Addressing heterogeneity across European electronic healthcare data sources: background rates of adverse events of special interest (AESI) – the ACCESS study.

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Disclosures

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BACKGROUND

The Covid-19 Vaccine monitoring readiness study (ACCESS) project create readiness to monitor COVID-19 vaccines. As part of the project a list of AESI was defined, operationalized into codes and algorithms, and background rates were estimated in 10 different data sources. In Europe, data sources capture events from different settings. It is of importance to consider the heterogeneity in provenance of event data in the pooling of results.

OBJECTIVES

To estimate incidence rates (IR) of AESI and assess the impact of provenance of data on the IR of AESI across 10 European electronic healthcare databases.

METHODS

- A multi-database distributed dynamic cohort study (protocol: EUPAS 37274) was conducted from 2017 to 2020 (2010 and 2014 for 2 databases) to generate background IR of 41 AESI in 10 population-based data sources from 7 European countries (DK, FR, DE, IT, ES, NL, UK) capturing event data from different provenances on 63 million persons:
  - inpatient (hospitalization discharge) and/or outpatient (specialist) diagnoses,
  - emergency room visits
  - general practitioner medical records (GP)

and varying vocabularies (ICD9/ICD10, ICPC, SNOMED, RCD).

- The list of AESI and their definitions capture 41 events (see protocol/definitions and code list) on https://www.zenodo.org/communities/vac4eu/
- The CONCEPTION common data model was used for syntactic harmonization[1]
- Semantic harmonization was conducted as part of the common R-script, using harmonized codelists and published code lists (see https://www.zenodo.org/communities/vac4eu/)

IR of each AESI were computed by age and sex by dividing the number of incident cases by the total person-time at risk in each data source. Age-standardized rates (against Eurostat population) were pooled using random effect models according to the provenance of the events diagnosis: (1) Inpatient event data only, (2) In and outpatient event data, (3) Inpatient and emergency room event data, (4) GP plus in-outpatient, (5) GP only.

RESULTS

Table 1. Categorisation of data sources by provenance of events

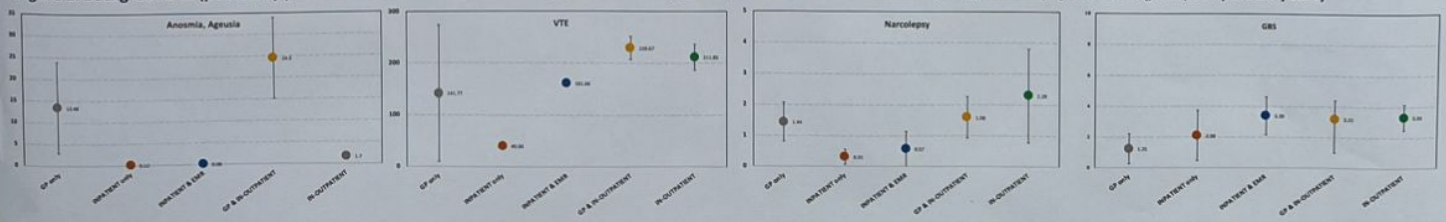
Categories for analysis based on provenance of events	Data sources
IN-OUTPATIENT	Danish registries; SNDS (France)
General Practitioners (GP) only	PEDIANET (Italy); BIFAP (Spain); SIDIAP (Spain); CPRD (UK)
INPATIENT & Emergency Room (EMR)	ARS (Italy)
INPATIENT only	PHARMO (The Netherlands); GePaRD (Germany)
GP & IN-OUTPATIENT	FISABIO (Spain), Subpopulation: BIFAP (Spain), SIDIAP (Spain), PHARMO (The Netherlands)

PEDIANET includes only pediatric population (0-18)

A total follow-up time of **63,456,074** persons and 211.7 million person-years was included in this analysis. Details on rates of 41 AESI per data source are publicly available as report plus excel sheets and an interactive dashboard. https://www.zenodo.org/communities/vac4eu/

The impact of the provenance of event data varied across AESI: Anosmia/ageusia is a mild event, not requiring specialist care and has a much higher rate data sources that capture diagnoses in primary care (GP) (figure 1). VTE and narcolepsy may be suspected by GPs but is typically diagnosed in outpatient setting by specialists which is reflected in the much higher IR in data sources that capture outpatient data. Guillain Barre Syndrome typical requires a hospitalization, reflected in the higher rates in data sources that capture specialist & inpatient event diagnoses, in GP data sources specialist diagnoses are only captured when feedback is provided.

Figure 1. Background IR (pooled by provenance and standardized for age) for Anosmia/ageusia, Venus thromboembolism (VTE), Narcolepsy and GBS (/100,000 person-years)



CONCLUSION

- Background IR data are crucial for conduct of appropriate vaccine safety signal evaluation in observed expected analyses, and multi-database studies based on existing health data can generate these data. Published multi-database studies by Li et al. pooled rates without considering provenance
- Our results show the importance to consider the nature of the event and the setting in which it is diagnosed when data are pooled.

REFERENCES

1. ACCESS https://www.zenodo.org/communities/vac4eu/)
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