Impact of Physician Enrollment Models on Diabetes Access to Care During the COVID-19 Pandemic: Insights from Population Data in Ontario, Canada

Laleh Rashidian, Walter Wodchis, Ruth Hall, Luke Mondor, Chris Bai

CAHSPR, May 31, 2023

Background

- Over 1.5 million patients with diabetes in Ontario in 2022

- Healthcare provision negatively impacted by COVID-19 between 2019-2022

- Diabetes management and care impacted by *inequity;* lower income populations have
  - higher rates of diabetes
  - poorer glycemic control
  - increased rates of complications

- Are Physician Enrolment Models related to diabetes management?

Research Objective & Methods

Research Objectives:

- To determine whether care for diabetes patients was affected by the COVID-19 pandemic by observing changes between 2019 and 2022.
- To assess differences in care for diabetes patients across Physician Enrollment Models (PEM) between 2019/20 to 2021/22
- To identify associations between PEM models and diabetes care in 2021/22

Methods:

- Descriptive analyses using longitudinal administrative data for Ontario (IC/ES databases)
- Logistic Regressions to assess association of diabetes care with PEM in 2021/22, controlling for baseline patient characteristics including socio-demographics, clinical conditions, primary care use, and diabetes control (as at start of observation period -- April 1, 2021)

Dalla Lana
School of Public Health

HSPN

IC/ES

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

Selected Diabetes Indicators

- Proportion of patients with up-to-date HbA1c testing (age >40)
  Proportion of patients that are regularly following-up on diabetes care

- Proportion of patients with up-to-date retinal examinations (age >40)
  Allows timely treatment of diabetes eye complications through early detection

- Proportion of patients with a statin dispensed (age 65+)
  Prevents vascular complications among older diabetes patients

- Proportion of patients with HbA1c >7 (age >40)
  Provides information on long-term glycemic status and reliably predicts risk for diabetes-related complications

- Hospitalizations for long-term diabetes related complications (age >18)
  Indicative of long-term poor management of disease resulting in blindness, kidney failure, loss of nerve function, amputation etc.

Dalla Lana
School of Public Health

HSPN

IC/ES

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

Physician Enrollment Models in Ontario

- Comprehensive Care Models
  Solo physician providing comprehensive care, fee-for-service

- Family Health Groups
  3+ physicians providing comprehensive care, fee-for-service

- Capitation Based Models (such as Family Health Organizations and Family Health Networks)
  Groups of family physicians working together, capitation payment

- Family Health Teams
  Interdisciplinary teams of healthcare providers who work together to provide comprehensive, patient-centered care, capitation payment
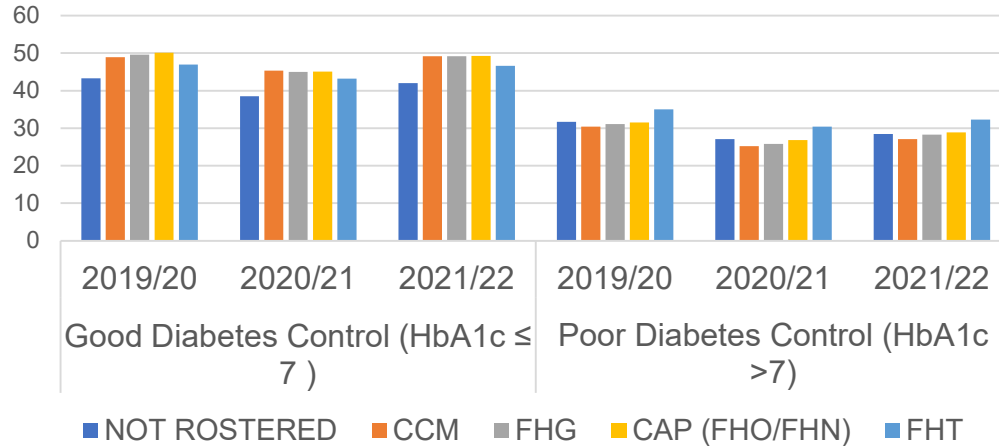
Diabetes Management by Physician Enrollment Models

HbA1c Screening, Retinal Screening and Statins Dispensed 2019/20, 2020/21 & 2021/22 for Ontario by Physician Enrollment Models
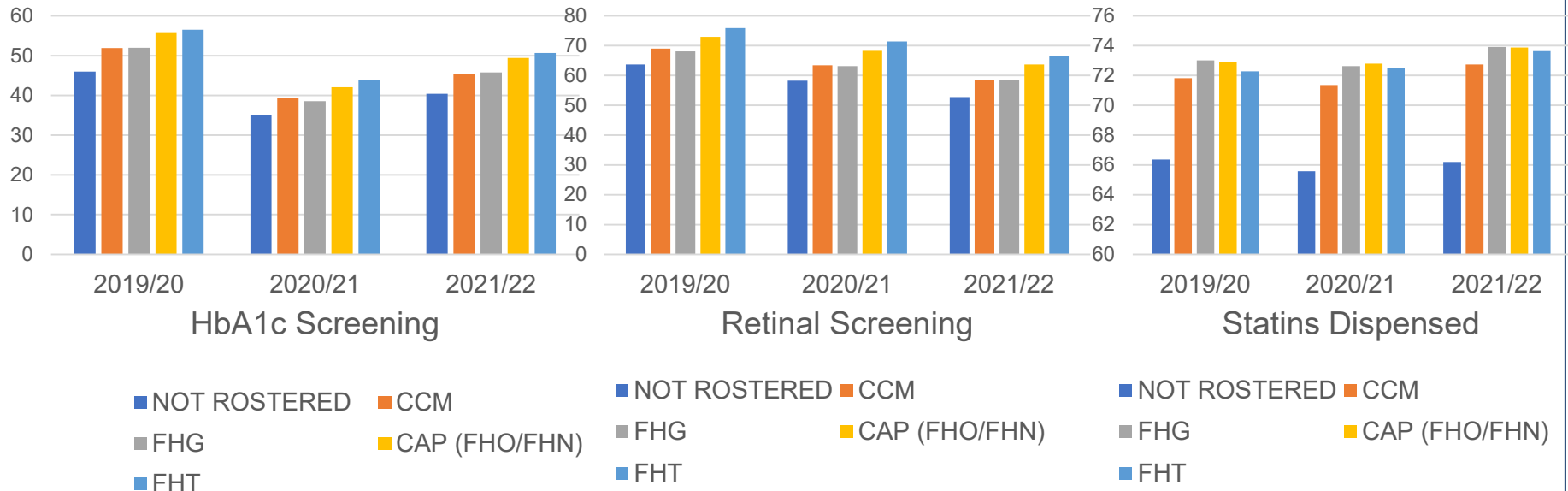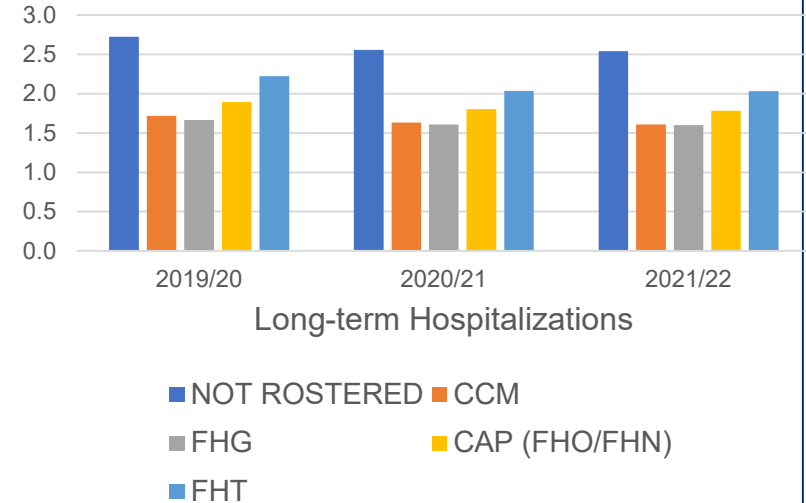
Diabetes Control by Physician Enrollment Models

Diabetes HbA1c Control 2019/20, 2020/21 & 2021/22 for Ontario by Physician Enrollment Models (missing is included in total %)

Diabetes-Related Hospitalizations in 2019/20, 2020/21 & 2021/22 for Ontario by Physician Enrollment Model

HbA1c Screening across Physician Enrollment Models

Adjusted* Odds of being up-to-date (4+ in past 12 months) on HbA1c Screening

	Estimate	StdErr	ProbChiSq	Ratio	Lower	Upper
Not Enrol. (FFS)	(reference)					
CCM	-0.0374	0.0105	0.0004	0.96	0.94	0.98
FHG	-0.0210	0.0059	0.0004	0.98	0.97	0.99
CAP (FHO/FHN)	0.0753	0.0058	<.0001	1.08	1.07	1.09
CAP - FHT	0.0506	0.0060	<.0001	1.05	1.04	1.06

- CCM and FHG models associated with a ***significantly lower likelihood*** of patient being up-to-date on HbA1c screening within the past year

- Patients receiving care from physicians enrolled in capitation-based models (CAP) and Family Health Teams (FHTs) are ***significantly more likely*** to be up-to-date on HbA1c screening*

* controlling for age, sex, multimorbidities, material deprivation, number of primary care visits and being in good control of diabetes

Retinal Screening across Physician Enrolment Models

Adjusted* Odds of being up-to-date (2+ in past 24 months) on Retinal Screening

	Estimate	StdErr	ProbChiSq	Ratio	Lower	Upper
Not Enrol. (FFS)	(reference)					
CCM	-0.1473	0.0110	<.0001	0.86	0.84	0.88
FHG	-0.1234	0.0063	<.0001	0.88	0.87	0.89
CAP (FHO/FHN)	0.0674	0.0062	<.0001	1.07	1.06	1.08
CAP - FHT	0.1334	0.0065	<.0001	1.14	1.13	1.16

- CCM and Family Health Groups *significantly less likely* to be up-to-date on retinal examinations compared to physicians not rostered with any models

- Patients receiving care from physicians enrolled in CAP and FHTs are *significantly more likely* to be up-to-date on retinal screening

* controlling for age, sex, multimorbidities, material deprivation, number of primary care visits and being in good control of diabetes

Statins dispensed to DM patients across PEM

Adjusted* Odds of Being Dispensed Statins

	Estimate	StdErr	ProbChiSq	Ratio	Lower	Upper
Not Enrol. (FFS)	(reference)					
CCM	0.1164	0.0164	<.0001	1.12	1.09	1.16
FHG	0.2190	0.0089	<.0001	1.24	1.22	1.27
CAP (FHO/FHN)	0.0989	0.0083	<.0001	1.10	1.09	1.12
CAP - FHT	-0.0263	0.0085	0.0019	0.97	0.96	0.99

- Patients over 65 receiving care from physicians enrolled in CCM, FHG, or CAP were **_significantly more likely_** to have been dispensed statins within the past year

- However, receiving statins was **_significantly less_** among FHT physicians compared to physicians not rostered with any models

* controlling for age, sex, multimorbidities, material deprivation, number of primary care visits and being in good control of diabetes

Dalla Lana
School of Public Health   **HSPN**   **IC/ES**

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

HbA1c Control Across Physician Enrollment Models

Adjusted* Odds of Having HbA1c Levels > 7 (Poor Control)

	Estimate	StdErr	ProbChiSq	Ratio	Lower	Upper
Not Enrol. (FFS)	(reference)					
CCM	-0.0461	0.0133	0.0006	0.95	0.93	0.98
FHG	-0.0240	0.0073	0.0011	0.98	0.96	0.99
CAP (FHO/FHN)	-0.0479	0.0071	<.0001	0.95	0.94	0.97
CAP - FHT	0.0569	0.0073	<.0001	1.06	1.04	1.07

- Patients with physicians enrolled in CAP, CCM or FHG were ***significantly less likely*** to have <u>poor diabetes control</u> (HbA1c > 7) within the past year

- However, poor control was ***significantly more likely*** among FHT physicians compared to physicians not rostered with any models

* controlling for age, sex, multimorbidities, material deprivation, number of primary care visits and being in good control of diabetes

Dalla Lana School of Public Health   HSPN   IC/ES

Institute of Health Policy, Management and Evaluation
UNIVERSITY OF TORONTO

Long-term diabetes related hospitalizations across PEM

Adjusted* Odds of diabetes-related hospitalizations

	Estimate	StdErr	ProbChiSq	Ratio	Lower	Upper
Not Enrol. (FFS)	(reference)					
CCM	-0.0566	0.0367	0.1231	0.94	0.88	1.02
FHG	-0.0278	0.0189	0.1416	0.97	0.94	1.01
CAP (FHO/FHN)	-0.0296	0.0182	0.1029	0.97	0.94	1.01
CAP - FHT	-0.0118	0.0184	0.5207	0.99	0.95	1.02

- No significant relationship was observed between PEM models and hospitalization for long-term diabetes related complications among diabetes population aged 18+

- When assessing populations <65 years old, CAP and FHG were associated with a ***significantly lower risk of hospitalization*** among diabetes patients compared to patients Not Enrolled in a PEM.

* controlling for age, sex, multimorbidities, material deprivation, number of primary care visits and being in good control of diabetes

Summary

- In 2021/22, capitation-based models were associated with better diabetes testing

- Team-Based Models (surprisingly?) associated with lower statin prescribing and diabetes control

Caveats & Limitations:

- Controlled for total physician contact but have not assessed the role of virtual care.

- Future research will look at the drivers of diabetes control; is it mostly driven by patient, physician, or system level factors?

Thank You!