

# DSEN ABSTRACT

Risk of arterial and venous thromboembolism events among patients with COVID-19: A multi-national collaboration of regulatory agencies from Canada, Europe, and US

*A study conducted by the Canadian Network for Observational Drug Effect Studies (CNODES)*

## Summary

- The risk of ATE and VTE among patients diagnosed with COVID-19 varied by country.
- This variation was observed among patients initially diagnosed in the ambulatory setting and the hospital setting, and before and during COVID-19 vaccine availability.

## Key messages

- Differences in healthcare systems, data sources, prevalence of underlying comorbid conditions, and approaches to COVID-19 and thromboembolism case definition may have contributed to the variation in thromboembolism risk estimates observed between countries.

## Project Lead & Team

- Michael Paterson, MSc and Robert Platt, PhD
- Team members [available here](#)

## Link to publication

- Lo Re et al. Clin Epidemiol 2024;16:71-89.  
<https://doi.org/10.2147/CLEP.S448980>

## What is the issue?

- Cohort studies have suggested that SARS-CoV-2 infection promotes abnormalities in blood coagulation that could lead to arterial thromboembolism (ATE) or venous thromboembolism (VTE).
- Few studies have examined how COVID-19-related thromboembolism risk evolved over time across different countries.

## What was the aim of the study?

- Regulatory agencies from Canada, Europe, and the US established a collaboration to evaluate the risk of ATE and VTE in the 90 days after diagnosis of COVID-19 in ambulatory and hospital settings in the periods before and during vaccine availability.

## How was the study conducted?

- A retrospective cohort study was conducted using routinely collected healthcare data from 7 countries: Canada, England, Germany, Italy, Netherlands, Spain, and the US.
- The study cohorts comprised patients aged 18 years or older initially diagnosed with COVID-19 in the ambulatory setting between April 2020 and December 2021. A secondary analysis was undertaken in patients diagnosed in a hospital setting in Canada, Spain, and the US.
- Patients were followed for 90 days after COVID-19 diagnosis to evaluate the risk of ATE (myocardial infarction or ischemic stroke) or VTE (acute deep venous thrombosis or pulmonary embolism).
- Country-level estimates of absolute risk of ATE and VTE were measured before (through November 2020) and during COVID-19 vaccine availability (after December 2020).

## What did the study find?

- In the period before COVID-19 vaccine availability, about 1 million patients were diagnosed with COVID-19 in the ambulatory setting. The risk of ATE in the 90 days post-infection ranged from 0.11% (Canada) to 1.01% (US), and risk of VTE from 0.23% (Canada) to 0.84% (England).
- About 3.5 million patients were diagnosed with COVID-19 during the period of vaccine availability. The risk of ATE in the 90 days post-infection ranged from 0.06% (England) to 1.04% (US), and the risk of VTE ranged from 0.25% (England) to 1.02% (US).
- Variation in the risk of ATE and VTE across countries also was observed among patients diagnosed with COVID-19 in the hospital setting.
- Differences in healthcare systems, data sources, prevalence of underlying comorbid conditions in the study cohorts, and approaches to COVID-19 and ATE and VTE case definition may have contributed to the variation in thromboembolism risk estimates observed between countries.

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