



Government of Canada Gouvernement du Canada

Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

Human Antimicrobial Use Short Report

2000–2010



...working towards the preservation of effective antimicrobials for humans and animals...

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Preamble

About CIPARS

The Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS) is pleased to present this short report on antimicrobial use (AMU) in humans. These data will also be presented as part of the 2010 CIPARS Annual Report integrating all components of CIPARS surveillance. This document contains final data of AMU surveillance in humans from 2000 to 2010 inclusive.

CIPARS Objectives

- Provide a unified approach to monitor trends in antimicrobial resistance and antimicrobial use in humans and animals.
- Disseminate timely surveillance data.
- Facilitate assessment of the public health impact of antimicrobials used in humans and agricultural sectors.
- Allow accurate comparisons with data from other countries that use similar surveillance systems.

Surveillance of Antimicrobial Use

Antimicrobial use surveillance in humans includes data obtained from the Canadian CompuScript dataset purchased from IMS Health Canada Inc. for the years 2000 through 2010. This dataset contains information on prescriptions for oral antimicrobials dispensed by a representative sample of Canadian retail pharmacies, approximately 5,900. A projection factor was used by IMS Health Canada Inc. to extrapolate the number of prescriptions dispensed in the stores actually sampled to that of the "universe" (8,691 pharmacies). The Territories were not included in the CompuScript dataset due to their low volumes.

The defined daily doses (DDDs) is the assumed average maintenance dose per day for a drug used for its main indication in adults.¹ The DDDs were based on the World Health Organization (WHO) Collaborating Centre for Drug Statistics Methodology guidelines. This statistical measure is used to standardize antimicrobial usage and allow international comparisons to be made.

What's new in the 2010 Human Antimicrobial Use Report

- Figures are only provided for individual antimicrobial classes whose trends in consumption were not consistent with previous years.
- More detailed Tables and Figures are provided to demonstrate provincial trends of individual antimicrobials
- The total cost of prescriptions in Canada has been adjusted to account for inflation values across Canada.

¹ Defined daily doses were computed from data on dispensed prescriptions for orally administered antimicrobials. However, an unknown proportion of orally administered antimicrobials sold by retail pharmacies is not consumed, therefore the DDDs may slightly overestimate true consumption.

Important Notes

Antimicrobial Groupings

- ATC class: Antimicrobials have been classified by the WHO Anatomic Therapeutic Chemical (ATC) classification system (Table A.1, Appendix A)
- Category of importance in human medicine: Antimicrobials have been categorized on the basis of importance in human medicine in accordance with the classification system of the Veterinary Drugs Directorate Health Canada (categories revised in April 2009, Table A.2, Appendix A).

Abbreviations of Canadian Provinces

- **BC** British Columbia
- **AB** Alberta
- **SK** Saskatchewan
- **MB** Manitoba
- **ON** Ontario
- **QC** Québec
- **NB** New Brunswick
- **NS** Nova Scotia
- **PEI** Prince Edward Island
- **NL** Newfoundland and Labrador

Antimicrobial Use

National Variations

Table 1. Number of prescriptions per 1,000 inhabitants of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	Number of prescriptions/1,000 inhabitants										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	18.66	18.41	17.54	17.69	16.98	18.66	19.35	19.67	20.54	21.01	18.75
Cefixime	Third-generation cephalosporins (J01DD)	5.66	5.28	4.83	4.23	3.68	3.74	3.77	3.98	4.23	4.45	5.26
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	76.23	81.03	85.73	91.74	94.22	95.30	98.66	97.58	97.42	96.35	97.01
Vancomycin	Glycopeptides (J01XA)	0.14	0.14	0.16	0.19	0.34	0.39	0.37	0.40	0.42	0.48	0.51
Metronidazole	Imidazole (J01XD)	NPD	16.65	16.71	17.09	17.25	17.41	18.50	17.70	18.06	18.59	19.39
Linezolid	Linezolid (J01XX)	NPD	< 0.01	0.01	0.02	0.04	0.04	0.04	0.05	0.05	0.06	0.07
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	193.18	183.54	171.05	169.81	156.08	168.34	168.94	158.51	155.79	157.37	162.56
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	45.42	42.10	39.85	39.62	36.59	36.89	37.25	34.87	32.93	32.07	28.34
Cloxacillin	β -lactamase resistant penicillins (J01CF)	19.78	18.38	16.78	15.61	14.17	12.49	11.87	10.34	9.30	8.35	10.19
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	41.03	41.70	43.07	45.23	45.65	48.36	51.48	49.95	50.17	50.08	48.12
Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	55.09	48.95	43.06	41.41	39.37	39.65	37.39	32.64	30.78	29.72	26.68
II Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	56.52	50.62	44.56	41.05	37.12	35.15	35.45	33.67	33.57	33.10	33.07
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	146.55	149.72	145.48	149.00	138.51	149.25	146.93	134.69	132.75	131.92	127.15
Clindamycin	Lincosamides (J01FF)	15.92	16.74	17.63	18.48	18.85	19.73	21.86	21.94	22.11	22.33	24.14
Nalidixic acid	Other quinolones, excluding fluoroquinolones (J01MB)	0.08	0.06	0.05	0.04	0.05	< 0.01	< 0.01	< 0.01	NPD	< 0.01	NPD
Erythromycin-sulfisoxazole	Sulfonamide combinations, excluding trimethoprim (J01RA)	3.50	2.43	1.58	1.05	0.67	0.60	0.52	0.36	0.12	< 0.01	NPD
Fusidic acid	Steroid antibacterials (J01XC)	0.06	0.06	0.05	0.05	0.05	0.06	0.07	0.05	0.04	0.02	< 0.01

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NPD = No prescriptions dispensed.

Table 1 (continued). Number of prescriptions per 1,000 inhabitants of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	Number of prescriptions/1,000 inhabitants											
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	43.47	41.16	39.31	38.41	36.71	36.33	37.07	35.55	35.52	35.61	36.38	
Trimethoprim	Trimethoprim and derivatives (J01EA)	2.22	2.12	2.13	2.16	2.02	1.85	1.95	1.93	1.87	1.91	1.94	
III Sulfamethizole, sulfapyridine, sulfisoxazole	Short-acting sulfonamides (J01EB)	0.07	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NPD	NPD	
Sulfadiazine, sulfamethoxazole	Intermediate-acting sulfonamides (J01EC)	0.02	< 0.01	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Nitrofurantoin	Nitrofurans derivatives (J01XE)	14.61	15.76	16.41	17.48	19.13	20.35	22.67	23.2	24.89	27.04	29.26	
Fosfomicin	Fosfomicin (J01XX)	0.44	0.47	0.29	0.21	0.14	0.11	0.09	0.05	0.01	0.02	0.01	
NC Methenamine	Methenamine (J01XX)	0.27	0.28	0.29	0.28	0.25	0.23	0.23	0.23	0.16	0.24	0.27	
Total (J01)		737.90	733.92	702.09	705.14	668.93	694.94	710.21	676.38	670.44	670.59	668.97	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

Chloramphenicol was removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported during the study period.

Table 2. Number of prescriptions per 1,000 inhabitants of individual oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

ATC Class	Antimicrobial	Number of prescriptions/1,000 inhabitants											
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
I	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	Amoxicillin and enzyme inhibitor (J01CR02)	18.66	18.41	17.54	17.69	16.98	18.66	19.35	19.67	20.54	21.01	18.75
	Third-generation cephalosporins (J01DD)	Cefixime (J01DD08)	5.66	5.28	4.83	4.23	3.68	3.74	3.77	3.98	4.23	4.45	5.26
	Fluoroquinolones (J01MA)	Ofloxacin (J01MA01)	1.78	1.47	1.22	1.09	0.98	0.84	0.85	0.74	0.64	0.55	0.43
		Ciprofloxacin (J01MA02)	51.25	47.70	48.32	51.35	53.46	55.90	61.06	61.76	62.56	62.50	64.23
		Norfloxacin (J01MA06)	12.49	12.06	11.43	10.71	10.06	9.30	8.83	7.58	6.96	6.41	5.89
		Levofloxacin (J01MA12)	10.35	14.32	13.11	13.36	13.10	11.48	10.52	9.68	9.68	9.20	9.18
		Moxifloxacin (J01MA14)	0.36	4.68	7.89	10.23	11.07	13.35	16.55	17.66	17.48	17.67	17.28
	Glycopeptides (J01XA)	Vancomycin (J01XA01)	0.14	0.14	0.16	0.19	0.34	0.39	0.37	0.40	0.42	0.48	0.51
	Imidazole (J01XD)	Metronidazole (J01XD01)	NPD	16.65	16.71	17.09	17.25	17.41	18.50	17.70	18.06	18.59	19.39
	Linezolid (J01XX)	Linezolid (J01XX08)	NPD	<0.01	0.01	0.02	0.04	0.04	0.04	0.05	0.05	0.06	0.07
	Penicillins with extended spectrum (J01CA)	Ampicillin (J01CA01)	3.28	2.77	2.22	1.98	1.68	1.36	1.19	0.98	0.86	0.78	0.73
		Amoxicillin (J01CA04)	179.87	172.09	162.04	162.10	149.79	163.86	165.55	155.76	154.31	156.58	161.83
		Pivampicillin (J01CA02)	9.75	8.48	6.64	5.70	4.60	3.12	2.19	1.78	0.63	0.01	<0.01
	β -lactamase sensitive penicillins (J01CE)	Penicillin G (J01CE01)	0.13	0.08	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		Penicillin V (J01CE02)	45.29	42.02	39.83	39.62	36.59	36.89	37.25	34.87	32.93	32.07	28.34
	β -lactamase resistant penicillins (J01CF)	Cloxacillin (J01CF02)	19.78	18.38	16.78	15.61	14.17	12.49	11.87	10.34	9.30	8.35	10.19
	First-generation cephalosporins (J01DB)	Cephalexin (J01DB01)	39.09	39.63	40.87	42.88	43.28	45.93	48.70	47.15	47.25	47.05	45.48
		Cefadroxil (J01DB05)	1.94	2.07	2.20	2.36	2.38	2.42	2.77	2.80	2.92	3.02	2.64
	Second-generation cephalosporins (J01DC)	Cefaclor (J01DC04)	18.62	13.78	9.73	7.19	4.98	4.36	3.23	2.54	2.06	1.65	0.36
Cefprozil (J01DC10)		14.59	16.47	18.50	21.20	22.98	23.82	23.44	20.01	18.95	18.52	17.96	
Cefuroxime axetil (J01DC02)		21.89	18.71	14.83	13.03	11.40	11.47	10.73	10.10	9.76	9.55	8.35	
Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	Sulfamethoxazole and trimethoprim (J01EE01)	56.27	50.43	44.41	40.95	37.07	35.14	35.45	33.67	33.57	33.09	33.07	
	Sulfadiazine and trimethoprim (J01EE02)	0.25	0.20	0.15	0.11	0.05	0.01	<0.01	NPD	<0.01	<0.01	NPD	
Macrolides (J01FA)	Azithromycin (J01FA10)	42.49	52.86	59.62	66.16	61.02	66.06	65.36	59.71	58.99	58.37	55.28	
	Clarithromycin (J01FA09)	69.20	69.22	64.72	63.47	59.11	65.01	67.07	65.07	65.01	66.61	65.53	
	Erythromycin (J01FA01)	34.14	26.99	20.63	18.69	15.06	12.65	11.14	9.09	8.56	6.81	6.19	
Lincosamides (J01FF)	Ciindamycin (J01FF01)	15.92	16.74	17.63	18.48	18.85	19.73	21.86	21.94	22.11	22.33	24.14	
Other quinolones, excluding fluoroquinolones (J01MB)	Nalidixic acid (J01MB02)	0.08	0.06	0.05	0.04	0.05	<0.01	<0.01	<0.01	NPD	<0.01	NPD	
Sulfonamide combinations, excluding trimethoprim (J01RA)	Erythromycin-sulfisoxazole (J01RA02)	3.50	2.43	1.58	1.05	0.67	0.60	0.52	0.36	0.12	<0.01	NPD	
Steroid antimicrobials (J01XC)	Fusidic acid (J01XC01)	0.06	0.06	0.05	0.05	0.05	0.06	0.07	0.05	0.04	0.02	<0.01	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate. ATC = Anatomical Therapeutic Chemical. NPD = No prescriptions dispensed.

Table 2 (continued). Number of prescriptions per 1,000 inhabitants of individual oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

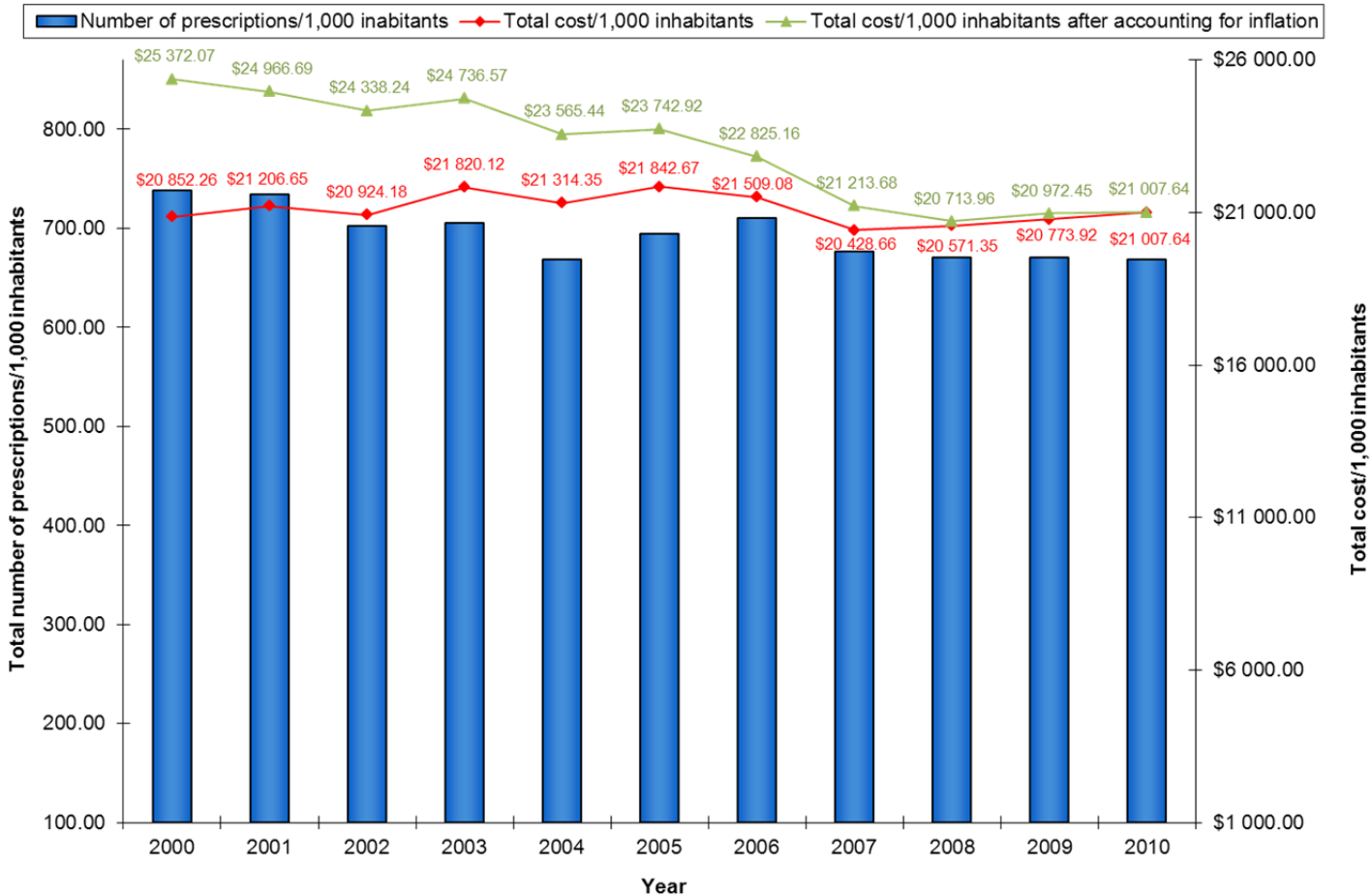
ATC Class	Antimicrobial	Number of prescriptions/1,000 inhabitants										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Tetracyclines (J01AA)	Doxycycline (J01AA02)	11.79	11.00	10.17	10.07	9.55	10.07	10.92	11.43	12.03	12.57	14.71
	Minocycline (J01AA08)	16.76	16.90	17.01	17.23	17.11	16.97	17.45	16.49	16.34	16.16	17.81
	Tetracycline (J01AA07)	14.91	13.23	12.08	11.07	10.01	9.26	8.66	7.61	7.14	6.88	3.87
Trimethoprim and derivatives (J01EA)	Trimethoprim (J01EA01)	2.22	2.12	2.13	2.16	2.02	1.85	1.95	1.93	1.87	1.91	1.94
III Short-acting sulfonamides (J01EB)	Sulfamethizole (J01EB02), sulfapyridine (J01EB04), sulfisoxazole (J01EB05)	0.07	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NPD	NPD
Intermediate-acting sulfonamides (J01EC)	Sulfadiazine (J01EC02), sulfamethoxazole (J01EC04)	0.02	< 0.01	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrofurans derivatives (J01XE)	Nitrofurantoin (J01XE01)	14.61	15.76	16.41	17.48	19.13	20.35	22.67	23.20	24.89	27.04	29.26
Fosfomicin (J01XX)	Fosfomicin (J01XX01)	0.44	0.47	0.29	0.21	0.14	0.11	0.09	0.05	0.01	0.02	0.01
NC Methenamine (J01XX)	Methenamine (J01XX05)	0.27	0.28	0.29	0.28	0.25	0.23	0.23	0.23	0.16	0.24	0.27
Total (J01)		737.90	733.92	702.09	705.14	668.93	694.94	710.21	676.38	670.44	670.59	668.97

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

Chloramphenicol was removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported during the study period.

Figure 1. Number of prescriptions and cost per 1,000 inhabitants (before and after accounting for inflation)¹ of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.



¹ Bank of Canada. Inflation Calculator. Available at: www.bankofcanada.ca/rates/related/inflation-calculator/. Accessed July 2012.

Table 3. Total cost per 1,000 inhabitants (after accounting for inflation)¹ of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	Total cost/1,000 inhabitants (\$)										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
I Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	923.13	873.35	750.05	717.42	646.40	685.99	703.73	696.47	695.31	723.97	664.25
Cefixime	Third-generation cephalosporins (J01DD)	258.27	231.67	208.87	176.09	147.29	149.45	144.62	153.32	159.97	170.81	206.35
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	5 214.65	5 363.75	5 534.67	5 757.50	5 372.40	4 652.61	4 432.50	4 358.38	4 224.70	4 164.79	4 002.39
Vancomycin	Glycopeptides (J01XA)	62.09	64.61	72.21	86.59	145.09	161.91	154.43	165.35	161.83	186.21	204.14
Metronidazole	Imidazole (J01XD)	NPD	234.15	261.19	275.77	288.80	292.12	313.90	292.92	292.80	305.32	376.21
Linezolid	Linezolid (J01XX)	NPD	7.49	22.72	49.44	79.15	104.16	97.23	102.77	99.77	118.29	119.58
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	3 239.69	3 012.85	2 810.49	2 784.62	2 537.56	2 665.80	2 622.95	2 480.15	2 906.97	3 053.52	3 250.18
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	605.12	550.15	526.61	525.19	481.99	469.70	465.21	437.15	451.92	454.11	423.57
Cloxacillin	β -lactamase resistant penicillins (J01CF)	350.06	321.03	292.63	274.56	250.02	214.26	200.60	175.48	200.70	188.29	236.44
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	896.39	890.56	929.30	978.59	984.39	1 014.20	1 061.46	1 017.99	1 223.22	1 262.00	1 290.87
Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	2 842.20	2 512.79	2 117.08	2 048.94	1 987.63	2 013.05	1 926.40	1 600.16	1 297.58	1 251.66	1 108.27
II Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	769.12	672.30	594.39	545.41	485.13	443.23	437.29	413.70	400.78	397.51	441.90
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	7 057.51	7 272.73	7 233.99	7 527.10	7 210.60	7 926.75	7 197.47	6 338.06	5 754.52	5 784.36	5 549.92
Clindamycin	Lincosamides (J01FF)	811.33	712.98	738.66	742.26	746.58	759.59	820.83	811.56	786.52	808.43	875.58
Nalidixic acid	Other quinolones, excluding fluoroquinolones (J01MB)	4.40	3.54	2.94	2.57	2.39	0.08	0.02	< 0.01	NPD	< 0.01	NPD
Erythromycin-sulfisoxazole	Sulfonamide combinations, excluding trimethoprim (J01RA)	115.76	77.96	50.56	33.31	21.67	19.79	16.78	11.74	3.83	< 0.01	NPD
Fusidic acid	Steroid antibacterials (J01XC)	7.47	7.94	7.03	7.14	6.90	7.54	7.65	5.79	4.81	2.25	0.11
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	1 771.73	1 709.25	1 728.33	1 728.77	1 672.20	1 648.26	1 662.51	1 587.69	1 465.12	1 456.42	1 546.47
Chloramphenicol	Amphenicols (J01BA)	0.02	0.06	0.01	NPD	< 0.01	< 0.01	NPD	NPD	NPD	NPD	< 0.01
Trimethoprim	Trimethoprim and derivatives (J01EA)	58.00	51.42	48.56	44.92	38.73	34.35	34.44	32.69	29.54	33.44	35.77
III Sulfamethizole, sulfapyridine, sulfisoxazole	Short-acting sulfonamides (J01EB)	3.39	0.41	0.03	0.02	0.02	< 0.01	0.01	< 0.01	< 0.01	NPD	NPD
Sulfadiazine, sulfamethoxazole	Intermediate-acting sulfonamides (J01EC)	0.55	0.47	0.37	0.54	0.24	0.18	0.17	0.19	0.14	< 0.01	< 0.01
Nitrofurantoin	Nitrofurans derivatives (J01XE)	354.00	367.71	387.14	413.71	447.20	469.27	515.60	524.07	549.78	604.80	667.70
Fosfomicin	Fosfomicin (J01XX)	17.90	18.91	12.09	8.62	6.10	4.82	3.81	2.19	0.39	0.91	0.59
NC Methenamine	Methenamine (J01XX)	9.30	8.56	8.30	7.47	6.98	5.80	5.55	5.80	3.79	5.39	7.34
Total (J01)		25 372.07	24 966.69	24 338.24	24 736.57	23 565.44	23 742.92	22 825.16	21 213.68	20 713.96	20 972.45	21 007.64

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate. ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

¹ Bank of Canada. Inflation Calculator. Available at: www.bankofcanada.ca/rates/related/inflation-calculator/. Accessed July 2012.

Table 4. Defined daily doses per 1,000 inhabitant-days of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	DDDs/1,000 inhabitant-days											
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	0.51	0.52	0.50	0.52	0.52	0.59	0.64	0.67	0.71	0.75	0.67	
I Cefixime	Third-generation cephalosporins (J01DD)	0.10	0.09	0.08	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.08	
Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	1.83	1.93	1.99	2.08	2.09	2.08	2.14	2.09	2.06	2.03	2.05	
Metronidazole	Imidazole (J01XD)	NPD	0.21	0.22	0.22	0.22	0.23	0.24	0.23	0.24	0.24	0.26	
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	5.07	4.90	4.63	4.57	4.38	4.52	4.61	4.43	4.43	4.54	4.74	
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	0.67	0.63	0.60	0.60	0.55	0.56	0.57	0.54	0.51	0.49	0.44	
Cloxacillin	β -lactamase resistant penicillins (J01CF)	0.37	0.35	0.32	0.31	0.28	0.25	0.24	0.21	0.19	0.18	0.22	
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	0.75	0.77	0.80	0.85	0.87	0.92	1.00	0.97	0.98	0.98	0.96	
Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	1.39	1.22	1.05	1.00	0.94	0.96	0.91	0.83	0.80	0.78	0.70	
II Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	1.39	1.25	1.12	1.04	0.92	0.84	0.84	0.78	0.77	0.76	0.75	
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	3.68	3.65	3.44	3.58	3.44	3.78	3.87	3.75	3.73	3.79	3.75	
Clindamycin	Lincosamides (J01FF)	0.24	0.27	0.28	0.31	0.32	0.32	0.36	0.37	0.38	0.39	0.43	
Erythromycin-sulfisoxazole	Sulfonamide combinations, excluding trimethoprim (J01RA)	0.09	0.06	0.04	0.03	0.02	0.02	0.01	0.01	< 0.01	< 0.01	NPD	
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	2.72	2.62	2.54	2.50	2.40	2.42	2.47	2.39	2.39	2.41	2.47	
III Trimethoprim	Trimethoprim and derivatives (J01EA)	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	
Sulfamethizole, sulfapyridine, sulfisoxazole	Short-acting sulfonamides (J01EB)	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NPD	NPD	
Nitrofurantoin	Nitrofurans derivatives (J01XE)	0.42	0.44	0.45	0.47	0.49	0.52	0.57	0.58	0.61	0.66	0.70	
NC Methenamine	Methenamine (J01XX)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	0.01	0.01	
Total (J01)		19.32	19.00	18.15	18.24	17.60	18.14	18.60	17.98	17.93	18.12	18.29	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NC = Not classified. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported during the study period. These are: chloramphenicol, fosfomicin, fusidic acid, linezolid, nalidixic acid, sulfadiazine, sulfamethoxazole, and vancomycin.

Table 5. Defined daily doses per 1,000 inhabitant-days of individual oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

ATC Class	Antimicrobial	DDDs/1,000 inhabitant-days											
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
I	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	Amoxicillin and enzyme inhibitor (J01CR02)	0.51	0.52	0.50	0.52	0.52	0.59	0.63	0.67	0.71	0.74	0.67
	Third-generation cephalosporins (J01DD)	Cefixime (J01DD08)	0.10	0.09	0.08	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.08
	Fluoroquinolones (J01MA)	Ofloxacin (J01MA01)	0.13	0.11	0.09	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.03
		Ciprofloxacin (J01MA02)	1.14	1.06	1.04	1.07	1.08	1.11	1.20	1.20	1.20	1.20	1.24
		Norfloxacin (J01MA06)	0.28	0.27	0.26	0.24	0.22	0.21	0.19	0.17	0.15	0.14	0.13
		Levofloxacin (J01MA12)	0.27	0.36	0.32	0.33	0.32	0.29	0.27	0.25	0.24	0.23	0.23
		Moxifloxacin (J01MA14)	0.01	0.11	0.19	0.24	0.26	0.32	0.40	0.43	0.42	0.42	0.42
	Imidazole (J01XD)	Metronidazole (J01XD01)	NPD	0.21	0.22	0.22	0.22	0.23	0.24	0.23	0.24	0.24	0.26
	Penicillins with extended spectrum (J01CA)	Ampicillin (J01CA01)	0.06	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.01
		Amoxicillin (J01CA04)	4.79	4.66	4.43	4.40	4.24	4.42	4.53	4.36	4.39	4.52	4.73
Pivampicillin (J01CA02)		0.21	0.19	0.15	0.13	0.11	0.08	0.06	0.05	0.02	< 0.01	< 0.01	
β -lactamase sensitive penicillins (J01CE)	Penicillin V (J01CE02)	0.67	0.63	0.60	0.60	0.55	0.56	0.57	0.54	0.51	0.49	0.44	
β -lactamase resistant penicillins (J01CF)	Cloxacillin (J01CF02)	0.37	0.35	0.32	0.31	0.28	0.25	0.24	0.21	0.19	0.18	0.22	
First-generation cephalosporins (J01DB)	Cephalexin (J01DB01)	0.72	0.74	0.78	0.82	0.84	0.89	0.96	0.94	0.94	0.94	0.92	
	Cefadroxil (J01DB05)	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	
II	Second-generation cephalosporins (J01DC)	Cefaclor (J01DC04)	0.37	0.27	0.19	0.15	0.11	0.09	0.07	0.05	0.04	0.04	0.01
		Cefprozil (J01DC10)	0.22	0.25	0.29	0.34	0.38	0.39	0.39	0.35	0.34	0.33	0.33
		Cefuroxime axetil (J01DC02)	0.80	0.69	0.56	0.51	0.46	0.47	0.45	0.43	0.42	0.41	0.36
Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	Sulfamethoxazole and trimethoprim (J01EE01)	1.38	1.25	1.12	1.04	0.92	0.84	0.84	0.78	0.77	0.76	0.75	
	Sulfadiazine and trimethoprim (J01EE02)	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	NPD	< 0.01	< 0.01	NPD	
Macrolides (J01FA)	Azithromycin (J01FA10)	0.53	0.65	0.73	0.82	0.76	0.83	0.83	0.78	0.78	0.79	0.79	
	Clarithromycin (J01FA09)	2.22	2.25	2.11	2.23	2.18	2.48	2.64	2.68	2.70	2.79	2.76	
	Erythromycin (J01FA01)	0.92	0.74	0.59	0.53	0.44	0.37	0.34	0.28	0.25	0.21	0.20	
Lincosamides (J01FF)	Clindamycin (J01FF01)	0.24	0.27	0.28	0.31	0.32	0.32	0.36	0.37	0.38	0.39	0.43	
Sulfonamide combinations, excluding trimethoprim (J01RA)	Erythromycin-sulfisoxazole (J01RA02)	0.09	0.06	0.04	0.03	0.02	0.02	0.01	0.01	< 0.01	< 0.01	NPD	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported during the study period. These are: chloramphenicol, fosfomycin, fusidic acid, linezolid, nalidixic acid, penicillin G, sulfadiazine, sulfamethoxazole, and vancomycin.

Table 5 (continued). Defined daily doses per 1,000 inhabitant-days of individual oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

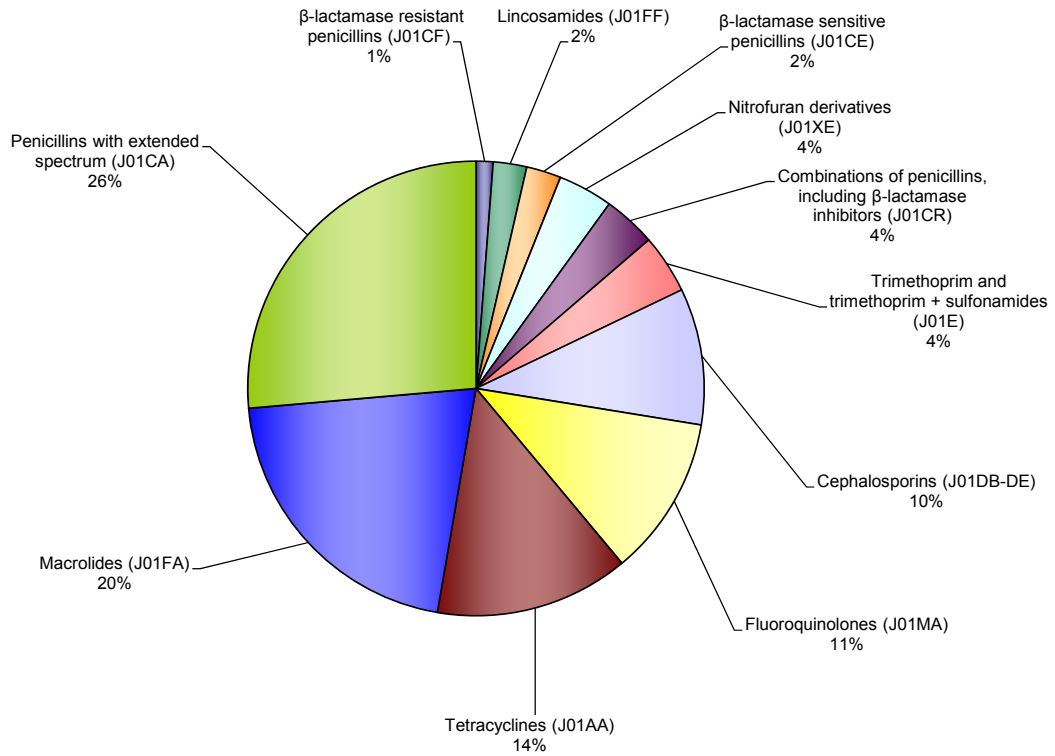
ATC Class	Antimicrobial	DDDs/1,000 inhabitant-days										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Tetracyclines (J01AA)	Doxycycline (J01AA02)	0.75	0.73	0.70	0.71	0.70	0.74	0.81	0.85	0.91	0.96	1.15
	Minocycline (J01AA08)	0.97	1.00	1.01	1.04	1.03	1.04	1.07	1.02	1.00	0.99	1.07
	Tetracycline (J01AA07)	0.99	0.89	0.83	0.75	0.67	0.63	0.60	0.52	0.48	0.46	0.25
III Trimethoprim and derivatives (J01EA)	Trimethoprim (J01EA01)	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05
Short-acting sulfonamides (J01EB)	Sulfamethizole (J01EB02), sulfapyridine (J01EB04), sulfisoxazole (J01EB05)	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	NPD	NPD
Nitrofurantoin (J01XE)	Nitrofurantoin (J01XE01)	0.42	0.44	0.45	0.47	0.49	0.52	0.57	0.58	0.61	0.66	0.70
NC Methenamine (J01XX)	Methenamine (J01XX05)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	0.01	0.01
Total (J01)		19.32	19.00	18.15	18.24	17.60	18.14	18.60	17.98	17.93	18.12	18.29

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NC = Not classified. NPD = No prescriptions dispensed.

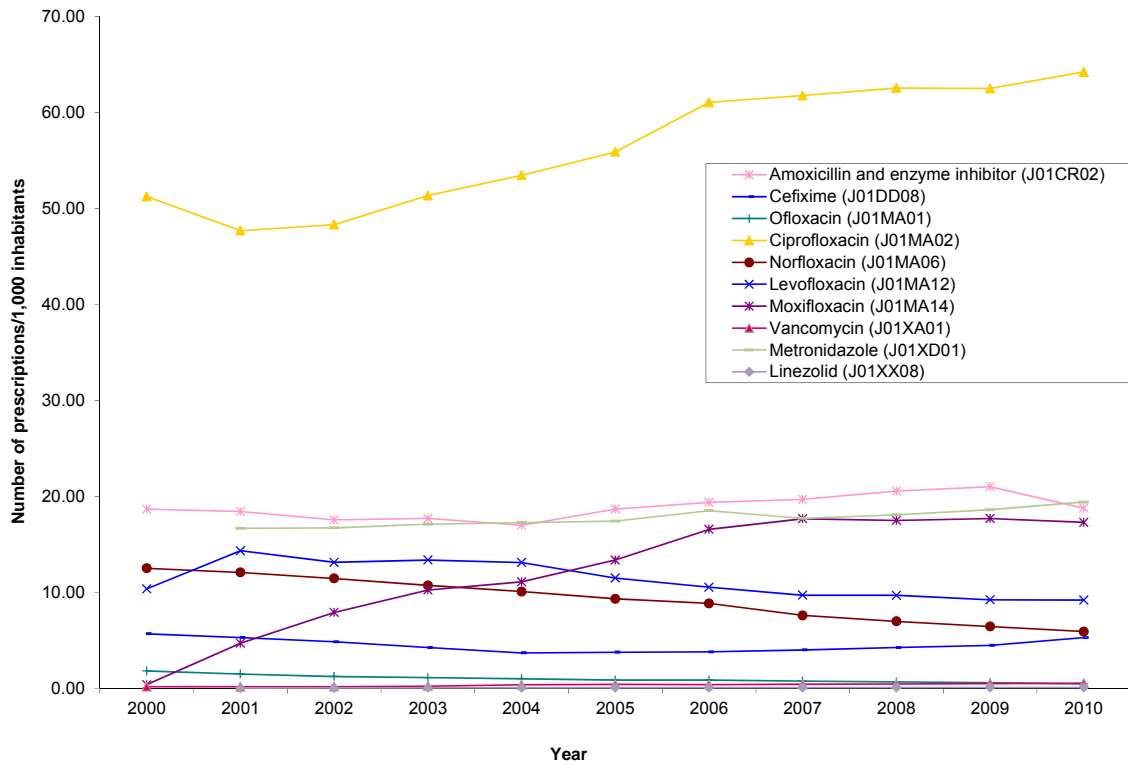
Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported during the study period. These are: chloramphenicol, fosfomycin, fusidic acid, linezolid, nalidixic acid, penicillin G, sulfadiazine, sulfamethoxazole, and vancomycin.

Figure 2. Percentages of defined daily doses per 1,000 inhabitant-days of oral antimicrobials dispensed by Canadian retail pharmacies, 2010.



Alphanumeric codes in parentheses represent Anatomical Therapeutic Chemical classes of antimicrobials.

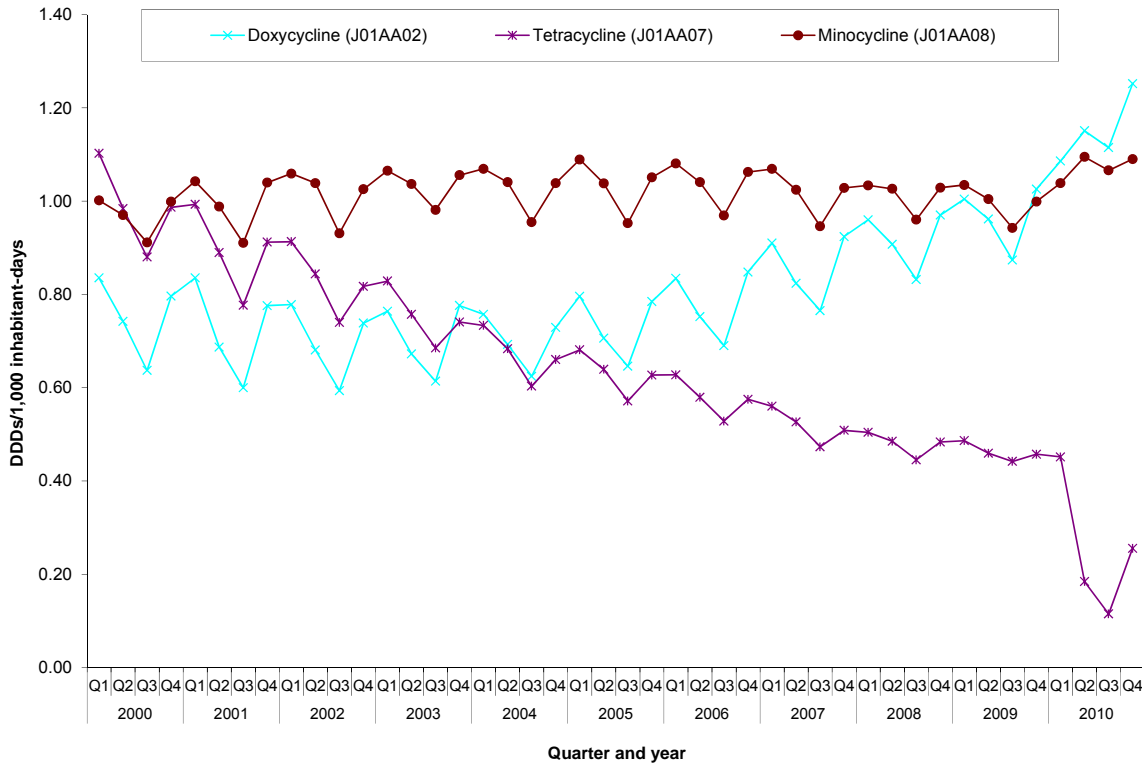
Figure 3. Number of prescriptions per 1,000 inhabitants of Category I (Very High Importance to Human Medicine)¹ oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.



Alphanumeric codes represent Anatomical Therapeutic Chemical classes of antimicrobials.

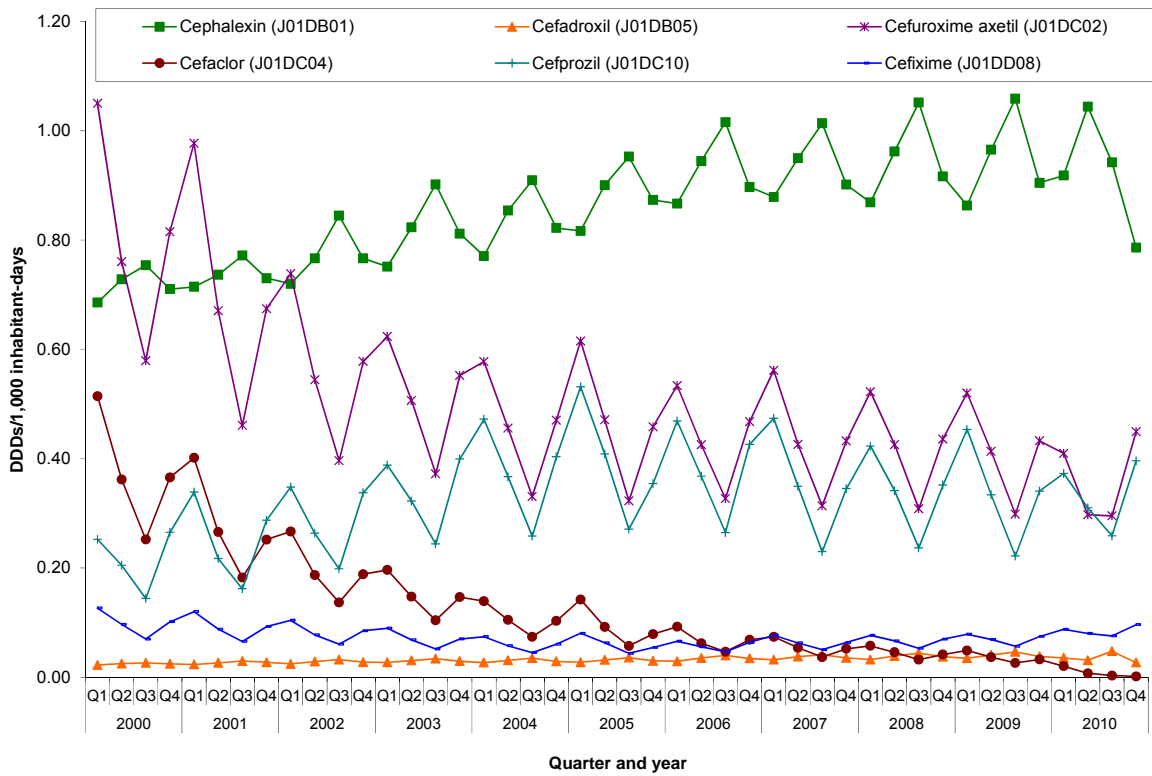
¹ Version April, 2009. Available at: www.hc-sc.gc.ca/dhp-mps/vet/antimicrob/amr_ram_hum-med-rev-eng.php. Accessed October 2012.

Figure 4. Consumption (DDDs/1,000 inhabitant-days) by quarter of oral tetracyclines (J01AA) dispensed by Canadian retail pharmacies, 2000–2010.



Alphanumeric codes represent Anatomical Therapeutic Chemical classes of antimicrobials.
 DDDs = Defined daily doses.

Figure 5. Consumption (DDDs/1,000 inhabitant-days) by quarter of oral cephalosporins (J01DB-DD) dispensed by Canadian retail pharmacies, 2000–2010.



Alphanumeric codes represent Anatomical Therapeutic Chemical classes of antimicrobials.
 DDDs = Defined daily doses.

Provincial Variations

Table 6. Number of prescriptions per 1,000 inhabitants of oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.

Antimicrobial	ATC Class	Number of prescriptions/1,000 inhabitants										
		BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	15.57	18.55	15.30	16.67	14.64	26.36	20.47	20.50	30.70	44.28	
Cefixime	Third-generation cephalosporins (J01DD)	5.55	5.41	1.89	4.11	5.62	4.87	3.61	5.80	13.45	8.17	
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	86.24	94.40	67.59	93.12	93.70	112.82	95.47	83.08	108.90	168.13	
Vancomycin	Glycopeptides (J01XA)	0.52	0.24	0.14	0.15	0.21	1.33	0.24	0.26	0.08	0.14	
Metronidazole	Imidazole (J01XD)	19.01	21.67	23.60	20.13	20.34	15.63	19.37	22.56	17.30	28.78	
Linezolid	Linezolid (J01XX)	0.05	0.02	0.09	0.01	0.05	0.14	0.04	0.02	0.04	0.02	
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	153.80	171.32	249.45	185.63	188.73	94.13	162.92	180.68	178.24	322.73	
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	28.48	30.13	20.70	32.50	23.28	34.99	36.67	30.12	26.68	38.88	
Cloxacillin	β -lactamase resistant penicillins (J01CF)	10.20	9.05	16.95	21.89	10.77	6.62	7.29	11.03	12.97	21.10	
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	59.24	58.04	93.98	61.66	47.59	26.22	56.53	56.98	50.71	84.05	
II Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	11.45	23.58	13.17	17.68	32.17	29.42	33.42	36.00	12.16	32.11	
Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	34.32	36.20	61.95	46.10	32.23	21.43	43.80	51.69	53.67	61.71	
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	100.97	128.40	137.24	141.42	142.12	108.33	139.02	134.30	154.85	189.08	
Clindamycin	Lincosamides (J01FF)	24.34	29.81	31.62	19.82	24.13	21.66	25.41	23.99	16.73	20.60	
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	42.88	45.65	62.83	35.83	28.85	36.61	31.38	47.32	47.74	41.47	
III Trimethoprim	Trimethoprim and derivatives (J01EA)	1.01	1.01	2.87	0.34	1.71	3.55	1.90	0.80	1.53	2.40	
Nitrofurantoin	Nitrofurans derivatives (J01XE)	34.10	24.29	41.80	18.50	36.77	16.19	29.16	39.11	22.80	21.40	
Fosfomicin	Fosfomicin (J01XX)	0.03	0.01	0.03	< 0.01	0.01	0.01	0.01	0.07	NPD	0.02	
NC Methenamine	Methenamine (J01XX)	0.24	0.14	0.14	< 0.01	0.14	0.71	0.16	0.01	NPD	0.01	
Total (J01)		628.06	697.97	841.54	715.61	703.15	561.16	707.05	744.34	748.55	1,085.11	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported among the provinces. These are: chloramphenicol, erythromycin-sulfisoxazole, fusidic acid, nalidixic acid, sulfadiazine, sulfamethizole, sulfamethoxazole, sulfapyridine, and sulfisoxazole.

Table 7. Consumption (DDDs/1,000 inhabitant-days) of oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.

Antimicrobial	ATC Class	DDDs/1,000 inhabitant-days									
		BC	AB	SK	MB	ON	QC	NB	NS	PE	NL
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	0.55	0.63	0.51	0.62	0.54	0.95	0.81	0.77	1.04	1.53
Cefixime	Third-generation cephalosporins (J01DD)	0.11	0.10	0.02	0.07	0.09	0.06	0.07	0.10	0.28	0.17
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	1.68	2.01	1.41	2.01	2.16	2.03	2.13	1.96	2.39	4.60
Vancomycin	Glycopeptides (J01XA)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Metronidazole	Imidazole (J01XD)	0.25	0.28	0.29	0.28	0.28	0.20	0.26	0.30	0.24	0.37
Ampicillin, amoxicillin, pivampicillin	Penicillins w ith extended spectrum (J01CA)	4.37	4.92	6.90	5.50	5.35	3.07	5.18	5.39	5.20	9.78
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	0.47	0.50	0.36	0.47	0.36	0.52	0.59	0.49	0.53	0.65
Cloxacillin	β -lactamase resistant penicillins (J01CF)	0.21	0.19	0.34	0.47	0.23	0.15	0.16	0.24	0.30	0.46
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	1.15	1.17	1.91	1.21	0.97	0.44	1.24	1.23	1.09	1.81
II Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	0.45	0.60	0.38	0.47	0.77	0.72	1.33	1.08	0.38	1.44
Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	0.87	0.96	1.43	1.04	0.72	0.37	1.00	1.14	1.27	1.69
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	3.38	4.03	3.17	3.40	4.07	3.27	4.12	3.87	4.30	6.25
Clindamycin	Lincosamides (J01FF)	0.42	0.54	0.59	0.38	0.41	0.39	0.50	0.45	0.35	0.38
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	3.05	3.15	4.56	2.56	2.32	1.77	1.99	3.07	3.48	2.61
III Trimethoprim	Trimethoprim and derivatives (J01EA)	0.04	0.03	0.11	0.01	0.06	0.05	0.05	0.02	0.03	0.12
Nitrofurantoin	Nitrofurans derivatives (J01XE)	0.79	0.64	1.05	0.49	0.87	0.34	0.80	1.02	0.69	0.65
NC Methenamine	Methenamine (J01XX)	0.01	0.01	0.01	< 0.01	< 0.01	0.01	0.01	< 0.01	NPD	< 0.01
Total (J01)		17.82	19.78	23.07	19.00	19.22	14.35	20.27	21.13	21.56	32.53

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NC = Not classified. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported among the provinces. These are: chloramphenicol, erythromycin-sulfisoxazole, fosfomicin, fusidic acid, linezolid, nalidixic acid, sulfadiazine, sulfamethizole, sulfamethoxazole, sulfapyridine, and sulfisoxazole.

Table 8. Consumption (DDDs/1,000 inhabitant-days) of individual oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.

ATC Class	Antimicrobial	DDDs/1,000 inhabitant-days										
		BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	
I	Combinations of penicillins, including β-lactamase inhibitors (J01CR)	Amoxicillin and enzyme inhibitor (J01CR02)	0.55	0.63	0.51	0.62	0.54	0.94	0.81	0.77	1.04	1.53
	Third-generation cephalosporins (J01DD)	Cefixime (J01DD08)	0.11	0.10	0.02	0.07	0.09	0.06	0.07	0.10	0.28	0.17
	Fluoroquinolones (J01MA)	Ofloxacin (J01MA01)	0.01	0.01	< 0.01	0.02	0.04	0.03	0.03	0.06	0.12	0.12
		Ciprofloxacin (J01MA02)	1.22	1.27	1.03	1.32	1.17	1.22	1.07	1.22	1.21	3.70
		Norfloxacin (J01MA06)	0.02	0.11	0.01	0.03	0.23	0.02	0.42	0.10	0.22	0.29
		Levofloxacin (J01MA12)	0.06	0.33	0.07	0.41	0.31	0.18	0.04	0.25	0.21	0.08
		Moxifloxacin (J01MA14)	0.37	0.28	0.30	0.23	0.40	0.58	0.57	0.32	0.63	0.41
	Glycopeptides (J01XA)	Vancomycin (J01XA01)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
	Imidazole (J01XD)	Metronidazole (J01XD01)	0.25	0.28	0.29	0.28	0.28	0.20	0.26	0.30	0.24	0.37
	Penicillins with extended spectrum (J01CA)	Ampicillin (J01CA01)	0.01	0.01	0.10	< 0.01	0.01	< 0.01	0.01	0.02	0.05	0.18
Amoxicillin (J01CA04)		4.35	4.91	6.80	5.50	5.34	3.06	5.16	5.37	5.15	9.60	
β-lactamase sensitive penicillins (J01CE)	Penicillin V (J01CE02)	0.47	0.50	0.36	0.47	0.36	0.52	0.59	0.49	0.53	0.65	
β-lactamase resistant penicillins (J01CF)	Cloxacillin (J01CF02)	0.21	0.19	0.34	0.47	0.23	0.15	0.16	0.24	0.30	0.46	
First-generation cephalosporins (J01DB)	Cephalexin (J01DB01)	1.15	1.17	1.91	1.21	0.97	0.30	1.23	1.23	1.09	1.81	
	Cefadroxil (J01DB05)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.14	0.01	< 0.01	< 0.01	< 0.01	
II	Second-generation cephalosporins (J01DC)	Cefaclor (J01DC04)	0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.03	0.01	0.01	0.02
		Cefprozil (J01DC10)	0.01	0.28	0.06	0.19	0.42	0.49	0.16	0.40	0.11	0.01
		Cefuroxime axetil (J01DC02)	0.43	0.32	0.31	0.28	0.34	0.23	1.13	0.67	0.27	1.41
Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	Sulfamethoxazole and trimethoprim (J01EE01)	0.87	0.96	1.43	1.04	0.72	0.37	1.00	1.14	1.27	1.69	
Macrolides (J01FA)	Azithromycin (J01FA10)	0.43	0.68	0.88	1.30	0.99	0.63	0.88	0.88	0.77	0.93	
	Clarithromycin (J01FA09)	2.66	3.16	1.53	1.78	2.91	2.59	3.03	2.61	2.60	4.97	
	Erythromycin (J01FA01)	0.30	0.20	0.76	0.33	0.17	0.05	0.22	0.38	0.92	0.35	
Lincosamides (J01FF)	Clindamycin (J01FF01)	0.42	0.54	0.59	0.38	0.41	0.39	0.50	0.45	0.35	0.38	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported among the provinces. These are: chloramphenicol, erythromycin-sulfisoxazole, fosfomicin, fusidic acid, linezolid, nalidixic acid, penicillin G, pivampicillin, sulfadiazine, sulfadiazine and trimethoprim, sulfamethizole, sulfamethoxazole, sulfapyridine, and sulfisoxazole.

Antimicrobial Use – Provincial Variations

Table 8 (continued). Consumption (DDDs/1,000 inhabitant-days) of individual oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.

ATC Class	Antimicrobial	DDDs/1,000 inhabitant-days									
		BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL
III	Doxycycline (J01AA02)	1.75	1.33	3.93	1.24	0.99	0.61	0.91	1.46	1.61	1.04
	Minocycline (J01AA08)	1.04	1.62	0.38	1.04	0.99	1.04	0.88	1.32	1.12	1.27
	Tetracycline (J01AA07)	0.26	0.20	0.25	0.28	0.34	0.11	0.19	0.29	0.75	0.30
Trimethoprim and derivatives (J01EA)	Trimethoprim (J01EA01)	0.04	0.03	0.11	0.01	0.06	0.05	0.05	0.02	0.03	0.12
	Nitrofurantoin (J01XE01)	0.79	0.64	1.05	0.49	0.87	0.34	0.80	1.02	0.69	0.65
NC	Methenamine (J01XX)	0.01	0.01	0.01	<0.01	<0.01	0.01	0.01	<0.01	NPD	<0.01
Total (J01)		17.82	19.78	23.07	19.00	19.22	14.35	20.27	21.13	21.56	32.53

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. DDDs = Defined daily doses. NC = Not classified. NPD = No prescriptions dispensed.

Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported among the provinces. These are: chloramphenicol, erythromycin-sulfisoxazole, fosfomycin, fusidic acid, linezolid, nalidixic acid, penicillin G, pivampicillin, sulfadiazine, sulfadiazine and trimethoprim, sulfamethizole, sulfamethoxazole, sulfapyridine, and sulfisoxazole.

Table 9. Total cost per 1,000 inhabitant-days of oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.

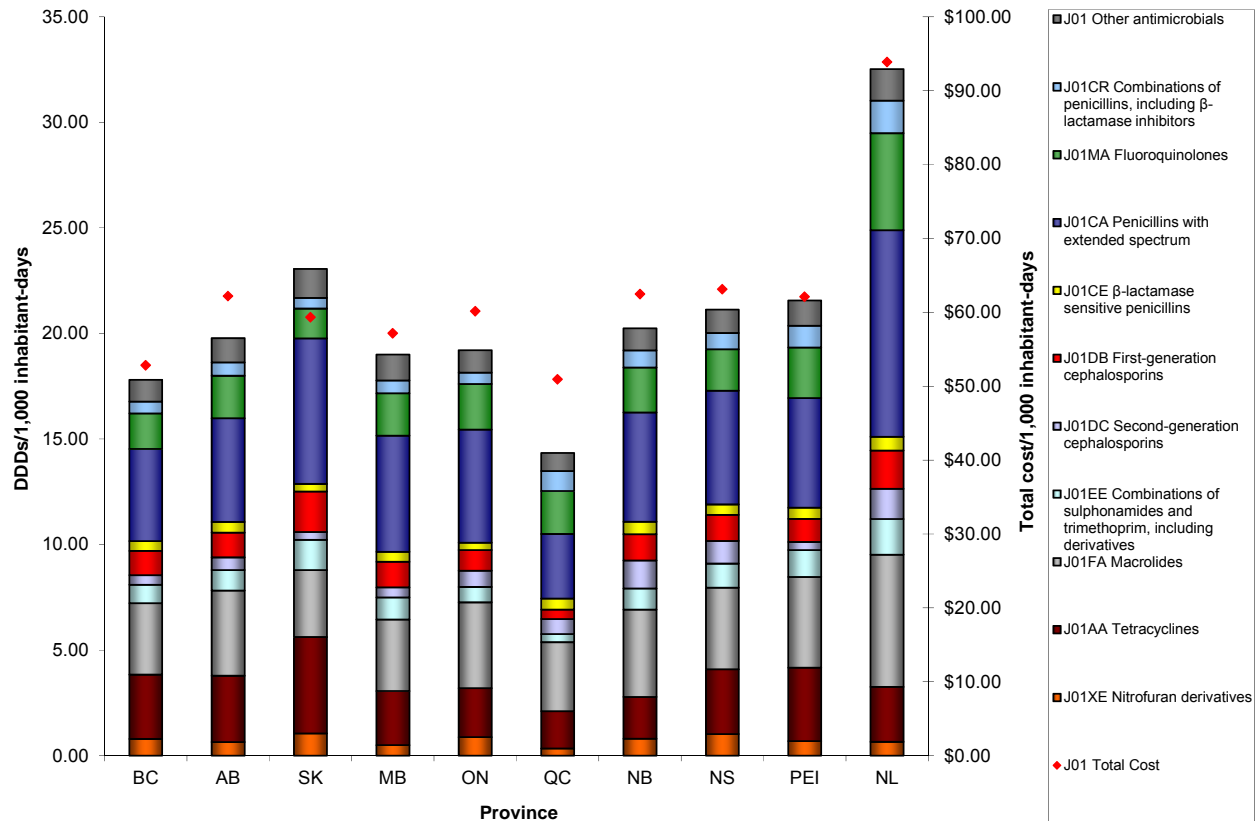
Antimicrobial	ATC Class	Total cost/1,000 inhabitant-days (\$)										
		BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	1.51	1.80	1.41	1.77	1.41	2.53	2.12	2.06	2.88	4.45	
Cefixime	Third-generation cephalosporins (J01DD)	0.66	0.63	0.17	0.48	0.62	0.41	0.43	0.66	1.83	1.01	
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	9.82	10.96	7.96	10.55	10.80	11.70	12.00	10.45	13.85	22.22	
Vancomycin	Glycopeptides (J01XA)	0.59	0.33	0.18	0.20	0.33	1.23	0.28	0.31	0.09	0.19	
Metronidazole	Imidazole (J01XD)	0.96	1.24	1.09	0.98	1.15	0.75	1.00	1.17	0.83	1.38	
Linezolid	Linezolid (J01XX)	0.37	0.09	0.52	0.17	0.30	0.53	0.10	0.13	0.21	0.11	
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	8.19	9.73	11.83	9.73	10.17	5.87	8.86	9.61	8.58	16.21	
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	1.17	1.36	0.77	1.34	0.93	1.46	1.34	1.14	0.96	1.35	
Cloxacillin	β -lactamase resistant penicillins (J01CF)	0.65	0.60	1.02	1.39	0.68	0.42	0.45	0.69	0.78	1.27	
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	4.25	4.36	6.08	4.52	3.57	1.93	4.30	4.28	3.52	6.05	
II Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	1.39	2.65	1.42	2.07	3.46	3.47	4.48	4.50	1.53	4.46	
Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	1.34	1.56	2.13	1.78	1.18	0.64	1.60	1.89	1.75	2.24	
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	12.45	15.97	13.60	14.68	16.63	13.70	17.14	15.73	16.94	24.28	
Clindamycin	Lincosamides (J01FF)	2.53	3.22	3.39	2.16	2.26	2.06	2.88	2.62	1.92	2.21	
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	4.65	5.89	4.74	4.15	4.18	3.23	3.43	5.21	4.97	4.82	
III Trimethoprim	Trimethoprim and derivatives (J01EA)	0.07	0.06	0.20	0.02	0.10	0.12	0.10	0.05	0.06	0.18	
Nitrofurantoin	Nitrofurans derivatives (J01XE)	2.17	1.72	2.77	1.16	2.32	0.81	1.92	2.60	1.37	1.42	
Fosfomycin	Fosfomycin (J01XX)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	NPD	< 0.01	
NC Methenamine	Methenamine (J01XX)	0.03	0.02	0.02	< 0.01	0.01	0.04	0.02	< 0.01	NPD	< 0.01	
Total (J01)		52.79	62.18	59.31	57.14	60.12	50.92	62.45	63.10	62.08	93.86	

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

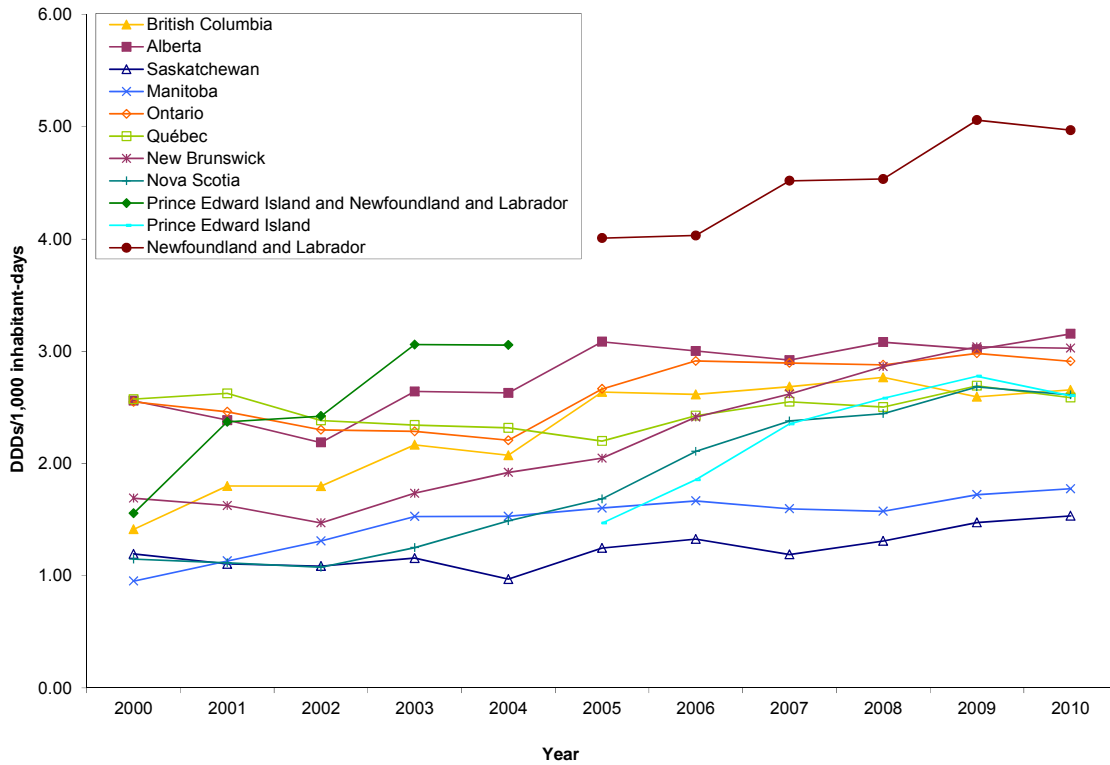
Certain antimicrobials were removed from this table due to low (< 0.01 prescriptions/1,000 inhabitants) to no sales reported among the provinces. These are: chloramphenicol, erythromycin-sulfisoxazole, fusidic acid, nalidixic acid, sulfadiazine, sulfamethizole, sulfamethoxazole, sulfapyridine, and sulfisoxazole.

Figure 6. Consumption (DDDs/1,000 inhabitant-days) and total cost per 1,000 inhabitant-days of oral antimicrobials dispensed by retail pharmacies across Canadian provinces, 2010.



Alphanumeric codes represent Anatomical Therapeutic Chemical classes of antimicrobials.
 DDDs = Defined daily doses.

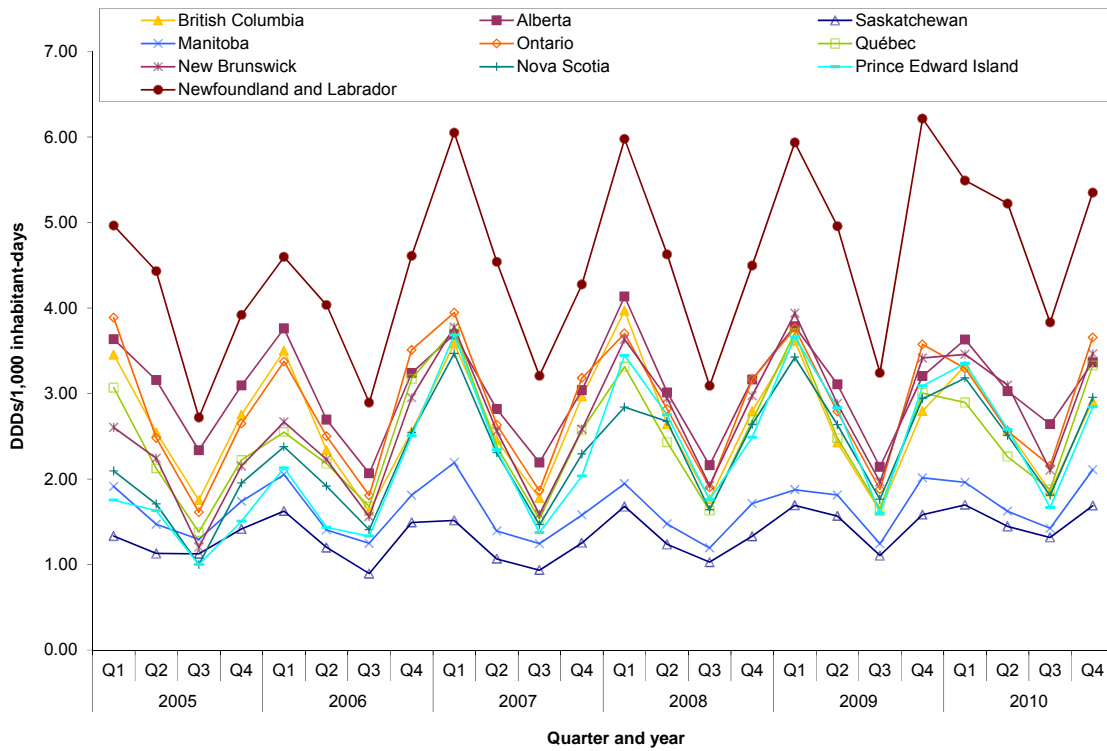
Figure 7. Consumption (DDD/1,000 inhabitant-days) of oral clarithromycin (J01FA09) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

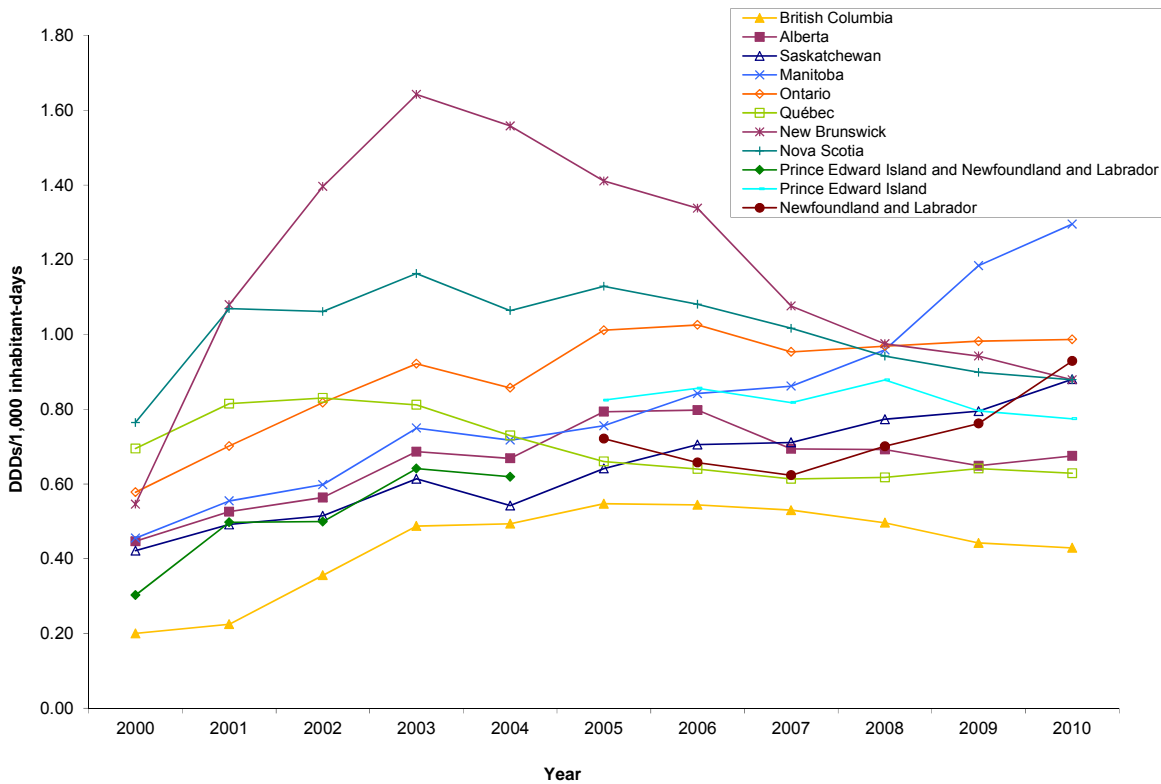
Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

Figure 8. Consumption (DDD/1,000 inhabitant-days) by quarter of oral clarithromycin (J01FA09) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

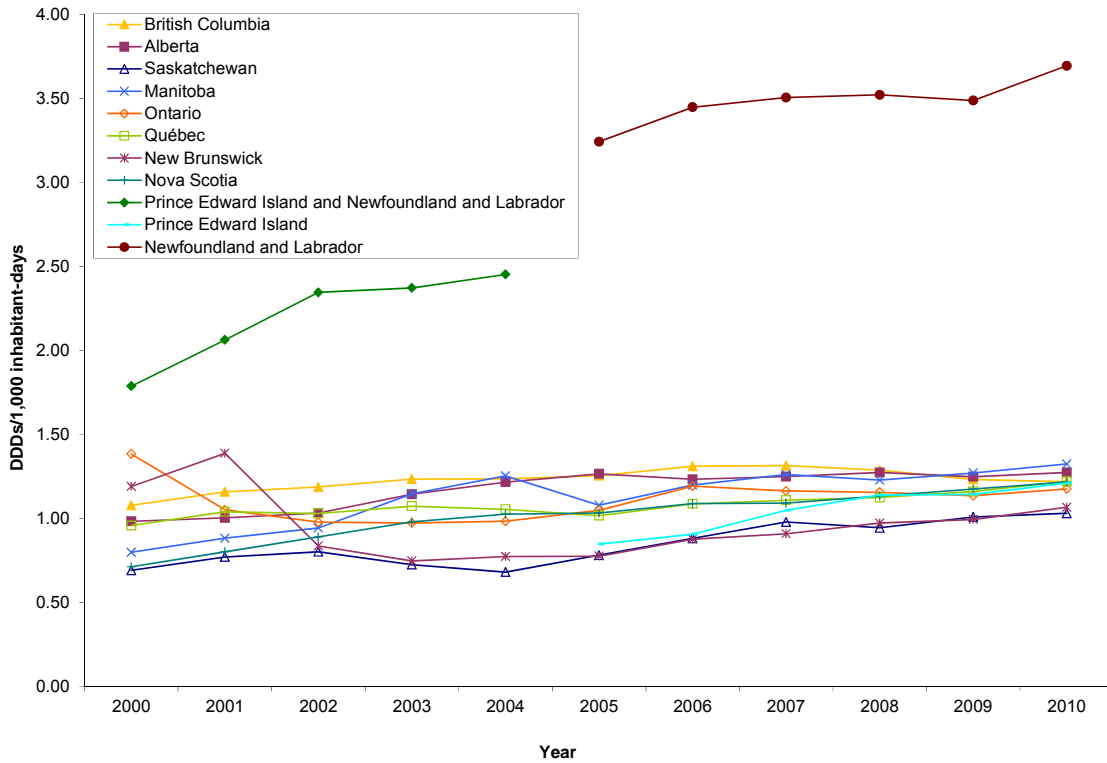
Figure 9. Consumption (DDD/1,000 inhabitant-days) of oral azithromycin (J01FA10) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

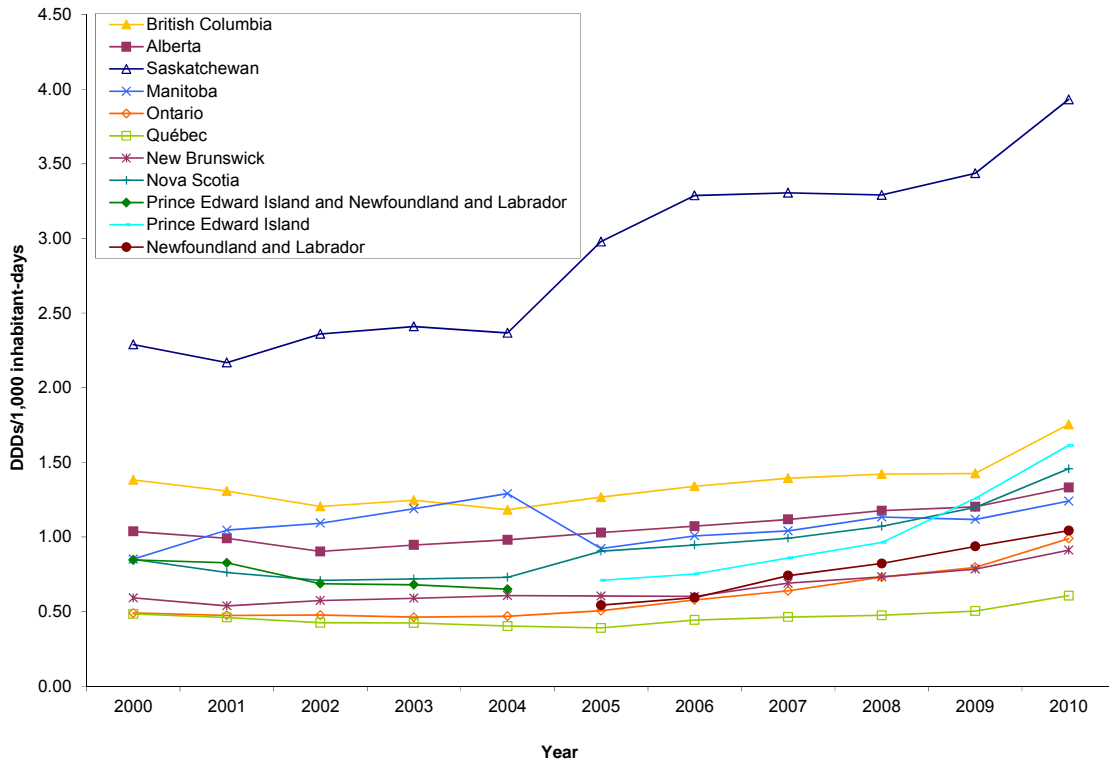
Figure 10. Consumption (DDD/1,000 inhabitant-days) of oral ciprofloxacin (J01MA02) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

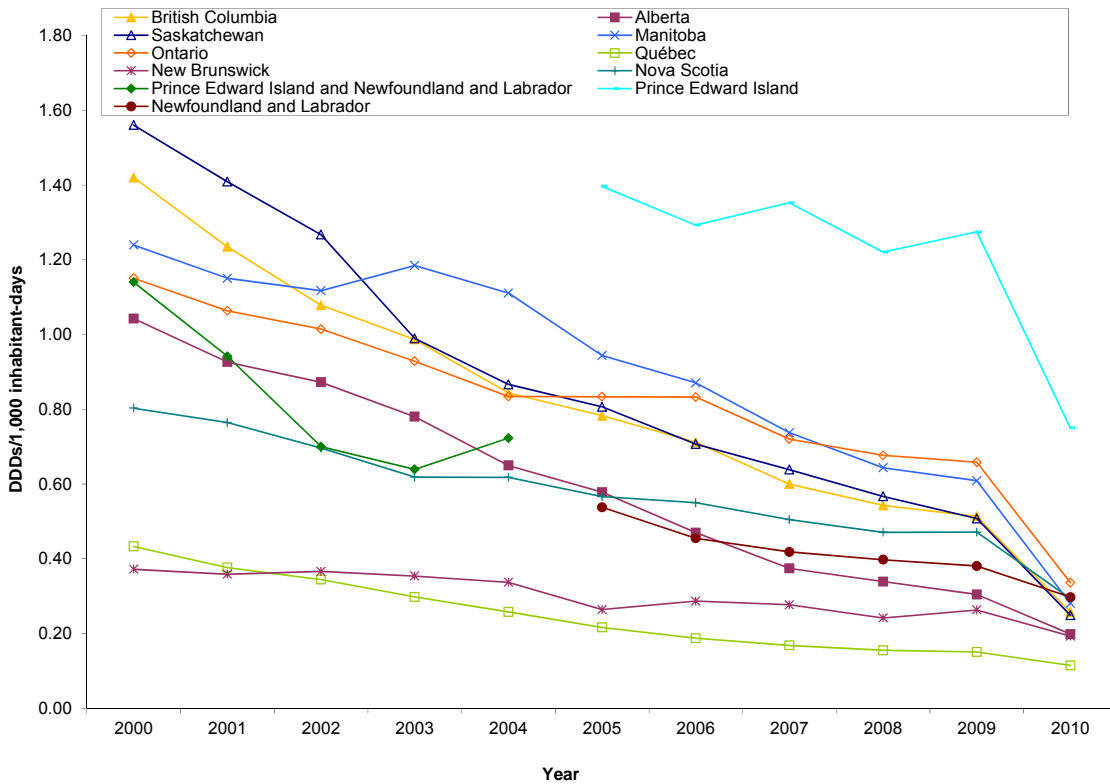
Figure 11. Consumption (DDD/1,000 inhabitant-days) of oral doxycycline (J01AA02) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

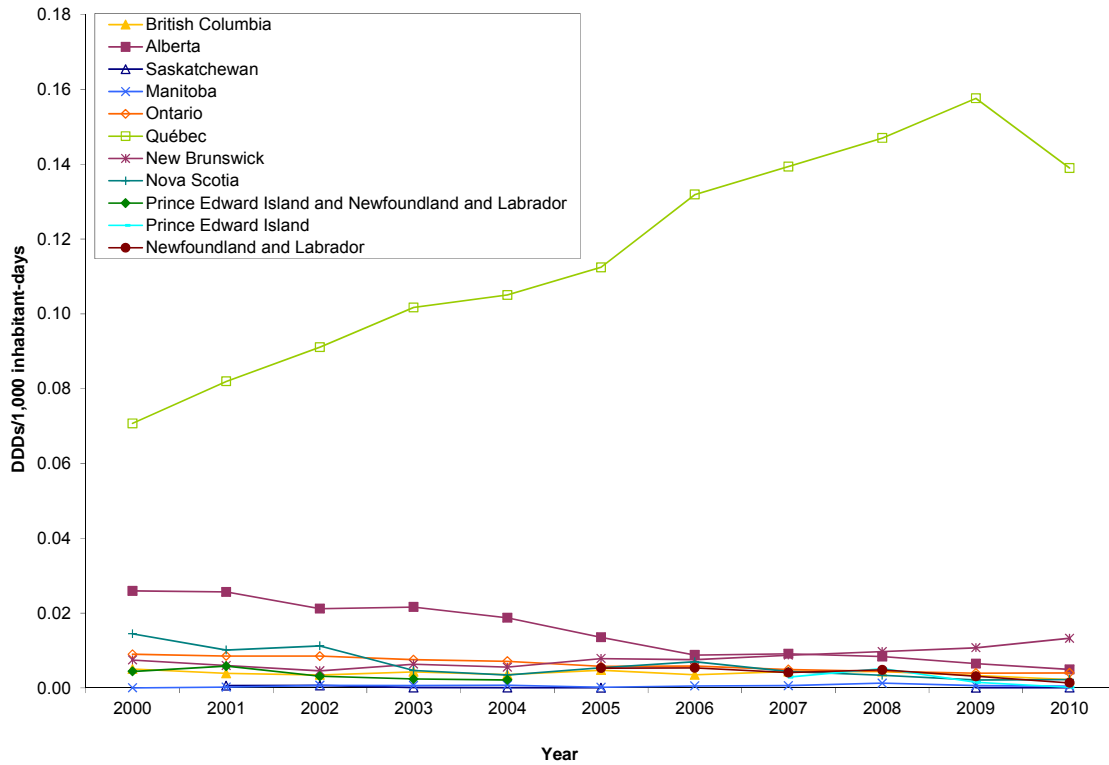
Figure 12. Consumption (DDD/1,000 inhabitant-days) of oral tetracycline (J01AA07) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

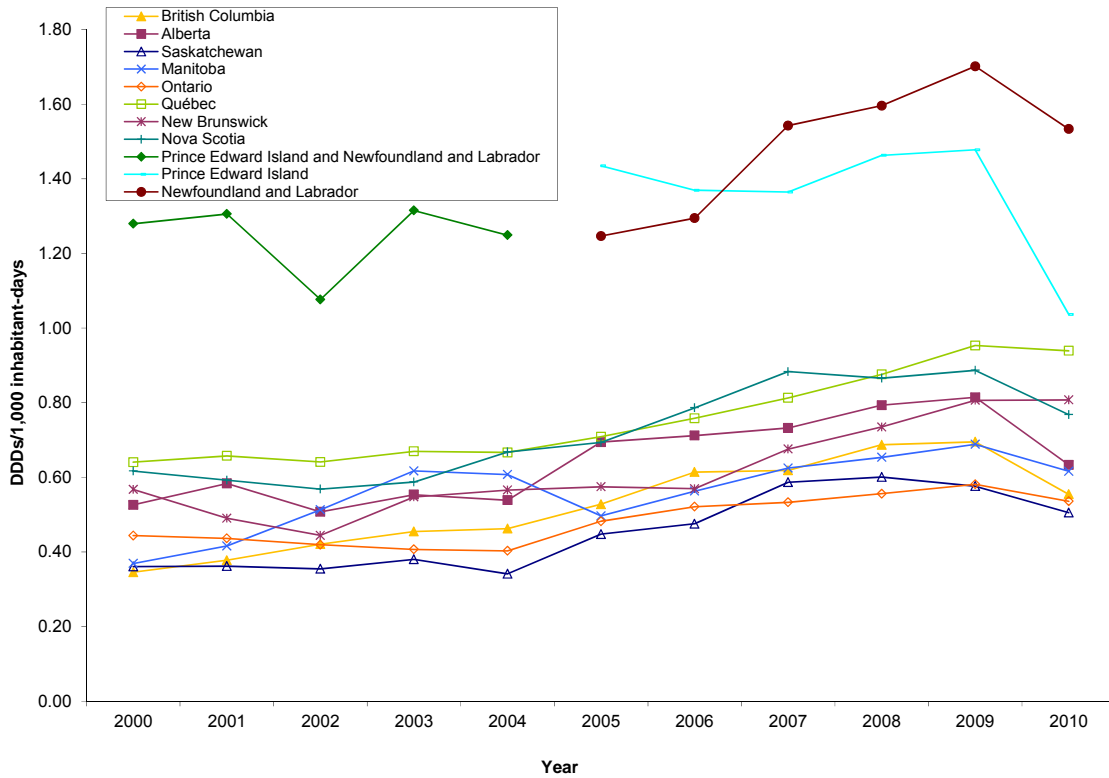
Figure 13. Consumption (DDD/1,000 inhabitant-days) of oral cefadroxil (J01DB05) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

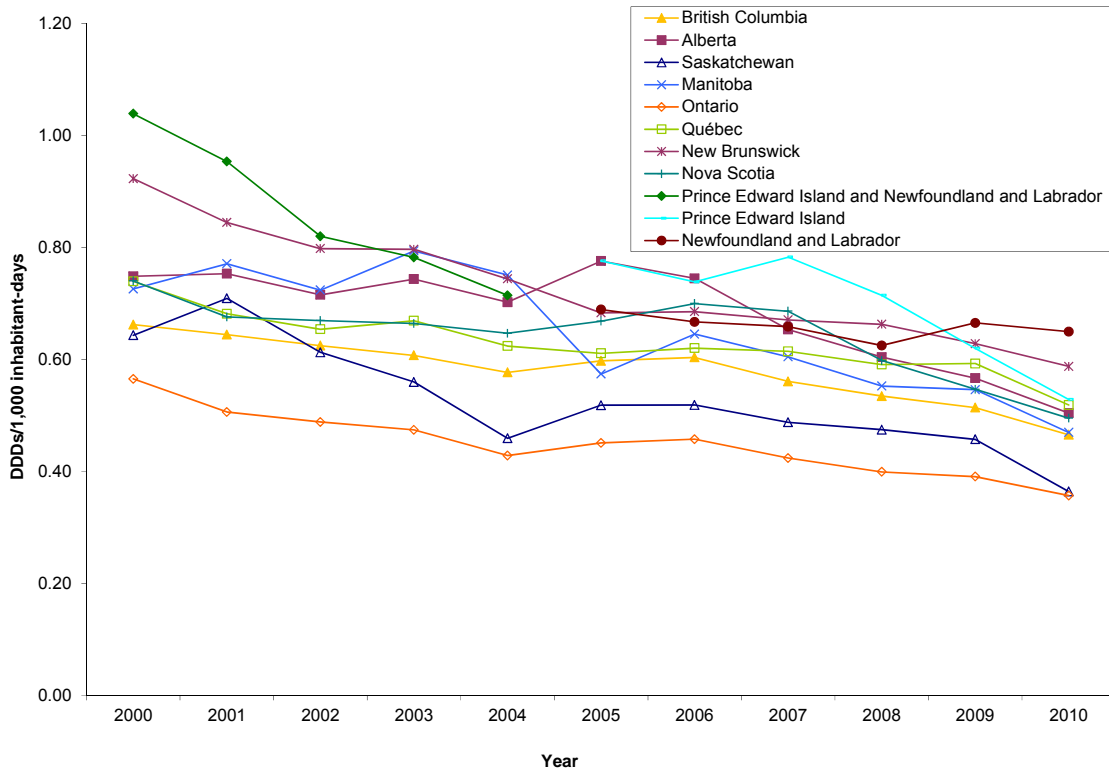
Figure 14. Consumption (DDD/1,000 inhabitant-days) of oral amoxicillin-clavulanic acid (J01CR02) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

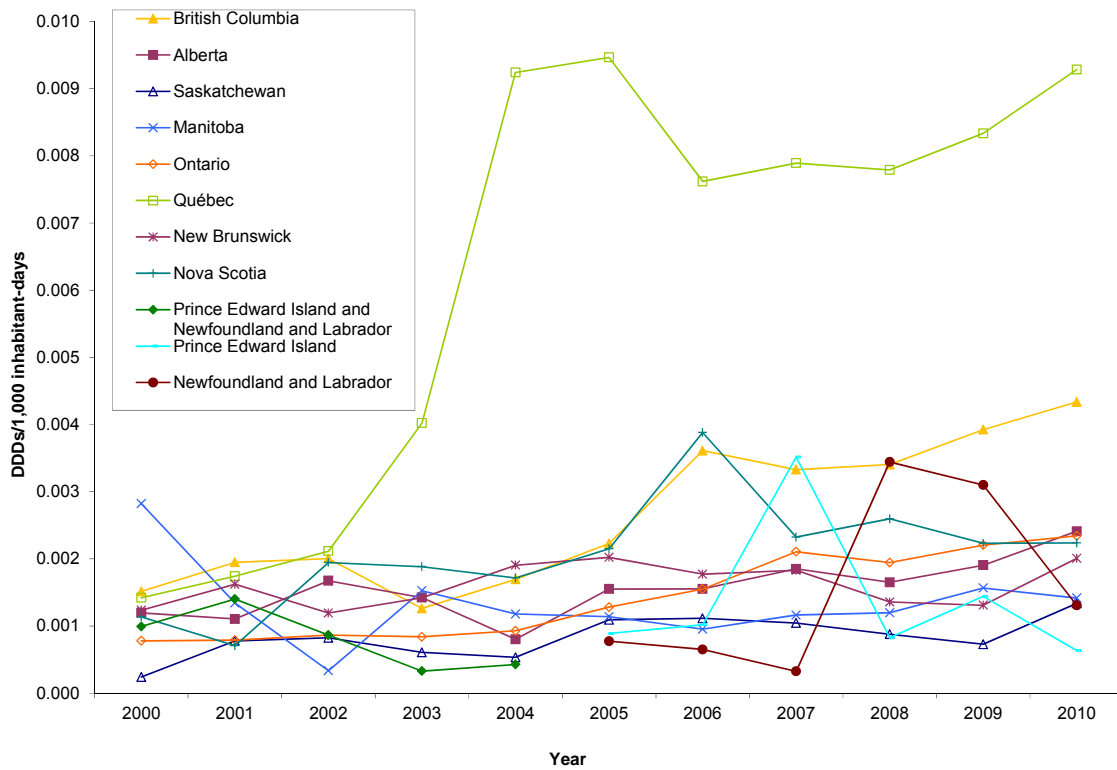
Figure 15. Consumption (DDD/1,000 inhabitant-days) of oral penicillin V (J01CE02) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

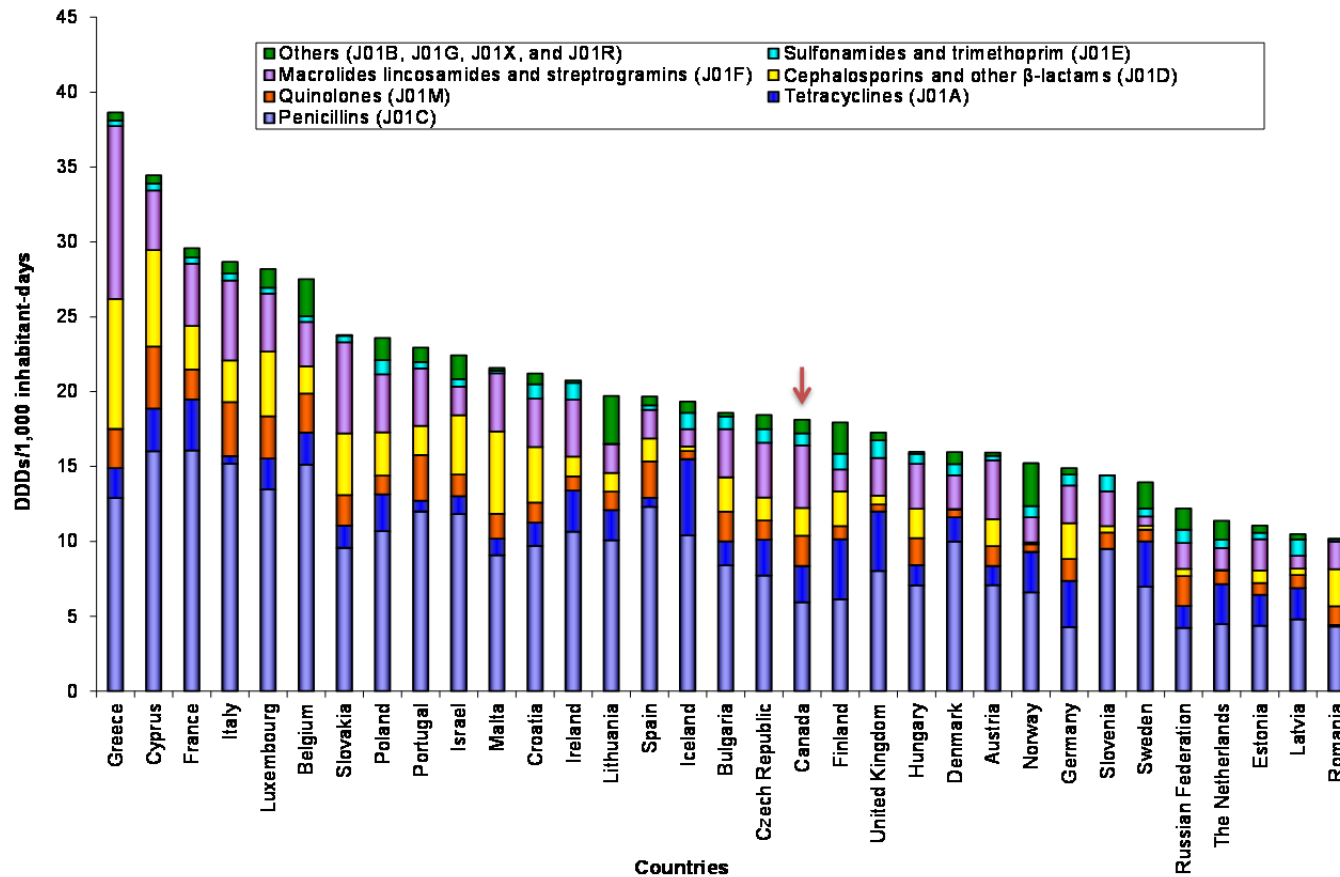
Figure 16. Consumption (DDD/1,000 inhabitant-days) of oral vancomycin (J01XA01) dispensed by retail pharmacies across Canadian provinces, 2000-2010.



DDDs = Defined daily doses.

Prior to 2005, data for the provinces of Prince Edward Island and Newfoundland and Labrador were provided in a combined format. As of 2005, data is available at the individual provincial level.

Figure 17. Antimicrobial consumption (DDDs/1,000 inhabitant-days) in 32 European countries and Canada; *European Surveillance of Antimicrobial Consumption*¹ and CIPARS, 2009.



DDDs = Defined daily doses.

Cyprus, Greece, and Lithuania: Total use, including the hospital sector.

Spain: Reimbursement data, does not include over-the-counter sales without prescription.

¹ ESAC Yearbook 2009. ESAC – European Surveillance of Antimicrobial Consumption ESAC Interactive Database. Available at: www.esac.ua.ac.be/main.aspx?c=*ESAC2&n=50036.

Appendix A – Additional Tables

Anatomical Therapeutic Chemical Classification System

Table A.1. List of antimicrobials for each ATC¹ class.

Antimicrobial	ATC Class
Amoxicillin and enzyme inhibitor (J01CR02)	Combinations of penicillins, including β -lactamase inhibitors (J01CR)
Cefixime (J01DD08)	Third-generation cephalosporins (J01DD)
I Ofloxacin (J01MA01), ciprofloxacin (J01MA02), norfloxacin (J01MA06), levofloxacin (J01MA12), moxifloxacin (J01MA14)	Fluoroquinolones (J01MA)
Vancomycin (J01XA01)	Glycopeptides (J01XA)
Metronidazole (J01XD01)	Imidazole (J01XD)
Linezolid (J01XX08)	Linezolid (J01XX)
Ampicillin (J01CA01), amoxicillin (J01CA04), pivampicillin (J01CA02)	Penicillins with extended spectrum (J01CA)
Penicillin G (J01CE01), penicillin V (J01CE02)	β -lactamase sensitive penicillins (J01CE)
Cloxacillin (J01CF02)	β -lactamase resistant penicillins (J01CF)
Cephalexin (J01DB01), cefadroxil (J01DB05)	First-generation cephalosporins (J01DB)
Cefaclor (J01DC04), cefprozil (J01DC10), cefuroxime axetil (J01DC02)	Second-generation cephalosporins (J01DC)
II Sulfamethoxazole and trimethoprim (J01EE01), sulfadiazine and trimethoprim (J01EE02)	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)
Azithromycin (J01FA10), clarithromycin (J01FA09), erythromycin (J01FA01)	Macrolides (J01FA)
Clindamycin (J01FF01)	Lincosamides (J01FF)
Nalidixic acid (J01MB02)	Other quinolones, excluding fluoroquinolones (J01MB)
Erythromycin-sulfisoxazole (J01RA02)	Sulfonamide combinations, excluding trimethoprim (J01RA)
Fusidic acid (J01XC01)	Steroid antibacterials (J01XC)

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical.

¹ World Health Organization Collaborating Center for Drug Statistics Methodology. Available at: www.whocc.no/atc_ddd_index/. Accessed May 2012.

Table A.1 (continued). List of antimicrobials for each ATC¹ class.

	Antimicrobial	ATC Class
	Doxycycline (J01AA02), minocycline (J01AA08), tetracycline (J01AA07)	Tetracyclines (J01AA)
	Chloramphenicol (J01BA01)	Amphenicols (J01BA)
	Trimethoprim (J01EA01)	Trimethoprim and derivatives (J01EA)
III	Sulfamethizole (J01EB02), sulfapyridine (J01EB04), sulfisoxazole (J01EB05)	Short-acting sulfonamides (J01EB)
	Sulfadiazine (J01EC02), sulfamethoxazole (J01EC04)	Intermediate-acting sulfonamides (J01EC)
	Nitrofurantoin (J01XE01)	Nitrofurans derivatives (J01XE)
	Fosfomicin (J01XX01)	Fosfomicin (J01XX)
NC	Methenamine (J01XX05)	Methenamine (J01XX)

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NC = Not classified.

¹ World Health Organization Collaborating Center for Drug Statistics Methodology. Available at: www.whocc.no/atc_ddd_index/. Accessed May 2012.

Categorization of Antimicrobials Based on Importance in Human Medicine

Categories of antimicrobials used in this report were taken from the document Categorization of Antimicrobial Drugs Based on Importance in Human Medicine¹ by Health Canada's Veterinary Drugs Directorate (Table A.2).

Antimicrobials are considered to be of Very High Importance in Human Medicine (Category I) when they are essential for the treatment of serious bacterial infections and there is no or limited availability of alternative antimicrobials for effective treatment. Antimicrobials of High Importance in Human Medicine (Category II) consist of those that can be used to treat a variety of infections, including serious infections, and for which alternatives are generally available. Bacteria resistant to antimicrobials of this category are generally susceptible to Category I antimicrobials, which could be used as alternatives. Antimicrobials of Medium Importance in Human Medicine (Category III) are used in the treatment of bacterial infections for which alternatives are generally available. Infections caused by bacteria resistant to these antimicrobials can, in general, be treated with Category II or I antimicrobials. Antimicrobials of Low Importance in Human Medicine (Category IV) are currently not used in human medicine.

Table A.2. Categorization of antimicrobials based on importance in human medicine.

Category of importance in human medicine	Antimicrobial class
I Very High Importance	Carbapenems
	Cephalosporins – the 3 rd and 4 th generations
	Fluoroquinolones
	Glycopeptides
	Glycylcyclines
	Ketolides
	Lipopeptides
	Monobactams
	Nitroimidazoles (metronidazole)
	Oxazolidinones
	Penicillin-β-lactamase inhibitor combinations
	Polymyxins (colistin)
	Therapeutic agents for tuberculosis (e.g. ethambutol, isoniazid, pyrazinamide, and rifampin)
II High Importance	Aminoglycosides (except topical agents)
	Cephalosporins – the first and second generations (including cephamycins)
	Fusidic acid
	Lincosamides
	Macrolides
	Penicillins
	Quinolones (except fluoroquinolones)
	Streptogramins
Trimethoprim-sulfamethoxazole	

¹ Version April, 2009. Available at: www.hc-sc.gc.ca/dhp-mps/vet/antimicrob/amr_ram_hum-med-rev-eng.php. Accessed October 2012.

Table A.2 (continued). Categorization of antimicrobials based on importance in human medicine.

Category of importance in human medicine		Antimicrobial class
III	Medium Importance	Aminocyclitols
		Aminoglycosides (topical agents)
		Bacitracins
		Fosfomycin
		Nitrofurans
		Phenicol
		Sulfonamides
		Tetracyclines
Trimethoprim		
IV	Low Importance	Flavophospholipols
		Ionophores

Antimicrobial Use

Table A.3. Quantity of active ingredients of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	Total active ingredients (kg)										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Amoxicillin and enzyme inhibitor	Combinations of penicillins, including β -lactamase inhibitors (J01CR)	6,943.80	7,111.36	6,953.47	7,328.95	7,354.77	8,276.17	8,829.72	9,653.61	10,434.61	11,042.43	9,972.34
Cefixime	Third-generation cephalosporins (J01DD)	441.47	412.56	372.50	321.45	275.37	282.37	274.85	303.43	322.03	341.52	421.21
I Ofloxacin, ciprofloxacin, norfloxacin, levofloxacin, moxifloxacin	Fluoroquinolones (J01MA)	17,387.35	17,569.37	17,718.15	18,469.28	18,738.69	18,781.31	19,348.63	19,806.00	19,946.58	19,875.99	20,342.44
Vancomycin	Glycopeptides (J01XA)	25.90	28.25	32.23	40.56	70.36	79.17	75.77	83.99	83.73	92.41	102.57
Metronidazole	Imidazole (J01XD)	NPD	4,808.34	4,927.11	5,126.54	5,237.51	5,311.07	5,563.92	5,587.82	5,791.00	6,027.77	6,459.99
Linezolid	Linezolid (J01XX)	NPD	1.55	4.91	10.82	17.29	23.26	22.44	25.34	26.11	31.23	31.65
Ampicillin, amoxicillin, pivampicillin	Penicillins with extended spectrum (J01CA)	57,566.37	56,004.37	53,404.23	53,132.75	51,471.46	53,138.73	53,534.54	53,445.95	54,514.40	56,299.19	59,225.50
Penicillin G, penicillin V	β -lactamase sensitive penicillins (J01CE)	15,079.86	14,253.92	13,722.26	13,802.13	12,916.80	13,174.53	13,139.44	12,881.10	12,395.39	12,214.39	11,000.10
Cloxacillin	β -lactamase resistant penicillins (J01CF)	8,351.00	8,004.27	7,376.34	7,135.18	6,596.38	5,861.06	5,604.72	5,159.05	4,777.41	4,355.43	5,396.23
Cephalexin, cefadroxil	First-generation cephalosporins (J01DB)	16,693.30	17,295.99	18,358.43	19,683.24	20,312.94	21,585.02	22,980.75	23,353.79	24,059.39	24,295.70	23,803.98
Cefaclor, cefprozil, cefuroxime axetil	Second-generation cephalosporins (J01DC)	11,099.40	9,857.59	8,712.26	8,570.41	8,277.23	8,410.81	7,937.34	7,424.93	7,216.85	7,126.74	6,506.07
II Sulfamethoxazole and trimethoprim, sulfadiazine and trimethoprim	Combinations of sulfonamides and trimethoprim, including derivatives (J01EE)	29,783.84	27,065.80	24,548.61	23,018.83	20,511.55	18,858.59	18,519.88	18,102.01	18,165.26	18,066.09	18,016.39
Azithromycin, clarithromycin, erythromycin	Macrolides (J01FA)	25,163.98	23,844.04	21,665.44	22,138.28	21,168.11	22,746.49	22,646.72	22,517.45	22,785.16	22,901.64	22,746.17
Clindamycin	Lincosamides (J01FF)	3,289.35	3,590.12	3,896.00	4,272.26	4,441.95	4,499.59	4,976.64	5,303.74	5,553.15	5,744.36	6,357.64
Nalidixic acid	Other quinolones, excluding fluoroquinolones (J01MB)	76.31	62.19	52.12	45.35	41.87	1.05	0.26	0.01	NPD	0.01	NPD
Erythromycin-sulfisoxazole	Sulfonamide combinations, excluding trimethoprim (J01RA)	2,745.17	1,910.05	1,251.28	843.14	548.87	494.05	418.86	305.33	102.70	0.07	NPD
Fusidic acid	Steroid antibacterials (J01XC)	34.79	39.06	35.54	37.27	36.64	41.91	42.73	34.22	30.08	14.26	0.66

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate.

ATC = Anatomical Therapeutic Chemical. NPD = No prescriptions dispensed.

Table A.3 (continued). Quantity of active ingredients of oral antimicrobials dispensed by Canadian retail pharmacies, 2000–2010.

Antimicrobial	ATC Class	Total active ingredients (kg)										
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Doxycycline, minocycline, tetracycline	Tetracyclines (J01AA)	14,112.37	13,169.24	12,595.12	11,902.77	11,050.90	10,709.61	10,280.96	9,678.89	9,419.51	9,300.87	7,211.78
Chloramphenicol	Amphenicols (J01BA)	0.78	0.99	0.20	NPD	0.06	0.01	NPD	NPD	NPD	NPD	< 0.01
Trimethoprim	Trimethoprim and derivatives (J01EA)	315.71	297.29	310.34	307.34	288.32	265.98	265.88	261.01	242.58	247.47	246.86
III Sulfamethizole, sulfapyridine, sulfisoxazole	Short-acting sulfonamides (J01EB)	105.38	13.45	0.88	1.04	1.02	0.26	0.13	0.03	0.03	NPD	NPD
Sulfadiazine, sulfamethoxazole	Intermediate-acting sulfonamides (J01EC)	28.08	4.48	4.77	5.55	4.51	2.93	2.27	2.36	1.33	0.04	0.10
Nitrofurantoin	Nitrofurans derivatives (J01XE)	935.24	981.97	1,019.51	1,073.19	1,152.40	1,210.89	1,323.74	1,390.41	1,503.67	1,621.76	1,741.72
Fosfomycin	Fosfomycin (J01XX)	64.76	74.26	48.00	35.71	26.28	20.78	17.78	11.00	1.98	5.04	3.43
NC Methenamine	Methenamine (J01XX)	389.51	356.69	350.35	296.88	282.20	253.34	249.14	261.99	163.43	210.81	238.88
Total (J01)		210,633.72	206,757.23	197,360.06	197,598.93	190,823.45	194,028.99	196,057.09	195,593.50	197,536.37	199,815.22	199,825.69

Roman numerals I to III indicate the ranking of antimicrobials based on importance in human medicine as outlined by the Veterinary Drugs Directorate. ATC = Anatomical Therapeutic Chemical. NC = Not classified. NPD = No prescriptions dispensed.

Demographics

Table A.4. Canadian population demographics¹; *Statistic Canada, 2010.*

Province	Population (thousands)
British Columbia	4531.0
Alberta	3720.9
Saskatchewan	1045.6
Manitoba	1235.4
Ontario	13,210.7
Québec	7907.4
New Brunswick	751.8
Nova Scotia	942.5
Prince Edward Island	142.3
Newfoundland and Labrador	509.7
Canada	34,108.8

Population data were obtained from updated and preliminary post-census estimates based on the results of the 2006 Census. Census counts were adjusted for net under-coverage.

¹ Statistics Canada. Population by year, by province, and territory. Available at: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/demo02a-eng.htm>. Accessed: July 2012.