

ANTIBIOTIC USE FOR COMMON INFECTIONS IN BRITISH COLUMBIA: A REVIEW OF OUTPATIENT PRESCRIBING FROM 2000 – 2018

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BACKGROUND

Antimicrobial resistance continues to jeopardize the future of modern medicine; as 92% of all antibiotics are used in the community, it is imperative to parse outpatient prescribing. In 2005, a provincial initiative was launched to disseminate information regarding the judicious use of antibiotics through educational programs targeted to the general public, as well as healthcare professionals.

OBJECTIVE

This study aims to review the trends in antibiotic use over the past two decades to identify new targets for provincial stewardship and intervention.

METHODS

Study Design & Timeline

- Design: population-based, retrospective cohort analysis
- Time Period: 2000 to 2018

Study Cohort

- Cohort: all patients in British Columbia (BC)
- Exposure: all oral antibiotic [J01] dispensations

Data Source

•BC Ministry of Health manages several health care related databases, each of which maintain comprehensive medical information on the majority of the provincial population.

•Antibiotic information was extracted from BC PharmaNet; a centralized data system that links all pharmacies with every prescription dispensed through community pharmacies. Data was extracted for all patients in British Columbia

•Antibiotics were classified based on the Anatomical Therapeutic Chemical (ATC) classification system developed by World Health Organization (WHO)

Data Analysis

- Overall rate of antibiotic use [J01] and by 7 major ATC classes

J01A	TETRACYCLINES
J01C	BETA-LACTAM ANTIBACTERIALS, PENICILLINS
J01D	OTHER BETA-LACTAM ANTIBACTERIALS
J01E	SULFONAMIDES & TRIMETHOPRIM
J01F	MACROLIDES, LINCOSAMIDES, STREPTOGRAMINS
J01M	QUINOLONES
J01X	OTHER ANTIBACTERIALS

•Also stratified by gender and age group (0-2, 3-9, 10-18, 19-49, 50-64, 65-79, 80+).

•Consumption rates were calculated as prescriptions per 1000 population per year, using age and gender specific denominator estimates for the population from statistics BC.

RESULTS

Our study included over 3.5 million individuals with a total of 51,367,938 dispensed, oral antibiotic prescriptions. Overall antibiotic utilization decreased over the course of the study period [Figure 1]. This trend in the reduction of antibiotic prescription was observed across the major ATC classes, apart from Other Antibacterials (J01X: nitrofurantoin, fosfomycin, linezolid, vancomycin, metronidazole) [Figure 2]. The largest magnitude of decreased prescribing was observed in the pediatric population [Figure 3].

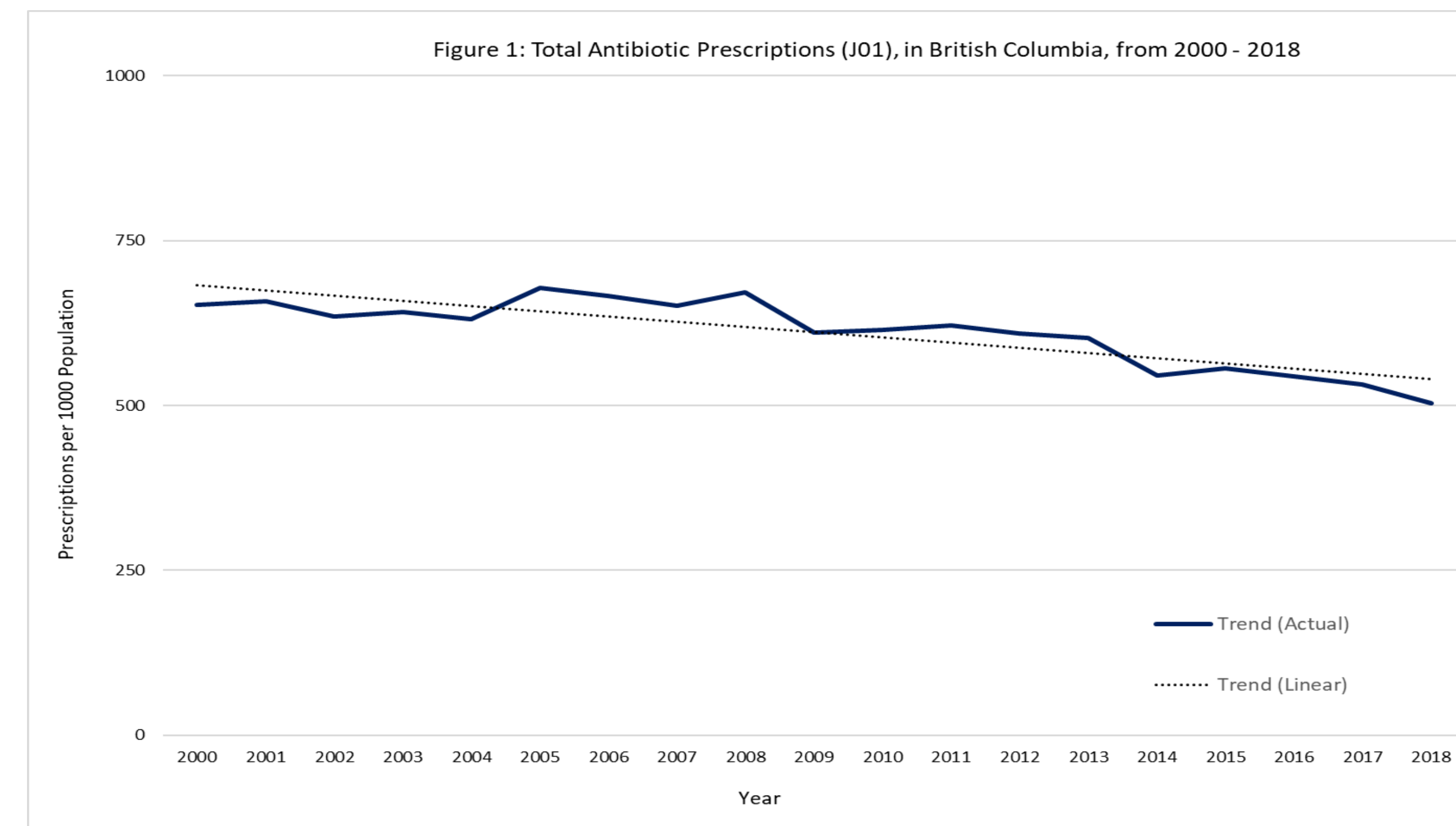


FIGURE 1: Overall antibiotic utilization decreased by 23%, with prescribing decreasing from 658 prescriptions per 1000 population in 2000 to 503 prescriptions per 1000 population in 2018.

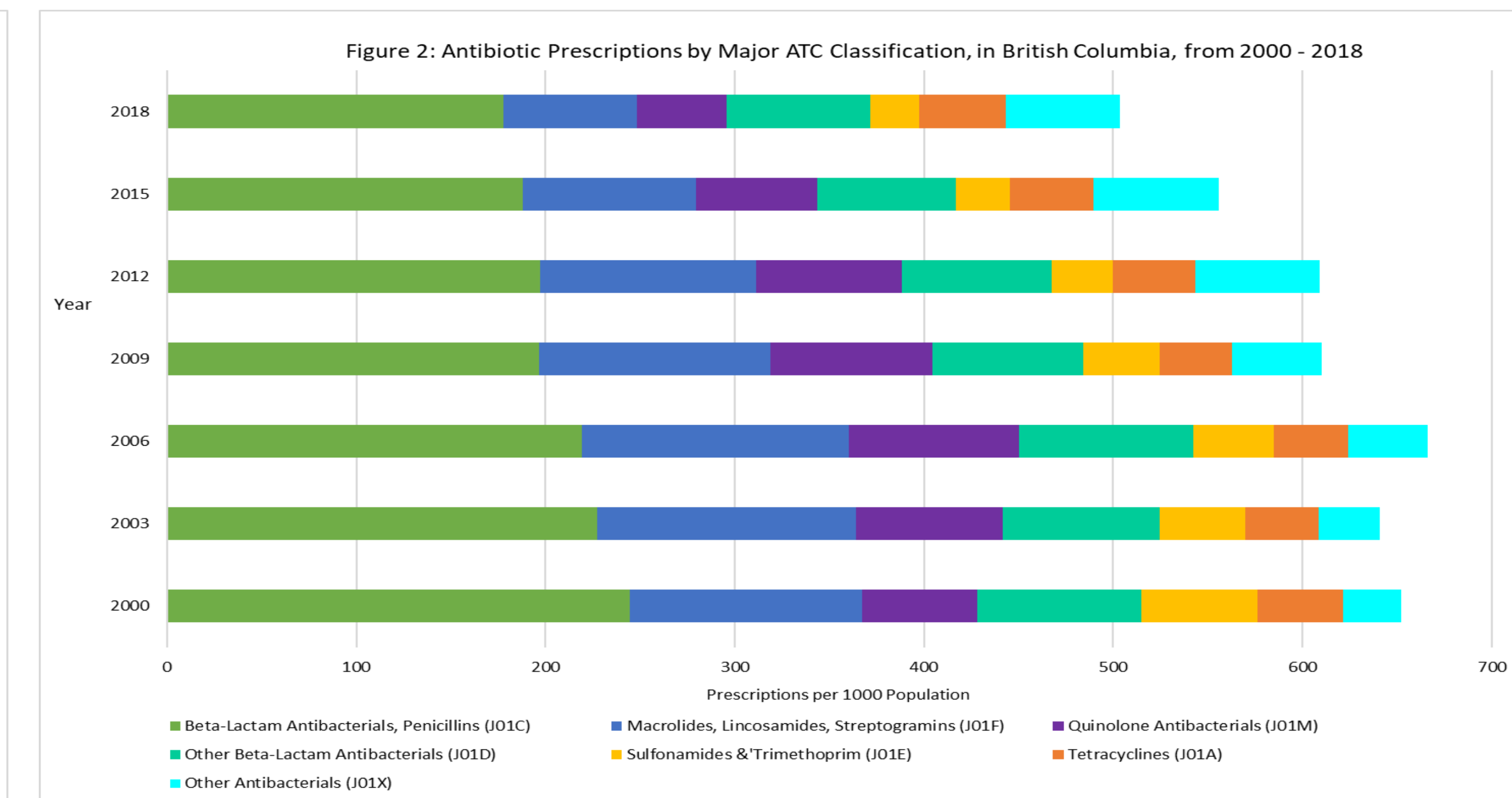


FIGURE 2: Five major ATC classes of antibiotics decreased in use over the study period, including: penicillins [J01C], cephalosporins [J01D], TMP/SMX [J01E], macrolides [J01F], and quinolones [J01M]; the largest decrease was seen with TMP/SMX (58%). Other Antibacterials [J01X] was the only class of antibiotics to increase, by 97%, over the study period. This increase can be ascribed to a change in guidelines wherein nitrofurantoin was recommended in the treatment of urinary tract infections.

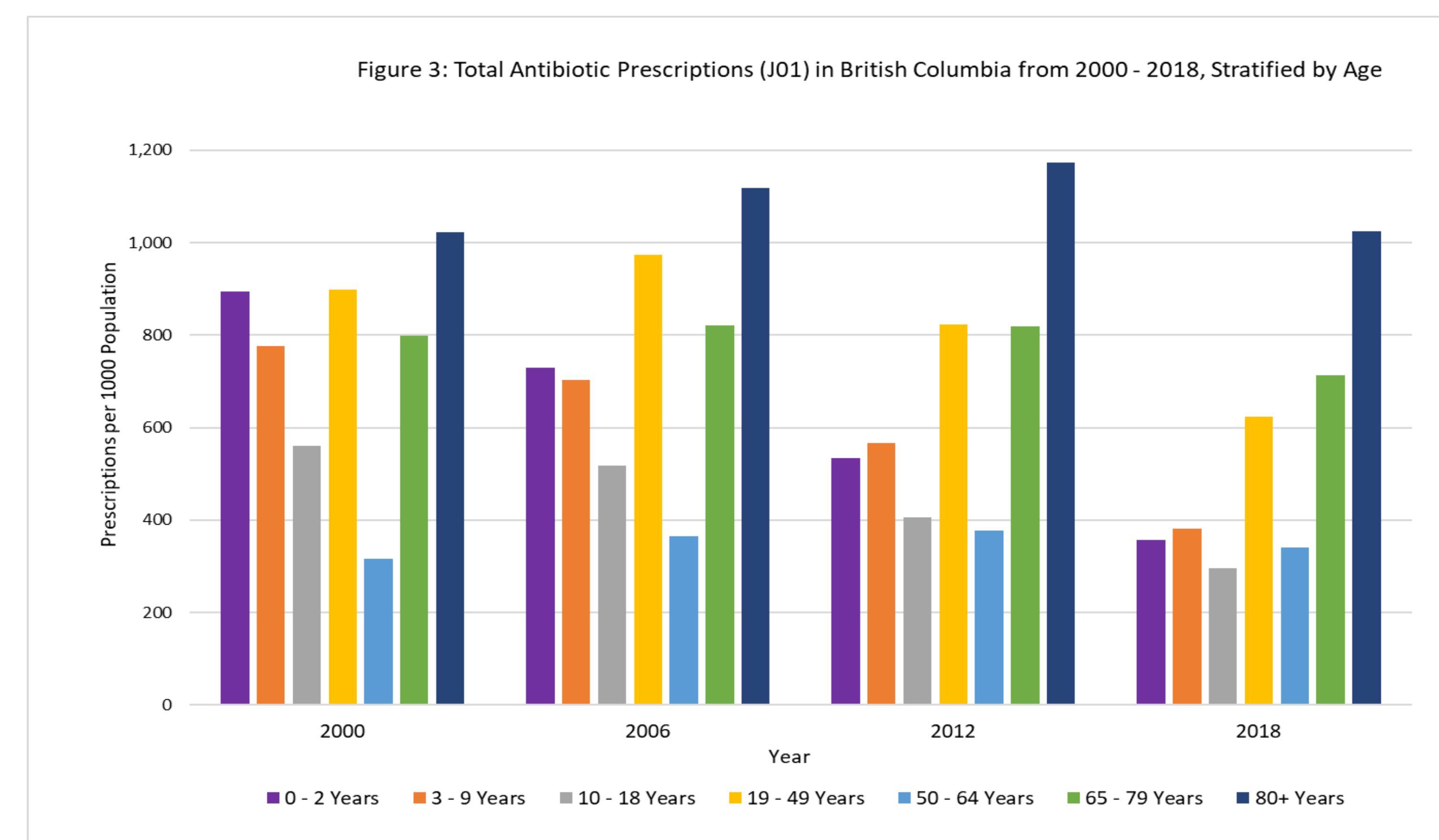


FIGURE 3: Antibiotics were consistently prescribed at the highest rate to the eldest cohort (80+ years), however the magnitude of their antibiotic usage remained constant over the study period. A decrease in prescribing was significant in the younger cohorts of 0-2 years (60%), 3-9 years (51%) and 10-18 years (47%).

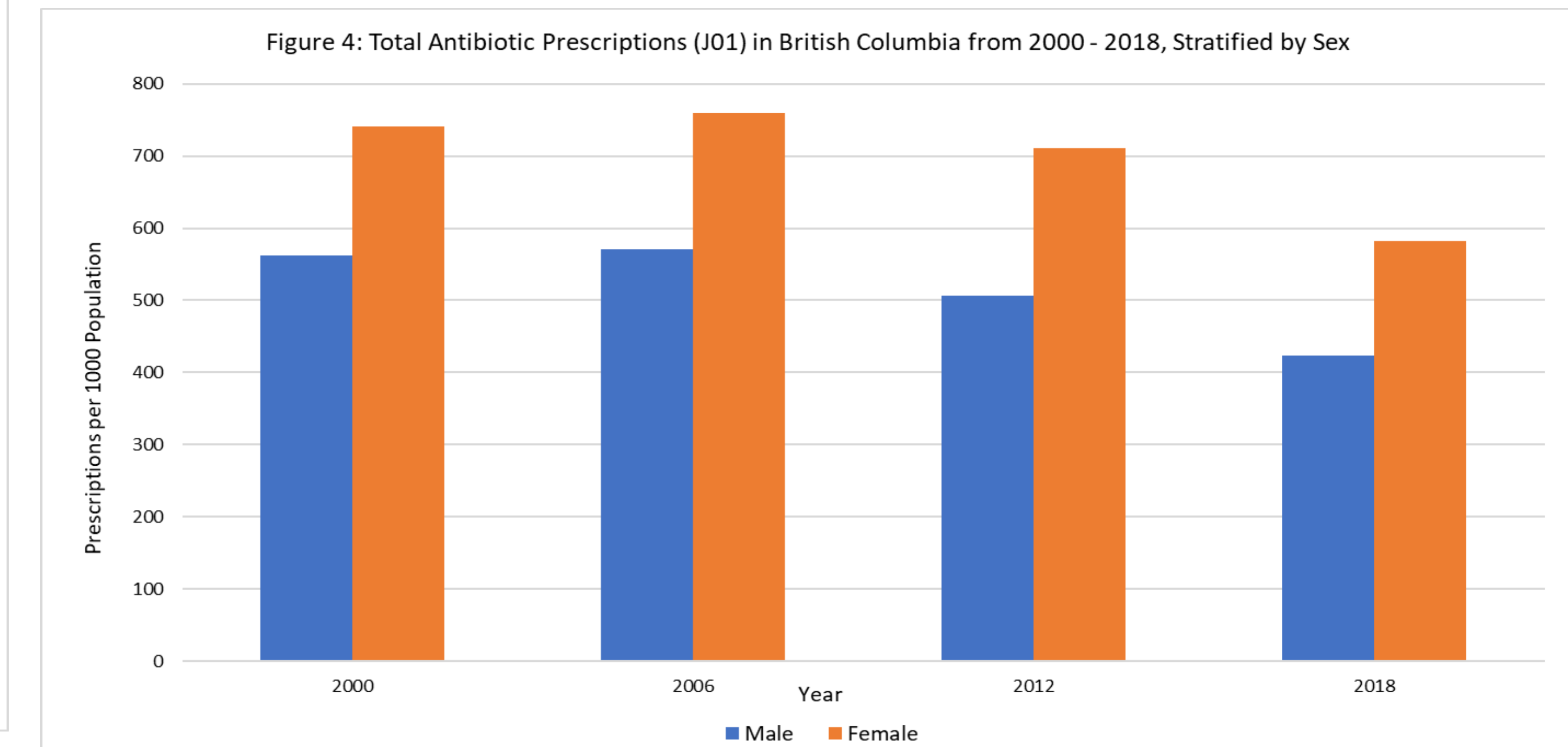


FIGURE 4: Over the course of the study period, females were consistently prescribed antibiotics at a higher rate than males. The difference in prescribing was applicable across all antibiotic classes.

CONCLUSION

Outpatient antibiotic prescribing has decreased steadily since 2000. These promising results can be ascribed to the various provincial initiatives to quell the misuse of these medications. However the consistent elevated antibiotic use in our elderly population presents a new target for promotional stewardship campaigns. Further analyses are necessary to evaluate prescribing quality to fully delineate the state of antibiotic use in BC. Next steps also include comparing BC rates with Ontario, another large province of Canada, to elucidate national comparators, as well as determine appropriateness of prescribing.

