ANALYSIS OF INFLUENZA VACCINATION COVERAGE AND VACCINE EFFECTIVENESS IN POPULATION AGED 65 AND OVER IN AMBULATORY MEDICINE IN FRANCE FROM 2016 TO 2019: A STUDY BASED ON REAL-WORLD DATA

Daouda Seck(1), Caroline Eteve-Pitsaer (1), Costantino De Palma (1), Carlos Iglesias (2), Juliette Paireau (3), Simon Cauchemez (3), Charlotte Renaudat (1)

1. Cegedim Health Data France, Boulogne-Billancourt, France; 2. Cegedim Health Data Spain , Sant Cugat del Vallès, Barcelona, Spain; 3. Institut Pasteur, Université Paris Cité, Paris, France

BACKGROUND

- Influenza virus infection remains a major public health concern worldwide, due to its variability and morbidity. The WHO estimates that there are 1 billion cases of seasonal influenza each year, including 3 to 5 million severe cases (1). In France, Santé Publique France estimates that there are 2 to 6 million cases of influenza each year, 90% of which affect people aged 65 and over (2). 10,000 deaths per year are recorded in France (2). Vaccination is strongly recommended for people over 65 and those at risk (3).

- Measuring vaccination coverage and vaccine effectiveness make it possible to monitor adherence to recommendations by people at risk, and adapt in real time public health communication.

OBJECTIVES

We aimed to estimate vaccination coverage (VC) and vaccine effectiveness (VE) in THIN® France database during the influenza seasons from 2015-2016 to 2018-2019.

METHODS

THIN® France (4) is a European medical databases network of Electronic Health Records extracts. These extracts are transmitted by a network of voluntary physicians (general practitioners and specialists) who firmly believe that supporting this kind of observatory benefits research and medical progress.
We formed four different influenza season cohorts: 2015-2026, 2016-2017, 2017-2018 and 2018-2019.
All persons having visited a physician from the THIN® France network before and after each influenza season, received any pharmacy dispensation and aged 65 and over, were included.
Vaccination status for each cohort was obtained from pharmacy influenza vaccine dispensation data.

VC was calculated in the conventional way by dividing the number of patients who received a vaccine by the number of eligible and included patients.

The outcome of influenza infection for VE was extracted from electronic medical records (EMR). VE was calculated as 1- RR where RR is the relative risk of disease in the vaccinated compared with the unvaccinated population.

RESULTS

For 2015-2016, 2016-2017, 2017-2018 and 2018-2019 influenza seasons, a total of 239.188,257.767, 251.970 and 250.914 participants were included respectively (Figure 1).
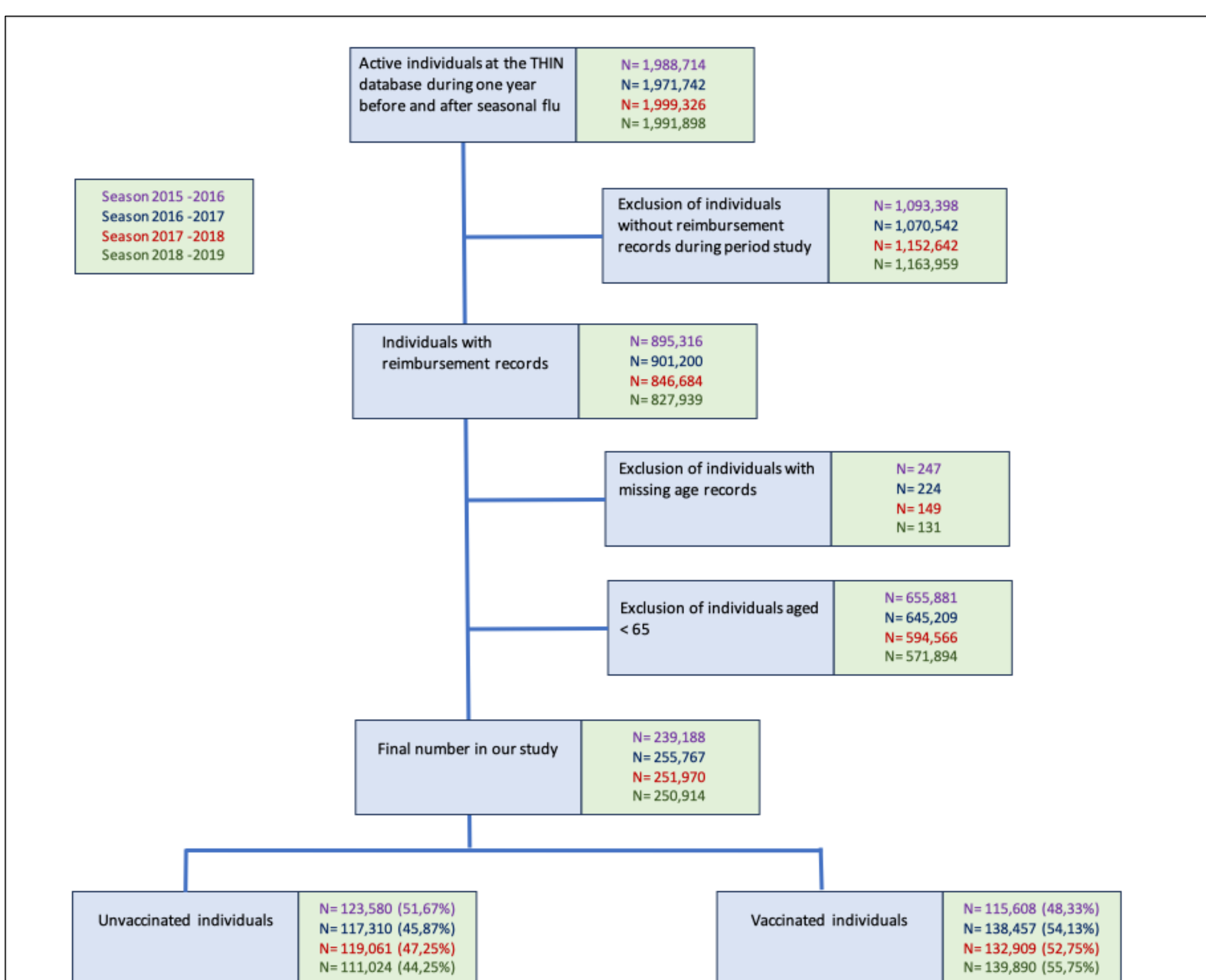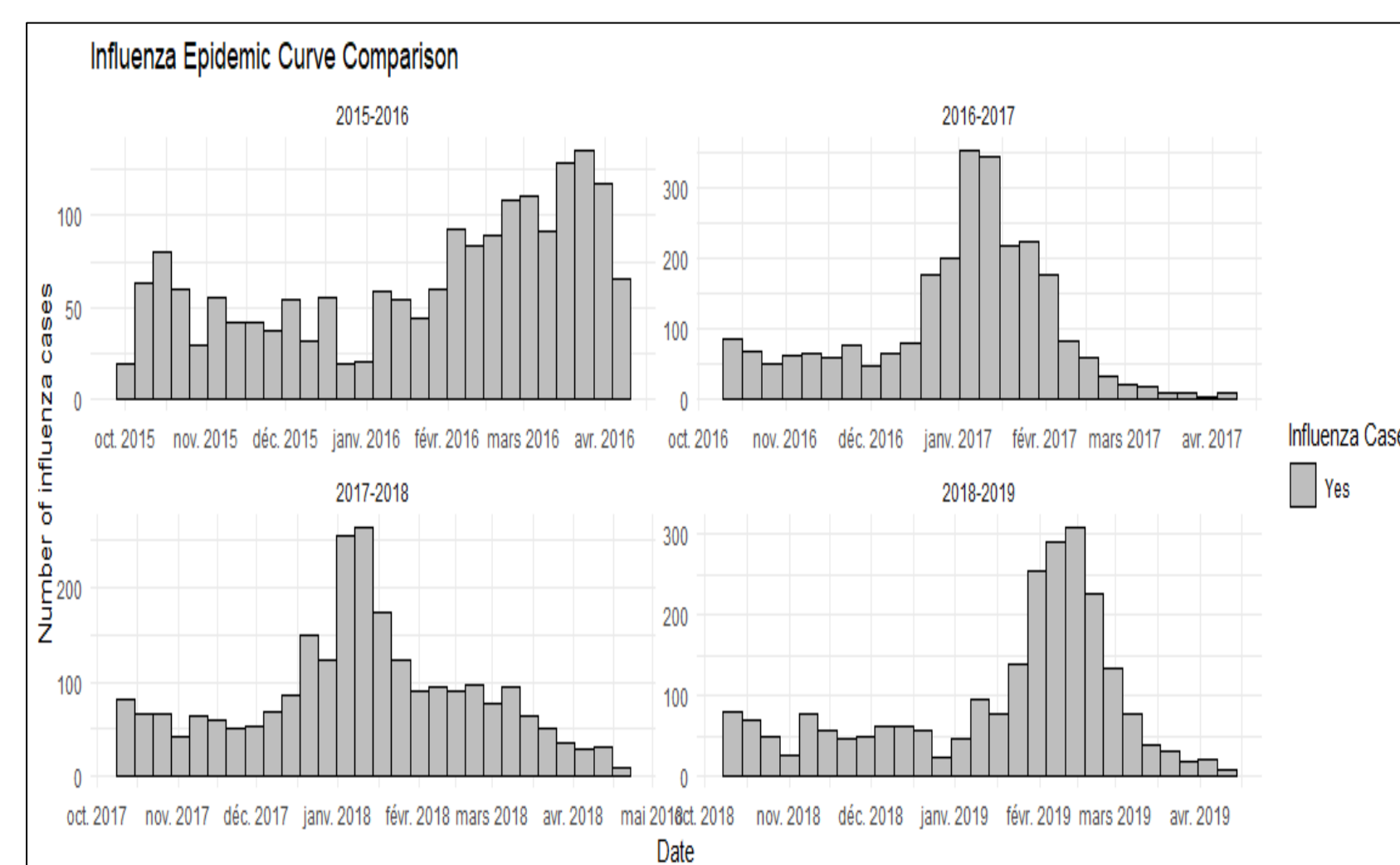

Figure 1. Flow Charts.

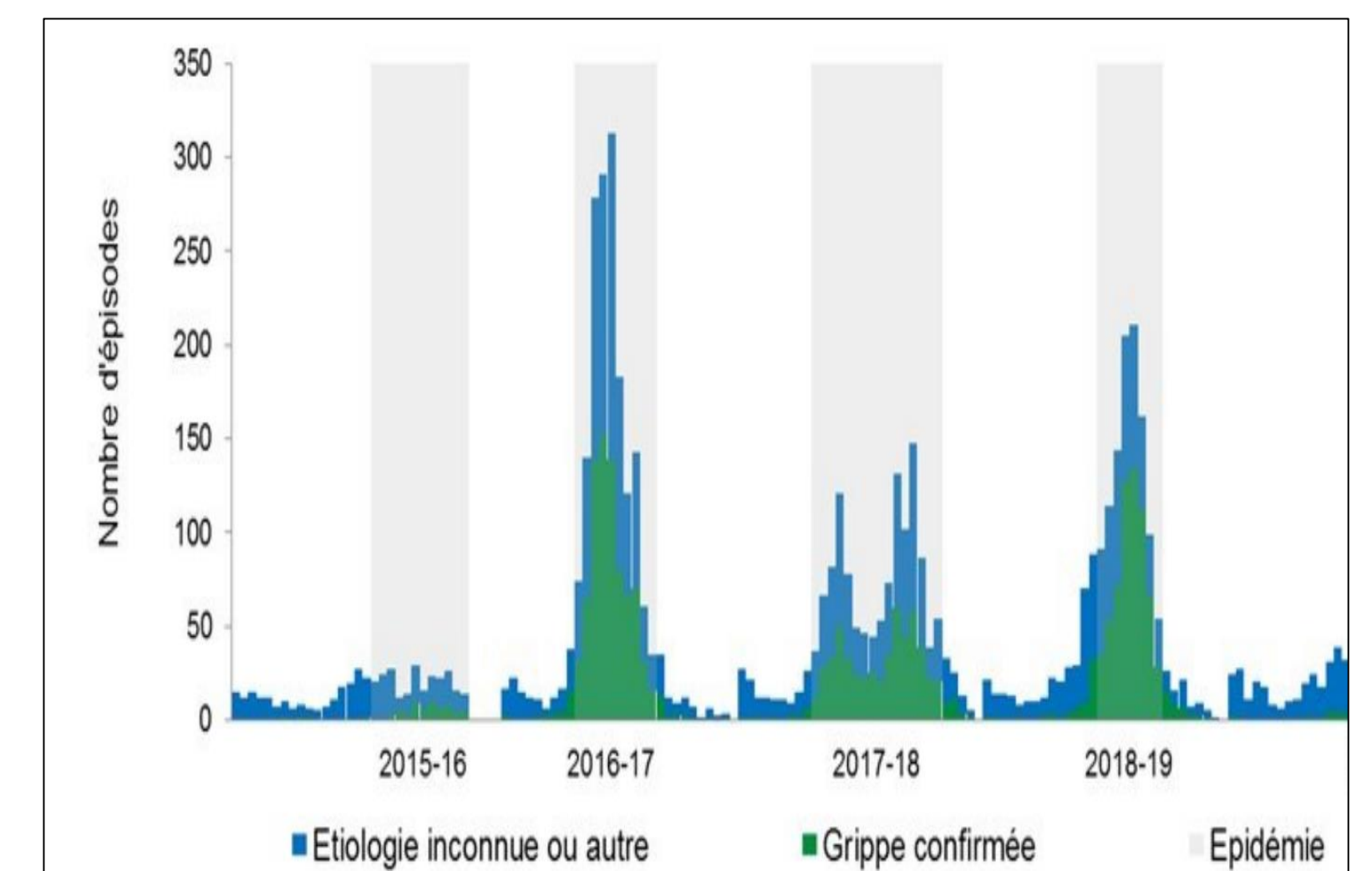
Figure 2. Epidemic curves within THIN® France Database

Figure 3. Epidemic curves Santé Publique France (6)

For the 4 influenza seasons studied, VC was estimated at 48.30%,54.13%, 49.95% and 55.7% and VE at 46.34% (IC, 43.25 % - 49.25 %), 49.95% (IC, 47.47 % - 52.30 %),52.96% (IC, 50.62 % - 55.18 %) and 42.67% (IC, 39.59 % - 45.58 %) respectively (Figure 4).
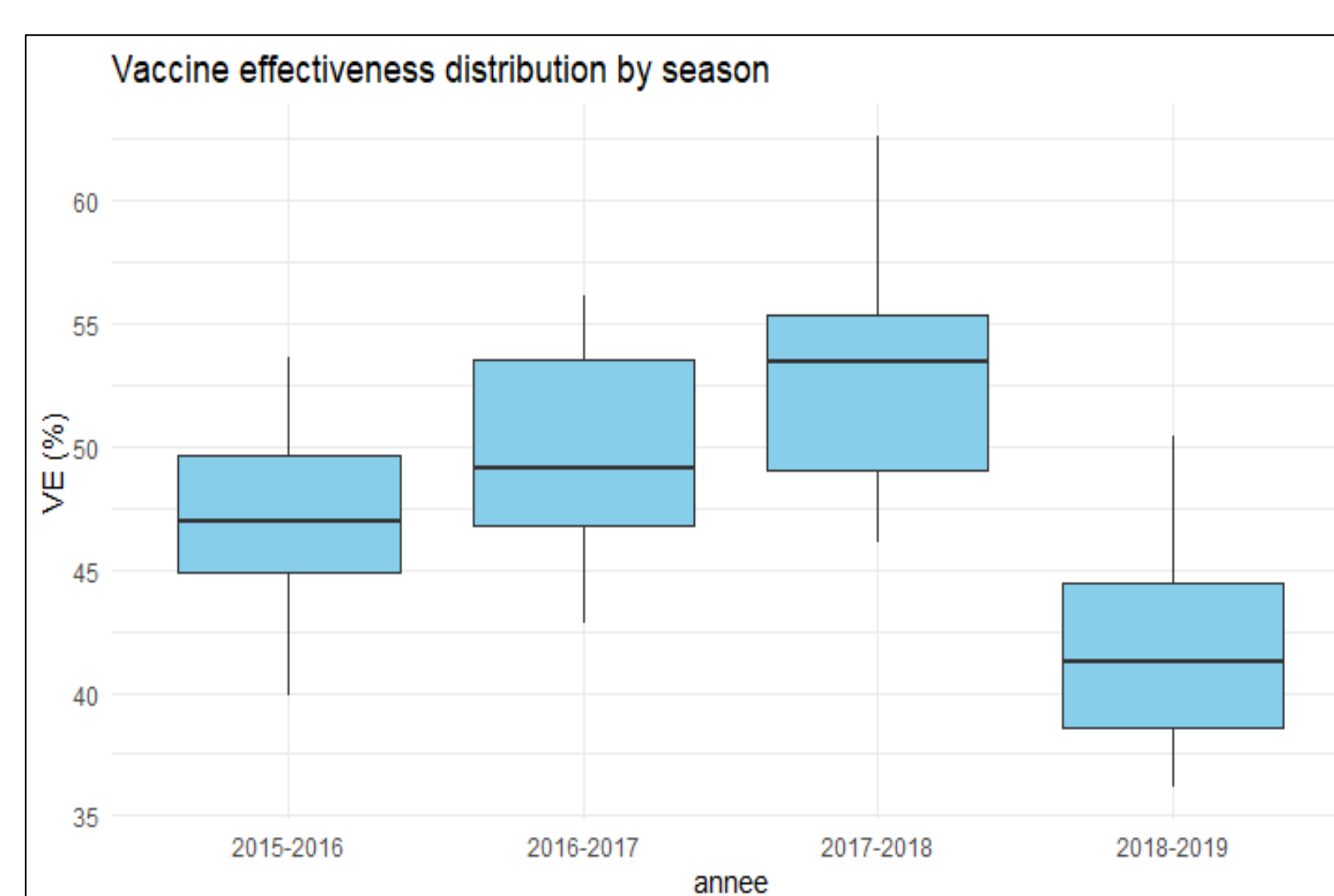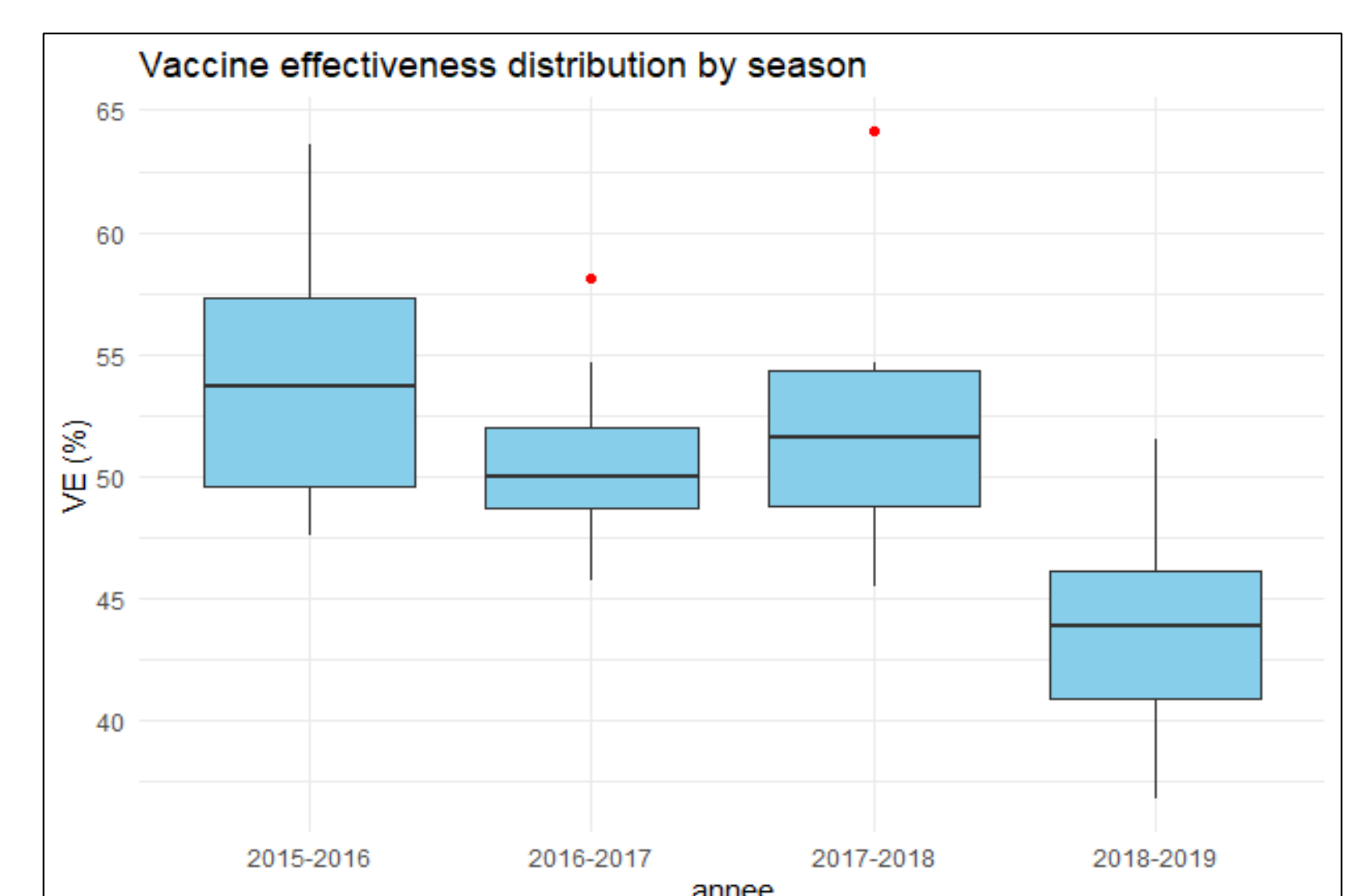

Figure 4. VE distribution by season, THIN® (our study)

Figure 5. VE distribution by season, literature review (7-10)

Table 1. Influenza vaccination coverage (Comparing THIN® and Santé Publique France(5)).

Seasons and Numbers	2015-2016 N=239,188	2016-2017 N=255,767	2017-2018 N=251,970	2018-2019 N=250,914
THIN ®	48,3%	54,1%	52,7%	55,7%
Santé Publique France	50,8%	50%	49,7%	51,1%

CONCLUSION

Our study, using THIN® France database, has enabled us to track trends in influenza infection over several seasons and to determine vaccination coverage and Vaccine Effectiveness. Our data are robust, as the same trends are observed in studies carried out by French health agencies. Comparing these results to Santé Publique France's surveys and Sentinelles Network's VE studies showed the robustness of THIN® France. The slight differences that we observed can be explained by the fact that THIN® France database only includes patients who had consulted a general practitioner, regularly monitored by a physician from the THIN® France network would have better medical follow-up and better compliance, whereas Santé Publique France data come from the national health data system (SNDS), which combines data from health insurance (SNIIRAM), hospitals (PMSI) and statistics related to medical causes of death (BCMD). Using THIN® France database could be a reliable and efficient method to monitor flu vaccination campaign and flu outbreak each year.

REFERENCES

1. Influenza (Seasonal) [Internet]. Available from: https://www.who.int/news-room/fact sheets/detail/influenza-(seasonal)
2. La grippe, une épidémie saisonnière [Internet]. Available from: https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections respiratoires/grippe/la-grippe-une-epidemie-saisonniere
3. THIN : The Health improvement Network [Internet]. Cegedim Health Data. Available from: https://www.cegedim-health-data.com/cegedim-health-data/thin-the-health-improvement-network/
4. SPF. Impact de la vaccination contre la grippe saisonnière sur la mortalité des personnes âgées en France, de novembre 2000 à avril 2009. Numéro thématique. Grippe 2014-2015 : une épidémie de forte intensité [internet]
5. Données de couverture vaccinale grippe par groupe d'âge. Available from: https://www.santepubliquefrance.fr/determinants-de-sante/vaccination/donnees-de-couverture-vaccinale-grippe-par-groupe-d-age
6. SPF. Surveillance de la grippe en France, saison 2018-2019. Available from: https://www.santepubliquefrance.fr/import/surveillance-de-la-grippe-en-france-saison-2018-2019
7. Estimation of seasonal influenza vaccine effectiveness using data collected in primary care in France: comparison of the test-negative design and the screening method Vilcu, A.M. et al. Clinical Microbiology and Infection, Volume 24, Issue 4, 431.e5 - 431.e12
8. Cécile Souty et al. Early estimates of 2016/17 seasonal influenza vaccine effectiveness in primary care in France, Journal of Clinical Virology, Volume 95, 2017, Pages 1-4, ISSN 1386-6532, https://doi.org/10.1016/j.jcv.2017.08.002
9. Esther Kissling et al. Effectiveness of influenza vaccine against influenza A in Europe in seasons of different A(H1N1)pdm09 and the same A(H3N2) vaccine components (2016-17 and 2017-18),Volume 3, 2019,100042,ISSN 2590-1362, https://doi.org/10.1016/j.jvacx.2019.100042
10. Kissling E, Rose A, Emborg HD, Gherasim A, Pebody R, Pozo F, et al. Interim 2018/19 influenza vaccine effectiveness: six European studies, October 2018 to January 2019. Eurosurveillance [Internet]. 2019 Feb 21;24(8). Available from: https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2019.24.1900121