Vaccine Effectiveness, Burden and Impact Studies (VEBIS) - Vaccine effectiveness hospital admission with Severe Acute Respiratory Infection

First published: 04/04/2024

Last updated: 03/04/2025

Study Ongoing

Administrative details

EU PAS number

EUPAS1000000099

Study ID

1000000099

DARWIN EU® study

No

Study countries

Belgium

Croatia

Czechia

Hungary
Ireland
Lithuania
Luxembourg
Malta
Portugal
Romania
Spain

Study description

This is a multi-country hospital-based study of vaccine effectiveness against hospitalisation with Severe Acute Respiratory Infection laboratory-confirmed with SARS-CoV-2 or with influenza.

This is a case-control study using a test negative design. The study population consists of individuals of all ages, belonging to the target group for COVID-19 or influenza vaccination, hospitalised with SARI symptoms and no contra-indication for being vaccinated with the vaccine of interest. The study period runs during the influenza circulation season for influenza vaccine effectiveness study.

Study status

Ongoing

Research institutions and networks

Institutions

European Centre for Disease Prevention and Control

EpiConcept

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Contact details

Study institution contact

Nathalie Nicolay vpd.vpd@ecdc.europa.eu

Study contact

vpd.vpd@ecdc.europa.eu

Primary lead investigator

Angie Rose

Primary lead investigator

Study timelines

Date when funding contract was signed

Actual: 13/10/2021

Study start date
Actual: 01/12/2021

Date of final study report
Planned: 31/10/2025

Sources of funding

- Other

More details on funding

Funded by European Centre for Disease Prevention and Control

Study protocol

covid-19-vaccine-effectiveness-sari-protocol-version-2.pdf (4.95 MB)

Regulatory

Was the study required by a regulatory body?

No

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

Not applicable

Methodological aspects

Study type

Study type list

Study topic:

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Effectiveness study (incl. comparative)

Data collection methods:

Primary data collection

Study design:

This is a multi-centre, hospital-based, test-negative, case–control study, using pooled data from several countries.

Main study objective:

The primary objective of this vaccine effectiveness study is:
• To measure, within each European participating country and in a pooled, multi-country analysis, the direct effect (effectiveness) of overall and product-specific COVID-19 vaccines against SARI due to laboratory confirmed SARS-CoV-2 in hospitalised patients, in order to provide up-to-date information on the ability of COVID-19 vaccines to prevent severe disease under real conditions of use.

Study Design

Non-interventional study design

Case-control

Study drug and medical condition

Medicinal product name

COMIRNATY

JCOVDEN

NUVAXOVID

SPIKEVAX

VAXZEVRIA

Study drug International non-proprietary name (INN) or common name

COVID-19 MRNA VACCINE (NUCLEOSIDE-MODIFIED)

COVID-19 VACCINE (RECOMBINANT, ADJUVANTED)

DAVESOMERAN

ELASOMERAN

IMELASOMERAN

RAXTOZINAMERAN

TOZINAMERAN

Anatomical Therapeutic Chemical (ATC) code

(J07BN01) covid-19, RNA-based vaccine

covid-19, RNA-based vaccine

(J07BN02) covid-19, viral vector, non-replicating

covid-19, viral vector, non-replicating

(J07BN04) covid-19, protein subunit

covid-19, protein subunit

Medical condition to be studied

COVID-19

Influenza

Additional medical condition(s)

Severe Acute Respiratory Infection (SARI)

Population studied

Short description of the study population

This hospital-based vaccine effectiveness study was conducted primarily in countries with pre-existing SARI surveillance systems, to facilitate the recruitment of patients. Therefore, the study population comprised individuals of all ages who belonged to the target group for vaccination, were hospitalised with SARI symptoms in participating hospitals/services and had no contraindication for COVID-19 vaccination.

Age groups

- **Paediatric Population (< 18 years)**
  - Preterm newborn infants (0 – 27 days)
  - Term newborn infants (0 – 27 days)
  - Infants and toddlers (28 days – 23 months)
  - Children (2 to < 12 years)
  - Adolescents (12 to < 18 years)
- **Adult and elderly population (≥18 years)**
  - Adults (18 to < 65 years)
    - Adults (18 to < 46 years)
    - Adults (46 to < 65 years)
  - Elderly (≥ 65 years)
    - Adults (65 to < 75 years)
    - Adults (75 to < 85 years)
    - Adults (85 years and over)

Estimated number of subjects

5500

Study design details

Setting

All SARI patients who consented to participate (where this is a requirement) and were not part of the exclusion
criteria were included in the study. Patients were not enrolled in the study if they:

• were unwilling to participate or unable to communicate and give consent (the consent could also have been provided by their legal representative or by specific consent procedures that are acceptable according to the
local ethical review process);

• had a contraindication for the COVID-19 vaccine;

• could not be swabbed due to severe septum deviation, obstruction or other conditions that contraindicate;

or

• had a history of hospitalisation within the 14 days immediately prior to this admission (including transfers from other hospitals).

Patients were not included in this analysis if they:

• were living in a long-term care facility;

• had errors in vaccination dates (e.g. first dose date was later than second dose date) or a non-recommended delay between the doses for two-dose regimens (<21 days for Comirnaty, <28 days for Vaxzevria or
Spikevax);

• had onset of SARI symptoms >3 days after their swab;

• were swabbed >10 days after symptom onset; or

• received the first or second vaccine dose within 14 days of symptom onset.

Comparators

An individual was considered vaccinated against COVID-19 with a product-specific vaccine under the following
categories:

• Fully vaccinated with the primary series (two-dose vaccine): patients were considered fully vaccinated if they received both doses at least 14 days* before symptom onset (whether homologous or heterologous vaccine products were received).
• Fully vaccinated with the primary series (single-dose vaccine): patients were considered fully vaccinated if they received one dose at least 14 days* before symptom onset.
• Fully vaccinated with the primary series plus booster: patients were considered fully vaccinated with the primary series plus booster if they were fully vaccinated (according to the definitions above), followed by a booster dose at least 14 days* before symptom onset.
• Partially vaccinated (two-dose vaccine): patients were considered partially vaccinated if they received only one of the two primary series doses at least 14 days* before symptom onset or received the second dose on the same day as or after symptom onset.
• Unvaccinated: patients were considered unvaccinated if they did not receive a COVID-19 vaccine or if they were vaccinated on the same day as or after symptom onset.
The period between December 2021 and September 2022 was used as a proxy for the Omicron-dominant period, using GISAID data to define week numbers for each participating country when ≥80% or <80% sequenced samples belonged to the Omicron variant.

Outcomes

The outcome of interest for the primary analysis was SARS-CoV-2 infection that was laboratory confirmed by RT-PCR (documented either on admission to hospital or within 14 days before admission) in patients of all ages who were hospitalised with SARI symptoms

---

Data analysis plan

The vaccine effectiveness estimated in this analysis was among hospitalised SARI patients aged 20 years and older, who were swabbed between 20 December 2021 and 30 September 2022. Vaccine effectiveness for fully vaccinated with the primary series plus booster was calculated relative to unvaccinated patients. Relative vaccine effectiveness for fully vaccinated with the primary series plus booster was calculated relative to patients who were fully vaccinated with the primary series (single or two-dose vaccination). Vaccine effectiveness is calculated as 1 minus the odds ratio (OR), where the OR is estimated from logistic regression (OR is the ratio of the odds of being vaccinated among cases over the odds of being vaccinated among controls). Study site (country) was included in the logistic regression as a fixed effect, with date of swab modelled as swab month (as a categorical variable) or as a restricted cubic spline of swab date. Additional adjustments included sex, age group (as a categorical variable), and at least one of four commonly collected chronic conditions (diabetes, heart disease, lung disease and asthma). For the age-specific vaccine effectiveness estimates, SARI patients were stratified into three age groups: 20–59 years, 60–79 years and ≥80 years. For time-since vaccination-specific vaccine effectiveness estimates, vaccinated SARI patients were stratified into 14-59 days, 60-119 days, 120-179 days, 180-239 days and 240-299 days since booster dose vaccination.
To avoid sparse data bias, vaccine effectiveness estimates were not calculated where the total number of vaccinated cases and controls was fewer than 20.

Documents

Interim analysis of COVID-19 vaccine effectiveness against Severe Acute Respira...

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.

Use of a Common Data Model (CDM)

CDM mapping

No

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

Not applicable