Complex, high needs patients – an Alberta perspective

Dr. Richard Lewanczuk
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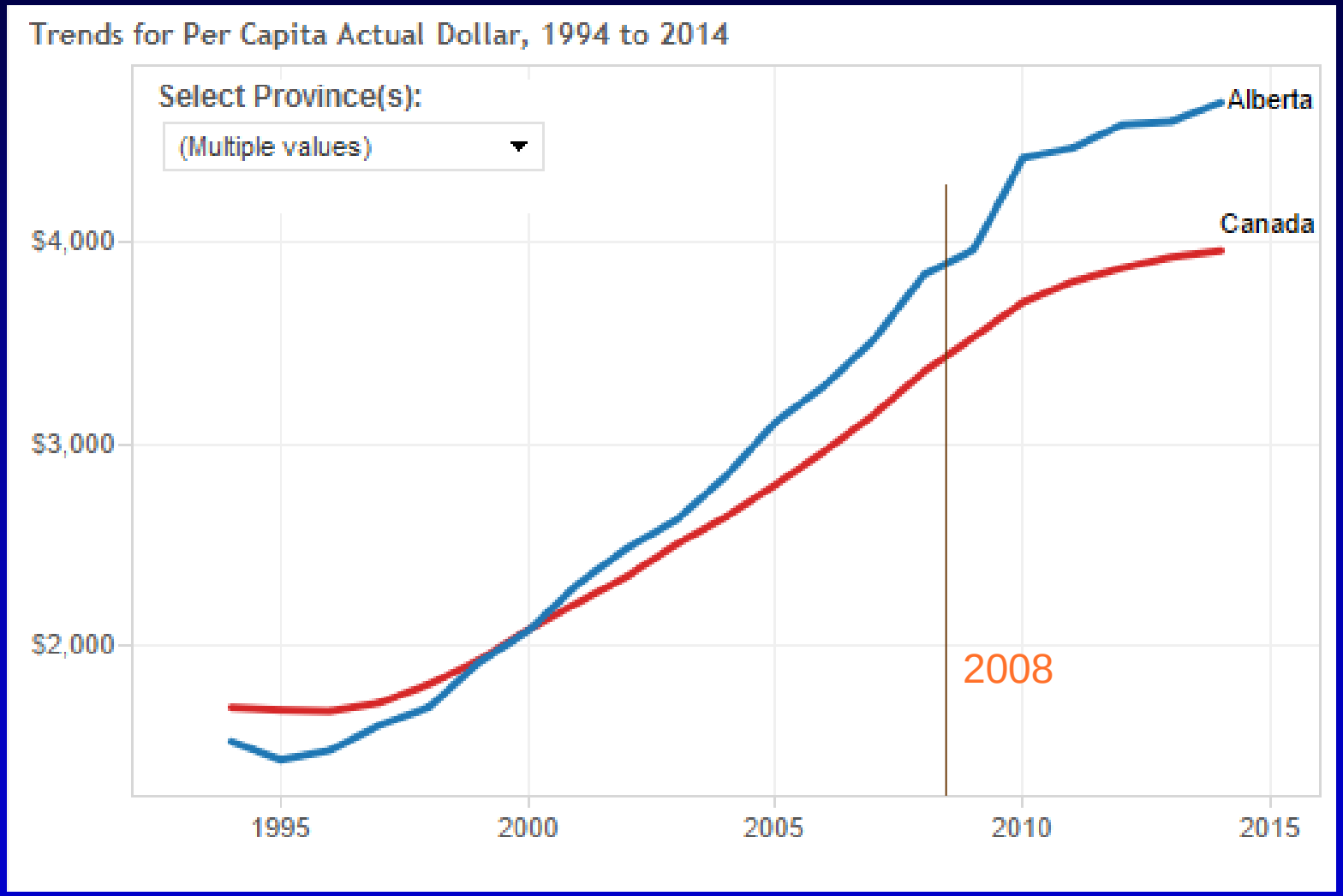
Primary Health Care
Alberta Health Services


Mystery

Per capita health spending

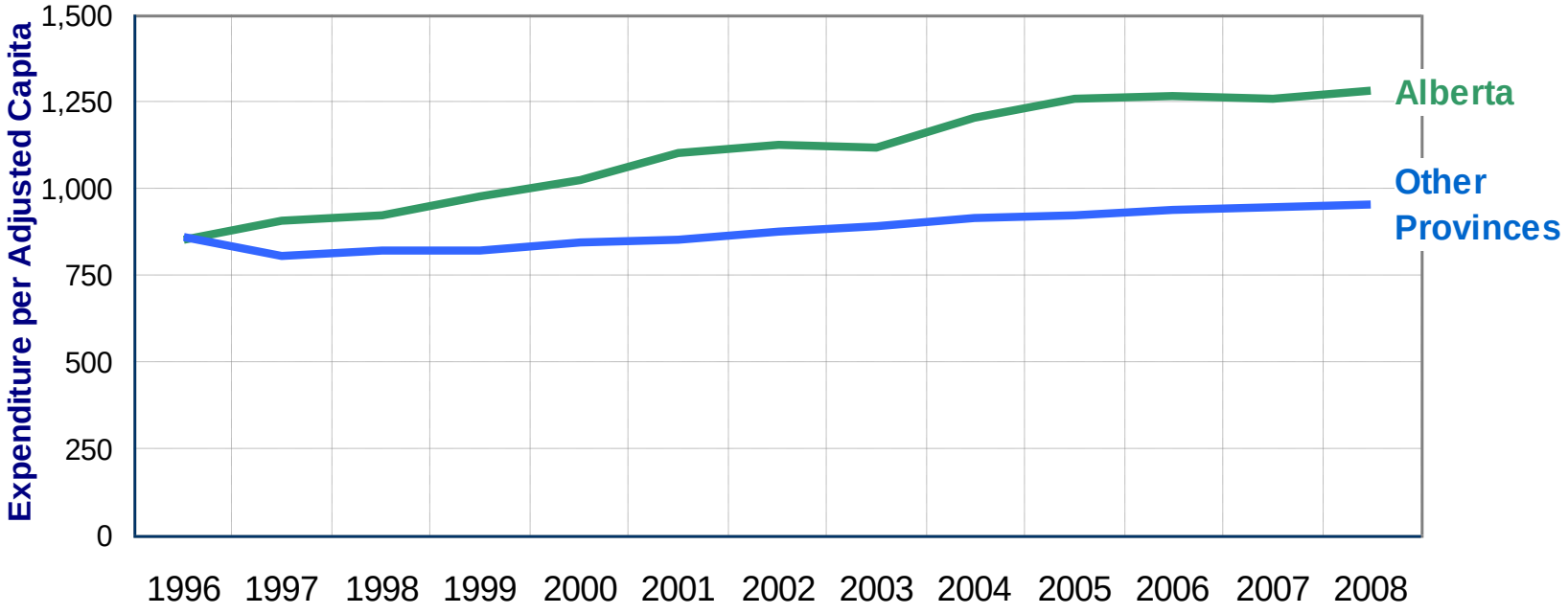


http://www.health.alberta.ca/health-info/macro-health-data-dashboard.html

Alberta spent 25% faster on Hospitals over the period than Other Provinces

Provincial Government Constant (2002)[1] Expenditure[2] on Hospitals

*per **Adjusted**[3] Capita, by **Jurisidiction, 1996** to **2008***

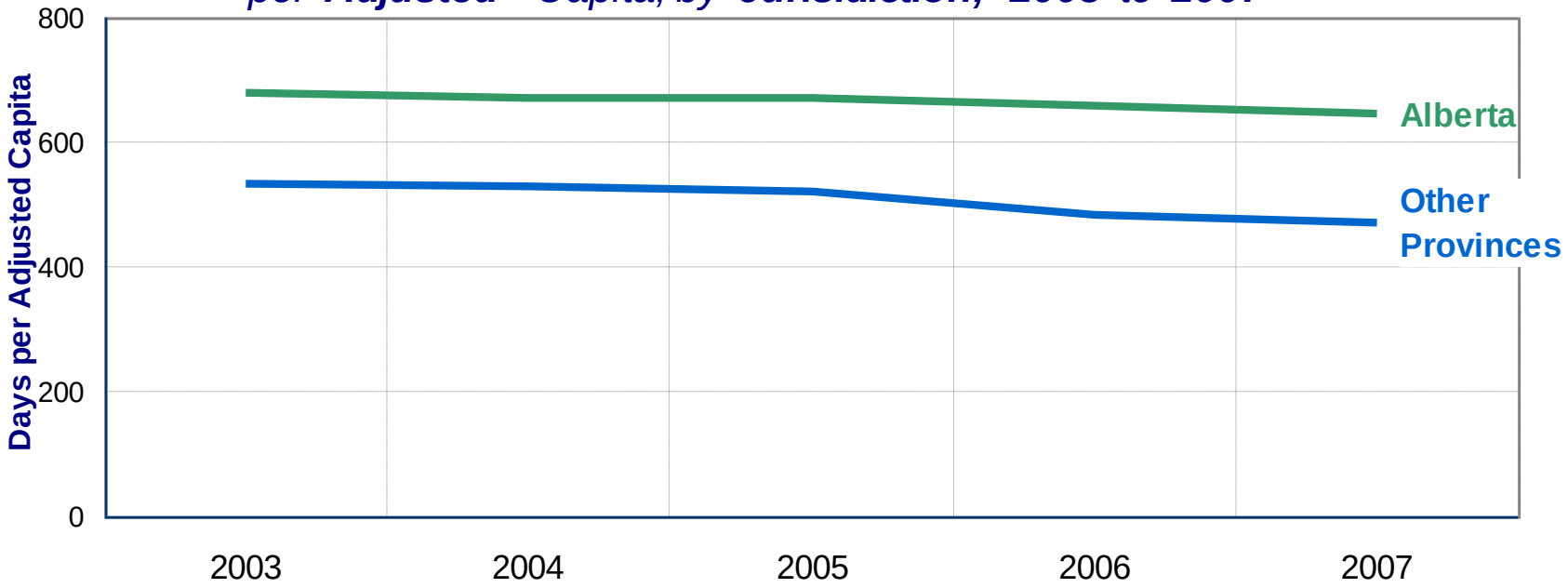


[1] *Source: Statistics Canada, CANSIM, table 326-0021 and Catalogue nos. 62-001-X and 62-010-X.*
[2] *Source: Canadian Institute for Health Information, National Health Expenditure Trends, 1975 – 2008 (Ottawa, Ont.: CIHI, 2008).*
[3] *Adjusted Population is Weighted by All-Sector Expenditure by Age and Gender (2007/2008 Population-Based Funding Weights for Alberta). Alberta's weights were applied across all provinces.*

Higher hospital expenditure is associated with greater utilization – more bed days

Acute Bed Days, All Cases (Typical and Non-Typical)[1]

*per **Adjusted**[2] Capita, by **Jurisidiction, 2003** to **2007***



[1] *Source: Canadian Institute for Health Information Portal. Extracted 08/28/2009. Parts of this material are based on data and information provided by the Canadian Institute for Health Information (CIHI). However, the analyses, conclusions, opinions and statements expressed herein are those of the author, and not necessarily those of the Canadian Institute for Health Information.*

[2] *Adjusted Population is Weighted by All-Sector Expenditure by Age and Gender (2007/2008 Population-Based Funding Weights for Alberta). Alberta's weights were applied across all provinces.*

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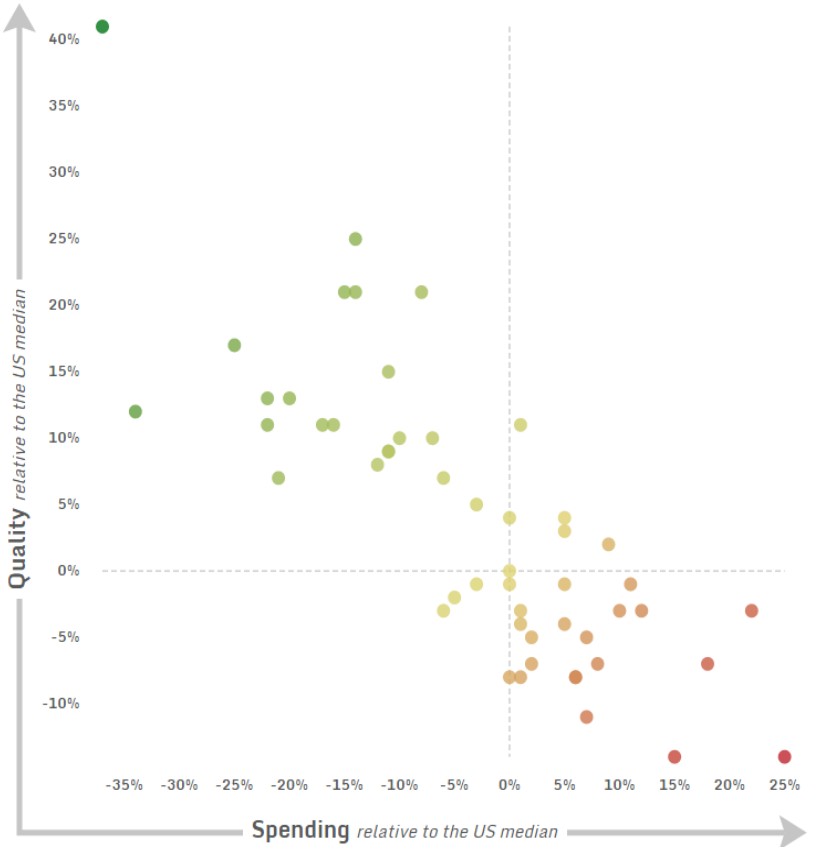
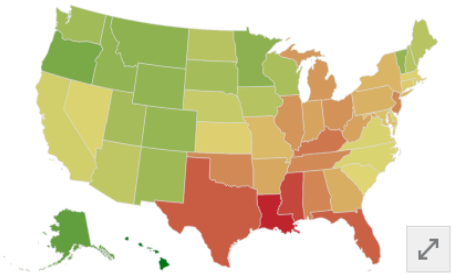
Total Medicare spending per capita vs. Overall quality score

View location type: States HRRs

better worse median





ENTER A LOCATION:

Search by zip code, state, or local area...

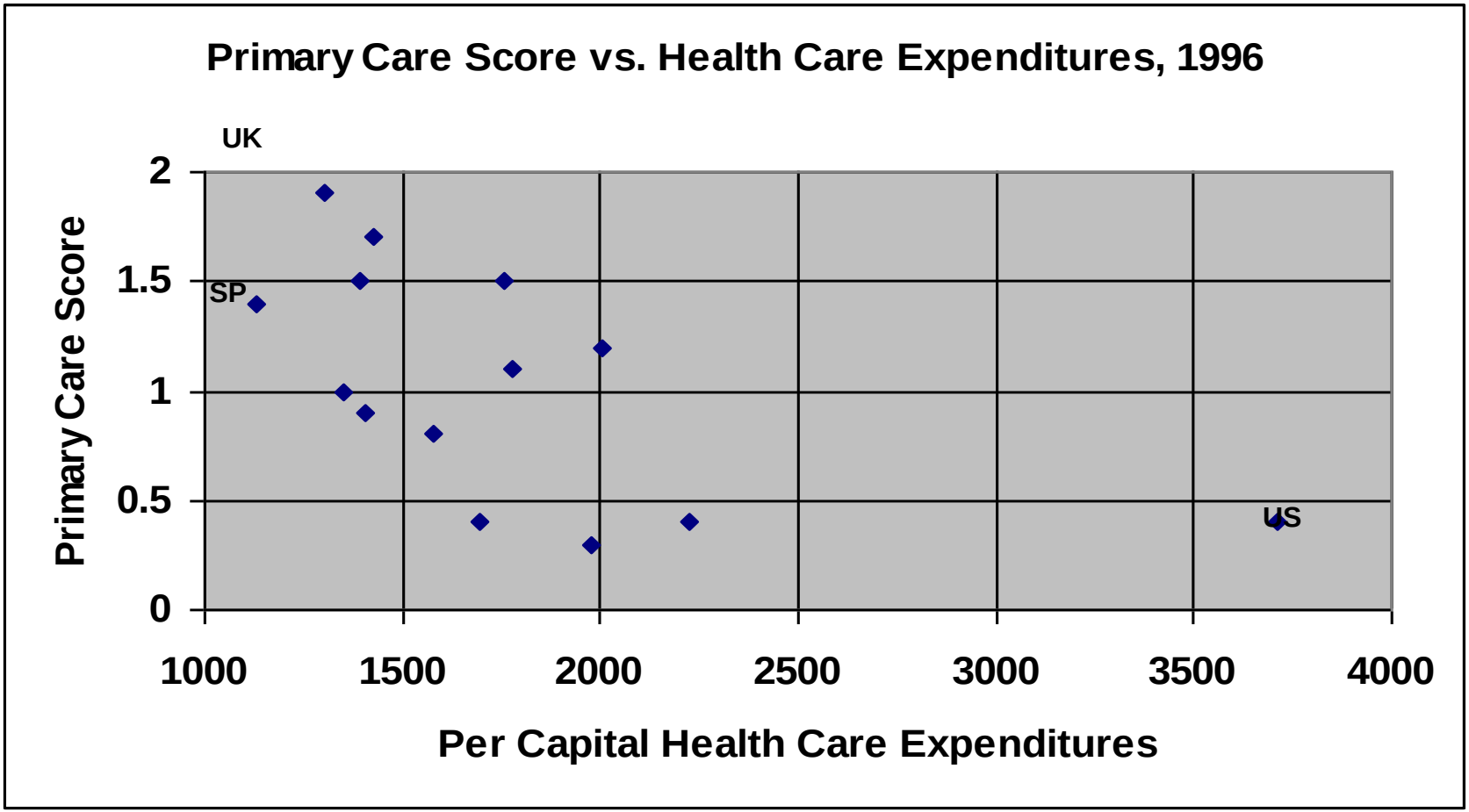
Therefore, if A=B, and B=C, then A=C

- Systems that spend the most have the poorest outcomes and quality
- Systems that spend the most do so by spending health care dollars on hospitals and acute care
- Therefore, spending on hospitals and acute care leads to the poorest outcomes, poorest quality and highest costs ?

Hypothesis

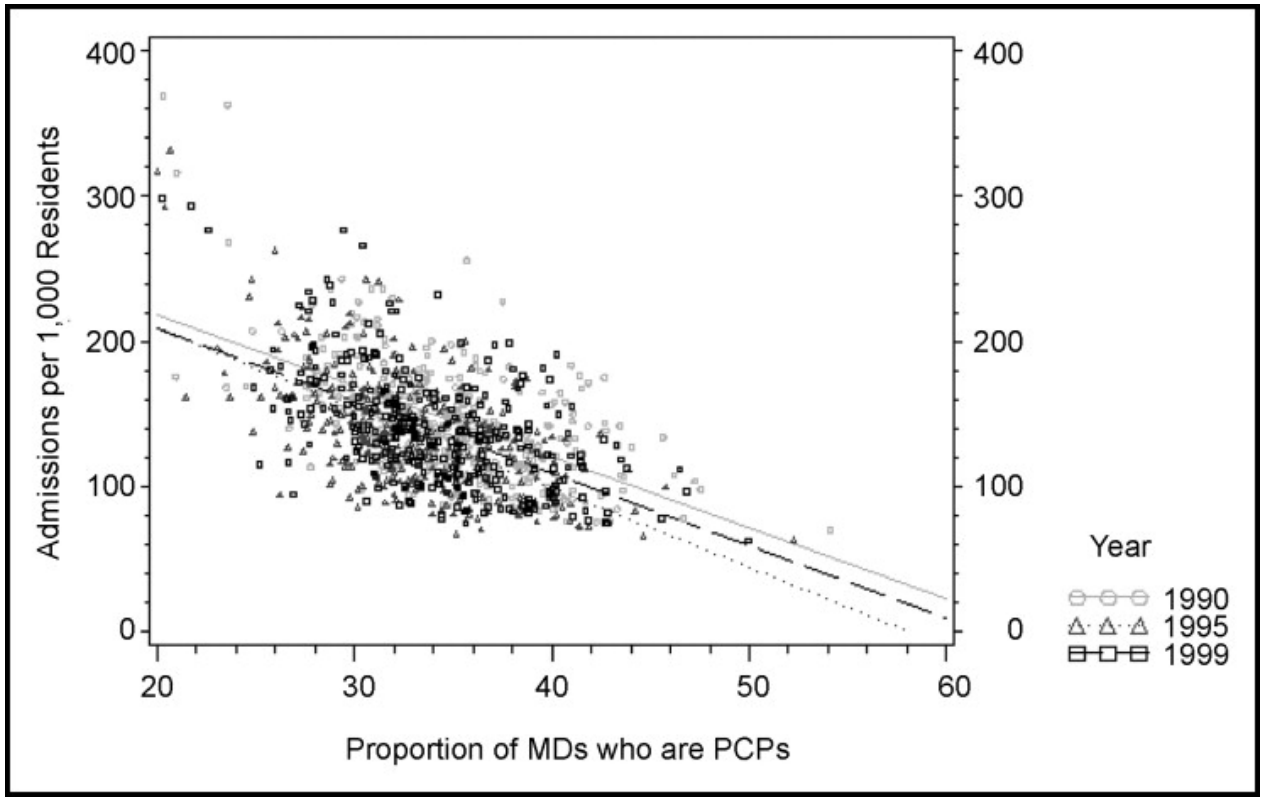
If we spend more on primary and community care will we have lower costs, better outcomes and higher quality?

Alberta Health Services



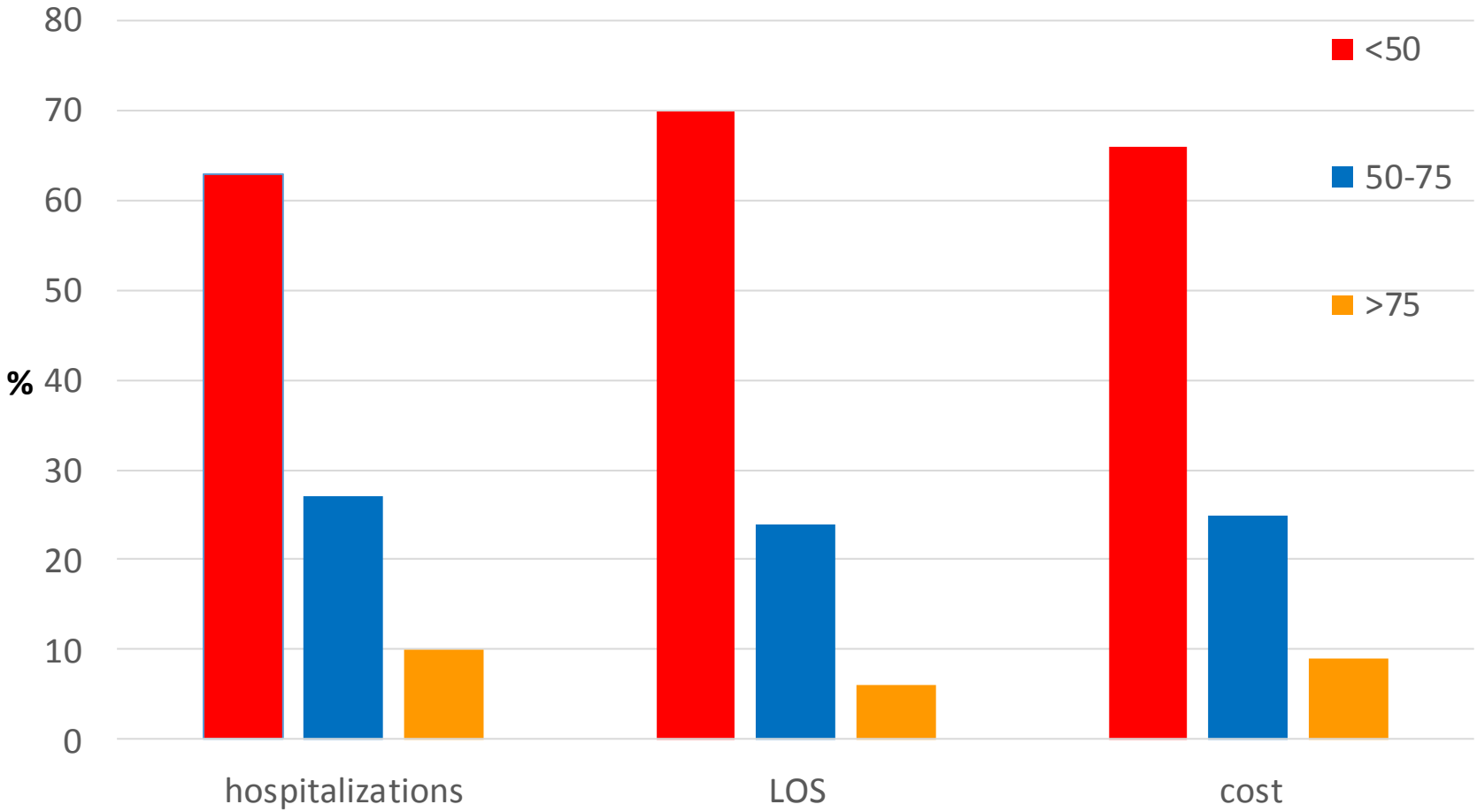
Primary Care Score: 2 = Stronger
From Barbara Starfield, MD

Utilization and Primary Care



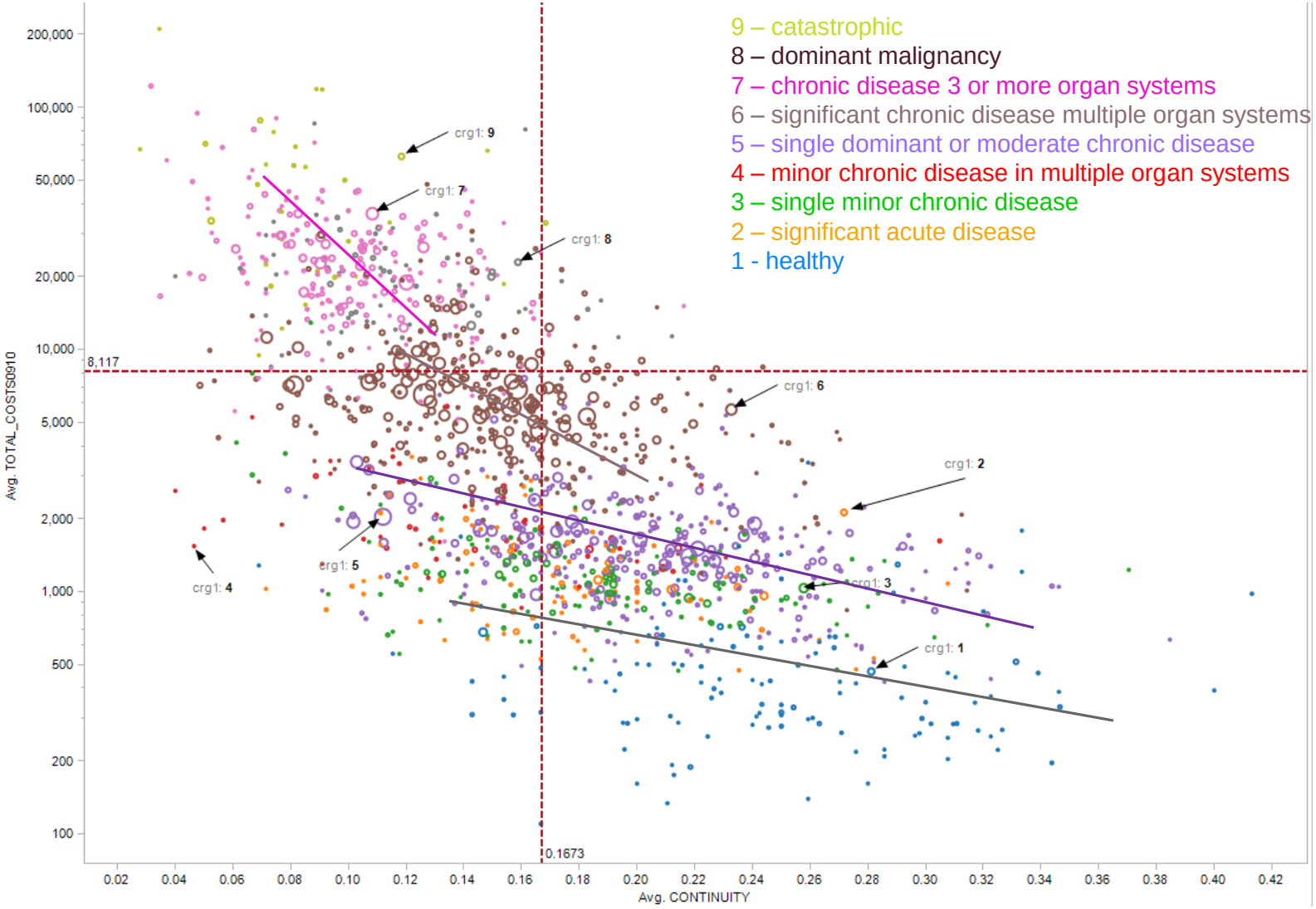
Kravet et al, Am J Med 121:142, 2008

Utilization by attachment to a family doctor (in the top 5%)

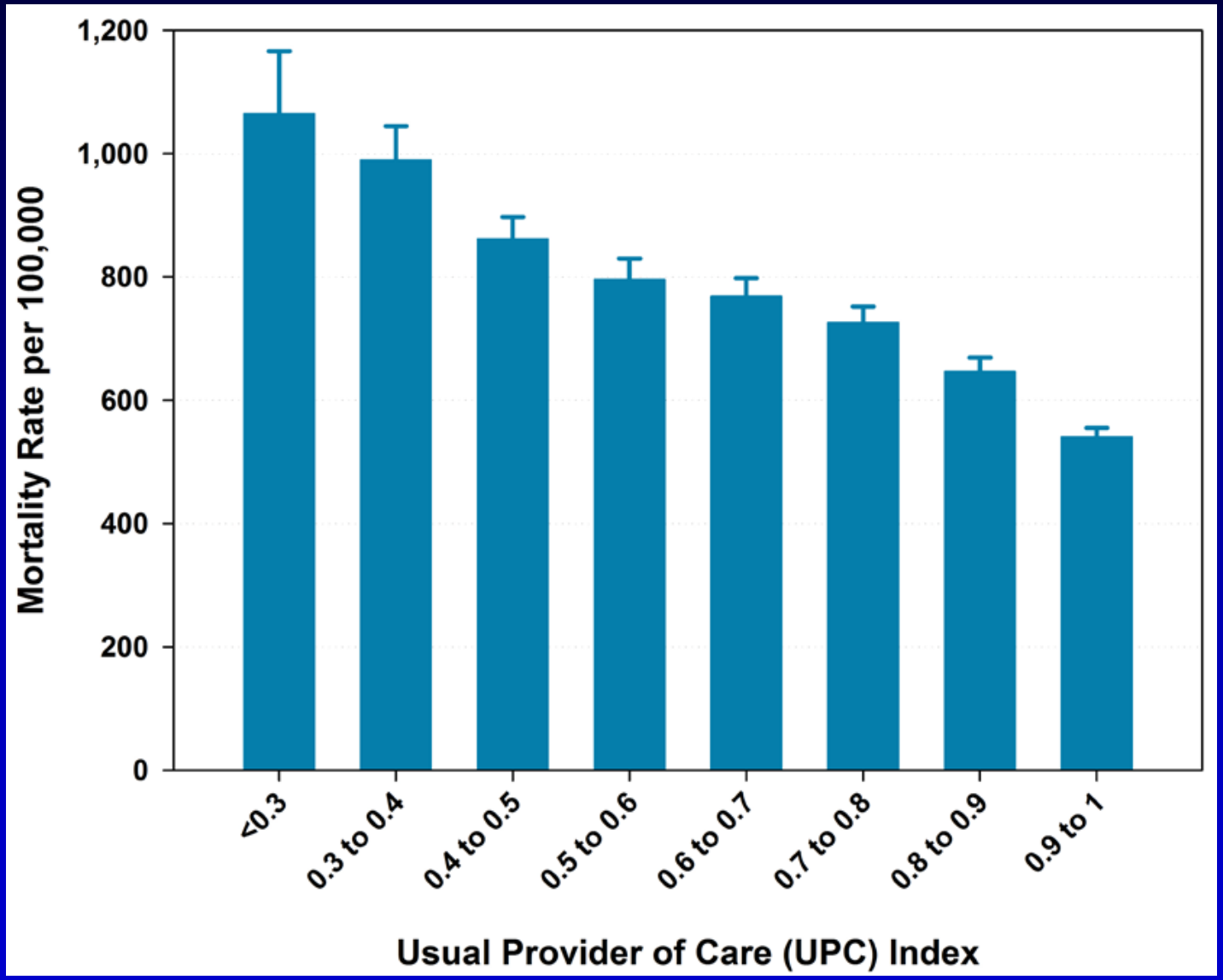


Work in progress, Interdisciplinary Chronic Disease Collaborative – courtesy of Dr. Paul Ronksley

Continuity vs cost by CRG



Mortality by continuity of care

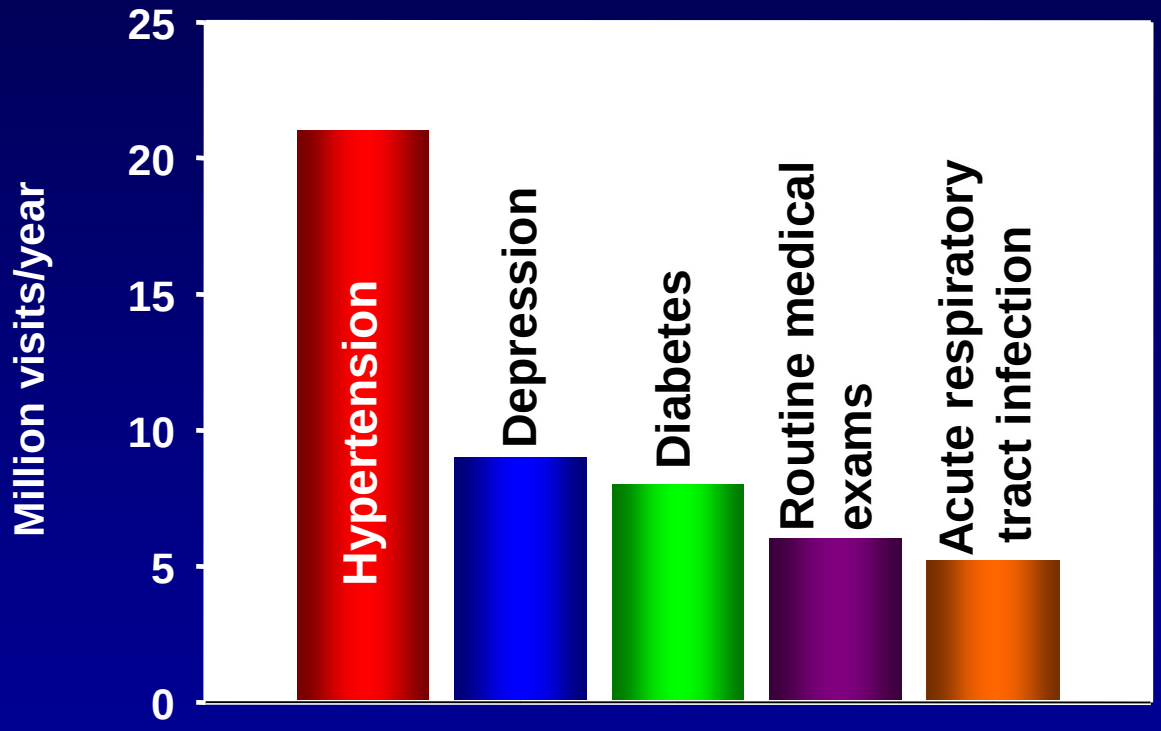


End of Chapter 1

Top diseases by cost in Alberta

1. Hypertension
2. Diabetes
3. Depression
4. Asthma
5. Dyslipidemia
6. Coronary artery disease

Leading diagnoses resulting in visits to physician offices in Canada



Source: IMS HEALTH Canada 2002. http://www.imshealthcanada.com/

Top clinical states by cost

1. Chronic renal disease and dominant medical condition
2. Dominant and moderate chronic condition
3. Digestive malignancy
4. Diabetes and dominant medical condition
5. Chronic renal disease and 2 dominant conditions
6. Chronic renal disease and diabetes and dominant condition
7. Two moderate conditions
8. Dementia and moderate condition
9. Diabetes and moderate condition
10. COPD and dominant moderate condition

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Health care costs are driven by the common chronic diseases that are managed by primary care every day

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It therefore makes sense why health systems that invest in primary care have lower costs and better outcomes

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How are health care costs driven ?

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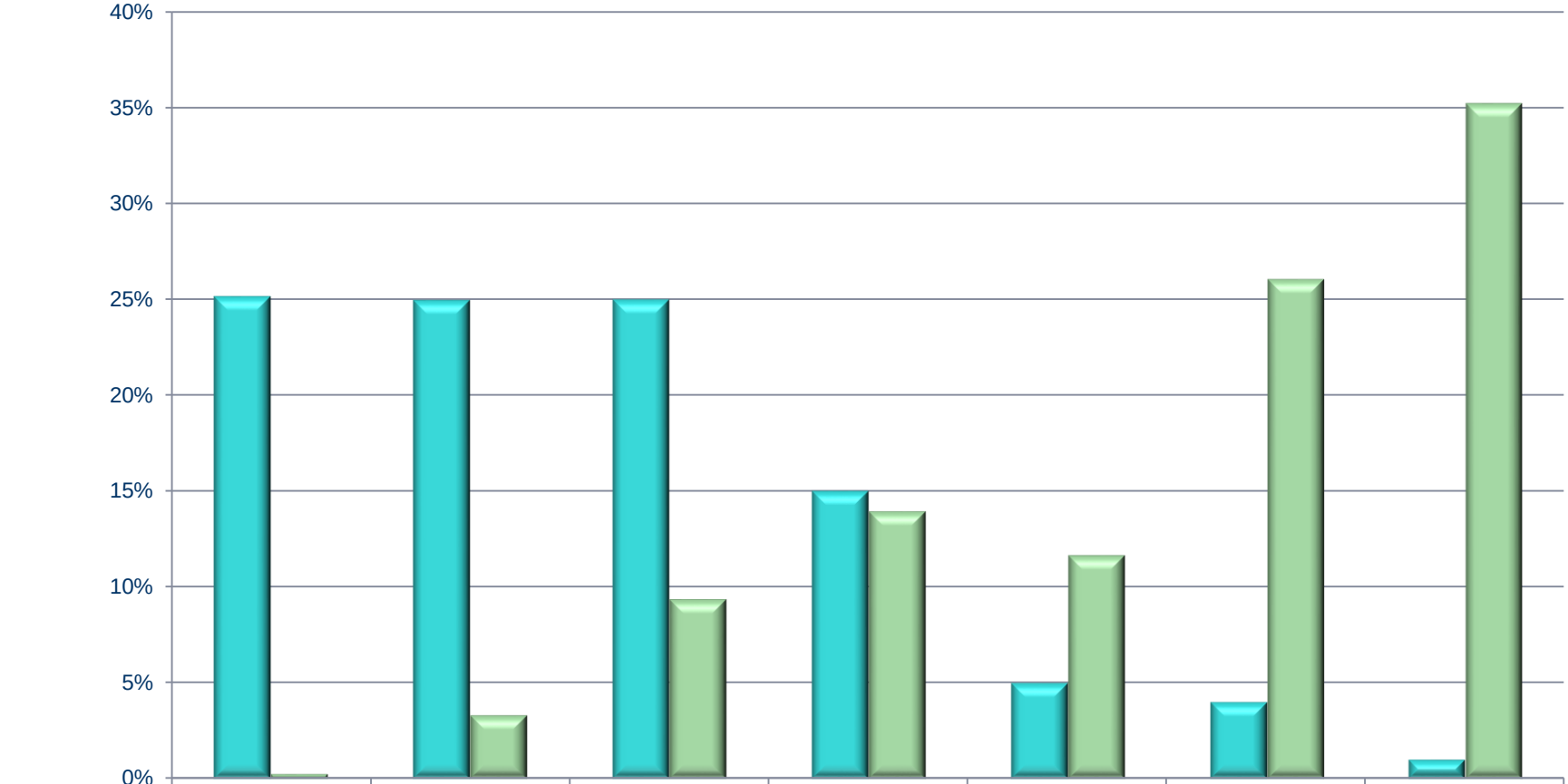
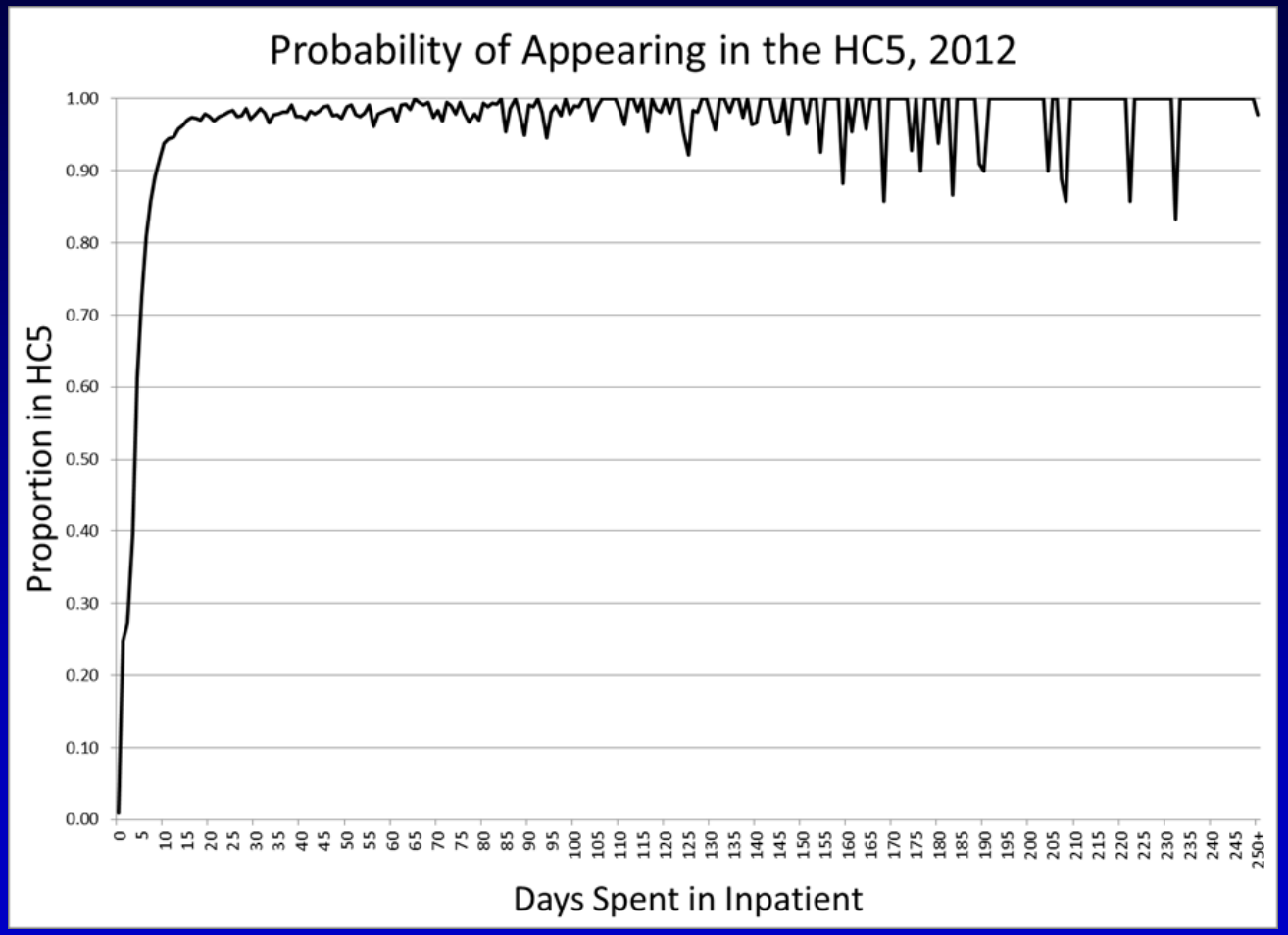
Alberta Population Proportions Versus Health Care Cost Proportions – 2009/10



	0-25th Cost Percentile ($10)	25-50th Cost Percentile ($131)	50-75th Cost Percentile ($369)	75-90th Cost Percentile ($911)	90-95th Cost Percentile ($2288)	95-99th Cost Percentile ($6367)	99-100th Cost Percentile ($34407)
% Of Population	25%	25%	25%	15%	5%	4%	1%
% Of Costs	0%	3%	9%	14%	12%	26%	35%

Notes: 1)Costs only include direct costs for inpatient, emergency, and urgent care and total physician costs for these same sectors and community primary care (approx. $3.7 billion). Costs in parantheses are average costs per person for the group.
2)Total population includes anyone active as of April 2010 or anyone who died within 2009/10.
3)Cost percentiles were: 90th=$1,511; 95th=$3,504; 99th=$13,977. In other words 5% of folks used $3,504 or more and consumed 61% of total reported costs.
Source: Strategic Analytics - DIMR - Alberta Health Services

Determinants of appearing in HC5



sex, age group, days spent in inpatient, death, number of previous years in the HC5, average rank in previous years, and the 6 Group A CACP chronic diseases included in model – on IP days had any significant bearing

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Keeping people out of hospital, is the single most important way of reducing health care costs

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Who are these people?

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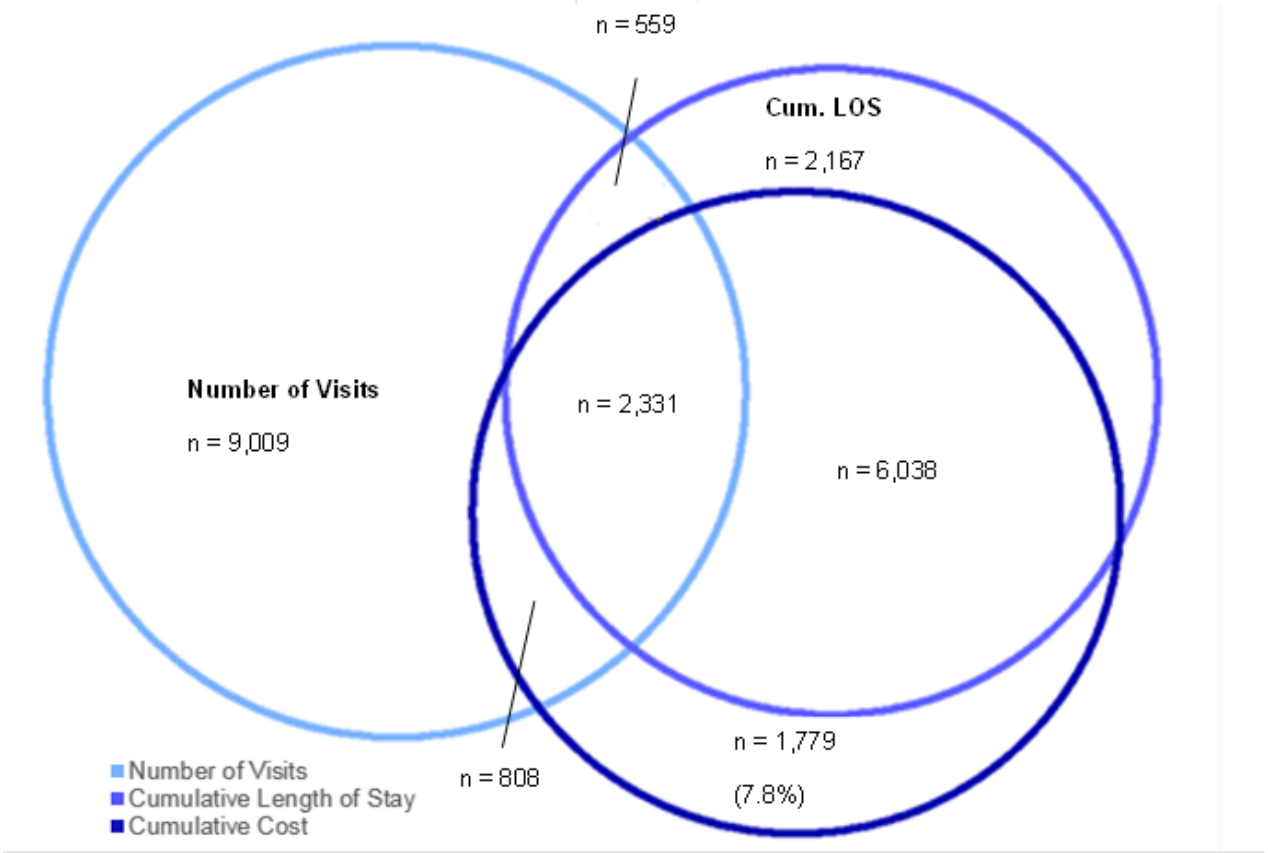
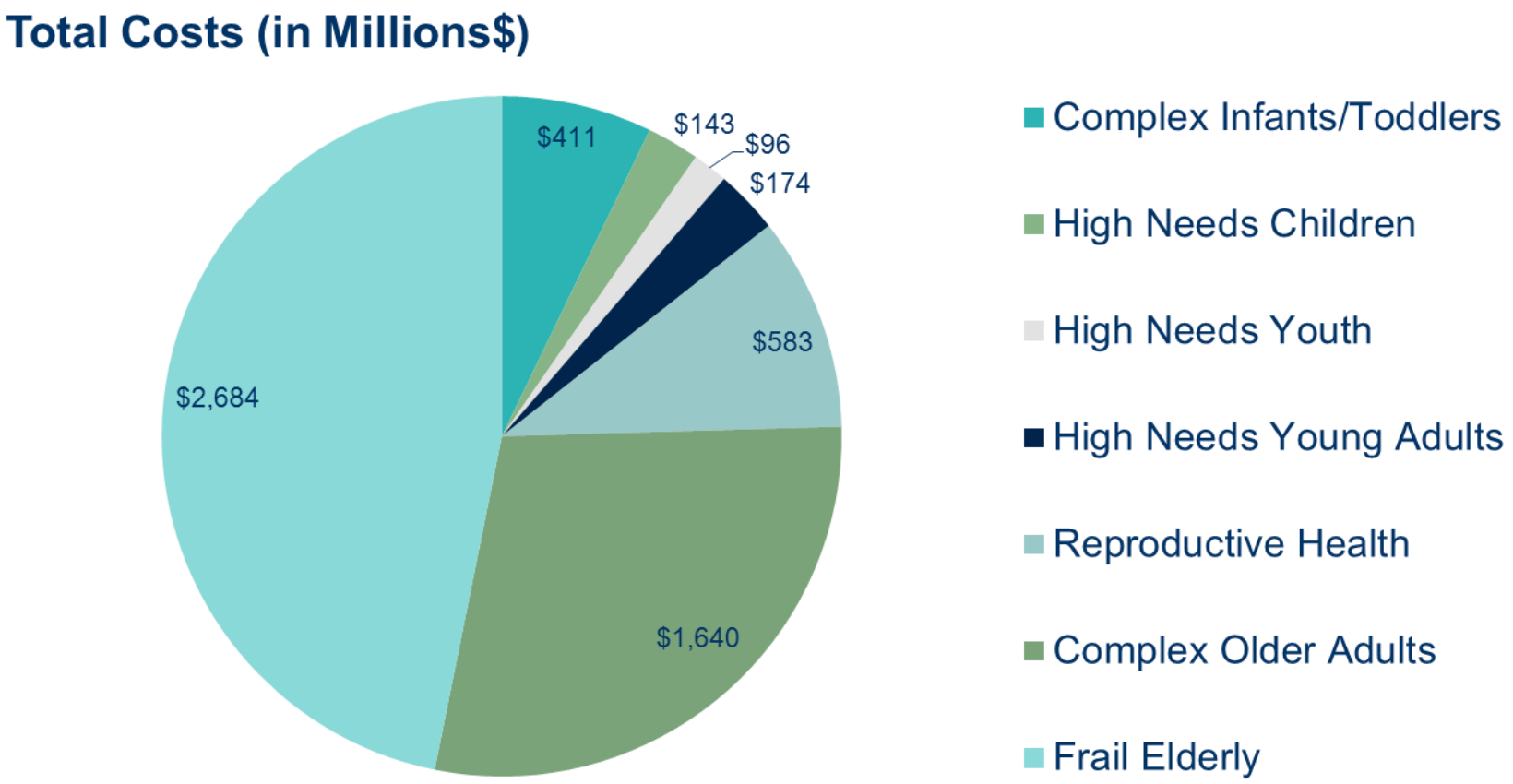
High users by 3 definitions: visits, LOS and cost



Work in progress, Interdisciplinary Chronic Disease Collaborative – courtesy of Dr. Paul Ronksley

Complex High Needs Patients - Financial Impact



Frail Elderly Clinical Profile (Partial)

Hypertension	72.5%
Acute Musculoskeletal Diagnosis	39.3%
Acute Respiratory Diseases/COPD	33.7% / 22.6%
Osteoarthritis	31.8%
Diabetes	28.5%
Congestive Heart Failure	20.8%
Neuromuscular/Neurological Diagnoses	20.7%
Depressive and/or Other Psychoses	20.2%
Average IP days	20.6

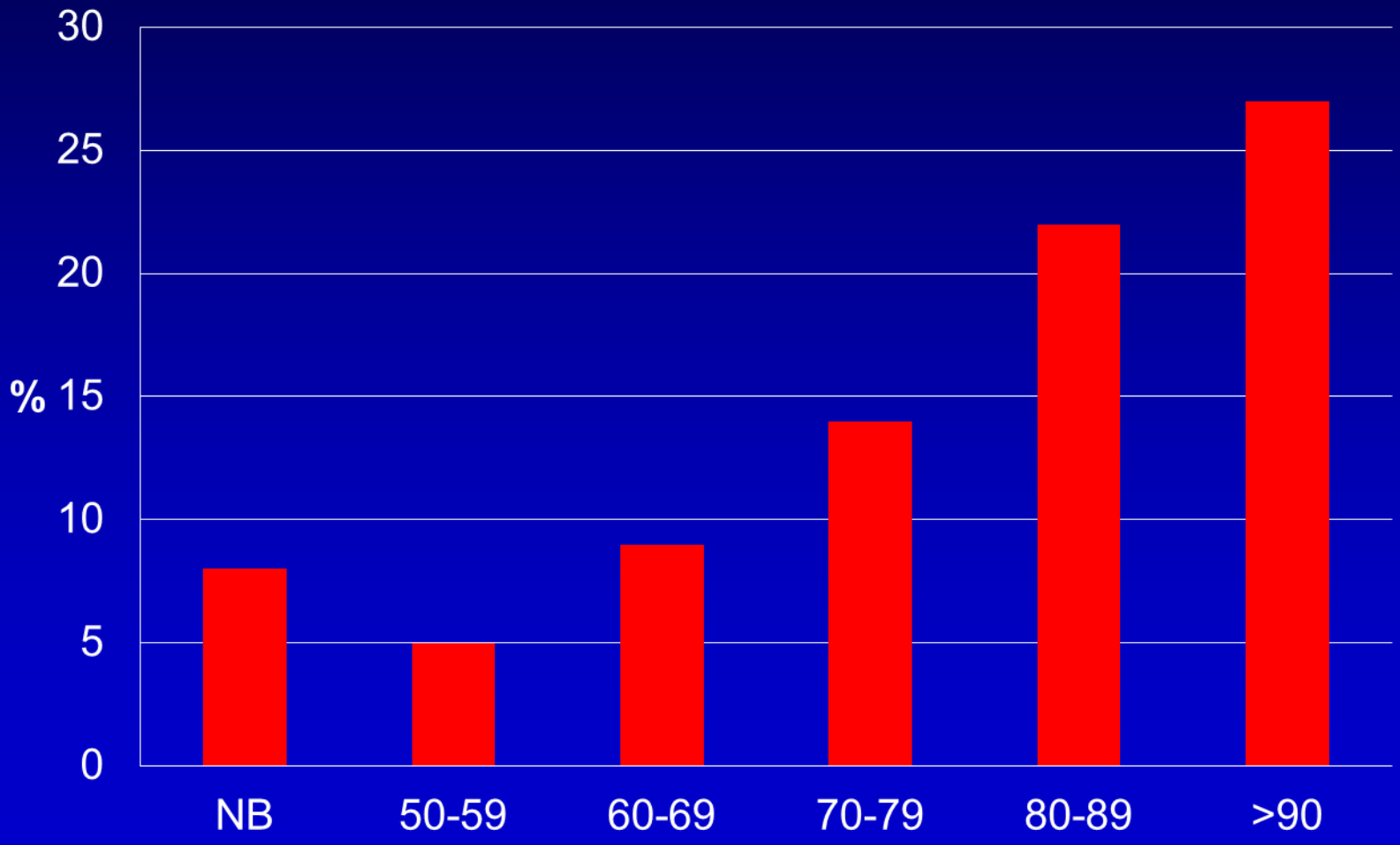
Note: Data shows averages based on physician visit billing

Complex Older Adults Clinical Profile (Partial)

Chronic diseases in 2+ Organ Systems	46.3%
Hypertension	37.6%
Depressive and/or other Psychoses	27.9%
Acute Joint and/or MSK Diagnoses	18.5%
Hyperlipidemia	14.1%
Acute Cardiovascular Disorders	11.9%
Acute Myocardial Infarctions	7.0%
Average IP Days	10.9

Note: Data shows averages based on physician visit billing

Composition of “top 5%” by age



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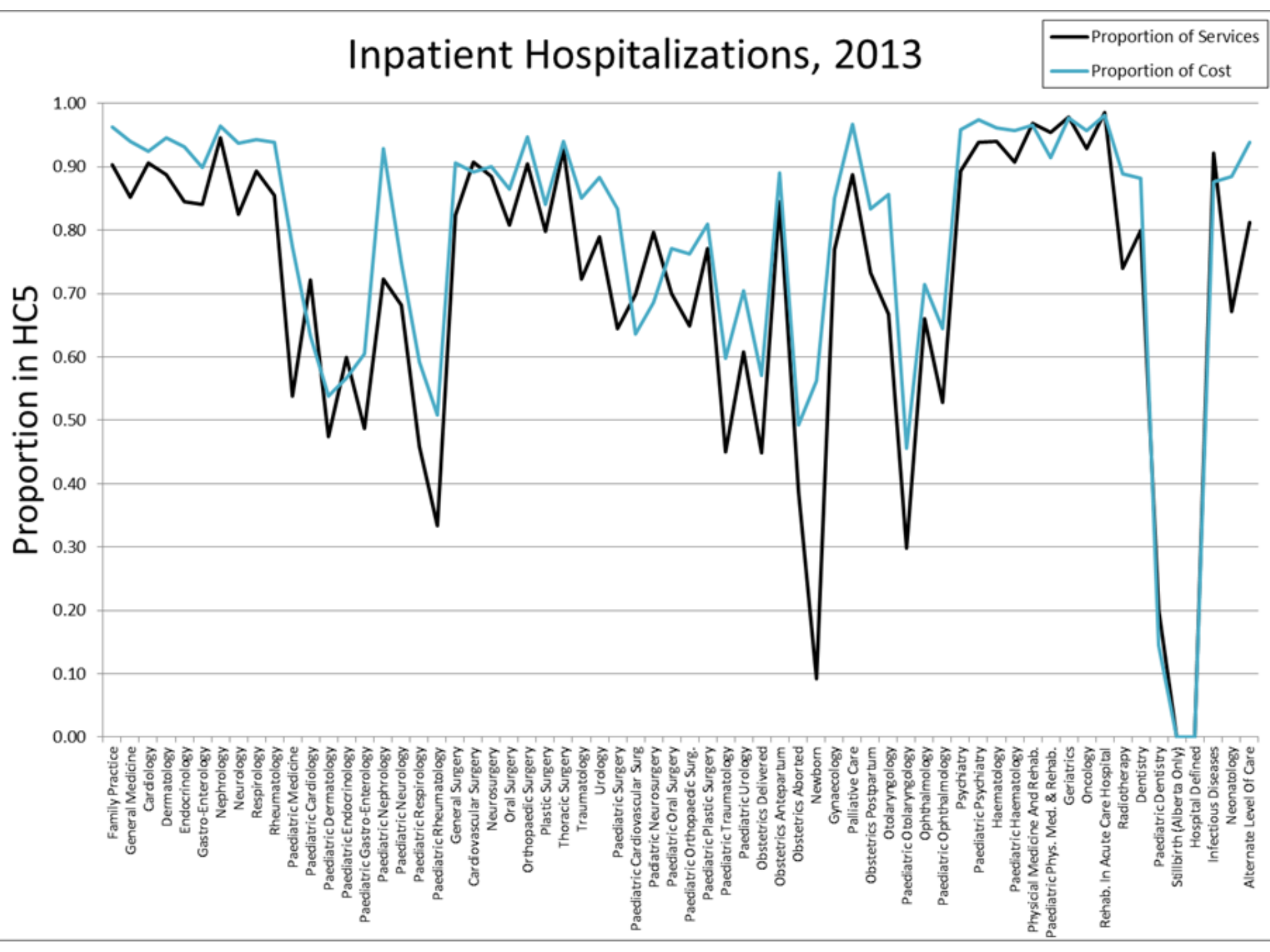
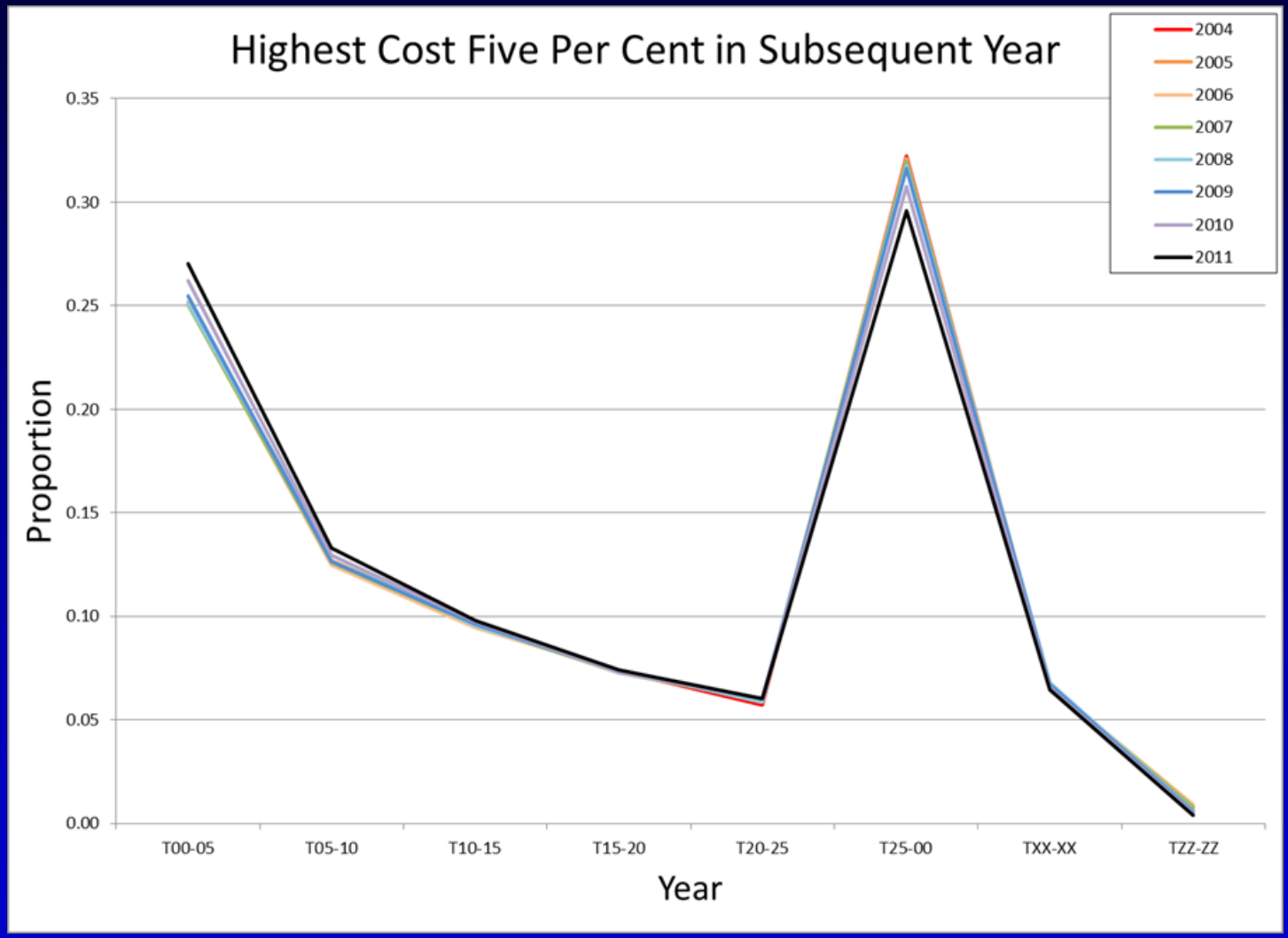
Why are they being admitted into hospital?

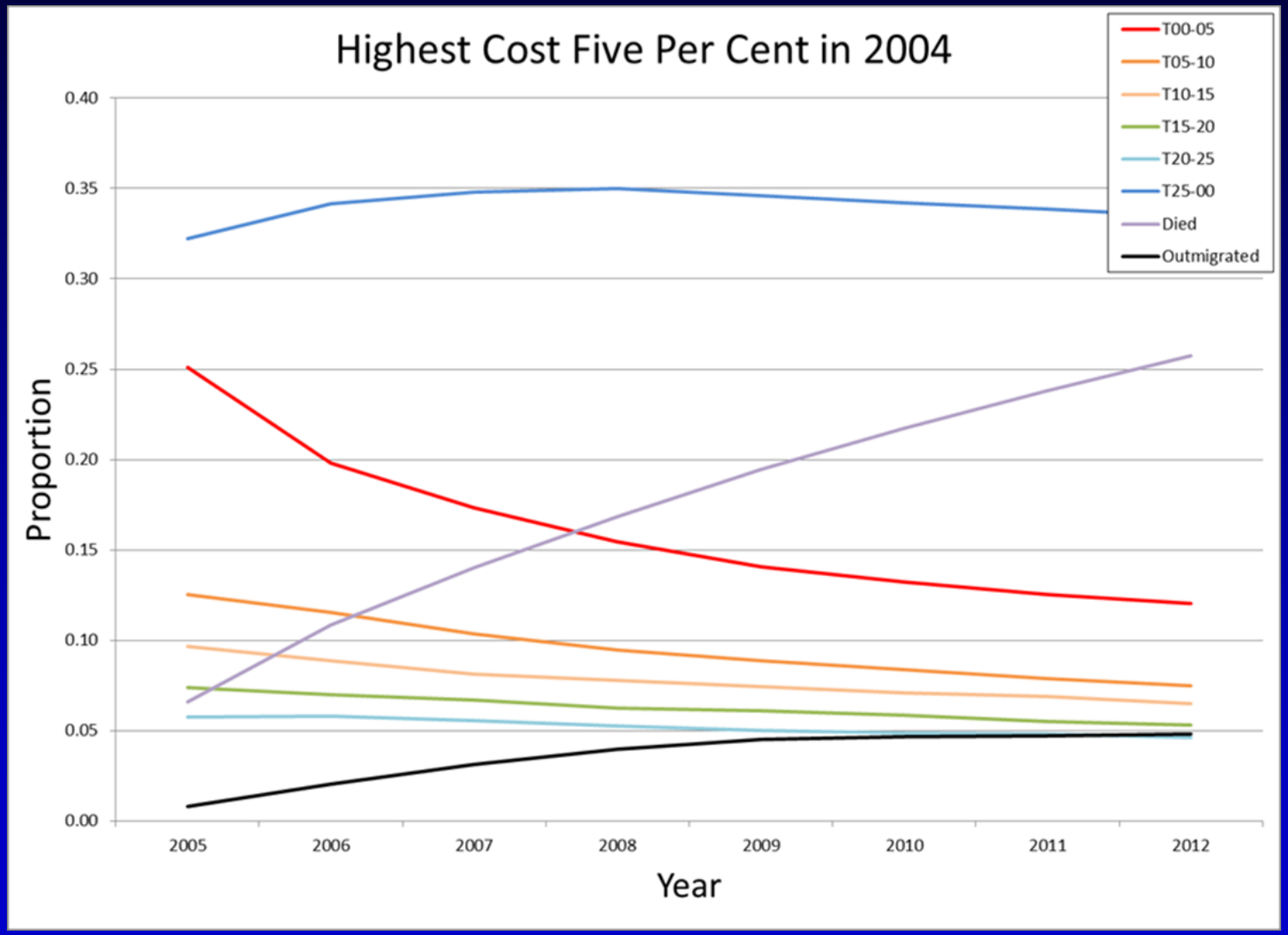

Inpatient Hospitalizations, 2013
Proportion of Services
Proportion of Cost
Proportion in HC5
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Family Practice
General Medicine
Cardiology
Dermatology
Endocrinology
Gastro-Enterology
Nephrology
Neurology
Respirology
Rheumatology
Paediatric Medicine
Paediatric Cardiology
Paediatric Dermatology
Paediatric Endocrinology
Paediatric Gastro-Enterology
Paediatric Nephrology
Paediatric Neurology
Paediatric Respirology
Paediatric Rheumatology
General Surgery
Cardiovascular Surgery
Neurosurgery
Oral Surgery
Orthopaedic Surgery
Plastic Surgery
Thoracic Surgery
Traumatology
Urology
Paediatric Surgery
Paediatric Cardiovascular Surg
Padiatric Neurosurgery
Paediatric Oral Surgery
Paediatric Orthopaedic Surg.
Paediatric Plastic Surgery
Paediatric Traumatology
Paediatric Urology
Obstetrics Delivered
Obstetrics Antepartum
Obstetrics Aborted
Newborn
Gynaecology
Palliative Care
Obstetrics Postpartum
Otolaryngology
Paediatric Otolaryngology
Ophthalmology
Paediatric Ophthalmology
Psychiatry
Paediatric Psychiatry
Haematology
Paediatric Haematology
Physicial Medicine And Rehab.
Paediatric Phys. Med. & Rehab.
Geriatrics
Oncology
Rehab. In Acute Care Hospital
Radiotherapy
Dentistry
Paediatric Dentistry
Stillbirth (Alberta Only)
Hospital Defined
Infectious Diseases
Neonatology
Alternate Level Of Care

Outcome of top 5% from 2003-2010



Courtesy of Michael Sanderson, Alberta Health, 2015

Longitudinal outcome of top 5%



Courtesy of Michael Sanderson, Alberta Health, 2015

Disposition

Outcome	Visits		LOS		Cost	
	Non-high	High	Non-high	High	Non-high	High
	206,399	12,707	208,001	11,095	208,149	10,956
	n(%)	n(%)	n(%)	n(%)	n(%)	n(%)
Discharge Disposition of last encounter						
Transferred to another facility providing inpatient hospital care	2095 (1)	288 (2.3)	2012 (1)	371 (3.3)	1931 (0.9)	452 (4.1)
Transferred to long term care facility	6343 (3.1)	752 (5.9)	4557 (2.2)	2538 (22.9)	5122 (2.5)	1973 (18)
Transferred to other	984 (0.5)	144 (1.1)	938 (0.5)	190 (1.7)	971 (0.5)	157 (1.4)
Discharged to a home setting with support services	16512 (8)	1928 (15.2)	15794 (7.6)	2646 (23.8)	16016 (7.7)	2424 (22.1)
Discharged home	169651 (82.2)	7651 (60.2)	173971 (83.6)	3331 (30)	173783 (83.5)	3519 (32.1)
Signed out/ Did not return	2199 (1.1)	270 (2.1)	2276 (1.1)	193 (1.7)	2287 (1.1)	182 (1.6)
Died	8615 (4.2)	1674 (13.2)	8463 (4.1)	1826 (16.5)	8040 (3.9)	2249 (20.5)
Readmission within 30 days	11983 (5.8)	6150 (48.4)	15455 (7.4)	2678 (24.1)	15289 (7.3)	2844 (26)

Facts about the “top 5%”

- 78% of Albertans in the “top 5%” were not there the year before – the top 5 % does not represent “frequent flyers”
- Only 11% of “top 5%” have been there 3 or more years
- 15% of the “top 5%” costs are related to end-of-life
- In a 7 year period, 20% of Albertans will be in the “top 5%”
- >50% of Albertans will be in the “top 5%” sometime in their lives

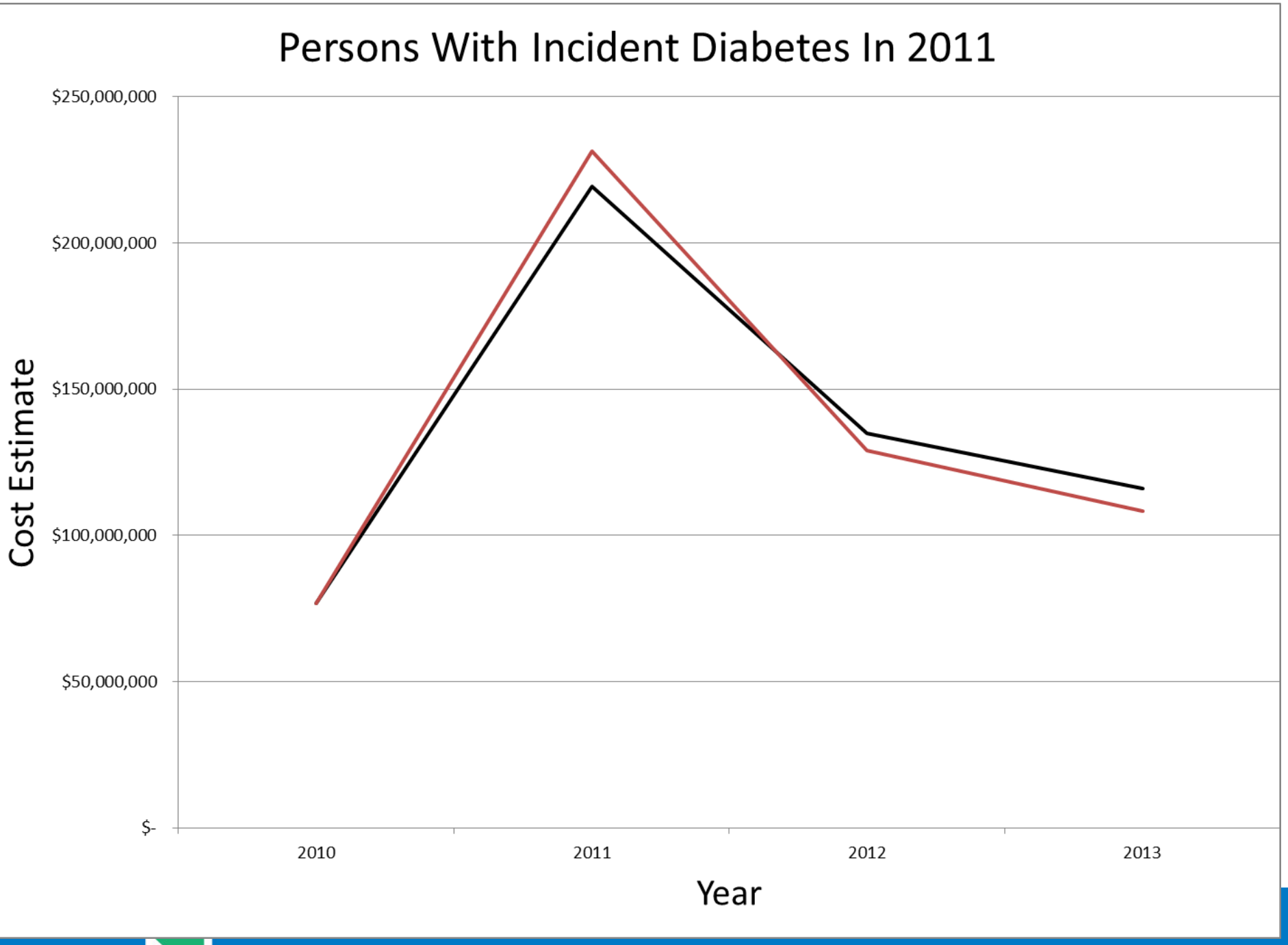
Who ends up in hospital for more than 14 days ?

Alberta hospitalizations

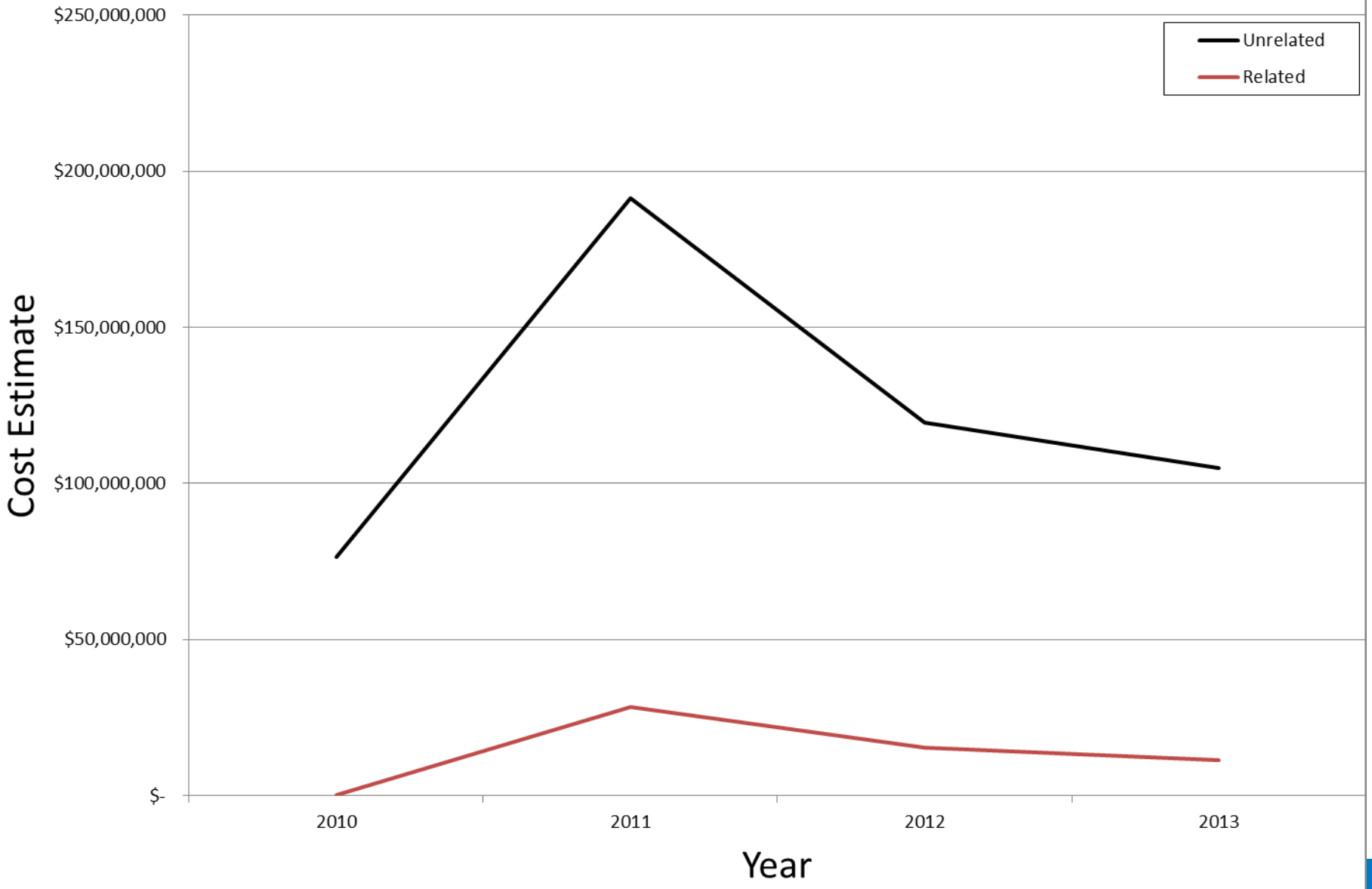
		n	%
1	Giving birth	50,822	15.2
2	Respiratory disease (COPD)	7,995	2.4
3	Convalescence, typically following treatments/procedures	6,392	1.9
4	Heart attack	6,335	1.9
5	Pneumonia	5,738	1.7
6	Gonarthrosis (arthrosis of knee)	5,711	1.7
7	Heart failure	5,303	1.6
8	Other medical care (e.g., palliative care, chemotherapy)	4,563	1.4
9	Fracture of lower leg, including ankle	4,323	1.3
10	Acute appendicitis	4,194	1.3

	Age group			
	18-64		65+	
	Most responsible diagnosis	n (%)	Most responsible diagnosis	n (%)
1	Paranoid schizophrenia	157 (4.14)	Congestive heart failure	275 (3.77)
2	Schizophrenia, unspecified	148 (3.9)	Unspecified dementia	234 (3.2)
3	Unspecified nonorganic psychosis	116 (3.06)	Intertrochanteric fracture, closed	186 (2.55)
4	Care involving use of rehabilitation procedure, unspecified	86 (2.27)	Care involving use of other rehabilitation procedures	170 (2.33)
5	Schizoaffective disorder, unspecified	77 (2.03)	Other physical therapy	159 (2.18)
6	Severe depressive episode without psychotic symptoms	69 (1.82)	Delirium superimposed on dementia	145 (1.99)
7	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries	51 (1.35)	Chronic obstructive pulmonary disease with acute lower respiratory infection	143 (1.96)
8	Schizoaffective disorder, mixed type	44 (1.16)	Cerebral infarction due to unspecified occlusion or stenosis of cerebral arteries	142 (1.94)
9	Congestive heart failure	37 (0.98)	Alzheimer's disease, unspecified	132 (1.81)
10	Care involving use of other rehabilitation procedures	37 (0.98)	Urinary tract infection, site not specified	132 (1.81)

cost

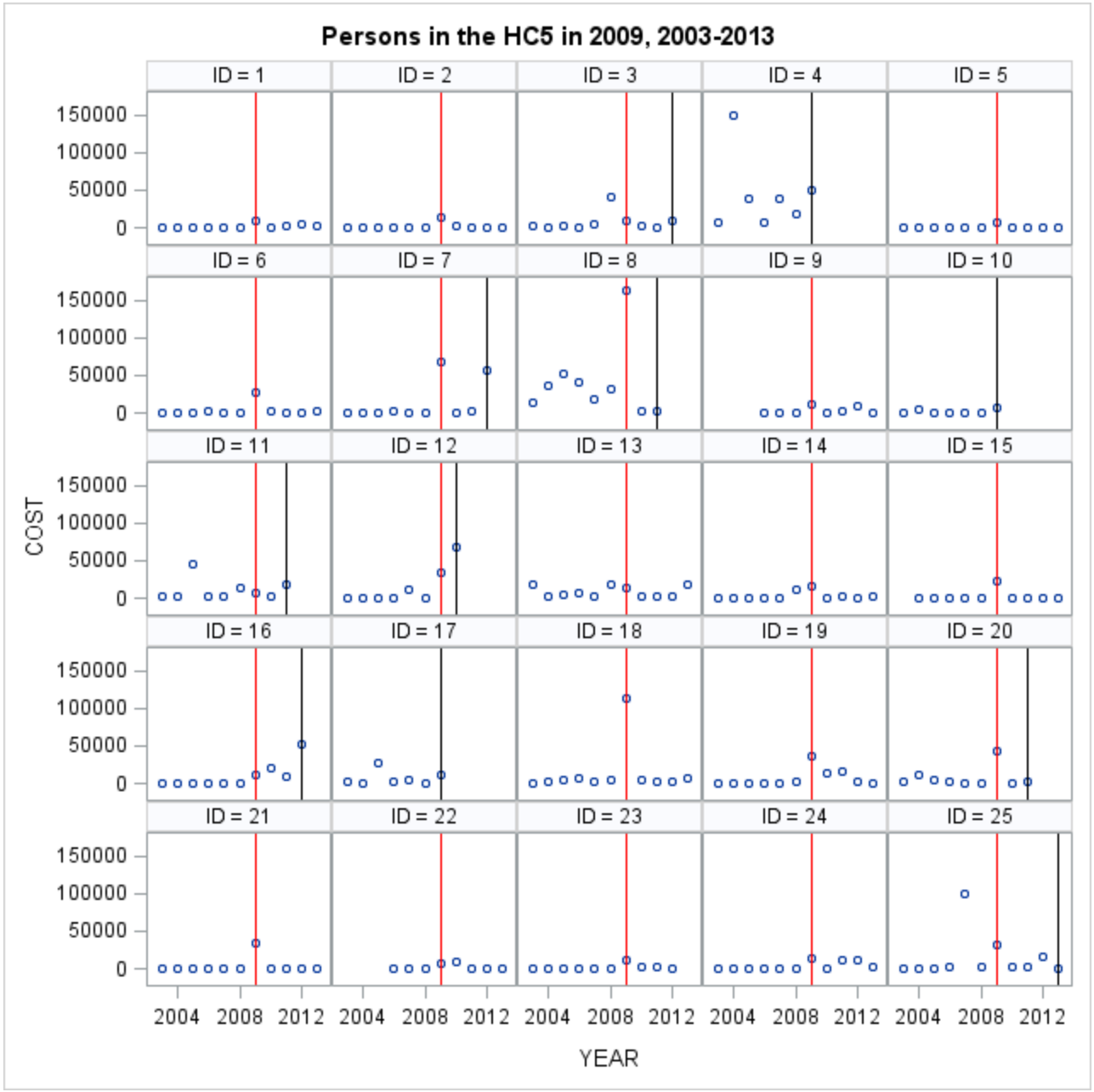

Persons With Incident Diabetes In 2011
$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$-
Cost Estimate
2010
2011
2012
2013
Year

Persons With Incident Diabetes In 2011

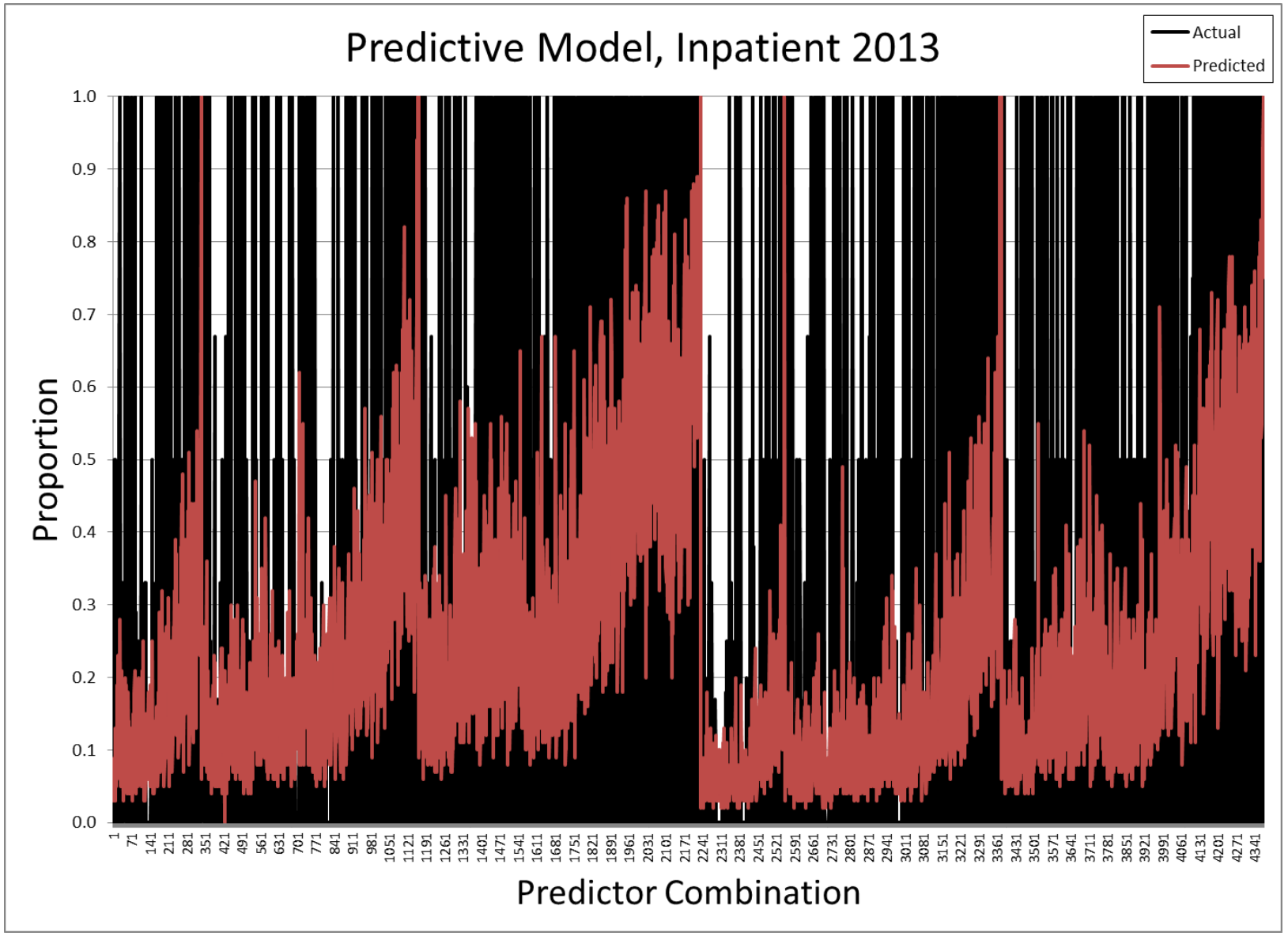


Commonest reason for hospital admission for heart failure

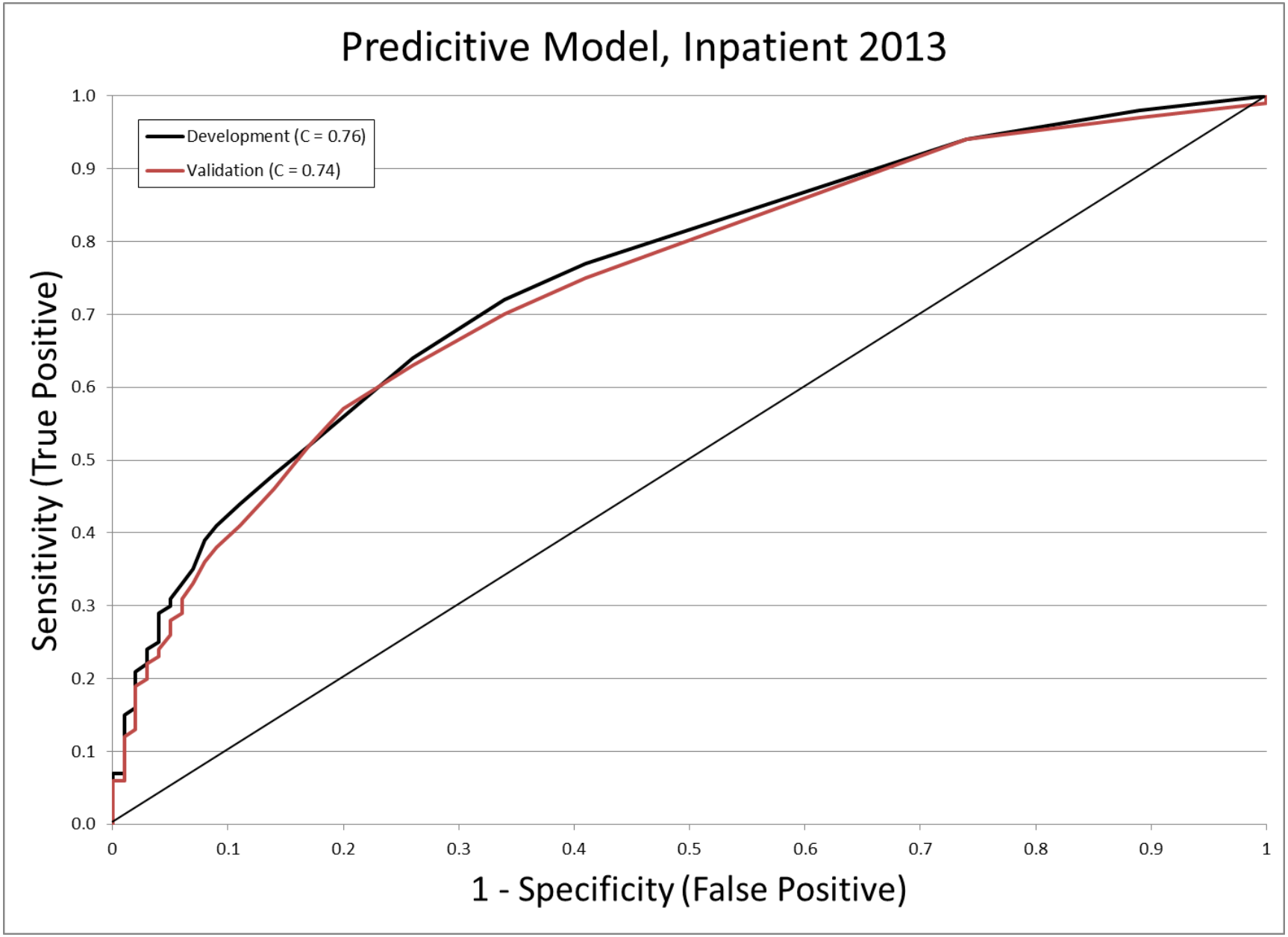
1. urinary incontinence
2. falls
3. care-giver not able to cope



Michael Sanderson, Alberta Health 2016



Michael Sanderson, Alberta Health 2016



Michael Sanderson, Alberta Health 2016

Highest Cost Persons in the Health Care System

Lo-Fi Predictive Modeling

- The overall probability of an inpatient hospitalization in 2013 was 6 per cent in the sample of 10,000.
- Of the 629 that were inpatient in 2013, the model assigned 372 (59 per cent) a higher probability.
- Of the 9371 that were not inpatient in 2013, the model assigned 7317 (78 per cent) a lower probability.

Predictors of high utilization

- Decreased mobility (SF-12, EQ5-D, mobility measures)
- Decreased social contacts (SF-12, other)
- Decreased social supports
- Decreased self-assessed health

Frailty - definitions

- Unable to function independently
  - Mild: help needed with complex functions (e.g. taxes, banking)
- Walking speed <0.8 m/sec
- Unable to cross the street in the length of a walk light

Alberta Home Care Clients

- 96% have an informal care-giver
- 44% of care-givers are showing signs of burnout

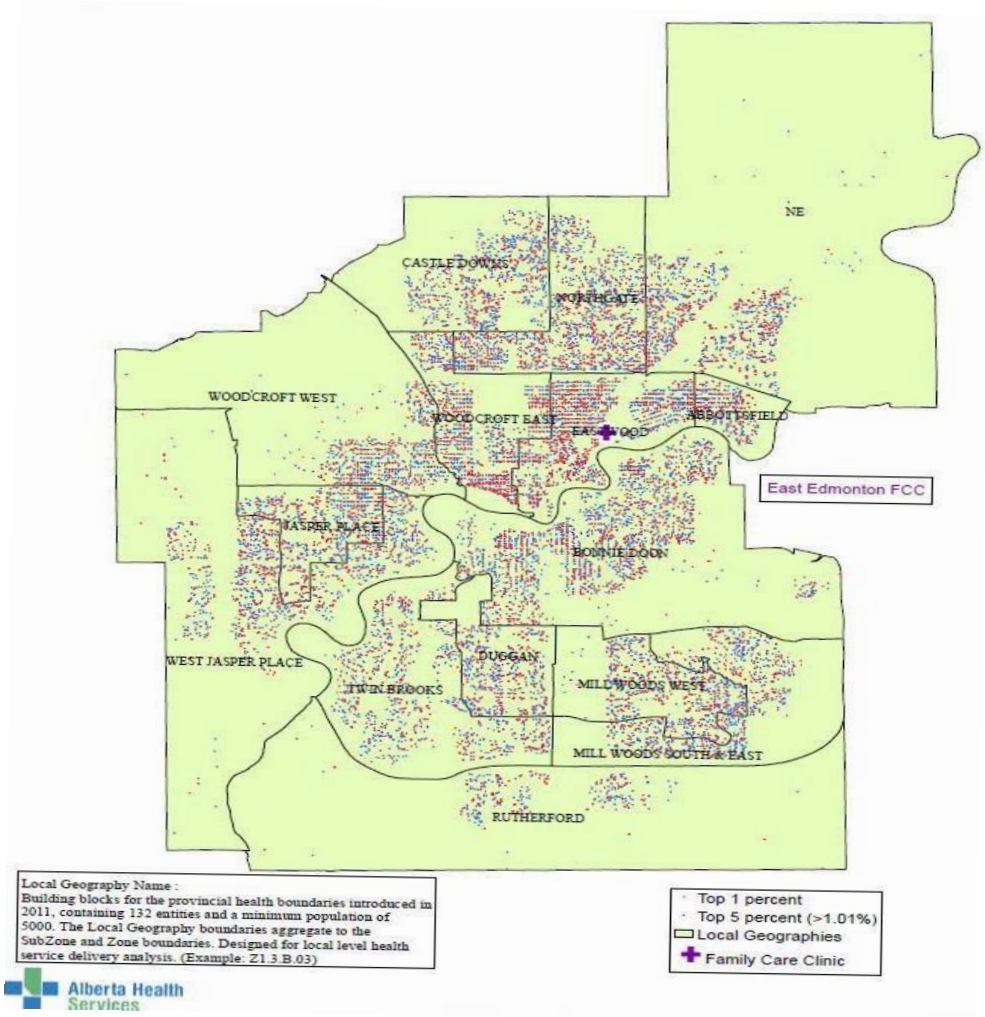
- 42% urinary incontinence
- 33% falls in last 90 days
- 28% dementia
- 57% on >9 medications
- 47% have daily pain

Poss, 2013

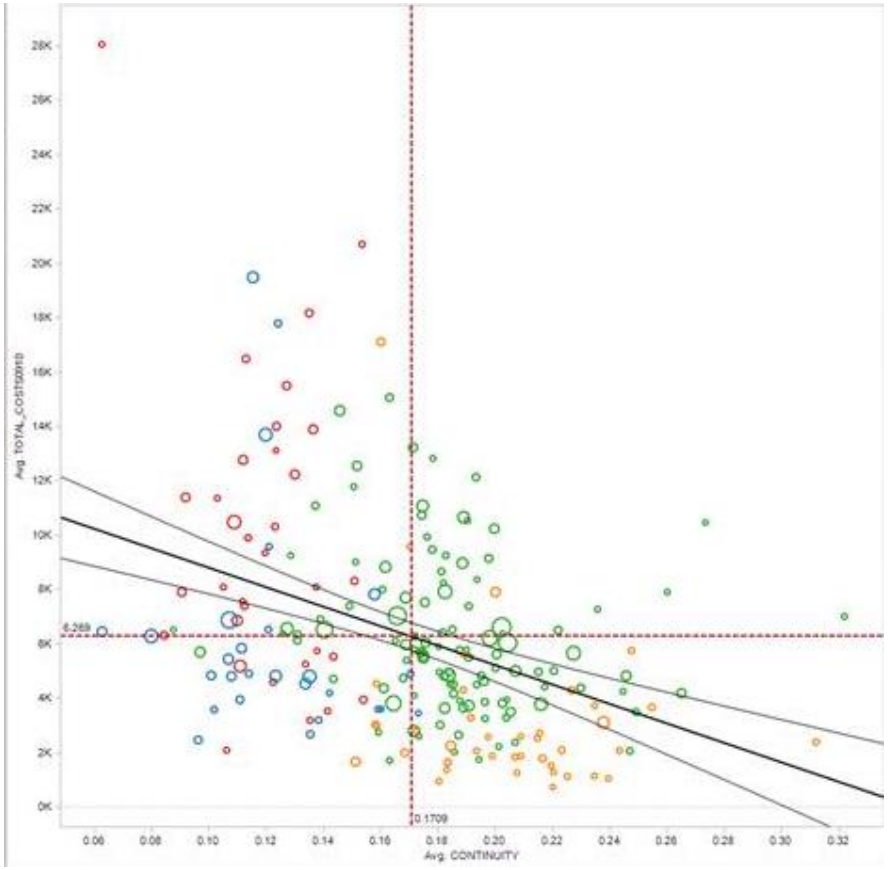
Alberta Health Services

Where should we put our resources ?

Complex High-Needs Patients



Effect of socioeconomic status on outcomes and utilization



Red – social assistance
Blue – First Nations
Green – health care supplement
Yellow – general population

Distribution by mean neighbourhood income quintile

	Visits		LOS		Cost	
	Non-high	High	Non-high	High	Non-high	High
1 (lowest)	53165 (25.8)	3911 (30.8)	53593 (25.8)	3483 (31.4)	53694 (25.8)	3382 (30.9)
2	45632 (22.1)	2887 (22.7)	45978 (22.1)	2541 (22.9)	46026 (22.1)	2493 (22.8)
3	37679 (18.3)	2199 (17.3)	37963 (18.3)	1915 (17.3)	37909 (18.2)	1969 (18.0)
4	32958 (16.0)	1683 (13.2)	33235 (16.0)	1406 (12.7)	33290 (16.0)	1351 (12.3)
5 (highest)	30089 (14.6)	1454 (11.5)	30199 (14.5)	1344 (12.2)	30209 (14.5)	1334 (12.2)
Unknown	6876 (3.3)	573 (4.5)	7033 (3.4)	406 (3.7)	7022 (3.4)	427 (3.9)

Work in progress, Interdisciplinary Chronic Disease Collaborative – courtesy of Dr. Paul Ronksley

Adjusted associations between the ratio of social to health spending with a one-year lag and health outcomes

Model 1[a]		Model 2[b]		
Health outcome	Estimated coefficient[c]	*p* value	Estimated coefficient[c]	*p* value
Percent of adults who:				
Were obese (body mass index ≥30)	−0.33	0.014	−0.16	0.101
Had asthma	−0.11	0.041	−0.12	0.012
Reported 14+ days in past 30 days as mentally unhealthy days	−0.43	0.007	−0.24	0.035
Reported 14+ days in past 30 days with activity limitations	−0.37		−0.25	0.002
Mortality rate for:				
Acute myocardial infarction (per 100,000 population)	−4.02	0.032	−0.64	0.649
Lung cancer (per 100,000 population)	−2.72	0.001	−2.35	0.002
Type 2 diabetes (per 100,000 population)	−0.45	0.004	−0.51	
Postneonatal infants[d] (per 100,000 live births)	−4.15	0.325	−6.56	0.037

Bradley et al, Health Affairs 35:760, 2016

Alberta Health Services

What could have been done to have kept this person out of hospital?

THE CITY OF EDMONTON
COMMUNITY SERVICES

December 31, 2007

Aging in Place Study

COMMUNITY SERVICES CONSULTING LTD.
9357 98A STREET
EDMONTON, ALBERTA T6E 3N3

PHONE (780) 439 5764
FAX (780) 439 3124
commserv@shaw.ca

Issues identified to facilitate aging in place

1. Mobility and Access to Transportation
2. Daily Living
3. Health and Well-being
4. Home Maintenance and Housing
5. Other (finances, cultural sensitivity, abuse)
6. Social isolation

City of Edmonton, Aging in Place 2007

Factors affecting Mobility and Access to Transportation

- Not being able to walk or manoeuvre scooter due to snow or ice on sidewalks and curbs and windrows on roads, or feeling fearful of making the attempt
- Feeling anxious about personal safely due to uneven sidewalks, the absence of sloping curbs and the insufficient length of pedestrian crossing lights
- Bus drivers sometimes insensitive to seniors' needs, will fail to wait for a senior trying to catch a bus or will move away from a stop before the senior is seated
- Not being able to walk to a bus stop (for reasons of stamina or other limitations)
- Not being able to get on or off buses unassisted
- Lack of familiarity with or understanding of the transit system or bus routes
- Inability to endure long bus rides
- Not being able to afford taxis, but not being eligible for specialized services such as DATS or assisted drivers

Summary

- One of the most effective ways of reducing health care costs and utilization is to have, and access, a family doctor/primary care provider
- Most health system costs are generated by hospitalization; more than 14 hospital days per year puts a person into the top 5% of costs
- Keeping people out of hospital is the single most important intervention to reduce health care costs
- It is mostly the frail or sick elderly who drive hospitalizations
- We need to ask ourselves “what could have been done to have avoided this hospitalization?” and act on it
- Often it is not an individual disease that leads to hospitalization but its contribution to frailty; investing in social supports can be an effective strategy

Questions, Comments, **Suggestions** ?