A Non-Interventional Post-Approval Safety Study of Pfizer-BioNTech COVID-19 Vaccine in the United States

First published: 19/10/2021

Last updated: 02/06/2026

Study Finalised

Administrative details

EU PAS number

EUPAS43468

Study ID

48132

DARWIN EU® study

No

Study countries

United States

Study description

This study will use a retrospective cohort design of individuals with concurrent unexposed comparators. The study will compare the incidence of safety events among individuals who have received a first, second, or third dose in a primary series of Pfizer-BioNTech COVID-19 Vaccine with that among individuals who have no record of any COVID-19 vaccine in a concurrent time period. Additionally, in individuals aged 5 years and older who have received 2 doses in a primary series of Pfizer-BioNTech COVID-19 Vaccine, the incidence of safety events among individuals who have received a third dose (either as an additional dose in a primary series or as an initial booster dose) of the vaccine more than 2 months after the second dose will be compared with that among individuals who have not received a third dose of any COVID-19 vaccine. Finally, the study will compare the prevalence of birth outcomes (including major congenital malformations and small size for gestational age) in infants born to pregnant women who have received at least 1 dose of Pfizer-BioNTech COVID-19 Vaccine during an exposure window of interest with that among infants born to pregnant women who have not received any COVID-19 vaccine during the exposure window of interest. The source population for this study will be health plan enrollees from 5 data research partners that contribute data from claims and electronic health records to the Sentinel System: CVS Health/Aetna, HealthCore/Anthem, HealthPartners, Humana, and Optum. Safety events of interest will be identified in claims and electronic health records (where available) using predefined algorithms based on diagnosis codes, with procedure and/or pharmacy dispensing codes as appropriate.

Study status

Finalised

Research institutions and networks

Institutions

Pfizer

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Harvard Pilgrim Health Care Institute

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Institution

Contact details

Study institution contact

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Study contact

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Primary lead investigator

Nana Koram

Primary lead investigator

Study timelines

Date when funding contract was signed
Planned: 05/11/2020

Actual: 05/11/2020

Study start date
Planned: 30/06/2022

Actual: 17/06/2022

Date of final study report
Planned: 31/03/2026

Actual: 30/01/2026

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

Pfizer

Study protocol

C4591009_PROTOCOL_19AUG2021 (1).pdf (3.62 MB)

C4591009_PROTOCOL AMENDMENT 3_V4_30JUN2023.pdf (2.16 MB)

Regulatory

Was the study required by a regulatory body?

Yes

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

EU RMP category 3 (required)

Methodological aspects

Study type

Study type list

Study topic:

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Drug utilisation

Safety study (incl. comparative)

Data collection methods:

Combined primary data collection and secondary use of data

Study design:

Retrospective cohort design of individuals with concurrent unexposed comparators

Main study objective:

To estimate the relative risk of safety events of interest (including myocarditis/pericarditis) following receipt of a first, second, or third dose in a

primary series of Pfizer-BioNTech COVID-19 Vaccine compared with no receipt of any COVID-19 vaccine within the overall study population and subgroups of pregnant women, immunocompromised individuals, and individuals with a history of COVID-19.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medicinal product name, other

Pfizer-BioNTech BNT162b2(original monovalent) COVID-19 Vaccine

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Anatomical Therapeutic Chemical (ATC) code

(J07BN01) covid-19, RNA-based vaccine

covid-19, RNA-based vaccine

Medical condition to be studied

COVID-19 immunisation

Population studied

Age groups

- 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)
- 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)

Special population of interest

Immunocompromised

Pregnant women

Estimated number of subjects

1

Study design details

Setting

The source population for this study will be health plan enrollees from 5 data research partners that contribute data from claims and electronic health records to the Sentinel System: CVS Health/Aetna, Carelon Research, HealthPartners, Humana, and Optum.

Outcomes

Adverse events of special interest as listed in the protocol, Among the overall study population and subgroups of interest: the proportion of individuals receiving the Pfizer-BioNTech COVID-19 vaccine, stratified by number of doses, timing and type of second/third doses, demographics and comorbidities.

Data analysis plan

Descriptive analysis will report on utilization of Pfizer-BioNTech COVID-19 Vaccine during the overall study period and in sequential increments of time. Characteristics of the matched and unmatched cohorts will be shown in a table. Vaccinated individuals will be matched to concurrent unexposed comparators. Confounding will be addressed through propensity score matching or through the inclusion of propensity scores in exposure-outcome regression models. In each data source, crude measures of incidence or prevalence of the study outcomes with associated 95% confidence intervals (CIs) will be estimated within the matched exposed and unexposed cohorts. Cox models or Poisson regression will be used to estimate risk ratios and 95% CIs for general safety events in the overall population and subgroups of interest. Sensitivity analyses will incorporate a self-controlled risk interval design or a cohort design with historical comparators in a period before the introduction of COVID-19 vaccines.

Documents

Abstract of study report

c4591009-final-abstract.pdf (726.62 KB)

Study report

c4591009-final-report-body.pdf (11.12 MB)

Study, other information

C4591009_PROTOCOL AMENDMENT 2_V3_07JUL2022.pdf (4.63 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), other

5 data research partners, including data from 4 national insurers (CVS Health/Aetna, Carelon Research [formerly HealthCore/Anthem], Humana, and Optum) and 1 regional insurer (HealthPartners). Each data research partner is a participant in the FDA Sentinel System.

Data sources (types)

Administrative healthcare records (e.g., claims)

Electronic healthcare records (EHR)

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

No