

Background

Population subgroups have been used to understand the quality of health care with populations typically segmented by specific diseases, patient age, or life-stage.

Population segmentation may have utility for the purposes of primary care performance measurement and reporting. Specifically, we look to divide the population into distinct groups such that we can understand primary care performance by these patient groups and health system planners can target specific models of care accordingly. Given the heterogeneity and diversity of primary care populations, we seek to develop an approach that takes both diagnoses and health care needs into account to group the population.

Methods

Data sources: Physician claims (MSP) and hospitalizations data (DAD) from Population Data BC. We will include prescription medicines and home and community care data when it becomes available.

Deriving population segments: We took a multi-staged approach.

1. We derived the prevalence of 15 common chronic conditions in the BC population (April 1999 to December 2012; using the standard definition of two physician diagnoses and/or one hospital admission associated with a chronic condition over a two year period).
2. We sought clinical input to develop a complexity definition for each chronic condition; complexity events are those that might indicate the need for a greater diversity of health care services across the health care system (e.g., team-based care or specialist care) on an ongoing basis (seven years of data were used, 2006-2012).
3. We used the combination of chronic conditions and complexity events to group the population into three segments as of December 31, 2012: **stable**, **multi-morbid**, and **complex**.

Physician use and costs: To examine whether our definitions were able to differentiate health care needs for each segment, we report physician use and hospitalization in 2013.

Results

Our results suggest that the nature and extent of health service use varies by population segment. For example, complex patients have a higher number of physician visits overall and see a larger range of physicians compared with patients in the multi-morbid group.

Conclusions

We developed three population segments based the presence of chronic conditions and health care events that might indicate complexity for specific chronic conditions. Patterns of physician use and hospitalizations over a 12 month period suggest that our segments may differentiate patients based on health care needs. This work is important for understanding the performance of primary care and targeting health care for different segments of the population.

Acknowledgements

TRANSFORMATION is funded by the Canadian Institutes of Health Research and the Michael Smith Foundation for Health Research.

Definition and prevalence of patient complexity

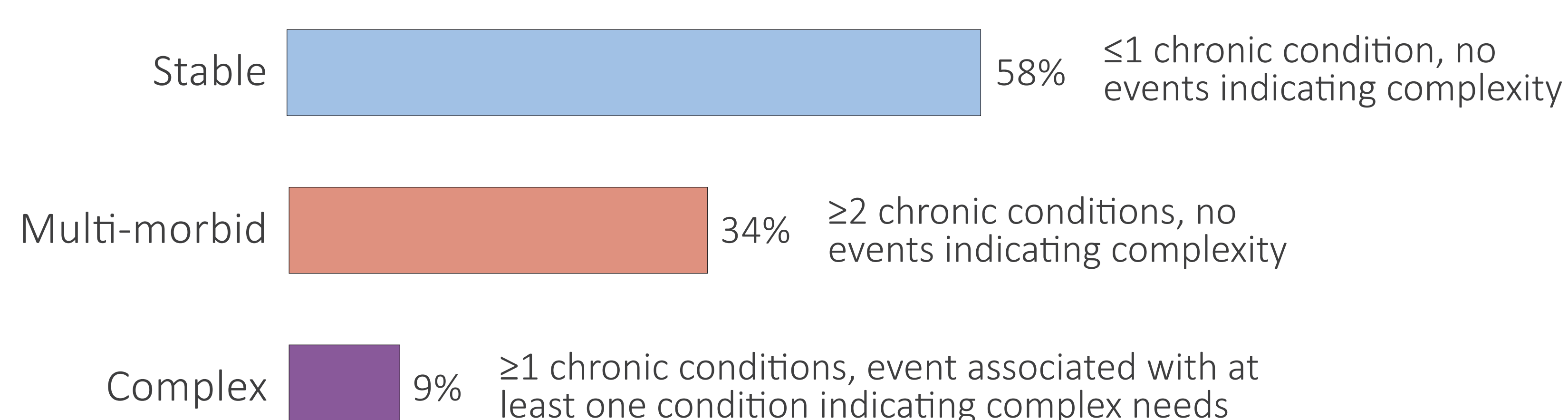
Percent of BC population diagnosed with 15 chronic conditions, complexity definitions associated with each condition, and percent of diagnosed patients that meet complexity definition, 2012

Chronic condition	Pop. prev.	Complexity definition	Percent of patients that meet complexity definition
Chronic obstructive pulmonary disease	4%	≥1 hospital admission for COPD or ≥2 visits with respirologist in 12 months	27%
Cerebrovascular disease	2%	≥1 hospital admission for stroke or cerebrovascular disease	19%
Chronic kidney disease	3%	Dialysis or kidney transplant	19%
Depression	32%	≥1 hospital psychiatry admission or ≥2 visits outpatient psychiatry	16%
Inflammatory bowel disease	1%	≥1 hospital admission for inflammatory bowel disease	11%
Diabetes	10%	Related complications (e.g. stroke, MI, amputation, renal, ophthalmology) or ≥1 hospital admission for diabetes	11%
Asthma	8%	≥1 hospital admission for asthma or ≥2 visits with respirologist in 12 months [or refill for oral corticosteroids, data not yet available]	11%
Osteoporosis	3%	≥1 fracture(s)	9%
Congestive heart failure	3%	≥1 hospital admission for congestive heart failure	8%
Hypertension	24%	Related complications (e.g. stroke, aneurysm, heart failure, MI) or ≥1 hospital admission for hypertension	7%
Chronic liver disease	2%	Related complications (e.g. hepatic encephalopathy, bleeds, esophageal varices, hepatorenal syndrome, spontaneous bacterial peritonitis), or liver transplant or ascites or portal hypertension	6%
Arthritis	33%	No complexity definition: Does not usually have complications	
Cancer	20%	No complexity definition: Treatment not usually delivered in primary care	
Ischemic heart disease	8%	No complexity definition: Hard to define "more complex" heart disease	
Chronic neurodegenerative diseases	5%	Complexity definition will be admission to aged care/ long-term care facility, but data not yet available	

Population prevalence: One hospital and/or two physician diagnoses over two years, cumulative over the period April 1999 to December 2012. Complexity: Measured over 2006-2012.

Population segments

Percent of BC population in each of three population segments, 2012

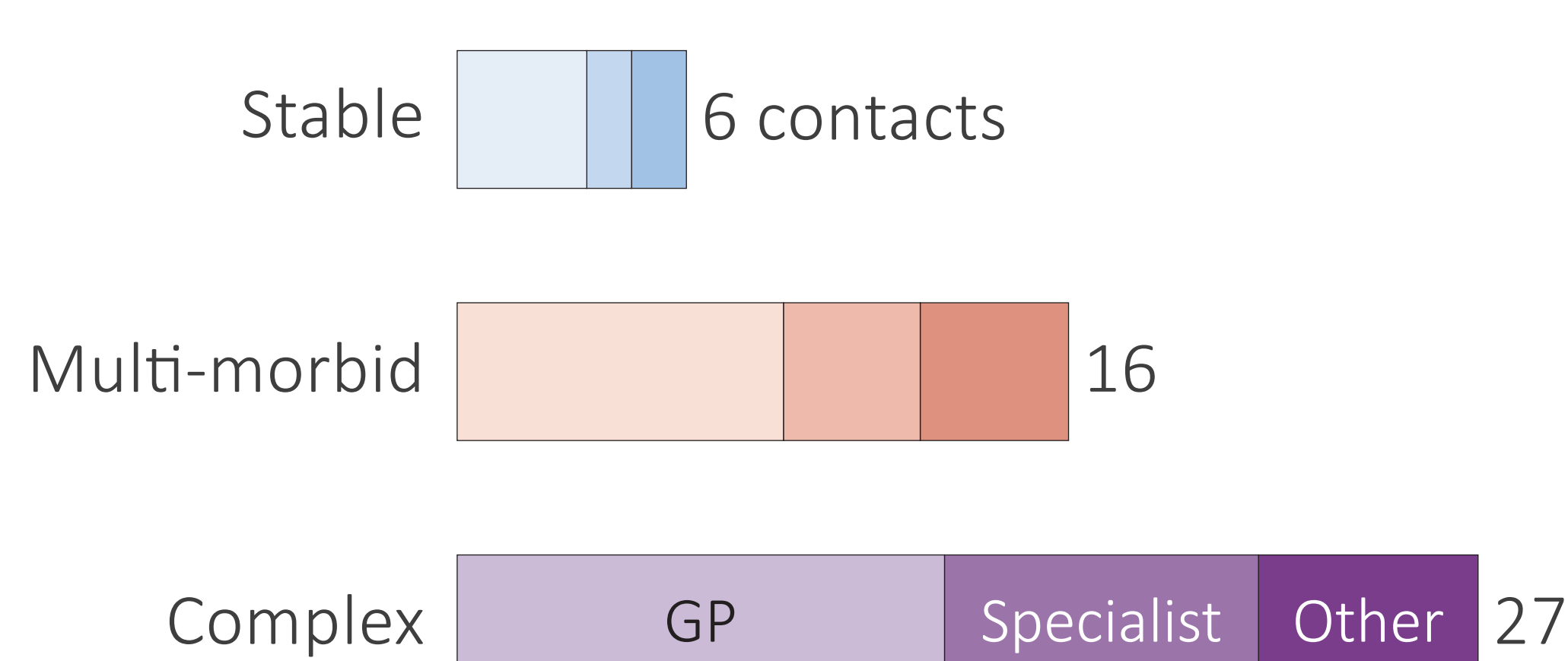


The presence of chronic conditions and complexity events over a seven year period were used to determine whether patients were in one of three groups in 2012

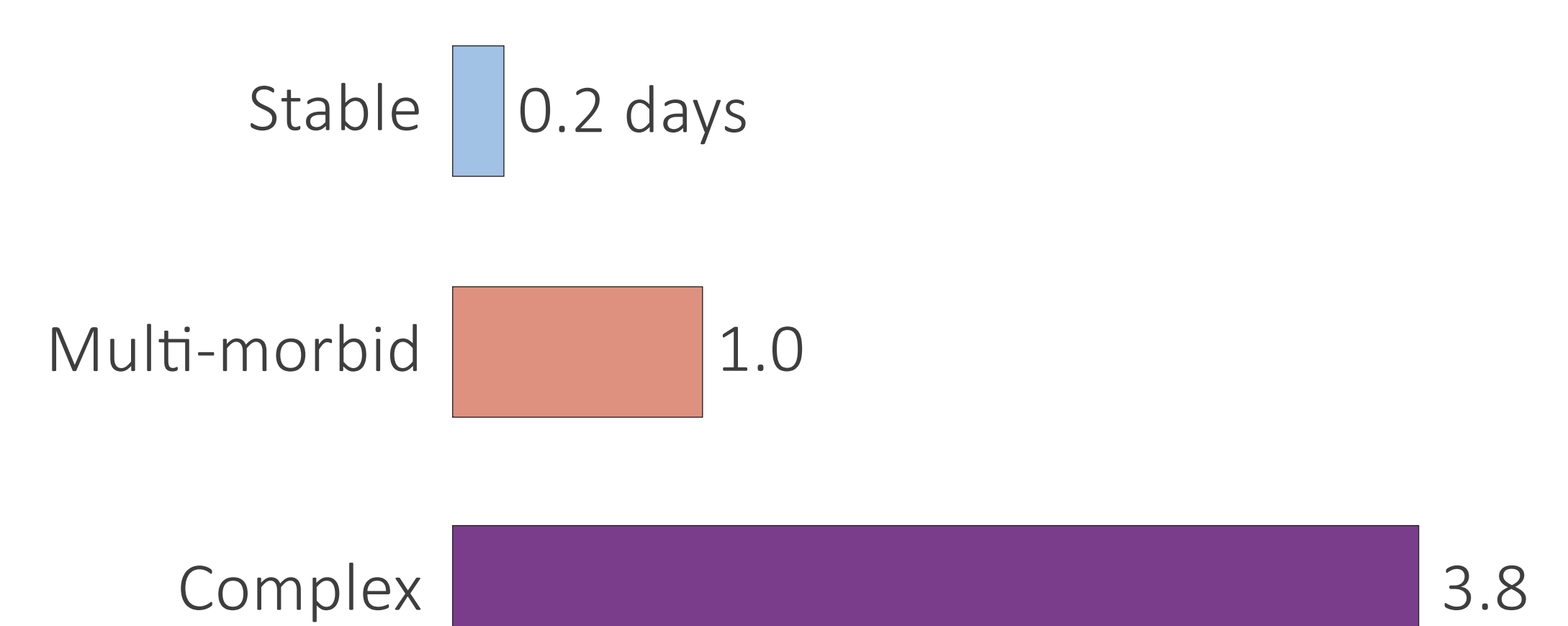
We hypothesized that the type and volume of health care use would be different for the three segments. Stable patients would be likely to use mainly primary care services, multi-morbid patients to use mostly primary care services with some specialist care, and complex patients to use primary, specialist, and acute care services.

Physician and hospital use by population segment

Mean number of patient contacts with GPs, specialists, and other (lab and imaging) physicians, by population segment, 2013



Mean total days in hospital, by population segment, 2013



We found that stable patients used a small number of physician visits, mostly to GPs, and had very few hospitalizations, on average. Multi-morbid patients used more visits to a range of physicians, and had slightly more hospitalizations. Complex patients had many specialist visits and a significant number of hospital days.