

Antibiotic Prescription Atlas 2021



Alberta's prescription drug monitoring program, Tracked Prescription Program Alberta (TPP Alberta), uses data to optimize safe patient care. Since it was established in 1986, TPP Alberta has been monitoring the use of certain medications prone to misuse.

The mandate of TPP Alberta is to:

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

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

Alberta College of Pharmacy

Alberta Health

Alberta Health Services

Alberta Medical Association

Alberta Pharmacists' Association

Alberta Veterinary Medical Association

College of Dental Surgeons of Alberta

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College of Podiatric Physicians of Alberta

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Executive Summary

While patterns of drug use were affected by several waves of COVID-19 in 2021, patterns for numbers of prescriptions and other parameters such as number of patients, number of prescriptions and number of dispenses continued to decline consistently to levels lower than those observed in 2020. With the exception of 2021Q4 where higher numbers of patients and antibiotic prescriptions were seen, COVID-19 public health restrictions may have been a contributor to the decreasing figures.

The Socio-Economic Deprivation Index has categories from 1 (least deprived) to 5 (most deprived). These categories are applied to geographical areas. The degree of deprivation was found to be correlated with the antibiotic consumption rate in the geographical areas. An association was noted between a higher deprivation index and the highest consumption of antibiotics. Areas with lower deprivation scores were also associated with lower levels of consumption.

New additions to the 2021 Atlas include:

- The inclusion of all routes of administration; previous versions only included oral route, and therefore quantities will be greater in this Atlas than those shown in the 2020 Atlas;
- A subdivision of the 0-4 age group into 0 and 1-4 years of age, so that information for infants can be viewed separately;
- An expanded breakdown of geographic patterns;
- A preliminary analysis of prescriber location versus dispense location.

Highlights

27% of the population (1,221,148 patients) received one or more antibiotic prescriptions in 2021 compared to 37% in 2016 (1,573,696 patients) —a drop of almost one quarter.

More than 80% of the patients received prescriptions from physicians, followed by dentists (19%) and pharmacists (8%) — patients may receive prescriptions from several prescriber types.

The number of patients receiving antibiotic prescriptions from more than one prescriber in 2021 was only 63% of the number observed in 2016 despite a rising and aging population.

Amoxicillin continued to be the most commonly prescribed antibioticin in 2021 with more patients who received this ingredient than the next two antibiotics combined (cephalexin and ciprofloxacin).

Almost three quarters of all antibiotic prescriptions received in 2021 were oral route products.

Background and Methods

About the Atlas

The purpose of this Tracked Prescription Program (TPP) Alberta Antibiotic Prescription Atlas 2021 is to provide an overview of provincial antibiotic medication utilization for the year 2021. Alberta's Pharmaceutical Information Network (PIN) is the source of medication utilization information.

Data used in the Atlas analyses were extracted on May 13, 2022. Age and Sex standardized rates are used throughout the Atlas. Compounded medications were excluded from the analyses. Antibiotic products that have a Drug Information Number (DIN), such as amoxicillin-clavulanate, were included.

Antibiotic Prescription Data Source

2016 to 2021 PIN data were used for the analyses. PIN data consist of dispense records from community pharmacies in Alberta. Ongoing gaps within PIN data include dispensing information from hospital pharmacies and extended care centres. 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. To capture actual dispensing as closely as possible, data were extracted from PIN on May 13, 2022, by which time most modifications and reversals would have occurred.

Pharmacy Local Aggregated Geographies

Pharmacy Local Aggregated Geographies (PhLAGs) merge local geographies with neighbouring geographies where their residents are dispensed medications, eliminating issues with utilization rates in local geographies being artificially low or high. In this Atlas, drug utilization rates count patients in the three numerators 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 PhLAGs. The method used to develop PhLAGs is consistent with those used to develop other Alberta geographic aggregations used in the health system, such as subzones. Rural PhLAG names include various municipality types, such as County, Planning and Special Area, and Municipal District. Edmonton - Abbottsfield is an area with a small population and a large number of pharmacies that could not be merged with an adjacent area since its patterns were quite different from the surrounding areas. High rates are observed in this PhLAG for most measures because a high number of dispenses from a high number of pharmacies that serve patients from inside and outside its boundaries must be divided by a small population.

Antibiotic Utilization Analyses

Analyses of medication utilization were carried out 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. Patients of all ages were included in analyses, including DDD calculations. Appendix A shows the patients, prescriptions, prescribers, and pharmacies associated with antibiotics prescribed during 2021 by main ingredient and ATC Code. Appendix B and C provide information on interpretation of graphs and maps. Appendix D shows rates for all measures by PhLAG. Appendix E shows antibiotic prescriptions, patients, prescribers and pharmacies by PhLAG.

Atlas Measures

Antibiotic utilization is presented in this Atlas using counts and age and sex standardized rates. Patient age was calculated on July 1, 2021.

Days of Treatment

Days of Treatment measures (also called Days of Therapy measures) are presented by main ingredient due to the large differences between antibiotics in standard days of treatment. The top 10 ingredients have been included. Treatment days are calculated by summing the "days of supply" for the entire year for each patient or prescription. The mean value for all patients and prescriptions is calculated for each of the more common antibiotics to obtain "treatment days per patient" and "treatment days per prescription". The total number of prescriptions are calculated for every patient for a whole year and the mean is calculated for the common antibiotics to obtain "prescriptions per patient."

These Days of Treatment measures highlight the length of treatment associated with each ingredient, including:

- Treatment days per patient
- Treatment days per prescription
- Prescriptions per patient

Defined Daily Dose (DDD)

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 adults¹. Drug DDD values were obtained primarily from the WHO DDD/ATC Index.²

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

Drug utilization data presented in DDDs give a rough estimate of consumption and not an exact picture of actual use. DDDs provide a fixed unit of measurement independent of price, currencies, package size and strength enabling the researcher to assess trends in drug utilization and to perform comparisons between population groups."³

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 antibiotic analytic class.

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

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

Dispense DDDs = strength x quantity / drug DDD

A patient's total DDDs were calculated as follows:

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

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

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

For example, if every Alberta resident received a dose of one DDD for every day in a single two-week treatment period in a year, the observed rate would be 0.0384 or 38.4 DDDs per day per 1,000 population (14 DDD/365 days). In 2021, seven percent of the population received antibiotic prescriptions, therefore if each of those patients received a dose of one DDD for every day in a single two-week treatment period, the observed rate would be 0.0384 per patient but 0.0027 for the whole population (0.0384 x 0.07) and 2.7 DDDs per day per 1,000 population.

Population utilization of antibiotics was presented using three measures:

- Patients per 1,000 population;
- Dispenses per 1,000 population; and,
- DDDs per 1,000 population.

Population rates were age and sex standardized for comparison between Pharmacy Local Aggregate Geographies (PhLAGs).

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

Urban/Rural Categories

An analysis of urban/rural patterns was conducted for the 2021 Atlas and the results were consistent with those observed in the 2020 Atlas. The detailed analyses for each measure were omitted in the 2021 Atlas. Please download the 2020 ABx Atlas to view this detailed analysis.

The urban/rural category definitions used in the Atlas are adapted from those used by Alberta Health to create Local Geographic Areas (LGAs). LGAs are used to report many types of data in small geographic areas which, when aggregated, match PhLAG boundaries used in the Atlas. For a full discussion about LGAs, visit: <u>http://aephin.alberta.ca/boundaries/</u>

The categories are:

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

Calgary & Edmonton — the areas within the cities of Edmonton and Calgary;

Rural — areas without major urban centres;

Suburban — areas surrounding larger urban areas.



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

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



Socio-Economic Index

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

In 2009, Pampalon et al.⁵ introduced a deprivation index for health data analysis in Canada based on data from Statistics Canada's "The Census of Canada."

Alberta Health Services (AHS) adapted the Pampalon approach using Alberta census data (Khakh, A. 2020),⁶ 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.

Map Category	Socio	o-Eco	nomic	Depr	ivation Index
		0	1	2	3
Cities	3.3				
Calgary & Edmonton	3.0				
Rural	3.6	1			
Suburban	2.7				

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

Note: 1 (least deprived) to 5 (most deprived)

³ <u>https://www.who.int/tools/atc-ddd-toolkit/about-ddd</u>

¹ 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: <u>http://www.whocc.no/ddd/definition_and_general considera/</u>

² <u>http://www.whocc.no/atc_ddd_index/</u>

⁴ "Days in time period analyzed" is used because the "days of supply" information in the dispense record is sometimes inaccurate with PIN data.

⁵ Pampalon, R, Hamel, D, & Gamache, P. (2009). A deprivation index for health planning in Canada. Chronic Diseases in Canada, 29(4): 178-191

⁶ Khakh, A. (2020). How to Use the Pampalon Deprivation Index in Alberta, Research and Innovation, Alberta Health Services

Antibiotic Utilization

During 2021, more than two million antibiotic prescriptions were dispensed for over 1.2 million unique patients (Table 1). Both of these reflect a much lower level of antibiotic utilization in 2021 than previous years. As expected, notable seasonal trends were observed in the dispensation of antibiotics between 2016 to 2021 (Figure 3 and 4) with a dramatic drop in the second quarter of 2020 (2020Q2) corresponding with the public health restrictions implemented in the province. Differences were observed according to both age and sex (Table 2 and 3).

Years	Patients	Prescriptions	Dispenses	Population
2016	1,573,696	3,096,375	3,293,790	4,252,720
2017	1,602,206	3,147,609	3,351,818	4,285,997
2018	1,604,970	3,146,997	3,356,219	4,306,822
2019	1,647,833	3,223,406	3,436,747	4,371,154
2020	1,312,807	2,508,330	2,735,693	4,421,681
2021	1,221,148	2,296,094	2,511,630	4,442,676
Trends	-			

Table 1. Utilization of Prescription Antibiotics in Alberta, 2016–2021

Note: All values have increased as compared to the 2020 Atlas, due to the inclusion of all forms and routes of antibiotics in 2021. The 2020 Atlas included only oral route values.

In the 2021 Atlas, values for 2016 through 2020 have been recalculated to include all forms and routes.

Years	Patients /1,000 pop	Prescriptions /1,000 pop	DDDs /1,000 pop
2016	370	728	16.2
2017	374	734	16.2
2018	373	731	16.1
2019	377	737	15.9
2020	297	567	12.7
2021	275	517	11.5
Trends			

Figure 3. Patients by Quarter, 2016–2021



Note: Alberta declared a local state of public health emergency on March 17, 2020, due to a COVID-19 outbreak. On March 27 many non-essential businesses were closed and gatherings limited to 15 people.



Figure 4. Prescriptions by Quarter, 2016–2021

Table 2. Patients by Age and Sex, 2021*

Age	Females	Males	Females Males
90+	10,748	5,316	
85 - 89	12,640	8,781	
80 - 84	18,327	14,101	
75 - 79	26,418	21,605	
70 - 74	35,910	30,023	
65 - 69	44,303	37,270	
60 - 64	49,007	40,073	
55 - 59	48,406	37,660	
50 - 54	45,017	33,900	
45 - 49	46,060	33,151	
40 - 44	52,144	34,666	
35 - 39	59,792	36,067	
30 - 34	58,241	31,930	
25 - 29	49,662	26,920	
20 - 24	44,807	25,523	
15 - 19	39,942	29,314	
10 - 14	21,852	18,983	
5 - 9	22,237	21,171	
1 - 4	20,871	22,989	
0	2,310	2,989	1
Total	708,694	512,432	

*18 patients excluded because of unknown sex and four excluded because of unknown age and sex

Table 3. Antibiotic Utilization Rates by Age and Sex, 2021*

Age Group	Female Patients per 1,000 pop	Male Patients per 1,000 pop	Female Dispenses per 1,000 pop	Male Dispenses per 1,000 pop	Female DDDs per 1,000 pop	Male DDDs per 1,000 pop	Female DDDs per 1,000 pop	Male DDDs per 1,000 pop
90+	565	575	1,705	1,666	24.5	28.6		
85 - 89	480	479	1,360	1,287	21.9	24.4		
80 - 84	462	446	1,246	1,147	21.2	23.8		
75 - 79	459	427	1,167	1,028	22.0	22.2		
70 - 74	418	376	1,003	882	19.0	20.1		
65 - 69	396	342	917	774	18.7	18.1		
60 - 64	364	300	831	679	16.6	15.6		
55 - 59	349	271	782	587	15.9	13.2		
50 - 54	341	248	735	515	15.0	11.7		
45 - 49	320	224	677	442	13.9	9.7		
40 - 44	321	210	660	390	13.5	8.6		
35 - 39	332	196	671	355	13.5	7.7		
30 - 34	337	179	655	315	12.7	6.7		
25 - 29	336	171	648	293	12.9	6.4		
20 - 24	340	180	655	304	14.0	7.2		
15 - 19	318	223	609	404	15.0	12.6		
10 - 14	159	132	264	207	4.9	4.0		
5 - 9	162	149	239	214	3.0	2.5		
1 - 4	203	214	314	341	2.7	3.0		
0	98	121	126	164	0.4	0.6	I	

Note: 18 patients excluded because of unknown sex, and four excluded because of unknown age and sex.

Antibiotics Prescribed by Prescriber Type

Of almost 19,000 unique prescribers, physicians prescribed 77% of all antibiotic prescriptions. Of prescriptions in PIN associated with an identified prescriber type, 15.7% have unknown prescribers (mostly dentists). 1.2% of prescriptions have an unknown prescriber type (Table 4). Most patients were dispensed antibiotics from one or two unique prescribers in a year. More than six percent of patients were dispensed antibiotics from three or more prescribers (Table 5). Over 10% of patients were dispensed three or more unique antibiotics in a year (Table 6).

Prescriber Type	Prescriptions	Dispenses	Patients	Prescribers	Pharmacies	Patients per Prescriber
Physician	1,769,621	1,965,035	979,644	12,354	1,643	79
Dentist	305,770	310,671	234,012	910	1,614	257
Pharmacist	122,465	128,677	93,644	4,367	1,605	21
Optometrist	43,926	46,330	36,201	748	1,275	48
Nurse Practitioner	26,950	31,425	19,844	582	1,177	34
Dental Hygienist	424	451	374	6	199	62
Dietician	177	180	149	1	89	149

Table 4. Prescriptions, Dispenses, Patients, Prescribers and Pharmacies by Prescriber Type, 2021*

* 26,761 (1.2%) prescriptions have no Prescriber Type identified.

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

Table 5. Patients by Number of Known Unique Prescribers* per Year, 2016-2021

Prescribers	2016	2017	2018	2019	2020	2021	Trend 2016-2020
1 Prescriber	1,167,168	1,172,686	1,179,186	1,204,476	1,018,965	964,148	
2 Prescribers	283,184	297,245	294,460	305,374	208,629	182,197	
3 Prescribers	83,161	89,117	88,264	92,112	57,564	50,459	
4 Prescribers	26,343	27,908	27,732	29,640	17,811	15,560	
5 Prescribers	8,579	9,533	9,542	10,008	6,088	5,334	
6 Prescribers	3,171	3,406	3,437	3,697	2,125	2,044	
7+ Prescribers	2,090	2,311	2,349	2,526	1,625	1,406	

*The individual prescriber is not known for the majority of prescriptions with a prescriber type of Dentists, Optometrists, Dental Hygienists

Table 6. Patients by Number of Unique Antibiotic Ingredients per Year, 2016-2021

Antibiotics	2016	2017	2018	2019	2020	2021 (%)	Trend 2016-2020
1 Antibiotic	964,518	980,954	988,243	1,012,789	844,052	799,627 (65.5)	
2 Antibiotics	379,599	386,528	383,813	394,488	297,631	270,757 (22.2)	
3 Antibiotics	143,572	146,393	145,342	150,220	107,730	96,521 (7.9)	
4 Antibiotics	53,605	55,104	54,621	56,217	39,451	34,315 (2.8)	
5 Antibiotics	20,056	20,548	20,434	21,270	14,827	12,410 (1.0)	
6 Antibiotics	7,733	7,840	7,889	7,995	5,606	4,743 (0.4)	
7+ Antibiotics	4,613	4,839	4,628	4,854	3,510	2,775 (0.2)	

Patients and Prescriptions by Type of Antibiotic

Figure 5 and Figure 6 show the number of unique patients and number of prescriptions by antibiotic in each year for the most commonly prescribed antibiotics. Overall, amoxicillin was the most commonly prescribed antibiotic in 2016 to 2021.

5	, ,	1					Trend	
Antibiotic	2016	2017	2018	2019	2020	2021	2016-2021	2021
Amoxicillin	537,909	540,049	529,939	549,413	376,264	340,376		
Cephalexin	192,306	196,118	198,962	202,152	185,545	175,279		
Ciprofloxacin	223,050	211,812	206,681	202,658	171,731	152,545		
Amox-Clav	145,075	166,067	172,620	181,671	133,716	119,497		
Nitrofurantoin	97,207	100,416	104,163	111,909	109,831	105,676		
Clindamycin	118,723	118,519	113,836	112,202	104,531	101,348		
Metronidazole	94,480	102,859	104,598	108,076	98,734	97,175	\sim	
Azithromycin	201,012	223,083	231,918	254,470	130,453	87,799		
Fusidic Acid	95,724	97,142	97,403	105,775	88,584	87,006	\sim	
Tobramycin	86,697	87,203	93,251	102,962	81,304	72,378		
Doxycycline	82,171	90,251	98,728	108,156	82,362	71,529	\sim	
Mupirocin	56,081	60,188	64,748	66,051	60,558	64,107	\sim	
Cefixime	34,682	44,210	50,072	56,747	56,164	60,184		·
Smx-Tmp	65,994	60,778	53,700	54,108	50,236	48,014		
Moxifloxacin	55,185	56,722	55,569	57,160	42,500	44,776		
Penicillin	63,098	64,195	62,762	62,145	42,755	33,302		
Framycetin	31,162	31,525	31,795	31,786	30,647	30,612		
Clarithromycin	128,167	114,923	96,462	85,231	41,246	26,683		
Minocycline	30,529	29,187	27,653	26,619	24,268	23,726		
Fosfomycin	8,310	13,693	16,363	17,488	17,707	18,553		
Erythromycin	30,203	29,649	29,608	20,747	11,418	17,608		
Gramicidin - Neomycin	14,093	14,670	15,221	16,057	14,134	14,351	~	
Levofloxacin	37,732	34,511	32,905	29,441	18,846	13,680		

Figure 5. Patients by Antibiotic per Year*, 2016–2021

*Only the most commonly-prescribed antibiotics are shown, representing over 95% of all antibiotics dispensed. Appendix A shows other commonly prescribed antibiotics in Alberta.

Figure 6. Prescriptions by Antibiotic per Year*, 2016–2021

Antibiotic	2016	2017	2018	2019	2020	2021	Trend 2016-2021	2021
Amoxicillin	689,457	686,637	669,657	692,003	459,580	418,615		
Cephalexin	232,051	236,574	240,904	244,638	227,982	212,446		
Ciprofloxacin	276,596	260,702	256,548	249,443	215,582	190,951		
Amox-Clav	168,818	193,454	201,958	213,037	158,527	142,316		-
Nitrofurantoin	122,314	125,688	130,862	140,554	139,132	132,985		 III
Clindamycin	149,370	149,881	142,780	140,225	132,100	126,574		~
Metronidazole	113,807	124,799	126,905	130,419	119,991	116,984		-
Azithromycin	230,414	255,338	266,165	291,376	148,630	102,784		-
Fusidic Acid	107,161	108,526	109,001	118,632	101,309	99,378	\sim	-
Tobramycin	101,078	101,153	109,132	119,655	96,645	85,866		-
Doxycycline	100,041	110,056	120,789	131,875	104,099	90,963	\sim	-
Mupirocin	62,827	66,698	72,056	73,353	68,326	71,961	\sim	1
Cefixime	40,748	52,147	59,256	67,356	67,046	72,546		-
Smx-Tmp	84,659	78,517	70,705	71,341	68,334	65,038		-
Moxifloxacin	64,558	65,823	64,975	66,904	50,271	53,663		-
Penicillin	69,963	70,977	69,822	68,738	48,160	37,469		.
Framycetin	44,668	45,406	45,839	45,278	45,017	44,351	\sim	< I
Clarithromycin	145,131	129,879	108,638	95,312	45,619	29,490		- 1
Minocycline	43,310	41,872	40,717	37,749	35,929	34,425		
Fosfomycin	9,794	16,248	19,570	20,849	21,281	22,330		- 1
Erythromycin	33,075	32,349	32,447	22,537	12,704	19,338		-
Gramicidin - Neomycir	n 16,114	16,697	17,450	18,255	16,626	16,694	\sim	-
Levofloxacin	45,443	41,298	39,615	35,235	22,931	16,474		_

*Only the most commonly-prescribed antibiotics are shown, representing over 95% of all antibiotics dispensed. Appendix A shows other commonly prescribed antibiotics in Alberta.

Antibiotic Prescriptions and Treatment Days per Patient 🥂

For an optimum viewing experience, please select the two-page layout in your PDF reader.

The average number of prescriptions per patient by the most common antibiotics in 2021 are shown in Figure 7. Figure 8 shows the distribution of the number of prescriptions per patient per year for the same antibiotics. Overall, most patients were dispensed only one to two prescriptions for the same antibiotic. However, depending on the antibiotic, one to six percent of patients were dispensed three or more prescriptions in 2021 for the same antibiotic.

For example, just over 82% of patients who received amoxicillin in 2021 had one prescription, about 13.7% of patients had two prescriptions, 3.7% had three to five prescriptions, 0.12% had six to 10 prescriptions and less than 0.01% had 11 or more prescriptions (Figure 8, opposite page).

Note: All forms and routes for the top 10 most commonly prescribed antibiotics are included in Figures 7 through 12.

Figure 9 shows the *average* number of treatment days *per patient* by antibiotic in 2021. It accompanies Figure 10 which displays the distribution of the number of treatment days per patient by antibiotic.

Treatment days refer to the number of treatment days prescribed, regardless of patient compliance.

A substantial number of patients were dispensed antibiotics for greater than 10 treatment days in the year regardless of antibiotic.

Antibiotics that have forms such as liquid, gel, cream or ointment formulations without a discrete dosage unit (such as tablet, pump or vial) may lead to inaccurately calculated days of treatment.

While calculated days of treatment may not be accurate for all products, some topical antibiotics prescribed for acne and rosacea are known to be dispensed in longer durations.

Figure 11 shows the *average* number of treatment days per prescription by antibiotic in 2021. It accompanies Figure 12 which displays the distribution of the number of treatment days *per prescription* by antibiotic. Treatment days per prescription of more than seven days was common for most antibiotics (Figure 12, opposite page).

Note: An explanation for the calculation of Days of Treatment appears in page 3.

- **†** See Figure 4 for prescription counts by antibiotic
- * Order is ranked by the most common antibiotics.

Figure 7. Average Prescriptions[†] per Patient by Antibiotic*, 2021



Figure 9. Average Treatment Days per Patient by Antibiotic*, 2021



Figure 11. Average Treatment Days per Prescription by Antibiotic*, 2021







Figure 10. Distribution of Treatment Days per Patient by Antibiotic*, 2021



Figure 12. Distribution of Treatment Days per Prescription by Antibiotic*, 2021



Figure 13. DDDs per Patient by Physician Specialty Group, 2021



Figure 14. Percentage of Patients by Physician Specialty Group, 2021

Specialty Group	Patients
Dermatology	2.1%
Emergency Medicine	2.8%
Family Medicine/GP Group	52.8%
Infectious Diseases Group	0.4%
Internal Medicine	1.1%
Ophthalmology	3.8%
Pediatrics	1.1%
Respirology	0.3%
Surgery	3.7%
Other	31.9%

Figure 15. Antibiotic Prescriptions by Drug Form and Route, 2021





Note: Other category includes: Inhalation, Intramuscular, Intravenous, Nasal, Otic, Parenteral, Rectal, Vaginal, as well as some Drops, some Solutions, some Powders, and some Suspension Drug forms.

Note: 0.5% are injectable.

Note: Topical Cream includes Topical Cream, Topical Lotion, Topical Ointment, and Topical Gel.

Figure 16. Patient Dose Proportion, 2021





Note: 0.02 DDD was used to identify a period of seven days of treatment.

Note: 37% of patients who received an antibiotic prescription did so for a week or less. 96% did so for 36 days or less.





Okotoks-Priddis

Figure 17b. Patients per 1,000 Population by PhLAG, 2021



Pharmacy Local Geographies



Figure 17c. Patients per 1,000 Population Trends for the Top Five PhLAGs, 2016-2021

There was a noticeable decrease in the number of patients who were prescribed antibiotics in 2020 and 2021. The areas with the highest consumption also dropped, sometimes even more dramatically. Frog Lake and Edmonton - Abbottsfield were on an upward trajectory until 2019 and declined consistently for the last two years.



Figure 17d. Antibiotic Prescriber Locations for Antibiotic Dispenses in Edmonton - Abbottsfield, 2021

Half of the dispenses in Edmonton - Abbottsfield are from prescribers in the same PhLAG and 18% are from nearby PhLAGs. 95% of all prescribers are from the Edmonton area. Edmonton - Abbottsfield has a larger number of pharmacies per 1,000 population than other PhLAGs and therefore a portion of the dispenses are due to the convenience of many available dispense locations.

Suburban areas report the lowest rates of antibiotic patients per 1,000 population, followed by cities. Rural areas and Calgary & Edmonton PhLAGs show a mix of rate categories. There is an association between socio-economic status and antibiotic patients. The lowest rates of patient per 1,000 population are observed in areas with low deprivation index scores and the highes rates in areas with the highest deprivation index scores.

















Figure 18b. Prescriptions per 1,000 Population by PhLAG, 2021



Pharmacy Local Geographies

Rate



Figure 18c. Prescriptions per 1,000 Population Trends for the Top Five PhLAGs, 2016-2021

There was a was a sharp decrease in the number of antibiotic prescriptions in 2020 and 2021 across the province. The areas with the highest consumption also dropped substantially. Edmonton - Abbottsfield dropped sufficiently to exchange the top category with Frog Lake in 2020, but Frog Lake had an even sharper decline in 2021. Wabasca reported the highest rate in 2016 but dramatic and consistent decreases have almost halved the observed rate in 2021.





62% of all prescribers for Frog Lake dispenses are local or from nearby PhLAGs. Four percent of dispenses are from prescribers in Edmonton - Bonnie Doon and a further 33% from other locations; this indicates that residents of this PhLAG are very mobile and therefore obtain prescriptions from prescribers in many different locations including specialists in larger urban areas.

Suburban areas report the lowest rates of prescriptions per 1,000 population. Rural areas and Calgary & Edmonton PhLAGs show variations of prescription rates.

There is an association between socio-economic status and prescriptions per 1,000 population. The lowest rates are observed in areas with low deprivation index scores and the highest rates in areas with the highest deprivation index scores. The areas with the lowest rates have very low deprivation index scores.





Figure 19b. DDDs per 1,000 Population, by PhLAG, 2021



Rate

Pharmacy Local Geographies



Figure 19c. DDDs per 1,000 Population Trends for the Top Five PhLAGs, 2016-2021

There was a sharp decline in antibiotic DDDs consumed per 1,000 population in 2020, especially after the COVID-19 restrictions. The areas with the highest consumption also dropped substantially. Edmonton-Abbottsfield and Frog Lake have exchanged the top position several times in the last five years. High Level is now part of the top five group.



Figure 19d. Antibiotic Prescriber Locations for Antibiotic Dispenses in Calgary - Centre, 2021

Almost one third of the dispenses in Calgary - Centre are from local prescribers and a total of 46% are from local or nearby PhLAGs. Calgary - Centre is similar to Edmonton - Abbottsfield in that it has a much higher number of pharmacies per 1,000 population than other portions of the province. It is likely that some of these dispenses are from people working downtown and using nearby pharmacies to obtain the needed antibiotic prescriptions.

Suburban areas report the lowest rates of DDDs per 1,000 population, followed by cities. Rural areas and Calgary & Edmonton PhLAGs show variations of DDD rates.

There is a slight association between socio-economic status and DDDs. The highest rates of DDDs are observed in areas with high deprivation index scores but the patterns were not as strong as for patients or prescriptions per 1,000 population.

Appendices

Appendix A. Prescriptions, Patients, Prescribers and Pharmacies by Antibiotic, ATC Code, and Route 2021

Main Ingredient	ATC Code		Route	Prescriptions	Patients	Prescribers	Pharmacies
Amikacin	J01GB06-AMIKACIN		Intramuscular	22	13	11	8
Amikacin Amox-Clay	J01GB06-AMIKACIN		Parenteral	1	1	1	1
Amox-Clav	J01CR02-AMOXICILLI	N AND BETA-LACTAMASE INHIBITOR	Oral	142,312	119,495	10,047	1,613
Amoxicillin	J01CA04-AMOXICILL		Oral Oral	418,615	340,376	11,029	1,627
Amphotericin B	J02AA01-AMPHOTER	ICIN B	Intravenous	4	1,048	420	2
Ampicillin	J01CA01-AMPICILLIN		Intramuscular	10	9	9	6
Ampicillin	J01CA01-AMPICILLIN		Oral	340	289	198	194
Atovaquone	P01AX06-ATOVAQUO	DNE	Oral	652	379	240	264
Azithromycin	J01FA10-AZITHROMY	íCIN íCIN	Intravenous Oral	4	4 87 795	4 7 605	4 1 603
Aztreonam	J01DF01-AZTREONAN	M	Inhalation	152	94	31	44
Bacitracin		IN st	Topical	106	94	61	70
Bacitracin - Gramicidin - Polymyxin B	D06AX30-COMBINA	TIONS OF ANTIBIOTICS	Topical	611	498	331	232
Bacitracin - Polymyxin B	D06AX05-BACITRAC		Topical	64	62	41	17
Bacitracin - Polymyxin B	D06AX55-BACITRACI	IN, COMBINATIONS	Topical	2,869	2,334	950	300
Besifloxacin	S01AE08-BESIFLOXA	CIN	Ophthalmic	525	472	64	261
Cefazolin	J01DB05-CEFADROXI	L	Intramuscular	2,296	1,801	350	407
Cefazolin	J01DB04-CEFAZOLIN		Intravenous	3,530	2,269	309	12
Cefotaxime	J01DD08-CEFIXIME	1F	Oral	72,546	60,184 1	6,760 1	1,537
Cefoxitin	J01DC01-CEFOXITIN	12	Intramuscular	18	4	3	2
Cefprozil	J01DC10-CEFPROZIL	45	Oral	4,393	3,892	486	749
Ceftazidime	J01DD02-CEFTAZIDIN	AE	Intravenous	146	96	69	18
Ceftobiprole	J01DI01-CEFTOBIPRO	LE MEDOCARIL	Intravenous	4	2	3	2
Ceftriaxone	J01DD04-CEFTRIAXO	INE INE	Intramuscular	2,019	952 1,373	477 207	163
Cefuroxime	J01DC02-CEFUROXIN	1E	Oral	9,392	8,277	2,465	1,194
Cephalexin	J01DB01-CEFALEXIN		Oral	212,446	175,279	10,872	1,611
Ciprofloxacin	J01MA02-CIPROFLOX	ACIN	Oral	121,154	95,737	9,247	1,599
Ciprofloxacin	S01AE03-CIPROFLOX	ACIN	Ophthalmic	6,511	5,514	1,242	1,062
Ciprofloxacin	S02CA05-FLUOCINOI	HASONE AND ANTIINFECTIVES	Otic	62,906	54,660	6,439	1,588
Ciprofloxacin	S03AA07-CIPROFLOX	ACIN	Ophthalmic	316	282	112	113
Clarithromycin	JUTFAU9-CLARITHRO	CIN	Oral Topical	29,490	26,683	4,/4/ 1.875	1,513
Clindamycin	D10AF51-CLINDAMY	CIN, COMBINATIONS	Topical	53,220	42,329	6,316	1,537
Clindamycin	G01AA10-CLINDAMY	/CIN	Vaginal	2,000	1,782	780	682
Clindamycin	J01FF01-CLINDAMYC	IN	Intravenous	6	6	6	5
Clindamycin	J01FF01-CLINDAMYC	IN	Oral	66,231	54,224	6,111	1,572
Cloxacillin	J01CF02-CLOXACILLI	N	Intramuscular	72	42	45	11
Cloxacillin	J01CF02-CLOXACILLI	N	Oral	9,012	7,773	2,018	1,197
Colistin	J01XB01-COLISTIN	YCIN	Intramuscular	51	29	17 4	23
Dapsone	D10AX05-DAPSONE		Topical	5,322	4,596	944	903
Dapsone	J04BA02-DAPSONE		Oral	1,437	693	605	484
Doxycycline	A01AB22-DOXYCYCL	INE	Oral	401	322	60	235
Doxycycline	J01AA02-DOXYCYCL	INE	Oral	90,562	71,230	8,034	1,592
Ertapenem	J01DH03-ERTAPENEN	1	Parenteral	17	371	8	34
Erythromycin	D10AF52-ERYTHROM		Topical	543	429	282	282
Erythromycin Erythromycin	JUIFAUI-ERY THROM	YCIN IYCIN	Ophthalmic	2,382	1,978	/46 3.531	1.404
Ethambutol	J04AK02-ETHAMBUT	OL	Oral	381	167	72	65
Fidaxomicin	A07AA12-FIDAXOMIC		Oral	179	135	106	100
Framycetin	C05AA01-HYDROCO	RTISONE	Rectal	43,823	30,365	5,626	1,521
Framycetin Framycetin Gramicidin	C05AA51-HYDROCOL	RTISONE, COMBINATIONS	Rectal	583	516	379	143
Framycetin - Gramicidin	S03CA01-DEXAMETH	ASONE AND ANTIINFECTIVES	Ophthalmic	1,111	998	358	410
Fusidic Acid	D06AX01-FUSIDIC AC		Topical	70,360	61,417	6,290	1,584
Fusidic Acid	D07CC01-BETAMETH	ASONE AND ANTIBIOTICS	Topical	5,241	4,862	2,962	924
Fusidic Acid	S01AA13-FUSIDIC AC	ID	Ophthalmic	6,229	5,874	1,465	1,065
Gatifloxacin	S01AE06-GATIFLOXA	ACIN ASONE AND ANTIBIOTICS	Ophthalmic	10,824	9,060 41	317	1,245
Gentamicin	J01GB03-GENTAMICI	N	Intramuscular	174	135	75	66
Gramicidin - Neomycin Gramicidin - Polymyxin B	D07CB01-TRIAMCING	DLONE AND ANTIBIOTICS	Topical	16,694	14,351	3,071	1,379
Gramicidin - Polymyxin B	S03AA30-ANTIINFEC	TIVES, COMBINATIONS	Ophthalmic	1,092	952	499	309
Grepafloxacin	J01MA11-GREPAFLOX		Oral	1	1	1	1
Levofloxacin	J01DH51-IMIPENEIN A	AND CILASTATIN	Intravenous	22	14	9	5
Levofloxacin	J01MA12-LEVOFLOXA	ACIN	Intravenous	1	1	1	1
Linezolid	J01MA12-LEVOFLOXA	ACIN	Oral	16,451	13,670	4,401	1,403
Meropenem	J01DH02-MEROPENE	M	Intravenous	166	81	62	17
Metronidazole	D06BX01-METRONID	AZOLE	Topical	14,975	13,132	4,153	1,374
Metronidazole	G01AF01-METRONID	AZOLE	Vaginal	4,529	4,065	1,801	1,048
Metronidazole	J01XD01-METRONIDA		Intravenous	60	48	43	21
Metronidazole	P01AB01-METRONID	AZOLE	Oral	89,979	76,469	8,393	1,596
Minocycline	J01AA08-MINOCYCL		Oral	34,425	23,726	4,552	1,497
Moxifloxacin	J01MA14-MOXIFLOX	ACIN	Oral	4,297	2 3,542	2 1,064	971
Moxifloxacin	S01AE07-MOXIFLOXA	ACIN	Ophthalmic	49,363	41,428	2,778	1,526
Nupirocin	C05AA01-HYDROCO	n RTISONE	lopical Rectal	/1,961	64,107 1	6,760 1	1,590 1
Neomycin	D10AA02-METHYLPR	EDNISOLONE	Topical	274	245	187	181
Neomycın - Polymyxin B Nitrofurantoin	SUICA01-DEXAMETH	ASONE AND ANTIINFECTIVES	Ophthalmic Oral	2,151 132 985	1,842	360 8.496	570
Norfloxacin	J01MA06-NORFLOXA	ACIN	Oral	1,110	789	426	380
Ofloxacin Ozenovacin	S01AE01-OFLOXACIN		Ophthalmic	849	738	168	349
Penicillin	J01CE01-BENZYLPENI	CILLIN	Intramuscular	216	198	35	35
Penicillin	J01CE02-PHENOXYM		Oral	37,037	32,976	4,035	1,498
Pentamidine Isetionate	P01C X01-PENTAMIDI		Intramuscular	216	148	125	/5

Pentamidine Isetio

Appendix A. Continued

Main Ingredient	ATC Code	Route	Prescriptions	Patients	Prescribers	Pharmacies
Pip-Tazo	J01CR05-PIPERACILLIN AND BETA-LACTAMASE INHIBITOR	Intravenous	355	227	136	25
Polymyxin B	S02AA30-ANTIINFECTIVES, COMBINATIONS	Otic	50	49	43	38
Polymyxin B - Trimethoprim	S01AA30-COMBINATIONS OF DIFFERENT ANTIBIOTICS	Ophthalmic	1,937	1,867	286	661
Pyrazinamide	J04AK01-PYRAZINAMIDE	Oral	4	4	3	2
Rifabutin	J04AB04-RIFABUTIN	Oral	85	55	40	43
Rifampin	J04AB02-RIFAMPICIN	Oral	910	619	358	333
Rifaximin	A07AA11-RIFAXIMIN	Oral	3,843	1,997	1,359	826
Smx-Tmp	J01EE01-SULFAMETHOXAZOLE AND TRIMETHOPRIM	Oral	65,038	48,014	8,174	1,581
Spiramycin	J01FA02-SPIRAMYCIN	Oral	4	4	0	4
Sulfacetamide	S01CA02-PREDNISOLONE AND ANTIINFECTIVES	Ophthalmic	709	552	143	289
Sulfadiazine	D06BA01-SILVER SULFADIAZINE	Topical	7,483	6,525	2,336	1,268
Tetracycline	J01AA07-TETRACYCLINE	Oral	4,127	3,308	1,654	1,036
Tigecycline	J01AA12-TIGECYCLINE	Intravenous	7	3	1	2
Tobramycin	J01GB01-TOBRAMYCIN	Inhalation	334	207	90	128
Tobramycin	J01GB01-TOBRAMYCIN	Intramuscular	174	89	64	52
Tobramycin	S01AA12-TOBRAMYCIN	Ophthalmic	20,413	18,816	3,441	1,462
Tobramycin	S01CA01-DEXAMETHASONE AND ANTIINFECTIVES	Ophthalmic	64,945	55,258	4,424	1,561
Trimethoprim	J01EA01-TRIMETHOPRIM	Oral	1,344	770	522	485
Vancomycin	A07AA09-VANCOMYCIN	Oral	3,552	2,290	1,860	859
Vancomycin	J01XA01-VANCOMYCIN	Intravenous	1,071	431	193	35

Appendix B. Graph and Map Legend

Example section of the graph showing individual Pharmacy Local Aggregated Geography (PhLAG) rates with 95% confidence intervals.



Grey bar represents the 95% confidence limits.

- Solid black line represents average provincial rate.
- Length of bar represents observed rate.

Bar colour in graph/map corresponds to rate ratio category.





Fort Sa



Grey neighbourhoods are industrial, while green zones are park areas. Other colours (yellow, orange, pink) are used to highlight neighbourhood boundaries and represent no other information.

Calgary



Grey neighbourhoods are industrial, while green zones are park areas. Other colours (yellow, orange, pink) are used to highlight neighbourhood boundaries and represent no other information.

Appendix D. Rates for all Measures by PhLAG, 2021

PhLAG Name	Urban/ Rural	Antibiotics Patients	Antibiotics Prescriptions	Antibioti DDDs
Airdrie - Crossfield	S	317	545	15
Athabasca	R	262	481	11
Bantt	R	1/2	260	10
Beaumont	r. S	215	355	10
Black Diamond	S	221	373	11
Bonnyville	R	369	693	18
Boyle	R	306	577	15
Calgary - Centre	M	314	516	13
Calgary - Centre North	IVI M	438	/19	12
Calgary - Elbow Fish Creek	M	330	544	12
Calgary - NE	M	342	616	17
Calgary - North	М	252	410	10
Calgary - Nose Hill	M	236	385	11
Calgary - NW	M	266	429	13
Calgary - SE	M	293	520	14
Calgary - SVV	IVI M	249	405	12
Calgary - West Bow	M	132	206	7
Camrose & County	R	275	463	12
Canmore	S	199	322	9
Cardston-Kainai	R	332	667	20
Castor/Coronation/Consort	R	251	469	13
Chestermere	S	248	416	11
Claresholm Cochrane - Springbank	K S	196	317	9
Cold Lake	R	337	609	14
County Of Forty Mile	R	187	324	8
County Of Warner	R	268	465	14
Crowsnest Pass	R	295	512	16
Didsbury	R	218	376	11
Drayton Valley	R	338	616	16
Eamonton - Abbottstield	M	556	1,069	24
Edmonton - Bonnie Doon	IVI M	299	487	10
Edmonton - Eastwood	M	323	602	16
Edmonton - Jasper Place & West	M	318	568	15
Edmonton - Mill Woods	M	322	557	14
Edmonton - NE	Μ	292	506	13
Edmonton - North Centre	Μ	313	555	14
Edmonton - Rutherford	M	300	474	12
Edmonton - Iwin Brooks	M	251	398	11
Edmonton - Woodcrott East Edson	IVI R	2/19	220	14
Fairview	R	249	445	11
Flagstaff County	R	301	530	14
Fort Macleod	R	226	374	12
Fort Saskatchewan - Sturgeon East	S	349	600	16
Fox Creek	R	276	459	12
Frog Lake	R	450	883	23
Grande Cache Grande Prairie Area	R	231	522	10
High Level	R	361	747	20
High Prairie	R	345	706	17
High River	S	218	378	11
Hinton	R	215	350	10
Innisfail	R	210	360	10
Jasper	R	256	412	12
Lac La Biche	R	242	402	17
Lamont County	R	205	369	10
Leduc - Devon - Thorsby	S	340	570	16
Lethbridge Area	С	285	507	15
Manning	R	238	408	13
Mayerthorpe	R	170	284	8
Medicine Hat Area	С	313	595	16
Newell Okotoka Briddia	K	29/	569	15
Olds	D R	201	418	12
Oven	R	209	354	9
Peace River - Falher	R	297	538	15
Pincher Creek	R	311	546	17
Planning & Special Area 2	R	301	538	17
Ponoka	R	360	644	17
Provost - Wainwright	K	284	503	16
Rimbey	R	212	3/3	18
Rocky Mountain House	R	255	442	12
Slave Lake	R	395	715	20
Smoky Lake	R	296	506	11
St. Albert - Sturgeon West	S	310	539	14
St. Paul	R	351	677	17
Starland County/Drumheller	K	298	526	13
Strathcona County	к c	320	588	10
Strathmore	د ۲	259	4// Δ71	13
Sundre	R	312	531	16
Swan Hills	R	269	475	10
Sylvan Lake	R	361	621	18
Taber MD	R	254	444	13
Three Hills/Highway 21	R	201	333	9
Totield	R	248	469	11
Iwo Hills County	R	172	288	8
Valleyview	K	311	583	18
Vermilion River County	R	201	400	12
Vikina	R	357	580	14
Vulcan	R	229	414	11
Wabasca	R	404	829	21
Westlock	R	282	489	13
Westview Inc. S Grove S Plain	S	232	398	11
Wetaskiwin County	R	324	647	16
Alleiteenent		227		1.0

Appendix E. A	Antibiotic Prescriptions,	Patients,	Prescribers a	and Pharmacies	by PhLAG,	2021

PhLAG Name	Prescriptions	Patients	Prescribers	Pharmacies
Airdrie - Crossfield	44,634	26,253	2,915	33
Athabasca	5,586	2,963	331	4
Banff	2,689	1,844	255	3
Barrnead	7,111	4,108	3/1	5
Black Diamond	9,089	2,204 2,134	1,220 407	1
Bonnyville	11,393	6,047	460	5
Boyle	2,269	1,144	173	1
Calgary - Centre	34,104	20,809	2,855	42
Calgary - Centre North	32,728	19,736	2,892	28
Calgary - East	35,116	19,623	2,578	30
Calgary - Elbow Fish Creek	90,354	53,291	4,200	65 77
Calgary - Ne Calgary - North	120,200	29 330	4,247	20
Calgary - Nose Hill	31.332	19.030	2,863	28
Calgary - NW	83,090	50,902	4,080	45
Calgary - SE	64,490	37,577	3,558	31
Calgary - SW	48,305	29,596	2,946	29
Calgary - West	70,133	41,783	3,783	39
Calgary - West Bow	4,712	2,959	9/7	12
Canmore	9 476	5 833	771	12
Cardston - Kainai	10,766	5,349	321	6
Castor/Coronation/Consort	3,084	1,598	196	3
Chestermere	10,822	6,439	1,293	6
Claresholm	3,208	1,839	271	2
Cochrane-Springbank	17,103	10,393	1,668	11
County Of Forty Mile	1.065	6,/8U	547	6
County Of Warner	5 29/	3 015	216	3
Crowsnest Pass	3.610	1.977	218	3
Didsbury	6,745	3,793	668	6
Drayton Valley	11,478	6,211	609	8
Edmonton - Abbottsfield	15,316	7,964	1,311	11
Edmonton - Bonnie Doon	48,673	29,449	3,493	47
Edmonton - Duggan	19,676	12,343	1,833	17
Edmonton - EastWood	43,686	23,2/3	2,936	63 70
Edmonton - Jasper Mace & West Edmonton - Mill Woods	74 526	00,701 43 383	4,598	10
Edmonton - NE	45 420	26.443	2 690	31
Edmonton - North Centre	86,689	48,716	3,320	56
Edmonton - Rutherford	51,007	33,136	3,017	33
Edmonton - Twin Brooks	31,377	19,419	2,561	21
Edmonton - Woodcroft East	34,047	19,864	2,562	35
Edson	7,120	3,953	373	6
Fairview	3,402	1,945	1/6	3
Fidystatt County Fort Macleod	5,051	2,/58 1,571	2/3	5
Fort Saskatchewan - Sturgeon Fast	19 896	11 563	1 519	4
Fox Creek	959	581	70	1
Frog Lake	4,204	2,137	216	3
Grande Cache	1,479	923	95	2
Grande Prairie Area	57,195	32,057	1,112	28
High Level	15,935	8,123	289	3
High Prairie	7,962	3,888	262	4
Hipton	10,257	5,660	860	11
Innisfail	4,24U 6.451	2,599	291 572	5 7
Jasper	2 075	1.312	139	3
Lac La Biche	6,697	3,567	284	4
Lacombe	10,039	5,917	644	8
Lamont County	2,697	1,435	303	4
Leduc - Devon - Thorsby	30,579	18,112	2,066	22
Lethbridge Area	67,332	37,331	1,593	52
ivianning Mayorthorpe	1,413	808	89	1
Medicine Hat Area	5,002	2,907	534	5
Newell	15 240	25,///	970 544	33 10
Okotoks - Priddis	20.315	12.071	1.717	15
Olds	7.724	4,511	633	6
Oyen	1,314	761	66	1
Peace River - Falher	12,098	6,674	478	12
Pincher Creek	4,877	2,700	299	5
Planning & Special Area 2	2,170	1,152	167	4
PONOKA	8,249	4,518	510	5
Red Deer Area	8,616 77 /17	4,801 /1 007	3/8 2 072	57
Rimbev	3 952	2 344	372	4
Rocky Mountain House	9.356	5.284	703	7
Slave Lake	7,800	4,398	417	6
Smoky Lake	2,724	1,501	248	3
St. Albert - Sturgeon West	56,300	31,853	2,726	38
St. Paul	10,236	5,324	566	7
Statiand County/Drumheller	6,651	3,62/	436	6
Strathcona County	7,938 50 373	4,107 29.688	451 2 7/1	27
Strathmore	17 106	9.354	1 370	14
Sundre	4.093	2.296	362	4
Swan Hills	551	311	66	1
Sylvan Lake	10,962	6,424	739	6
Taber MD	8,107	4,680	333	5
Three Hills/Highway 21	4,079	2,351	393	5
Iotield	3,886	2,023	271	2
Iwo Hills County	1,533	919	143	1
Vareville/Minburn County	4,191	2,214	228	2
Vermilion River County	26 924	14 125	470	14
Viking	1.507	885	110	1
Vulcan	3,146	1,668	264	3
Wabasca	3,120	1,575	175	1
Westlock	10,124	5,659	683	8
Westview Inc. S Grove S Plain	39,414	22,669	2,350	33
Wetaskiwin County	21,658	10,815	1,059	15
Wood Ruffalo EM	8,396	4,659	420	6
	41,000	23,005	574	19