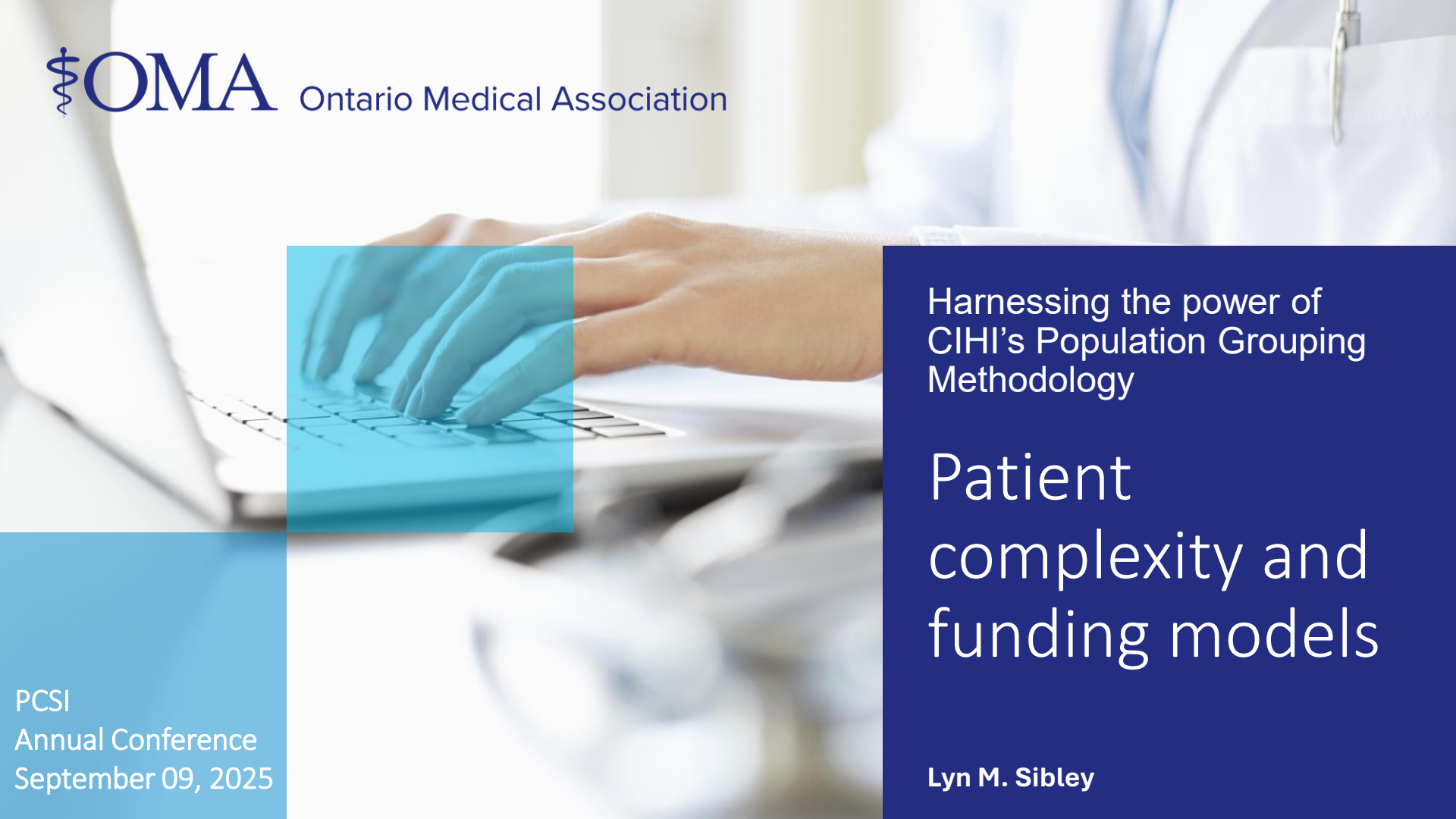

OMA Ontario Medical Association

Harnessing the power of CIHI's Population Grouping Methodology

Patient complexity and funding models

PCSI
Annual Conference
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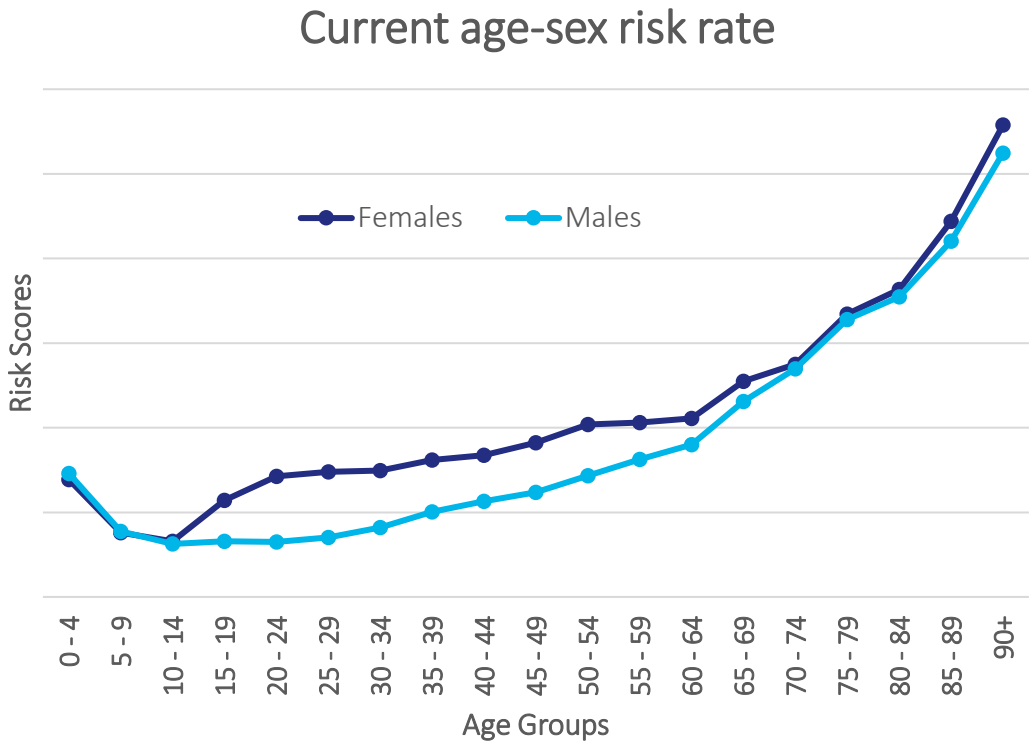
Ontario Canada

- 16.2M Population
- Health insurance
  - Universal
  - Publicly funded and administered

Background: Family Health Organizations

- FHOs are the most common primary care physician payment model in Ontario with 6,278 physicians – 36% of family physicians.
- This group care model reimburses physicians via a combination of capitation payments, fee-for-service fees, and incentive premiums.
- Since their introduction in 2007 the capitation payments have been based solely on the **age and sex** of the patients on their roster.

Age-sex adjusted capitation rates



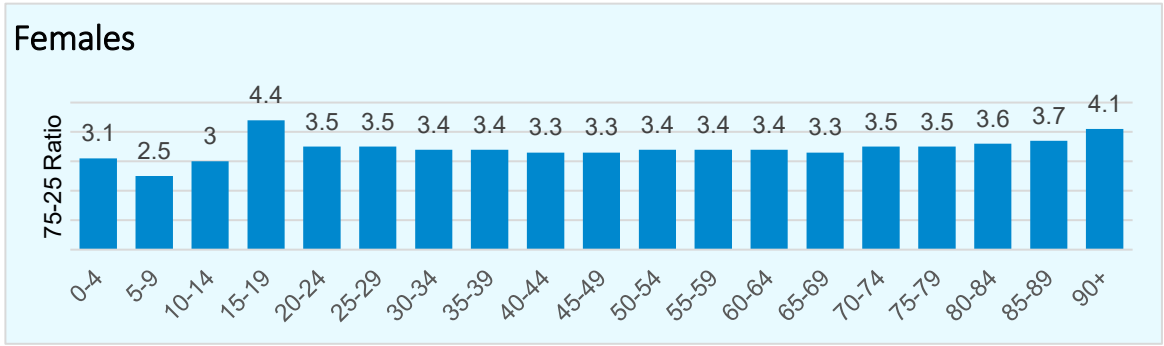
Since their introduction in 2007 the capitation payments have been based solely on the **age and sex** of the patients on their roster.

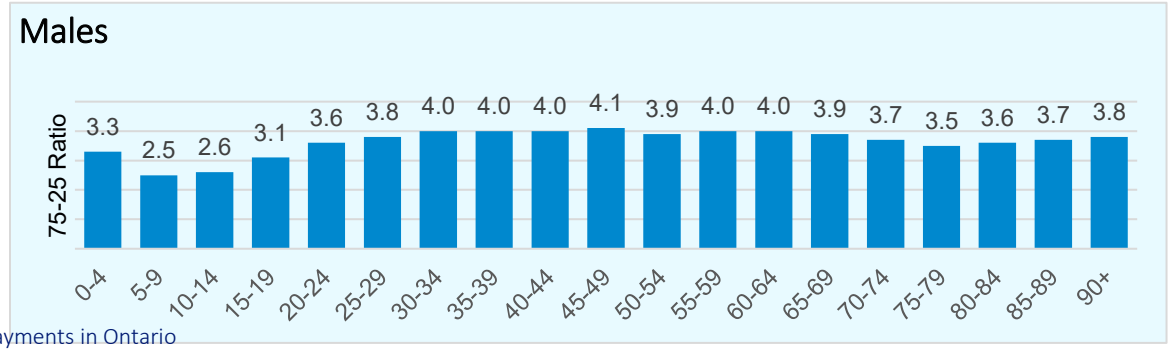
Background: Current capitation rates

1. Age and sex poor predictors of need

Total variation	7.9157
Explained by age and sex	0.0192
NOT explained by age and sex	7.8965
R^2	**0.20%**

2. Significant variation in need within each group





Background: Current capitation rates

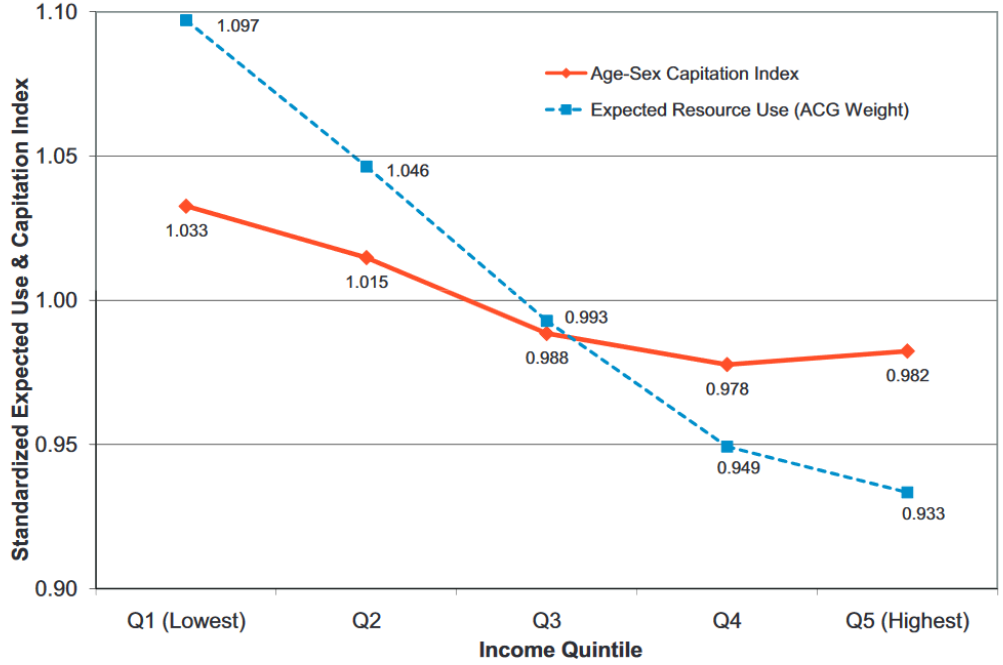
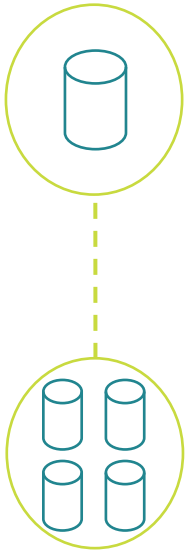


Fig. 2. Difference by Socioeconomic Status in expected resource use and age–sex capitation index (Ontario Family Health Networks, 2005–2006). *Legend*: age–sex capitation index; morbidity burden (ACG weight).

Background: Physician Services Agreement

- Any significant changes to the funding model are negotiated between the Ontario government and the Ontario Medical Association.
- Over the past 15 years attempts were made to update the capitation payment to account for patient acuity/complexity.
- Finally in 2022 an agreement was reached, between the Ontario MoH and the OMA, to incorporate a risk-adjustment factor into the capitation payments for FHOs, that uses the Canadian Institute for Health Information (CIHI) population grouping methodology.

Background: CIHI Population Grouper



Registry Data

HCN Valid during concurrent period

Diagnosis Data

- Physician encounters
- Inpatient stays
- Day Surgery
- Emergency department
- Ambulatory clinics
- Long-term care
- Inpatient mental health

Diagnoses during concurrent period

Grouper Software

Clinical Classification

- 226 health conditions
- 239 health profile groups (mutually exclusive)
- Functional status

Predictive Indicators

- Cost (concurrent and prospective)
- Primary care visits
- ED visits
- Admission to LTC

Results: Top health conditions in Ontario

Health Condition	Frequency
H46 - Joint/Tendon Disorder and Injury (incl. Pain, Sprain)	2,750,307
C42 - Acute ENT, Upper Respiratory Condition	2,746,379
E10 - Hypertension	1,853,827
K03 - Other Disease/Disorder Bladder & Urethra	1,828,758
F81 - Signs, Symptoms Digestive & Hepatobiliary System	1,787,556
Q11 - Neurotic/Anxiety/Obsessive Compulsive Disorder	1,662,884
P43 - Other Viral Infection	1,075,874
H06 - Vertebral/Disk & Other Disease of Back	1,051,063
J02 - Diabetes Mellitus	1,026,355
I42 - Skin Infection (incl. Cellulitis)	967,076
E82 - Signs, Symptoms Cardiovascular System	961,168
D81 - Signs, Symptoms Respiratory System	911,169
L02 - Menstruation Disorder (incl. Menopause)	836,487
H02 - Osteoarthritis	801,014
F04 - Gastritis & Duodenitis	780,876
H09 - Myositis and Soft Tissue Disorder (incl Muscle Inflam)	768,060
H81 - Neuromuscular Signs & Symptoms	744,016

Health Condition	Frequency
I09 - Other Condition of Skin/Subcutaneous Tissue	726,661
K42 - Urinary Tract Infection/Cystitis	711,327
D44 - Acute and Other Respiratory Diseases & Disorders	677,454
Q82 - Mental Health Signs & Symptoms	676,805
J09 - Hypercholesterolaemia and other Dyslipidemia	658,098
I03 - Eczema/Dermatitis/Hives	653,103
H44 - Other Fracture/Dislocation	647,359
F41 - Acute Gastrointestinal Infection	632,319
P45 - Other & Unspecified Infection	625,600
D06 - Asthma	567,657
I43 - Superficial Skin Injury/Contusion/Non-Serious Burn	551,020
J10 - Obesity	546,233
B01 - Cataract/Lens Disorder	536,384
C41 - Otitis Media	534,036
B42 - Infection/Inflammation Eye	530,214
J08 - Malnutrition & Vitamin Deficiency	526,474
I06 - Benign Skin Neoplasm	522,501

Background: Data availability

	Diagnostic data available						Payment
	T-6	T-5	T-4	T-3	T-2	T-1	T
Diagnostic information							
Primary care utilization							

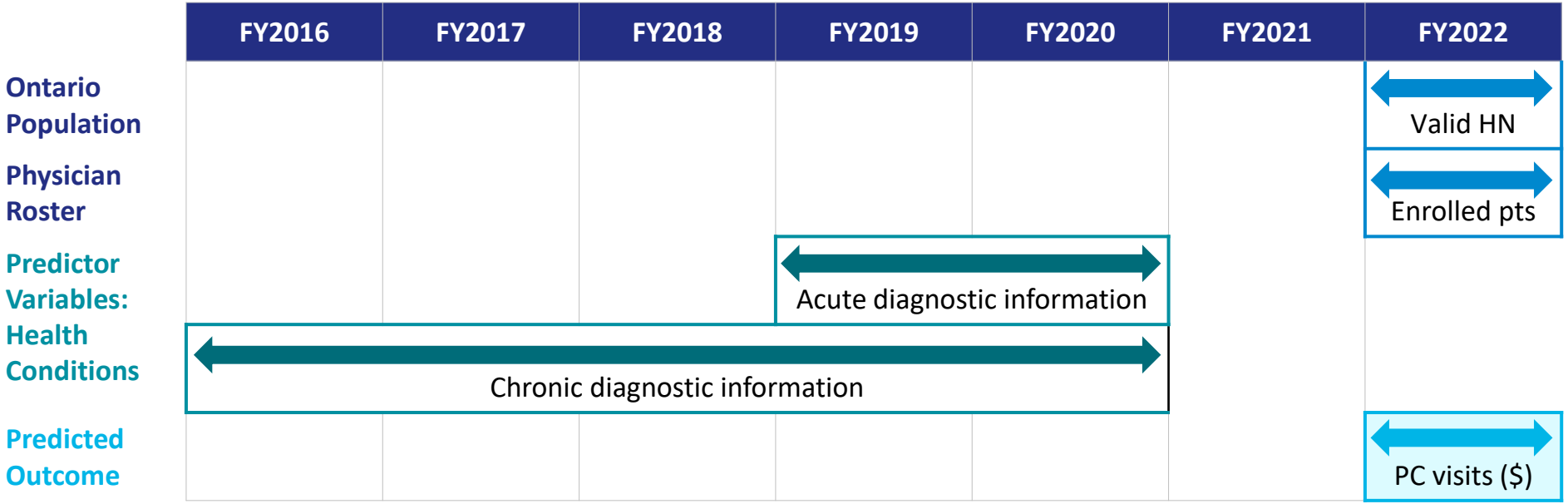
Methods: Outcome variable

- Primary care physician service utilization
  - Fee codes that make up the FHO basket of service
  - Sum of the fee value of all in-basket physician claims submitted by family physicians.
  - Includes paid and shadow-billed

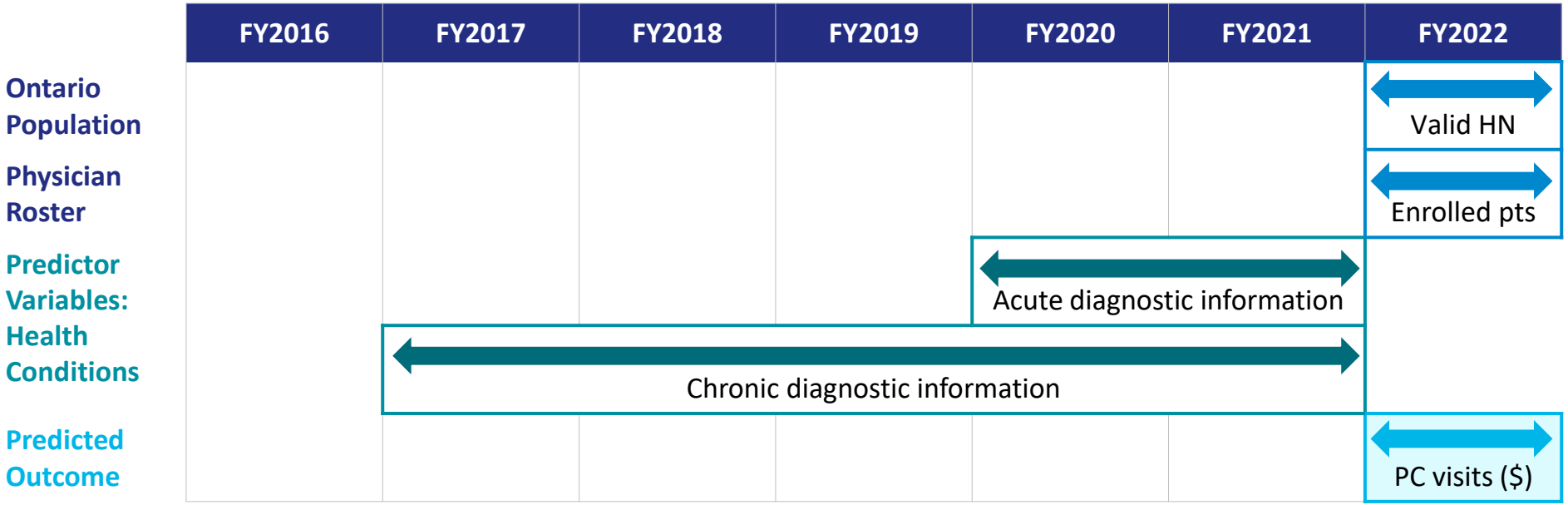
Methods: Predictive variables

- Age
- Sex
- Health conditions (N=226)
  - Identified by the CIHI population grouper
  - Acute conditions based on diagnoses from **two** years (FY2019-FY2020)
  - Chronic conditions based on diagnoses from **five** years (FY2016-FY2020)
- Interactions (N=460)
  - Dummy variable indicating combinations of health conditions

Methods: Operational timeline (T-2)



Methods: Evaluation timeline (T-1)



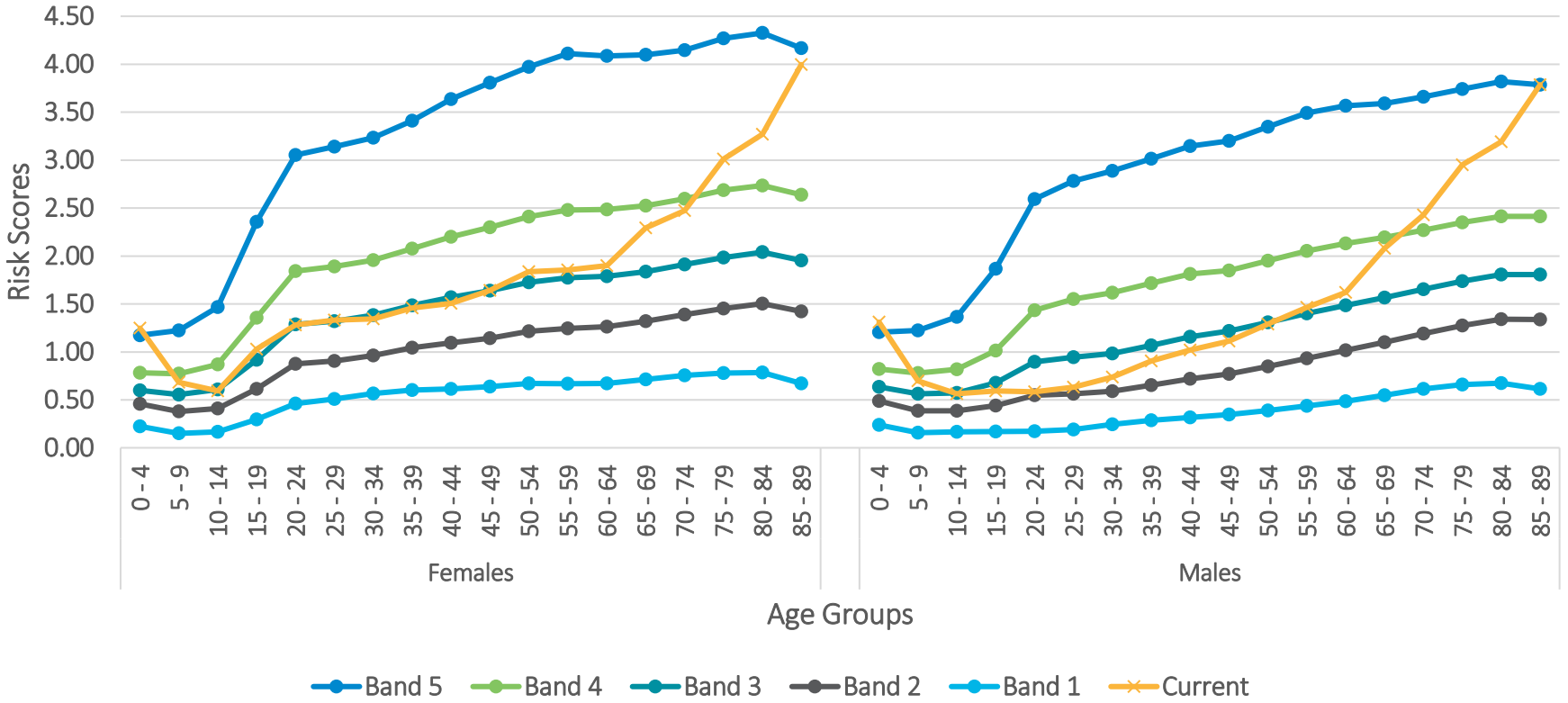
Methods: Approach - Development

1. A risk score for primary care physician utilization was calculated for all residents of Ontario based on:
   - age,
   - sex,
   - health conditions generated by the CIHI Population Grouper
2. Based their risk score, the people in each age-sex group were assigned to one of five Primary Care Utilization Bands (PCUB).
3. Each PCUB was assigned a relative weight which indicates their predicted level of primary care resource use.

Results 2: Primary care utilization bands

Age Group	Females					Males				
	Band 1	Band 2	Band 3	Band 4	Band 5	Band 1	Band 2	Band 3	Band 4	Band 5
0 to 4	0.22	0.46	0.60	0.78	1.17	0.24	0.49	0.63	0.82	1.21
5 to 9	0.15	0.38	0.56	0.77	1.22	0.16	0.39	0.56	0.78	1.22
10 to 14	0.17	0.41	0.61	0.87	1.47	0.17	0.39	0.57	0.82	1.36
15 to 19	0.30	0.61	0.92	1.36	2.36	0.17	0.44	0.68	1.01	1.87
20 to 24	0.46	0.87	1.29	1.84	3.05	0.17	0.55	0.90	1.44	2.59
25 to 29	0.51	0.90	1.32	1.89	3.14	0.19	0.56	0.95	1.55	2.78
30 to 34	0.57	0.96	1.38	1.96	3.23	0.24	0.59	0.98	1.62	2.89
35 to 39	0.60	1.04	1.48	2.08	3.41	0.29	0.65	1.07	1.72	3.01
40 to 44	0.61	1.10	1.57	2.20	3.64	0.32	0.72	1.16	1.81	3.15
45 to 49	0.64	1.14	1.64	2.30	3.81	0.35	0.77	1.22	1.85	3.20
50 to 54	0.67	1.21	1.73	2.41	3.97	0.39	0.85	1.31	1.95	3.35
55 to 59	0.67	1.25	1.77	2.48	4.11	0.44	0.93	1.40	2.05	3.49
60 to 64	0.67	1.26	1.79	2.49	4.09	0.49	1.02	1.49	2.13	3.57
65 to 69	0.71	1.32	1.84	2.52	4.10	0.55	1.10	1.57	2.19	3.59
70 to 74	0.75	1.39	1.91	2.60	4.15	0.61	1.19	1.65	2.27	3.66
75 to 79	0.78	1.45	1.98	2.69	4.27	0.66	1.28	1.74	2.35	3.74
80 to 84	0.78	1.50	2.04	2.74	4.33	0.67	1.34	1.81	2.41	3.82
85 to 89	0.67	1.42	1.95	2.64	4.17	0.61	1.34	1.81	2.41	3.78
90+	0.46	1.16	1.66	2.30	3.72	0.45	1.19	1.65	2.24	3.53

Results: PCUB Weights



Methods: Approach - Evaluation

4. Ran regression models to evaluate the ability of PCUB weights to predict the total primary care utilization of each physicians' patient roster.
5. The analysis was repeated with diagnostic information from one year prior to primary care utilization.

Results 1: Population models

Model	2022 primary care utilization modeled on	R^2
Current	= [age] + [sex]	0.2%
Operational	= [226 health conditions from **2020** CIHI PG] + [460 interactions from **2020** CIHI PG] + [age] + [sex]	10.0%
Evaluation	= [226 health conditions from **2021** CIHI PG] + [460 interactions from **2021** CIHI PG] + [age] + [sex]	11.0%

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Results 3: Roster models – R^2

Model	2022 primary care utilization of FHO Physicians' rosters modeled on	R^2
Current	= [Sum of age/sex adjusted capitation scores of roster]	55%
Operational	= [Sum of PCUB scores of physician roster – 2020 CIHI PG]	77%
Evaluation	= [Sum of PCUB scores of physician roster – 2021 CIHI PG]	80%

Conclusions

- Adjusting FHO capitation payments using the CIHI population grouper will bring compensation levels more in alignment with the actual primary care utilization of rostered patients.
- Besides resulting in more equitable physician compensation, this would also provide more of an incentive for physicians to enroll higher needs patients.
- There is minimal impact of using morbidity measures from two years prior compared to one year prior to the payment year.

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Thank you.

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