TEMPORAL ANALYSIS OF DIABETES, HYPERTENSION AND ASTHMA PREVALENCE

A comparative study in European countries (Belgium, France, Italy, Romania and Spain) using a real-world ambulatory medical database (2018-2022)

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BACKGROUND

Chronic diseases present a significant public health challenge. Prevalence is the key epidemiological indicator for healthcare planning. Real-world data (RWD) appears to be a rapidly mobilisable and reliable resource to understand the prevalence of and establish trends in diabetes, hypertension, and asthma. RWD could therefore provide crucial support for effective healthcare planning.

OBJECTIVES

To estimate and compare the prevalence of diabetes, hypertension and asthma in five European countries (Belgium, France, Italy, Romania and Spain) over a five-year period (2018 to 2022) using THIN®, the anonymised real-world primary care medical database powered by Cegedim Health Data.

METHODS

Firstly, we reviewed the prevalences estimated since 2018 for diabetes, hypertension and asthma, through studies conducted by public health and/or national statistics institutes in Belgium, France, Italy, Romania and Spain. We attempted to reproduce these rates by defining equal relevant study populations –namely, matching the age and the year of the study- to then compare the available institutional statistics with the statistics extracted from The Health Improvement Network, THIN®, an anonymised primary care medical database available in the aforementioned five countries. Subsequently, we leveraged the harmonised data structure of the Common Data Model in THIN® to recalculate prevalences by applying a common definition of the relevant population across the years and countries, while still defining different inclusion criteria across the diseases to accurately reflect the literature reviewed. Our estimates are based on a pathology-specific definition for the numerator and on common inclusion criteria for the denominator - i.e., an active patient with a relevant diagnosis record. Using this standardised approach, we were able to systematically analyse the evolution of each disease across all five countries.

RESULTS

The national prevalence data we reviewed for diabetes, hypertension and asthma were mostly derived from surveys conducted by public health and/or national statistics institutes for the five countries. Overall, these results are heterogenous and cannot be compared across the countries as study design and inclusion criteria differ systematically. By defining populations in THIN® similar to the ones found in these surveys, we observed that some results closely approach national estimates, while others are substantially divergent (Table 1). These differences often depend on the availability of information concerning the methods used in national studies: in particular, on how accurately we can observe and match the studies' inclusion criteria and design in THIN® .

Table 1: Prevalence of diabetes, hypertension and asthma in Belgium, France, Italy, Romania and Spain. Population criteria and result of the initial study reproduced in THIN®

Country	National study/source	Year	Study population	National study result	THIN® result [CI95%]
Diabetes					
Belgium	Sciensano[1]	2018	≥15 yrs	5,9% [5.3-6.5]	4,82 % [4,78 - 4,86]
France	Sante Publique France[2]	2021	whole population= all ages	5,41%	6,25 % [6,22 - 6,28]
France	Sante Publique France[2]	2020	whole population= all ages	5,30%	6,54 % [6,51 - 6,57]
Italy	Epicentro[3]	2020	≥15 yrs	5,90%	5,54 % [5,51 - 5,58]
Romania	INSSE[4]	2019	≥15 yrs	9,90%	8,04 % [7,99 - 8,10]
Spain	Encuesta europea de salud en España[5]	2020	≥15 yrs	7,54%	5,87 % [5,83 - 5,91]
Hypertension					
Belgium	Sciensano[1]	2018	≥15 yrs	17,6% [16.5-18.6]	16.70 % [16.66 - 16.74]
France	Sante Publique France[2]	2019	18-75 yrs	17,60%	17 % [16.95- 17.05]
Romania	SEPHAR IV[6]	2022	18-80	42,93%	33.25 % [33.21 - 33.28]
Spain	Encuesta europea de salud en España[5]	2020	≥15 yrs	19,34%	16.01 % [15.95 - 16.07]
Asthma					
Belgium	Sciensano[1]	2018	≥15 yrs	5.8% [5.1-6.4]	4.21 % [4.19 - 4.24]
France	Sante Publique France[2]	2019	10-17 yrs	10%	12.17 % [12.03 -12.29]
France	Sante Publique France[2]	2019	Adults	6-7%	8.29 % [8.25- 8.32]
Italy	Epicentro[3]	2020	all ages	≈10%	2.18 % [2.16 -2.2]
Romania	INSSE[4]	2019	≥15 yrs	4,50%	2.56 % [2.53 -2.60]
Spain	Encuesta europea de salud en España[5]	2020	≥15 yrs	4,11%	4.51 % [4.48 - 4.54]

[1] https://www.sciensano.be/fr/file/mafr2018pdf - [2] https://www.santepubliquefrance.fr/maladies-et-traumatismes - [3]https://www.epicentro.iss.it -
[4]https://insse.ro/cms/sites/default/files/field/publicatii/starea_de_sanatate_a_populatiei_din_romania_2019.pdf -
[5]https://www.sanidad.gob.es/estadEstudios/estadisticas/EncuestaEuropea - [6] Pop C, Gheorghe Fronea OF, Branea IA, Itu LM, Darabont R, Parepa I, Benedek T, Dorobantu M. Prevalence and Predictors of Renal Disease in a National Representative Sample of the Romanian Adult Population: Data from the SEPHAR IV Survey. Diagnostics (Basel). 2022 Dec 16;12(12):3199. doi: 10.3390/diagnostics12123199. PMID: 36553206; PMCID: PMC9777169.

It should be noted that, whilst national studies do not limit the definition of the population of interest to diagnosis records, the active patients in our results are only included if a diagnosis in the patient history is registered by a healthcare professional within the network. Although inclusion by treatment is often a criterion used in national surveys, we did not use it in this analysis. The inclusion criteria used in our standardised approach and detailed in the figure descriptions are in line with the literature (Figures 1 to 4).

Prevalence estimates for individual countries are influenced by the country's healthcare system and the specific epidemiological characteristics of its population. Nevertheless, the common approach leveraging THIN® common data model represents a great first step towards cross-country comparisons.
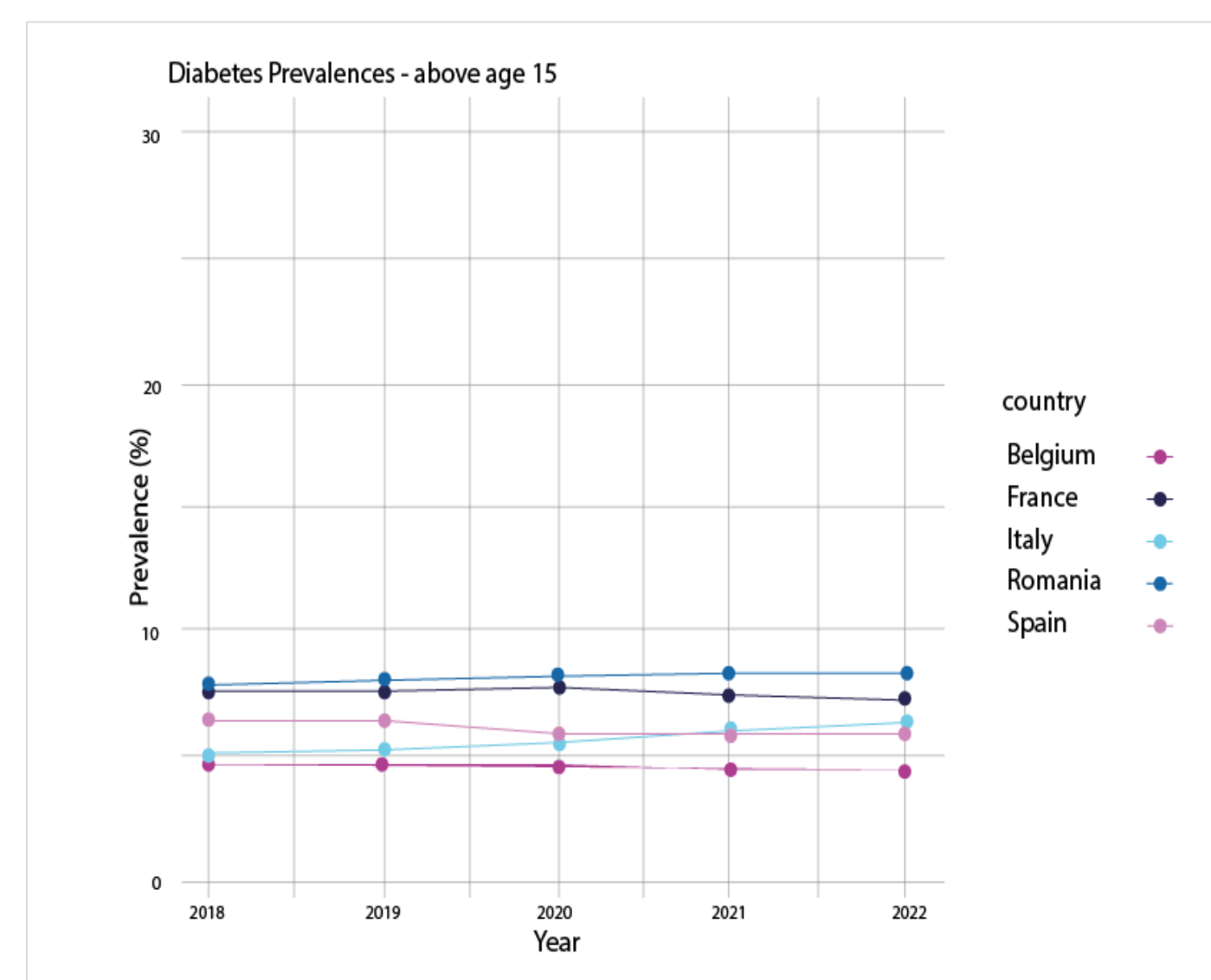

Figure 1: Diabetes prevalence among THIN® patients followed by a general practitioner care and aged ≥15 between 2018 and 2022
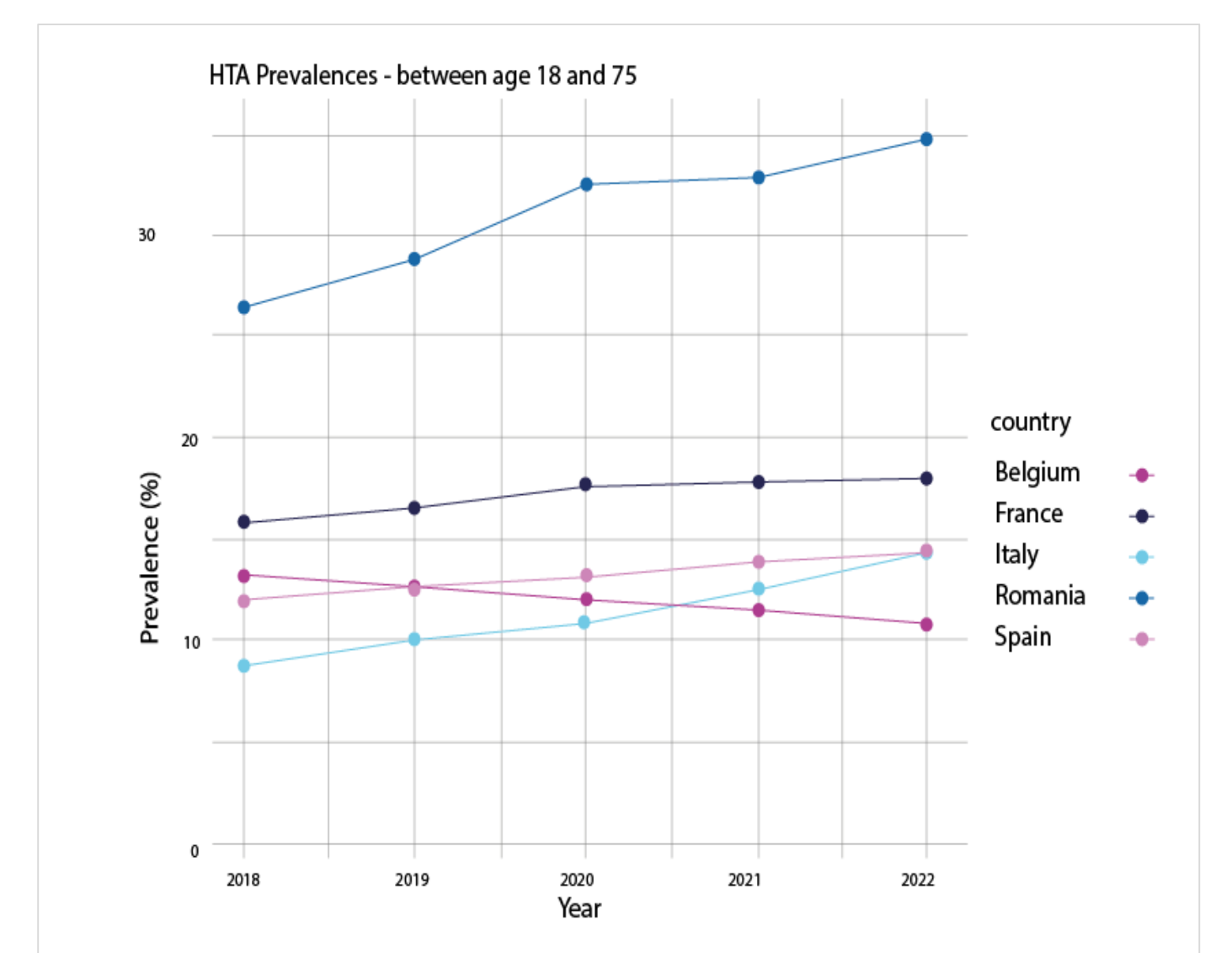

Figure 2: Hypertension prevalence among THIN® patients followed by a general practitioner care and aged 18 to 75 between 2018 and 2022
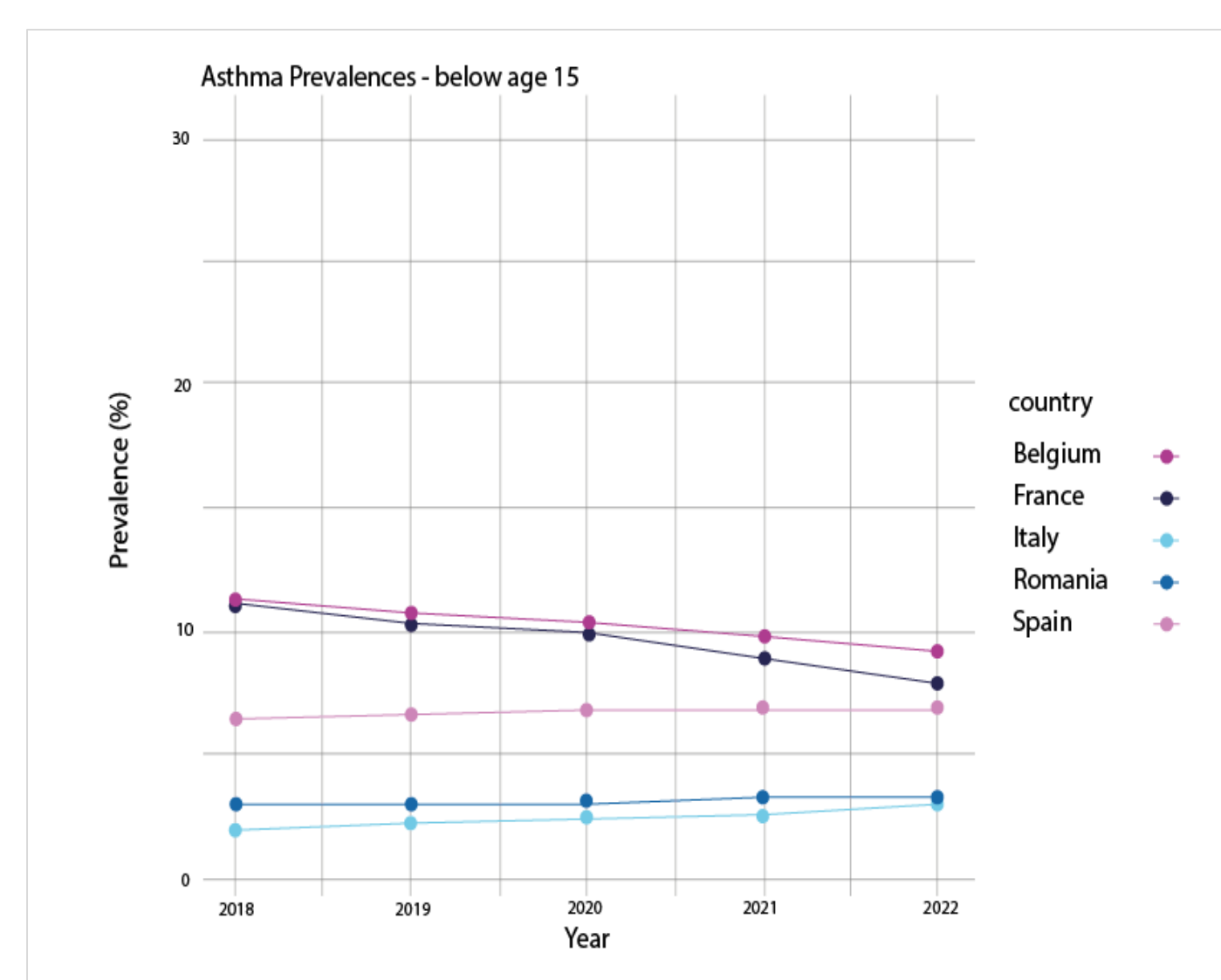

Figure 3: Asthma prevalence among THIN® patients followed by a general practitioner care and aged <15 between 2018and 2022
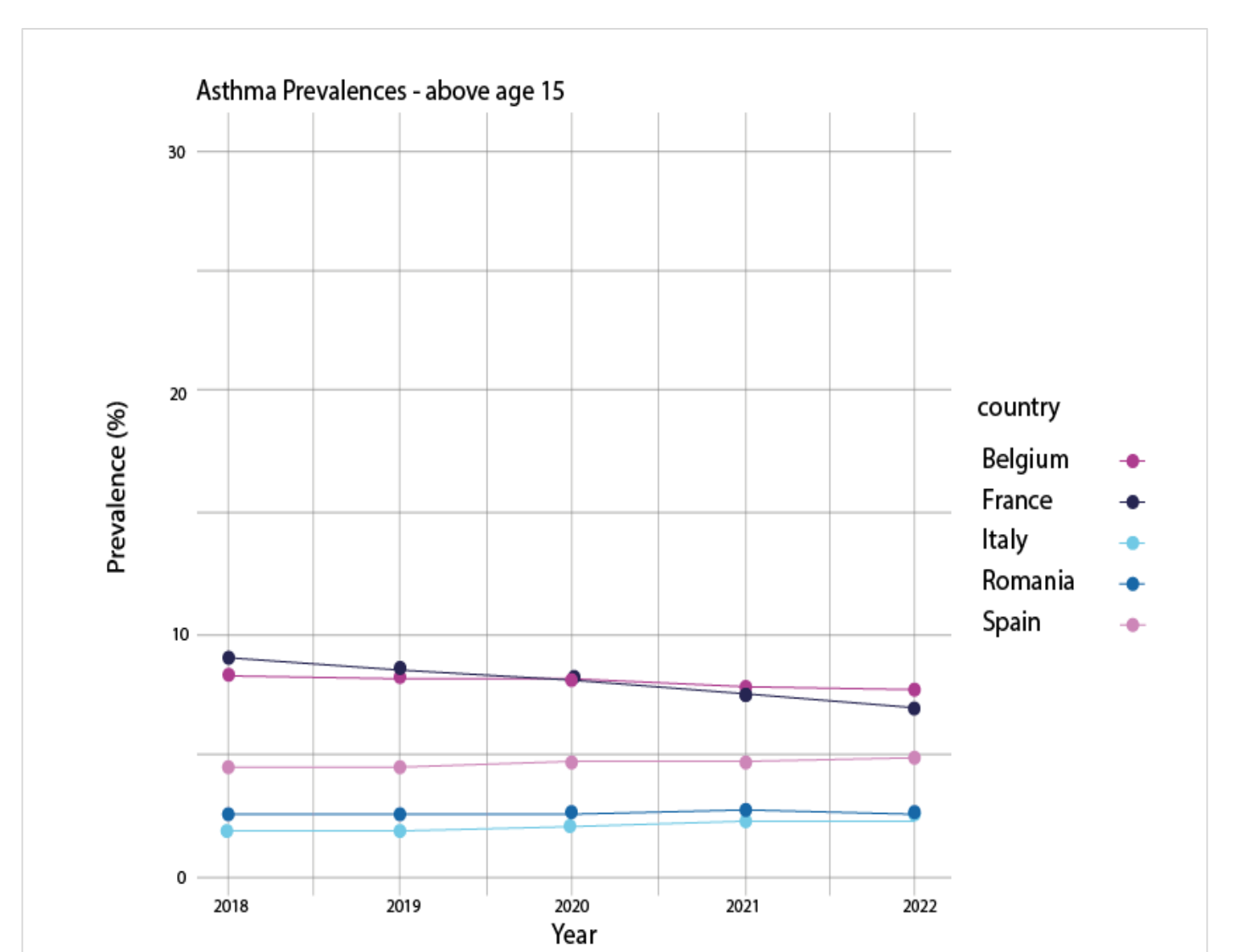

Figure 4: Asthma prevalence among THIN® patients followed by a general practitioner care and aged ≥15 between 2018 and 2022

Lastly, the dynamics of prevalence are nonetheless influenced by national factors. We consistently observed that the 2020 Covid pandemic played a major role in confirming or reversing evolutionary trends. The kinetics of prevalence across different countries can be partly explained by the relative coverage of the national network of physicians represented in THIN® and the relevant year of incorporation into THIN® for each country.

CONCLUSIONS

National prevalence surveys carried out on diabetes, hypertension and asthma in different countries do not always use the same populations, study design or inclusion criteria, which makes comparisons across countries a daunting task. Replicability and availability also make trends difficult to interpret over time. By leveraging the Common Data Model in THIN® in Belgium, France, Italy, Romania and Spain, we were able to obtain some comparable cross-country results which were often close to the national survey results. Differences are probably linked to heterogeneous study populations, the structure of local healthcare systems and the set of national epidemiological characteristics. By applying a common methodology (population definition, diagnosis codes, panellist physician specialty, etc.) to harmonised medical records, THIN® offers a solid basis for comparison across countries and over time. Although national differences caused some discrepancies in results, our study leveraging real-world data provides valuable insights into the evolution of prevalences of chronic conditions in selected countries, which could be used to drive better monitoring of this diseases across Europe.