DARWIN EU® EHDS Use Case: Natural history of coagulopathy in COVID-19 patients and persons vaccinated against SARS-CoV-2 in the context of the OMICRON variant

First published: 03/10/2023

Last updated: 10/03/2026

Study Finalised

Administrative details

EU PAS number

EUPAS106679

Study ID

107276

DARWIN EU® study

Yes

Study countries

Estonia

Germany

Netherlands

Spain

United Kingdom

Study description

The aim of the study is to contextualize the risk of venous and arterial thromboembolic events associated with COVID-19, during the Omicron period, and SARS-CoV-2 vaccination. The research objectives which will be addressed incrementally to support the project aim are to estimate the background incidence rate of venous and arterial thromboembolic events among the general pre-pandemic population, to estimate the incidence rate of venous and arterial thromboembolic events among patients with COVID-19 within 30-, 60-, and 90- and 180-days during the Omicron period, stratified by prior SARS-CoV-2 vaccination and prior infection status, to estimate the incidence rate of venous and arterial thromboembolic events among patients with SARS-CoV-2 vaccination within 30-, 60-, 90- and 180-days, stratified by prior infection status, to estimate the association between clinical risk factors including prior SARS-CoV-2 vaccination on the incidence rate of venous and arterial events among patients with COVID-19 and the impact that thromboembolic events have on worsening severity of COVID-19 during the Omicron period and to estimate incidence rate ratios for venous and arterial thromboembolic events among patients with COVID-19 and people vaccinated against SARS-CoV-2, compared to the background population using incidence rates estimated in objectives 1 to 3.

Study status

Finalised

Research institutions and networks

Institutions

Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina, IDIAPJGol

Spain

First published: 05/10/2012

Last updated: 09/07/2026

Institution | **Educational Institution** | **Laboratory/Research/Testing facility** | **Not-for-profit** | **ENCePP partner**

Networks

Data Analysis and Real World Interrogation Network (DARWIN EU®)

Belgium
Croatia
Denmark
Estonia
Finland
France
Germany
Greece
Hungary

Italy
Netherlands
Norway
Portugal
Spain
Sweden
United Kingdom

First published: 01/02/2024

Last updated: 30/04/2025

Network

Contact details

Study institution contact

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Study contact

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Primary lead investigator

Marti Catala Sabate

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 26/07/2023

Actual: 26/07/2023

Study start date

Planned: 01/12/2021

Actual: 01/12/2021

Date of final study report

Planned: 30/12/2023

Actual: 14/02/2024

Sources of funding

- EMA

Study protocol

Study Protocol P2 C3-001 Version 3.1 final.pdf (994.09 KB)

Regulatory

Was the study required by a regulatory body?

Yes

Is the study required by a Risk Management Plan (RMP)?

Not applicable

Methodological aspects

Study type

Study type list

Study topic:

Disease /health condition

Study type:

Non-interventional study

Scope of the study:

Disease epidemiology

Data collection methods:

Secondary use of data

Study design:

New User Cohorts

Main study objective:

To estimate the background incidence rate of venous and arterial thromboembolic events among the general pre-pandemic population. To estimate the incidence rate of venous and arterial thromboembolic events among patients with COVID-19 within 30-, 60-, and 90- and 180-days during the Omicron period

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Anatomical Therapeutic Chemical (ATC) code

(J07BN) Covid-19 vaccines

Covid-19 vaccines

Population studied

Age groups

- Adults (18 to < 46 years)
- Adults (46 to < 65 years)
- Adults (65 to < 75 years)
- Adults (75 to < 85 years)
- Adults (85 years and over)

Estimated number of subjects

18.890.000

Study design details

Outcomes

Venous thromboembolic events: In the primary analysis, venous thromboembolic events will be identified by diagnostic codes for pulmonary embolism or deep vein thrombosis. Arterial thromboembolic events: In the primary analysis, arterial thromboembolic events will be identified by diagnostic codes for an acute myocardial infarction or acute ischemic stroke.
Venous thromboembolic events: In a secondary analysis pulmonary embolism and deep vein thrombosis will be assessed separately. We will also assess portal vein thrombosis, splanchnic venous thrombosis (SVT) and cerebral venous sinus thrombosis separately. Arterial thromboembolic events: In a secondary analysis acute myocardial infarction and acute ischemic stroke will

be assessed separately.

Data analysis plan

Objective 1 - 3: We will use Poisson models to estimate incidence rates and 95% confidence interval. Overall, age group, and sex specific rates will be reported. Within each age-sex strata, rates by prior COVID-19 diagnosis, prior vaccination status and brand, and whether patients are immunosuppressed will be reported as well when event number is larger than 5 within the strata. Objective 4a: To assess the association between potential risk factors on the incidence of venous and arterial thromboembolic events among patients with COVID-19 during the Omicron period, cause-specific Cox models will be used to calculate hazard ratios for the incidence of venous and arterial thromboembolic events for each of the COVID-19 cohorts. Adjusted models will evaluate potential predictors including age, sex, prior COVID-19 infection status, prior vaccination status and brand, cancer, whether patients were immunocompromised on the index date, prior use of antithrombotics, prior use of corticosteroids.

Documents

Study report

DARWIN EU_P2_C3_001_EHDS_Study_Report_V3.pdf (3.23 MB)

Data management

ENCePP Seal

The use of the ENCePP Seal has been discontinued since February 2025. The ENCePP Seal fields are retained in the display mode for transparency but are no longer maintained.

Data sources

Data source(s)

The Information System for Research in Primary Care (SIDIAP)

Integrated Primary Care Information (IPCI)

Clinical Practice Research Datalink (CPRD) GOLD

IQVIA Disease Analyzer Germany

Estonian Biobank

Data sources (types)

Electronic healthcare records (EHR)

Other

Use of a Common Data Model (CDM)

CDM mapping

Yes

CDM Mappings

CDM name

OMOP

CDM website

https://www.ohdsi.org/Data-standardization/

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

No