

A RETROSPECTIVE DATABASE STUDY TO DEFINE A PULMONARY ARTERIAL HYPERTENSION PATIENT COHORT AND EVALUATE THE ECONOMIC BURDEN OF ILLNESS IN FRANCE

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Introduction

- Pulmonary arterial hypertension (PAH) is a progressive and rare disease caused by narrowing or constriction of the pulmonary arteries, leading to right heart failure and premature death⁽¹⁾.
- In France in 2011⁽²⁾, according to the National Register of Pulmonary Hypertension, 3,193 patients were reported and treated for PAH.
- PAH is recognised by the French Health Insurance as a long-term disease (Affection de Longue Durée). Treatments for diseases with this recognition are free of charge at the point of care for all patients. ⁽³⁾

Objective

- The objective of this study was to define a PAH patient cohort in the French national hospital discharge database (PMSI-MCO) and evaluate the hospital medical resource utilisation and economic burden of PAH illness from a national health service (NHS) point of view.

Methods

- A database analysis on a historical cohort was performed using PMSI-MCO over the period 2012-2016. PMSI-MCO offers full coverage of the French population treated at private and public French hospitals.
- A selection algorithm was developed to define a PAH patient cohort as there is no ICD-10 code specifically isolating PAH. The main criteria used were: PH ICD-10 codes (I27.0 or I27.2); a visit to an expert referral centre; a right heart catheterisation procedure; and/or a prescription of a PAH specific drug (available from the "liste en sus" [i.e., bosentan, iloprost, epoprostenol, treprostinil, or selexipag]).
- The index date (date of first evidence of PAH) was defined as the date of the first PH-related ICD-10 code or first prescription of a PAH-specific drug in the study period.
- Patients were followed from index date to the last available date in the database. All hospital events from the study period defined in the cohort were extracted.
- The hospital events were split based on the length of stay. Hospital events with 0-day length of stay were labelled outpatient events and hospital events with ≥1 day length of stay were labelled as inpatient events.
- A subgroup of the 20% of patients with the most expensive associated cost was selected to analyse the impact of the highest medical resource users on the hospital event rates and the annual costs.
- Annual costs in acute care were estimated according to the NHS perspective using diagnosis-related groups (GHS) valued using official national tariffs for 2012 to 2016. Costs were converted to 2017 (Euros), updated by the health specific price index (INSEE).







	Total number of hospital events 26,944	
	 	 
Total number of events	12,896 (48%)	14,048 (52%)
Mean events per patient per year (SD)	2.0 (8.1)	2.2 (2.8)
Mean cost per patient per year	1,670 €	10,695 €
	 Outpatient event	 Inpatient event

Figure 1: Total number of events, mean number of events and mean cost per patient per year by type of event for the PAH cohort

Conclusion

- The PAH cohort defined in PMSI was smaller than the cohort reported in the National Register of Pulmonary Hypertension⁽²⁾. This is likely due to the conservative nature of the selection algorithm, which was developed to provide the highest certainty of selecting true PAH patients.
- The approach to defining the selection algorithm for this study could be used to define algorithms for identifying PAH patients in other databases.
- Inpatient events are the most expensive type of hospital events for PAH patients compared to the outpatient events and their occurrence have remained stable over the study period.
- The increase of outpatient events was mainly related to co-morbidities (events related to chemotherapy and dialysis).
- There is a proportion of patients that contributes to a significant amount of the total costs. Focusing on strategies to appropriately manage the high risk patients can deliver significant benefits the healthcare system.

1. Galiè, N. et al. 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension: The Joint Task Force for the Diagnosis and Treatment of Pulmonary Hypertension of the European Society of Cardiology (ESC) and the European Respiratory Society (ERS)

2. Haute Autorité de Santé, Avis de la commission de la Transparence - UPTRAVI (séléxipag), antithrombotique

3. HAS. Hypertension artérielle pulmonaire. Protocole national de diagnostic et de soins pour une maladie rare. (2017)

Results – PAH patient cohort

- Using the selection algorithm, a cohort of 2,173 PAH patients was defined over 5 years (study period), with 184 newly identified patients and 1,160 prevalent patients in 2016.
- In the PAH cohort, approximately 63% of the patients were female. The mean [±SD] age at index date was 57.7 [±16.2] years and one quarter of patients were older than 70 years of age.
- Inpatient events represented 52% (14,048) of total hospital events while the rest were outpatient events (see Figure 1).
- The number of inpatient events was stable from 2012 to 2016 (average of 2.3 per patient per year), while the number of outpatient events increased from 1.4 in 2012 to 2.5 in 2016 (see Figure 2).
- Of the patients with a first hospitalisation between 2013-2015, 61% had a second hospitalisation within a year and 36% had a third hospitalisation within the same year. The average time between successive inpatient hospital events was approximately 5 months.
- The most common co-morbidities for inpatient hospital events related to PAH as a main diagnosis were hypertension, heart failure, dyspnoea and chronic respiratory failure. Chemotherapy and dialysis represented 38% of the total number of outpatient events.
- Over the 5 years of observation, the economic burden of acute care for the PAH cohort was € 66,252,641. The total cost increased from € 10,649,784 in 2012 to € 13,629,202 in 2016.
- The majority (87%) of acute care costs were attributable to inpatient events.

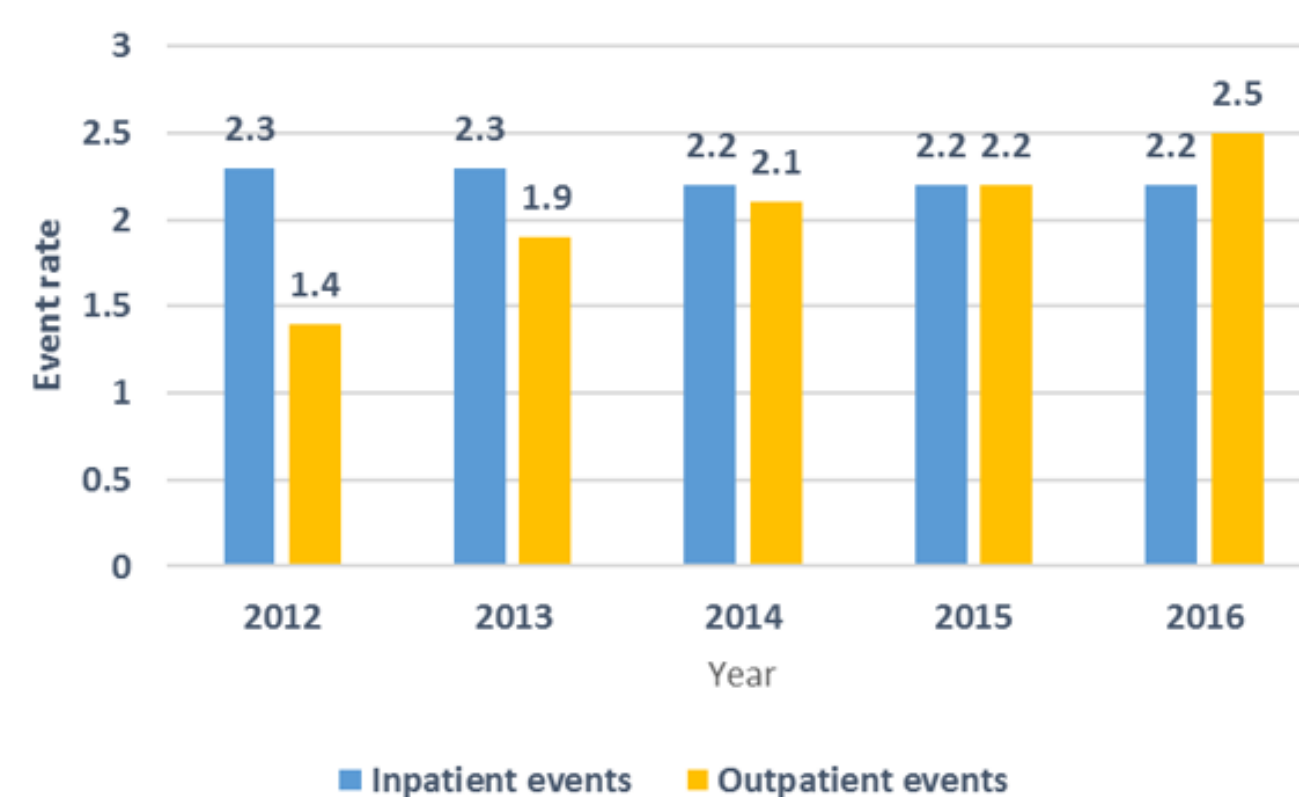


Figure 2: Evolution of hospital event rates per patient per year

Results - Most expensive patients

- As illustrated in Figure 3, over the study period 20% of the patients represented 55% of the total cost of the PAH cohort and were responsible for 48% (13,190) of all hospital events. The top 20% of patients had a higher proportion of males (44% vs 37%; p-value <0.001) and were younger (mean [±SD]) 54 [±14.3] years vs 58 [±16.2] years; p-value <0.001) compared to the overall PAH cohort.
- Incident patients were over-represented in the top 20% most expensive patients compared to the overall PAH cohort (62% vs 53%).
- Over the 5 years of observation, the most expensive patients recorded a mean [±SD] of 3.9 [±4.6] inpatient events and 4.5 (±15.6) outpatient events, per patient per year (mean [±SD] 8.5 [±16.7]).

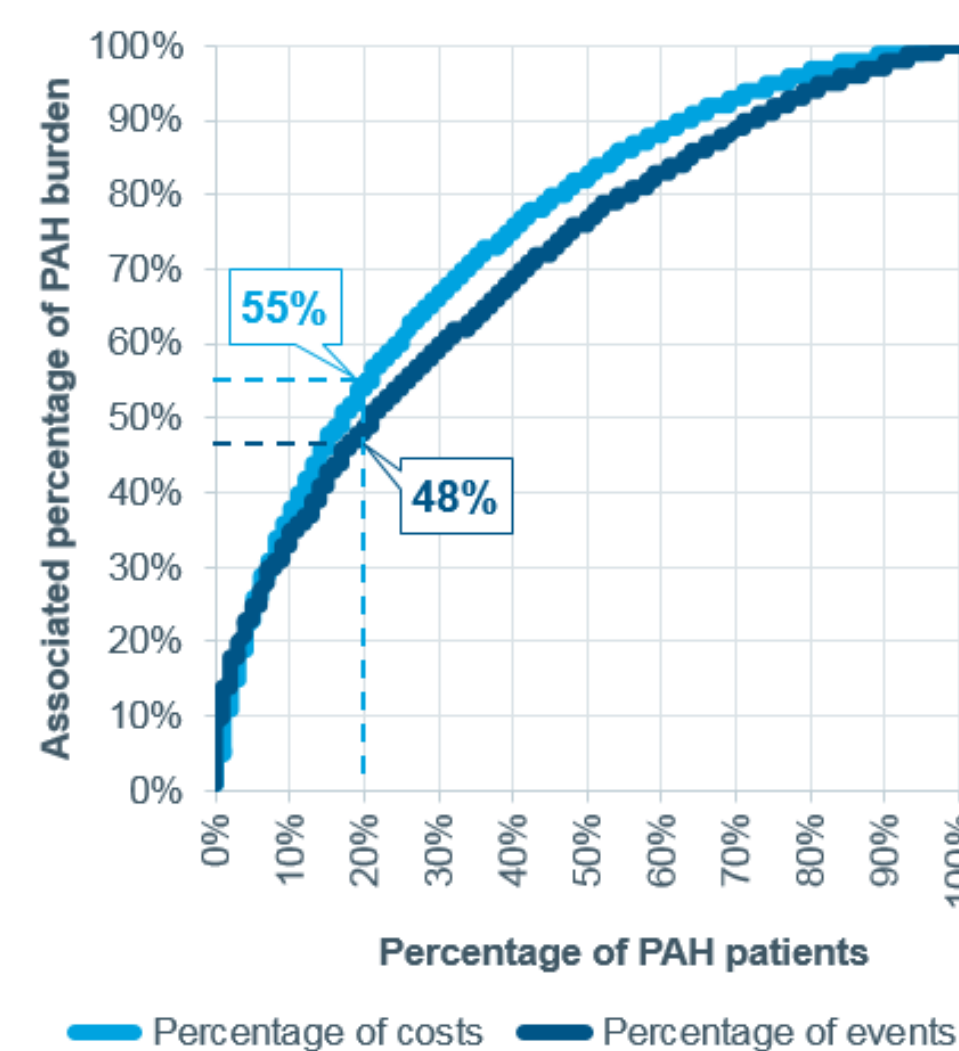


Figure 3: Concentration curve for PAH patient cohort based on cumulative value of costs and cumulative number of events

Abbreviations

PAH - Pulmonary arterial hypertension; PMSI - Programme de médicalisation des systèmes d'information; MCO - Médecine Chirurgie Obstétrique; INSEE - Institut national de la statistique et des études économiques; GHS - Groupe homogène de séjours