



Province of BC Digital Health Strategy (Draft)

*Transforming our health system so all
British Columbians can achieve optimal health and wellness*

BCHIMPS Conference Keynote - March 1, 2019

Partnerships (First Round of Engagement)



Health Trends and Facts

We're living longer....

- Since 1990s, British Columbians have had longest life expectancy in country
(Source: Statistic Canada, 2013)
- In 2016, Canada's average life expectancy = 82 years; BC's = 82.5 years
(Source: Statistic Canada, 2017)

Our spending on health care continues to go up....

- Forecasted total health spending per person in 2018:
 - Canada: \$6,839, up 3.2% from 2017
 - BC: \$6,597, up 2.8% from 2017 *(Source: CIHI, 2018)*

Health Trends and Facts

We're spending most of our health dollars on acute care....

- Hospitals continue to account for the largest share of health dollars, i.e., ~ 60% of total health spending for 2018 in Canada. *(Source: CIHI, 2017)*
- BC Health Authorities spent 59% of their overall budgets on acute care in 2015/16. *(Source: Office of the Provincial Health Officer, 2017)*

And, the cost of staying in a hospital continues to increase....

- The average cost of a standard hospital stay in BC at \$6,136 is higher than the Canadian average of \$5,992. *(Source: CIHI, 2017)*

Our Transformation Imperative

Why British Columbia is undergoing transformation of healthcare delivery towards better health outcomes.



Disparate efforts

Lack of coordination across health system to invest in improvements is further fragmenting efforts towards an integrated system of care.



Misfocused

Health System remains largely focused on hospital and not remaining independent practices.



Siloed

Critical health information locked in systems or on paper. Making it difficult for care givers to provide coordinated end to end patient care across care continuum.



Disconnected

Patient services are too often fragmented, untimely, and inefficient.

15%

Of the population today is over 65 years old - over the next 20 years, the proportion of seniors will double.

20%

Of BC residents are living with two or more chronic conditions.

\$19b

A year is spent on health care in BC, nearly 46% of direct provincial spent; these rising costs are not sustainable.

Patients are ready for, and want....

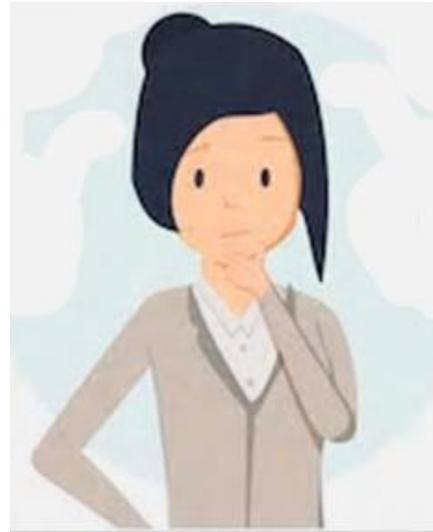
**To adopt technology
into their
treatment plans**
([PatientEngagementHIT](#))

**Better access to
telehealth tools**
([PatientEngagementHIT](#))

**To use technology
as part of managing
their health**
([Accenture](#))

**To use smartphones
to communicate with
health care providers**
([Accenture](#))

**A provider who allows them
to conduct health care
interactions online or
on a mobile device**
([Medical Economics](#))



**A single integrated
electronic medical record**
([MOH Patients as Partners
annual conference 2018](#))

Digital Health Drivers

The majority of Canadians

see **multiple care providers** in addition to their regular doctor/place of care to support their health care needs.



Availability of digitally-enabled

health services (e-services) is **not meeting the demand** of Canadians.



Canadians accessing their medical records online the past year **has doubled (7% - 15%)**.



The top four e-services

in demand by Canadians include:

- Renewing prescriptions
- Viewing their health records
- Confirmation of specialist referrals and notification of confirmed specialist appointments
- Online booking of appointments



Canadians with access

to digitally-enabled health services **report improved:**

- Convenience
- Self-management
- Timeliness of care
- Communication
- Ability to work in partnership with their care providers



There is a growing trend

for **smartphone use** when accessing digital health e-services.



Gartner - Digital Innovation is Transforming Health Care

Disruptive yet vital role to tackling issues of sustainable, scalable and automated services to meet increasing demand.

Three biggest disruptions:



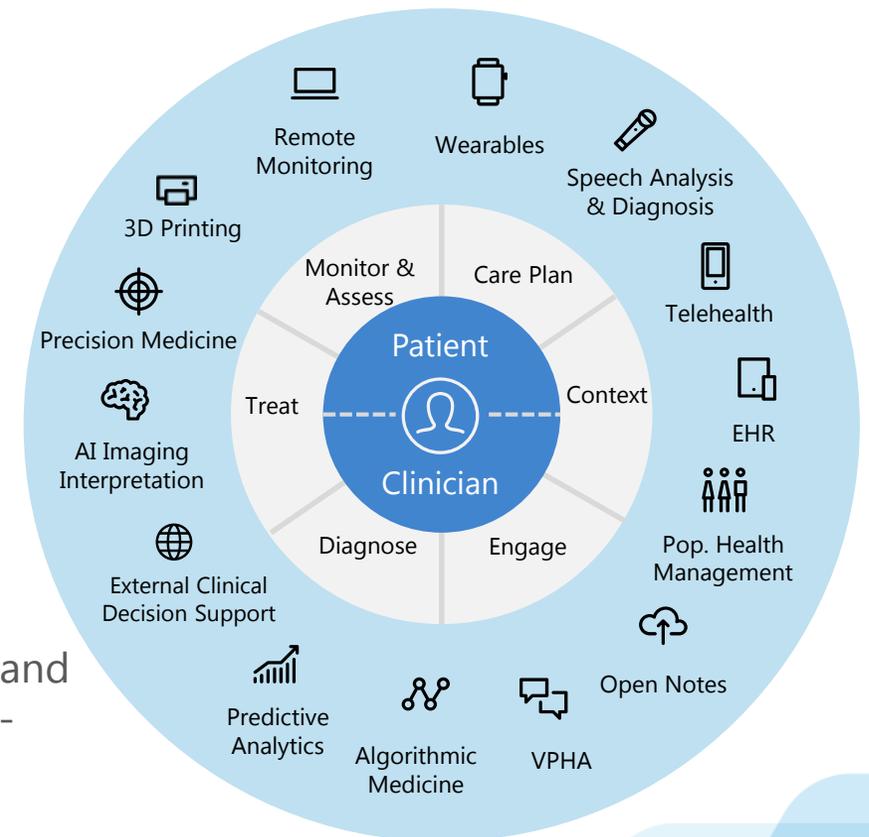
Explosion of consumer-centric health care to empower patients.



Digital access to health care which eliminates geographic barriers.



Advancements like precision medicine, artificial intelligence and analytics pivots health care to “wellness, prevention and self-management”.



In BC - Our Transformation Principles



Patient Experience

We believe that citizens are stewards of their health information and want choices on how they engage with the health care system. Citizens are confident in their healthcare system and trust the security and privacy of their data.



Provider Experience

We believe in team-based care that improves provider and patient experience and coordination. Provider experience and collaboration is supported by digital technology and literacy.



Supports Population Health Outcomes

We believe in creating a holistic, proactive and preventative approach to health to support a lifetime of wellness.



Cost Efficient & Sustainable

We believe that digital solutions should maximize value for money in helping overcome system cost and capacity constraints. Digital solutions support a sustainable health system and allow for optimal allocation of resources.



Accessible & Appropriate

We believe that healthcare must be accessible and appropriate regardless of location, culture or access to technology. There is equity in its access and use.



Learning & Insight

We believe in a supportive environment where we can learn, take appropriate risks and gain insights to improve the efficiency and effectiveness of care delivery and our health system.



Privacy & Security

We believe that personal health information must have the appropriate controls in place to ensure authorized access and use of sensitive information.

Goals

- 
Patient Empowerment
 Empower patients as partners in their care and wellness
- 
Integrated Care
 Create an integrated and comprehensive care experience for patients and clinicians
- 
Improved Care Team Experience
 Build a culture of trust, collaboration and joy in work to support the care team in delivering quality health care
- 
Enhanced Decision Support
 Provide timely, accessible, accurate information and tools to support clinical and system planning decisions

Vision

Optimal health and wellness for every British Columbian

Mission

Co-create an integrated and sustainable health care system that delivers improved health outcomes and embraces a culture of innovation, trust and partnerships

Five Strategic Pillars to Digitally Enable Health Transformation



Digital Health Foundation

- Infrastructure
- Policy and Standards
- Privacy and Security
- Identity Management
- Architecture

Digital Health Transformation Principles

Patient Experience • Provider Experience • Learning & Insight • Accessible & Appropriate • Cost-Efficient & Sustainable Supports Population Health Outcomes • Privacy & Security

Empower Patients

1

Empower Patients

2

Accelerate Primary & Community Care

3

Transform Acute & Hospital Based Care

4

Advance Analytics Capabilities

5

Enhance Foundational Clinical Systems

What we will accomplish

- As a health system we will prepare for the shift in consumer power and lead digital efforts to empower citizens to make informed decisions to improve their health and wellness.
- Create a common citizen experience through a provincial portal to provide a single view of their health information.
- Establish a shared-care plan for patients and their care team to collaborate on care decisions.
- Enable virtual visits and improve patient access to health care.
- Develop patient health knowledge information to assist with patient literacy.

Why this is a priority

- Empowerment is essential to enabling citizens to have control over the management of their care.
- This includes their families and individuals they need to participate in co-management and shared decision making.
- The widespread adoption of digital health consumer technologies is transforming how consumers manage their health and wellness and interact with health care professionals.

Accelerate Primary & Community Care

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Enhance Foundational Clinical Systems

What we will accomplish

- Develop and deploy solutions to facilitate effective delivery of multidisciplinary team-based primary care.
- Collaborate with PCNs and other provider groups to co-create improved workflows and care models with enabling innovation and technologies. These will be called Innovation Acceleration Centres (IAC).
- IACs will include change management and communications to gain momentum with initial success and learnings and expand provincially when it makes sense, building a network of PCNs.
- Provincial standards, policies, culture and change management support, and enabling tools that support team-based care.

Why this is a priority

- New methods are required to enable and support the care team communication and collaboration.
- More importantly, the vision of multidisciplinary team-based care will be difficult if not impossible to achieve without digitization.
- Supporting PCNs will allow them to deliver faster care closer to patients' homes.

Transform Acute & Hospital Based Care

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Enhance Foundational Clinical Systems

What we will accomplish

- Provincial strategy for health authority clinical information systems that maximizes health system benefits and contains costs.
- Sector governance and clinical leadership to identify and pursue clinical workflow, templates and data standards in alignment with the implementation of the system transformations.
- Pursue opportunities for collaboration among the broader Canadian CIS client base, and specifically those using advanced EHR functionality.
- Strategy and plan to contain costs while ensuring business applications support the clinical transformations.

Why this is a priority

- The delivery of health services is increasingly complex. Medical knowledge and digital technologies are maturing and expanding exponentially.
- Advancement of the EHR is a priority to mitigate risks related to the fragmentation of care, and enable improvements in quality and safety; outcomes and experience; and population health and health system sustainability.

Advanced Data Analytics & System Planning

1

Empower Patients

2

Accelerate Primary & Community Care

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Transform Acute & Hospital Based Care

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Advance Analytics Capabilities

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Enhance Foundational Clinical Systems

What we will accomplish

- Provide capability for analytics to support health system planning, quality improvement, program evaluation and planning, operational research and population health monitoring across distributed systems of care.
- Develop data collection, data platform and analytic capabilities to assess clinical programs, guide technology uptake and enable robust measurement of outcomes
- Provide mechanisms to implement performance measurements and metrics defined by clinical, population health and other business stakeholders

Why this is a priority

- Health system planning, quality improvement, program evaluation and planning, operational research and population health monitoring can directly influence quality and effectiveness of care.
- Analytics can drive a near-real-time learning systems by altering how care is delivered in response to data-driven learnings.

Enhance Foundational Clinical Systems

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Enhance Foundational Clinical Systems

What we will accomplish

- Develop strategies for delivering report distribution, end-to-end medication management, referral management, lab and imaging ordering, immunization management and image/media management, amongst others.
- The intent of this focus is to systematically improve clinical workflows and access to relevant clinical information by care teams.

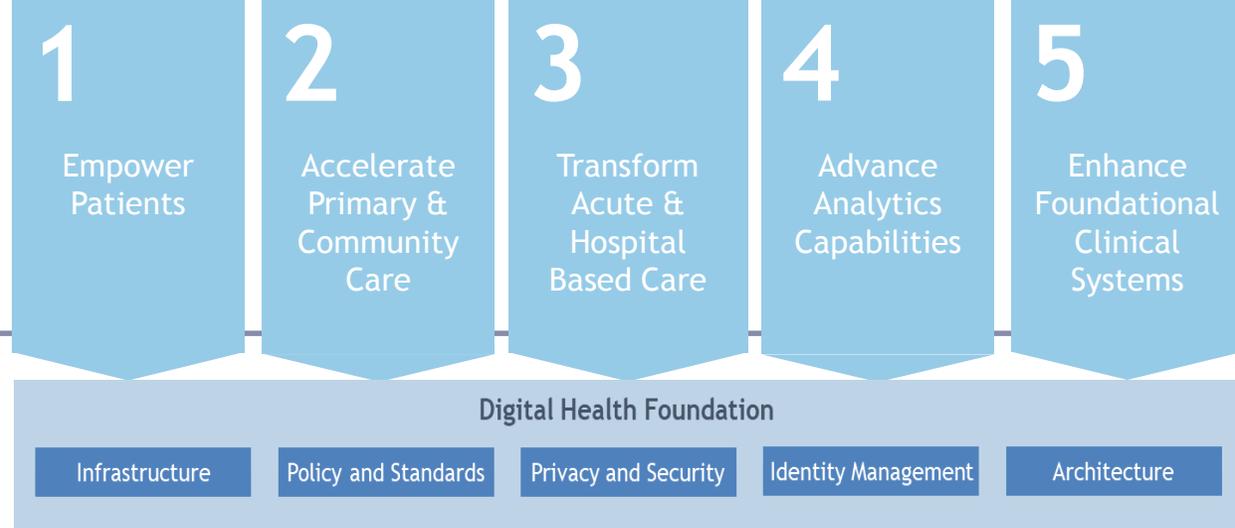
Why this is a priority

- Access and use of provincial medicine and lab clinical systems across both community and facility-based providers is essential to inform decisions and provide quality care.
- This includes results distribution, medication management, laboratory ordering, medical imaging ordering and image management.

Digital Health Foundation

What we will accomplish

- Digital ecosystem and platform strategy and approach for a health system ecosystem with interconnected and overlapping platforms.
- Advance Provincial Identity Management to ensure secure access to health information and minimize administration.
- Advance Health Information Exchange infrastructure and standards to enable an interoperable ecosystem.
- Implement robust and reliable networks, workstations and hosting services to ensure a secure, scalable, accessible and well supported foundation for sustainability and growth.



Why this is a priority

- The BC health care system operates in silos and has created fragmentation, leading to negative impacts on health outcomes.
- We must create an integrated and connected system of care based on standards and interoperability to behave as an integrated system.
- System sustainability is at risk due to increasing costs. Disparate efforts underway in common areas such as portals and virtual care are further fragmenting our system and not containing costs.

Digital Health Strategy: Analytics

Innovation through Analytics



Health System Has Two Value Propositions

1. Quality - Population & Patient

- Meaningful health outcomes for the population and patients; and,
- A quality service experience

2. Fiduciary (Taxpayer)

- Government is accountable for the allocation and use of funding for the public health system, and the efficient and effective provision of health services

Analytics Drive Innovation & Continuous System Improvement

Strategic Approach to analyzing the system:

- Understanding individual and population health needs
- Service Delivery Meets Population & Public Health Needs
- Health Human Resource Management
- Digital, IM/IT Technologies and Workplace Infrastructure

Context of Improvement:

- quality & fiduciary value propositions

Understanding Individual and Population Health Needs

Objective:

Through health surveillance & analysis better understand the health needs of:

- *Individuals and*
- *Populations*

to better align services and resources to achieve improved health outcomes.

Staying Healthy

- Healthy non-users; Maternal & healthy newborns

Getting Better

- Major Episodic Health Needs; Major or Significant time-limited health needs

Living with Illness or Disability

- Living in Community
- Low, Medium, High, Complex Mental Health and/or Substance Use Issues
- Low, Medium Complex Chronic Conditions
- High Complex Medical Conditions
- Cancer

Optimally Coping with End of Life

- Home & Community Care
- Palliative & End of Life Care

What We're Doing & Where We're Going: Examples of Innovations in Analytics in Understanding Health Needs

CIHI's Population Grouping Methodology

provides a rich clinical profile for each person. 226 health conditions, 239 health profile groups (can roll-up to 16). The foundation for risk adjustment and predictive modelling.

Geocoded Data

Identification of geographic "hot spots" of population impacted by disease, accessibility to services and measures of social determinants of health. Important for understanding potential causes of geographic disparities.



The Ministry's Health System Matrix

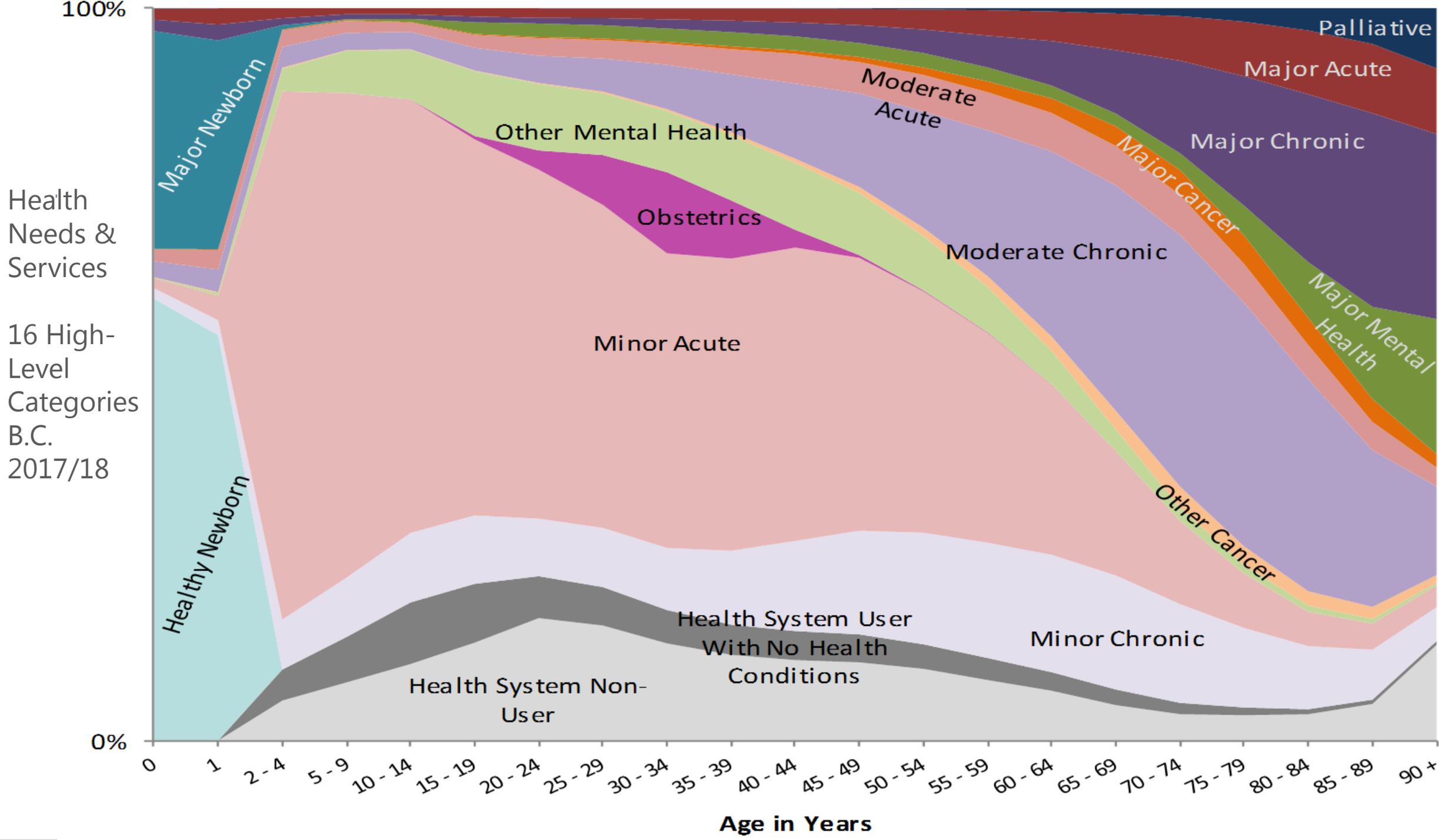
provides a rich picture of how each person interacted with the health sector. It complements the Population Grouper in development of predictive models.

Community Health Service Areas

allow focus on specific populations to identify communities that are in greater need.

What CPOP offers

- **Leverages from clinical data in health administrative data**
 - **226 health conditions** in additive classification. People tagged with all relevant health conditions
 - **239 health profile groups** in 'mutually exclusive' classification. People assigned based on most relevant health condition
 - Roll-up to **16 high-level categories**

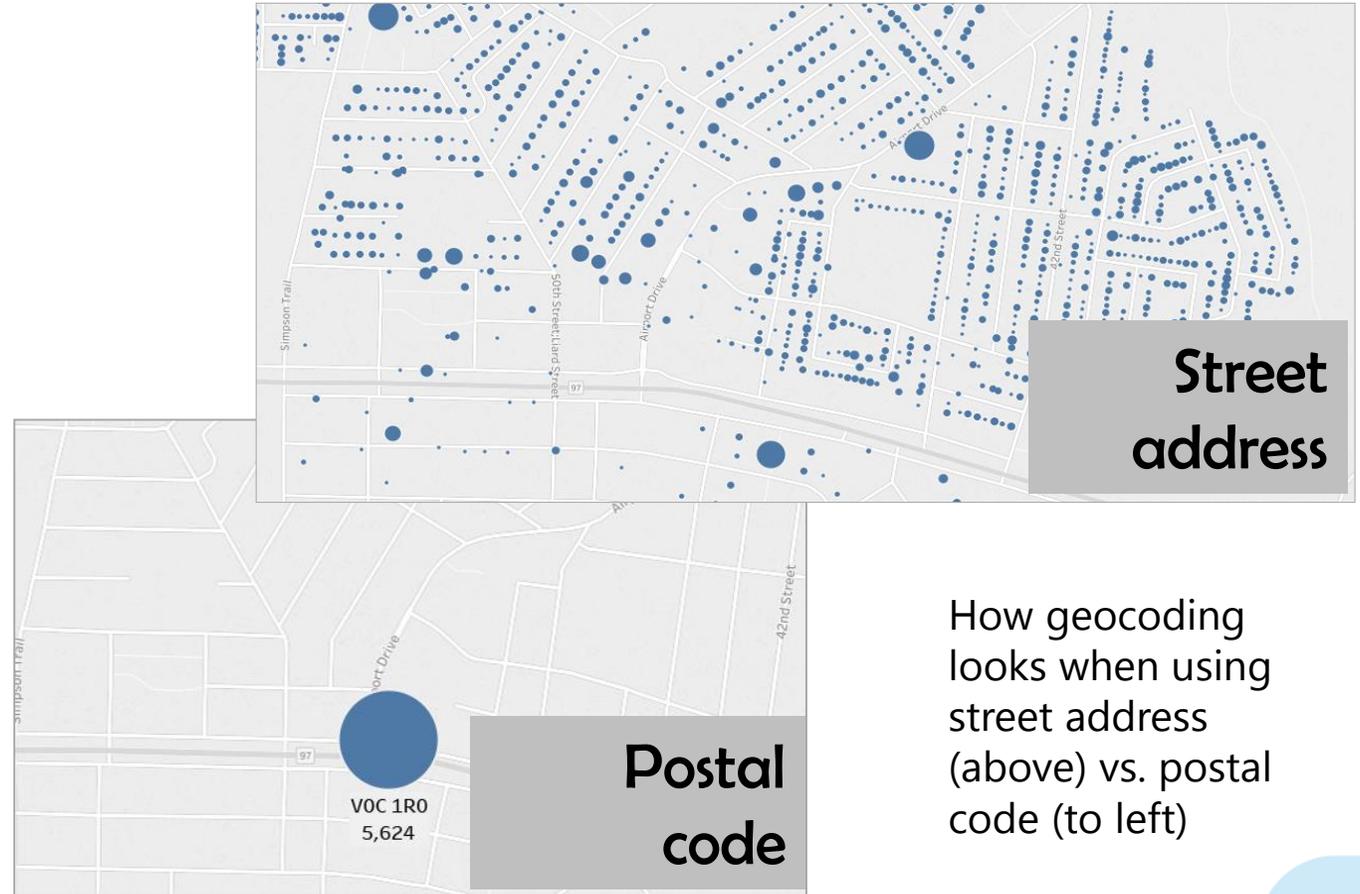


Community Health Service Areas

- Value: understanding variation related to the health system at the community level
- 89 Local Health Areas needed to be subdivided
- Design Principles:
 - Reflect where people live
 - Identify where health services are needed for local populations
- Result: 218 CHSAs

B.C.'s Population Geocoded

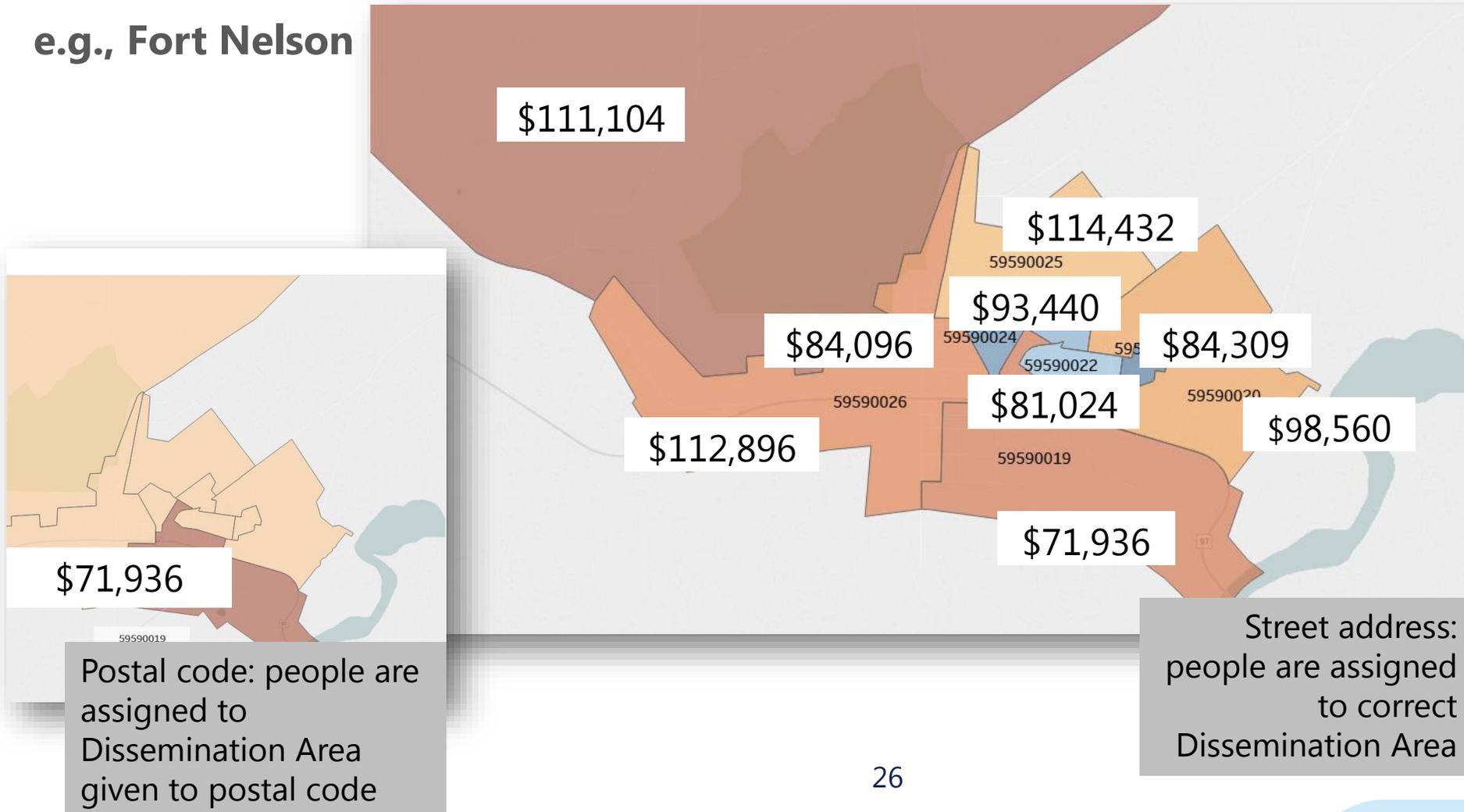
- Needed to geocode people accurately to CHSAs
- Addresses from Client Roster
- **Longitude/Latitude File**
 - Started using street address to geocode
 - Stopped using postal code



How geocoding looks when using street address (above) vs. postal code (to left)

Census Data Attributed to People via Street Address Geocoding

e.g., Fort Nelson



Note on Data Linking

Inter-Ministry data are frequently linked.

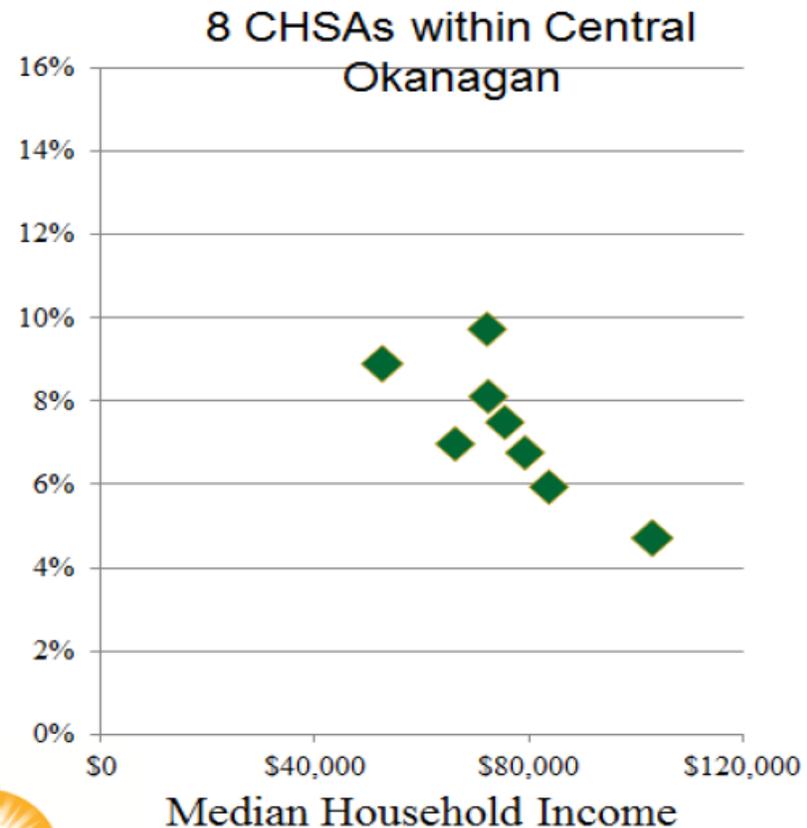
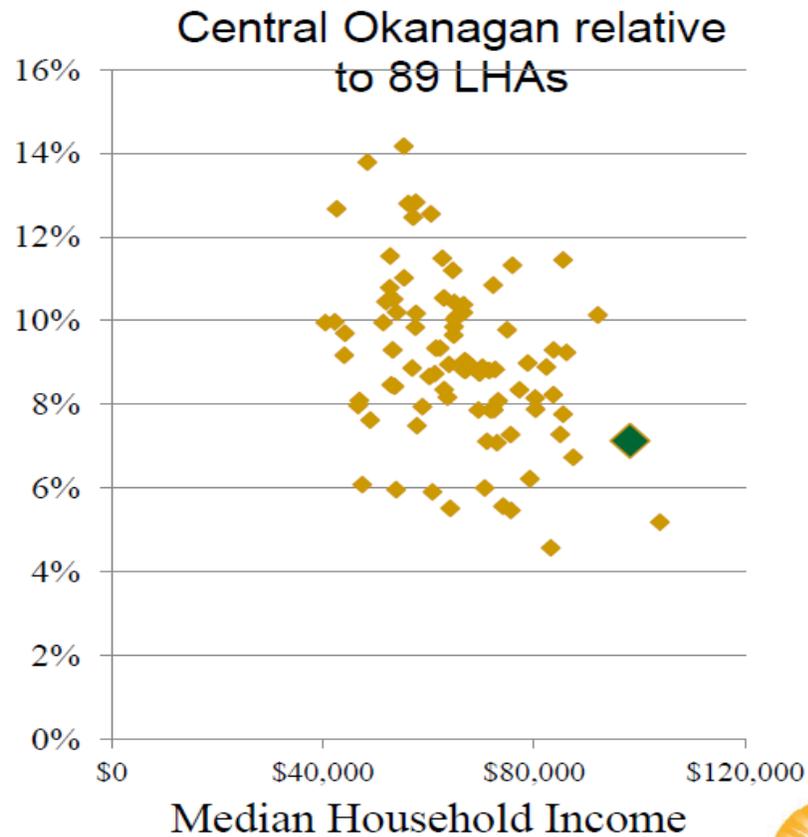
This is getting easier to do – the Integrated Data Division of the BC Government has data from several ministries that can be easily linked and are relatively easy to access.

CHSA Data: LHA Vancouver - Centre North *(formerly 162 Downtown Eastside)*

	LHA 322 Vancouver - Centre North	CHSA 3221 Downtown Eastside	CHSA 3222 Northeast False Creek	CHSA 3223 Grandview- Woodland
Census Population Count	61,532	19,960	12,392	29,180
Median Household Income	\$49,033	\$23,359	\$77,156	\$55,141
Percent Unaffordable Shelter	41.0%	49.5%	41.2%	35.1%
Percent University Degree/Higher	37.9%	27.0%	55.0%	37.0%
Unemployment Rate	6.2%	9.2%	5.5%	5.7%
Percent Attached to GP/NP Practice	71.5%	69.2%	67.7%	74.7%
Percent Living with Illness or Chronic Conditions	8.2%	9.6%	6.6%	7.8%
Percent with Severe Mental Health and Substance Use	6.1%	11.8%	2.4%	3.3%

Sources: LHA profiles (PAS 3000.0256); Matrix CHSA User Tool (PAS 3000.0418)

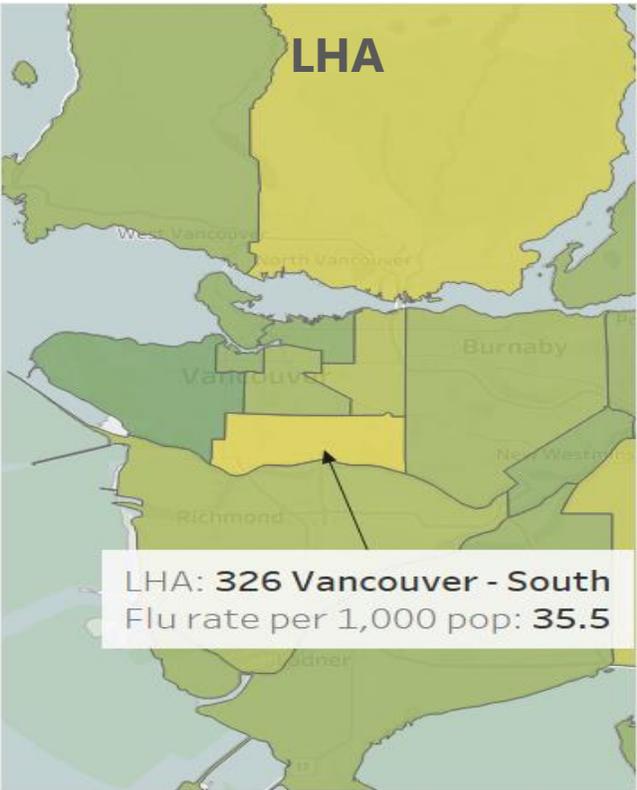
Diabetes Prevalence & Income, Central Okanagan



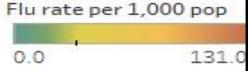
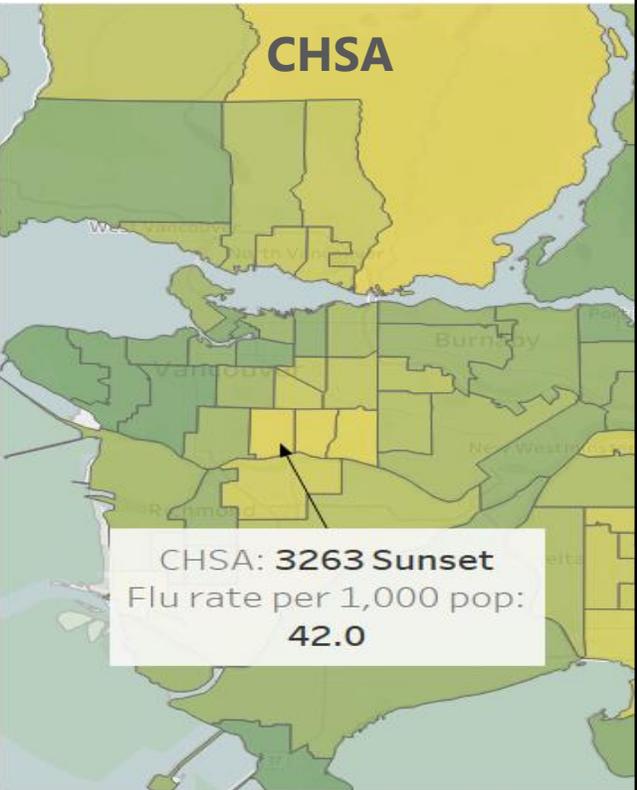
Analytics Potential: Example

Flu Rate per 1,000 population (2015/16)

LHA Level

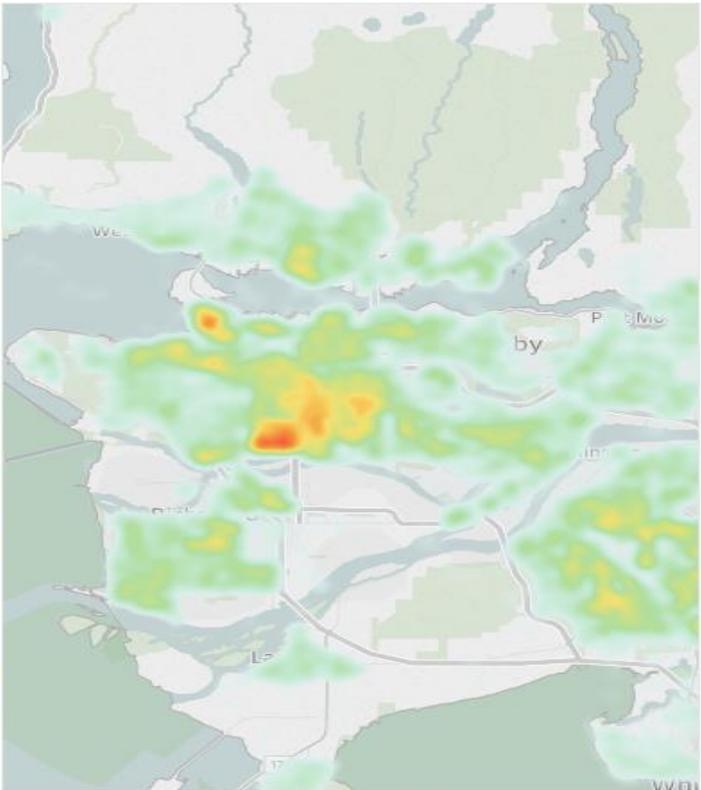


CHSA Level



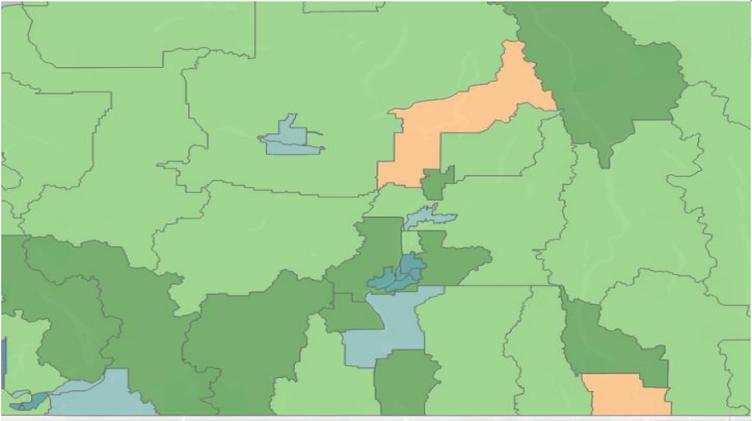
Heat map, no pre-defined health boundaries

Heat map

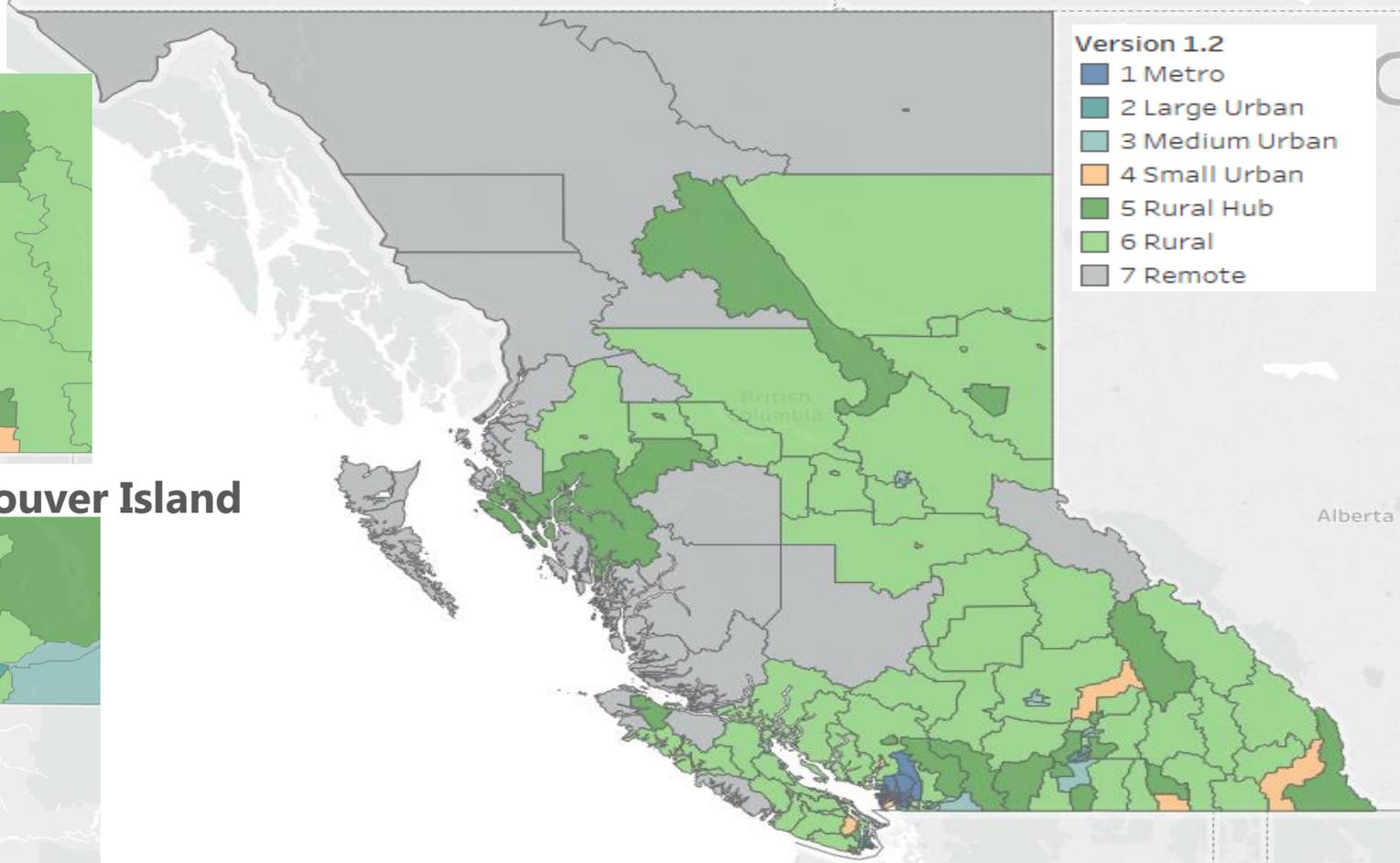
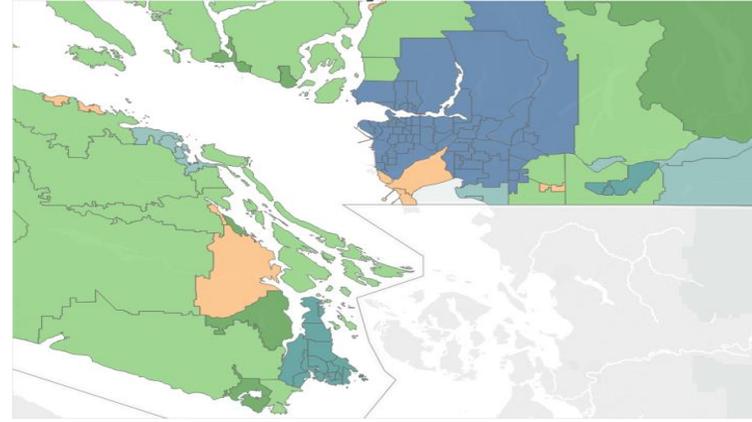


Urban/Rural Classification for CHSAs

Interior



Lower Mainland/South Vancouver Island



Predictive Modelling: at risk of being admitted to LTC

B.C.'s senior population (70+ years) living in the community
476,000

CPOP 226 HC clinical profile identifies those most at risk

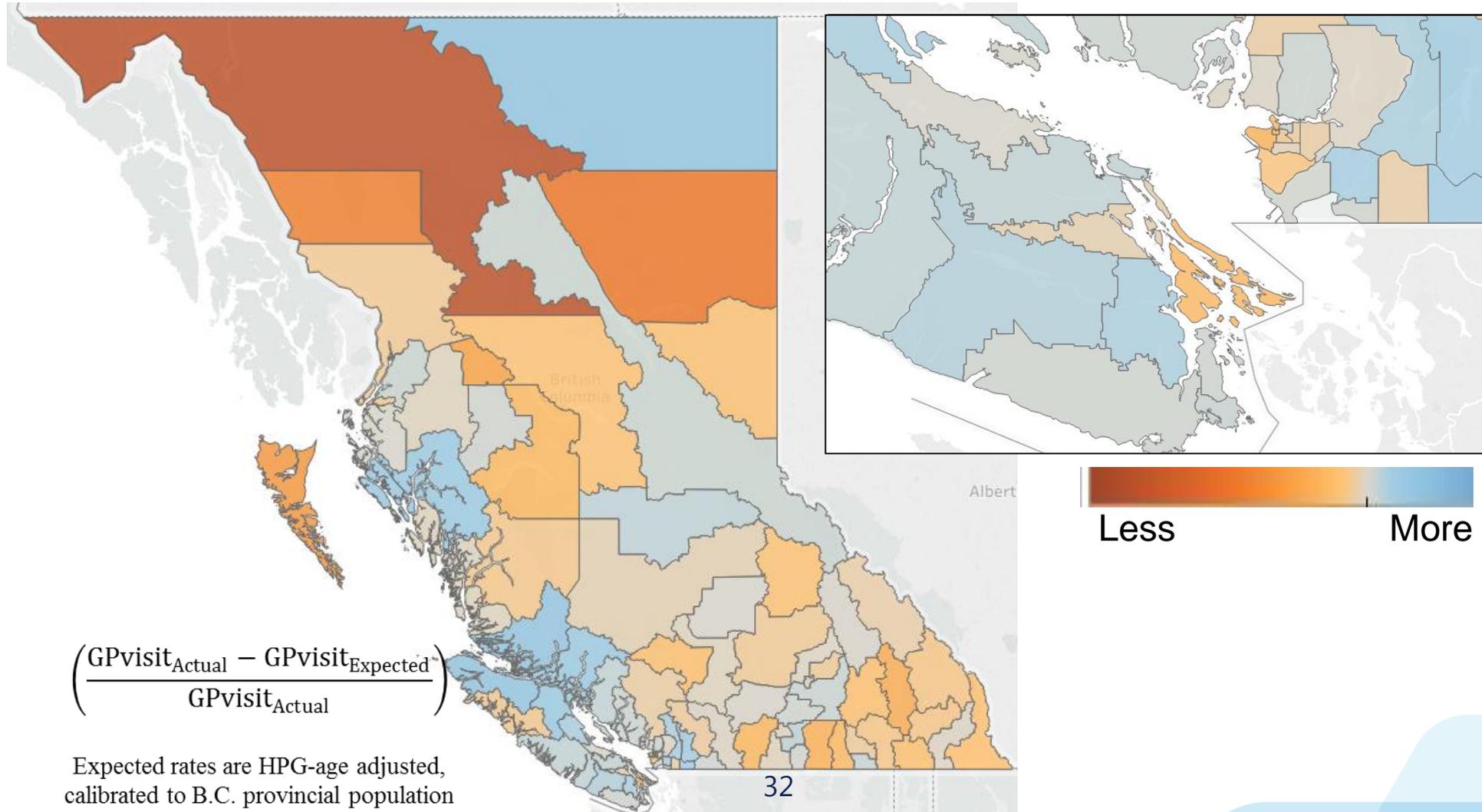
Subset who are high risk of long-term care admission
24,000

Those who were admitted to long-term care the next **two** fiscal years
6,000

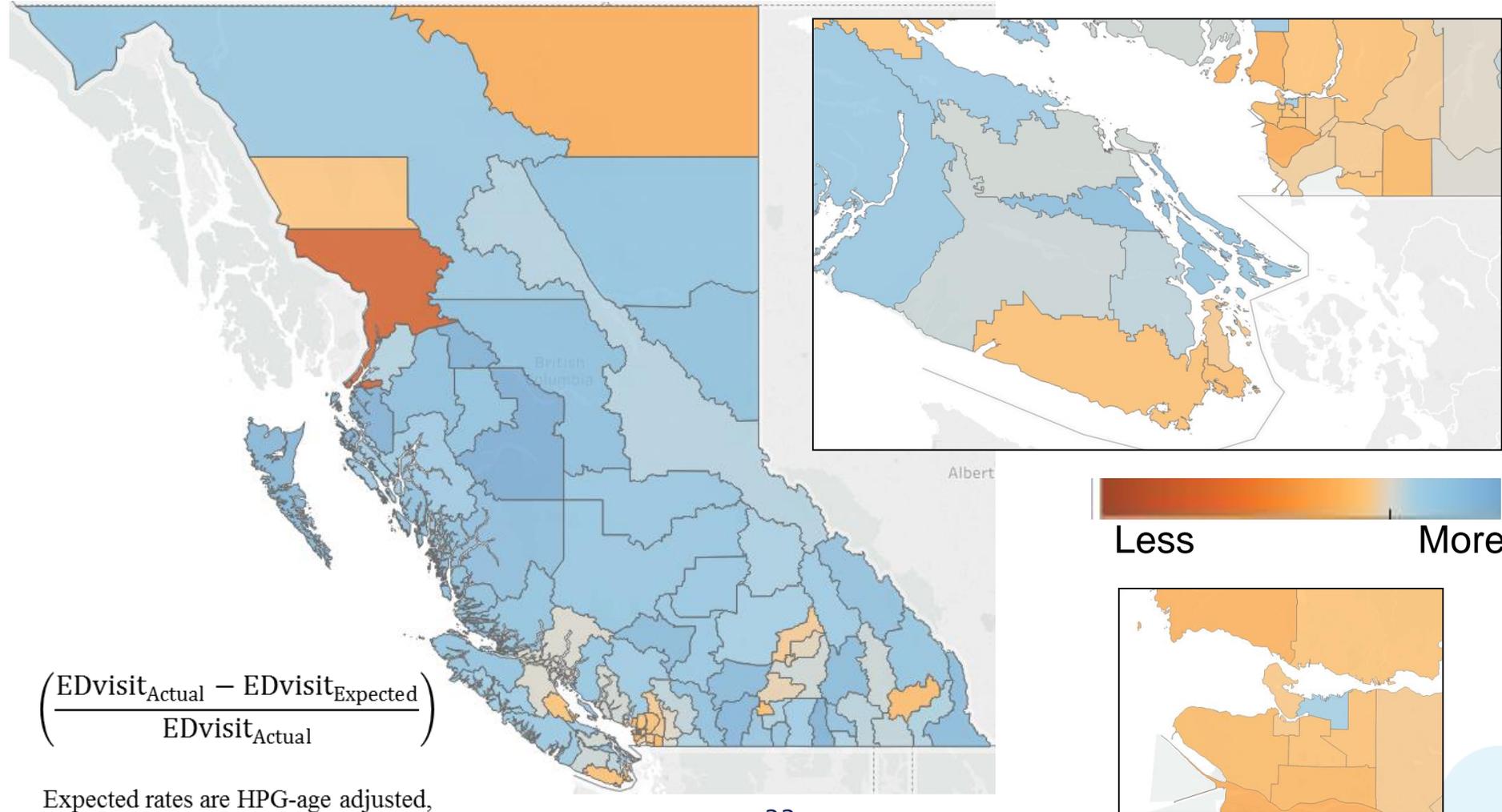
1 in 4 people in high-risk pool

Method: B.C. Ministry model fitted to B.C.'s population. Ability to build/customize variety of models (e.g. risk of death, # of primary care visits, likelihood of developing diabetes).

Risk (Morbidity) Adjustment: Populations GP Visits – Actual v Expected



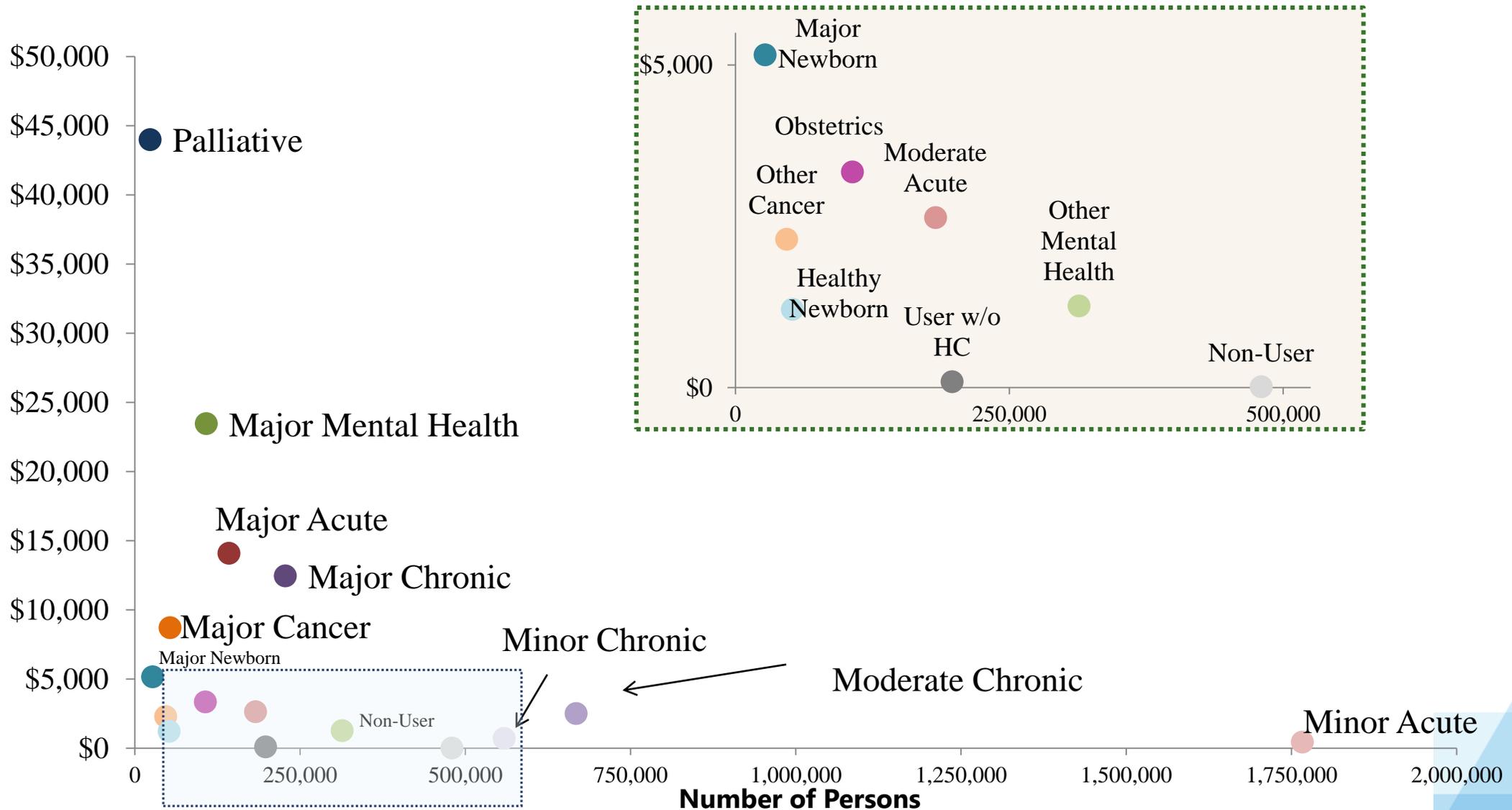
Risk (Morbidity) Adjustment: Populations ED Visits – Actual v Expected



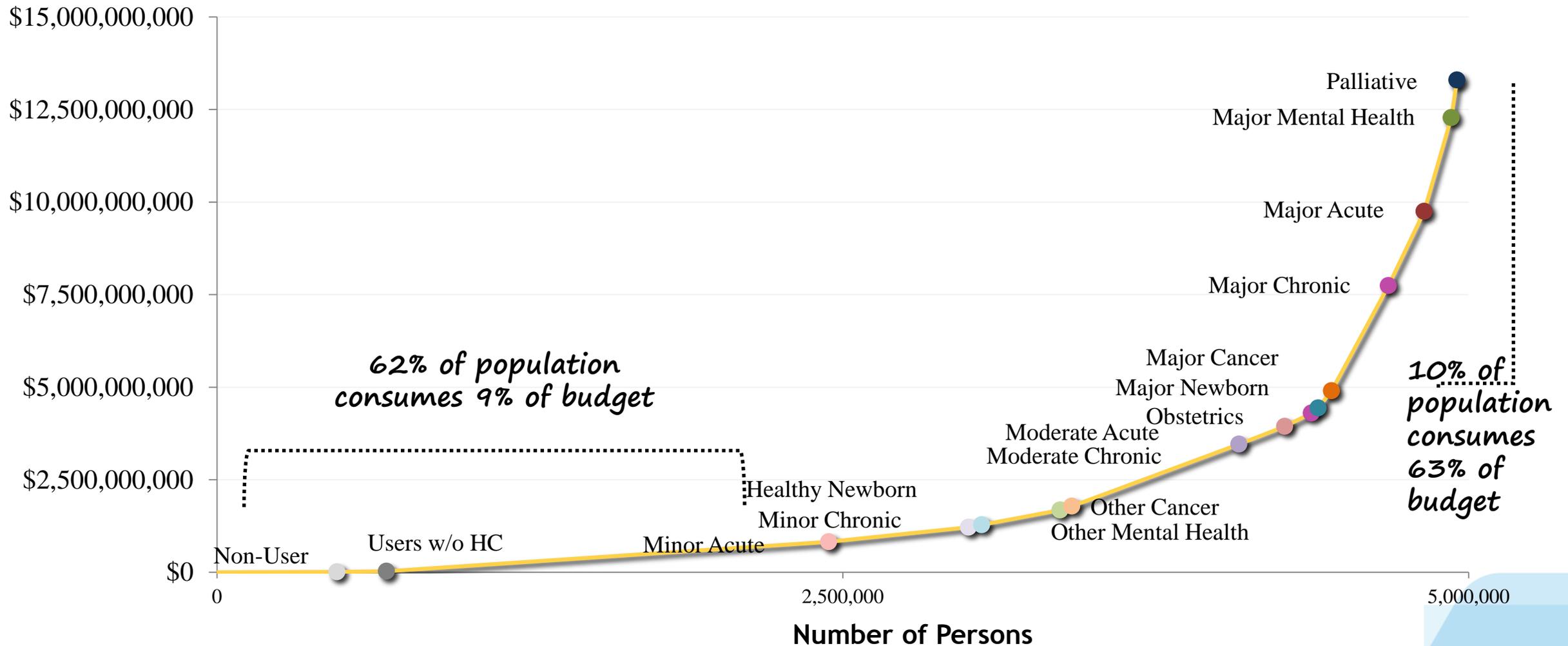
$$\left(\frac{\text{EDvisit}_{\text{Actual}} - \text{EDvisit}_{\text{Expected}}}{\text{EDvisit}_{\text{Actual}}} \right)$$

Expected rates are HPG-age adjusted, calibrated to B.C. provincial population

Descriptive Statistics: Average Matrix Expenditure by PopGrouper High-Level Category

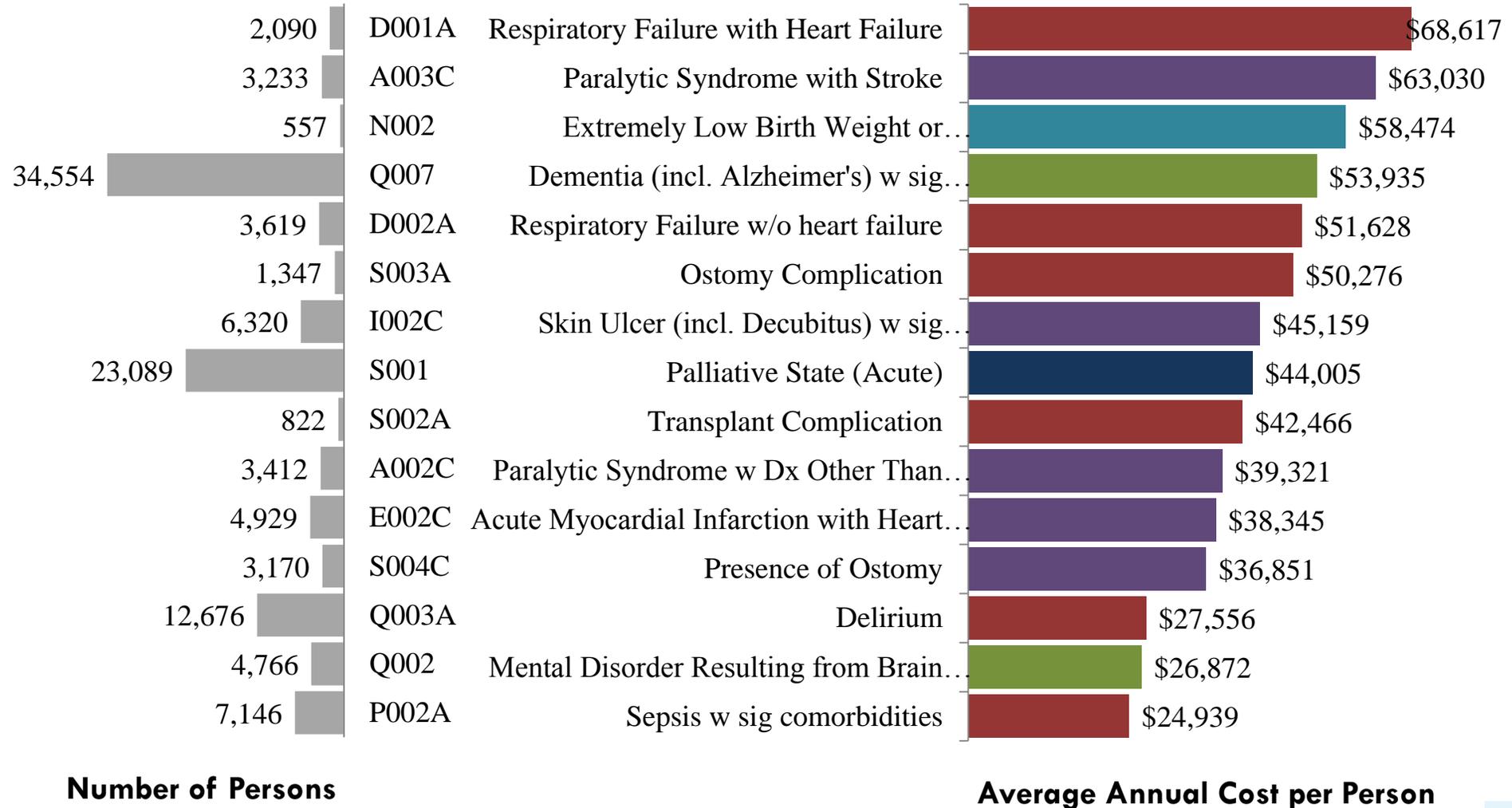


Descriptive Statistics: Cumulative Annual Health Expenditures



Source: 2016/17 expenditure from Matrix V9

Descriptive Statistics: Most Costly Health Profile Groups



Source: 2016/17 expenditure from Matrix V9

Service Delivery Meets Population & Public Health Needs

Objective:

Establish a health service delivery system that effectively & efficiently meets patient & population health needs at:

- *local community*
- *geographical service area*
- *regional, and*
- *provincial levels*

Population & Public Health, Primary & Community Care Services

- Healthy Living & Health Promotion & Protection
- Primary Care
- Public Health & Specialized Community Services

Diagnostic & Pharmaceutical Services

- Pathology Services
- Diagnostic Imaging/Radiology Services
- Pharmaceutical Therapies and Services

Hospital Services

- Outpatient
- Ambulatory Support Therapies
- Physical Medicine & Rehabilitation Services
- Maternity Services
- Ambulance & Emergency Services
- In-Patient Services

Health Human Resources Management

Objective:

Health service teams are:

- *Accessible, engaged, skilled, efficient, safe and healthy;*
- *Supported and well-led in delivering health services; &*
- *Working within the health system.*

Practice Level Inputs

- HHR Deployment and Team Functioning
- Professional and Inter-professional culture
- Motivation and Engagement

Organizational Level Inputs

- Education and Transition from Education to Practice
- Recruitment, Orientation, Training, Learning, and Development
- HR & Change Management
- Workplace Health and Safety

Provincial Level Inputs

- HHR Planning
- Professional Education, Legislation & Regulation
- Funding and Remuneration
- Labour Organization, Bargaining Structure & Labour Relations

Digital, IM/IT Technologies & Workplace Infrastructure

Objective:

Digital technologies:

- *effectively & efficiently support patient care;*
- *allow health teams to deliver quality health services to patients & populations; &*
- *enables effective and efficient business operations.*

Health & Care Service Digital/IT Delivery

- Digitally Enabled Services, e.g. mobility
- Clinical Information: Accurate, & current for improved patient outcomes, health care planning; research; policy development

Digital IT/Solution Design

Infrastructure

- Technology
- Facilities
- Business

Provincial Level Inputs

- Integrated Planning & Funding Strategy
- Privacy and Cyber Security

Imagine a Health Care System...

- That is efficient, sustainable, personalized and easy to navigate
- That supports new and improved models of care delivery
- That makes better use of data
- Where...
 - Patients are enabled to take an active role in their health and well-being
 - Patients, families and multi-disciplinary care team members are connected
 - We are achieving quality, measurable and meaningful outcomes
 - We are empowered and have trust and confidence in our health care system

