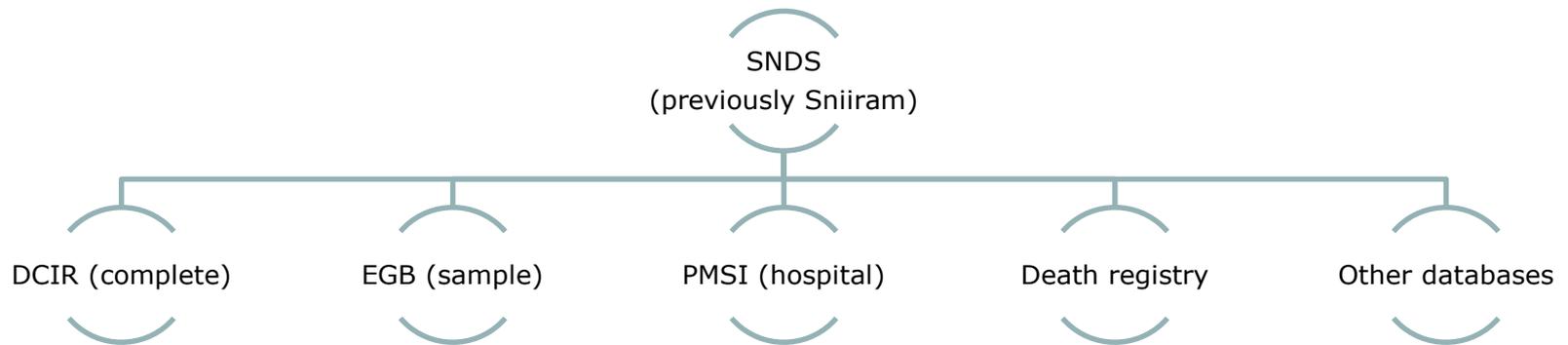




# Short overview of the French health insurance database and how it can be used for Real World Evidence studies

# Overall organization



- SNDS (système national des données de santé): national health data system
- Sniir-AM: (Système national d'information inter-régime de l'assurance maladie)
- DCIR (datamart de consommation inter-régimes): complete in-patient database
- EGB (Echantillon généraliste des bénéficiaires): permanent representative sample
- PMSI (hospital discharge database)
- Cepi-DC: death registry

# SNDS

- Inter-scheme consumption data (données de consommation inter-régimes [DCIR])
- 3 main schemes and other minor schemes, 69 million people, amounting to 99% of the total French population
  - **General scheme including salaried employees of the private sector and their dependents (i.e. about 76% of the population living in France)**
    - **In addition local mutualist sections, e.g. civil servants**
  - **Self-employed workers scheme**
  - **Agricultural scheme**

# DCIR

- Data are collected prospectively at the local level, and then transmitted to the National Health Insurance Fund for Salaried Workers (Caisse nationale de l'assurance maladie des travailleurs salariés [CNAMTS]) that hosts all the data in a huge digital warehouse
- A claims database: data used for billing and reimbursement of:
  - **outpatient health care consumption**
  - **→ not first developed for research**
- Beneficiaries are identified in SNDS by a pseudonymised identifier
  - **Same identifier lifelong**
- Past 10 years on demand

# Simplified architecture of SNDS

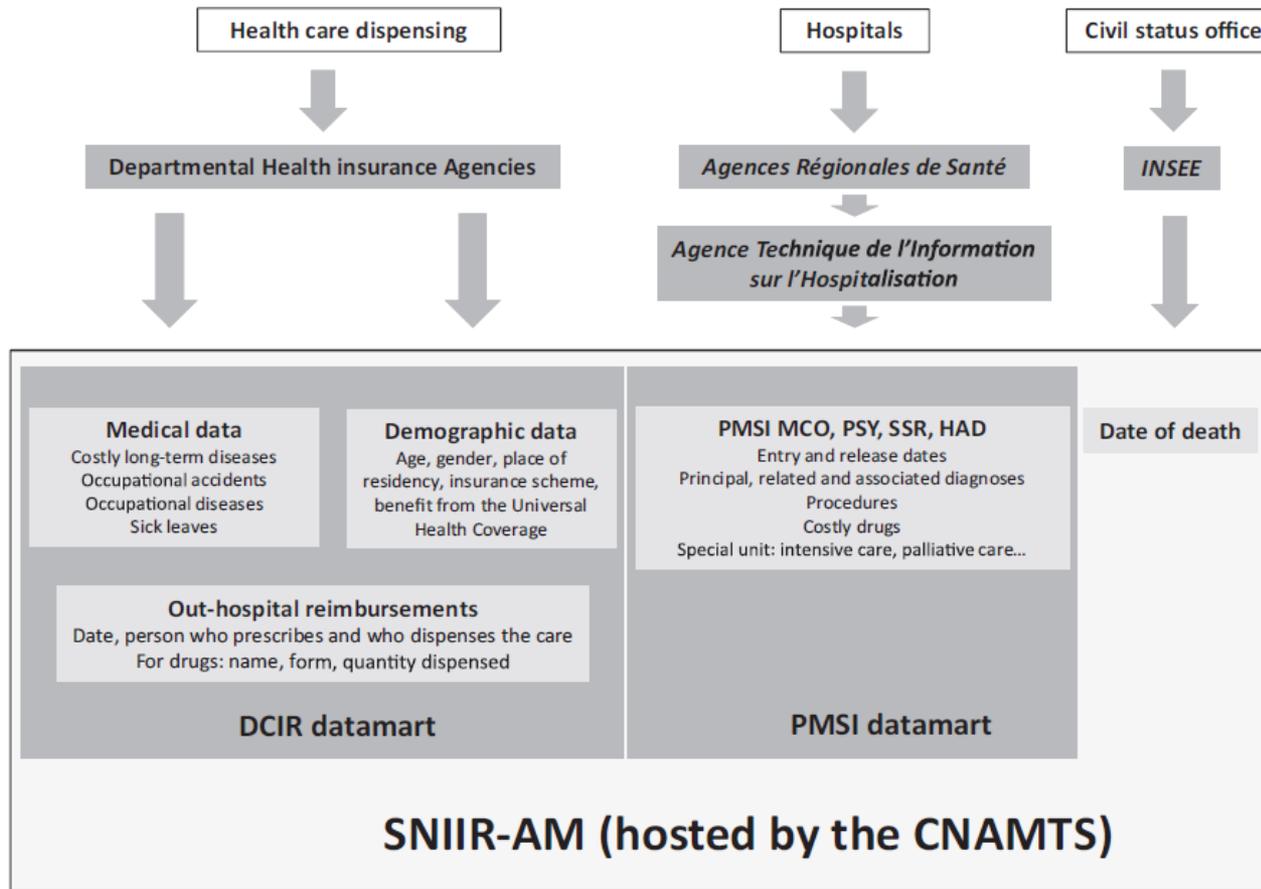


Fig. 1. Simplified architecture of the French National Health Insurance Information System. CNAMTS: *Caisse nationale de l'assurance Maladie des travailleurs salariés* (National Health Insurance Fund for Salaried Workers); DCIR: *données de consommation inter-régimes* (Inter-Scheme Consumption Data); HAD: *hospitalisation à domicile* (Home Hospitalization); INSEE: *Institut national des statistiques et des études économiques* (National Institute of Statistics and Economic Studies); MCO: *médecine, chirurgie, obstétrique* (Medicine, Surgery, Obstetrics); PMSI: *programme de médicalisation des systèmes d'information* (Program for the Medicalization of Information Systems); PSY: *psychiatrie* (Medicine, Psychiatry); SNIIR-AM: *Système national d'information inter-régime de l'assurance maladie* (National Health Insurance Information System); SSR: *services de suite et de réadaptation* (after-care and rehabilitation).

Source: 1

# DCIR (complete DB) strengths

- number of people
- extensive coverage
- starts in 2005
- accurate description and quantification of drug exposure, no recall bias
- individual data on patients
- Specifically appropriate for:
  - **signal detection or long-term follow up**
  - **rare disease**
  - **linkage of outside sources**

# DCIR limitations

## ■ Lack of information

- **Socioeconomic characteristics**
- **Type of employment, employment status**
- **Risk factors**
- **Disease severity and stage**
- **Results of clinical examinations**
- **Laboratory (biology) test results**
- **Over-the-counter drugs not recorded**
- **Whether drugs have been taken**
- **Reasons for diagnosis of medical or paramedical consultations**
- **Drugs dispensed during acute or long ward, apart from costly drugs on the excess list**
- .....

## ■ Complexity

- **An extraction of the SNDS has several dozen of tables , hundreds of variables**

# EGB (sample)

- 1/97th random sample of total beneficiaries of national healthcare insurance, and their dependents, in terms of age and sex
- started in 2005
- about 780,000 people
- Each quarter,
  - adds neonates, newcomers of schemes included in the EGB, foreigners arriving in France
  - leaves: deceased persons, persons who leave schemes, foreigners leaving France
- Appropriate for:
  - feasibility and algorithm testing
  - long-term research on more frequent diseases.

# Type of studies

- **Enrichment of outside databases**
  - **Clinical studies: social security number (NIR) or probabilist linkage with a 80% to 90% success**
  - **Cohorts, specific registries**
- **Epidemiological study**
  - **Assessment of incidence and prevalence of diseases**
- **Pharmacoepidemiological study**
  - **Adherence/persistence study**
  - **Post-registration studies (PRS) (5)**
  - **Post-marketing authorization safety study**
  - **Drug effectiveness study**
- **Economic study**
- **Care pathway study**
- **...**

# Examples

- Follow-up of **proper usage of Duoplavin ® in real life** with EGB data (anti platelet agent). Work in progress.
- **Real life effectiveness of Tecfidera® in multiple sclerosis** with Sniiram data. Work in progress.
- **Retrospective study of patients with Zepatier ® delivery (C hepatitis)**. Work in progress
- Management of pulmonary arterial hypertension in France. Work in progress
- Care pathway and clinical and economical burden of patients suffering from multiple myeloma in France. Work in progress
- **Prevalence and incidence of Sjögren's Syndrome in France: A Claims-based Nationwide Study**. Work in progress

# Examples

- Latry P and al. **Adherence with statins in a real-life setting is better when associated cardiovascular risk factors increase:** a cohort study. BMC Cardiovasc Disord. 2011 Jul 26;11:46. doi: 10.1186/1471-2261-11-46.
- Le Moigne M; and al. **Healthcare cost impact of biological drugs compared with traditional systemic treatments in psoriasis:** a cohort analysis in the French insurance database. J Eur Acad Dermatol Venereol. 2014 Sep;28(9):1235-44. doi: 10.1111/jdv.12318. Epub 2013 Nov 15.
- Mathonnet M. **What is the care pathway of patients who undergo thyroid surgery in France and its potential pitfalls?** A national cohort. BMJ Open. 2017 Apr 7;7(4):e013589. doi: 10.1136/bmjopen-2016-013589.
- Filipovic P. **Estimating the prevalence of depression associated with healthcare use** in France using administrative databases. BMC Psychiatry. 2017 Jan 3;17(1):1. doi: 10.1186/s12888-016-1163-4.

# Approval and access to data

## Normal access

- Expert committee+Data protection authority: ca. 9 months

## Fast access

- EGB(representative sample)/ ca. three months
- Hospital database: self-declaration one month

## Permanent access

- Health authorities and accredited agencies

# Access to data

- Need for a “public interest” in the research
- Data available with a remote secured access in a “bubble”
- Non-profit and profit research can apply
- Protocols needed to get approval
- Results made public at the end of the study
- Two specific objectives are explicitly prohibited: the promotion of health products to practitioners and health care institutions and the exclusion of insurance coverage or modifications of health insurance premiums.

# Economic model

## ■ Currently

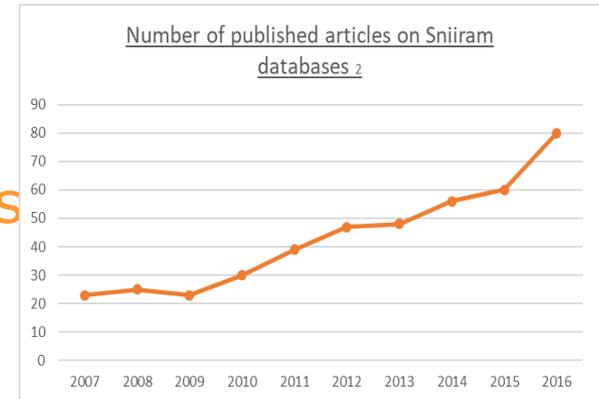
- **EGB/DCIR: 0 € for data**
- **PMSI(hospital): database charged to data researcher**

## ■ Planned for early 2020

- **Upon request of health authorities**
  - **No change**
- **In other cases**
  - **DCIR (complete database): about 22 k€ per projet**
  - **EGB (representative sample): 23k€ per end-user and yeard**
  - **PMSI (hosipital): about 11k€ per end-user and per year**

# Next

- Increased number of publications
- Additional healthdatabases
  - Disabled people database
  - Complementary health insurance
- SNDS→Healthdata hub
  - New registries



# Conclusions

- A whole-life, whole-country coverage
- One of the largest healthcare database in the world
- Appropriate for:
  - **(very) rare events: DCIR (complete database)**
  - **More common patterns: EGB (permanent representative sample)**
- Richness of data, with limitations in certain areas
- Reasonable costs and time of access
- Development in progress for more qualitative data

# References

- 1. G. Moulis, M. Lapeyre-Mestreb, A. Palmarob, G. Pugneta, J.-L. Montastruc, L. Sailler, French health insurance databases: What interest for medical research? *La Revue de médecine interne* 36 (2015) 411–417
- 2. P. Tuppin and al, From the système national d'information interrégimes de l'Assurance Maladie (SNIIRAM) to the système national des données de santé (SNDS) in France, *Revue d'Epidémiologie et de Santé Publique* 65S (2017) S149–S167
- 3. A. Palmaro, G. Moulis, F. Despas, J. Dupouy, M. Lapeyre-Mestre. Overview of drug data within French health insurance databases and implications for pharmacoepidemiological studies, *Fundamental and clinical pharmacology* (2016)
- 4. J. Bezin, M. Duong, R. Lassalle, C. Droz, A. Pariente, P. Blin, N. Moore. The national healthcare system claims databases in France, SNIIRAM and EGB: Powerful tools for pharmacoepidemiology, *Pharmacoepidemiol Drug Saf.* 2017 Aug;26(8):954-962
- 5. D. Berdai and al. *Thérapie.* 2018 Feb;73(1):13-24. doi: 10.1016/j.therap.2017.12.008. Epub 2017 Dec 30. Requests for post-registration studies (PRS), patients follow-up in actual practice: Changes in the role of databases.

## To go further:

- Median Conseil
- Benoît Thomé, General manager,  
[benoit.thome@median-conseil.com](mailto:benoit.thome@median-conseil.com),
- tel 00 33 6 81 37 96 19
- [www.median-conseil.com](http://www.median-conseil.com)
  
- Performs studies on SNDS data
- Gives training on SNDS data