,612	0.5	2,492	1,500	853
Triazolam	5,491	0.4	3,390	691	826
Chlordiazepoxide	2,887	0.2	1,400	887	630
Midazolam	1,815	0.1	1,350	264	148
Flurazepam	1,265	0.1	508	418	384
Clorazepate Dipotassium	124	0.0	78	82	75
Total	1,280,992	100.0			

Table 13. Benzodiazepine Patients and Associated Prescribers by Dose, 2013-2016

Patients

Patient Dose*	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
≥ 2 DDDs	14,957	4.4	15,491	4.3	15,216	4.1	14,622	3.8
≥ 4 DDDs	2,239	0.7	2,193	0.6	2,100	0.6	1,844	0.5
≥ 6 DDDs	614	0.2	583	0.2	516	0.1	439	0.1
≥ 8 DDDs	210	0.1	200	0.1	154	0.0	119	0.0
≥ 10 DDDs	73	0.0	77	0.0	63	0.0	50	0.0
Total	341,318		357,805		373,852		386,416	

Prescribers

Patient Dose*	2013		2014		2015		2016	
	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent
≥ 2 DDDs	5,287	49.0	5,638	49.7	5,705	47.5	5,920	46.5
≥ 4 DDDs	2,325	21.6	2,297	20.2	2,255	18.8	2,104	16.5
≥ 6 DDDs	1,112	10.3	1,038	9.1	832	6.9	749	5.9
≥ 8 DDDs	564	5.2	488	4.3	327	2.7	263	2.1
≥ 10 DDDs	225	2.1	239	2.1	128	1.1	135	1.1
Total	10,784		11,351		12,019		12,738	

* can include prescriptions from multiple prescribers

Table 14. Benzodiazepine Patients and Associated Prescribers by Number of Ingredients, 2013-2016

Patients

Ingredients*	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
2+	70,382	20.6	74,803	20.9	77,846	20.8	80,134	20.7
3+	13,568	4.0	14,359	4.0	14,548	3.9	15,015	3.9
4+	2,696	0.8	2,898	0.8	2,773	0.7	2,844	0.7
5+	544	0.2	590	0.2	550	0.1	552	0.1
6+	109	0.0	114	0.0	116	0.0	118	0.0
Total	341,318		357,805		373,852		386,416	

Prescribers

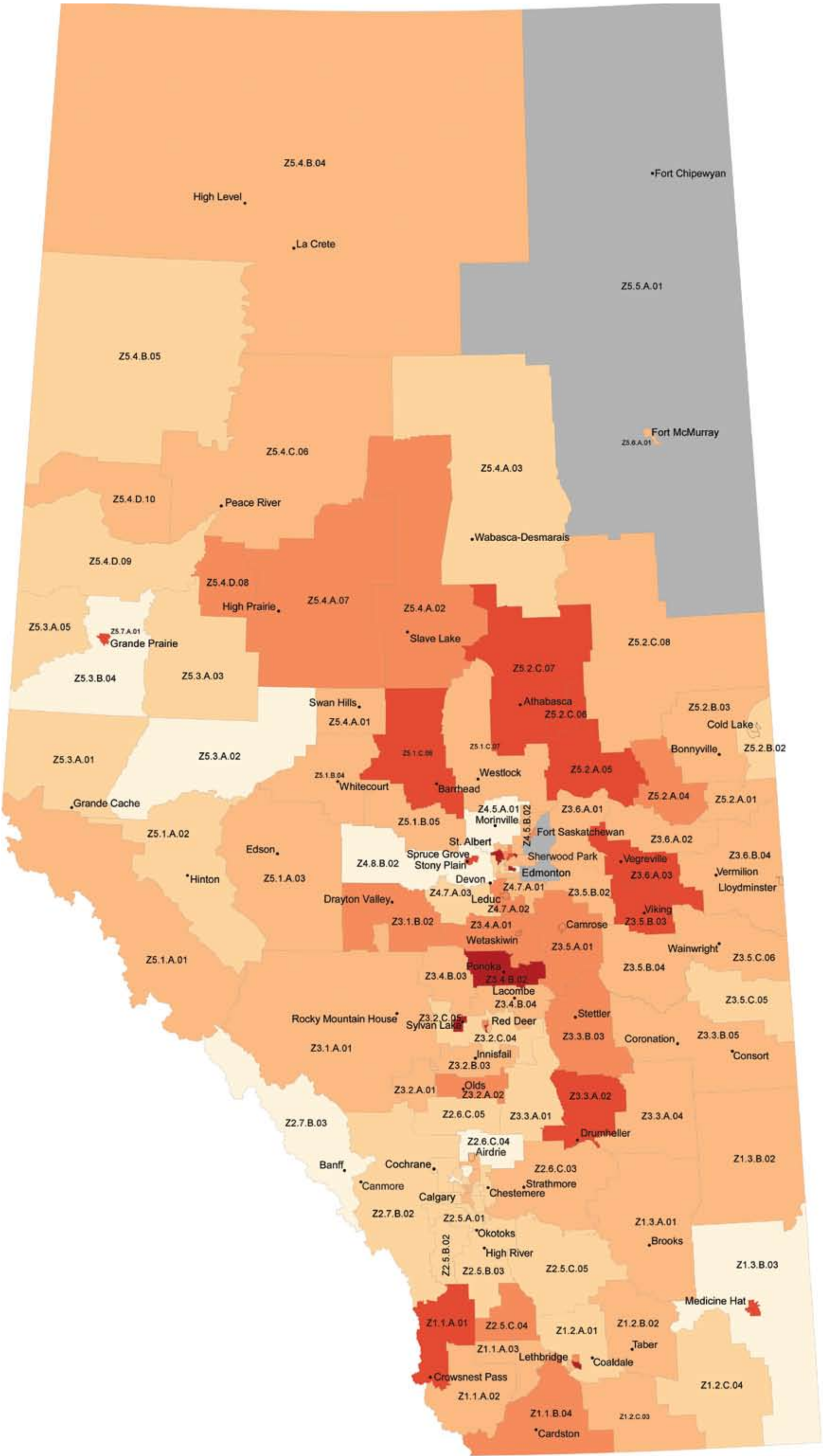
Ingredients*	2013		2014		2015		2016	
	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent	Prescribers	Percent
2+	8,285	76.8	8,856	78.0	9,353	77.8	9,898	77.7
3+	5,521	51.2	5,923	52.2	6,183	51.4	6,571	51.6
4+	3,003	27.8	3,198	28.2	3,230	26.9	3,430	26.9
5+	1,292	12.0	1,456	12.8	1,333	11.1	1,420	11.1
6+	448	4.2	500	4.4	497	4.1	478	3.8
Total	10,784		11,351		12,019		12,738	

* can include prescriptions from multiple prescribers

Table 15. Benzodiazepine Patients by Number of Prescribers, 2013-2016

Number of Prescribers	2013		2014		2015		2016	
	Patients	Percent	Patients	Percent	Patients	Percent	Patients	Percent
2+	84,099	24.6	88,458	24.7	94,276	25.2	100,627	26.0
3+	26,802	7.9	28,275	7.9	30,922	8.3	33,408	8.6
4+	10,059	2.9	10,808	3.0	11,910	3.2	13,106	3.4
5+	4,360	1.3	4,835	1.4	5,299	1.4	5,724	1.5
6+	2,210	0.6	2,491	0.7	2,689	0.7	2,770	0.7
7+	1,223	0.4	1,392	0.4	1,538	0.4	1,504	0.4
8+	730	0.2	859	0.2	924	0.2	857	0.2
Total	341,318		357,805		373,852		386,416	

Figure 6a. Age and Sex Standardized, Total DDDs per 1,000 Population, by Local Geography, 2016



Legend: Provincial and Urban Maps

Total DDDs per 1,000 Population

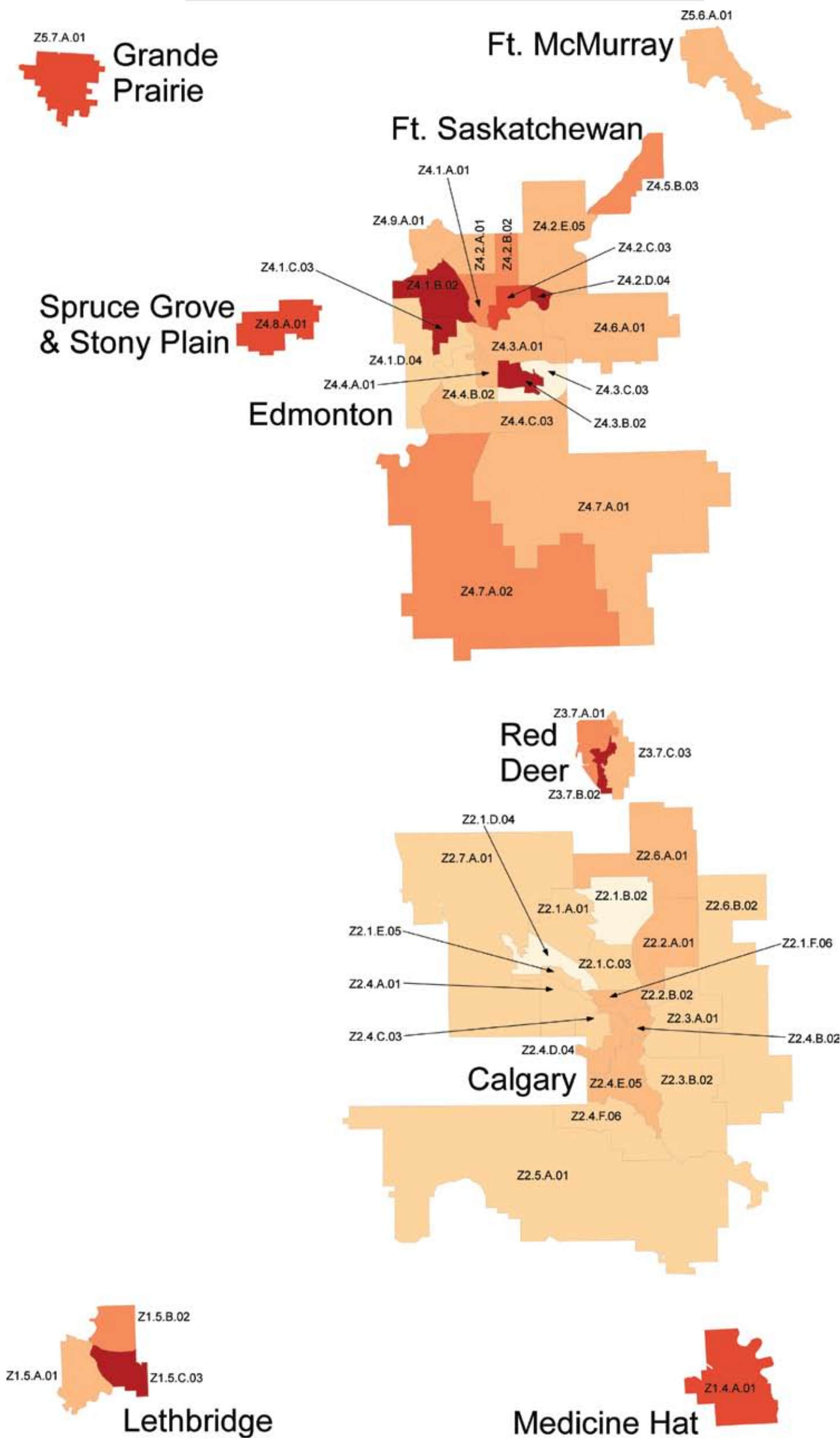
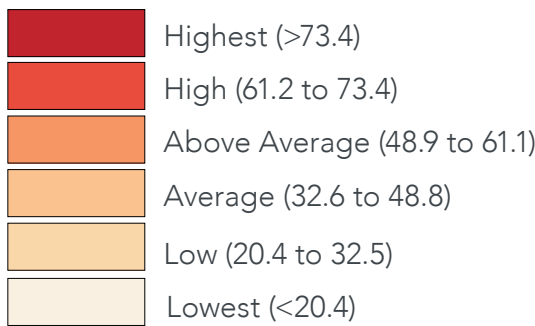
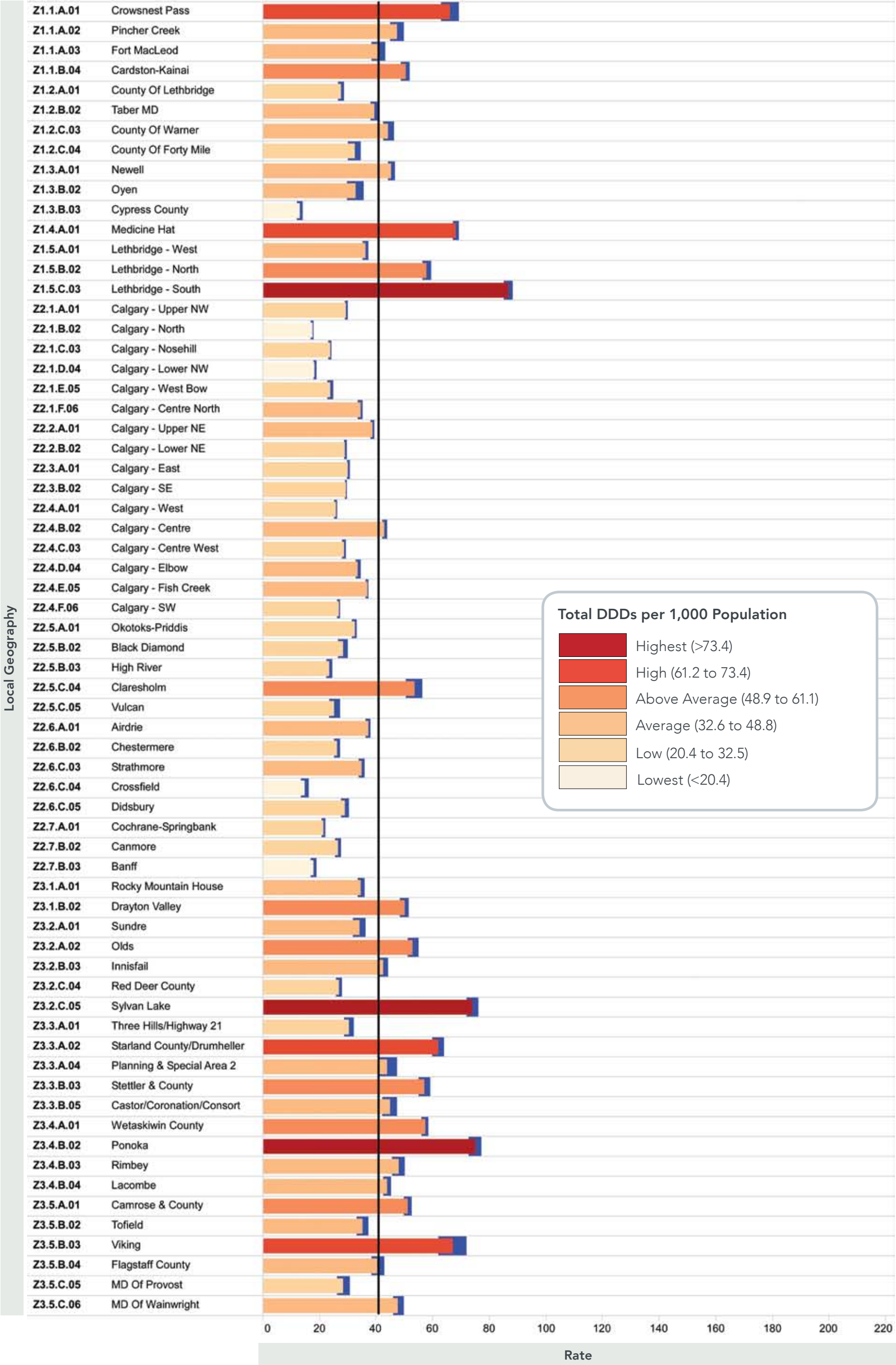


Figure 6b. Age and Sex Standardized, Total DDDs per 1,000 Population, by Local Geography, 2016



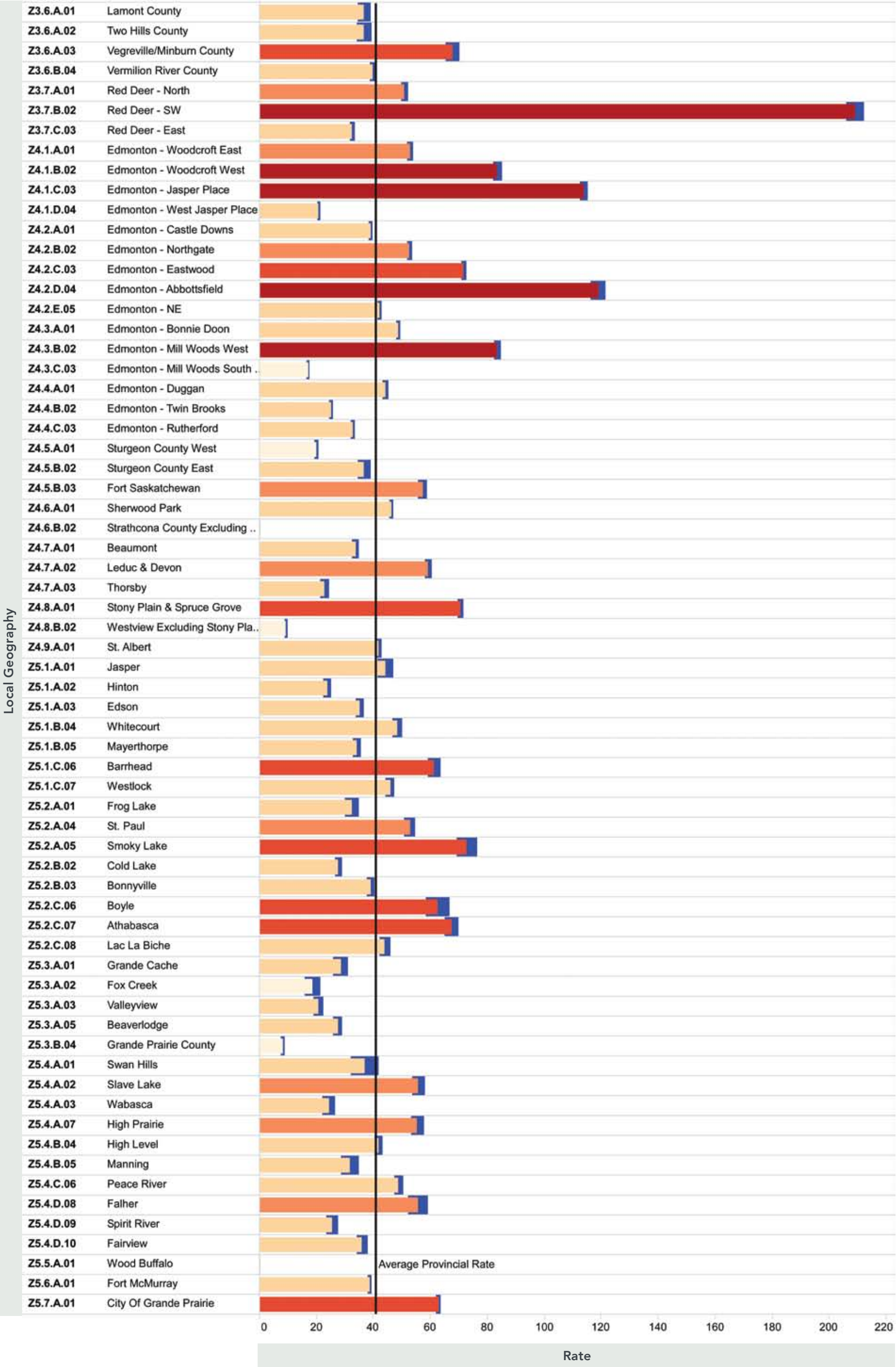
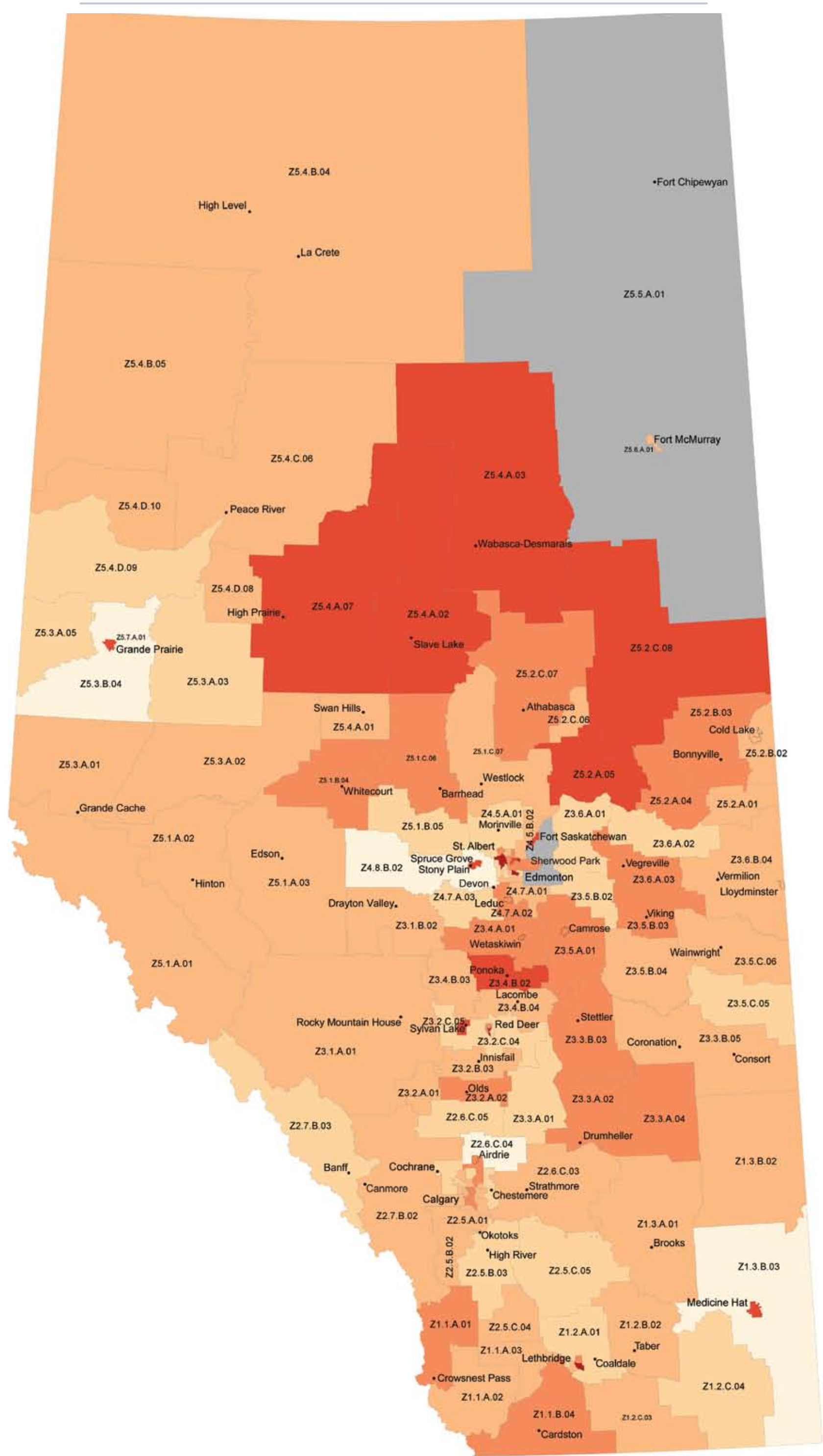


Figure 7a. Age and Sex Standardized, Benzodiazepine Patients per 1,000 Population, by Local Geography, 2016



Legend: Provincial and Urban Maps

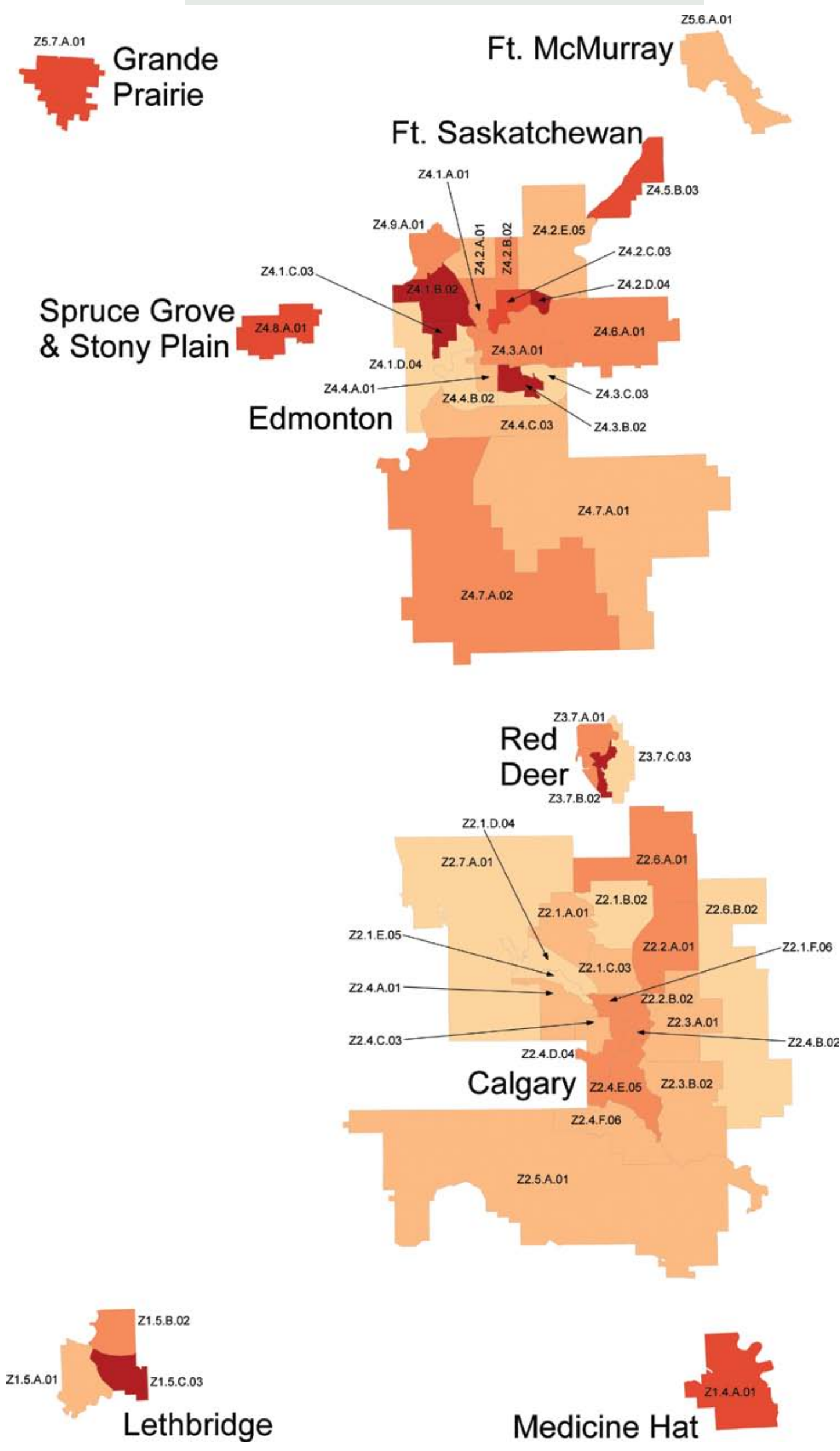
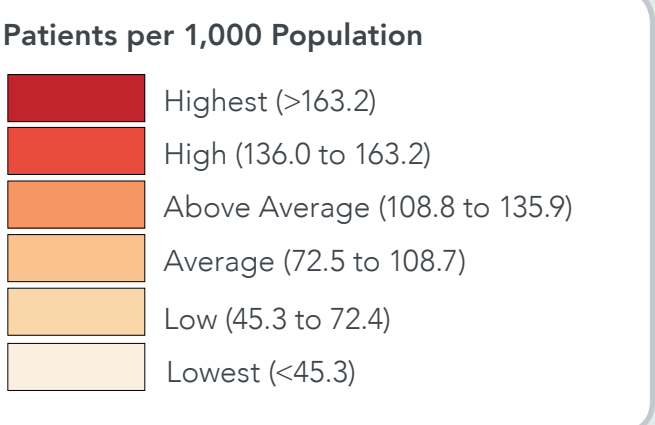
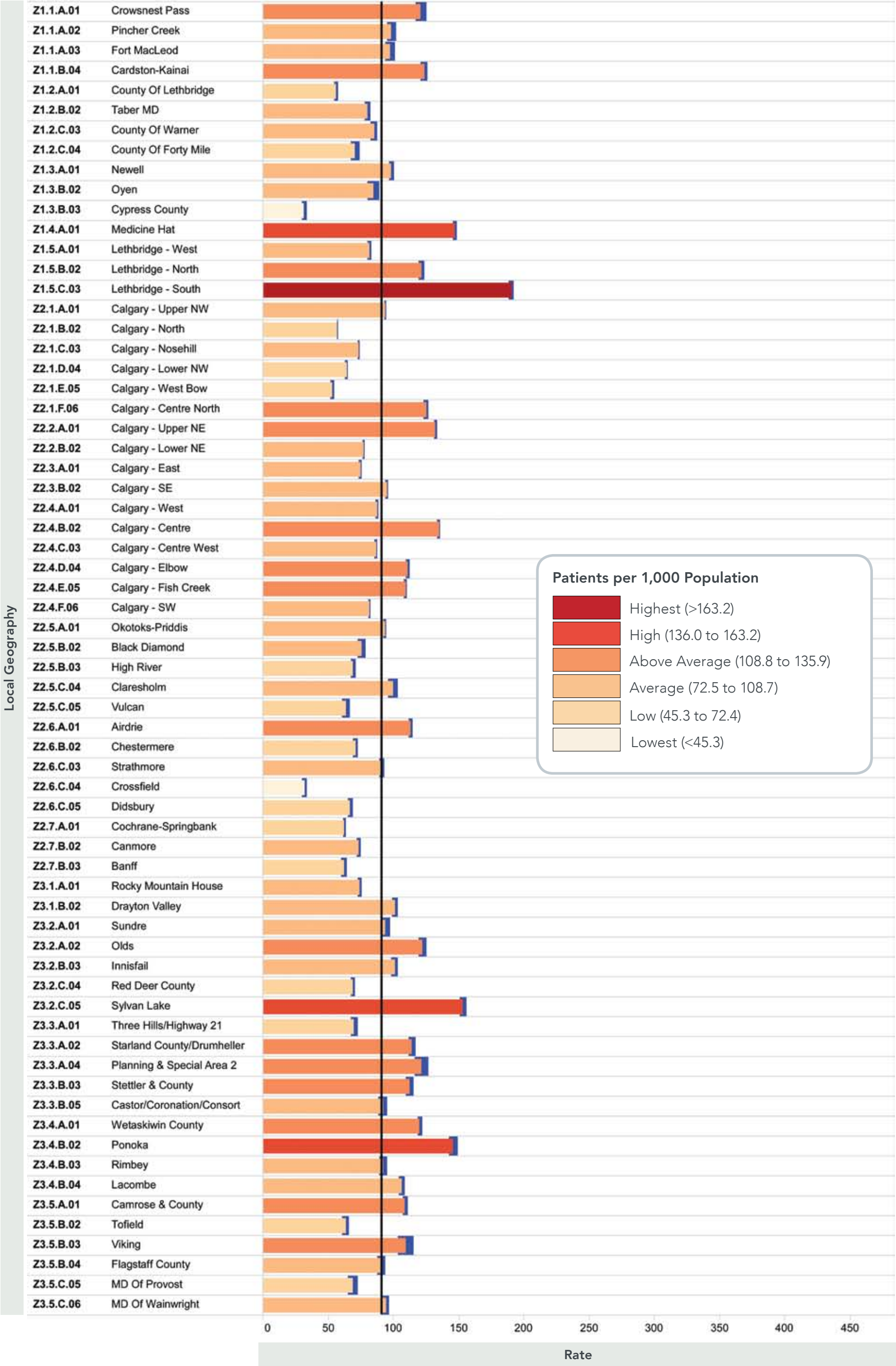


Figure 7b. Age and Sex Standardized, Benzodiazepine Patients per 1,000 Population, by Local Geography, 2016



MEDICATION USE – Benzodiazepines

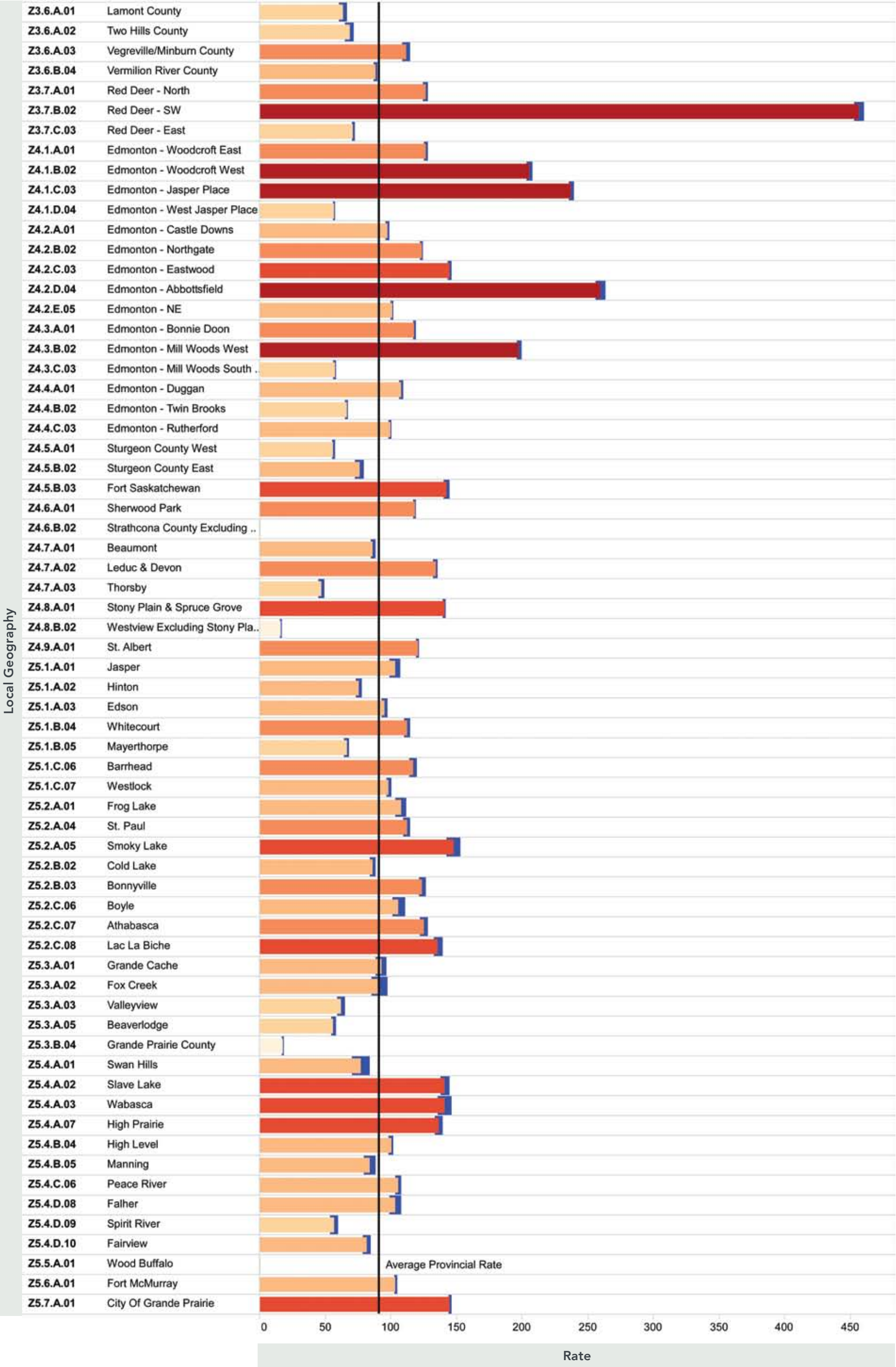
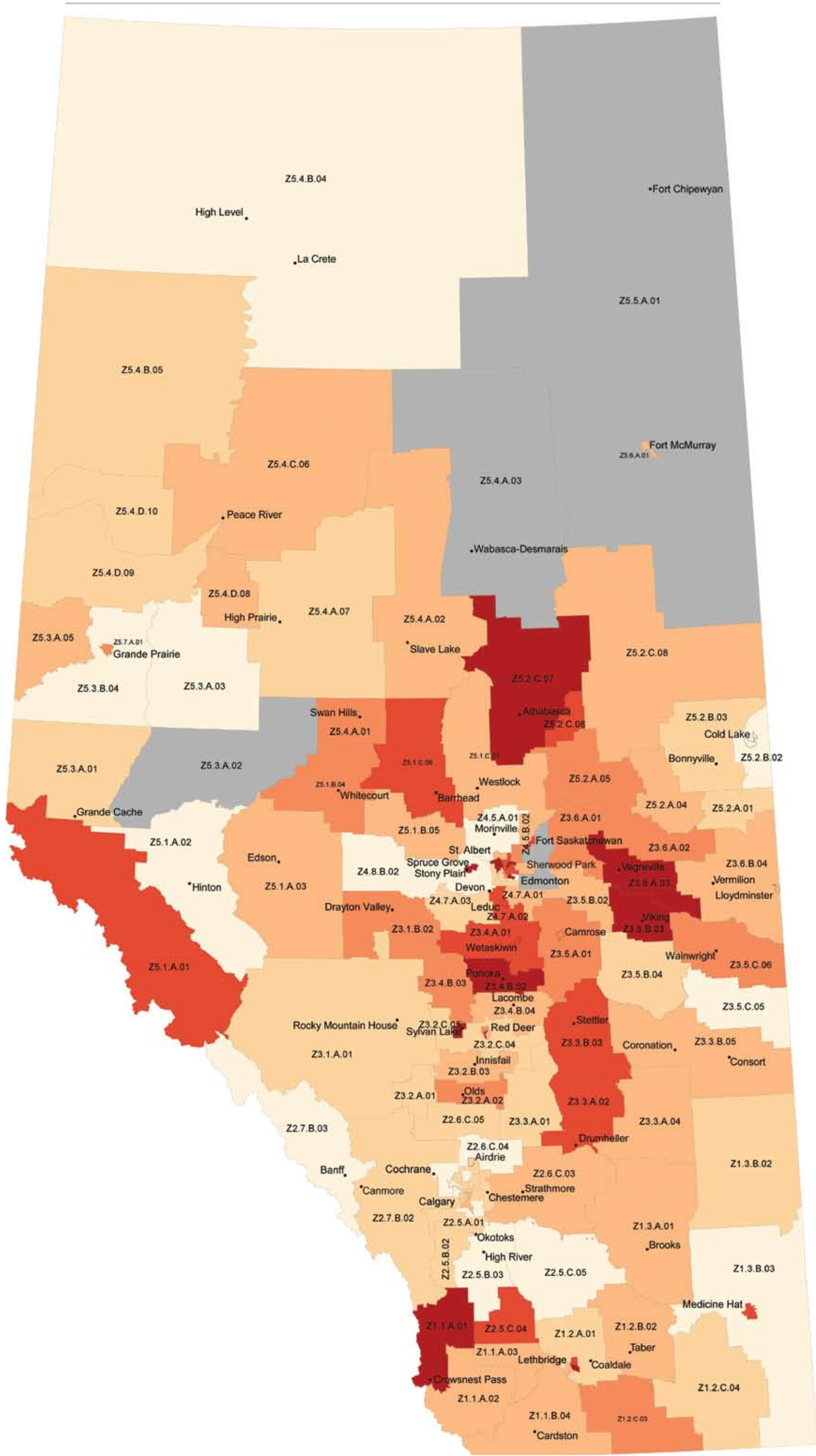


Figure 8a. Age and Sex Standardized, Benzodiazepine Patients Who Received 2 DDDs or Greater per 1,000 Population, by Local Geography, 2016



Legend: Provincial and Urban Maps

Patients ≥2 DDDs per 1,000 Population

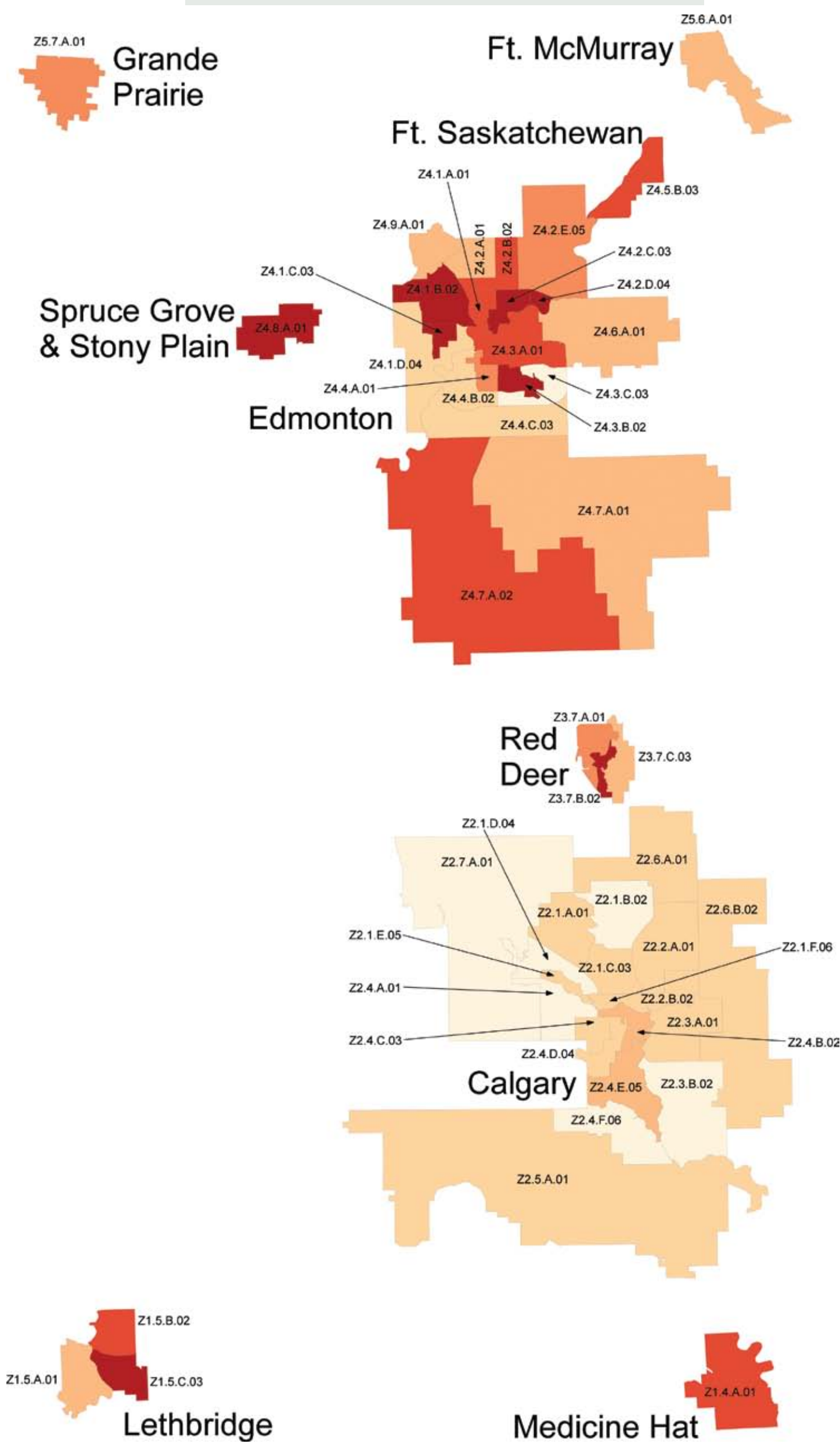
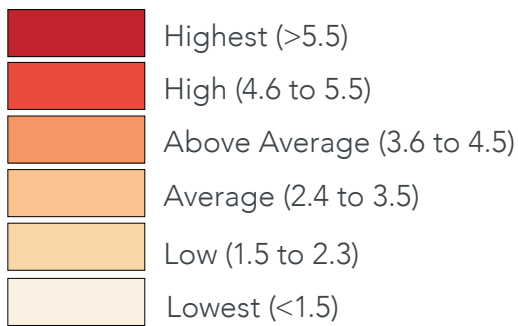
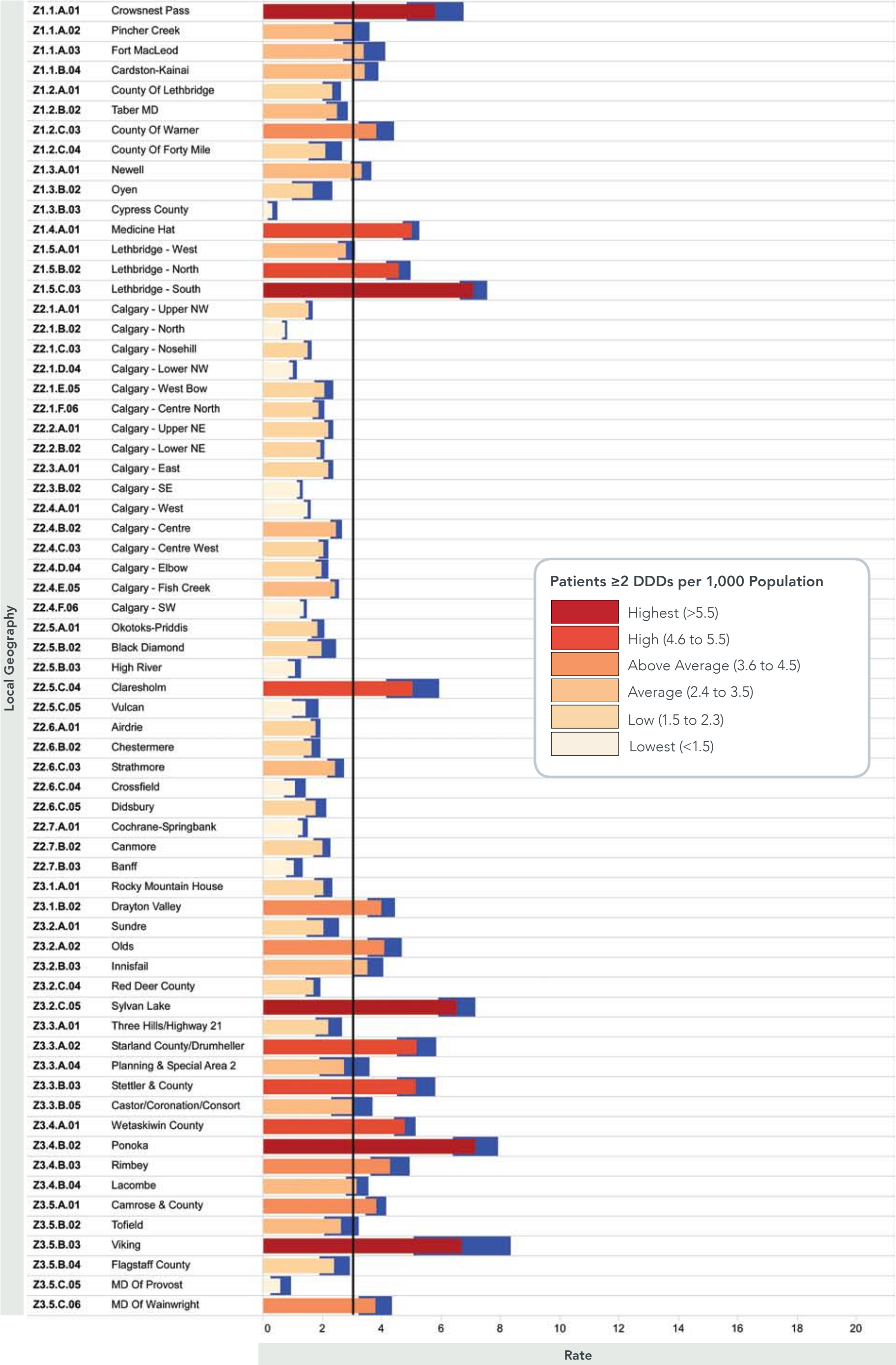
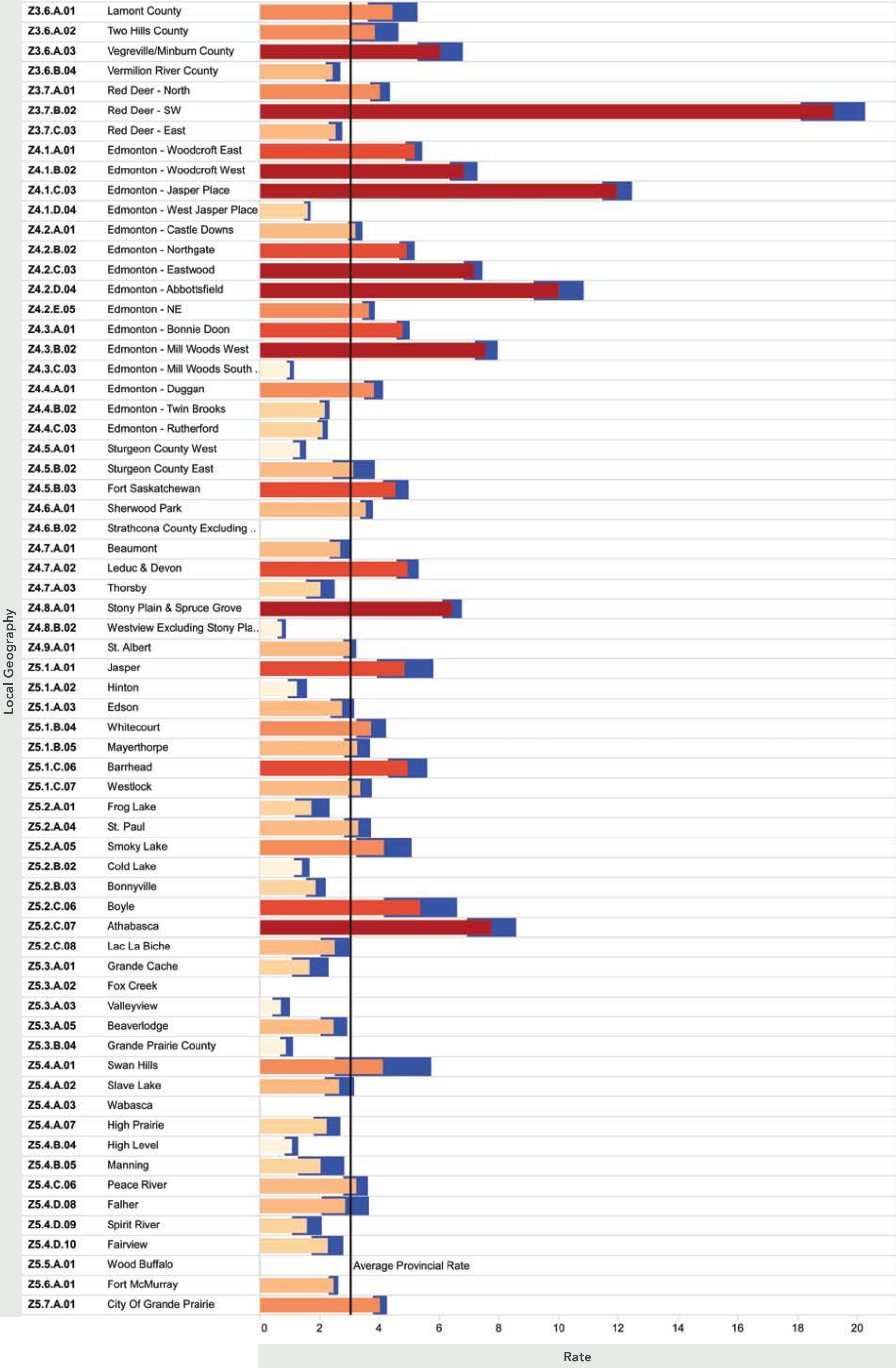


Figure 8b. Age and Sex Standardized, Benzodiazepine Patients Who Received 2 DDDs or Greater per 1,000 Population, by Local Geography, 2016



MEDICATION USE – Benzodiazepines



Legend: Provincial and Urban Maps

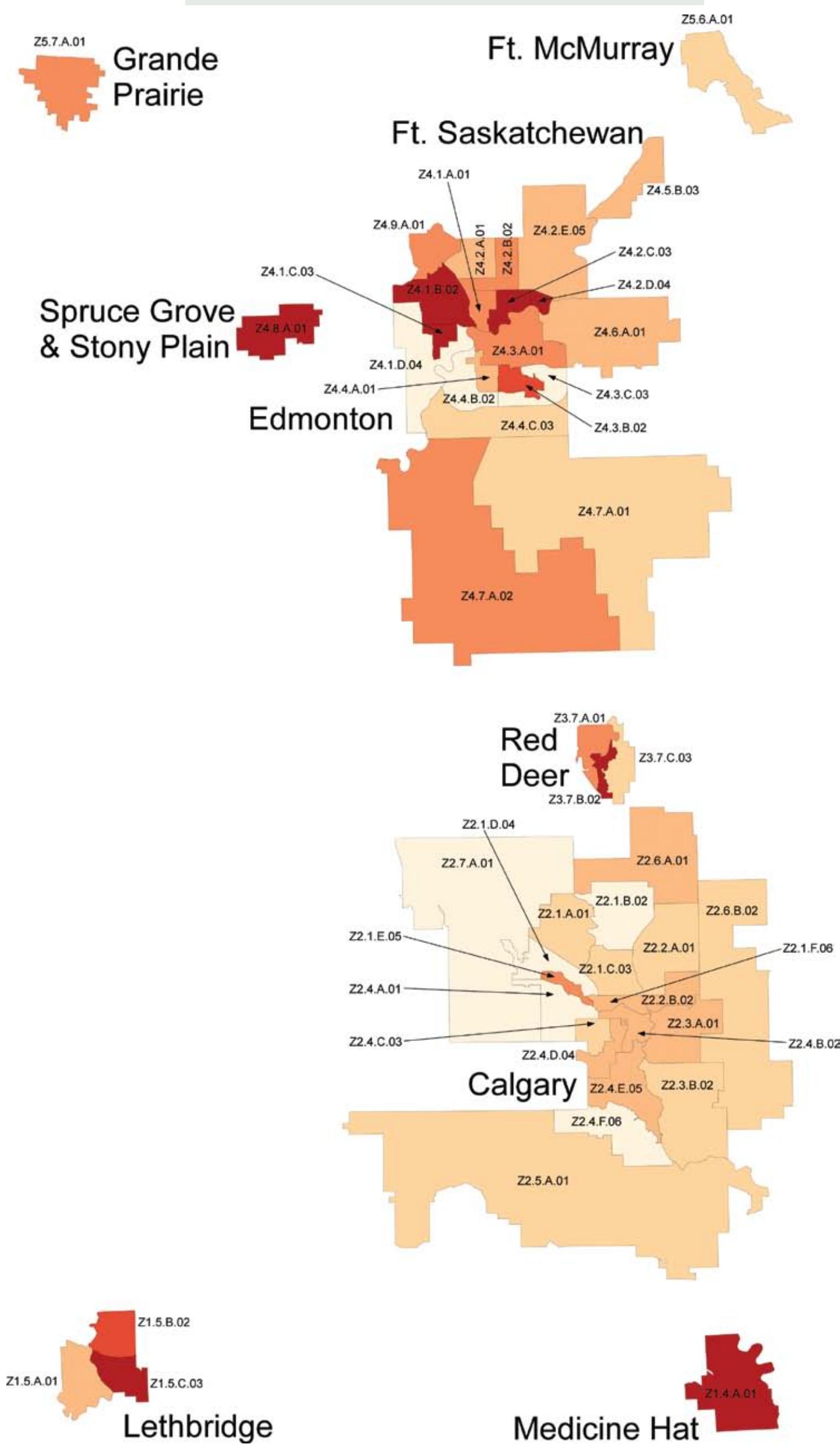
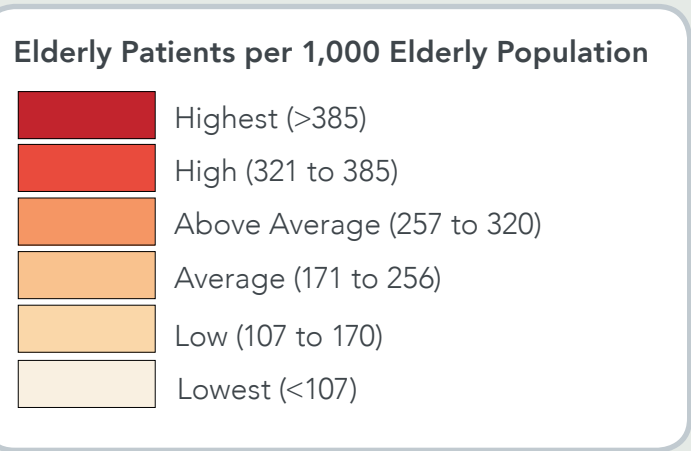
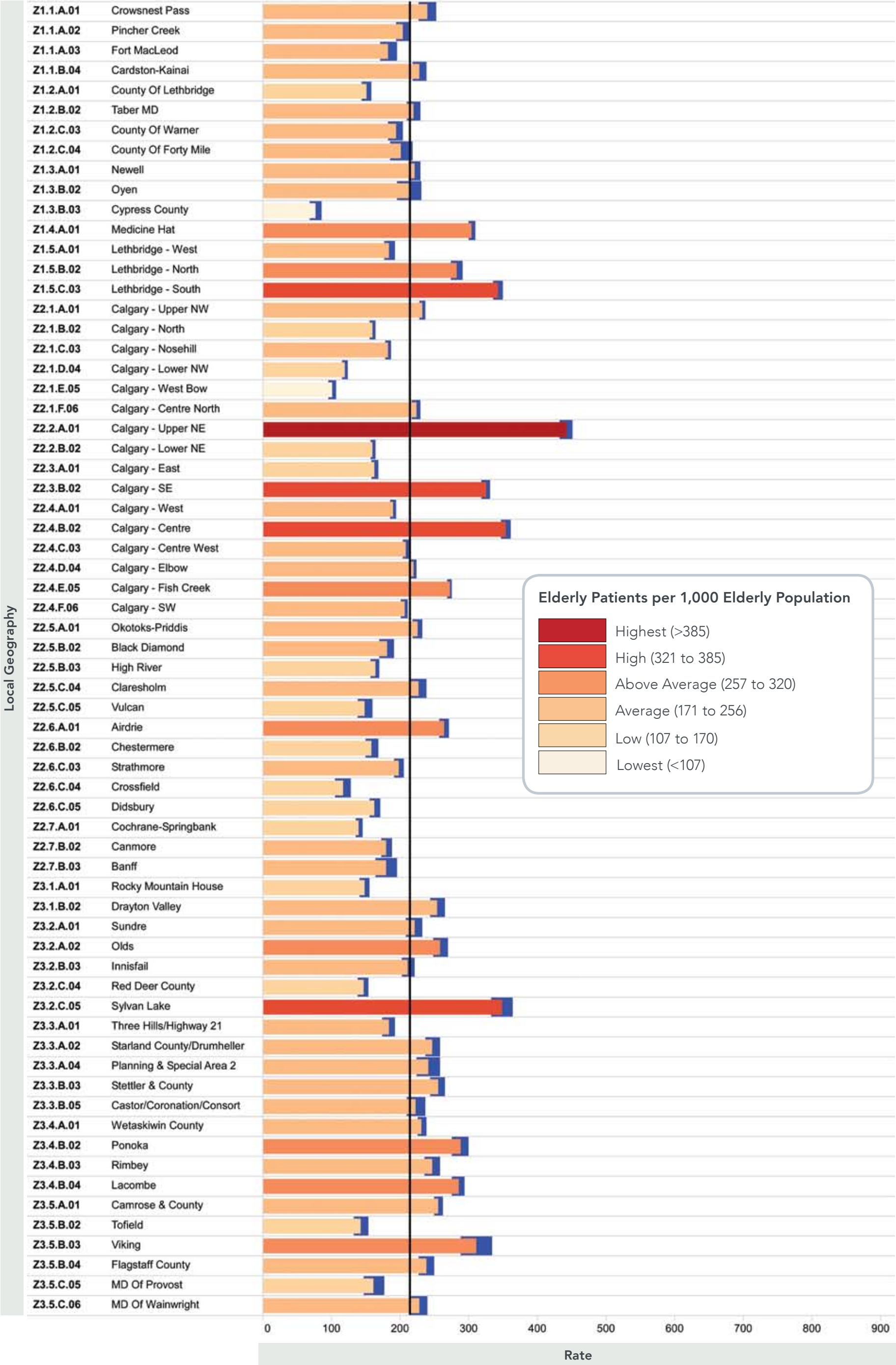
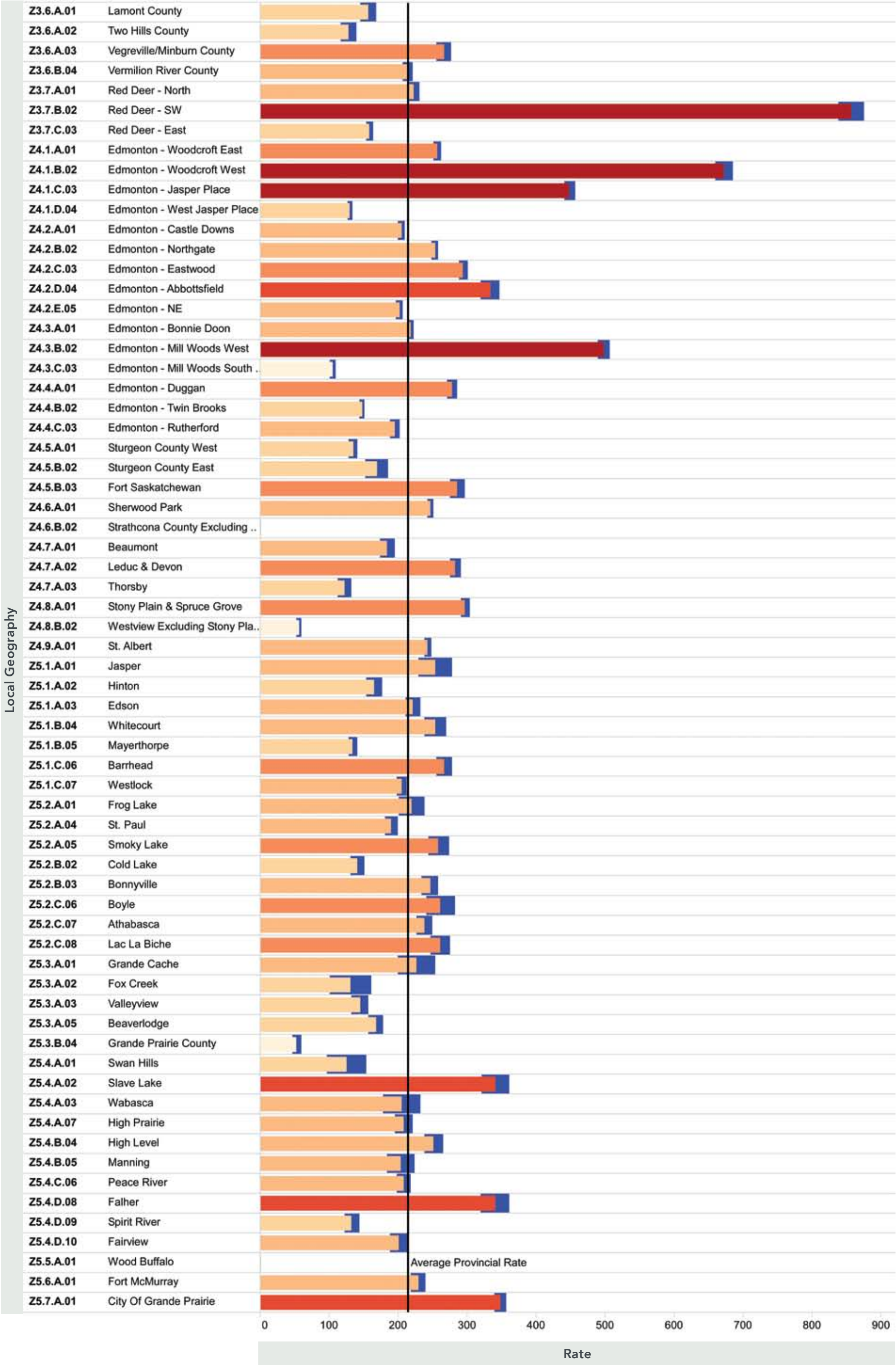


Figure 9b. Benzodiazepine Patients 65 Years and Over per 1,000 Elderly Population, by Local Geography, 2016



MEDICATION USE – Benzodiazepines

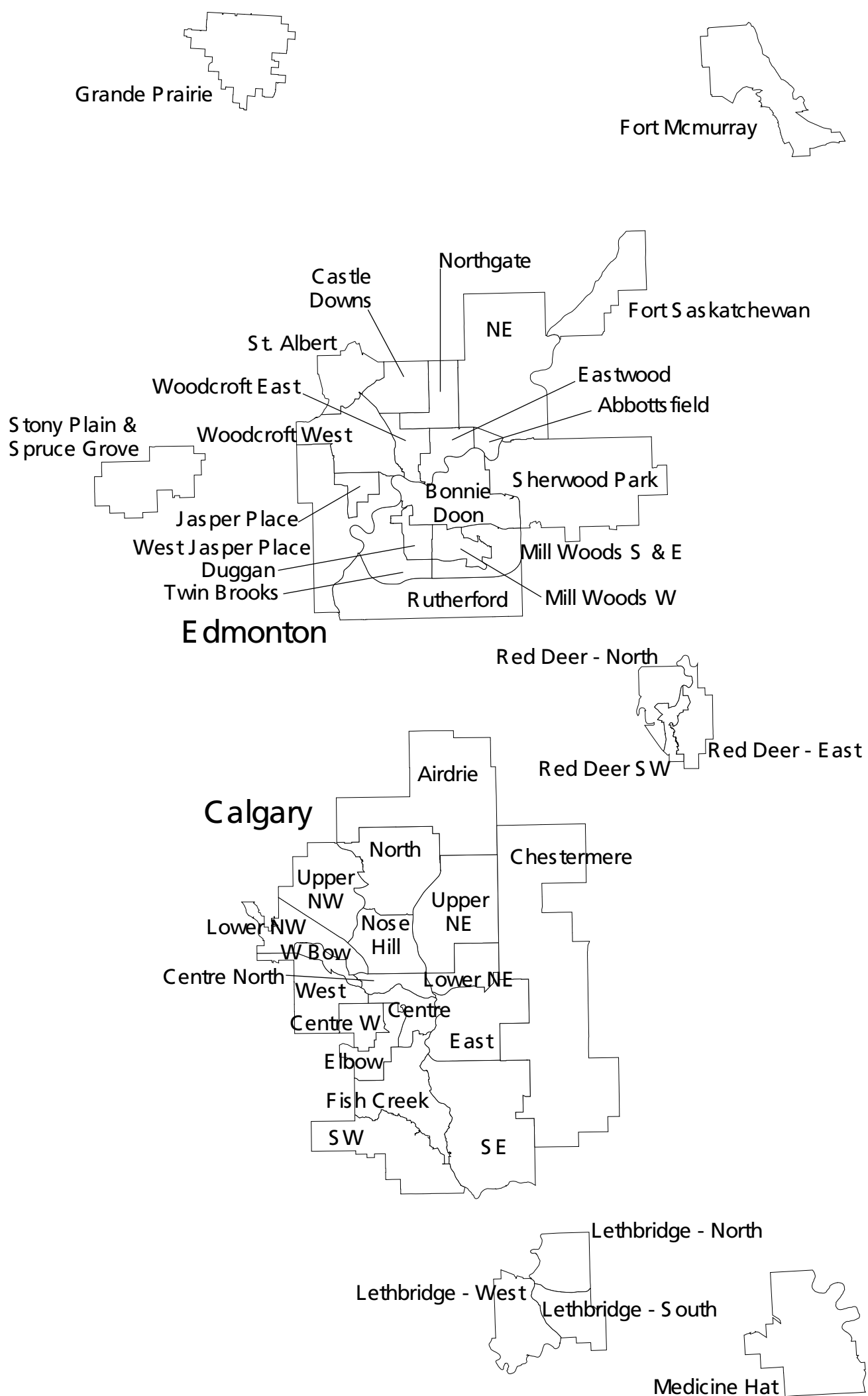


Appendix A – Alberta Local Geography

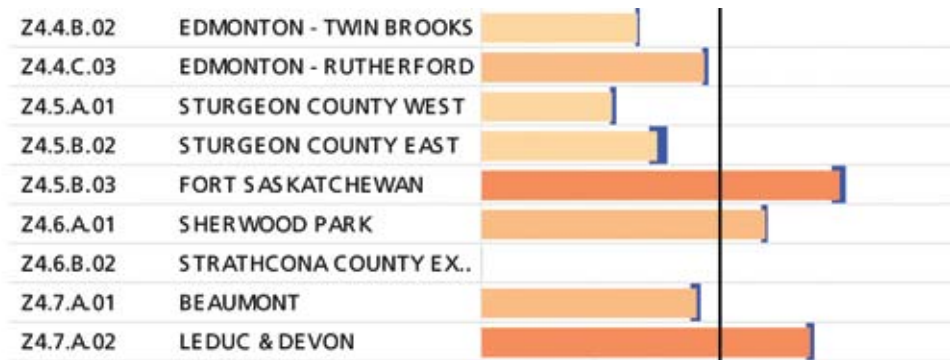
Map showing provincial local geography boundaries.



Map showing urban local geography boundaries.

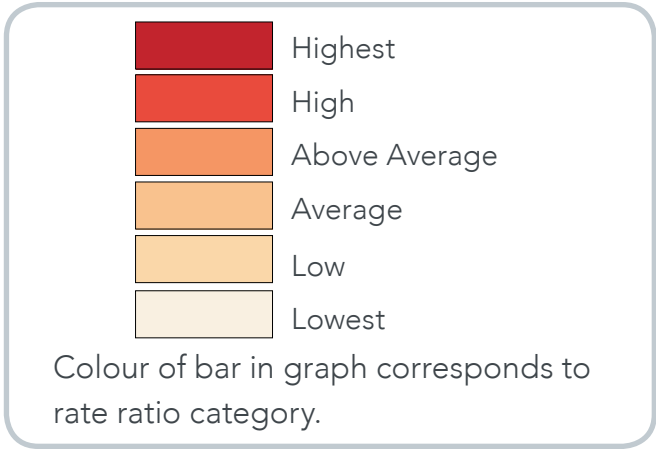


Example section of the graph showing individual local geography rates with 95% confidence intervals.



Blue bar represents one standard error above and below the observed rate.

Black line represents average provincial rate.



Appendix B – Opioid Analytic Class, 2016

Table 16. Opioid Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient and ATC Code, 2016.

Main Ingredient	ATC Code Description	Route	Prescriptions	Patients	Prescribers	Pharmacies
BUPRENORPHINE	N02AE01-BUPRENORPHINE	TRANSDERMAL	13,209	4,306	1,605	938
BUPRENORPHINE	N07BC01 - DRUGS USED IN OPIOID DEPENDENCE	SUBLINGUAL	2	1	1	1
BUPRENORPHINE	N07BC51-BUPRENORPHINE, COMBINATIONS	SUBLINGUAL	23,089	2,396	275	550
BUTALBITAL	N02AA79-CODEINE, COMBINATIONS WITH PSYCHOLEPTICS	ORAL	2,134	700	564	437
BUTALBITAL	N02BA71-ACETYLSALICYLIC ACID, COMB WITH PSYCHOLEPTICS	ORAL	586	239	227	204
BUTORPHANOL	N02AF01-BUTORPHANOL	NASAL	436	99	122	115
CODEINE	M03BB53-CHLORZOXAZONE, COMBINATIONS EXCL PSYCHOLEPTICS	ORAL	47	29	28	21
CODEINE	N02AA59-CODEINE, COMBINATIONS	ORAL	700,161	313,508	11,148	1,340
CODEINE	N02BE51-ACETAMINOPHEN, COMB EXCL PSYCHOLEPTICS	ORAL	61,261	29,354	4,731	1,205
CODEINE	R05DA04-CODEINE	INTRAMUSCULAR	10	6	6	4
CODEINE	R05DA04-CODEINE	ORAL	75,358	35,395	5,428	1,286
CODEINE	R05DA04-CODEINE	UNKNOWN	159	131	20	29
CODEINE	R05DA20-COMBINATIONS	ORAL	105,318	85,788	3,129	1,234
CODEINE	R05FA02-OPIUM DERIVATIVES AND EXPECTORANTS	ORAL	53,337	45,158	4,393	1,182
CODEINE	UNKNOWN	ORAL	193,337	70,605	4,566	1,174
FENTANYL	N01AH01-FENTANYL	INTRAMUSCULAR	1,563	869	239	124
FENTANYL	N02AB03-FENTANYL	BUCCAL	51	15	15	16
FENTANYL	N02AB03-FENTANYL	SUBLINGUAL	9	5	5	6
FENTANYL	N02AB03-FENTANYL	TRANSDERMAL	19,577	4,048	2,118	970
FENTANYL	N02AB03-FENTANYL	UNKNOWN	21	10	6	3
HYDROCODONE	R05DA03-HYDROCODONE	ORAL	147	85	72	67
HYDROCODONE	R05DA03-HYDROCODONE	UNKNOWN	2	2	2	2
HYDROCODONE	R05DA20-COMBINATIONS	ORAL	785	618	327	319
HYDROMORPHONE	N02AA03-HYDROMORPHONE	INTRAMUSCULAR	3,756	1,738	609	193
HYDROMORPHONE	N02AA03-HYDROMORPHONE	ORAL	114,978	28,417	5,125	1,266
HYDROMORPHONE	N02AA03-HYDROMORPHONE	RECTAL	32	4	4	5
HYDROMORPHONE	N02AA03-HYDROMORPHONE	UNKNOWN	4	4	4	4
KETAMINE	N01AX03-KETAMINE	INTRAMUSCULAR	48	14	15	15
KETAMINE	N01AX03-KETAMINE	UNKNOWN	5	4	4	3
MEPERIDINE	N02AB02-PETHIDINE	INTRAMUSCULAR	592	135	129	111
MEPERIDINE	N02AB02-PETHIDINE	ORAL	2,225	738	538	488
METHADONE	N07BC02-METHADONE	ORAL	52,056	5,234	515	815
METHADONE	N07BC02-METHADONE	UNKNOWN	97	42	30	25
MORPHINE	N02AA01-MORPHINE	INTRAMUSCULAR	2,841	1,324	648	260
MORPHINE	N02AA01-MORPHINE	INTRAVENOUS	31	28	24	5
MORPHINE	N02AA01-MORPHINE	ORAL	61,746	15,312	4,147	1,218
MORPHINE	N02AA01-MORPHINE	PARENTERAL	146	98	62	7
MORPHINE	N02AA01-MORPHINE	RECTAL	145	42	46	38
MORPHINE	N02AA01-MORPHINE	UNKNOWN	63	48	30	19
NORMETHADONE	R05DA20-COMBINATIONS	ORAL	32	28	18	24
OXYCODONE	N02AA05-OXYCODONE	ORAL	127,569	24,392	4,500	1,269
OXYCODONE	N02AA05-OXYCODONE	RECTAL	74	9	13	9
OXYCODONE	N02AA05-OXYCODONE	UNKNOWN	14	4	5	5
OXYCODONE	N02AA55-OXYCODONE, COMBINATIONS	ORAL	2,385	768	456	451
OXYCODONE	UNKNOWN	ORAL	169,185	55,955	5,405	1,296
PENTAZOCINE	N02AD01-PENTAZOCINE	ORAL	265	64	69	66
REMIFENTANIL	N01AH06-REMIFENTANIL	INTRAVENOUS	1	1	1	1
SUFENTANIL	N01AH03-SUFENTANIL	INTRAVENOUS	9	3	5	4
TAPENTADOL	N02AX06-TAPENTADOL	ORAL	3,987	997	575	512

Table 17. Benzodiazepine Analytic Class Prescriptions, Patients, Prescribers and Pharmacies by Main Ingredient and ATC Code, 2016.

Main Ingredient	ATC Code Description	Route	Route	Prescriptions	Patients	Prescribers	Pharmacies
ALPRAZOLAM	N05BA12-ALPRAZOLAM		ORAL	28,636	9,987	3,262	1,177
ALPRAZOLAM	N05BA12-ALPRAZOLAM		UNKNOWN	3	2	2	2
BROMAZEPAM	N05BA08-BROMAZEPAM		ORAL	21,646	4,133	1,636	915
CHLORDIAZEPOXIDE	N05BA02-CHLORDIAZEPOXIDE		ORAL	2,877	1,396	887	626
CHLORDIAZEPOXIDE	N05BA02-CHLORDIAZEPOXIDE		UNKNOWN	1	1	1	1
CLOBAZAM	N05BA09-CLOBAZAM		ORAL	9,753	3,313	1,963	965
CLOBAZAM	N05BA09-CLOBAZAM		UNKNOWN	242	90	87	72
CLONAZEPAM	N03AE01-CLONAZEPAM		ORAL	170,190	53,264	5,973	1,311
CLONAZEPAM	N03AE01-CLONAZEPAM		UNKNOWN	128	65	57	49
CLORAZEPATE DIPOTASSIUM	N05BA05-CLORAZEPATE POTASSIUM		ORAL	124	78	82	75
DIAZEPAM	N05BA01-DIAZEPAM		INTRAMUSCULAR	40	17	16	18
DIAZEPAM	N05BA01-DIAZEPAM		ORAL	47,242	15,668	4,031	1,224
DIAZEPAM	N05BA01-DIAZEPAM		RECTAL	144	104	56	91
DIAZEPAM	N05BA01-DIAZEPAM		UNKNOWN	21	11	12	10
FLURAZEPAM	N05CD01-FLURAZEPAM		ORAL	1,234	500	418	376
LORAZEPAM	N05BA06-LORAZEPAM		INTRAMUSCULAR	89	77	65	34
LORAZEPAM	N05BA06-LORAZEPAM		ORAL	122,741	54,060	6,103	1,303
LORAZEPAM	N05BA06-LORAZEPAM		SUBLINGUAL	203,481	106,721	7,359	1,317
LORAZEPAM	N05BA06-LORAZEPAM		UNKNOWN	29	14	17	13
MIDAZOLAM	N05CD08-MIDAZOLAM		INTRAMUSCULAR	1,686	1,216	260	142
MIDAZOLAM	N05CD08-MIDAZOLAM		UNKNOWN	115	92	13	13
NITRAZEPAM	N05CD02-NITRAZEPAM		ORAL	17,808	3,770	1,373	862
NITRAZEPAM	N05CD02-NITRAZEPAM		UNKNOWN	46	16	17	15
OXAZEPAM	N05BA04-OXAZEPAM		ORAL	6,548	2,476	1,500	851
TEMAZEPAM	N05CD07-TEMAZEPAM		ORAL	85,452	23,961	3,947	1,250
TEMAZEPAM	N05CD07-TEMAZEPAM		UNKNOWN	26	13	15	11
TRIAZOLAM	N05CD05-TRIAZOLAM		ORAL	5,458	3,373	691	824
TRIAZOLAM	N05CD05-TRIAZOLAM		UNKNOWN	1	1	0	1
ZOLPIDEM	N05CF02-ZOLPIDEM		SUBLINGUAL	39,949	17,542	3,772	1,188
ZOLPIDEM	N05CF02-ZOLPIDEM		UNKNOWN	1	1	1	1
ZOPICLONE	N05CF01-ZOPICLONE		ORAL	504,427	190,915	10,849	1,345
ZOPICLONE	N05CF01-ZOPICLONE		UNKNOWN	26	9	14	7

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