

**The association of post-COVID-related symptoms
and preceding SARS-CoV-2 infection among fully
vaccinated paramedics in Canada**

Presented By:

Michael Asamoah-Boaheng, PhD

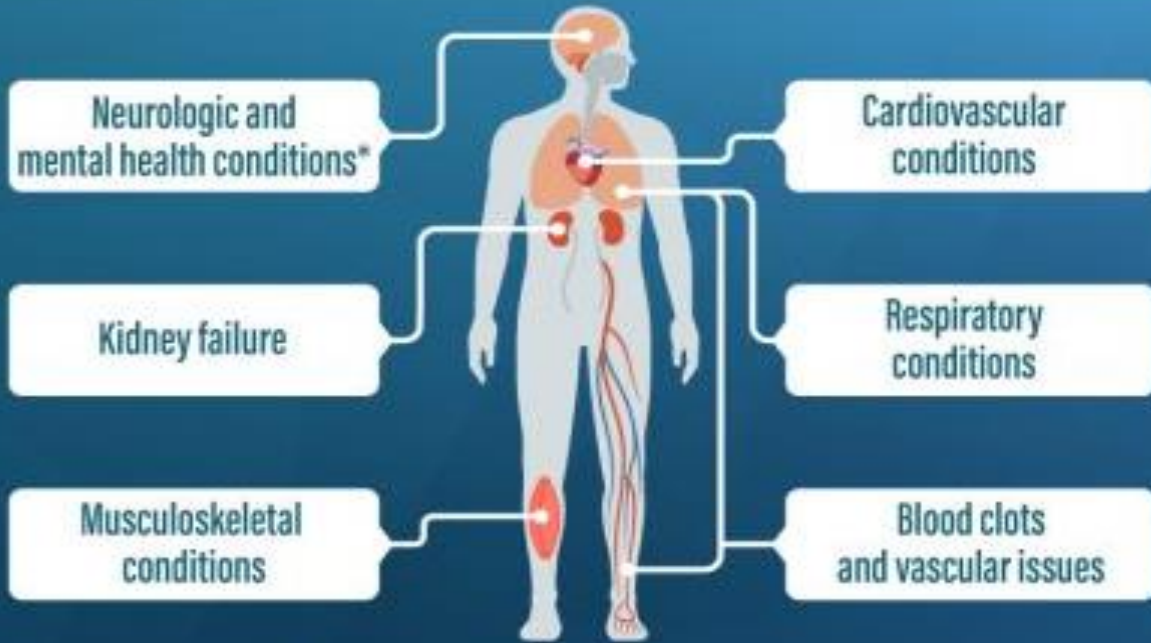
Outline of presentation

- Introduction
- Objectives/Research question
- Methods
- Results
- Conclusion

Introduction

- Most people who develop COVID-19 fully recover, but current evidence suggests approximately 10%-20% of people experience a variety of mid- and long-term effects after they recover from their initial illness.
- These mid- and long-term effects are collectively known as post COVID-19 condition or “long COVID.”

Approximately
1 in 5 adults
ages 18+ have a
health condition
that might be related to
their previous COVID-19
illness, such as:



**Talk to your health care provider
if you have symptoms after COVID-19**



bit.ly/MMWR7121

MAY 24, 2022

* Adults aged 65 and older at increased risk

MMWR

Source: Bull-Otterson et al., 2022; CDC 2023

-
- “Post-COVID conditions” are associated with significant morbidity and may result in occupational absenteeism,—may have large impacts on the health care system.
 - However, post-COVID symptoms, commonly including dyspnea, fatigue, “brain-fog”, and depression, may overlap substantially with non-COVID conditions

Study objective

- To investigate the relationship between Post-COVID-19 related symptoms and preceding SARS-CoV-2 infection among fully vaccinated paramedics in Canada.

Methods


- Study data was obtained from the ongoing CORSIP Canada study.
- Ethics approval obtained from **UBC, UoT & Canadian Blood Services** Research Ethics Boards.
- Participants provided written consent.

- Participants were asked to provide a **blood sample** and **questionnaire data** (including questions of **post-COVID-related symptoms**) on the same date (“study date”), between July 6-September 2022
-

- We excluded participants who:
 - **a)** had received less than two COVID-19 vaccines before the study date;
 - **b)** had COVID-19 (diagnosed by positive PCR or RAT within the preceding 30 days prior to the study date.

- All samples were tested with the Elecsys Anti-SARS-CoV-2 Nucleocapsid assay to identify preceding SARS-CoV-2 infections (“N-seropositive”).
-

Exposure variable:

- SARS-CoV-2 infection was classified into three groups:
 - (a) “*Known prior SARS-CoV-2 infection*” (previous positive polymerase chain reaction [PCR] or rapid antigen test [RAT]);
 - (b) “*Unknown prior SARS-CoV-2 infection*” (N-seropositive, but not aware of serology result and no previous positive PCR/RAT tests).
 - (c) “*No previous SARS-CoV-2 infection*” (N-seronegative and no previous positive PCR/RAT tests).
- (Control group)
- 

Outcome variable

- The primary outcome was the **number of post-COVID-related symptoms**.
-
- Secondary outcomes were a positive screen for “mild” or “moderate-to-severe” depression, using the Patient Health Questionnaire (PHQ-9).

Statistical analysis

- Multivariate negative binomial regression and multinomial logistic regression models were fit to investigate the association.

Results

Association between SARS-CoV-2 Infection Group and risk of post-COVID-related symptoms and positive PHQ-9 mild or moderate/severe depression screen

	Model 1 (Outcome: COVID-Related Symptoms)		Model 2 (Outcome: Mild or Moderate/Severe Depression)			
	Primary Model: Full Cohort	Sensitivity Analysis	Outcome: Mild Depression	Outcome: Moderate/Severe Depression	Sensitivity Analysis Outcome: Mild Depression	Sensitivity Analysis Outcome: Moderate/Severe Depression
SARS-CoV-2 infection Group	IRR (95% CI)	IRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)
No previous SARS-CoV-2 infection	Reference	Reference	Reference	Reference	Reference	Reference
Unknown prior SARS-CoV-2 infection	0.52 (0.26, 1.04)	0.56 (0.28, 1.09)	0.80 (0.48, 1.30)	0.87 (0.51, 1.49)	0.83 (0.51, 1.35)	0.84 (0.50, 1.43)
Known prior SARS-CoV-2 infection	1.40 (0.55, 3.52)	1.62 (0.63, 4.16)	0.80 (0.35, 1.81)	0.81 (0.33, 1.96)	0.85 (0.38, 1.93)	0.76 (0.31, 1.86)

- The study included 883 paramedics: 502 (57%) had a SARS-CoV-2 infection (41% known, 16% unknown).
-

- With reference to the “no previous SARS-CoV-2 infection” group, there was no detected association between “known prior SARS-CoV-2 infection” (IRR 1.40, 95% CI:0.55-3.52), nor “unknown prior SARS-Cov-2 infection” (IRR 0.52, 95% CI:0.26-1.04), and the number of post-COVID-related symptoms.
- The results of the models examining depression outcomes, and all sensitivity analyses, demonstrated similar results.

Conclusion

- Our data, however, is reassuring from an occupational health lens, given that **we did not see an increased risk of post-COVID-related symptoms, or requirement for medical leave**, among paramedics who had been infected with SARS-CoV-2.
- Implementation of COVID-19 prevention strategies, as well as routine assessment for post-COVID conditions among persons who survive COVID-19, is critical to reducing the incidence and impact of post-COVID conditions.

Acknowledgement

- Government of Canada, through the COVID-19 Immunity task Force.

- CORSIP study participants



Paramedic Association of Canada
Association des Paramédics du Canada

Co-authors

- Brian Grunau MD MHSc; David M. Goldfarb MD; Tracy L. Kirkham PhD; Paul A. Demers PhD, Chris MacDonald MSc; & Mohammad Ehsanul Karim PhD.

• **THANK YOU**