

# The Prevalence and Management of Inflammatory Bowel Disease on Vancouver Island

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## Introduction

Inflammatory bowel disease (IBD) is a chronic, debilitating disease with a complex etiology which places a significant burden on both patients and healthcare resources. Canada has one of the highest prevalence rates of IBD in the world, at 0.7%.<sup>1,2</sup> In 2018, the direct and indirect costs of IBD totaled over \$2.6 billion, and it is expected that both prevalence and costs will continue to rise.<sup>1,3</sup> IBD management is complex and particularly challenging for those living in rural settings. It has been shown that IBD patients living farther from gastrointestinal (GI) services experience poorer outcomes.<sup>4,5</sup> Vancouver Island (VI) poses challenges to GI service access, with no gastroenterologists located outside the South Island region (see Appendix A for regional map).<sup>6</sup>

The epidemiological understanding of IBD on VI is lacking. Due to the distribution of GI services, there is potential for regional disparities in quality of IBD care. To date, there have been no studies of IBD on VI. As a result, there is a paucity of information surrounding prevalence and quality of care; this is important information, given the nationally high prevalence of IBD and large population living outside the South Island region.<sup>7</sup> This pilot study aimed to better understand the prevalence and management of IBD on VI and identify if regional disparities in access to and quality of care exist.

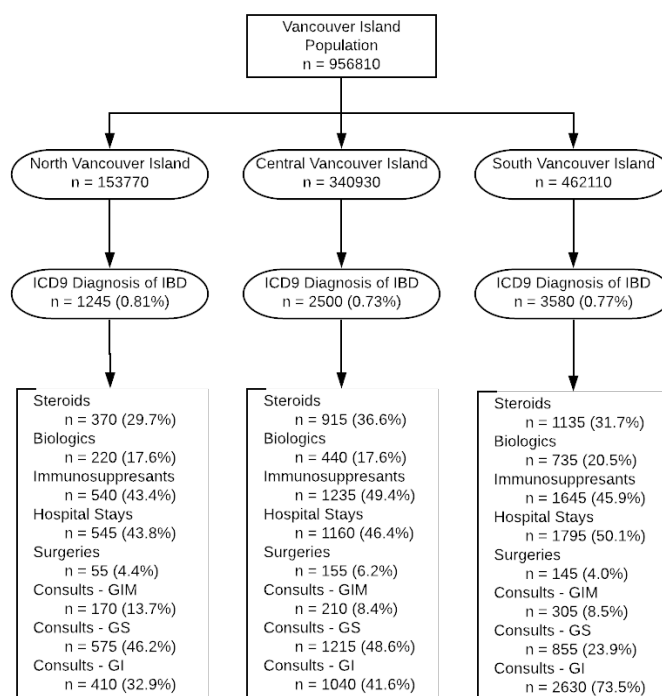
## Methods

We accessed data from BC Data Scout, a data feasibility service supported by Population Data BC, to gain estimates of prevalence and resource use statistics. The data submission separated VI into 3 geographic regions: North Island (NI), Central Island (CI), and South Island (SI). Patients were selected based on a diagnosis of IBD (diagnostic codes 555-556) using the ninth revision of the International Classification of Diseases (ICD9) because the BC Medical Services Plan utilizes the ICD9 diagnostic codes for billing purposes.<sup>8</sup> Eight cohorts were made for each region, categorizing patients by use of IBD medications, hospital stays, surgeries, and consults with specialist physicians (Figure 1). Appendix B outlines the specific interventions falling under each category. These cohorts overlap (patients may belong to more than one cohort), such that the total number of patients receiving any one intervention is accounted for in the cohort. Patients without an ICD9 diagnosis of IBD or without a primary residence on VI were not included. Resulting data were utilized to calculate prevalence and resource usage rates to compare IBD management between regions.

## Results

BC Data Scout outputs estimated the prevalence of IBD on VI to be 0.77%. Over half of IBD patients were from the NI or CI (Figure 1). There were no significant differences in IBD prevalence or demographics across regions (Figure 1). There were significantly lower rates of GI consultations (SI: 73.5%; CI: 41.6%; NI: 32.9%;  $p < 0.0001$ ) and higher rates of general surgery consultations in the NI and CI than in the SI (SI: 23.9%; CI: 48.65%; NI: 46.2%;  $p < 0.0001$ ). Compared to living in the SI, living in the CI was associated with a higher likelihood

of surgery (OR 1.96, 95% CI: 1.58-2.35,  $p < 0.0001$ ) and steroid use (OR 1.25, 95% CI: 1.12-1.38,  $p < 0.0001$ ). Both NI and CI residents had a lower likelihood of being prescribed a biologic than SI residents (OR 0.82, 95% CI: 0.7368-0.9307,  $p < 0.001$ ) (Figure 2).



**Figure 1** | Selected cohorts from BC Data Scout with the number of patients in each cohort for 2015-2017. GIM: General Internal Medicine; GS: General Surgery; GI: Gastroenterology.

## Discussion

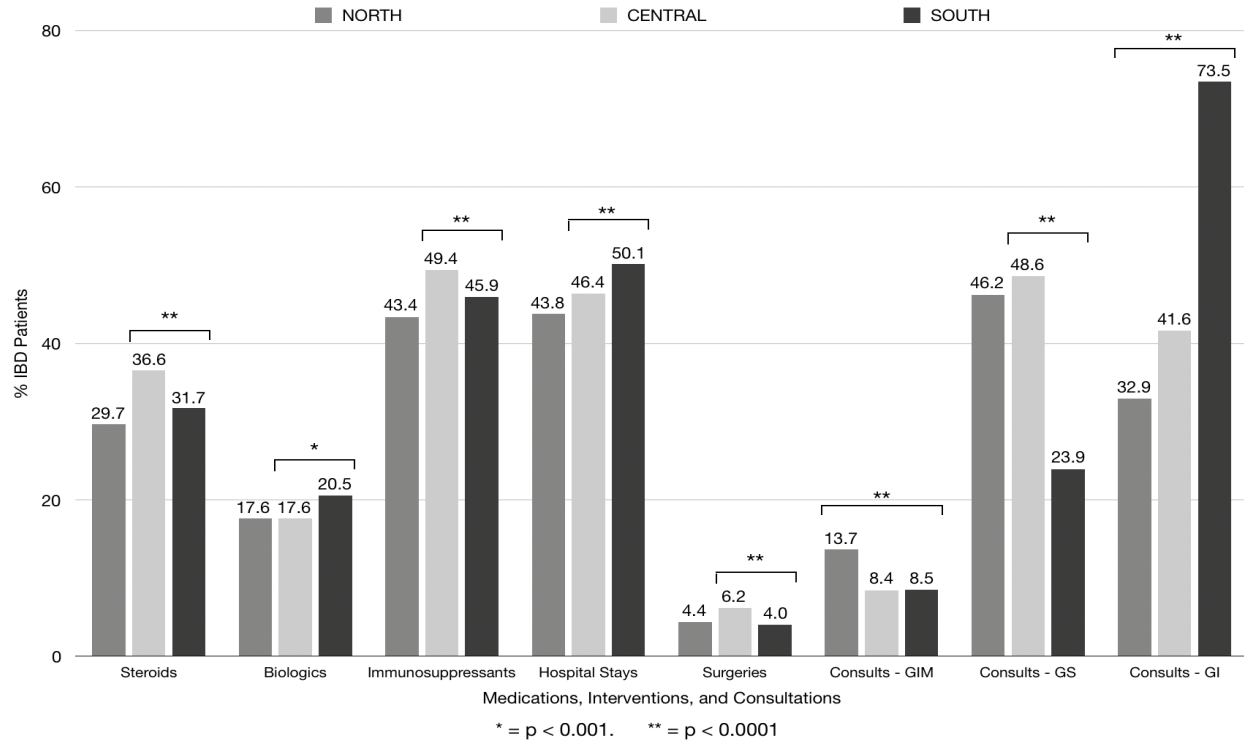
This preliminary evidence suggests a high prevalence of IBD and disparities in access to GI care and treatment approaches across VI. Patients living outside the SI, where all GI services are concentrated, received significantly fewer consultations with gastroenterologists (the specialists with the most expertise in IBD management) and significantly more consultations with both general surgery and internal medicine. Limited access to GI care is associated with poorer outcomes,<sup>9-11</sup> suggesting a potential area of concern for IBD patients living outside of the SI. Additionally, patients in the CI faced significantly higher rates of surgery and steroid use, which are associated with poorer outcomes, and patients in both the CI and the NI received fewer biologics, medications with extensive evidence supporting long-term efficacy.<sup>12-14</sup>

The primary limitation of this study is that BC Data Scout provides only summary statistics, limiting our ability to gain a detailed picture of the care received by patients in each region and to comprehensively identify confounding variables. Our future aim is to utilize more robust data sets, such as those from Island Health and the Ministry of Health, to further identify and quantify differences in IBD care.

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**Figure 2** | Percentage of IBD patients who received steroid, biologic, or immunosuppressant medications; surgical hospital stays; routine hospital stays; general internal medicine (GIM) consults; general surgery (GS) consults; or gastroenterology (GI) consults in the North, Central, or South Island from 2015-2017.

## Conclusion

VI has a high prevalence of IBD, yet these apparent disparities in the distribution of GI services exist. The results of this pilot study suggest that the barriers to care faced by IBD patients outside of the SI may lead to this population receiving less GI care, suboptimal medication regimens, and higher surgery rates. These apparent disparities have the potential to lead to poorer outcomes for patients living farther away from GI services. These results indicate the need to further investigate the impacts of these apparent disparities and to identify ways to increase access to GI services for IBD patients across VI.

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