# Using Canadian Administrative Data to Understand the Interplay between Primary and Oncology Care for Breast Cancer Patients during Pre-diagnosis, Treatment and Survivorship: A CanIMPACT Study

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## INTRODUCTION

CanIMPACT is a multi-province Canadian research team funded to identify and address key issues faced by cancer patients and providers at the intersection of primary and specialist oncology care. One stream of inquiry uses administrative data to quantify factors during pre-diagnosis, treatment and survivorship.

## OVERALL OBJECTIVES

- To describe variation and identify gaps in healthcare utilization during the diagnosis, treatment and survivorship phases of breast cancer with a focus on understanding factors affecting delivery of primary and specialist oncology care
- To identify subgroups of patients at risk of sub-optimal outcomes with a special focus on specific vulnerable populations

## SPECIFIC OBJECTIVES

**Diagnosis**
- Investigate inter- and intra-provincial variation in the percentage of screen *vs* symptom-detected patients and the length of their diagnostic intervals. Compare activity levels during the interval with a focus on the role of primary care

**Treatment**
- Investigate inter- and intra-provincial variation in patients receiving systemic cancer therapy who experience a serious therapy related toxicity (defined as Emergency Department (ED) visit or hospitalization)
- Assess the frequency and reasons for primary care physician visits during chemotherapy treatment
- Examine the associations between Primary Care Physician (PCP) visits and hospital use and between treatment delay and overall survival

**Survivorship**
- Investigate variation within and across provinces in adherence to guidelines on breast cancer follow-up care and factors affecting inappropriate care
- Assess quality of comorbid illness and preventive care between 1-3 years post diagnosis

**Cross-cutting Objectives**
- Investigate the cost of resource utilization during each phase
- Analyze longitudinal patterns of PCP use across three phases
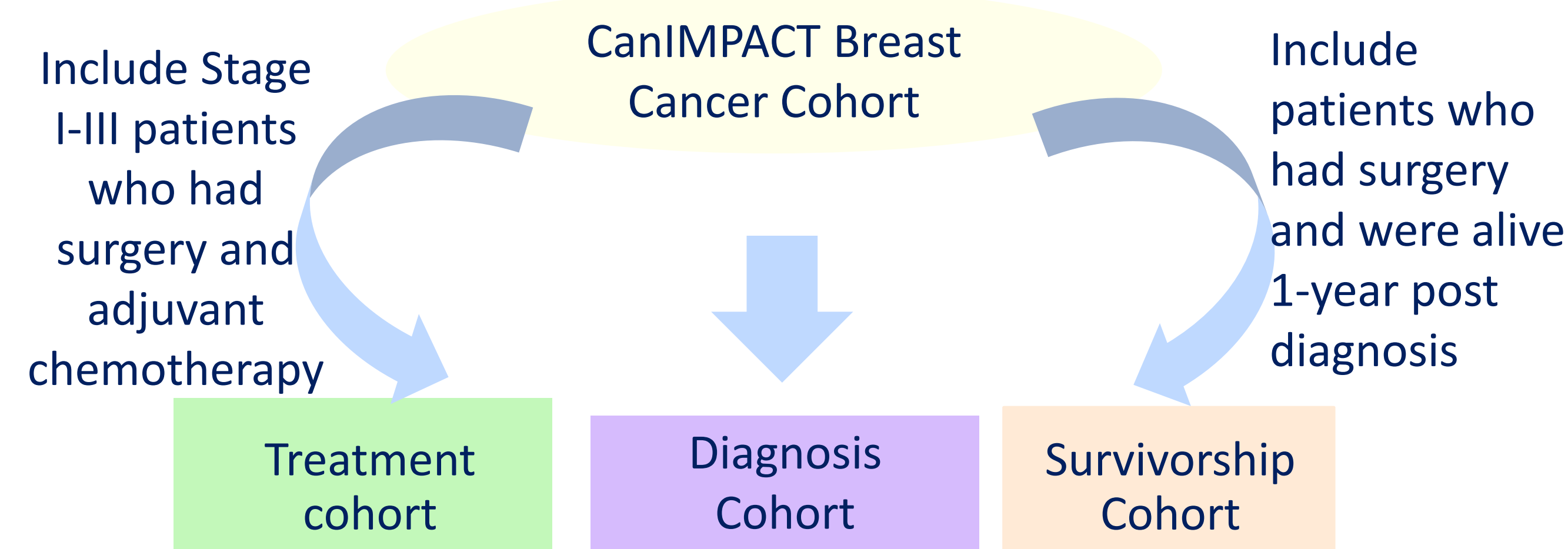- Compare chronic and preventive care (survival vs. pre-dx)

## METHODS

### Study Setting
Population-level, multi-province study using administrative databases from five Canadian provinces: British Columbia, Alberta (diagnosis-phase only), Manitoba, Ontario, and Nova Scotia

### Study Population

Women with first-ever invasive stage I-IV breast cancer diagnosed between Jan 1st, 2007 and Dec 31st, 2011

CanIMPACT Breast Cancer Cohort

Include Stage I-III patients who had surgery and adjuvant chemotherapy → **Treatment cohort**

**Diagnosis Cohort**

Include patients who had surgery and were alive 1-year post diagnosis → **Survivorship Cohort**

### Study Variables and Data Sources*

|  | Diagnosis | Treatment | Survivorship |
|---|---|---|---|
| **Common Covariates** | Age at diagnosis; Socio-economic status; Regional health authority; Co-morbidity; Immigration status (urban areas only); Urban/rural/remote residence; Continuity of care; Cancer stage | | |
| **Phase-specific Covariates** | Detection method Histological grade | Time to adjuvant chemotherapy | Treatment modalities |
| **Common Data Sources** | Cancer registry; Census data; Health insurance plan client registry; Hospital inpatient data; Physician billing claims data; Provincial care provider registry | | |
| **Phase-specific Data Sources** | Breast cancer screening data | Radiotherapy data | Radiotherapy data |

\* Methods for each phase = common methods **PLUS** phase-specific methods

## CHALLENGES

### Variation in Data Availability across Provinces

| Databases | British Columbia | Alberta | Manitoba | Ontario | Nova Scotia |
|---|---|---|---|---|---|
| Hospital outpatient data including ED | No | Yes | No | Yes | No |
| Postal Code Conversion File application (PCCF+) versions | Version 5K | Version 5K | Version 5J | Version 5E | Version 5K |
| Citizenship and Immigration Canada Data | Yes | No | No | Yes | No |
| Chemotherapy end date | Yes | N/A | No | Yes | No |

**Approach**: We will ensure comparability through 1) same data source and/or 2) same variable definitions and/or 3) sensitivity analyses when different sources are used and/or 4) comparison across fewer provinces

### Challenges in Measuring Covariates – An Example

**Measures of Socio-economic Status (SES)**

**Direct Measure**

**Indirect Measures** –based on 2006 Census dissemination area (DA) data using Statistical Canada Postal Code Conversion Files

**Canadian Marginalization Deprivation Index (CMDI)**
- Based on solid science
- 4 dimensions  1) Residential Instability 2) Material Deprivation 3) Dependency 4) Ethnic Concentration
- Currently used in Ontario
- Subject to misclassification especially in rural areas

**Neighbourhood Income Quintile (NIQ)**
- Based on % people at a DA level below the low income cut-off adjusted for number of persons living in that household
- Use by Canadian Partnership Against Cancer in recent report
- Subject to misclassification especially in rural areas

**Approach**: We will use both the CMDI and the NIQ as measures of SES but run separate analyses for urban and rural census dissemination areas

### Progress to Date
We have finalized our objectives, data planning, and requests for each care phase. We are developing standardized analytical methods, algorithms, programs and data dictionaries to minimize methodological heterogeneity for inter-provincial comparisons.

## IMPACT

- Provide a quantitative evidence base for developing a framework for shared care that improves transition care along the cancer care continuum
- Demonstrate the ability of administrative databases to measure and monitor system change and improvement across and within jurisdictions
- Build infrastructure and capacity for ongoing quality surveillance