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About Us

The Health System Performance Network (HSPN) is a collaborative network of investigators, visiting scholars, post-doctoral fellows, graduate students and research staff working with health system leaders, and policymakers to improve the management and performance of our health system. Building on Ontario’s established record of performance measurement created by the 1998 ground-breaking Hospital Report Research Collaborative, the HSPN was established in 2009 and has built a track record in performance measurement, research, evaluation and improvement in Ontario with expertise in multiple domains of health system performance including perspectives of patients, providers, population health, and cost. The HSPN receives funding from the Ontario Ministry of Health.

Contact information

Health System Performance Network
155 College Street, Suite 425
Toronto ON M5T 3M6
Telephone: +1 (416) 946-5023
Email: hspn@utoronto.ca

Authors Affiliations

Luke Mondor, MSc – HSPN and ICES
Ruth E. Hall, PhD – HSPN, University of Toronto; Institute for Better Health, Trillium Health Partners; and ICES
Walter P. Wodchis, PhD – HSPN, University of Toronto; Institute for Better Health, Trillium Health Partners; and ICES

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Contents

Abbreviations ........................................................................................................................................... 6
Purpose of this Report .............................................................................................................................. 8
1.0 – A Brief Primary on Using Population Segmentation for Population Health Management .......... 9
  1.1 – How to Use HSPN Population Segmentation to Focus Improve Health Outcomes Measured by
        Improvement Indicators: An example using collaborative Quality Improvement Indicators ............. 9
2.0 – The British Columbia Health System Matrix .................................................................................. 11
  2.1 – Segment Technical Definitions for the BC Health System Matrix ............................................... 12
        PS14 – End of Life .............................................................................................................................. 12
        PS13 – Frail in Residential Care .................................................................................................... 13
        PS12 - Cancer ................................................................................................................................. 13
        PS11 – Frail with High Complex Chronic Conditions .................................................................... 13
        PS10 – High Complex Chronic Conditions .................................................................................. 15
        PS09 – Frail in the Community ..................................................................................................... 15
        PS08 – Maternity and Healthy Newborns ....................................................................................... 16
        PS07 – Mental Health and Substance Use ..................................................................................... 17
        PS06 – Medium Complex Chronic Conditions ............................................................................... 17
        PS05 – Low Complex Chronic Conditions .................................................................................... 17
        PS04 – Child and Youth Major <18 years ....................................................................................... 18
        PS03 – Adult Major Age 18+ years ................................................................................................. 18
        PS02 – Healthy ............................................................................................................................... 19
        PS01 – Non-users ............................................................................................................................ 19
  2.2 – Segment Data Lookback Periods for the BC Health System Matrix segmentation ...................... 20
  2.3 – Definitions for Chronic Conditions for the BC Health System Matrix segmentation .................. 21
        Alzheimer’s and Other Dementias .................................................................................................... 21
        Cystic Fibrosis (episodic) ................................................................................................................ 22
        Heart Failure ................................................................................................................................... 22
        Solid Organ Transplant ................................................................................................................ 22
        Stroke ............................................................................................................................................ 23
        Chronic Kidney Disease on Dialysis .............................................................................................. 23
        Angina ............................................................................................................................................. 24
        Chronic Obstructive Pulmonary Disease (COPD) ........................................................................... 24
        Multiple Sclerosis .......................................................................................................................... 24
        Parkinson’s Disease ....................................................................................................................... 25
        Pre-Dialysis Chronic Kidney Disease .............................................................................................. 25
        Rheumatoid Arthritis ....................................................................................................................... 26
        Coronary Artery Bypass Graft (CABG) ........................................................................................... 26
        Acute Myocardial Infarction (AMI) ................................................................................................ 27
        Percutaneous Transluminal Coronary Angioplasty ......................................................................... 27
        Asthma ............................................................................................................................................ 27
Mood/Anxiety Disorders (episodic) ................................................................. 28
Diabetes ........................................................................................................... 28
Epilepsy .......................................................................................................... 29
Hypertension .................................................................................................. 29
Osteoarthritis ................................................................................................. 29
Osteoporosis ................................................................................................... 30
3.0 – Material Deprivation Quintile ................................................................. 31
4.0 – Primary Care Patient Enrolment Model .................................................. 31
5.0 – Canadian Institutes for Health Information Population Grouping Methodology ..................................................................................... 31
6.0 – HSPN Total Population Indicators Technical Specifications ................. 32
  Premature mortality .................................................................................... 32
  Cost per month alive ................................................................................ 32
  Days in acute inpatient care ..................................................................... 33
  Alternate level of care (ALC) days .............................................................. 33
  Hospitalizations for ambulatory care sensitive conditions (ACSCs) .............. 34
  Readmissions within 30 days for selected HBAM Inpatient Grouper (HIG) conditions ................................................................. 35
  Emergency visits for conditions that could be treated in alternative primary care setting ................................................................. 35
  Physician visits after discharge from hospital for selected HIG conditions ..................................................................................... 36
  Continuity of Care – Usual Provider of Care (UPC) Index ........................... 37
  Proportion of OHT attributed patients with a virtual physician encounter ................................................................. 37
6.1 – HSPN Mental Health and Addictions Indicator Technical Specifications .... 38
  7-day follow-up with a physician after hospitalization for MHA .................. 38
  First contact in the emergency department for MHA ................................. 39
  Frequent (4+) emergency department visits for help with MHA .................. 39
  Rate of emergency department visits for deliberate self-harm ...................... 40
6.2 – HSPN Older/ Frail Population Indicator Technical Specifications ............ 41
  Days spent at home, among those identified as frail .................................... 41
  Repeat fall-related emergency visits, among those identified as frail .......... 42
  Caregiver distress ...................................................................................... 43
  Change in Minimum dataset health status index (MDSHSI) ........................ 43
  Change in Activities of daily living – long form ......................................... 44
6.3 – HSPN End of Life Population Indicator Technical Specifications ............ 45
  Deaths in hospital ...................................................................................... 45
  Days spent at home in the last 6 months (180 days) of life .......................... 45
  Proportion of decedents with one or more emergency department visits in the last 30 days of life ......................................................... 46
  Proportion of decedents receiving palliative home care in the last 90 days of life ................................................................. 46
  Proportion of decedents receiving palliative physician home visits in the last 90 days of life ................................................................. 47
6.4 – Collaborative Quality Improvement Indicator Technical Specifications ....... 47
  Percentage of screening eligible patients up-to-date with Papanicolaou (Pap) Tests ................................................................. 47
  Percentage of screen-eligible patients up-to-date with a mammogram .......... 48
Percentage of screen-eligible patients up-to-date with colorectal screening.......................... 48
References........................................................................................................................................ 49
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCHSM</td>
<td>British Columbia Health System Matrix</td>
</tr>
<tr>
<td>CAPE</td>
<td>Client Agency Program Enrolment database</td>
</tr>
<tr>
<td>CCC</td>
<td>Complex Continuing Care database</td>
</tr>
<tr>
<td>CCI</td>
<td>Canadian Classification of Health Interventions</td>
</tr>
<tr>
<td>CCP</td>
<td>Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures</td>
</tr>
<tr>
<td>CCRS</td>
<td>Continuing Care Reporting System database</td>
</tr>
<tr>
<td>CHC</td>
<td>Community Health Centre database</td>
</tr>
<tr>
<td>CIHI</td>
<td>Canadian Institute for Health Information</td>
</tr>
<tr>
<td>cQIP</td>
<td>collaborative Quality Improvement Program</td>
</tr>
<tr>
<td>DAD</td>
<td>Discharge Abstract Database</td>
</tr>
<tr>
<td>ED</td>
<td>Emergency department</td>
</tr>
<tr>
<td>ESTSOB</td>
<td>Estimated Schedule of Benefits</td>
</tr>
<tr>
<td>FFS-CCM</td>
<td>Fee-For-Service Comprehensive Care Model</td>
</tr>
<tr>
<td>FHG</td>
<td>Family Health Groups</td>
</tr>
<tr>
<td>FHN</td>
<td>Family Health Networks</td>
</tr>
<tr>
<td>FHO</td>
<td>Family Health Organizations</td>
</tr>
<tr>
<td>FHT</td>
<td>Family Health Team</td>
</tr>
<tr>
<td>GAPP</td>
<td>GAPP Decision Support Systems</td>
</tr>
<tr>
<td>HCD</td>
<td>Home Care Database</td>
</tr>
<tr>
<td>Hosp</td>
<td>Hospitalization</td>
</tr>
<tr>
<td>HSPN</td>
<td>Health System Performance Network</td>
</tr>
<tr>
<td>ICD</td>
<td>International Classification of Diseases</td>
</tr>
<tr>
<td>interRAIHC</td>
<td>inter Resident Assessment Instrument for Home Care database</td>
</tr>
<tr>
<td>LTC</td>
<td>Long-term care</td>
</tr>
<tr>
<td>MDSHSI</td>
<td>Minimum Dataset Health Status Index</td>
</tr>
<tr>
<td>MHA</td>
<td>Mental health and addictions</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>NACRS</td>
<td>National Ambulatory Care Reporting System database</td>
</tr>
<tr>
<td>NRS</td>
<td>National Rehabilitation Reporting System database</td>
</tr>
<tr>
<td>OBSP</td>
<td>Ontario Breast Screening Program database</td>
</tr>
<tr>
<td>OCCI</td>
<td>Ontario Case Costing Initiative database</td>
</tr>
<tr>
<td>OCR</td>
<td>Ontario Cancer Registry database</td>
</tr>
<tr>
<td>ODB</td>
<td>Ontario Drug Benefits claims database</td>
</tr>
<tr>
<td>OHIP</td>
<td>Ontario Health Insurance Program claims database / physician encounters</td>
</tr>
<tr>
<td>OHCAS</td>
<td>Ontario Home Care Administrative System database</td>
</tr>
<tr>
<td>OHT</td>
<td>Ontario Health Team</td>
</tr>
<tr>
<td>OHTAM</td>
<td>Ontario Health Team Attribution Model database</td>
</tr>
<tr>
<td>OMHRS</td>
<td>Ontario Mental Health Reporting System database</td>
</tr>
<tr>
<td>PEM</td>
<td>Patient Enrolment Model</td>
</tr>
<tr>
<td>PGLO</td>
<td>Provincial Geriatrics Leadership Office of Ontario</td>
</tr>
<tr>
<td>PS</td>
<td>Population segment</td>
</tr>
<tr>
<td>QIP</td>
<td>Quality Improvement Plan</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>RAICA</td>
<td>Resident Assessment Instrument Contact Assessment database</td>
</tr>
<tr>
<td>RAIHC</td>
<td>Resident Assessment Instrument for Home Care database</td>
</tr>
<tr>
<td>RPDB</td>
<td>Registered Persons Database</td>
</tr>
<tr>
<td>SDS</td>
<td>Same Day Surgery database</td>
</tr>
<tr>
<td>UPC</td>
<td>Usual provider of care</td>
</tr>
</tbody>
</table>
Purpose of this Report

This technical report accompanies population segmentation and Health System Performance Network (HSPN) improvement indicators that were distributed in the winter of 2022 to each Ontario Health Team with comparative provincial results made available on the HSPN OHT evaluation website (and shared in the January 25th, 2022 HSPN Webinar). These reports build on prior HSPN improvement indicator reports that were distributed to each OHT and reported provincially in May and June of 2021 [1-4]. The 2021 reports provided results for each OHT on 25 Improvement indicators: ten for the overall OHT population and five for each of three focus areas including mental health and addictions, frail older adults, and palliative / end of life populations. The 2021 reports also reported on the ratio of each indicator in the highest quintile of material deprivation compared to the lowest quintile of material deprivation.

For 2022, the HSPN has created a data package with three Excel spreadsheets. These Excel spreadsheets included results for 25 indicators identified by the original reports supplemented by three new cancer screening indicators. The new cancer screening indicators were identified by Ontario Health as part of a set of five collaborative Quality Improvement Program (cQIP) indicators. The other two indicators were for indicators included in our original 25, namely Alternate Level of Care (ALC) days and presentations to Emergency Departments (ED) as the first source of mental health and addictions care (based on physician billings and hospital presentations). There are also worksheets included that report on contextual measures of the total number of physician visits, the number and proportion of physician visits that were to primary care, and the proportion of physician visits to specialist physicians.

In the first spreadsheet, all indicators are reported according to the British Columbia Health System Matrix (BCHSM) population segments and by Material Deprivation quintile. Data are also provided for Material Deprivation quintiles 1-3 and 4-5 combined.

In the second spreadsheet all indicators are reported according to the Canadian Institute for Health Information (CIHI) Population Grouping Methodology segments and by Material Deprivation quintile. Data are also provided for Material Deprivation quintiles 1-3 and 4-5 combined.

A third spreadsheet includes all indicators reported by primary care Patient Enrolment Model (PEM).

A fourth file provided a PowerPoint presentation of selected cQIP indicators according to BCHSM population segments, Material Deprivation, primary care PEM and according to CIHI Population Grouping Methodology population segments.

The purpose of this report is to outline the methodology used to create the BCHSM population segments, Material Deprivation quintiles, and primary care PEMs. The CIHI Population Grouping Methodology categories were obtained from existing health administrative data and the reader is referred to CIHI for details for that system.
1.0 – A Brief Primary on Using Population Segmentation for Population Health Management

The goal for population health management is to improve the health of the population which means increasing overall health and reducing inequalities in health outcomes [5]. One of the very first steps in population health management is to use available health data to segment the population into groups of individuals with similar health-related needs. The HSPN produced a series of three white papers on population health management and population segmentation using an international review of existing approaches [6-8]. Key conclusions of these reports were:

- Population segmentation is an essential tool to be able to match patient needs with suitable interventions.
- Population segmentation should aim to be inclusive of the entire population and therefore to use data that are as inclusive as possible for the entire population.
- In order to use population segmentation in the design and implementation of interventions, segments need to be clinically meaningful and interpretable at the front lines of care.
- There is no single gold standard for population segmentation: some form of segmentation is essential, the exact approach should support the achievement of goals and priorities in the local implementation of population health management.
- Three broad approaches to population segmentation include:
  1) risk-oriented models which aim to predict which individuals will require high cost and high-intensity services in the year future;
  2) clinically-oriented models which identify the types of care needs experienced by patients; and
  3) data driven approaches which aim to identify clusters of conditions that tend to accompany each other.
- HSPN should support Ontario Health Teams (OHTs) seeking to implement population health management with each of the first two broad approaches and work to determine suitability and usefulness of each approach.

The present set of data packages pick up where the previous series of white papers left off, bolstered by the new availability of 28 improvement indicators selected for early OHT implementation. Segmenting the population and then examining improvement indicators within population segments is aimed to further refine understanding the characteristics of individuals who contribute to lower scores on improvement indicators.

1.1 – How to Use HSPN Population Segmentation to Focus Improve Health Outcomes Measured by Improvement Indicators: An example using collaborative Quality Improvement Indicators

The PowerPoint presentations report on five cQIP improvement indicators as an example of how to use the data in the accompanying Excel spreadsheets to inform improvement ideas. In reviewing these data, we have identified a few common patterns across the different cQIP indicators. For example, while ALC is a well-known indicator for all OHTs, the BCHSM segments identify that there are a proportion of individuals in ALC who have palliative care needs, another group who are frail with complex medical needs and aim to be transitioned to the community, and another group that hold spaces/beds in long-term care homes. The interventions and pathways for these groups may differ based on the availability of resources and intended goals of care. In contrast, most individuals who are behind on screening for breast, colorectal or cervical cancers are relatively healthy individuals, many of whom have not had any encounter in the health system in the prior year. Interventions here require that OHTs both use contacts with the health system to remind individuals to have cancer screening tests but also require that OHTs find ways to reach out to patients who are not using the health care system.

We also use segments according to material deprivation to identify which indicators there may be additional socio-economic challenges to overcome in order to make advances in indicator scores. Cancer screening indicators for example show significant gradients where individuals living in areas with high levels of material deprivation are less likely to have completed recommended screening as compared to individuals living...
in areas with low levels of material deprivation. When considering the cQIP indicator for presentations to ED as the first source of mental health and addictions care (based on physician billings and hospital presentations), the data generally indicate at the provincial level (which tends to be mirrored in individual OHT results), that individuals living in areas with high material deprivation tend to have higher rates of ED visits for mental health and addictions causes but that these are equally likely to be the first presentation across all levels of material deprivation. Hence, it is primarily the preventative screening indicators where interventions may need to provide special consideration for individuals in areas of high material deprivation.

Ontario’s primary care system has a wide variety of PEMs that represent different physician funding methods and enhanced team-based resources. There are several models that provide patient rostering that represents an agreement between patients and physicians to have a priority if not entirely exclusive primary care relationship. Within rostered models, physicians may be paid primarily through Fee-For-Service (Comprehensive Care Model – FFS-CCM), primarily through capitation (Family Health Organizations and Family Health Networks – FHO/FHN), or through blended payment (Family Health Groups – FHG). Some FHO/FHN providers are also affiliated with Family Health Teams (FHTs) which enables access to additional interprofessional health care team resources. The cQIP cancer screening indicators demonstrate a consistent relationship with the patient’s PEM where patients enrolled to FHT models achieving rates of screening that are as much as 10% higher than patients who are not rostered.

The CIHI Population Grouping Methodology provides results that have similarities to those of the BCHSM (for example, the largest screening opportunities amongst those with few or no health conditions or who did not access health care). There are differences between the BCHSM and CIHI Population Grouper because of definitional differences. The palliative population for example is smaller in the CIHI system because fewer community-based patients with palliative care needs are identified in the CIHI system. The CIHI system also does not consider individuals living in long-term care facilities separate from community-dwelling individuals, and the CIHI system also does not have a frailty modifier included in the characterization of population health needs (associated individuals with dementia, for example, are captured in major mental health). The CIHI grouper, however, provides distinctions between minor and major acute, minor and major cancers, and has three levels of chronic condition severity.

We have provided examples here using five cQIP indicators. It is intended, however, that OHTs are able to use the data in the Excel spreadsheets to undertake an equivalent analysis for any indicator(s) within the 28 supplied indicators to further understand sources of variation and focus populations that represent opportunities for improvement on any of the associated indicators. Some of the most common indicators identified by OHTs include frequent ED visits, ambulatory-care sensitive hospitalizations and physician follow-up after hospital discharge. A similar analysis as presented in the associated PowerPoint slide deck could be undertaken by OHTs given the data supplied in the Excel files.
2.0 – The British Columbia Health System Matrix

Summary
The BCHSM is a population segmentation approach that divides the entire population into 14 mutually exclusive population segments (PS) ranging from Healthy (lowest health care needs) to End of Life (greatest health care needs). An individual can meet the definition for multiple segments but are assigned to the segment that represents their greatest need in that year. Specifically, the BCHSM places individuals in the category with the highest expected clinical complexity ranked in descending order as PS14 to PS01 (where PS represents Population Segment). An individual living in long-term care with palliative care needs will be associated with the palliative care group, an individual with advanced cancer who is living in long-term care facility will be identified in the long term care group, and so forth.

The BCHSM was inspired from the Bridges to Health model [9], which divides a population into eight mutually exclusive groups including healthy, maternal and infant health, acutely ill, chronic conditions, stable but serious disability, short period of decline before dying, limited reserve and exacerbations, and frailty. Each group has their own definitions for optimal health and priorities for care and it is proposed that addressing the needs of these segments leads to more efficient and reliable health care supporting improvement of health across the entire population.

The following table identifies the 14 segments in the BCHSM. Definitions for Ontario health administrative data are in the following section.

Table 1. The 14 Segments of the British Columbia Health System Matrix

<table>
<thead>
<tr>
<th>Category</th>
<th>No</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Towards the End of Life</td>
<td>PS14</td>
<td>End of Life – People who received any health care services specifically for palliative care in the prior year.</td>
</tr>
<tr>
<td>Towards the End of Life</td>
<td>PS13</td>
<td>Frail in Care – Residents of long-term care facilities that provide 24-hour nursing care and assistance with Activities of Daily Living (ADL) in the prior year.</td>
</tr>
<tr>
<td>Living with Illness</td>
<td>PS12</td>
<td>Cancer – People diagnosed with cancer in the prior two years.</td>
</tr>
<tr>
<td>Towards the End of Life</td>
<td>PS11</td>
<td>Frail with High Complex Chronic Conditions – People 40 years of age or older and have one or more high chronic conditions, such as cognitive impairment, incontinence, falls, nutritional difficulties, functional difficulties, targeted health service utilization or decline in general health status.</td>
</tr>
<tr>
<td>Living with Illness</td>
<td>PS10</td>
<td>High Complex Chronic Conditions – People with one or more high chronic conditions such as cystic fibrosis, heart failure, organ transplant, have had a stroke, or are on dialysis, or have a specific combination of chronic conditions.</td>
</tr>
<tr>
<td>Towards the End of Life</td>
<td>PS09</td>
<td>Frail in the Community – Community dwelling people who had two or more of the seven following conditions: cognitive impairment, incontinence, falls, nutritional difficulties, functional difficulties, targeted health service utilization or decline in general health status.</td>
</tr>
<tr>
<td>Staying Healthy</td>
<td>PS08</td>
<td>Maternity and Healthy Newborns – Women who are pregnant or delivered a baby in the prior year, and their healthy newborns.</td>
</tr>
<tr>
<td>Living with Illness</td>
<td>PS07</td>
<td>Mental Health and Substance Use – People who experience severe mental disorders (including substance use disorders) in the prior five years.</td>
</tr>
<tr>
<td>Living with Illness</td>
<td>PS06</td>
<td>Medium Complex Chronic Conditions – People in this population segment have one or more medium chronic conditions such as angina, COPD, multiple sclerosis, Parkinson’s, pre-dialysis chronic kidney disease, rheumatoid arthritis, have had a major cardiac event or intervention, or have a specific combination of chronic conditions.</td>
</tr>
<tr>
<td>Living with Illness</td>
<td>PS05</td>
<td>Low Complex Chronic Conditions – People in this population segment have one or more low complex chronic conditions, such as asthma, mood, or anxiety disorder including depression, diabetes, epilepsy, hypertension, osteoarthritis, or osteoporosis.</td>
</tr>
<tr>
<td>Getting Healthy</td>
<td>PS04</td>
<td>Child and Youth Major &lt;18 years – Residents who are under 18 years old with major health conditions that were not identified in other population segments.</td>
</tr>
<tr>
<td>Getting Healthy</td>
<td>PS03</td>
<td>Adult Major Age 18+ – Residents who are 18 years old or older with major health conditions that are not identified in other population segments.</td>
</tr>
<tr>
<td>Staying Healthy</td>
<td>PS02</td>
<td>Healthy – Residents who are low users of publicly funded services, and do not have any of the health conditions that are identified in the other population segments.</td>
</tr>
<tr>
<td>Staying Healthy</td>
<td>PS01</td>
<td>Non-Users – Residents who do not use any of the public health services included in Health System Matrix.</td>
</tr>
</tbody>
</table>
### 2.1 – Segment Technical Definitions for the BC Health System Matrix

**PS14 – End of Life**

**Definition:** People who received any health care services specifically for palliative care in the prior year.

**Data Sources:** CCRS, DAD, HCD, interRAIHC, NACRS, NRS, OHIP, OMHRS, RAICA, RAIHC

**Codes/Algorithms Used:** Individuals were included in PS14 if they had any of the following codes assigned in the prior year:

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Codes Used</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OHIP</strong></td>
<td>FEECODES = A945, B966, B997 (after Oct 2009), B998, C882, C945, C982, G511, G512, K015, K023, K700, W872, W882, W972, W982</td>
</tr>
<tr>
<td><strong>NACRS</strong></td>
<td>PRVSERV[1-10] = 00121, CONSULTSERV[1-3], DX10CODE[1-25] = Z515</td>
</tr>
<tr>
<td><strong>RAICA</strong></td>
<td>B2C = 1, B4 = 12, E7 = 2</td>
</tr>
<tr>
<td><strong>RAIHC</strong></td>
<td>CC3F = 1, P2S = 1 or 2, K8E = 1, CAP_PALLIATIVE_CARE = 5 or 6, CAP_PALLIATIVE_CARE_ACTION = 1</td>
</tr>
<tr>
<td><strong>interRAIHC</strong></td>
<td>J6C = 1, N2M = 2 or 3</td>
</tr>
<tr>
<td><strong>HCD – Clients</strong></td>
<td>SRC_ADMISSION = 95, RESIDENCE_TYPE = 2000, SRC_DISCHARGE = 54 or 95</td>
</tr>
<tr>
<td><strong>HCD – Services</strong></td>
<td>SERVICE_RPC = 54 or 95, SERVICE = 17</td>
</tr>
<tr>
<td><strong>CCRS – CCC</strong></td>
<td>P1AO = 1, J5C = 1, K2A = 248</td>
</tr>
<tr>
<td><strong>CCRS – LTC</strong></td>
<td>P1AO = 1, J5C = 1, K2A = 248</td>
</tr>
<tr>
<td><strong>NRS</strong></td>
<td>ADMICD10CODE, DHCPICD10CODE[01-15]</td>
</tr>
<tr>
<td><strong>OMHRS</strong></td>
<td>DISCHLIVING = 11</td>
</tr>
</tbody>
</table>

**Notes and Limitations:**
### PS13 – Frail in Residential Care

**Definition:** Residents of long-term care facilities that provide 24-hour nursing care and assistance with Activities of Daily Living (ADL) in the prior year.

**Data Sources:** CCRS, ODB, OHIP

**Codes/Algorithms Used:** Individuals were included in PS13 if they had any of the following codes assigned in the prior year:

<table>
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<th>Dataset</th>
<th>Codes Used</th>
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<tr>
<td>OHIP</td>
<td>FEECODES starting with ‘W’</td>
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<td></td>
<td>LOCATION = L</td>
</tr>
<tr>
<td>ODB</td>
<td>LTC = 1</td>
</tr>
<tr>
<td>CCRS - LTC</td>
<td>Any admission</td>
</tr>
</tbody>
</table>

**Notes and Limitations:** N/A

### PS12 - Cancer

**Definition:** People diagnosed with cancer in the prior two years.

**Data Sources:** OCR

**Codes/Algorithms Used:** Individuals were included in PS12 if, in the prior 2 years, they entered the Ontario Cancer Registry with a new diagnosis of cancer.

**Notes and Limitations:** N/A

### PS11 – Frail with High Complex Chronic Conditions

**Definition:** People in this population segment are 40 years of age or older and meet the Provincial Geriatrics Leadership Office of Ontario (PGLO) frailty definition (either had dementia or had two or more of the seven following conditions: cognitive impairment, incontinence, falls, nutritional difficulties, functional difficulties, targeted health service utilization or decline in general health status) AND have previously been diagnosed with one or more high chronic conditions (any of Alzheimer’s disease or other dementia, cystic fibrosis, heart failure, organ transplant, have had a stroke, are on dialysis, or have a specific combination of chronic conditions).

**Data Sources:** CCRS - LTC, DAD, HCD, NACRS, ODB, OHIP, RAICA, RAIHC, RPDB, SDS
Codes/Algorithms Used: Frailty includes all persons:

- With two or more of the following seven conditions identified in DAD or OHIP:
  - Cognitive impairment, including dementia and delirium (ICD-10 codes F05X: F050, F051, F058, F059 and ICD-9 codes 293)
  - Incontinence (ICD-10: R32, R15).
  - Falls (ICD-10: E9177, E9178, E9293, W01,W05-W19)
  - Nutritional difficulties (ICD-10: R627, R634, R633, R630, F500, F501, R63, R636, R638,78322, 7833, 7839),
  - Functional difficulties (ICD-10: R26, R262, M6250-9, M6281, L89X)
  - Targeted health service utilization (OHIP specialty 07 with OHIP feecodes W770, W775, W795, A770, A775, A795, C770, C775, C795, E071, E075, E077, E703, DAD patserv 77, OHIP location home with OHIP feecodes B960-4, B966, B986, B987, B988, B990-8)
  - Decline in general health status (2+ non-elective hospital admissions or unscheduled ED visits in the last year, or malaise, fatigue/debility and/or cachexia diagnoses (ICD-10 R53, G933, R64, ICD-9: 795).

In addition, persons must have 1 or more High Complex Chronic Conditions, as outlined in Section 2.3 Definitions for Chronic Conditions in BC Health System Matrix segmentation.

Notes and Limitations:

- Frail in the community in the BCHSM was implemented in British Columbia based on the provision of professional home care services or publicly funded services to assist with ADL. The HSPN has adopted the PGLO definition of frailty because it has the widest population availability; this definition does not currently include home care data. Not all home care recipients are frail (see: Campitelli MA, Bronskill SE, Hogan DA, et al. (2016) The prevalence and health consequences of frailty in a population-based older home care cohort: a comparison of different measures. BMC Geriatrics; 16: 133, available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937594/pdf/12877_2016_Article_309.pdf [accessed July 12, 2021]). Restricting to home care populations only could underestimate the total number of individuals with frailty. Therefore, we used a frailty assessment method for use with physician and hospitalization data in Ontario developed and endorsed by PGLO (see: https://rgps.on.ca/wp-content/uploads/2019/08/PGLO-report-May15r.pdf [accessed Feb 11, 2022]). This definition was applied to the attributable population aged 40 years and older (from 65+). Future consideration for additions of using home care data to identify additional frail individuals is under review.

- The PGLO frailty definition includes individuals that were a resident in long-term care (LTC), received palliative care services, had dementia, or had two or more of the seven conditions. However, residents receiving palliative care would be first assigned to PS14 and non-palliative residents in LTC facilities would be first assigned to PS13).
**PS10 – High Complex Chronic Conditions**

**Definition:** People in this population segment have ever been diagnosed with one or more high chronic conditions such as cystic fibrosis, heart failure, organ transplant, have had a stroke, are on dialysis, or have a specific combination of chronic conditions.

**Data Sources:** DAD, ODB, OHIP, RPDB, SDS

**Codes/Algorithms Used:** High Complex Chronic Conditions are outlined in Section 2.3 Definitions for Chronic Conditions for the BC Health System Matrix segmentation.

**Notes and Limitations:** The BCHSM includes Alzheimer’s disease or other dementia as High Complex Chronic Conditions. However, these individuals also meet the PGLO definition of frailty so would be first assigned to PS11.

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**PS09 – Frail in the Community**

**Definition:** People in this population segment are 40 years of age or older and met the PGLO frailty definition (had two or more of the seven following conditions: cognitive impairment, incontinence, falls, nutritional difficulties, functional difficulties, targeted health service utilization or decline in general health status) and reside in the community.

**Data Sources:** CCRS - LTC, DAD, HCD, NACRS, ODB, OHIP, RAICA, RAIHC, RPDB

**Codes/Algorithms Used:** Frailty includes all persons:
- With two or more of the following seven conditions identified in DAD or OHIP:
  - Cognitive impairment, including dementia and delirium (ICD-10 codes F05X: F050, F051, F058, F059 and ICD-9 codes 293)
  - Incontinence (ICD-10: R32, R15).
  - Falls (ICD-10: E9177, E9178, E9293, W01-W05-W19)
  - Functional difficulties (ICD-10: R26, R262, M6250-9, M6281, L89X)
  - Targeted health service utilization (OHIP specialty 07 with OHIP feecodes W770, W775, W795, A770, A775, A795, C770, C775, C795, E071, E075, E077, E703, DAD patser 77, OHIP location home with OHIP feecodes B960-4, B966, B986, B987, B988, B990-8)
  - Decline in general health status (2+ non-elective hospital admissions or unscheduled ED visits in the last year, or malaise, fatigue/debility and/or cachexia diagnoses (ICD-10 R53, G933, R64, ICD-9: 795).

**Notes and Limitations:**
- Frail in the community in the BCHSM is based on the provision of professional home care services or publicly funded services to assist with ADL. Not all home care recipients are frail, however (see: Campitelli MA, Bronskill SE, Hogan DA, et al. (2016) The prevalence and health consequences of frailty in a population-based older home care cohort: a comparison of different measures. BMC Geriatrics; 16: 133, available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4937594/pdf/12877_2016_Article_309.pdf [accessed July 12, 2021]). Further, restricting to home care populations only could underestimate the total number of individuals with frailty. Therefore, we used a frailty assessment method for use with physician and hospitalization data in Ontario developed and endorsed by PGLO (see: https://rgps.on.ca/wp-content/uploads/2019/08/PGLO-report-May15r.pdf [accessed Feb 11, 2022]). This definition was applied to the attributable population aged 40 years and older (from 65+).
- The PGLO frailty definition includes individuals that were a resident in long-term care (LTC), received palliative care services, had dementia, or had two or more of the seven conditions. However, residents in LTC facilities would be reassigned.
PS08 – Maternity and Healthy Newborns

**Definition:**
Women who are pregnant or delivered a baby in the prior year, and their healthy newborns.

**Data Sources:**
DAD, MOMBABY, OHIP, RPDB

**Codes Used:**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Codes Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHIP</td>
<td>FEECODES A920, A921, P002, P003, P004, P005, Q605, Q606, or Q607 with LOCATION = office, home, LTC, or phone/ virtual</td>
</tr>
</tbody>
</table>

Women who delivered were identified by having any of the following codes assigned in the prior year:

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Codes Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOMBABY</td>
<td>Any record in period</td>
</tr>
</tbody>
</table>

Healthy newborns were identified as being born in the prior year with a typical length of stay in hospital, and without a hospital transfer or special care unit days:

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Codes Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPDB</td>
<td>Birth day in the period</td>
</tr>
</tbody>
</table>
| MOMBABY linked to DAD | Hospital births with the following code are re-assigned to PS04:  
  SCU1-SCU6 = 50, 51, 52, 53  
  OMG code not = 576, 577  
  Discharge disposition not = 04, 05  
  Length of stay > 2 days |

**Notes and Limitations:**


- Data on in-home births are not available. These are assumed to be healthy newborns.
### PS07 – Mental Health and Substance Use

**Definition:** People who experience severe mental disorders (including substance use disorders) in the prior five years.

**Data Sources:** DAD, OMHRS

**Codes/Algorithms Used:** Individuals with mental health and/or substance abuse were identified as having any hospitalization record in the past 5 years for substance-related and addictive disorders, schizophrenia spectrum and other psychotic disorders, mood and anxiety disorders, trauma/stressor related disorders, OCD and related disorders, personality disorders, and deliberate self-harm.

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Codes Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAD</td>
<td>DX10CODE1 = F06-F99 or DX10CODE2:DX10CODE25 = X60-X84, Y10-Y19, Y28 when DX10CODE1 ne F06-F99</td>
</tr>
<tr>
<td>OMHRS</td>
<td>Any OMHRS (including missing, except for 290.x, 294.x in primary diagnosis). If primary dx missing and provisional=2, exclude</td>
</tr>
</tbody>
</table>

**Notes and Limitations:** N/A

### PS06 – Medium Complex Chronic Conditions

**Definition:** People in this population segment have ever been diagnosed with one or more medium chronic conditions such as angina, COPD, multiple sclerosis, Parkinson's, pre-dialysis chronic kidney disease, rheumatoid arthritis, have had a major cardiac event or intervention, or have a specific combination of chronic conditions.

**Data Sources:** DAD, ODB, OHIP, OMHRS, RPDB, SDS

**Codes/Algorithms Used:** Medium Complex Chronic Conditions are outlined in Section 2.3 Definitions for Chronic Conditions in BC Health System Matrix segmentation.

**Notes and Limitations:** N/A

### PS05 – Low Complex Chronic Conditions

**Definition:** People in this population segment have ever been diagnosed with one or more low complex chronic conditions, such as asthma, mood, or anxiety disorder including depression, diabetes, epilepsy, hypertension, osteoarthritis, or osteoporosis.

**Data Sources:** DAD, ODB, OHIP, OMHRS, RPDB, SDS

**Codes/Algorithms Used:** Low Complex Chronic Conditions are outlined in Section 2.3 Definitions for Chronic Conditions in BC Health System Matrix segmentation.

**Notes and Limitations:** N/A
### PS04 – Child and Youth Major <18 years

**Definition:** Residents who are under 18 years old with major health conditions that were not identified in other population segments.

**Data Sources:** CCRS (LTC and CCC), DAD, HCD, NACRS, NRS, ODB, OHIP, OMHRS, RPDB, SDS

**Codes/Algorithms Used:** Individuals were included in PS04 if they were <18 years of age and in the prior year
- Used more than $1,500 in physician services, or
- Used more than $1,000 in drugs dispensed, or
- Used more than $0 in day surgery costs
- Used more than $0 in hospital (inpatient + OMHRS) costs
- Newborns that were not healthy (see PS08) are counted towards this segment as well.

**Notes and Limitations:**
- Drug costs are not available for the majority of residents <18 years of age. Counts may therefore be underreported.

### PS03 – Adult Major Age 18+ years

**Definition:** Residents who are 18 years old or older with major health conditions that are not identified in other population segments.

**Data Sources:** CCRS (CCC and LTC), DAD, HCD, NACRS, NRS, ODB, OHIP, OMHRS, RPDB, SDS

**Codes/Algorithms Used:** Individuals were included in PS03 if they were 18 years of age or older and in the prior year
- Used more than $1,500 in physician services
- Used more than $1,000 in drugs dispensed
- Used more than $0 in day surgery costs
- Used more than $0 in hospital (inpatient + OMHRS) costs

**Notes and Limitations:**
- Drug costs are not available for the majority of residents <65 years of age. Counts may therefore be underreported.
PS02 – Healthy

**Definition:** Residents who are low users of publicly funded services, and do not have any of the health conditions that are identified in the other population segments.

**Data Sources:** CCRS (CCC and LTC), DAD, HCD, NACRS, NRS, ODB, OHIP, OMHRS, SDS

**Codes/Algorithms Used:** Individuals were included in PS02 if in the prior year they
- Used less than $1,500 in physician services
- Used less than $1,000 in drugs dispensed
- Used $0 in day surgery costs
- Used $0 in hospital (inpatient + OMHRS) costs

**Notes and Limitations:**
- Drug costs are not available for the majority of residents <65 years of age. Counts may therefore be overreported.

PS01 – Non-users

**Definition:** Residents who do not use any of the public health services included in Health System Matrix

**Data Sources:** CCRS (CCC and LTC), DAD, HCD, NACRS, NRS, ODB, OHIP, OMHRS, SDS

**Codes/Algorithms Used:** Individuals were included in PS01 if they had $0 in health care costs across sectors (excluding capitation costs) in the prior year.

**Notes and Limitations:**
2.2 – Segment Data Lookback Periods for the BC Health System Matrix segmentation

The figure below highlights the data lookback period applied to each segment. For ascertainment of chronic conditions, all available data are used (i.e., back to 1991 for OHIP billings).

![Diagram showing lookback periods for different segments.]

**Figure 1. BCHSM Segment Data Lookback Periods**
### 2.3 – Definitions for Chronic Conditions for the BC Health System Matrix segmentation

Table 2 below lists the chronic conditions and combinations of chronic conditions for Low, Medium and High Complex Chronic Condition segments. Technical specifications for each individual condition follow.

**Table 2. Types and Combinations of Chronic Conditions for Low, Medium and High Complex Chronic Condition Segments**

<table>
<thead>
<tr>
<th></th>
<th>High CCs</th>
<th>Medium CCs</th>
<th>Low CCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alzheimer’s and other dementias</td>
<td>Angina</td>
<td>Asthma</td>
<td></td>
</tr>
<tr>
<td>Cystic fibrosis (episodic)</td>
<td>COPD</td>
<td>Mood/anxiety disorder (episodic)</td>
<td></td>
</tr>
<tr>
<td>Heart failure</td>
<td>Multiple sclerosis</td>
<td>Diabetes</td>
<td></td>
</tr>
<tr>
<td>Organ transplant</td>
<td>Parkinson’s disease</td>
<td>Epilepsy</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>Chronic kidney disease (pre-dialysis)</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Chronic kidney disease (on dialysis)</td>
<td>Rheumatoid arthritis</td>
<td>Osteoarthritis</td>
<td></td>
</tr>
<tr>
<td>Coronary artery bypass graft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percutaneous transluminal coronary angioplasty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMI &amp; Chronic kidney disease (pre-dialysis)</td>
<td>Diabetes &amp; Mood/anxiety disorder (episodic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angina &amp; COPD</td>
<td>Osteoarthritis &amp; Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes &amp; Hypertension &amp; Osteoarthritis</td>
<td>Osteoporosis &amp; Hypertension</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Osteoporosis &amp; Osteoarthritis</td>
</tr>
</tbody>
</table>

### Alzheimer’s and Other Dementsias


**Data Sources:** DEMENTIA (ICES derived cohort)

**Codes/Algorithm Used:** ≥1 Hosp (DAD/SDS) or ≥1 ODB claim for cholinesterase inhibitors or ≥3 OHIP at least 30 days apart in a two-year period

- OHIP (ICD9): 290, 331
- ICD9: 46.1, 290.0, 290.2, 290.3, 290.4, 294.1, 294.2, 331.0, 331.1, 331.5
- ICD10: F00, F01, F02, F03, G30

**Age Criteria (years):** ≥40

**Notes and Limitations:**
<table>
<thead>
<tr>
<th>Condition</th>
<th>Reference</th>
<th>Data Sources</th>
<th>Codes/ Algorithm Used</th>
<th>Age Criteria (years)</th>
<th>Notes and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cystic Fibrosis (episodic)</td>
<td>N/A</td>
<td>DAD, SDS</td>
<td>≥1 Hosp (DAD/SDS)</td>
<td>≥1</td>
<td>Physician data was not included due to specificity of diagnosis codes in the data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICD9: 277.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICD10: E84, P75</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>OHIP (Feecode): Q050</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICD9: 428</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICD10: I500, I501, I509</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Organ Transplant</td>
<td>N/A</td>
<td>DAD, SDS</td>
<td>≥1 Hosp (DAD/SDS)</td>
<td>1 and up</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CCP: 143, 4369, 455, 456, 495, 5899, 6249, 5352, 6484, 6481, 6483, 675, 530</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CCI: 1AE85, 1GJ85, 1GR85, 1GT85, 1HY85, 1HZ85, 1NK85, 1NP85, 1OA85, 1OB85, 1OJ85, 1OK85, 1PC85, 1WY19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Stroke


**Data Sources:** DAD, SDS

**Codes/Algorithm Used:** ≥1 Hosp (DAD/SDS)
- ICD9: 362.3, 430, 431, 433X1, 434, 436
- ICD10: H341, I60, I61, I63, I64
- Exclude I63.6 or any traumatic brain injury in record: S02, S06, Z50, 800, 801, 802, 803, 804, 850, 851, 852, 853, 854

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A

### Chronic Kidney Disease on Dialysis

**Reference:** N/A

**Data Sources:** DAD, OHIP, SDS

**Codes/Algorithm Used:** Chronic Kidney Disease: ≥1 Hosp (DAD/SDS) or ≥2 OHIP in a two-year period
- OHIP (ICD9): 403, 585
- ICD9: 4030, 4031, 4039, 4040, 4049, 585, 586, 5888, 5889, 2504
- ICD10: E102, E112, E132, E142, I12, I13, N08, N18, N19

Dialysis: ≥1 Hosp (DAD/SDS) or ≥1 OHIP
- CCP: 5195, 6698
- CCI: 1PZ21HQBS, 1PZ21HQBR, 1PZ21HPD4

Both CKD and Dialysis algorithms must be met

**Age Criteria (years):** ≥1

**Notes and Limitations:** N/A
### Angina


**Data Sources:** DAD, OHIP, SDS

**Codes/ Algorithm Used:** ≥1 Hosp or ≥2 OHIP in a one-year period
- ICD9: 413
- ICD10: I20

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A

---

### Chronic Obstructive Pulmonary Disease (COPD)


**Data Sources:** COPD (ICES derived cohort – specific definition used)

**Codes/ Algorithm Used:** ≥1 Hosp or ≥3 OHIP in a two-year period
- ICD9: 491, 492, 496
- ICD10: J41, J42, J43, J44

**Age Criteria (years):** ≥35

**Notes and Limitations:** See Gershon A, et al. (2009) Identifying individuals with physician diagnosed COPD in health administrative databases. COPD, 6:388-94 for details

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### Multiple Sclerosis


**Data Sources:** DAD, SDS, OHIP

**Codes/ Algorithm Used:** ≥1 Hosp or ≥5 OHIP in a two-year period
- OHIP (ICD9): 340
- ICD9: 340
- ICD10: G35

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A
### Parkinson's Disease


**Data Sources:** OHIP

**Codes/Algorithm Used:** ≥3 OHIP (30 days apart) in a two-year period
- ICD9: 332

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A

### Pre-Dialysis Chronic Kidney Disease

**Reference:** N/A

**Data Sources:** DAD, OHIP, SDS

**Codes/Algorithm Used:** Chronic Kidney Disease: ≥1 Hosp (DAD/SDS) or ≥2 OHIP in a two-year period
- OHIP (ICD9): 403, 585
- ICD9: 4030, 4031, 4039, 4040, 4049, 585, 586, 5888, 5889, 2504
- ICD10: E102, E112, E132, E142, I12, I13, N08, N18, N19

Dialysis: ≥1 Hosp (DAD/SDS) or ≥1 OHIP
- CCP: 5195, 6698
- CCI: 1PZ21HQBS, 1PZ21HQBR, 1PZ21HPD4

CKD but NOT Dialysis algorithm must be met

**Age Criteria (years):** ≥1

**Notes and Limitations:** N/A
### Rheumatoid Arthritis


**Data Sources:** ORAD (ICES derived cohort)

**Codes/Algorithm Used:**
- ≥1 Hosp (DAD/SDS) or ≥3 OHIP (with ≥1 of the claims made by a musculoskeletal specialist (IPDB) –Rheumatology, Orthopedic surgery, or Internal medicine)
  - ICD9: 714
  - ICD10: M05, M06

**Age Criteria (years):** ≥15

**Notes and Limitations:**

### Coronary Artery Bypass Graft (CABG)

**Reference:** BC Chronic Disease and Selected Procedure Case Definitions: CABG. Available at: http://www.bccdc.ca/resource-gallery/Documents/Chronic-Disease-Dashboard/ischemic-heart-disease.pdf [accessed July 7, 2021]

**Data Sources:** DAD, SDS

**Codes/Algorithm Used:**
- ≥1 Hosp (DAD/SDS)
  - CCP: 4811, 4812, 4813, 4814, 4815, 4816, 4817, 4819
  - CCI: 1IJ57LA, 1IJ57VS, 1IJ76

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A
### Acute Myocardial Infarction (AMI)


**Data Sources:** DAD, SDS

**Codes/Algorithm Used:**
- ≥1 Hosp (DAD/SDS)
- ICD9: 410
- ICD10: I21, I22

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A

### Percutaneous Transluminal Coronary Angioplasty

**Reference:** BC Chronic Disease and Selected Procedure Case Definitions: PTCA. Available at: http://www.bccdc.ca/resource-gallery/Documents/Chronic-Disease-Dashboard/ischemic-heart-disease.pdf [accessed July 7, 2021]

**Data Sources:** DAD, SDS

**Codes/Algorithm Used:**
- ≥1 Hosp (DAD/SDS)
- CCP: 4802, 4803
- CCI: 1IJ50, 1IJ57G

**Age Criteria (years):** ≥20

**Notes and Limitations:** N/A

### Asthma


**Data Sources:** ASTHMA (ICES derived cohort – specific definition used)

**Codes/Algorithm Used:**
- ≥1 Hosp (DAD/SDS) or ≥3 OHIP in a two-year period
  - ICD9: 493
  - ICD10: J45, J46

**Age Criteria (years):** <99

**Notes and Limitations:**
### Mood/Anxiety Disorders (episodic)


**Data Sources:** DAD, OHIP, OMHRS, SDS

**Codes/ Algorithm Used:** ≥1 Hosp (DAD/SDS/OMHRS) or ≥2 OHIP in a two-year period AND ≥1 Hosp (DAD/SDS/OMHRS) or ≥1 OHIP in the prior two years (episodic care)
- ICD9: 296, 300, 311

**Age Criteria (years):** ≥1

**Notes and Limitations:** N/A

### Diabetes


**Data Sources:** ODD (ICES derived cohort – specific definition used)

**Codes/ Algorithm Used:** ≥3 OHIP in a one-year period (18+) or ≥4 OHIP two-year period OR ≥1 OHIP procedure (<18)
- OHIP (Fee code): Q040, K029, K030, K045, K046
- ICD9: 250

**Age Criteria (years):** All ages

**Notes and Limitations:**
### Epilepsy

**Reference:** BC Chronic Disease and Selected Procedure Case Definitions: Epilepsy. Available at: http://www.bccdc.ca/resource-galley/Documents/Chronic-Disease-Dashboard/epilepsy.pdf [accessed July 7, 2021]

**Data Sources:** DAD, OHIP, SDS

**Codes/Algorithm Used:** ≥1 Hosp (DAD/SDS) or ≥3 OHIP separated by 30 days in a two-year period
- OHIP (ICD9): 345
- ICD9: 3450, 3451, 3454, 3455, 3456, 3457, 3458, 3459
- ICD10: G40

**Age Criteria (years):** ≥1

**Notes and Limitations:** N/A

### Hypertension


**Data Sources:** HYPER (ICES derived cohort)

**Codes/Algorithm Used:** ≥1 Hosp (DAD/SDS) or ≥1 OHIP followed by ≥1 OHIP or ≥1 Hosp in a two-year period
- ICD9: 401, 402, 403, 404, 405
- ICD10: I10, I11, I12, I13, I15

**Age Criteria (years):** ≥20


### Osteoarthritis


**Data Sources:** DAD, OHIP, SDS

**Codes/Algorithm Used:** ≥1 Hosp (DAD/SDS) or ≥2 OHIP in a one-year period
- ICD9: 715
- ICD10: M15, M16, M17, M18, M19

**Age Criteria (years):** ≥1

**Notes and Limitations:** N/A
<table>
<thead>
<tr>
<th>Osteoporosis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Sources:</strong></td>
</tr>
<tr>
<td><strong>Codes/Algorithm Used:</strong></td>
</tr>
<tr>
<td><strong>Age Criteria (years):</strong></td>
</tr>
<tr>
<td><strong>Notes and Limitations:</strong></td>
</tr>
</tbody>
</table>
3.0 – Material Deprivation Quintile

Quintile of material deprivation is derived from the 2016 Ontario Marginalization Index data [10]. Values are assigned to the attributed population based on location of residence as of April 1st of a reporting period (i.e., at baseline). This area-based measure of socioeconomic status is derived from census data on dissemination areas of Ontario, geographic units containing approximately 400 to 700 individuals. The material deprivation measure of the Ontario Marginalization Index includes dimensions of education level attained, household structure, household income (and low-income households), and housing. The measure is closely connected to poverty and reflects the ability of individuals and/or communities to attain basic material needs. All dissemination areas of Ontario are ranked according to their level of material deprivation and then divided into quintiles for segmentation (where quintile 1 reflects low material deprivation or higher affluence and quintile 5 reflects high deprivation or low affluence).

4.0 – Primary Care Patient Enrolment Model

Primary care enrolment models (PEMs) were introduced in Ontario in the early 2000s with the goal of improving patient healthcare experience and providing a better working environment for primary care physicians [11]. Along with changes to how physicians are paid, patients are formally registered with a physician or group. The CAPE database tracks patient enrolment. We assign persons in the attributed population to a unique model of care on April 1st of a reporting period (i.e., at baseline) and segment PEMS according to the model of care including: enhanced fee-for-service models including Family Health Groups (FHG) and Comprehensive Care Models (CCM), capitation (Family Health Networks [FHN] and Family Health Organizations [FHO]), Family Health Groups (FHG), and Other Groups (for example, Rural and Northern [RAN]). Those not formally rostered – roughly 25% of the attributable population – are assigned to a Not Rostered segment.

5.0 – Canadian Institutes for Health Information Population Grouping Methodology

The Canadian Institute for Health Information developed the Population Grouping methodology to predict health care costs and use of selected health system resources using diagnoses obtained from prior patient health care encounters across multiple sectors. With the data collected, full clinical profiles are created for all individuals in the attributable population, and an individual’s most complex and clinically relevant health condition is identified. Health Profile Group categories (i.e., segments) include major acute, major chronic, major cancer, major mental health, major newborn, moderate acute, moderate chronic, minor acute, minor chronic, other cancer, other mental health, obstetrics, healthy newborn, palliative, users with no health conditions and non-users of health care. Full details of the methodology are available elsewhere [12].
### Premature mortality

**Rationale:** Premature mortality is a marker of unfulfilled life expectancy, population health, and health system performance

**Indicator Reference:** N/A

**Data Sources:** OHTAM, RPDB

**Numerator (a subset of the denominator):** Number of deaths within the reporting period

**Denominator:** Total population less than 75 years of age

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments. Results are expressed as a rate per 100,000 population.

**Notes and Limitations:**
- Cause of death is not recorded in the RPDB
- A lower value is desirable for this measure

### Cost per month alive

**Rationale:** Healthcare spending is highly skewed across the population. Understanding average cost differences across attributable population can facilitate allocation of resources including interventions to improve the management of high-cost individuals.


**Data Sources:** CAPE, CCRS, DAD, ESTSOB, GAPP, HCD, NACRS, NRS, OCCI, OHCAS, OHTAM, ODB, OHIP, OHMRS, RPDB, SDS

**Numerator (a subset of the denominator):** Total attributable government health care spending per individual, divided by the number of months alive in the reporting period

**Denominator:** Total population

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments. All costs are in $2020CAD.

**Notes and Limitations:**
- Costs for care not paid for by the MOH are not included
- A lower value is desirable for this measure
## Days in acute inpatient care

**Rationale:** An indicator of efficiency, a shorter inpatient stay will reduce costs and shift care to (less costly) post-acute settings.

**Indicator Reference:** N/A

**Data Sources:** DAD, OHTAM, RPDB

**Numerator (a subset of the denominator):** Total days spent in acute care in the reporting period

**Denominator:** Total population with one or more days spent in non-psychiatric acute care hospital in the reporting period

**Exclusions:** Persons without a hospitalization record in the reporting period (approximately 95% of the total population)

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:** • A lower value is desirable for this measure

## Alternate level of care (ALC) days*

**Rationale:** Alternate Level of Care (ALC) describes patients waiting for an appropriate level of care to meet their needs. Most often this refers to hospitalized patients who have finished the acute care phase of treatment but remain in an acute hospital bed using costly resources while awaiting to be discharged to a more appropriate setting (for example, home care, inpatient rehabilitation, complex continuing care, assisted living or long-term care facility).

Collaborative Quality Improvement Plan – Technical Specifications 2022/23 (Ontario Health)

**Data Sources:** DAD, OHTAM, RPDB

**Numerator (a subset of the denominator):** Total number of inpatient days designated as ALC in the reporting period

**Denominator:** Total number of inpatient days in the reporting period

**Exclusions:** Newborn and stillborn inpatient records

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:** • A lower value (%) is desirable for this measure

* This is also a FY 2022/23 OH collaborative QIP indicator
**Hospitalizations for ambulatory care sensitive conditions (ACSCs)**

**Rationale:** Ambulatory care sensitive conditions (ACSCs) reflect chronic conditions which, if treated and monitored effectively in the community, should reduce the likelihood for a hospital admission. ACSC hospitalizations may also reflect poor access to primary/specialist care.


**Data Sources:** DAD, OHTAM, RPDB

**Numerator (a subset of the denominator):** Count of admissions from an acute care hospital in Ontario within the reporting period for any of: grand mal status and other epileptic convulsions (ICD-10 codes that begin with G40 or G41), chronic obstructive pulmonary disease (J41, J42, J43, J44, or J47), asthma (J45), congestive heart failure and pulmonary edema (I50 and J81, excluding cases with cardiac procedures* that are not coded as abandoned after onset); hypertension (I10.0, I10.1, or I11 excluding cases with cardiac procedures* that are not coded as abandoned after onset); angina (I20, I23.82, I24.0, I24.8, or I24.9 excluding cases with cardiac procedures* that are not coded as abandoned after onset); diabetes (E10.0, E10.1, E10.63, E10.9, E11.0, E11.1, E11.63, E11.9, E13.0, E13.1, E13.63, E13.9, E14.0, E14.1, E14.63, E14.9, E16.64, E16.64, E16.64, E16.64, E16.64), and lower respiratory (J10.0, J11.0, J12-J16, J18, or J20-J22 only when a secondary diagnosis of J44 is also present).

**Denominator:** Total population age 74 years and younger.

**Exclusions:** Cardiac procedures* resulting in an exclusion include CCI codes beginning with: 1HA58, 1HA80, 1HA87, 1HB53, 1HB54, 1HB55, 1HB87, 1HD53, 1HD54, 1HD55, 1HH59, 1HH71, 1HJ76, 1HJ82, 1HM57, 1HM78, 1HM80, 1HN71, 1HN80, 1HN87, 1HP76, 1HP78, 1HP80, 1HP82, 1HP83, 1HP87, 1HR71, 1HR80, 1HR84, 1HR87, 1HS80, 1HS90, 1HT80, 1HT89, 1HT90, 1HU80, 1HU90, 1HV80, 1HV90, 1HW78, 1HW79, 1HX71, 1HX78, 1HX79, 1HX80, 1HX83, 1HX86, 1HX87, 1HY85, 1HZ53, 1HZ54, 1HZ55, 1HZ56, 1HZ57, 1HZ59, 1HZ80, 1HZ85, 1HZ87, 1IF83, 1I50, 1I55, 1I57, 1J76, 1J80, 1K57, 1K80, 1K87, 1IN84, 1LA84, 1LC84, 1LD84, 1J86 and not equal to 1HZ53LAKP or 1HZ55LAKP. Records indicating an admission for newborn or stillborn were also excluded.

**Standardization:** Observed or unadjusted data are presented across segments. Results are expressed as a rate per 100,000 population.

**Notes and Limitations:** A lower value is desirable for this measure.
## Readmissions within 30 days for selected HBAM Inpatient Grouper (HIG) conditions

**Rationale:** Measuring hospital readmissions may provide insight to the quality of care of inpatient and post-discharge services provided to patients.


**Data Sources:** DAD, OHTAM, RPDB

**Numerator (a subset of the denominator):** Hospital readmissions with the admission date within 30 days of the index (denominator) discharge, where the admission category is coded as urgent/emergent and the admission is not coded as an acute transfer.

**Denominator:** Patients discharged from an acute care hospital in Ontario within the reporting period with any of: Acute Myocardial Infarction (age 45+, HIG: 193a, 193b, 194a, 194b), cardiac conditions other than heart attack (age 40+, HIG: 202, 204a, 204b, 208a, 208b), congestive heart failure (age 45+, HIG: 196), chronic obstructive pulmonary disease (age 45+, HIG: 139c, 139d), pneumonia (all ages, HIG: 136, 138, 143), diabetes (all ages, HIG: 437a, 437b, 437c, 437d), stroke (age 45+, HIG: 025, 026, 028), or gastrointestinal disease (all ages, HIG: 231, 248, 251, 253, 254, 255, 256, 257, 258, 285, 286, 287, 288).

**Exclusions:** Hospital records where the Inpatient HIG atypical code was not in: ‘00’ (typical cases), ‘01’ (transfer in cases), ‘09’ (short stay outlier cases), ‘10’ (long stay outlier cases), or ‘11’ (transfer in long stay cases). Records coded as transfers to another acute inpatient hospital, deaths, or sign outs were also not considered.

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** A lower value (%) is desirable for this measure.

## Emergency visits for conditions that could be treated in alternative primary care setting

**Rationale:** Higher rates of emergency visits for conditions that could be treated in alternative settings may reflect poor access to primary care services.


**Data Sources:** NACRS, OHTAM, RPDB


**Denominator:** Total population age 1 to 74 years

**Exclusions:** Emergency visits where the patient was admitted to hospital, or not seen by a physician.

**Standardization:** Observed or unadjusted data are presented across segments. Results are expressed as a rate per 1,000 population.

**Notes and Limitations:** A lower value is desirable for this measure.
**Physician visits after discharge from hospital for selected HBAM Inpatient Grouper (HIG) conditions**

**Rationale:** This indicator measures the transition of continuity of patient care from the acute to community settings. The days immediately following discharge can be high risk and a vulnerable transition period for many patients.

**Indicator Reference:**

**Data Sources:** DAD, OHIP, OHTAM, RPDB

**Numerator (a subset of the denominator):** Physician consults/ visits occurring within 0 to 7 days from discharge taking place in an office, home or long-term care setting.

**Denominator:** Patients discharged from an acute care hospital in Ontario within the reporting period with any of: Acute Myocardial Infarction (age 45+, HIG: 193a, 193b, 194a, 194b), cardiac conditions other than heart attack (age 40+, HIG: 202, 204a, 204b, 208a, 208b), congestive heart failure (age 45+, HIG: 196), chronic obstructive pulmonary disease (age 45+, HIG: 139c, 139d), pneumonia (all ages, HIG: 136, 138, 143), diabetes (all ages, HIG: 437a, 437b, 437c, 437d), stroke (age 45+, HIG: 025, 026, 028), or gastrointestinal disease (all ages, HIG: 231, 248, 251, 253, 254, 255, 256, 257, 258, 285, 286, 287, 288)

**Exclusions:** Hospital records where the Inpatient HIG atypical code was not in: ‘00’ (typical cases), ‘01’ (transfer in cases), ‘09’ (short stay outlier cases), ‘10’ (long stay outlier cases), or ‘11’ (transfer in long stay cases). Records coded as transfers to another acute inpatient hospital, deaths, or sign outs were also not considered.

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- A higher value (%) is desirable for this measure
### Continuity of Care – Usual Provider of Care (UPC) Index

**Rationale:** Continuity of care is a cornerstone of primary care and is associated with favourable outcomes including lower rates of hospitalization, improved adherence to treatment and greater patient satisfaction.

**Indicator Reference:** N/A

**Data Sources:** OHIP, OHTAM, RPDB

**Numerator (a subset of the denominator):** Total number of physician consults/visits to an individual’s most regularly seen doctor

**Denominator:** Total number of physician consults/visits (across all physician specialties) across the most recent 2 years of data

**Exclusions:** All persons with fewer than two physician consults/visits from 2 years prior to the end of the reporting period to the end of the reporting period. Repeat consults/visits to the same physician on the same day by the same person were excluded from estimation.

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- The UPC is interpreted as the average proportion of an attributed person’s contacts that was with their most regularly seen doctor. For example, if an individual had 10 physician visits, 8 of which were with the same physician, then their UPC would be 0.8
- A minimum number of 2 or more visits and 2-year observation period is used in the denominator to increase the stability in estimates
- A higher value is desirable for this measure, indicating greater (relational) continuity

### Proportion of OHT attributed patients with a virtual physician encounter

**Rationale:** Virtual encounters can improve patient access to services and supports continuity of care. Since COVID-19, demand for virtual encounters has increased.

**Indicator Reference:** N/A

**Data Sources:** OHIP, OHTAM, RPDB

**Numerator (a subset of the denominator):** All persons with one or more physician consults/visits in the reporting period with a corresponding phone/virtual code: location=P, or codes B103A, B203A, B209, K080-K083, or pre-April 2020: B100A, B101A, B102A, B200A, B201A, B202A, B099A

**Denominator:** All persons with one or more physician consults/visits in the reporting period

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- A higher value (%) is desirable for this measure
### 6.1 – HSPN Mental Health and Addictions Indicator Technical Specifications

#### Repeat emergency visits for mental health (within 30 days)

| Rationale: | Repeat unscheduled emergency department visits for mental health and addictions may indicate inadequate transitions from hospital to community care |
| Data Sources: | NACRS, OHTAM, RPDP |
| Numerator (a subset of the denominator): | Presence of 1 or more unscheduled ED visits for mental health conditions or substance abuse within 30 days of the index visit (see denominator) |
| Denominator: | All unscheduled ED visits for mental health conditions (Primary diagnosis field = F06–F99 or secondary diagnosis fields = X60–X84, Y10–Y19, Y28 when primary diagnosis is not F06–F99, and excluding substance abuse, ICD-10 F10-F19) in the reporting period |
| Exclusions: | N/A |
| Standardization: | Observed or unadjusted data are presented across segments. |
| Notes and Limitations: | • A lower value is desirable for this measure |

#### 7-day follow-up with a physician after hospitalization for MHA

| Rationale: | Timely follow-up with a physician after hospital discharge may help to improve adherence to treatment and reduce the likelihood of readmissions |
| Data Sources: | DAD, OHIP, OHTAM, OMHRS, RPDB |
| Numerator (a subset of the denominator): | Consults/visits with primary care providers, psychiatrists and/or pediatricians occurring within 7 days from discharge taking place in an office, home or long-term care setting. |
| Denominator: | Patients discharged alive from a hospital in Ontario for mental health and addictions in the reporting period (Primary diagnosis field = F06–F99 or secondary diagnosis fields = X60–X84, Y10–Y19, Y28 when primary diagnosis is not F06–F99, and excluding substance abuse, ICD-10 F10-F19) |
| Exclusions: | Patients readmitted to hospital or that died within 30 days of discharge |
| Standardization: | Observed or unadjusted data are presented across segments. |
| Notes and Limitations: | • A higher value is desirable for this measure |
### First contact in the emergency department for MHA*

**Rationale:** When community-based mental health and addictions services are unavailable, individuals who require service may use the emergency department as their first point of contact.

And Collaborative Quality Improvement Plan – Technical Specifications 2022/23 (Ontario Health)

**Data Sources:** CHC, DAD, NACRS, OHIP, OHTAM, OMHRS, RPDB

**Numerator (a subset of the denominator):** Population without a mental health and addictions-related service contact (hospitalization, ED visit or physician visit) in the 2 years prior to the incident ED visit (see denominator)

**Denominator:** Population with an incident (first in the reporting period) unscheduled ED visit for mental health and addictions (Primary diagnosis field = F06–F99 or secondary diagnosis fields = X60–X84, Y10–Y19, Y28 when primary diagnosis is not F06–F99, and excluding substance abuse, ICD-10 F10–F19)

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** • A lower value is desirable for this measure

* This is also a FY 2022/23 OH collaborative QIP indicator

### Frequent (4+) emergency department visits for help with MHA

**Rationale:** Frequent ED visits may be an indication that people do not have access to the community-based services or support they need.

**Indicator Reference:** Canadian Institute for Health Information indicator library: [https://indicatorlibrary.cihi.ca/pages/viewpage.action?pageld=15565180](https://indicatorlibrary.cihi.ca/pages/viewpage.action?pageld=15565180) [accessed Mar26, 2021]

**Data Sources:** NACRS, OHTAM, RPDB

**Numerator (a subset of the denominator):** Total population with 4 or more ED visits for mental health and addictions in 1 year prior to index visit (see denominator)

**Denominator:** Total population with at least 1 ED visit for mental health and addictions (Primary diagnosis field = F06–F99 or secondary diagnosis fields = X60–X84, Y10–Y19, Y28 when DX10CODE1 is not F06–F99) in the reporting period. The most recent encounter is considered the index visit.

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** • A lower value is desirable for this measure
### Rate of emergency department visits for deliberate self-harm

<table>
<thead>
<tr>
<th><strong>Rationale:</strong></th>
<th>Deliberate self-harm includes nonfatal self-poisoning or self-injury</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Sources:</strong></td>
<td>NACRS, OHTAM, RPDB</td>
</tr>
<tr>
<td><strong>Numerator (a subset of the denominator):</strong></td>
<td>Total number of ED visits for deliberate self-harm (Secondary diagnosis fields = X60–X84, Y10–Y19, Y28 when primary diagnosis is not F06–F99)</td>
</tr>
<tr>
<td><strong>Denominator:</strong></td>
<td>Total population aged 10 years and older</td>
</tr>
<tr>
<td><strong>Exclusions:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Standardization:</strong></td>
<td>Observed or unadjusted data are presented across segments. Results are presented as a rate per 10,000 population</td>
</tr>
<tr>
<td><strong>Notes and Limitations:</strong></td>
<td>• A lower value is desirable for this measure</td>
</tr>
</tbody>
</table>
6.2 – HSPN Older/ Frail Population Indicator Technical Specifications

Days spent at home, among those identified as frail

**Rationale:** Days spent at home is a patient-driven quality indicator. Although some hospital visits are necessary, most people would prefer to spend their time at home.

**Indicator Reference:** N/A

**Data Sources:** CCRS (CCC and LTC), DAD, NACRS, NRS, OHTAM, OMHRS, RPDB

**Numerator (a subset of the denominator):** For each decedent, calculated as the total days in the observation period (or to death) minus the sum of days spent in hospital (DAD and OMHRS data), emergency department (NACRS), inpatient rehab (NRS), and complex continuing care (CCC).

**Denominator:** Person-years contributed from the OHT attributed population age 66 years or older that were frail:

- Residents in a long-term care facility (based on having any record in CCRS in the last 5 years), or
- Receiving palliative care services (in the past 1 year) based on:
  - DAD: ICD-10 codes that begin with Z515, patserv=58, prvserv or inserv=00121
  - OPHP: feecodes that begin with A945, K023, G512, G511, B998,B997, K700, B966, B997, B998, G511, C945, C945, C882, C982, E083 (following C982, C882, C122, C123, C124, C142, C143), B966 (billed with B998/B996), K023, B400, C945, C982, G512, Q641, )
  - NACRS: prvserv or consultserv = 00121
  - HCD: src_admission, service_rpc or src_discharge=95, residence_type=2000
  - RAICA: b2c=1 or b4=12, or
- With two or more of the following seven conditions identified in DAD or OHPH:
  - Cognitive impairment, including dementia and delirium (ICD-10 codes F05X: F050, F051, F058, F059 and ICD-9 codes 293)
  - Incontinence (ICD-10: R32, R15).
  - Falls (ICD-10: E9177, E9178, E9293, W01,W05-W19)
  - Nutritional difficulties (ICD-10: R627, R634, R633, R630, F500, F501, R63, R636, R638,78322, 7833, 7839),
  - Functional difficulties (ICD-10: R26, R262, M6250-9, M6281, L89X)
  - Targeted health service utilization (OHIP specialty 07 with OHIP feecodes W770, W775, W795, A770, A775, A795, C770, C775, C795, E071, E075, E077, E703, DAD patserv 77, OHIP location home with OHIP feecodes B960-4, B966, B986, B987, B988, B990-8)
  - Decline in general health status (2+ non-elective hospital admissions or unscheduled ED visits in the last year, or malaise, fatigue/debility and/or cachexia diagnoses (ICD-10 R53, G933, R64, ICD-9: 795).

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:**
- Observation periods are scaled to 365.25 days to account for leap years
- A higher value (mean days) is desirable for this measure
### Repeat fall-related emergency visits, among those identified as frail

**Rationale:** Injuries from falls can negatively impact the health and independence of older adults and require costly medical intervention.

**Indicator Reference:** N/A

**Data Sources:** NACRS, OHTAM, RPDB

**Numerator (a subset of the denominator):** Population with a fall-related emergency department visit in the observation period (index event, ICD10: W01, W02, W03, W04, W05, W06, W07, W08, W09, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19) and a second fall-related ED visit within 365 days prior to the index event. Where multiple ED visits occur in the observation period, the most recent ED visit is used as the index event.

**Denominator:** The number of OHT attributed population age 66 years or older that were frail

All persons:
- Residents in a long-term care facility (based on having any record in CCRS in the last 5 years), or
- Receiving palliative care services (in the past 1 year) based on:
  - DAD: ICD-10 codes that begin with Z515, patserv=58, prserv or inserv=00121
  - OHIP: feecodes that begin with A945, K023, G512, G511, B998,B997, K700, B966, B997, B998, G511, C945, C945, C882, C982, E083 (following C982, C882, C122, C123, C124, C142, C143), B966 (billed with B998/B996), K023, B400, C945, C982, G512, Q641,
  - NACRS: prserv or consultserv = 00121
  - HCD: src_admission, service_rpc or src_discharge=95, residence_type=2000
  - RAICA: b2c=1 or b4=12, or
- With two or more of the following seven conditions identified in DAD or OHIP:
  - Cognitive impairment, including dementia and delirium (ICD-10 codes F05X: F050, F051, F058, F059 and ICD-9 codes 293)
  - Incontinence (ICD-10: R32, R15),
  - Falls (ICD-10: E9177, E9178, E9293, W01,W05-W19)
  - Nutritional difficulties (ICD-10: R627, R634, R633, R630, F500, F501, R63, R636, R638,78322, 7833, 7839),
  - Functional difficulties (ICD-10: R26, R262, M6250-9, M6281, L89X)
  - Targeted health service utilization (OHIP specialty 07 with OHIP feecodes W770, W775, W795, A770, A775, A795, C770, C775, C795, E071, E075, E077, E703, DAD patserv 77, OHIP location home with OHIP feecodes B960-4, B966, B986, B987, B988, B990-8)
  - Decline in general health status (2+ non-elective hospital admissions or unscheduled ED visits in the last year, or malaise, fatigue/debility and/or cachexia diagnoses (ICD-10 R53, G933, R64, ICD-9: 795).

**Exclusions:** N/A

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** A lower value is desirable for this measure.
### Caregiver distress

**Rationale:** Caregiver distress may indicate whether home care clients and their caregivers have access to sufficient and appropriate level of services and supports. It may also help flag where additional resources are needed in order to prevent caregiver burnout.

**Indicator Reference:** N/A

**Data Sources:** interRAIHC, OHTAM, RPDB

**Numerator (a subset of the denominator):** Assessments that indicate a caregiver is unable to continue in caring activities (variable P2A) or the caregiver expresses feelings of distress, anger or depression (P2B)

**Denominator:** Total population age 66 years or older with an interRAIHC assessment in the observation period that had a caregiver (variable P1b1 = 0, 1 or 2). For long-stay home care clients with >1 assessment, we take the most recent.

**Exclusions:** Assessments that are not the most recent in the reporting period, for those with multiple assessments.

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- A lower value (%) is desirable for this measure

### Change in Minimum dataset health status index (MDSHSI)

**Rationale:** The MDSHSI is a preference-based health-related quality of life measure derived by mapping items collected in the RAI instrument onto the Health Utilities Index Mark 2 system. It is a single summary score of overall health. The change in MDSHSI captures the individual within-person change in overall health status. Slowing health declines amongst older adults may result from multi-faceted interventions.

**Indicator Reference:** N/A

**Data Sources:** interRAIHC, OHTAM, RPDB

**Numerator (a subset of the denominator):** Change in MDSHSI score from first to most interRAIHC assessment

**Denominator:** Total population age 66 years or older with an interRAIHC assessment in the observation period (index assessment) and a second interRAIHC assessment within 365d prior. The index assessment is the most recent in the observation period.

**Exclusions:** Clients with <2 interRAIHC assessments within 365d

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- MDSHSI ranges from -0.03 to 1, with higher scores (approaching 1) indicative of good health.
- A value of ≥0.03 is a clinically meaningful difference in MDSHSI.
- The MDSHSI was validated on the RAIHC assessment instrument, which is not longer used in Ontario. Data items collected on the interRAIHC assessment instrument (which was adopted in Ontario in March 2018) differs, notably for assessing mobility, which results in a marginally higher MDSHSI score. Interpretation requires caution.
- A higher value (mean score) is desirable for this measure
### Change in Activities of daily living – long form

<table>
<thead>
<tr>
<th><strong>Rationale:</strong></th>
<th>This scale provides a measure of a client's ability to perform activities of daily living (ADL), including personal hygiene, dressing, locomotion, toilet use, bed mobility and eating. ADL is the most common measure of function in older adults.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicator Reference:</strong></td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Data Sources:</strong></td>
<td>interRAIHC, OHTAM, RPDB</td>
</tr>
<tr>
<td><strong>Numerator (a subset of the denominator):</strong></td>
<td>Change in ADL Long score from first to most interRAIHC assessment</td>
</tr>
<tr>
<td><strong>Denominator:</strong></td>
<td>Total population age 66 years or older with an interRAIHC assessment in the observation period (index assessment) and a second interRAIHC assessment within 365d prior. The index assessment is the most recent in the observation period.</td>
</tr>
<tr>
<td><strong>Exclusions:</strong></td>
<td>Clients with &lt;2 interRAIHC assessments within 365d</td>
</tr>
<tr>
<td><strong>Standardization:</strong></td>
<td>Observed or unadjusted data are presented across segments</td>
</tr>
</tbody>
</table>
| **Notes and Limitations:** | • ADL Long ranges from 0 to 28, with higher values indicating greater difficulty in performing activities  
  • A lower value (mean score) is desirable for this measure |
# 6.3 – HSPN End of Life Population Indicator Technical Specifications

## Deaths in hospital

<table>
<thead>
<tr>
<th>Rationale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The majority of people would prefer to die at home, rather than in hospital.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Reference:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Data Sources:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCRS (CCC and LTC), DAD, NACRS, NRS, OHTAM, OMHRS, RPDB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numerator (a subset of the denominator):</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of decedents with a death recorded in DAD (discharge_disposition = 07, 66, 67, 72, 73, 74), NACRS (visit_disposition = 10, 11, 72, 73, 74, 71), OMHRS (discharge_reason = 2 or 3), NRS (discharge_reason_code = 8) or CCC (discharge_to_facility_type = 11) datasets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Denominator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of OHT attributed patients that died in the reporting period</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exclusions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standardization:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed or unadjusted data are presented across segments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes and Limitations:</th>
</tr>
</thead>
</table>
| • Data on each decedent’s preferred place of death is not available
• Cause of death is not available in the data sources used for this indicator
• Location of death does not necessarily correlate with the location of where care was received before death
• A lower value (%) is desirable for this measure |

## Days spent at home in the last 6 months (180 days) of life

<table>
<thead>
<tr>
<th>Rationale:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days spent at home is a patient-driven quality indicator. Although some hospital visits are necessary, most people would prefer to spend their time at home.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Reference:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Data Sources:</th>
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</thead>
<tbody>
<tr>
<td>CCRS (CCC and LTC), DAD, NACRS, NRS, OHTAM, OMHRS, RPDB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numerator (a subset of the denominator):</th>
</tr>
</thead>
<tbody>
<tr>
<td>For each decedent, calculated as 180 minus the sum of days spent in hospital (DAD and OMHRS data), emergency department (NACRS), inpatient rehab (NRS), and complex continuing care (CCC)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Denominator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The number of OHT attributed patients that died in the reporting period</td>
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</table>

<table>
<thead>
<tr>
<th>Exclusions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standardization:</th>
</tr>
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<tbody>
<tr>
<td>Observed or unadjusted data are presented across segments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Notes and Limitations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A higher value (mean days) is desirable for this measure</td>
</tr>
</tbody>
</table>


### Proportion of decedents with one or more emergency department visits in the last 30 days of life

**Rationale:** Unplanned emergency department visits can be a difficult experience for individuals at the end-of-life and may indicate that they did not receive the care they needed in the community.


**Data Sources:** CCRS (CCC and LTC), DAD, NACRS, NRS, OHTAM, OMHRS, RPDB

**Numerator (a subset of the denominator):** The number of decedents who had one or more unplanned emergency department visits in their last 30 days of life

**Denominator:** The number of OHT attributed patients that died in the reporting period

**Exclusions:** Decedents that were hospitalized in an acute care facility for the last 30 days of life

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:** • A lower value (%) is desirable for this measure

### Proportion of decedents receiving palliative home care in the last 90 days of life

**Rationale:** Increasing in-home palliative care at the end-of-life may improve community home death percentages


**Data Sources:** CCRS (CCC and LTC), DAD, HCD, NACRS, NRS, OHTAM, OMHRS, RPDB

**Numerator (a subset of the denominator):** All decedents who had at least one palliative home care service (HCD: service_rpc, src_admission or src_discharge=95 and home care service [excluding case management and placement services] in the reporting period) in their last 90 days of life

**Denominator:** The number of OHT attributed patients that died in the reporting period

**Exclusions:** Decedents that were hospitalized in an acute care facility or long-term care for the last 90 days of life

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:** • A higher value (%) is desirable for this measure
### Proportion of decedents receiving palliative physician home visits in the last 90 days of life

**Rationale:** Increasing in-home palliative care at the end-of-life may improve community home death percentages


**Data Sources:** CCRS (CCC and LTC), DAD, NACRS, NRS, OHIP, OHTAM, OMHRS, RPDB

**Numerator (a subset of the denominator):** All decedents with one or more physician consults/visits in the reporting period with a corresponding palliative in-home visit code (G511, B966 [billed with B998.B996], B998, B997, A901, B990, B992, B993, B994, B996, A900, B960, B961, B962, B963, B964, B986, B987, B988) in their last 90 days of life

**Denominator:** The number of OHT attributed patients that died in the reporting period

**Exclusions:** Decedents that were hospitalized in an acute care facility or long-term care for the last 90 days of life

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- A higher value (%) is desirable for this measure

### 6.4 – Collaborative Quality Improvement Indicator Technical Specifications

For ALC and ED First Mental Health and Addiction indicators, please see definitions above.

### Percentage of screening eligible patients up-to-date with Papanicolaou (Pap) Tests

**Rationale:** Effective screening enables early detection and may reduce mortality

**Indicator Reference:** Collaborative Quality Improvement Plan – Technical Specifications 2022/23 (Ontario Health)

**Data Sources:** DAD, OCR, OHIP, RPDB, SDS

**Numerator (a subset of the denominator):** Number of screen eligible women aged 23 to 69 years who had a Pap smear in the 3 years prior to the end of the reporting period
- Pap tests identified using fee codes in OHIP (E430, G365a, G394a, L712, or L812, Q678, L713 and L733)
- Each woman is counted once regardless of the number of Pap tests performed in a three-year period

**Denominator:** Total number of screen-eligible women aged 23 to 69 years at index date

**Exclusions:**
- Women with a history of cervical cancer and/or a hysterectomy
- Palliative care patients identified from hospital and physician billing claims data (OHIP fee codes: A945, C945, C882, C982, W872, W882, W972, W982, B998, B996, B997, G511, G512; CIHI DAD pat serv: 58; CIHI DAD ICD10 code: Z515)

**Standardization:** Observed or unadjusted data are presented across segments

**Notes and Limitations:**
- A higher value (%) is desirable for this measure
### Percentage of screen-eligible patients up-to-date with a mammogram

**Rationale:** Effective screening enables early detection and may reduce mortality

**Indicator Reference:** Collaborative Quality Improvement Plan – Technical Specifications 2022/23 (Ontario Health)

**Data Sources:** DAD, OBSP, OCR, OHIP, RPDB, SDS

**Numerator (a subset of the denominator):** Total number of screen-eligible women aged 52 to 69 years, who have completed at least one mammogram in the 2 years prior to the end of the reporting period. Includes:
- OBSP mammograms and Non-OBSP mammograms identified using OHIP fee codes (X172 Unilateral screening mammography; X178 bilateral screening mammography; X185 diagnostic bilateral mammography)

**Denominator:** Total number of screen-eligible women, aged 52 to 69 years at index date

**Exclusions:**
- Women with a history of breast cancer using the diagnostic code (dxcode-174)
- Women with a mastectomy before the two-year period
- Palliative care patients identified from hospital and physician billing claims data (OHIP fee codes: A945, C945, C882, C982, W872, W882, W972, W982, B998, B966, B997, G511, G512; CIHI DAD patserv: 58; CIHI DAD ICD10 code: Z515)

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** A higher value (%) is desirable for this measure

### Percentage of screen-eligible patients up-to-date with colorectal screening

**Rationale:** Effective screening enables early detection and may reduce mortality

**Indicator Reference:** Collaborative Quality Improvement Plan – Technical Specifications 2022/23 (Ontario Health)

**Data Sources:** DAD, OCR, OHIP, RPDB, SDS

**Numerator (a subset of the denominator):** Number of screen-eligible patients aged 52 to 74 years who had a FOBT/FIT 2 years prior to the end of the reporting period, other investigations (i.e., flexible sigmoidoscopy) or colonoscopy 10 years prior to the end of the reporting period. Included:
- A fecal occult blood testing (FOBT) or FIT (L181 or G004, L179, Q152, Q043, Q133)
- A colonoscopy, codes Z491 through Z499, or Z555
- A flexible sigmoidoscopy, code Z580

**Denominator:** Number of screen-eligible patients aged 52 to 74 years at index date

**Exclusions:**
- Patients who have ever had colon cancer, inflammatory bowel disease or colectomy
- Palliative care patients identified from hospital and physician billing claims data (OHIP fee codes: A945, C945, C882, C982, W872, W882, W972, W982, B998, B966, B997, G511, G512; CIHI DAD patserv: 58; CIHI DAD ICD10 code: Z515)

**Standardization:** Observed or unadjusted data are presented across segments.

**Notes and Limitations:** A higher value (%) is desirable for this measure
References


