

# CIHI Introduction and Solutions for Health Analytics

Products, Solutions, and Capabilities

Canadian Institute for Health Information

# Overview

- About CIHI
- Standardization and approach to delivering products
- CIHI's Public and Private (secure) solutions to help the health industry

# About CIHI

CIHI is an independent, not-for-profit organization that provides essential information and insight on Canada’s health system and the health of Canadians. [CIHI - What we do - YouTube](#)

## Vision

**Better data.  
Better decisions.  
Healthier Canadians.**

## Mandate

**Deliver comparable and actionable information to accelerate improvements in health care, health system performance and population health across the continuum of care.**

## Values

Respect • Integrity • Collaboration • Excellence • Innovation

**Better data, better decisions, healthier Canadians:**

powered by a shared sense of purpose, the highest standards of excellence and trust.

# CIHI's impact on health care in Canada

## CIHI's data and analyses make a positive difference in Canada's health systems

- CIHI shared COVID-19 data on visits to hospitals, ED's, and long-term care facilities and jurisdictions used a new CIHI health system capacity modelling tool to help with COVID-19 pandemic impact analysis and planning
- We focus on vulnerable populations such as seniors; children and youth; recipients of mental health and addictions services; and First Nations, Inuit and Métis.
- CIHI continually strives to improve access to data and information, while maintain individual privacy.

## Some examples of how CIHI make an impact on health care in Canada

[CIHI COVID-19 Resources](#)

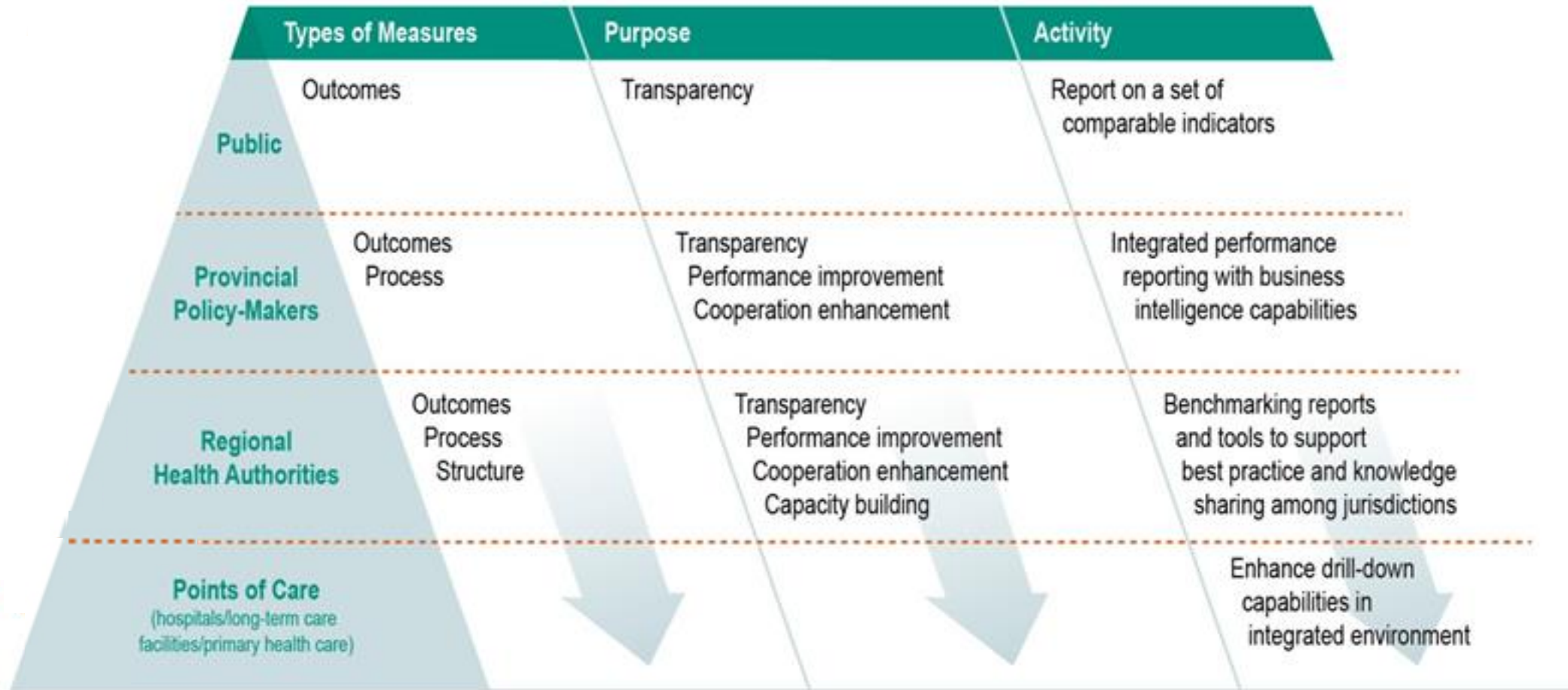
[Highlight issues related to end-of-life services](#)

[Measure health inequalities by socio-economic status and demographic factors](#)

[Showcase the latest information on hospitalizations due to harmful substance use](#)

[Estimate the average cost of services provided in an acute care facility](#)

# Pyramid of stakeholder needs



# CIHI's Health and Health System Data & Information



## Types of care

- Hospital and emergency
- Mental health
- Home care
- Long-term care
- Rehabilitation
- Pharmaceuticals
- Clinical registries: organ transplant/renal, hip and knee replacements; trauma
- More



## Patient-reported data

- Patient-reported outcome measures (PROMs)
- Patient-reported experience measures (PREMs)



## Health spending

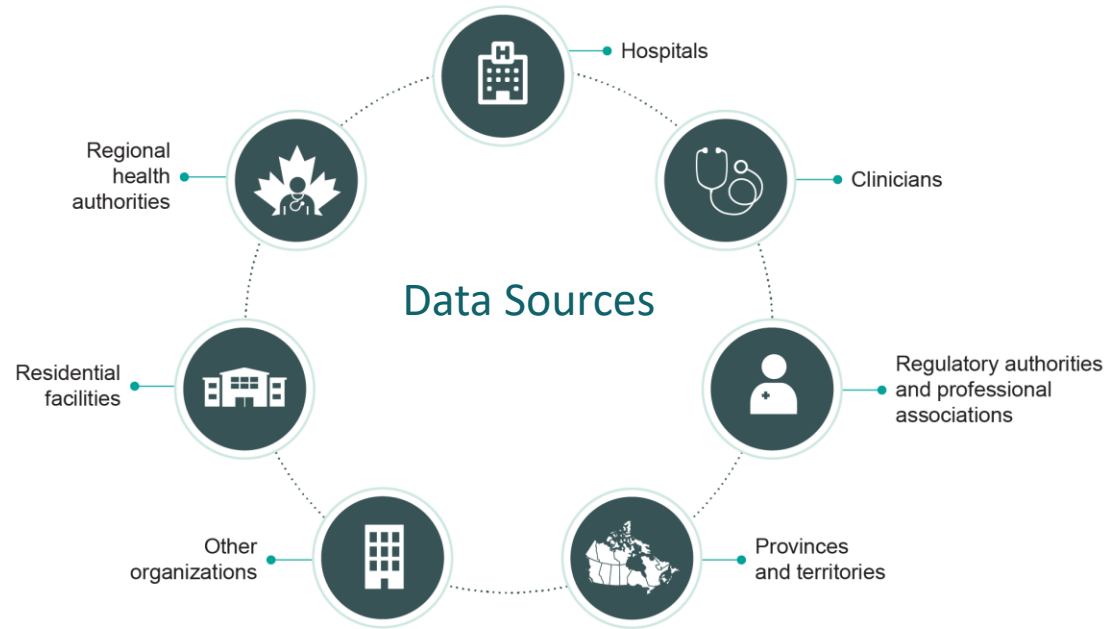
- Patient costing data
- Hospital and regional health authority financial accounts
- Physician billing
- System-wide health expenditures



## Health workforce

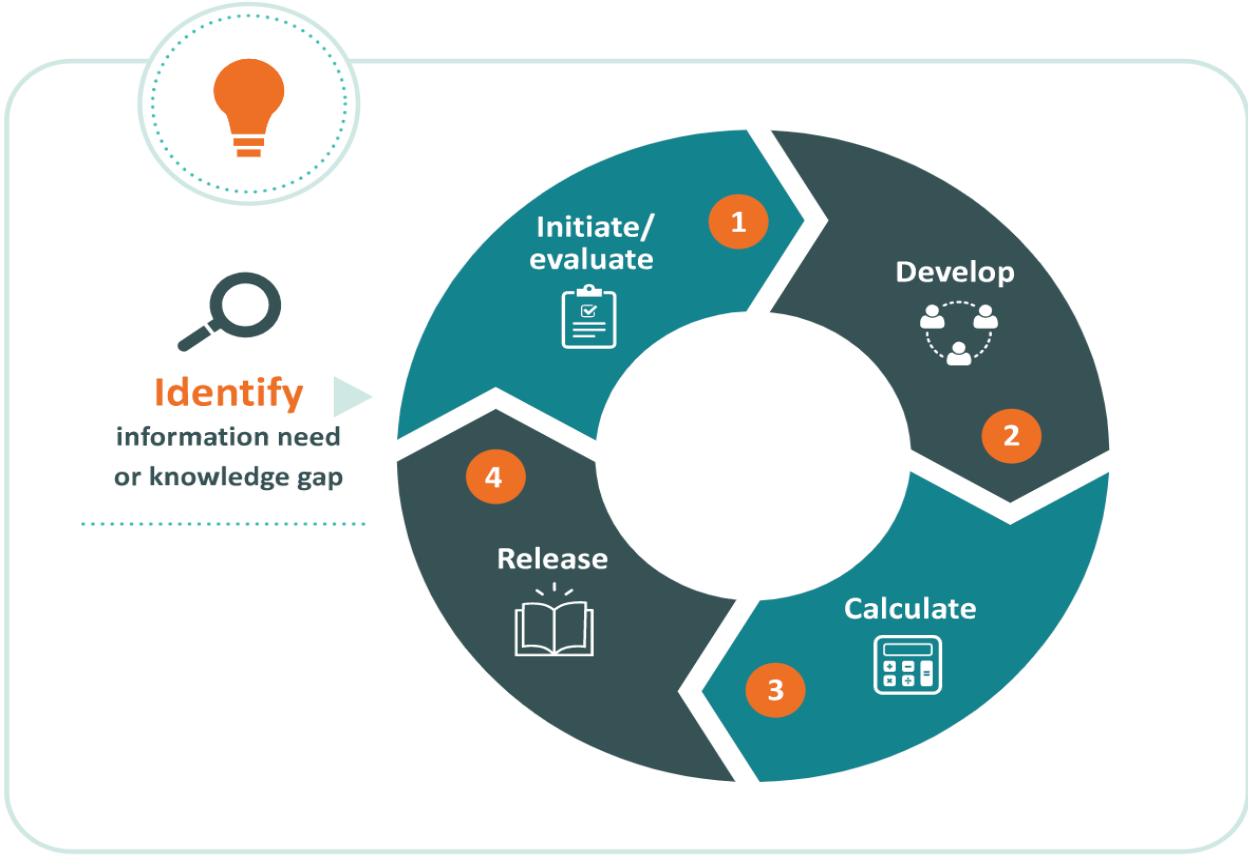
- Physicians
- Nurses
- Occupational therapists
- Pharmacists
- Physiotherapists
- Allied health professionals
- More

**CIHI strives to provide high quality, standardized data, and information to help with pan-Canadian, and international comparisons**



# How is an indicator developed at CIHI?

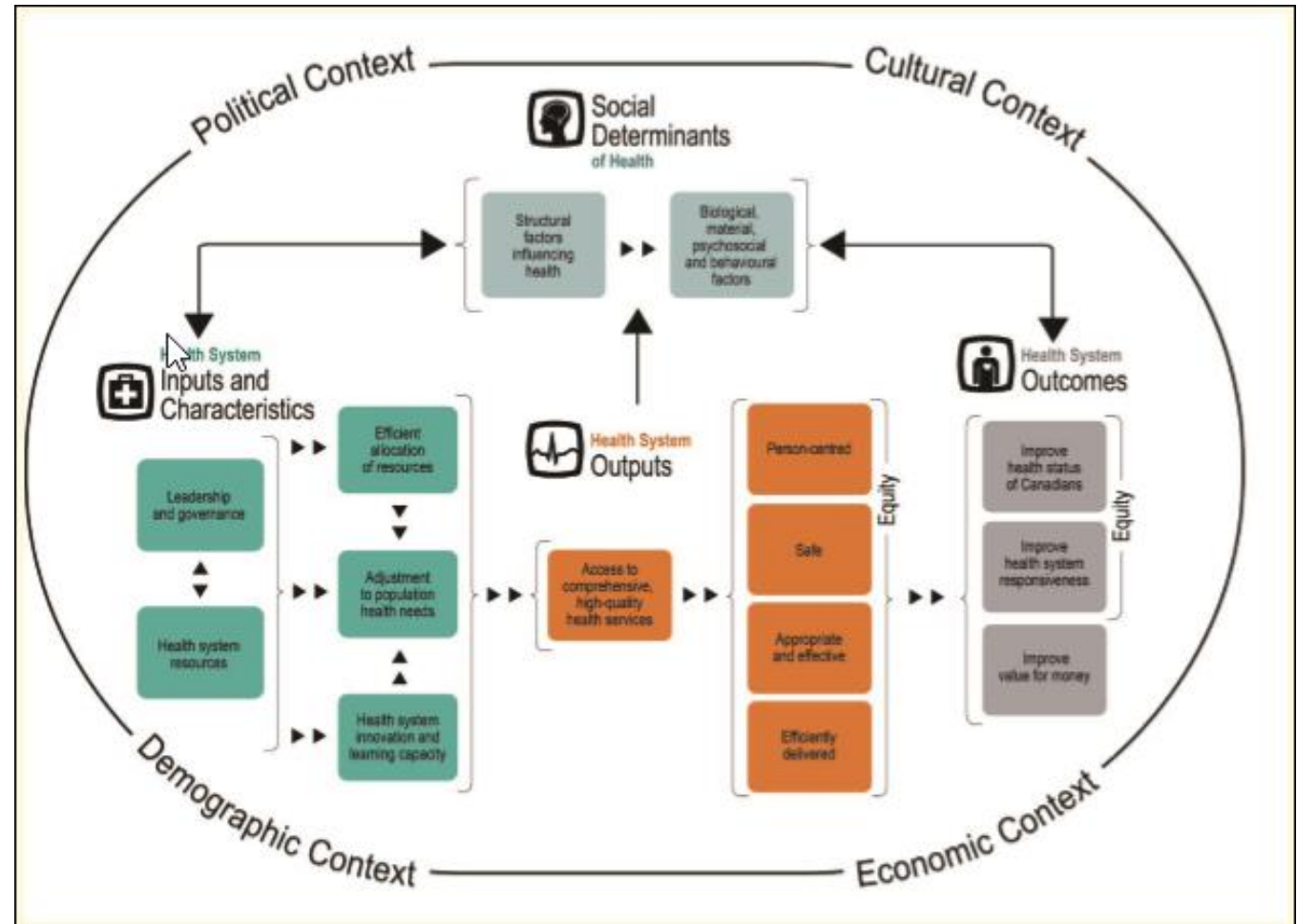
At CIHI, indicators are developed in 4 stages after an information need or knowledge gap has been identified. Each stage has multiple activities.



# Health System Performance Framework

## Main Themes:

1. Access
2. Person-Centric
3. Safety
4. Appropriateness & Effectiveness
5. Efficiency
6. Health Status
7. Social Determinants

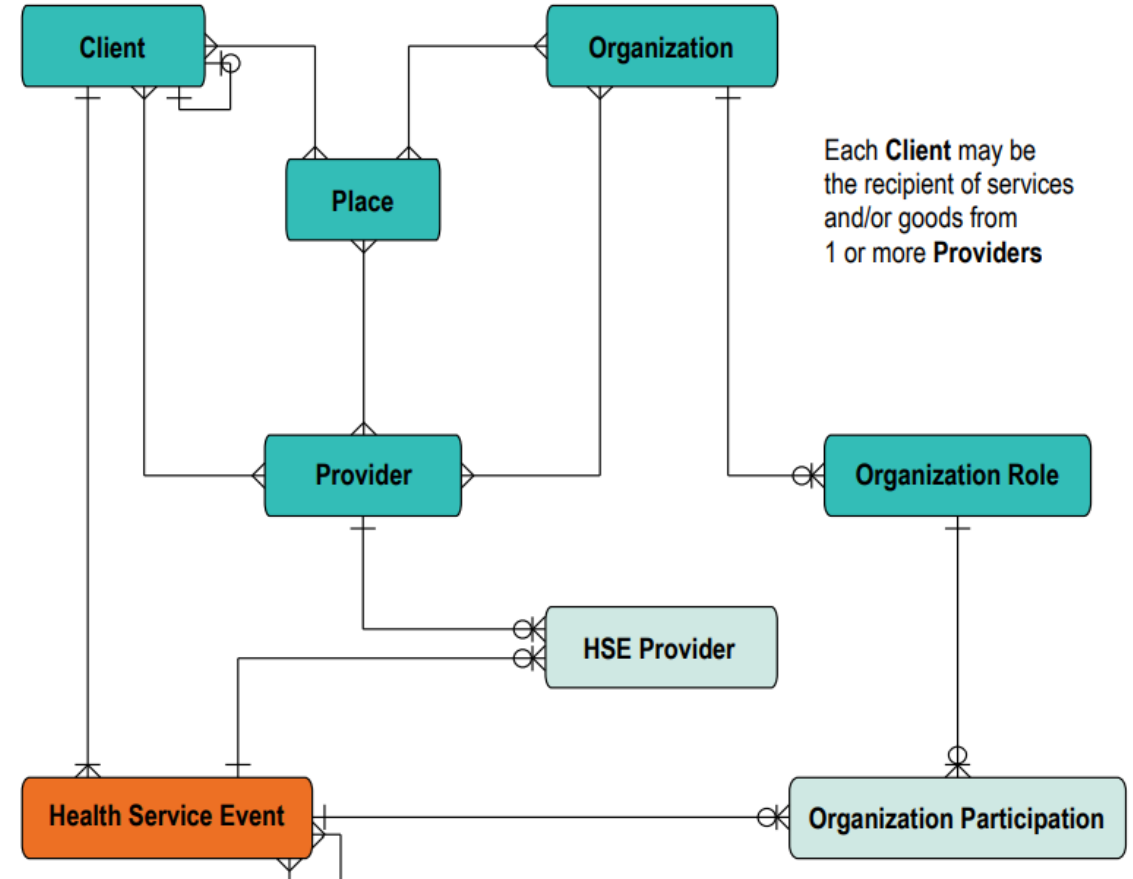


## Source

Canadian Institute for Health Information. *A Performance Measurement Framework for the Canadian Health System*. Ottawa, ON: CIHI; 2013. [https://secure.cihi.ca/free\\_products/Aligning\\_Frameworks\\_for\\_Sectors\\_and\\_Organizations\\_to\\_Health\\_Systems.pdf](https://secure.cihi.ca/free_products/Aligning_Frameworks_for_Sectors_and_Organizations_to_Health_Systems.pdf)

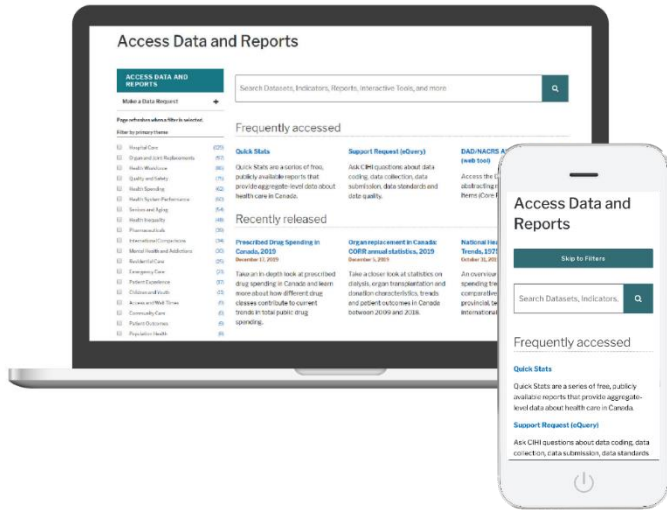
# CIHI Reference Data Model (CRDM)

- Data model for Health Data and Health System Performance Data
- CRDM leverages and uses external standards
- CIHI solutions leverage and use CRDM to model their data
- CIHI provides CRDM for free use in the Canadian Health Industry

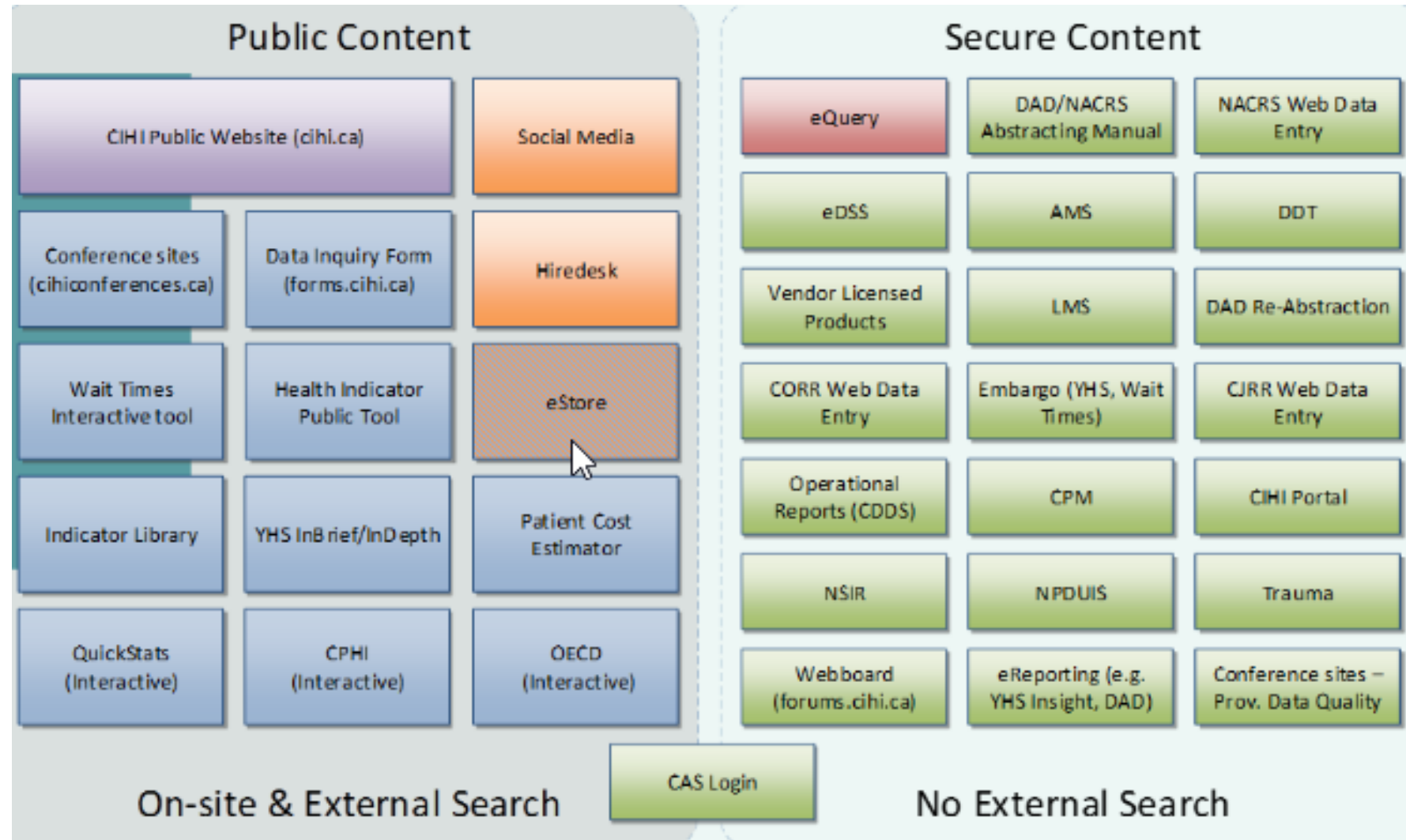


<https://www.cihi.ca/en/submit-data-view-standards/data-standards>

# CIHI Digital Reports and Interactive Visualizations



The first step to access CIHI content is to create a CIHI profile which can be done in the top right of [cihi.ca](http://cihi.ca) home page – “register” hyperlink.



# CIHI's Indicator Library (Public)

Highly popular, with visitors from around the world, CIHI's indicator library helps users understand what health indicators have already been developed

## Target Audience

Researchers, Analysts, Decision Makers, Managers, Media

## When to use

- When you want to explore what indicators exist that might be useful to you or your team
- When you need meta data details on health and health system indicators including definition, adjustment methodologies, calculation details, update frequency, data sources, geographic assignment and URLs to indicators

The screenshot shows the CIHI Indicator Library website. At the top, there is a navigation bar with 'Indicator Library', 'About This Tool', and 'Resources'. Below the navigation bar, there is a search bar and a 'View Indicators' button. The main content area displays a table of indicators with columns for 'Indicator', 'HSP Framework', 'Areas of Need', and 'Reporting Levels'. The 'Reporting Levels' column is further divided into 'Equity', 'National', 'Prov./Terr.', 'Region', and 'Facility'. The table lists several indicators, including '30-Day Acute Myocardial Infarction In-Hospital Mortality', '30-Day Acute Myocardial Infarction Readmission', '30-Day Readmission for Mental Illness', '30-Day Stroke In-Hospital Mortality', and 'Administrative Expense'.

Indicator	HSP Framework	Areas of Need	Reporting Levels				
			Equity	National	Prov./Terr.	Region	Facility
<a href="#">30-Day Acute Myocardial Infarction In-Hospital Mortality</a>	3.4 Appropriate and effective	B Getting better	•	•	•	•	
<a href="#">30-Day Acute Myocardial Infarction Readmission</a>	3.4 Appropriate and effective	B Getting better	•	•	•	•	
<a href="#">30-Day Readmission for Mental Illness</a>	3.2 Person-centred	C Living with illness, disability or reduced function	•	•	•	•	
<a href="#">30-Day Stroke In-Hospital Mortality</a>	3.4 Appropriate and effective	B Getting better	•	•	•	•	
<a href="#">Administrative Expense</a>	2.3 Efficient allocation of resources			•	•	•	•

<http://Indicatorlibrary.cihi.ca>

# Your Health System: In-Brief, In-Depth, Insight

**Audience: General public**

**Audience: Ministry, facility, regional decision-makers (available publicly)**

**Summary Results**

Welcome [Organization Name] Please search for indicator results for [Organization Name] View Organization Information

To select another organization, type the organization's name preceded by an asterisk (\*) in the organization box.

Legend: Above average (green), Same as average (blue), Below average (red), Not applicable (grey), Low volume (light blue), Outlier (yellow), Improving (green arrow), Weakening (red arrow), No change (blue line), Not available (grey circle)

	2014-2015 Closed	Performance Trend (3-Year Closed)	2015-2016 Open YTD	Latest 12 Months
Total Time Spent in Emergency Department	8.1	Improving (green arrow)	7.5	[Line chart]
Emergency Department Wait Time for Inpatient Bed	18.1	No change (blue line)	15.3	[Line chart]
Time in Emergency Department Until Disposition Decision	6.6	No change (blue line)	6.4	[Line chart]
Emergency Department Wait Time for Physician Initial Assessment	2.6	No change (blue line)	2.4	[Line chart]
30-Day Overall Readmission	8.7	No change (blue line)	6.3	[Line chart]

**Audience: regional/facility managers, analysts and clinicians**

# YHS: In-Brief (Public)

Interactive exploration of indicators on how well healthcare is doing by hospital, city or province/territory.

## Target Audience

General public, media, researchers, students

## When to use

- When seeking reliable, quotable, health information in areas identified as important and meaningful by Canadians
- When looking for health information at different geographic levels (including international, national, provincial, regional and facility levels) that is (1) comparable across institutions, regions and provinces with comparison flags (2) as current as possible and (3) comparable over time (e.g. trend analyses)

The screenshot shows the 'Your Health System' interface. At the top, a teal header contains the title 'Your Health System'. Below this is a dark grey box with the question 'How well is your health system actually working?' and a map of Canada in the background. The text in the dark box asks users to look at the big picture for their health system, check out their province or territory, city, or even their local hospital, and explore the 5 themes that Canadians told us were most important. Below the dark box is a search bar with the prompt 'Start by entering your province, territory, city or hospital' and a text input field with the placeholder 'Please enter 2 or more characters...'. The main content area is divided into five sections, each with an icon and a question: 'Access' (clock icon) asks 'Can you get the health services you need when you need them?'; 'Quality of Care' (thumbs up icon) asks 'How good is the care you are receiving, and is it safe?'; 'Spending' (calculator icon) asks 'How much do the health services you use cost the system?'; 'Health Promotion and Disease Prevention' (apple icon) asks 'How well is the system working to help you stay healthy and avoid getting sick?'; and 'Health Outcomes' (heart with arrow icon) asks 'Are Canadians actually getting healthier?'. At the bottom, there is a navigation bar with five icons corresponding to the sections above, each with a title and a brief description of the indicator: 'Access' (Hospital Stays for Harm Caused by Substance Use), 'Quality of Care' (All Patients Readmitted to Hospital), 'Spending' (Age-Adjusted Public Spending per Person), 'Health Promotion and Disease Prevention' (Obesity (Age 18 and...)), and 'Health Outcomes' (Life Expectancy at Birth and Avoidable Deaths).

# YHS: In-Depth (Public)

Interactive reporting and comprehensive information on a balanced set of health indicators to help facilitate health improvement strategies

## Target Audience

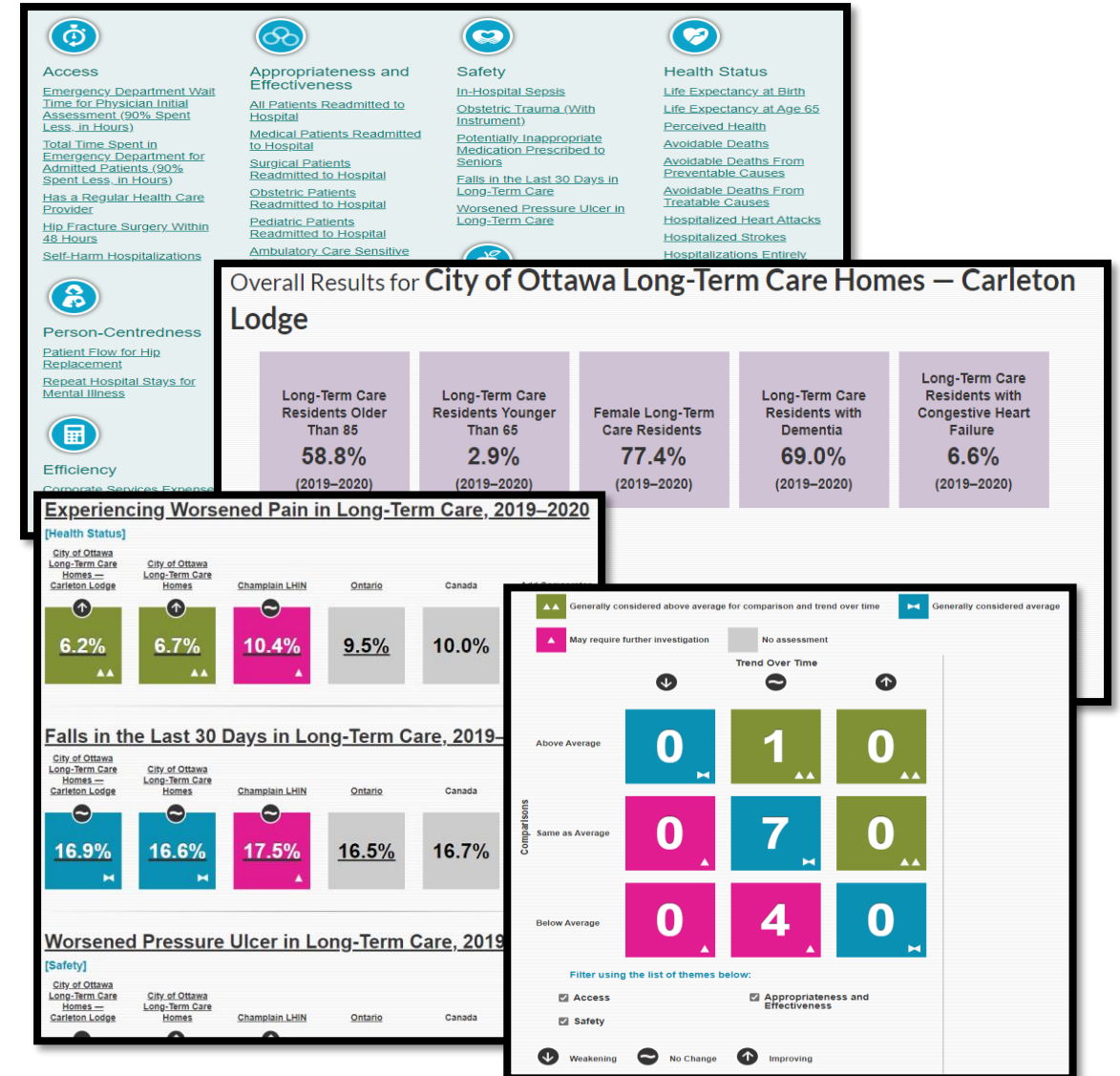
Provincial and Territorial Ministries of Health, regional health authority decision-makers, organizational quality and performance managers or analysts

## When to use

- When looking to make informed decisions about the health system by having a balanced view of performance in different dimensions of care compared to others, and over time

## For Hospitals/Long term care homes:

- when tracking their performance over time
- when comparing their organizations to Peer averages, and top performers



# CIHI Topic Based Data Reports & Analysis (Public and Private)

Domain specific interactive analytical tools, Quick Stats, Downloadable data, and Analytical Publications on specific health, and health system topics

## Target Audience

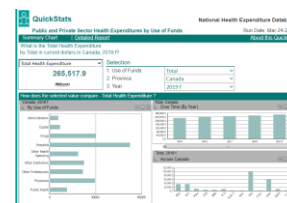
Individuals with interest and influence related to specific health and health system performance topics including Provincial and Territorial Ministries of Health, regional health authority decision-makers, organizational quality and performance managers or analysts, media and general public.

## When to use

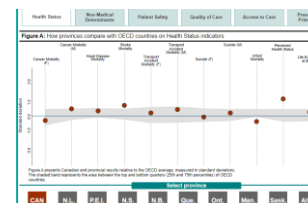
- When looking to share or quote data and information facts from a reputable source to help drive investigation or change
- When looking make making informed data-and-information driven decisions related to a specific health or health system topics

## Interactive analytical tools

Health Expenditure Trends



OECD Country Compare



Wait Times

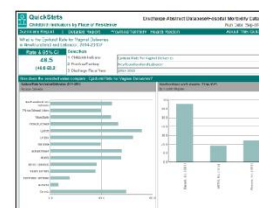


Patient Cost Estimator



## Quick Stats

Interactive data



Pre-formatted data tables

Province/Territory	Indicator	Value	Unit
Alberta	Health Expenditure	1,234	Million CAD
British Columbia	Health Expenditure	1,567	Million CAD
Manitoba	Health Expenditure	890	Million CAD
Ontario	Health Expenditure	2,345	Million CAD
Quebec	Health Expenditure	3,456	Million CAD
Saskatchewan	Health Expenditure	1,012	Million CAD
Atlantic	Health Expenditure	567	Million CAD
Canada	Health Expenditure	10,123	Million CAD

## Analytical publications



- Physicians in Canada
- Nursing report
- National Prescribed Drug Spending and Utilization
- Continuing Care Reporting
- Home Care Reporting
- National Rehabilitation Reports
- Canadian MIS Data financial and Spending
- Etc.

# YHS: Insight (Private)

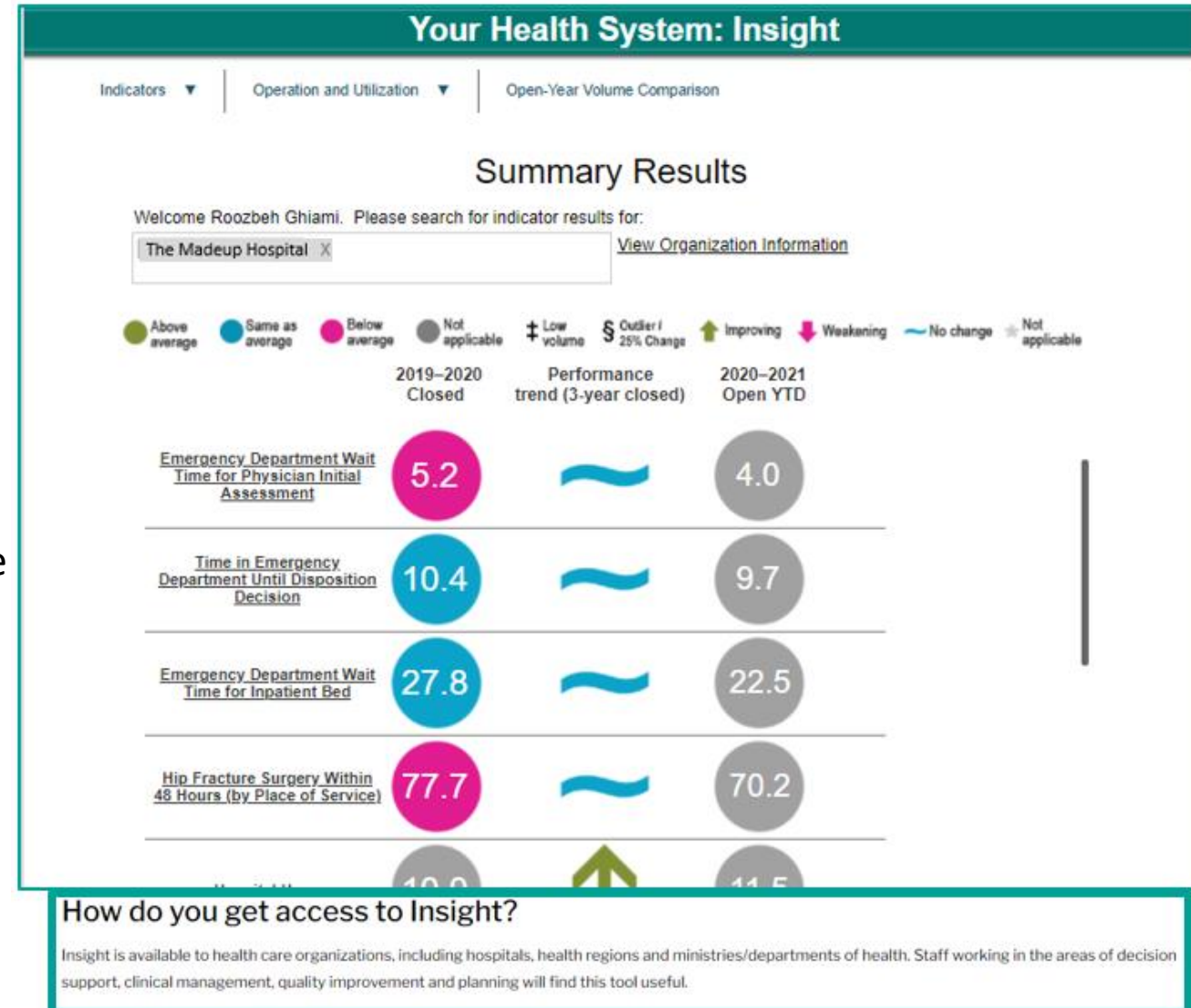
Interactive data visualization of health indicators to help health care delivery organizations, and health regions, understand what is driving health performance results.

## Target Audience

Health care planners, managers, and analysts

## When to use

- When there is a need to understand details from YHS In-brief via review of data that is not publically available
- When there is desire to identify what is driving results and review peer comparisons
- To review chart-level information (access permitting) and see which cases are included in results and why
- Investigate costs. Insight marries clinical and cost data and provides estimated costs of treating different types of patients



# CIHI Portal (Private)

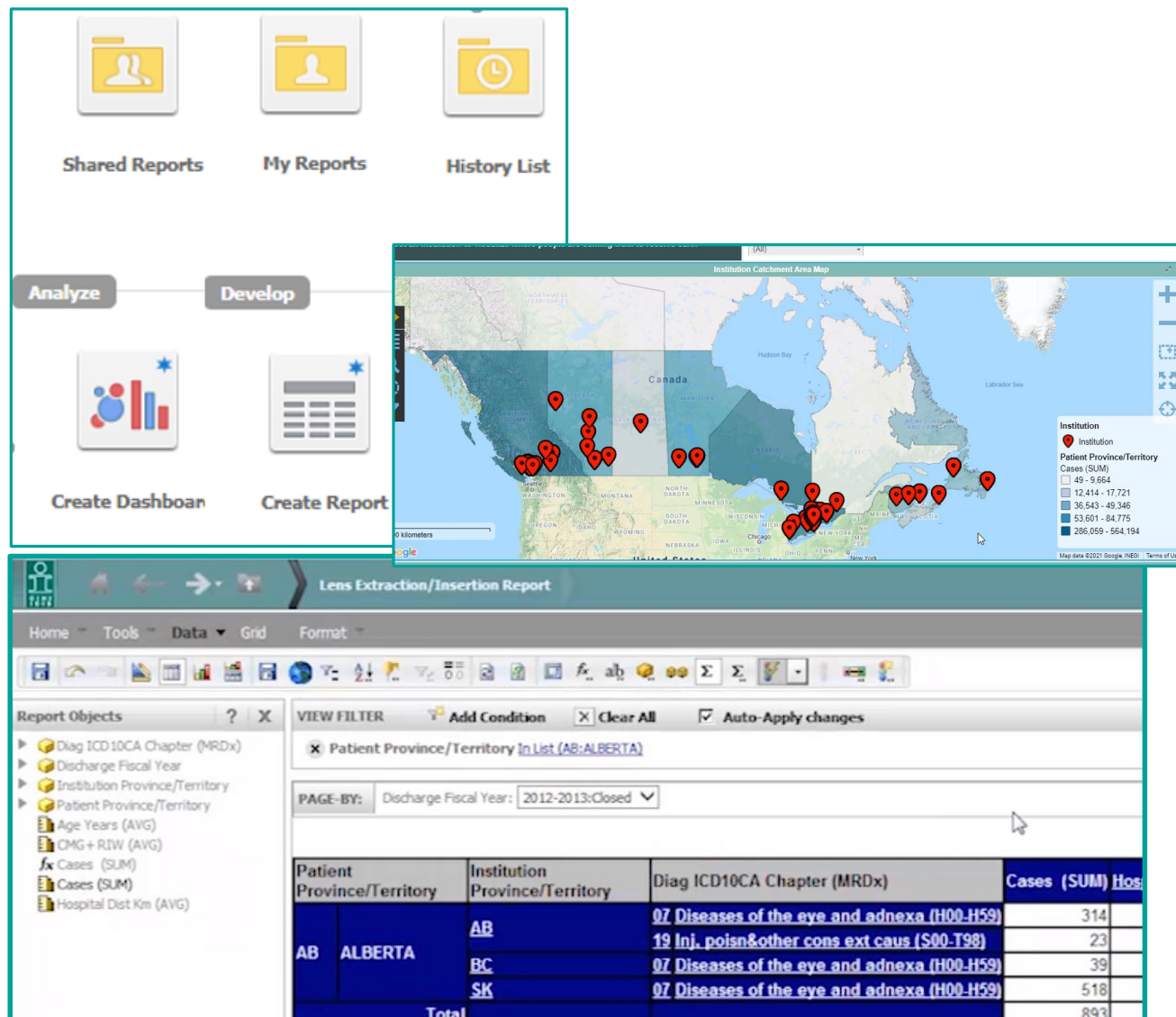
Use, create, and share visualizations and data reports on CIHI's data

## Target Audience

Health care planners, managers, and analysts

## When to use

- When advanced customized reports are required; access to almost all DAD and NACRS data elements in Portal, so you can create reports based on your own design (as well as using pre-built reports)
- Visualize data on a map or dashboard
- Access financial data (CMDB) and rehabilitation data (NRS)
- When access to chart information is not required



# What is unique (and common) to each Solution

## YHS: Insight

Predefined Performance Indicators

Episode Building  
(Data Linked Across Databases)

Quebec Emergency Data

Marries Clinical & Cost Data

Chart-level Information

## Both Solutions

Data:

- Pan Canadian
- Facility identifiable
- Open Year
- Case Mix
- Cost

Features:

- Interactive dashboard
- Customized reports
- CIHI Help and Support

## CIHI Portal

Ability to create reports from scratch

Ability to general GIS map visualizations

Population Data  
Crude Rates & Age-Standardized rates

Income Quintiles/Deciles

# How to Choose

Feature	Insight	Portal
<b>Analytics Focus</b>	Indicators and operational data; Data are pre-integrated	Ad hoc custom reporting, no linkage between data holdings
<b>Data Years Available</b>	6 FY	DAD/NACRS: 7 years, CMDB: 5 years; NRS: 20+ FY
<b>Data Refresh</b>	Monthly	Monthly, Quarterly, Annually
<b>Organizational Coverage</b>	Pan-Canadian (Per data availability)	Pan-Canadian (Per data availability)
<b>Data elements available</b>	Limited to most relevant	Broad
<b>Access</b>	Free for core plan	Subscription-based (\$)
<b>Data Holdings Included</b>	DAD;HDMB; NACRS'; CMG+, CACS	DAD; NACRS; NRS; CMBD (Financial and Statistical Data) STC (Income deciles/quintiles, geography data and population data)

Data	Insight	Portal
Pan- Canadian Data	Y	Y
Quebec emergency department data	Y	N
Open-year data	Y	Y
Chart-level information	Y	N
Facility-identifiable data	Y	Y
Population data: Crude rates and age-standardized rates	N	Y
Income quintiles/deciles	N	Y
Cost data	Y	Y
Case-mix grouping info: 2 most recent CMG/CACs methodology years	Y	Y
Pre-defined performance indicators	Y	N
Performance comparison and identifying opportunities for improvement	Y	Y
Customized reports	Y	Y
Ability to create reports from scratch	N	Y
Interactive dashboards	Y	Y
GIS mapping software	N	Y
Data linked across databases (episode building)	Y	N
Case-mix grouping info: 2 most CMG/CACs methodology years	Y	Y

# CIHI Education Services – focus on the analyst

## Foundational Courses

- Portal course series from introduction through building complex reports
- YHS Insight course series from introduction to diving into specific indicators

## Capacity Building

- Learning products to support the use of CIHI indicators in health system performance planning
- Courses to support health system decision making across the health system

Educational courses on CIHI methodologies, current databases, standards and more

CIHI offers educational courses on current databases, CIHI methodologies, CIHI reports and many other topics in an online format, as well as web conference and video conference. For information on technical requirements, pricing, cancellation and in-house educational services please read Information for learners.

[Log in to Browse Courses](#)

[Browse Events and Conferences](#)

<https://www.cihi.ca/en/news-events-and-education/education>

# Data Requests (Private)

Extracted CIHI aggregate or record level data in a format that is fit for use

## Target Audience

Researchers, decision-makers, analysts, managers

## When to use

- When other CIHI solutions will not meet your needs
- If your request includes confidential, or personal data, you must be prepared to protected data and follow data destruction requirements

The screenshot shows the CIHI website's 'Make a data request' page. At the top, there is a navigation bar with the CIHI logo, the tagline 'Better data. Better decisions. Healthier Canadians.', a search bar, and links for 'Français', 'Help', 'Register', and 'LOG IN'. Below the navigation bar are four main menu items: 'Access Data and Reports' (highlighted in dark teal), 'Submit Data and View Standards', 'News, Events and Education', and 'About CIHI'. A row of social media icons (Facebook, Twitter, LinkedIn, Email, Print) is located to the right of the menu items. The main heading is 'Make a data request'. On the left is a sidebar menu with 'ACCESS DATA AND REPORTS' (highlighted), 'Make a Data Request' (with a minus sign), and 'Data Holdings'. The main content area contains a paragraph explaining that researchers can request specific data from CIHI's databases, followed by a large dark teal button labeled 'Access Data Inquiry Form'. Below this is a section titled 'Data request pricing' with the text 'CIHI responds to data requests on a cost-recovery basis, as follows:'. On the right side, there are two informational boxes: 'Data availability' with a link to 'data holdings' and 'Response time' explaining that complexity and request type affect turnaround times.

<https://www.cihi.ca/en/access-data-and-reports/make-a-data-request>

# CIHI SAE (Private) New!

\*Pilot April-June 2021

Secure access environment (SAE) is a cloud-based data analytical environment for 3<sup>rd</sup> party access to data requested from CIHI

## Target Audience

Researchers, decision-makers, analysts, managers

## When to use

- When you have a need for an analytical environment for either data extract provided by CIHI or your own data
- When you have your own data to include and link to CIHI data
- To eliminate manual efforts in protecting confidential private data records and destruction after use

### *Appropriate access to CIHI data*



Only named researchers have access to data



Data can only be used for requested purpose



Administrative controls

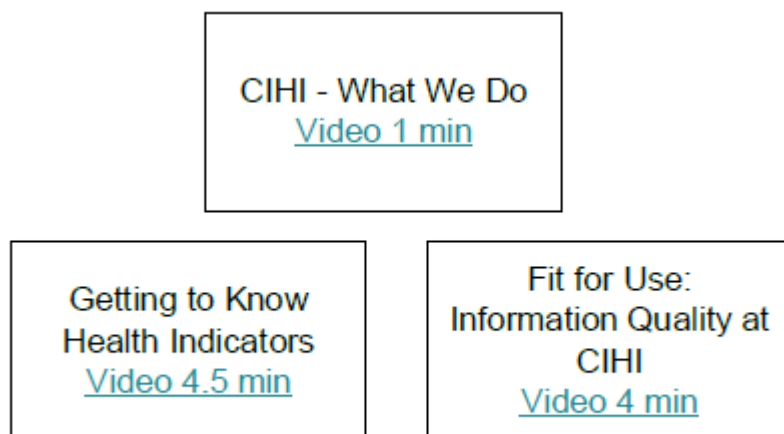


Data is destroyed/archived upon project closure

# CIHI Subject Matter Expertise and Services

- CIHI's team includes over 700 team members including subject matter experts with coverage across numerous health and health system topics
- CIHI regionally focused members are an invaluable resource. They are actively engaged and aware of regional needs and initiatives
- CIHI subject matter specialists can provide help and guidance related to health data subjects (methodology, data standards, data quality, etc.), tooling that the analyst might require (eg Portal), and are a great way to learn about resources and working groups
- CIHI works with organizations across the country to provide expertise for analytical (including advanced analytics), modelling, data quality assessment, and custom reporting
- Confused? Need help or access? You can always contact [help@cihi.ca](mailto:help@cihi.ca) or via phone at 613-241-5543

# Getting to know CIHI



Source:  Getting to Know CIHI

Stakeholders at all levels of Canada's health systems use CIHI's data to inform change. Watch a few examples:

Following the Flow of Health Care Data: A Home Care Example  
[Video 4 min](#)

Measuring Health Inequalities: An Introduction  
[Video 4 min](#)

CIHI Data... Helping Move Births Closer to Home  
[Video 3 min](#)

Improving Canadian Rehabilitation Through Quality  
[Video 4 min](#)

CIHI Data... Helps Put Philosophy Into Practice  
[Video 4 min](#)

Data in Action: Hospitals Use CIHI Data to Improve Patient Safety  
[Video 3.5 min](#)

CIHI Data... Helps Battle Depression  
[Video 3 min](#)

CIHI Data... Helps Change Practice  
[Video 4 min](#)

Over the years, we've developed numerous tools. Today, we're working to streamline these to give all our stakeholders better access.

Case Mix in Action  
[Video 5 min](#)

Improving Data Access With Integrated eReporting  
[Video 6 min](#)

CIHI's Health Inequalities Interactive Tool  
[Video 8 min](#)

Your Health System: Insight Video  
[Video 6.5 minutes](#)

Hop on the Pop Grouper  
[Video 5.5 min](#)





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**Better data. Better decisions. Healthier Canadians.**



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