



## Risk Assessment of 32 Adverse Effects of Special Interest Following COVID-19 Vaccination in the French population

C Dureau-Pournin<sup>1</sup>, MA Bernard<sup>1</sup>, J Jové<sup>1</sup>, P Blin<sup>1</sup>, NH Thurin<sup>1</sup>

<sup>1</sup>Bordeaux Pharmacovigilance Epidemiology, INSERM CIC-P 1401, Université de Bordeaux, France



Inserm



CAIRO 2025  
ANNUAL MEETING



24<sup>th</sup> ISoP Annual Meeting  
Pharmacovigilance: Back to the Future

Cairo, Egypt  
October 24-27, 2025



# DISCLAIMER

This study has been labeled as a National Research Priority by the National Orientation Committee for Therapeutic Trials and other researches on COVID-19 (CAPNET).

The investigators would like to acknowledge

- the ANRS | Emerging infectious diseases for their scientific support,
- the French Ministry of Health and Prevention and the French Ministry of Higher Education, Research and Innovation for their funding and support.

The authors declare that they have no conflict of interest related to this presentation

The content of this presentation has been developed authentically, without any involvement of artificial intelligence tools or automated content generators.

The views expressed in this presentation reflect the personal views of the author and do not necessarily reflect the official positions of the author's employer, ISoP, or any other organization with which the author may be affiliated or collaborating with.

# INTRODUCTION

- Vaccines against COVID-19 have been administered to hundreds of millions of individuals globally
- Numerous studies have assessed their safety, frequently in response to alerts from health authorities
- Several safety signals identified in published case reports have yet to be systematically investigated

# OBJECTIVE

- To assess the risk of 32 acute adverse events of special interest (AESI), prespecified by the European Medicines Agency<sup>1</sup>, following COVID-19 vaccination in the French population

<sup>1</sup>European Medicines Agency. Consideration on core requirements for RMPs of COVID-19 vaccines. coreRMP19 guidance v3.1. EMA/PRAC/709308/2022. 2022

# METHODS

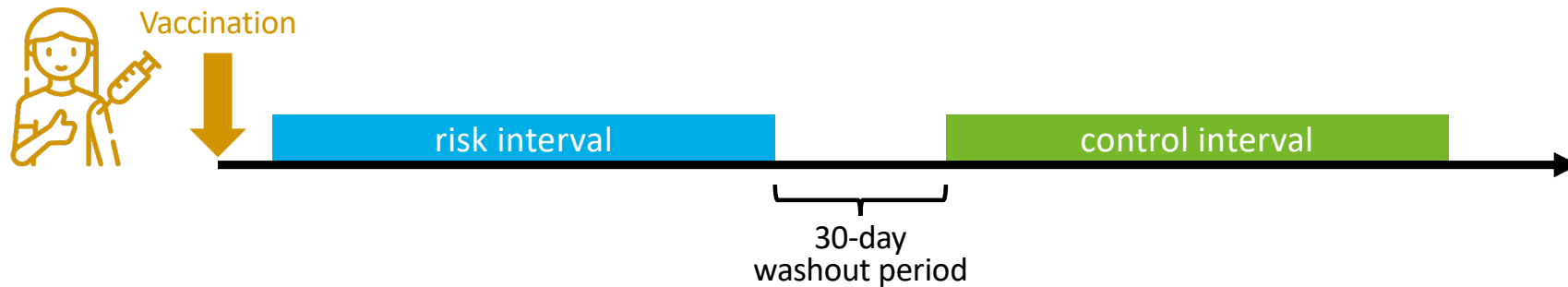
# DATA SOURCES

Extraction of patients with  $\geq 1$  AESI and  $\geq 1$  dose of COVID-19 vaccine in 2021 from

- **French National Healthcare Data System (SNDS)**  $f \leq 1.5/100\ 000$ 
  - 67 million individuals covered lifelong
  - National claims (drug dispensing, visits, procedures, etc.)
  - Hospital discharge summaries
  - Cause of death
- **10% SNDS sample**  $f > 1.5/100\ 000$

# DESIGN

- Self-controlled risk interval



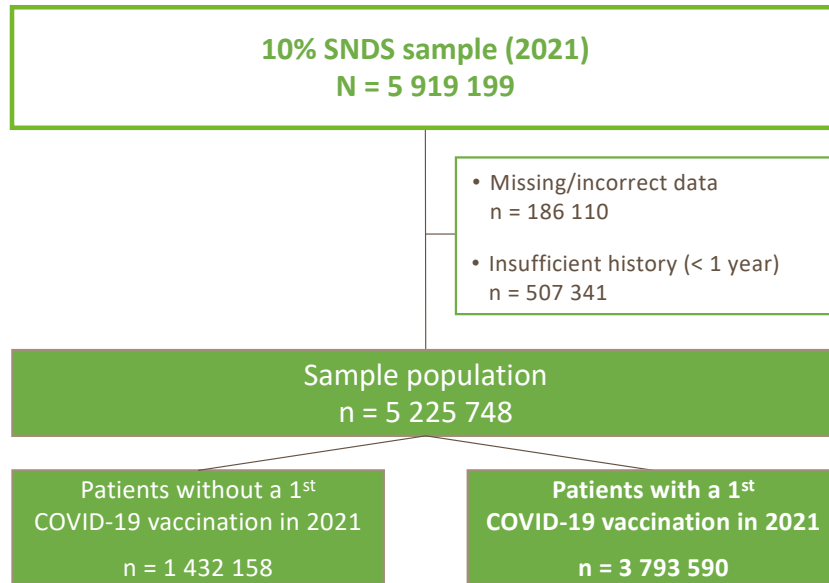
- AESI-specific intervals
- Risk interval = control interval, unique for a patient
- Incidence rate ratios (IRR) estimated using conditional Poisson regression
- $IRR = \text{incidence rate}_{\text{risk interval}} / \text{incidence rate}_{\text{control interval}}$

# ANALYSES

- **Exposure**
  - All COVID-19 vaccines considered individually
  - Stratified by platform : mRNA, adenoviral vector
- **Outcomes**
  - 32 AESI across auto-immune, cardiovascular, hematological, metabolic or neurological outcomes, including death and COVID-19 positive test or hospitalization
  - Rare  $f \leq 1.5/100\ 000$  and non-rare  $f > 1.5/100\ 000$
- **Stratifications**
  - Age-classes, immunocompromised status, pregnancy status, etc.

# RESULTS

# VACCINATED POPULATION



**Figure 1. Identification and selection of the populations from the 10% SNDS sample**

**Table 1. Characteristics of the patients with a 1<sup>st</sup> COVID-19 vaccination in 2021, 10% SNDS sample**

	Male n= 1 811 482	Female n= 1 982 108	Total n= 3 793 590
<b>Sex, %</b>	47.8	52.2	100.0
<b>Age, median (years)</b>	48.0	50.0	49.0
<b>Number of comorbidities*, %</b>			
0	49.0	41.2	45.0
1	27.8	30.9	29.4
2	14.3	17.5	15.9
≥ 3	8.8	10.5	9.7
<b>COVID-19 vaccine, % (2021)</b>	100.0	100.0	100.0
mRNA BNT162b2	77.6	79.0	78.3
mRNA-1273	11.3	10.9	11.1
Adenoviral-vector ChAdOx1	9.0	8.2	8.6
Ad26.COVS.S	2.1	1.9	2.0

\* During the 4-year pre-index period among the following comorbidities: cancer, chronic kidney disease, chronic liver disease, chronic respiratory disease, cardio/cerebrovascular disease, obesity, down syndrome, mental health disease, sickle cell disease, diabetes, immunodeficiency (including HIV)

# ELIGIBLE POPULATIONS

# ELIGIBLE POPULATIONS

## FOR NON-RARE AESI

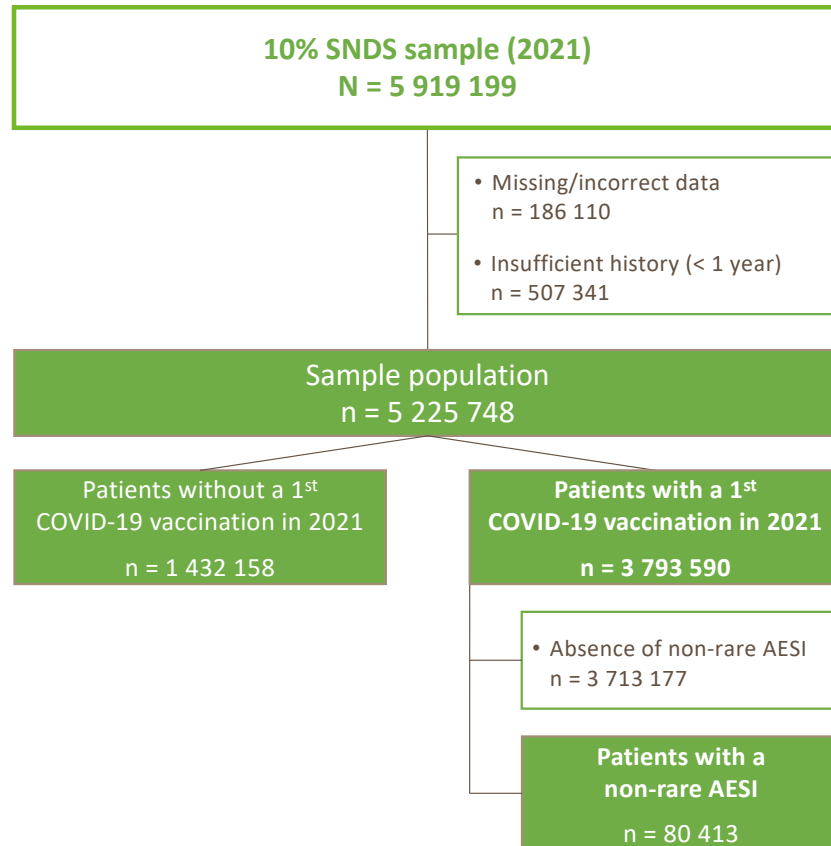


Figure 1. Identification and selection of the populations from the 10% SNDS sample

# ELIGIBLE POPULATIONS

## FOR NON-RARE AESI

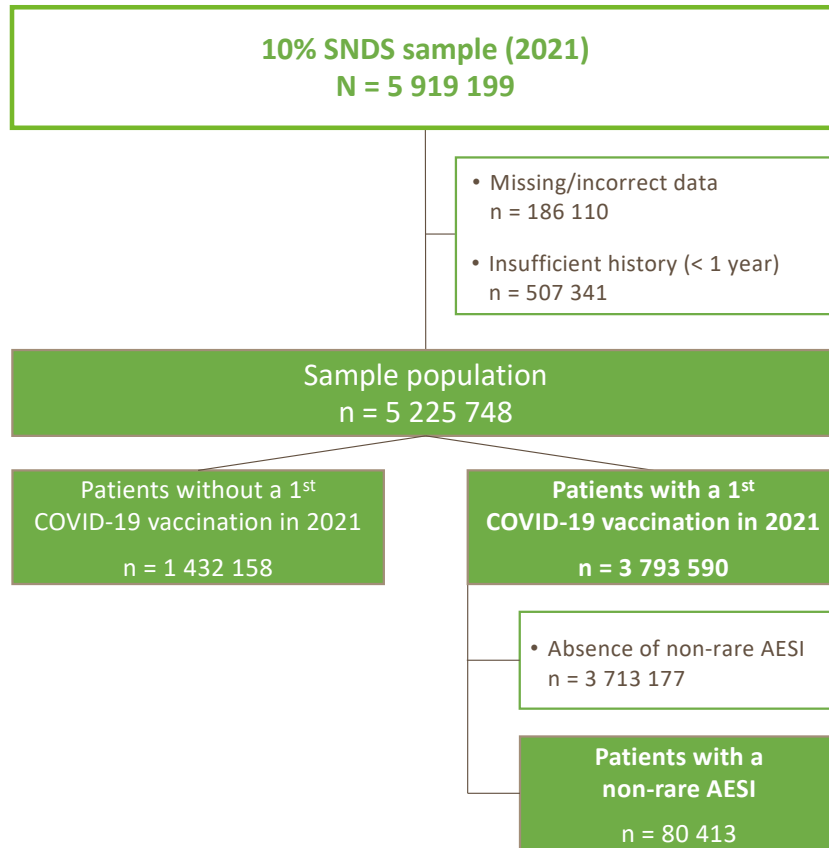


Figure 1. Identification and selection of the populations from the 10% SNDS sample

## FOR RARE AESI

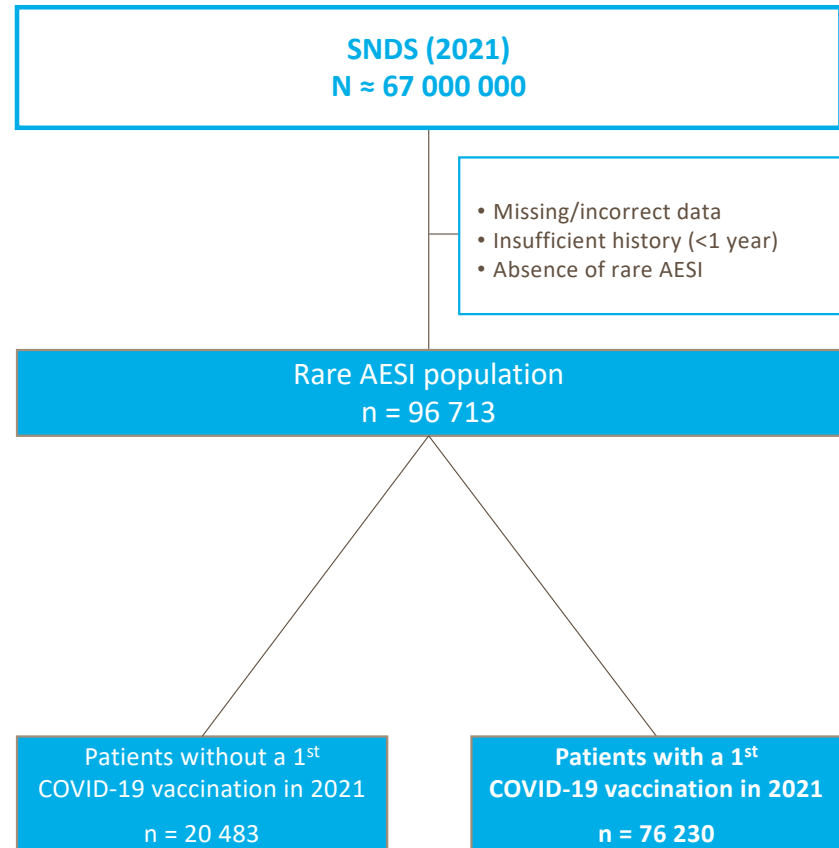


Figure 2. Identification and selection of the population with at least one rare AESI in the full SNDS database

# AESI INCIDENCE RATE RATIO (IRR) FROM MRNA AND ADENOVIRAL-VECTOR COVID-19 VACCINES

**Table 2.1. Incidence rate ratios (IRR) comparing the AESI incidence rates between risk and control intervals from the sample or the rare AESI populations, stratified by type of vaccine – Conditional Poisson regression models**

AESI type	mRNA vaccines IRR [95% CI]	Adenoviral-vector vaccines IRR [95% CI]
<i>Auto-immune diseases</i>		
Guillain-Barré Syndrome	0.94 [0.49 ; 1.83]	3.00 [0.61 ; 14.86]
<b>Acute disseminated encephalomyelitis</b>	<b>10.00 [1.28 ; 78.12]</b>	1.00 [0.06 ; 15.99]
Kawasaki disease	-	-
Thrombocytopenia	1.12 [0.81 ; 1.54]	2.50 [0.49 ; 12.89]
<i>Cardiovascular system: Acute cardiovascular injury</i>		
<b>Microangiopathy</b>	<b>1.41 [1.01 ; 1.97]</b>	3.50 [0.73 ; 16.85]
Heart failure	1.00 [0.92 ; 1.09]	0.96 [0.68 ; 1.34]
Coronary artery disease (CAD)	1.11 [0.99 ; 1.26]	0.94 [0.64 ; 1.38]
Arrhythmia	1.00 [0.92 ; 1.09]	1.22 [0.93 ; 1.60]
<b>Myocarditis or Pericarditis</b>	<b>1.95 [1.41 ; 2.69]</b>	1.17 [0.39 ; 3.47]
<b>Myocarditis alone</b>	<b>3.51 [3.02 ; 4.08]</b>	1.42 [0.68 ; 2.97]
<i>Circulatory system: Coagulation disorder</i>		
<b>Disseminated intravascular coagulation (DIC)</b>	<b>2.08 [1.07 ; 4.03]</b>	-
VTE	1.13 [0.98 ; 1.32]	1.30 [0.76 ; 2.25]
Thrombotic microangiopathy	1.20 [0.81 ; 1.77]	1.50 [0.25 ; 8.98]
<b>Hemorrhagic stroke</b>	<b>1.32 [1.05 ; 1.66]</b>	1.40 [0.62 ; 3.15]
Ischemic stroke	1.07 [0.96 ; 1.20]	1.00 [0.71 ; 1.41]
<b>Cerebral venous sinus thrombosis (CVST)</b>	<b>1.87 [1.31 ; 2.67]</b>	<b>3.20 [1.17 ; 8.73]</b>
Thrombotic thrombocytopenia syndrome	-	-
Single Organ Cutaneous Vasculitis	1.20 [0.89 ; 1.61]	1.33 [0.56 ; 3.16]

 Sample Population

 AESI Population

**Table 2.2. Incidence rate ratios (IRR) comparing the AESI incidence rates between risk and control intervals from the sample or the rare AESI populations, stratified by type of vaccine – Conditional Poisson regression models**

AESI type	mRNA vaccines	Adenoviral-vector vaccines
	IRR [95% CI]	IRR [95% CI]
<b><i>Nerves and central nervous system</i></b>		
Bells' palsy	1.00 [0.49 ; 2.05]	-
Generalized convulsion	1.13 [0.89 ; 1.44]	0.69 [0.30 ; 1.62]
Meningoencephalitis	1.16 [0.96 ; 1.40]	1.24 [0.65 ; 2.34]
Transverse myelitis	0.83 [0.36 ; 1.93]	1.00 [0.06 ; 15.99]
<b><i>Skin and mucous membrane, bone and joints system</i></b>		
Erythema multiforme	2.50 [0.78 ; 7.97]	-
Chilblain – like lesions	2.00 [0.50 ; 8.00]	-
Rhabdomyolysis	1.34 [1.03 ; 1.74]	1.00 [0.48 ; 2.10]
Severe Cutaneous Adverse Reactions (SCARs)	-	-
<b><i>Other system</i></b>		
Acute respiratory distress syndrome	1.19 [0.84 ; 1.70]	1.14 [0.41 ; 3.15]
Acute pancreatitis	1.12 [0.90 ; 1.40]	2.14 [0.87 ; 5.26]
Anosmia ageusia	0.92 [0.40 ; 2.08]	-
Anaphylaxis	6.00 [0.72 ; 49.84]	-
MISC-C	-	-
<b><i>Death</i></b>		
<b>Death (any causes)</b>	<b>0.10 [0.08 ; 0.12]</b>	<b>0.08 [0.04 ; 0.19]</b>
Sudden death	0.75 [0.17 ; 3.35]	-
<b><i>COVID-19</i></b>		
<b>Positive test or hospitalization</b>	<b>1.11 [1.09 ; 1.12]</b>	<b>1.51 [1.40 ; 1.62]</b>

 Sample Population

 AESIr Population

# CONCLUSION

- Analyses relying on a nationwide database of 67 million individuals
- Safety signals linked to COVID-19 vaccines warrant further investigation
- Design does not allow to draw strong conclusion at this stage:
  - SCRI design does not allow risk quantification
  - Overlap between the risk interval and the timeframe when individuals are more vulnerable to contracting COVID-19
- Comparative cohort studies are ongoing to clarify signals and provide reliable risk quantification.

# Thank you



**Bordeaux PharmacoEpi** - <http://www.pharmacoepi.eu>  
**Plateforme de recherche en Pharmaco-épidémiologie**

CIC Bordeaux CIC1401

INSERM - Université de BORDEAUX - CHU de Bordeaux - Adera

Bâtiment Le Tondu - case 41 - 146 rue Léo Saignat - CS 61292 - 33076 Bordeaux Cedex

Acc. +33 (0)5 57 57 46 75 – Fax +33 (0)5 57 57 47 40

