COMPOUNDING DISADVANTAGE: THE IMPACT OF COVID-19 ON IMMIGRANTS LIVING WITH CANCER

https://ccdproject.ca/

Drs. Mandana Vahabi, Josephine Wong & Aisha Lofters

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INTRODUCTION

- Immigrants made up about half of the COVID-19 cases in Ontario
- Racialized immigrants have been hit hard by COVID-19
- Highest rates of COVID-19 were among people who identified as South Asian or Indo-Caribbean (27%), Black (16%), Southeast Asian (13%), Arab, Middle Eastern or West Asian (8%)
- COVID-19 disparity derives from immigrants' under-privileged social and economic position in Canada
- Disproportionately represented in:
  - Precarious jobs
  - Working in sectors with greater exposure to COVID-19
  - Living below the poverty line

INTRODUCTION

- The association of social inequities with COVID-19 morbidity/mortality further can be intensified in the context of underlying chronic health conditions, like cancer
- Cancer is the leading cause of mortality and morbidity in Canada
- Cancers and some cancer-related treatments can weaken the body's immune system, hence putting people living with cancer at a higher risk of COVID-19 morbidity and mortality
- What happened to those who are at the intersection of social and clinical disadvantage?
- There is little information on this area
- Our study aimed to examine the impact of COVID-19 on immigrants living with cancer

METHODOLOGY

Study design: A population-based retrospective cohort study based on Ontario's linked healthcare administrative databases: CIHI-DAD, NACRS, IRCC, RPDB, COVax-ON, OCR

- **Inclusion criteria: Ontario residents aged 18 and above**
- **Exclusion: Rural areas (based on Statistics Canada definition)**

4 Subgroups

- **Immigrants with active cancer**
- **Immigrants without active cancer**
- **Non-immigrants with active cancer**
- **Non-immigrants without active cancer**

METHODOLOGY

Definition of "active cancer"

- Any cancer diagnosis (from the Ontario Cancer Registry) with cancer-related procedures within 6 months of the index date (i.e., March 31, 2020) **OR** cancer diagnosis within 1 year of the index date

METHODOLOGY

Outcomes

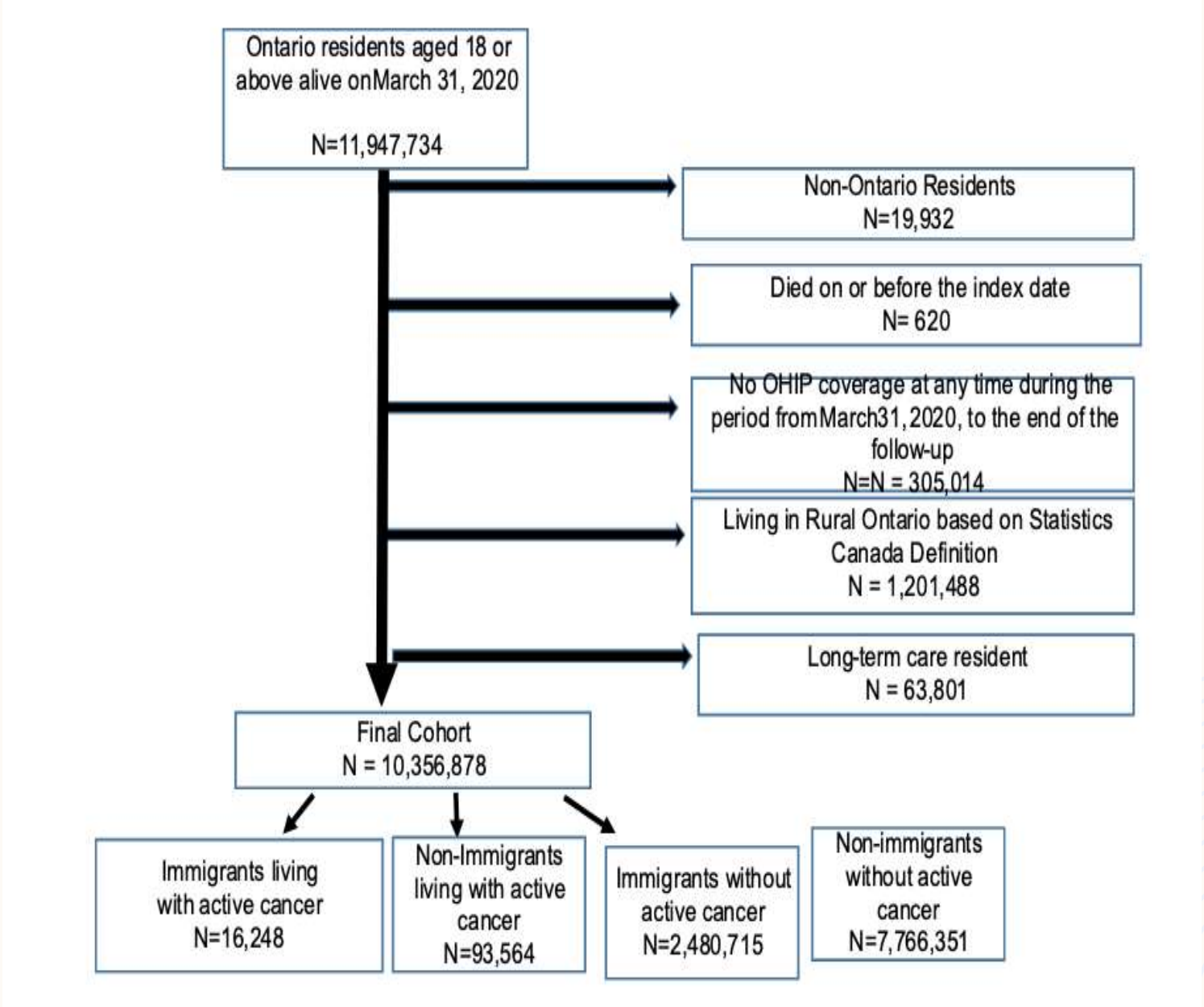
- COVID-19 diagnosis
- Hospitalization
- ICU admission
- COVID-19 related mortality
- COVID-19 vaccination

Time period for outcomes

- January 2020 – December 2021

FIGURE 1: COHORT FLOWCHART

- **Cohort Size: 10,356,878**
  Ontario residents **aged 18 or older**
  - **Immigrants:** 2,496,963 (24.10%)
  - **Non-immigrants** (Canadian-born/long-term residents): 7,859,915 (75.89%)



SOCIODEMOGRAPHIC CHARACTERISTICS :

Overall

- Immigrants were younger than non-immigrants (mean age 47 vs. 49).
- The average length of stay of immigrants in Canada was 17 years.
- 16% of immigrants were refugees and protected persons.
- The highest concentration of immigrants was in Toronto followed by Central West and Central East (34% vs 29% vs 20% respectively).
- The most common region of origin of immigrants was East Asia and Pacific (26.2%) followed by South Asia (26%), Europe and Central Asia (25.5%), Latin America and the Caribbean (12.9%), and Sub-Saharan Africa (7.6%)

SOCIODEMOGRAPHIC CHARACTERISTICS :

More immigrants (vs. non-immigrants) lived in neighbourhoods that:

- Had the **lowest household income** (25% vs 18%),
- Were the **most residentially unstable** (28% vs 24%),
- Were the **most materially deprived** (22% vs 18%,)
- Were the **most ethnically diverse** (60% vs. 22%)

- More immigrants (vs. non-immigrants) **did not have a primary care provider** (9.3% vs. 7.4%)

- The **average number of comorbidities**, was **significantly higher** among non-immigrants vs. immigrants (5.3 vs. 4.9).

PEOPLE LIVING WITH ACTIVE CANCER

➢**16,248 (0.7%)** immigrants were identified as having active cancer as opposed to **93,564 (1.2%)** non-immigrants.

Age and Gender:

- Immigrants living with cancer were significantly younger than non-immigrants with cancer (59.1 vs. 65.7 years).
- 63.3% of immigrants with active cancer were female vs. 55.8% of non-immigrants with active cancer

Socioeconomic characteristics:

A higher proportion of immigrants living with cancer (vs. non-immigrants with cancer) lived in neighbourhoods that:

Had the **lowest household income** (26% vs 18%),
Were the **most residentially unstable** (29% vs 25%),
Were the **most materially deprived** (23% vs 17%,)
Were the **most ethnically diverse** (59% vs. 17%)

PEOPLE LIVING WITH ACTIVE CANCER

Cancer Types:

- No significant difference with respect to the types of cancer across immigrants and non-immigrants living with cancer

- Common cancer types: Breast (27.4%), Blood (9.6%), Prostate (8.9%), Colorectal (8.3%), Cervix (7.1%), Lung (5.7%)

PEOPLE LIVING WITH ACTIVE CANCER

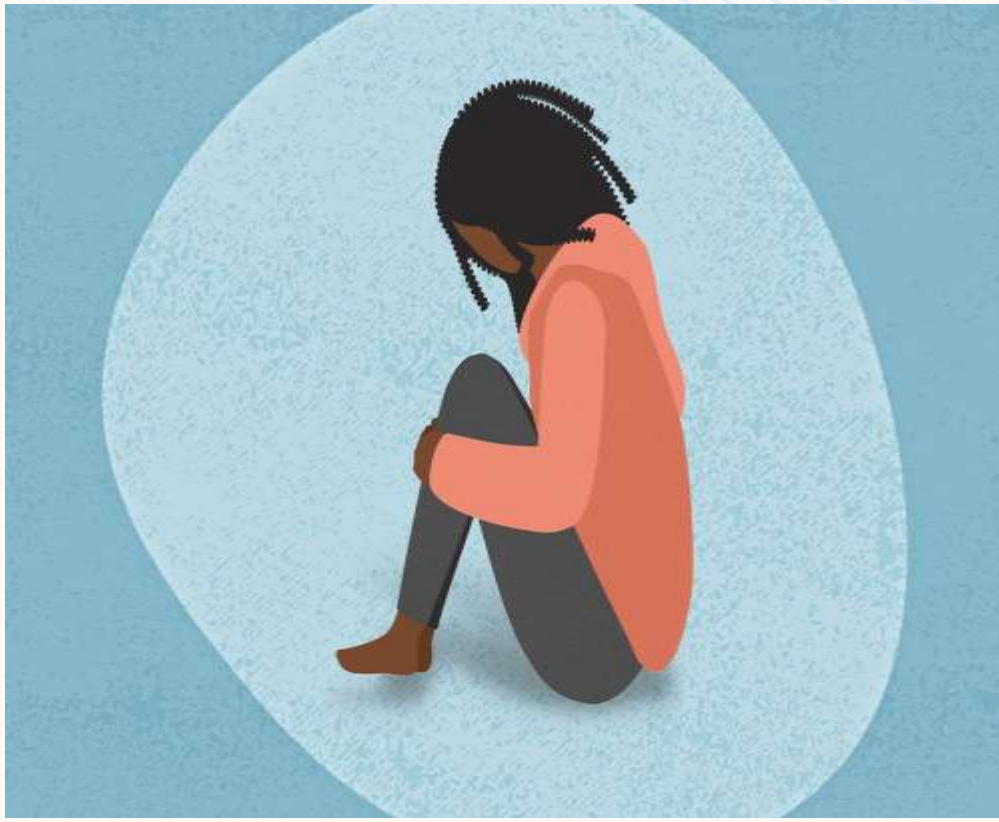
Comorbidities:

- Immigrants with cancer lived with **other comorbidities** like osteo- and other arthritis, stroke, diabetes, and hypertension

- About **15%** of immigrants with active cancer also suffer from **Mental health and addiction disorders** (MH&A):
  - Common MH&A types: included Anxiety (11.2%), Major mood disorders (2.7%), Psychotic disorders (0.4%), and Substance use disorders (0.4%).

Healthcare Access and Enrollment:

- 1.2% of immigrants with active cancer had no primary care provider.



CONFIRMED POSITIVE TESTS

- 60% of immigrants and non-immigrants with active cancers were tested for COVID-19, ***confirmed positive test results were significantly higher among immigrants (12.4%) than non-immigrants (5.3%).***
- Similarly, a significantly higher proportion of immigrants without cancer tested positive as opposed to non-immigrants without cancer (19.1% vs. 10.5%)

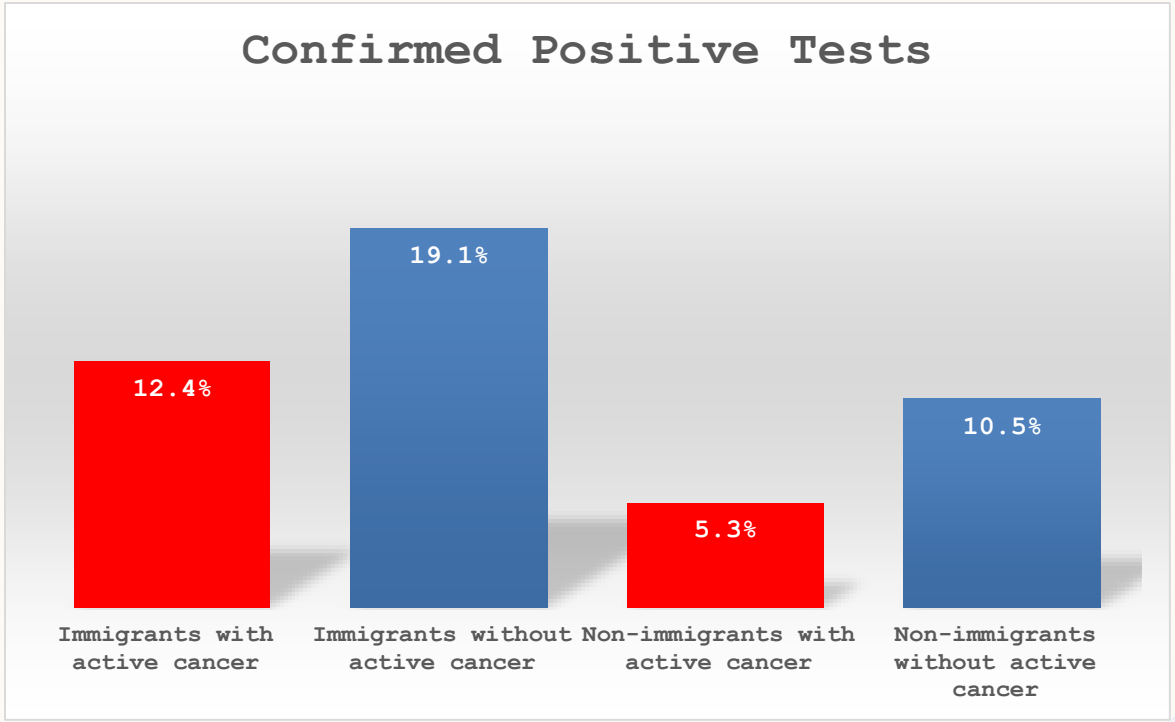
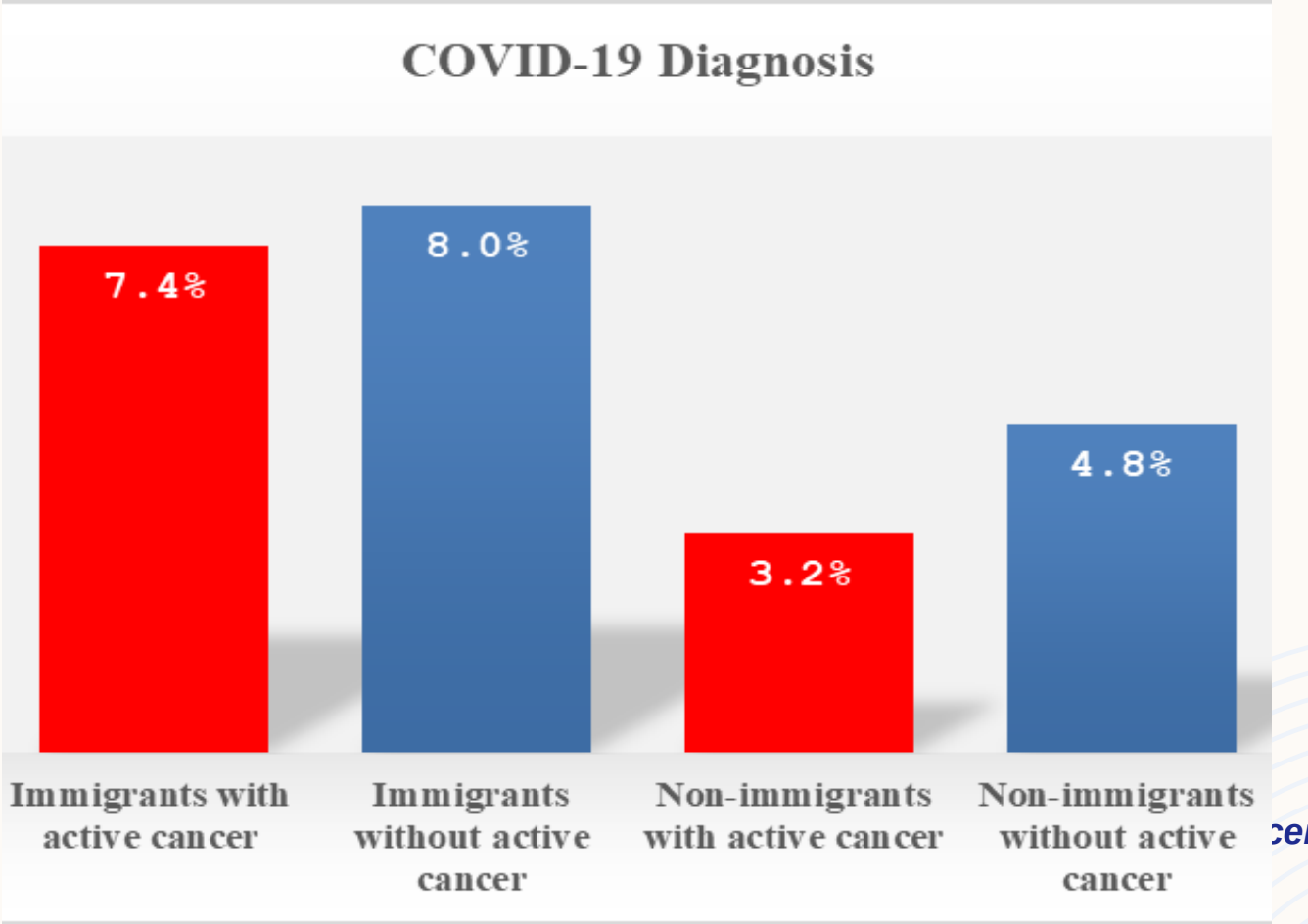


Figure 5: Percent positivity among those tested by immigration and active cancer status

PREVALENCE OF COVID-19 DIAGNOSIS

- The prevalence of COVID-19 diagnosis was significantly higher among immigrants than non-immigrants overall
- Prevalence of COVID-19 was significantly higher among immigrants with active cancer compared to non-immigrants with active cancer (7.4% vs. 3.2%, Std diff=0.19)
- However, the prevalence of COVID-19 was not significantly different among immigrants with or without active cancer (7.4% vs. 8.0%, Std diff= 0.024)



PREVALENCE OF COVID-19 HOSPITALIZATION

- COVID-19 hospitalizations were significantly higher among immigrants living with cancer compared with all other groups

- No significant difference in COVID-19 ICU admission and mortality rates was observed across immigrants and non-immigrants with or without active Cancer.

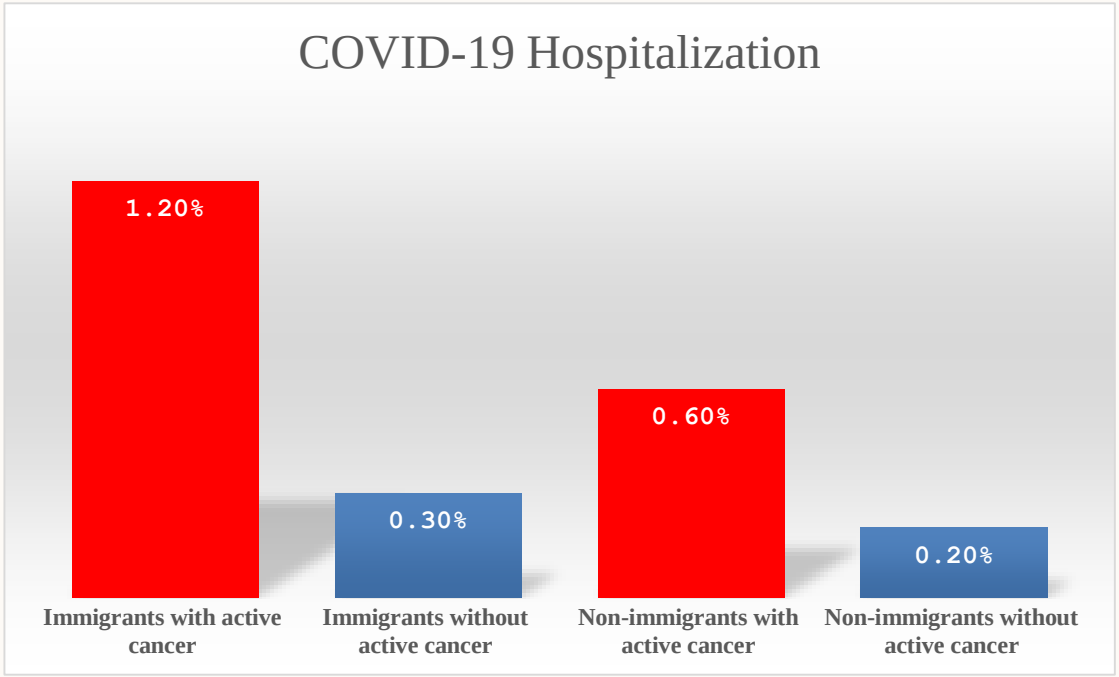
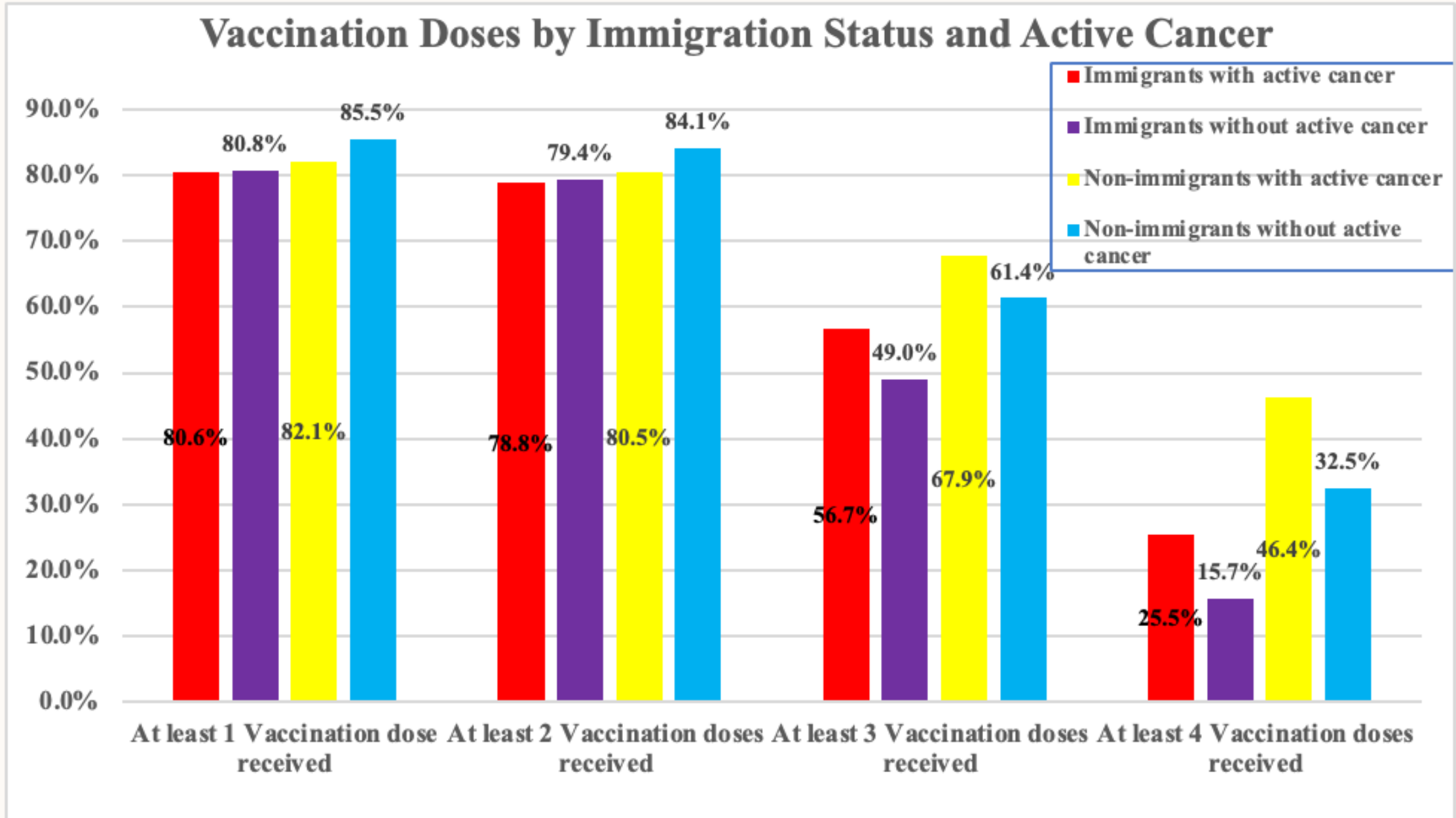


Figure 4: Prevalence of COVID-19 hospitalization by immigrant and active cancer status

Toronto Metropolitan University

WCHRI WOMEN'S COLLEGE HOSPITAL Healthcare REVOLUTIONIZED



LOGISTIC REGRESSION MODELS

Outcomes:

- COVID-19 diagnosis
- Hospitalization
- ICU admission
- COVID-19 related mortality
- COVID-19 vaccination

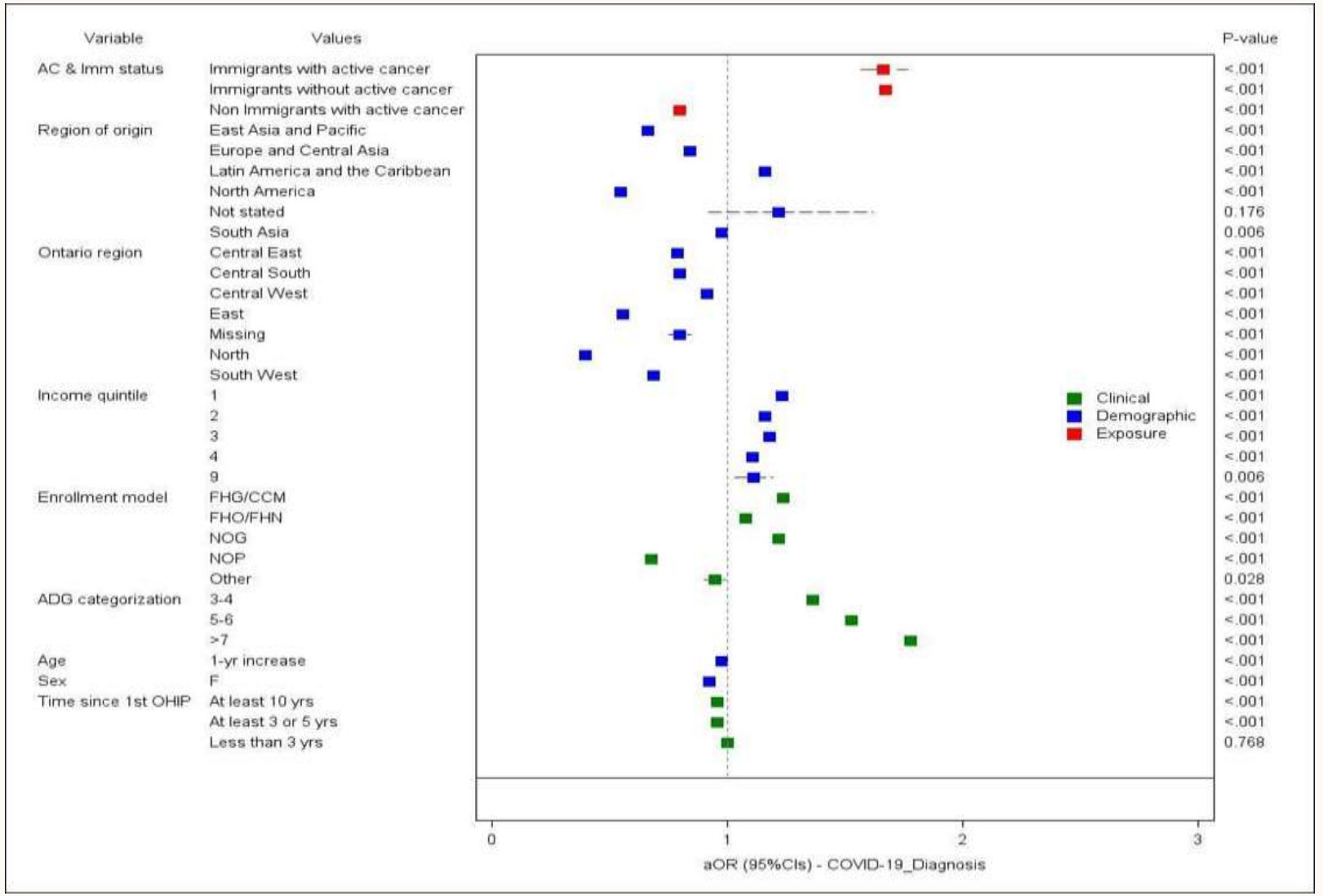
Adjusted for:

- Age
- Sex
- Income,
- Region of origin
- Length of OHIP eligibility time in Ontario
- Region of residence in Ontario
- Number of ADGs (comorbidities)
- Primary Care Patient Enrollment Model

LOGISTIC REGRESSION MODEL RESULTS BY IMMIGRANT STATUS AND CANCER - - **COVID-19 DIAGNOSIS**

Immigrants living with and without cancer **were 66% and 67% more likely to be diagnosed with COVID-19** than non-immigrants without cancer.

Those living in the **lowest-income neighbourhoods were 23% more likely to be diagnosed with COVID-19** compared to the highest-income

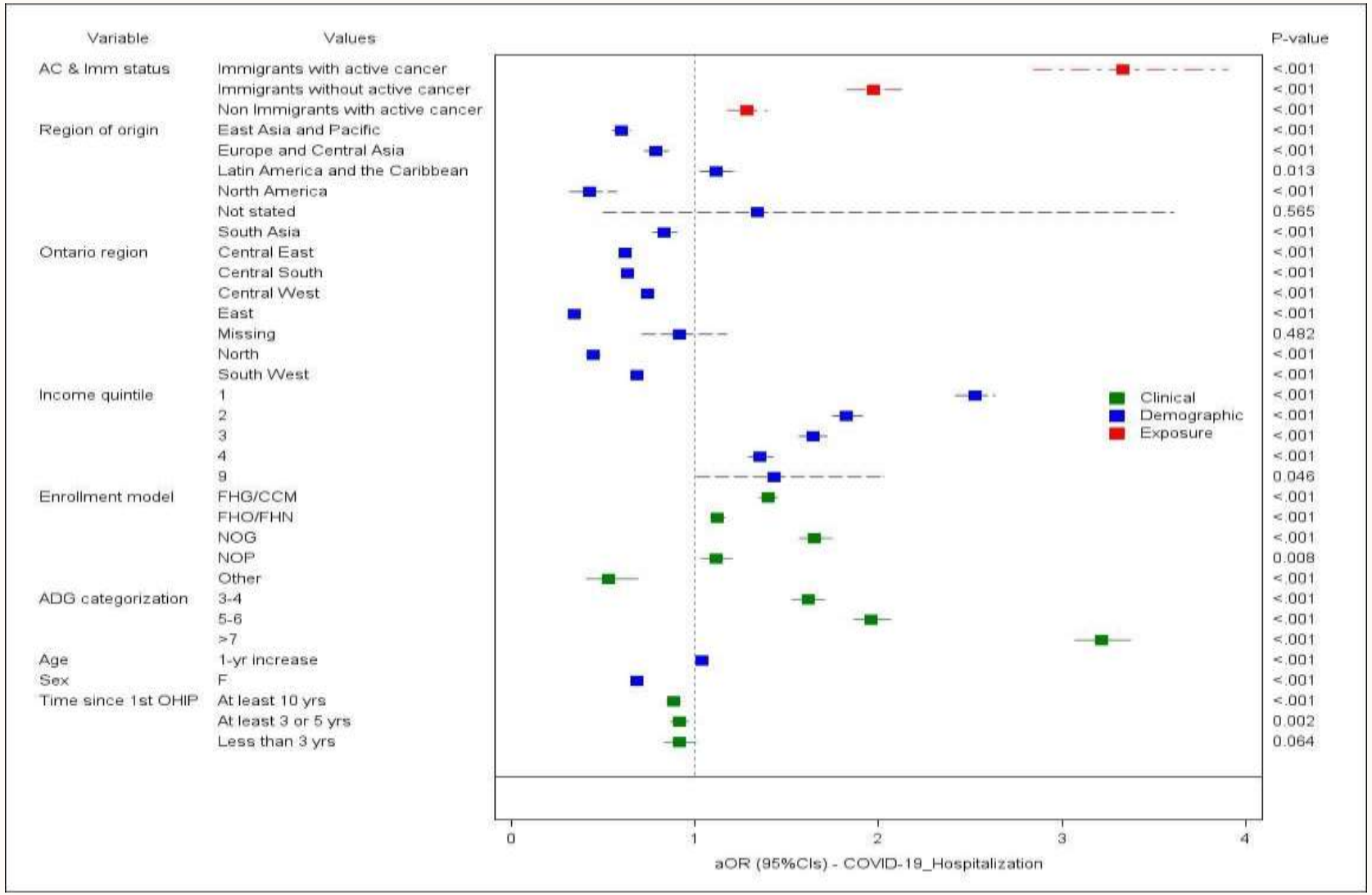


Immigrants from **Latin America and the Caribbean were 16% more likely to be diagnosed with COVID-19** compared to those from Canada

LOGISTIC REGRESSION MODEL RESULTS BY IMMIGRANT STATUS AND CANCER - **COVID-19 HOSPITALIZATION**

Immigrants living with cancer **were almost 3.3 times more likely to be hospitalized** than non-immigrants without cancer.

Immigrants from **Latin America and the Caribbean were 12% more likely to be hospitalized** compared to those from Canada.

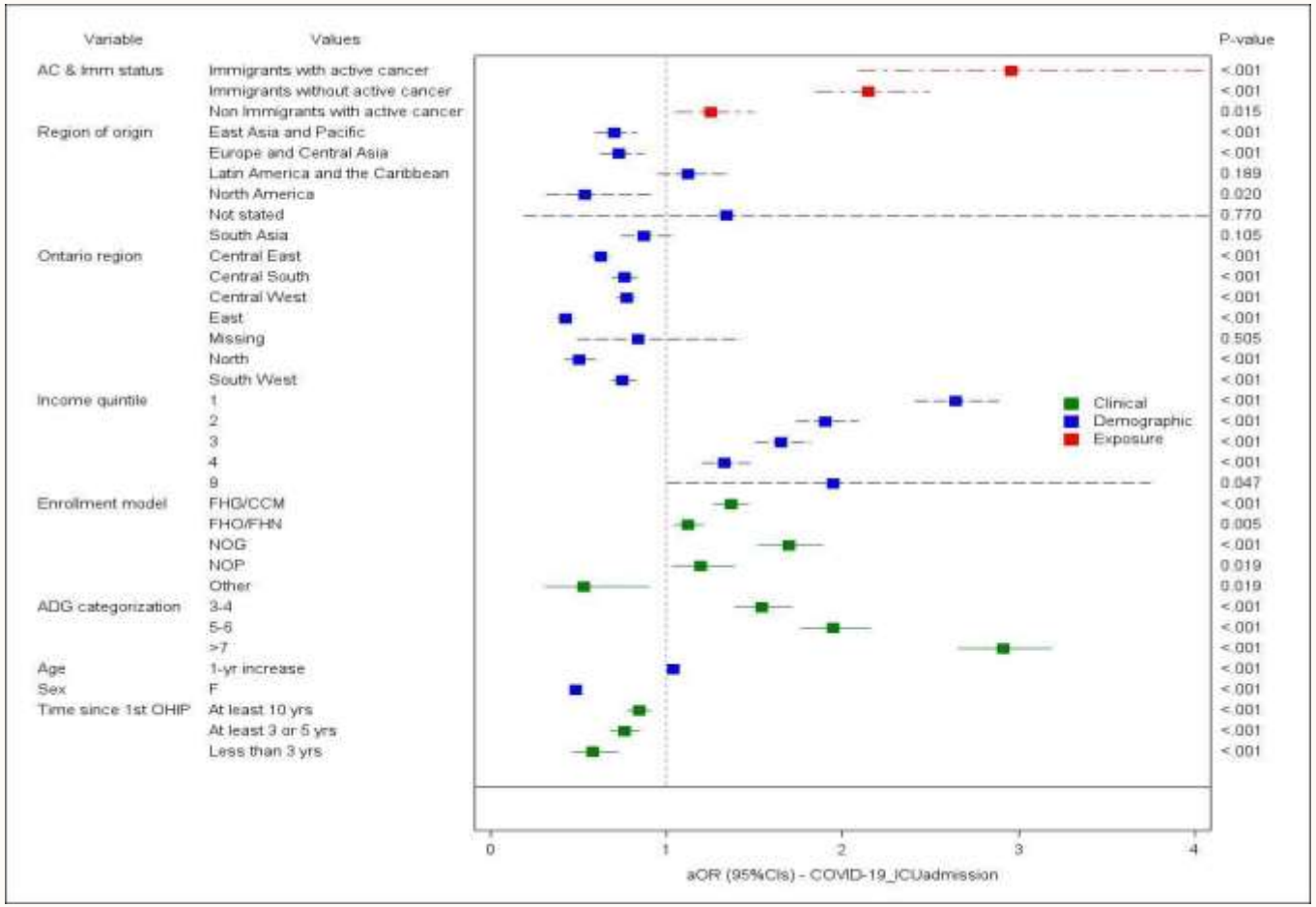


Those living in the lowest-income neighbourhoods were about **2.5 times more likely to be hospitalized** compared to those living in the highest-income neighbourhoods

LOGISTIC REGRESSION MODEL RESULTS BY IMMIGRANT STATUS AND CANCER - COVID-19 ICU ADMISSION

Immigrants living with cancer were almost **3 times more likely to be admitted to ICU** compared to non-immigrants without cancer

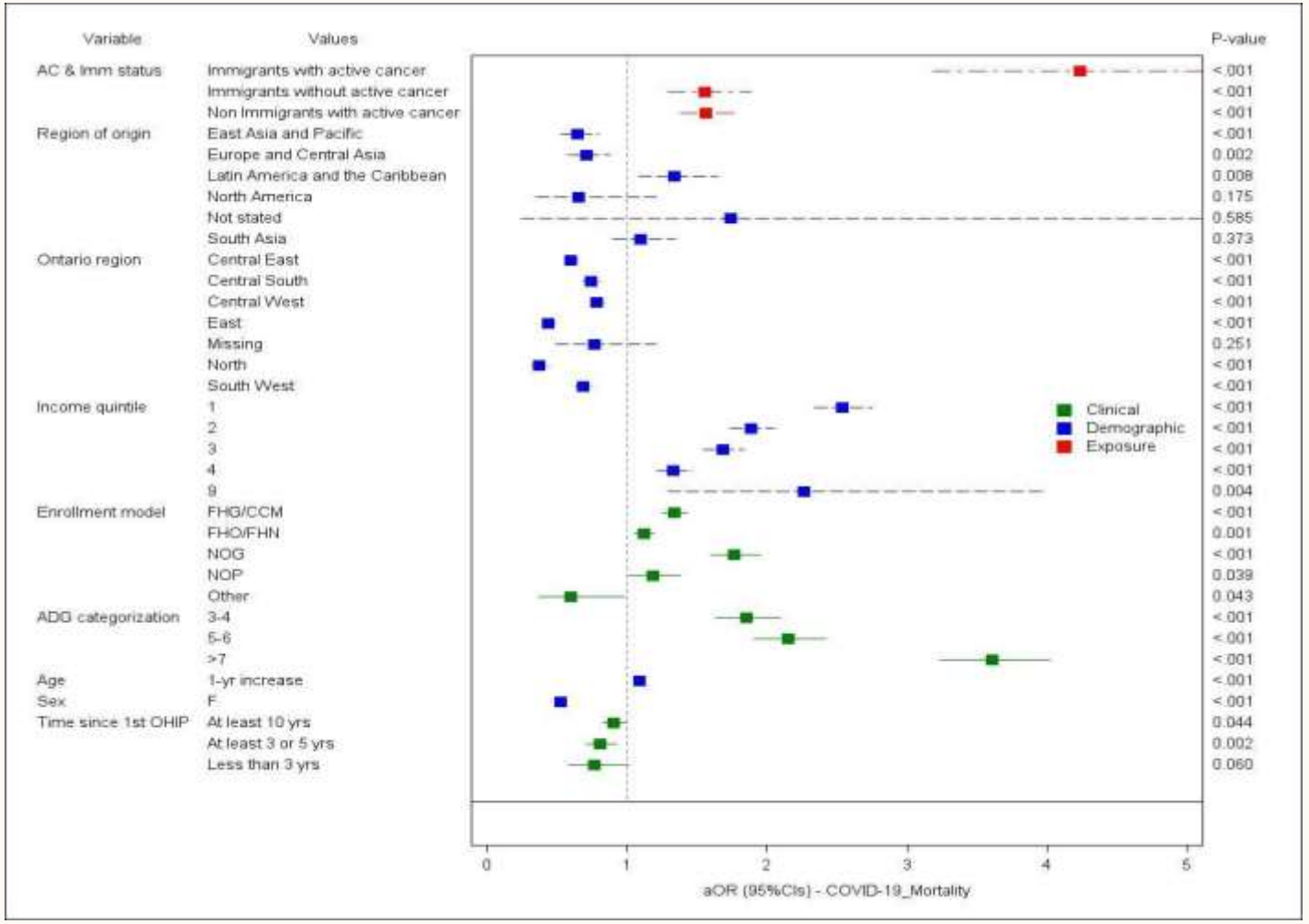
Immigrants from **Latin America and the Caribbean were 12% more likely to be admitted to ICU** compared to those from Canada.



Those living in the **lowest-income neighbourhoods were about 2.5 times more likely to be admitted to ICU** compared to the highest-income neighbourhoods.

LOGISTIC REGRESSION BY IMMIGRANT STATUS AND CANCER - **COVID-19 MORTALITY**

The COVID-19 mortality among immigrants living with cancer was almost **4.2 times more** than non-immigrants without cancer

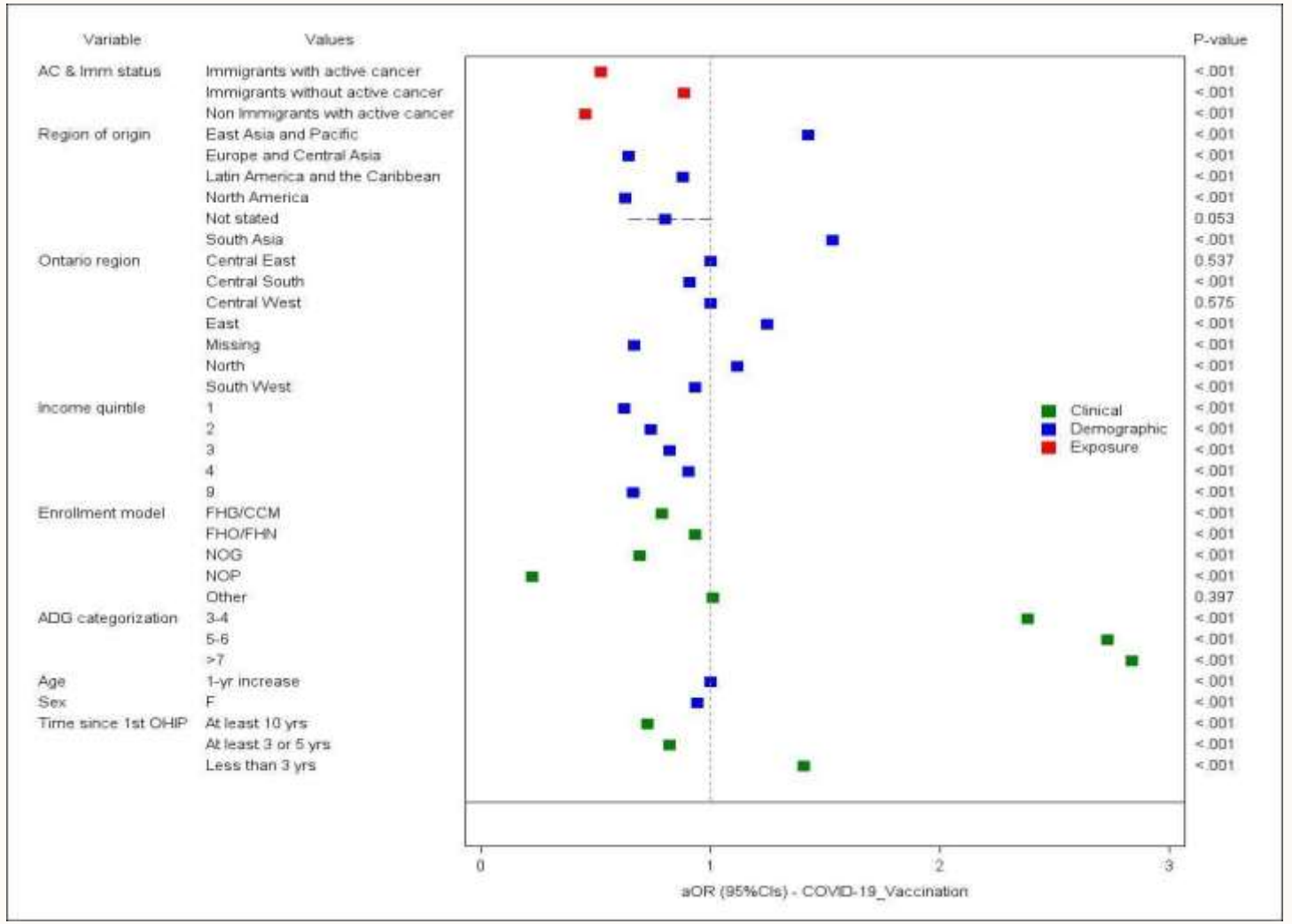


Those living in the lowest-income neighbourhoods were about **2.5 times more likely to die** from COVID-19 compared to the highest-income neighbourhoods

LOGISTIC REGRESSION BY IMMIGRANT STATUS AND CANCER - **COVID-19 VACCINATION**

COVID-19 vaccination among immigrants living with cancer was **48% less** than non-immigrants without cancer.

COVID-19 vaccination among immigrants without cancer was about **11% less** than non-immigrants without cancer



Those living in the **lowest-income** neighbourhoods were about **38% less likely to receive COVID-19 vax** compared to the highest-income neighbourhoods

Those **without a primary care provider** were **78%less** likely to receive vaccination

KEY FINDINGS

Immigrants:

- were worse off socioeconomically than non-immigrants.
- living with cancer were worse off socioeconomically than non-immigrants with or without cancer
- ***Immigrants with cancer generally had worse COVID outcomes in our adjusted models.***
- **What strategies can be taken to avoid this in the future?**

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QUESTIONS?