

# Vaccine Effectiveness against Omicron hospital admission and severe outcomes:

## a report from the CIRN Serious Outcomes Surveillance Network

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### Introduction

The CIRN Serious Outcomes Surveillance Network has been conducting active surveillance for influenza since 2009. Originally established to support Canada's pandemic preparedness, this established infrastructure was pivoted to inform Canada's COVID-19 response, conducting active surveillance for COVID-19 to describe disease burden and vaccine effectiveness (VE).

### Objective

Here we report VE against hospitalization and severe outcomes during the first Omicron wave (B.A.1), with stratification by age.

### Methods

Patients with laboratory-confirmed COVID-19 and test-negative controls admitted between December 1/2021 - March 31/2022.

Individuals reporting two or more COVID vaccine doses were considered vaccinated. Measures included age, frailty, demographics, vaccination status, ICU admission, and death.

VE against hospital admission was calculated using a test-negative design as 1-Odds of vaccination in cases vs. controls.

Estimates were age-stratified and adjusted for age, sex, frailty, and comorbidity.

VE against the most severe outcomes among individuals admitted with COVID-19 was estimated by comparing the rate ratio of events in vaccinated vs. unvaccinated cases.



### Results: VE against hospitalization

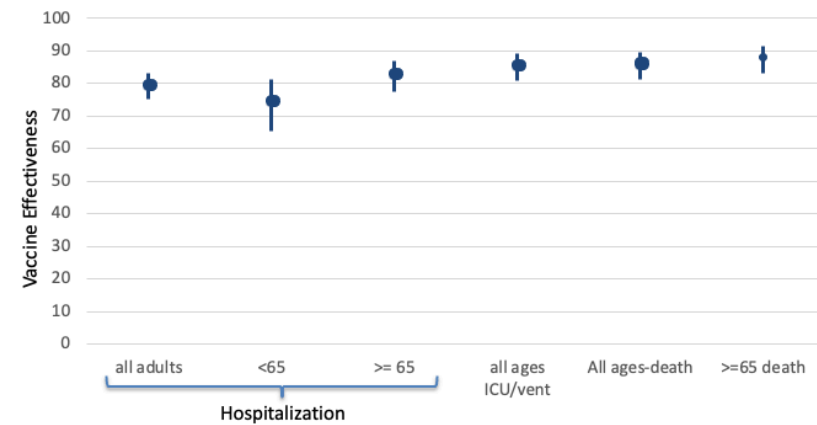
2,991 cases and 1,313 test-negative controls, 46.8% were women  
Mean age was 68.8 ±18.5 years (cases) and 72.8 ±24.9 (controls)  
≥2 COVID-19 vaccines: 64.1% (cases) and 89.3% (controls)

Among those with known frailty status, 46.4% of cases and 54.6% of controls were frail.

ICU admission was experienced by 20.3% of those aged <65 years vs. 10.5% aged 65+; 5.3% vs. 16.4% died.

Adjusted VE against Omicron hospitalization was 79.6% (95%CI 75.1-83.3%) overall and differed slightly according to age: 82.8% (77.6-86.8%) for those 65+ vs. 74.6%(65.4-81.3%) for age <65.

Figure 1. Test negative design VE: hospitalization, ICU & death.



### Conclusions

VE against the Omicron variant-related hospitalization was high and was similar to higher for older vs. younger adults.

Age and frailty are essential factors when interpreting clinical outcomes and VE.

Notably, VE against severe outcomes was also substantial and was not only due to the prevention of hospitalization in the first instance.

### Age stratified VE once already hospitalized

Comparing rate ratios for severe outcomes among already admitted cases, VE was 48% (35-57%) against ICU admission and 24%(3-41%) against death.

Figure 2. Cox regression models for ICU admission. a) <65; b) 65+

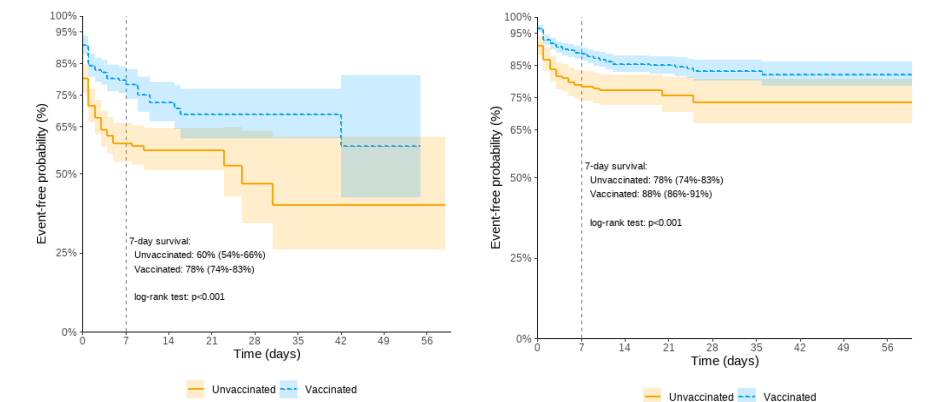
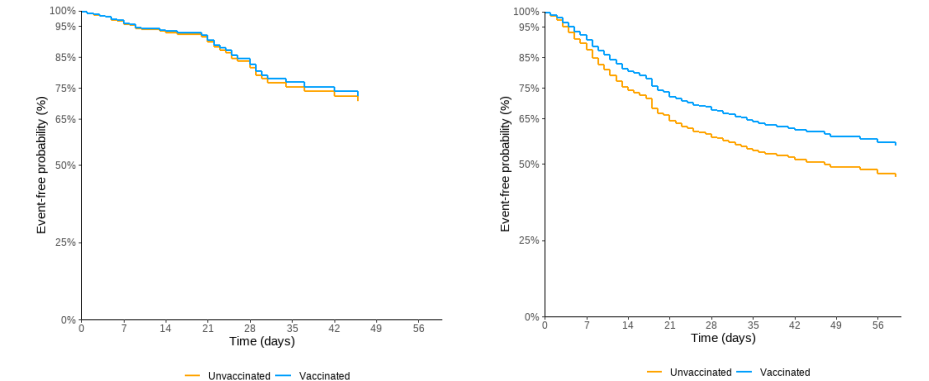


Figure 3. Cox regression models for mortality. a) age <65 b) 65+



### Reference

Andrew MK et al. Older age and frailty are associated with higher mortality but lower ICU admission with COVID-19. Can Geriatr J 2022;25(2):183



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