

Geospatial Mapping of the NL Population by Age, Sex and Standardized Rates of Antibiotic Use

Objective

To determine whether there are particular regions in NL with high antibiotic use.

Practice Points

1. Antibiotic resistant bacterial infection is one of the top 10 concerns of the WHO and a major public health problem in Canada. It is associated with unnecessary antibiotic prescribing, often driven by patient demand.
2. Despite audit, feedback and academic detailing to family physicians (FPs) in Eastern Health (EH) and provision of Practice Points advice to all FPs in the province, only a modest decrease in antibiotic use has occurred.
3. Antibiotic use is associated with the volume of patients seen by FPs, but there is wide variability in the quantity of prescriptions provided by FPs seeing similar volumes of patients.
4. Antibiotics are prescribed more frequently in females and in those ≥ 65 years. Consequently, comparisons of different regions of the province requires controlling for differences in demography between regions.
5. Geo-spatial mapping of prescriptions using postal codes, together with age and sex standardized rates, may identify areas of high use for public education and prescriber communication.

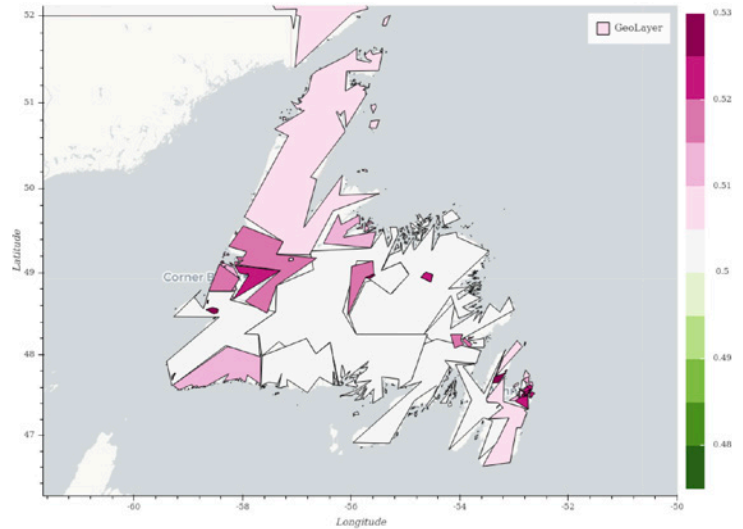
Methods

1. Data on all antibiotic prescriptions provided to outpatients in NL was obtained from the NL Pharmacy Network from 1 Jul 2017 to 30 Jun 2019.
2. The Defined Daily Dose (DDD)/1,000 inhabitant days was calculated (see previous summary paper) to facilitate comparisons between regions.
3. Geo-spatial mapping of the amount of antibiotics DDD/1,000 inhabitant days was mapped based on patients' postal code. For calculating the DDD/1,000 inhabitant days of each postal code, region population rates by postal code was obtained from Census 2016 on www.statscan.gc.ca.

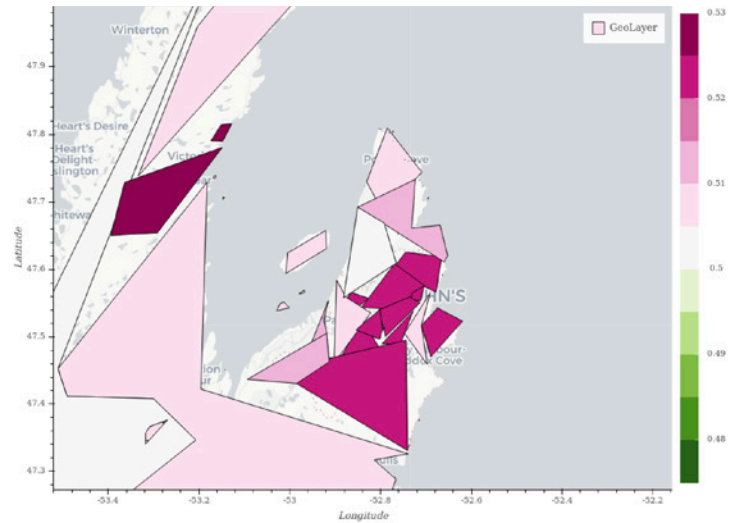
*Antibiotics rates were standardized according to proportions in NL of males and females in four age categories (<10 years, 10–19, 20–64, and ≥ 65 years).

Results

A. Newfoundland



B. St. John's



C. Labrador

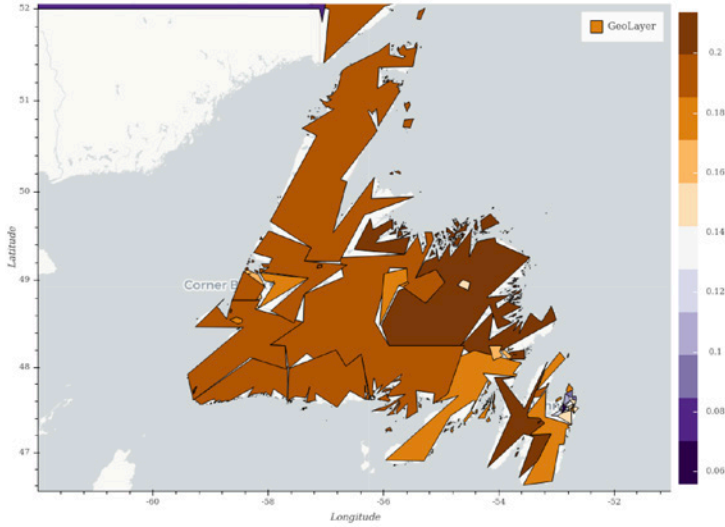


*Dark Purple = Regions With a Higher Rate of Females

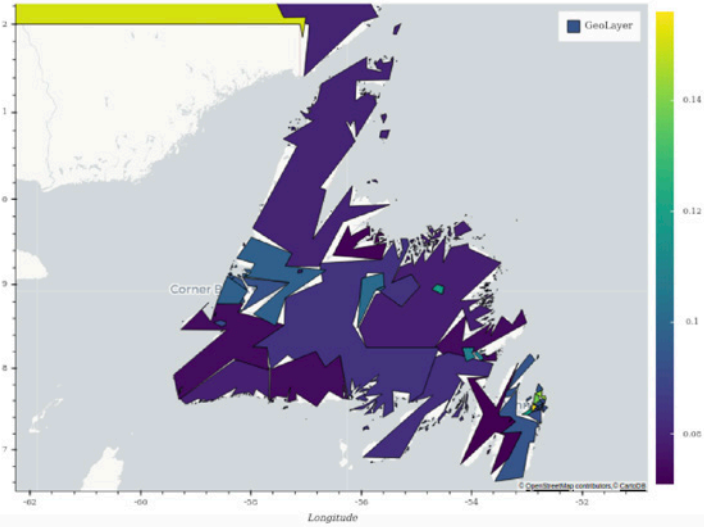
- St. John's and Corner Brook areas have higher female population compared to the rest of the province.

Figure 1. Map of NL Showing the Rate of Females in the Population by Postal Code

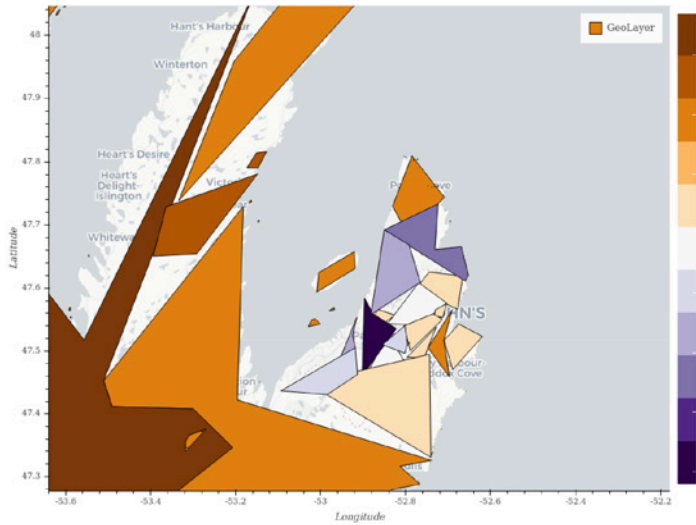
A. Newfoundland



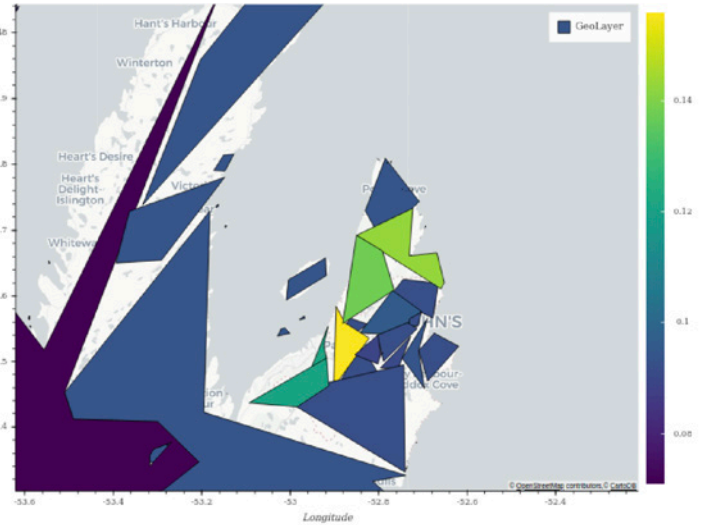
A. Newfoundland



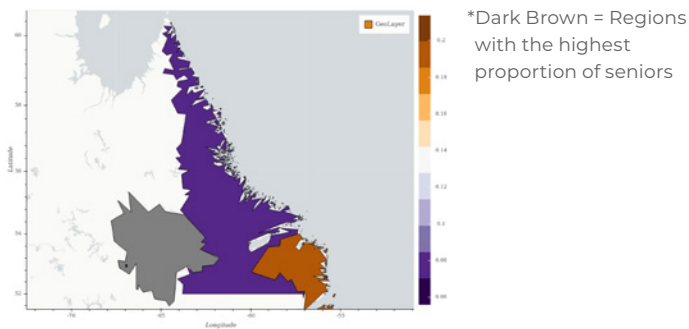
B. St. John's



B. St. John's



C. Labrador



C. Labrador

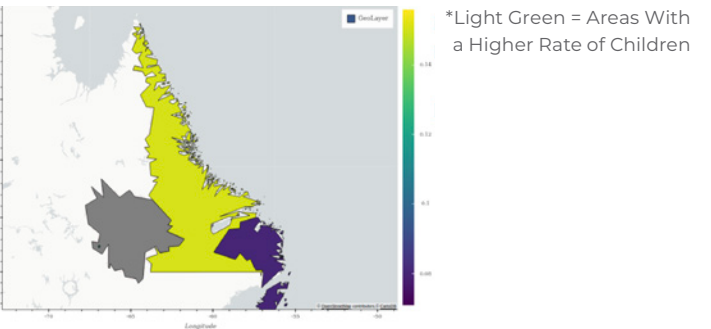


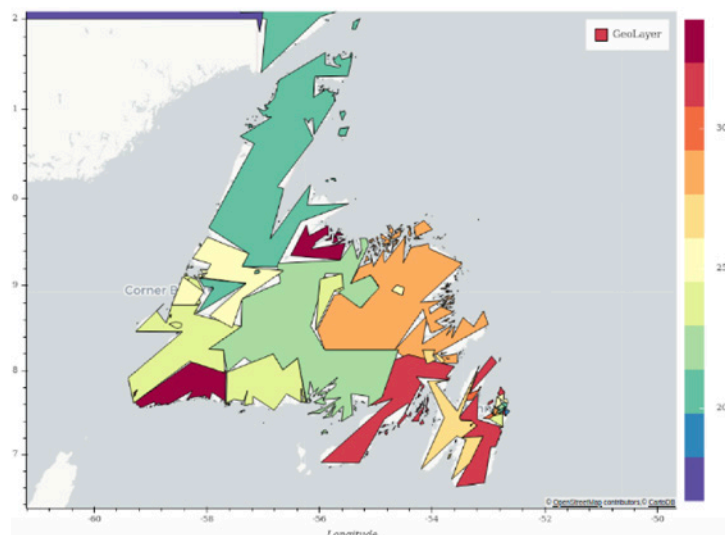
Figure 2. Map of NL Showing the Rate of Persons ≥ 65 Years in the Population by Postal Code

- The regions with the highest proportion of persons ≥ 65 years were Western Avalon, Bonavista Peninsula, North East Newfoundland, and Northern Newfoundland.

Figure 3. Map of NL Showing the Rate of Children < 10 Years Old in the Population by Postal Code

- Areas with the highest proportion of children are Paradise, Torbay, Portugal Cove-St. Phillips, and CBS.

A. Newfoundland

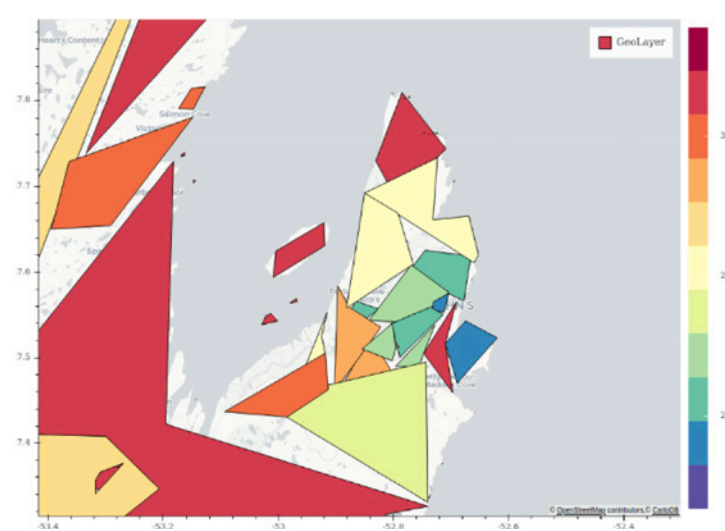


- The highest rates of antibiotic use, corrected for difference in sex and age, were in the rural areas area of La Poile Bay, Northern Newfoundland, South East Avalon, and the Burin Peninsula.
- Higher rates were also observed in St John's South West, Conception Bay, Paradise, North Eastern Newfoundland, and Carbonear.

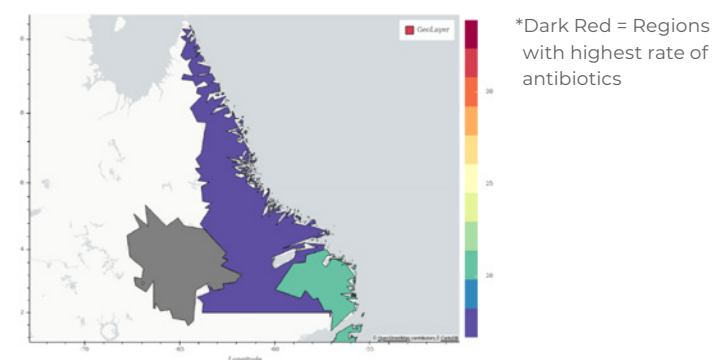
Conclusions

1. There are substantial demographic differences across the regions of NL with more women and children in urban areas and more seniors in rural areas.
2. Even with correction for these differences, the highest rates of antibiotic use are in rural areas of NL. To limit antibiotic use in these areas, prescriptions could be post-dated for use if symptoms persist.
3. Some urban areas have high rates, which could be ameliorated by education of mothers/females on unnecessary antibiotics in an attempt not to provide a prescription.

B. St. John's



C. Labrador



*Dark Red = Regions with highest rate of antibiotics

Figure 4. Map of NL Showing the Age and Sex Standardized DDD/1,000 Inhabitant Days by Postal Code