Examining the Drivers of High Cost Healthcare Usage in Prince Edward Island

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Preliminary results of the study, Small Area Variation in Rates of High Cost Healthcare Use Across PEI, currently underway by UPEI's Centre for Health and Community Research and the Maritime SPOR Support Unit.

RATIONALE

Previous research in Canada has shown a consistent trend of a very small percentage of the population accounting for the majority of public healthcare costs.[1] Many of these patients have chronic conditions which, when not properly managed, can lead to avoidable and costly healthcare system usage and decreased quality of life.[1]

There is a growing interest and concern in examining the importance of the social determinants of health and their influence on population health. Previous research in PEI has demonstrated a relationship between the social determinants of health, chronic disease rates, and health behaviours.[2]

To identify key, actionable areas to target in order to improve the efficiency and effectiveness of healthcare delivery to this population of high cost users, requires to characterize and understand this unique segment of the population.

OBJECTIVES

Building on the work of the Small Area Rate Variation (SARV) study completed in Nova Scotia by Kephart et al., our research aims to identify the main drivers of high cost healthcare use.[1] More specifically, we target to determine whether healthcare costs are disproportionately higher for individuals poorer in status with respect to the social determinants of health, and higher rates of certain chronic diseases and co-morbidity.

METHODS

Healthcare costs were determined for each individual aged 30 and over who was eligible for PEI Medicare for at least 365 days between the 2012-13 and 2014-15 fiscal years, inclusive. Costs considered in this analysis include physician billing costs (fee for service and shadow billed claims), and acute inpatient stays using data from the Discharge Abstract Database (DAD) for in-province stays, and the Medicare claims system for out-of-province stays.[i]

For each individual, an annualized adjusted cost was calculated for each study year in which the person was eligible for Medicare coverage for at least 90 days. The adjusted cost takes into consideration the proportion of the year an individual was eligible for PEI Medicare. Costs associated with inpatient stays were attributed to the fiscal year of discharge.

Adjusted Cost = [Total Cost/(# Eligible Days/365)]

Each individual was assigned a percentile ranking for each fiscal year of the study based on this adjusted cost, which was used to determine the top one, five, and ten percent of healthcare users.

The chronic disease status was determined for specific chronic diseases using Canadian Chronic Disease Surveillance System algorithms, where applicable, or other similar methodology using data from 2001-02 to 2014-15. Lifetime prevalence was considered for all conditions with the exception of mood and anxiety disorders.

Each individual was assigned disease status (yes/no) in each eligible fiscal year of the study. To be considered a prevalent case, an individual must have met the case algorithm on or before the last day of the fiscal year. For mood and anxiety disorders, any individual who met the case definition at any point in the fiscal year was considered a prevalent case for that year.

Using the Postal Code Conversion File Plus (PCCF+) version 6C, each individual's postal code was linked to Statistics Canada geographical boundaries, which were linked to area level measures of socio-economic status, including the 2011 version of the social and material deprivation index created by Pampalon et al.[3] [4] The material deprivation index takes into consideration three indicators: the rate of employment, high school education, and average income of individuals aged 15 and older. The social deprivation index takes into consideration the proportion of individuals aged 15 and older who live alone, who are separated, divorced or widowed, and the proportion of single parent families in an area.

Trends in healthcare spending among the top one, five, and ten percent of healthcare users were analyzed. The relationship between chronic disease prevalence and the social determinants of health with high cost use healthcare use was examined for all study years. This analysis serves as a starting point for further work in this area.

[i] DAD data is currently not available for out of province hospital stays and could not be obtained within the study timeframe.

FINDINGS

1. ALMOST THREE-QUARTERS OF HEALTHCARE COSTS ORIGINATE FROM 5% OF THE POPULATION

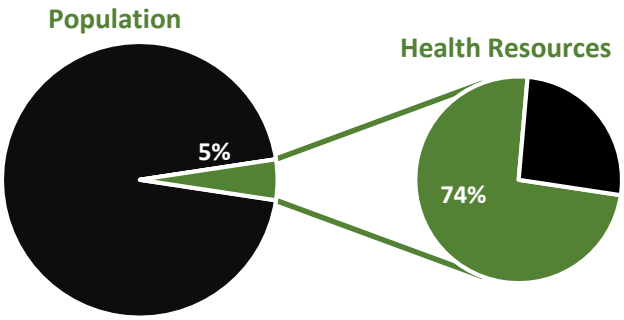
Most healthcare spending on PEI is accounted for by a very small number of people. The top 5% of healthcare users account for almost three-quarters of total inpatient hospital and physician costs, while the top 1% and 10% of healthcare users account for 41% and 84% of costs, respectively.

The median yearly cost per patient in the top 5% of healthcare users was just under $15,700 per year over the study period. By contrast, the median yearly cost for all other users was just over $200.

The costs included in this study represented just under $195 million annually in healthcare spending, over $140 million of which was accounted for by just 5% of the population. The majority of these costs (83%) was related to hospital stays. A modest reduction in spending on this small segment of the population could result in millions of dollars in recovered costs. For example, just a 5% reduction in costs for this group would result in estimated annual savings of $7 million.

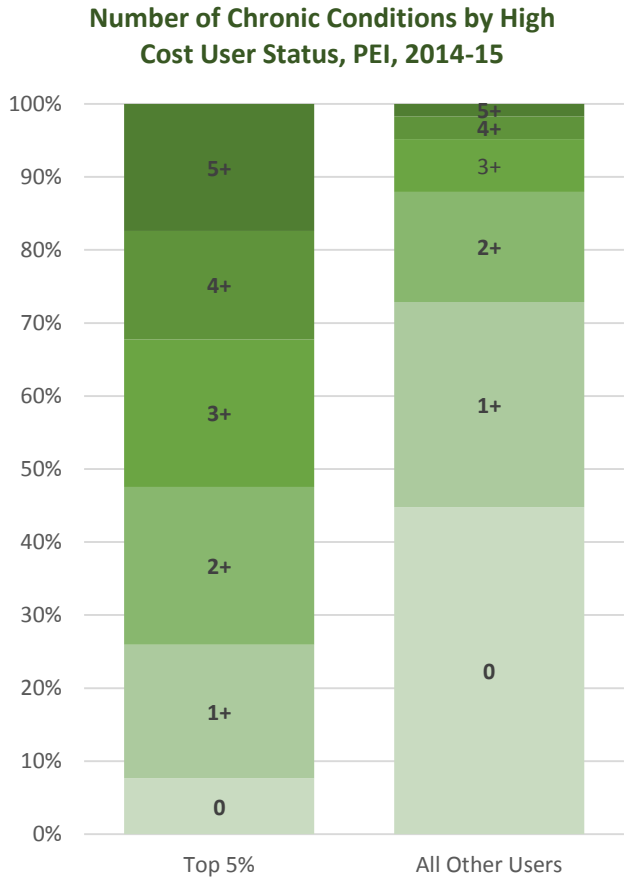
2. CHRONIC CONDITIONS ARE SIGNIFICANTLY MORE PREVALENT IN THE TOP 5% OF HEALTHCARE USERS

Individuals in the top 5% were significantly more likely to have been diagnosed with a range of chronic conditions in their lifetime. Almost three-quarters of high cost users have been diagnosed with two or more chronic conditions, and almost one in three had four or more chronic conditions. In comparison, less than one third of all other users had two or more conditions, and less than one in twenty had four or more.



Top Group (Percentage)	Percentage of Total Costs (%)
Top 10	84
Top 5	74
Top 1	41

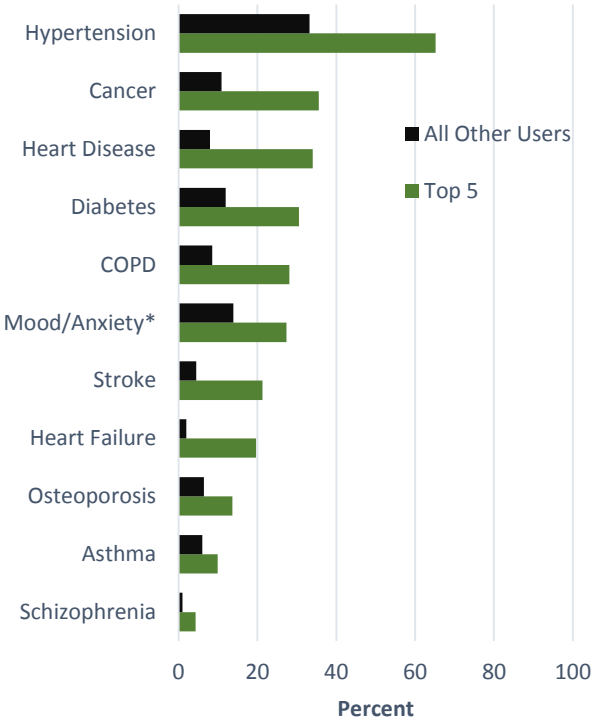
Percentage in Reduced Costs (%)	Projected Costs Recovered per Year
5	$7 million
10	$14 million
15	$21 million
20	$28 million
30	$42 million



The most common chronic conditions observed in the top 5% of healthcare users were hypertension, cancer, heart disease, diabetes, and chronic obstructive pulmonary disease (COPD). It is important to note that with the exception of mood and anxiety disorders, these rates describe lifetime prevalence of each disease (e.g., any individual in the study who received a cancer diagnosis since 2001 is counted, not just those currently living with cancer). Compared to the rest of the population, individuals in the top 5% were approximately

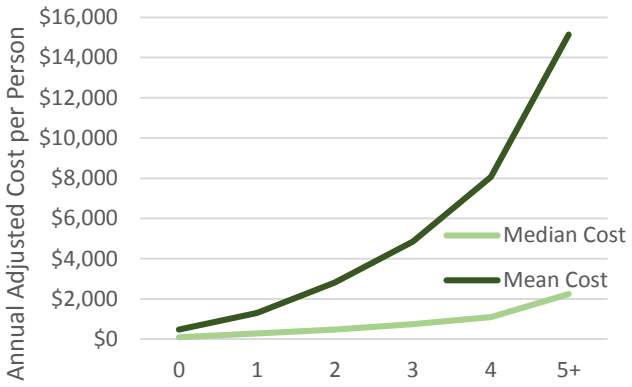
- ten times more likely to have heart failure
- four times more likely to have ischemic heart disease
- three times more likely to have COPD or cancer
- two and a half times more likely to have diabetes, and
- twice more likely to have hypertension or a mood or anxiety disorder.

Chronic Disease Prevalence by High Cost User Status, PEI, 2014-15

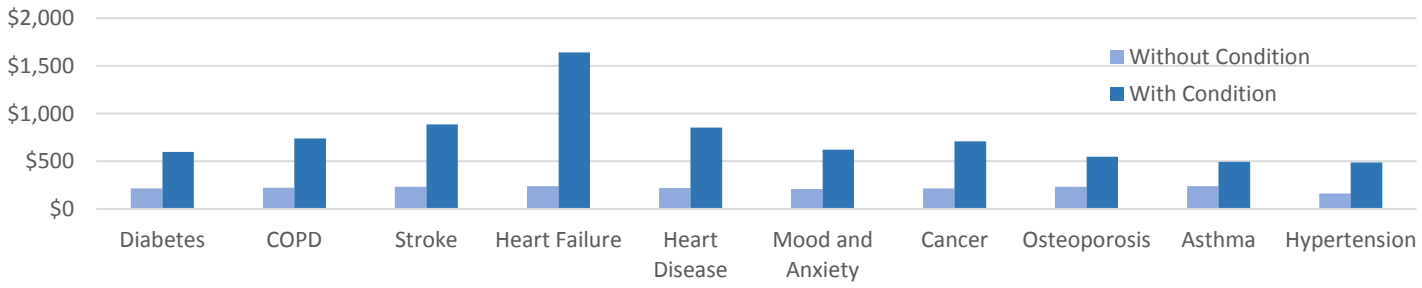


Among all individuals, there is a clear increase in annual healthcare spending per person with each chronic disease diagnosis. As shown below, the median annual adjusted cost for persons with specific chronic diseases is two to three times higher for most diseases compared to the cost for persons without these diseases, with a few exceptions. The median yearly cost of treating an individual with heart disease or stroke is almost four times higher than an individual without, and is almost seven times higher for an individual with heart failure than an individual without.

Annual Costs by Number of Chronic Conditions, PEI, 2012-13 to 2014-15



Median Annual Cost per Persons with and without Chronic Conditions, PEI, 2012-13 to 2014-15



3. THERE IS A HIGHER CONCENTRATION OF HIGH COST USERS AMONG AREAS WITH POORER STATUS WITH RESPECT TO THE SOCIAL DETERMINANTS OF HEALTH

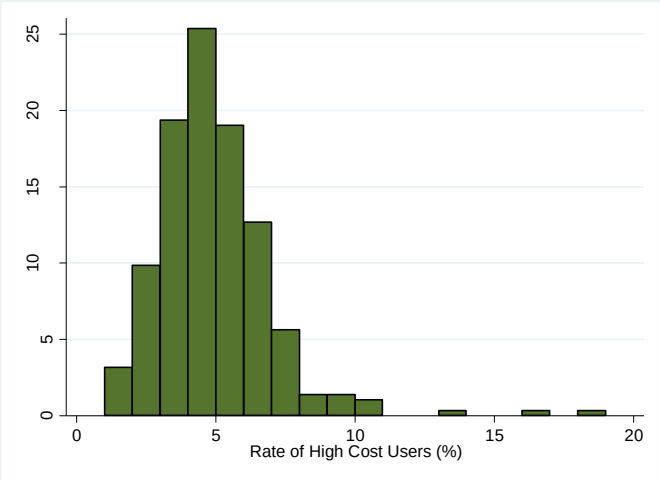
The rate of high cost healthcare users varies across the province, ranging from a low of 1% to a high of 18% at the dissemination area (DA) level in 2014-15. Some areas may have more high cost users for different reasons. Aside from age and chronic disease rates, social determinants of health, including material and social deprivation may vary between areas and individuals and may account for some of this variation in high cost healthcare use.

Each DA on Prince Edward Island was given a score for material deprivation based on the proportion of the population over age 15 who were employed and who had a high school education, as well as their average income. Additionally, each DA was given a score for social deprivation based on the proportion of the population over age 15 who live alone, are separated, divorced or widowed, and the proportion of single parent families in the area.

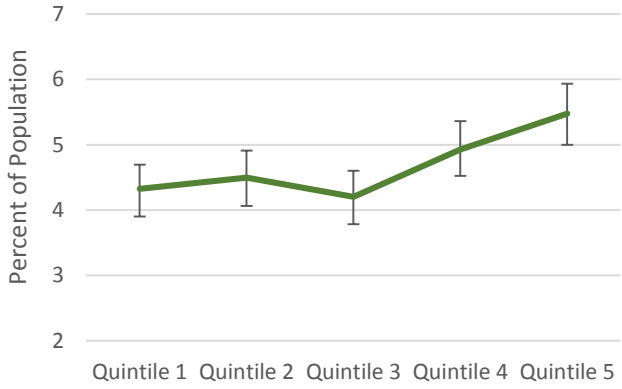
The scores for both types of deprivation were ranked, and broken into 5 equal groups, referred to as quintiles. Quintile one represents the areas with the lowest levels of deprivation, while quintile 5 represents the areas with the highest levels of deprivation.

There was a statistically significant association between both social and material deprivation and the rate of high cost users in an area. In other words, areas with higher levels of deprivation had a higher proportion of high cost healthcare users. DA's in the lowest three social deprivation quintiles had similar rates of high cost users, but DA's in the two highest social deprivation quintiles had higher concentrations of high cost users. Rates of high cost users were also similar among areas in the two lowest material deprivation quintiles, but increased with increasing levels of material deprivation.

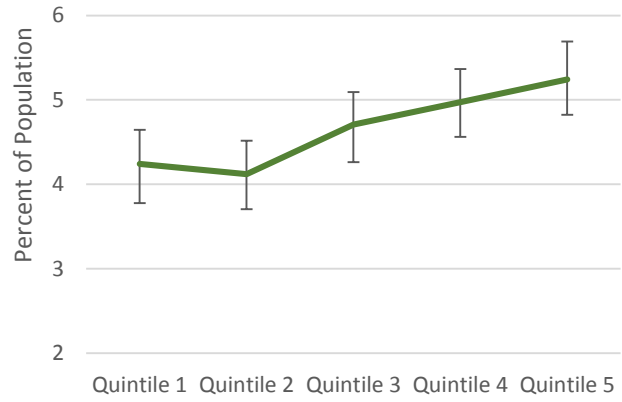
Distribution of High Cost Users at the DA Level, PEI, 2014-15



Rate of High Cost Users by Social Deprivation Quintile, PEI, 2014-15



Rate of High Cost Users by Material Deprivation Quintile, PEI, 2014-15



DISCUSSION

This preliminary analysis revealed variation in rates of high cost users across PEI, and a relationship between high cost use, chronic disease prevalence, and the social determinants of health. Future work will include more advanced and in depth analyses aimed at further understanding this population of high cost users, and to identify key, actionable areas to target in order to reduce healthcare spending.

While it is clear that chronic diseases are highly prevalent among high cost users of the healthcare system, it is also important to note that many of these diseases have common, modifiable risk factors, including unhealthy diet, lack of physical activity, and tobacco use.[5] High rates of chronic disease may be to some degree a reflection of each individual's lifestyle choices, but are also driven by the impact of the social determinants of health that influence a person's ability or decision to make healthy lifestyle choices which in turn reduce their risk of developing these conditions. Previous research conducted in PEI has demonstrated the impact of the social determinants of health on chronic disease rates and other health behaviours and outcomes.[2] While more resources may be required to deal with the current disease burden in our province, in order to create long term sustainability of our healthcare system, and to reduce costs and improve the quality of life for all Islanders, more emphasis must also be placed on investing in upstream, root causes of health in order to prevent or better manage these illnesses.

PROJECT INFO

The Centre for Health and Community Research (CHCR) is a collaborative research group based in the University of Prince Edward Island. The CHCR specializes in innovative research to support the healthcare sector throughout Prince Edward Island and the rest of Canada.

For more information, contact chcr@upei.ca or visit www.chcresearch.ca

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Health and Wellness

New Nouveau Brunswick
CANADA

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