

Heart failure management: a nationwide population-based cohort study using the French EGB database



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Introduction

- Heart Failure (HF) is a progressive disease associated with a high mortality rate, frequent hospitalizations and poor quality of life. It is one of the leading medical causes of hospitalization among people older than 60 years¹. Approximately 40% of HF patients admitted to the hospital will either die or be readmitted within one year².
- This chronic disease is a major public health problem and is part of the Public Health Policy Act of August 9th, 2004³.
- Few data were published about characteristics, patient pathways and costs of hospitalizations for French HF patients.
- Therefore, an analysis from the Echantillon Généraliste des Bénéficiaires (EGB) was conducted in order to fill the gap.

Objectives

The objectives of this study were to identify and describe features and care pathway for HF patients, and the related healthcare resource use and expenditures in France, from EGB database.

Methods

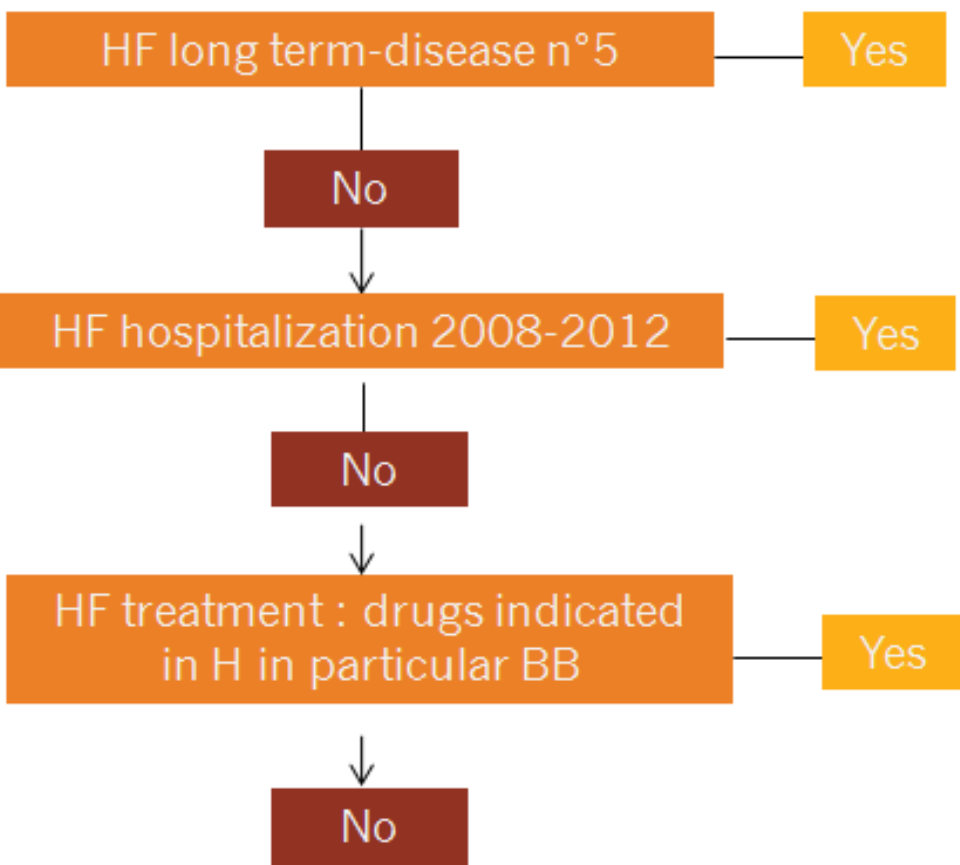
Data source

- EGB database is a permanent representative sample (1/97th) of the population covered by French National Health Insurance which monitors beneficiaries' health care consumption over a period of 20 years.
- It contains anonymous sociodemographic and medical characteristics. This database records health care reimbursements and is linked with the national hospital discharge summary database (PMSI).

Study population

As it is not possible to identify all HF patients directly with a unique criterion from EGB database, a step by step procedure was followed, taking account of limitations of reimbursement system. Thus, patients with at least one of the following criteria were included in study population (Figure 1).

Figure 1: Study population



Economic analysis

- Costs of patients' health care consumption were determined using tariffs.
- 2012 Diagnosis Related Groups (DRG) were used for the hospital stays tariffication.

Statistical analysis

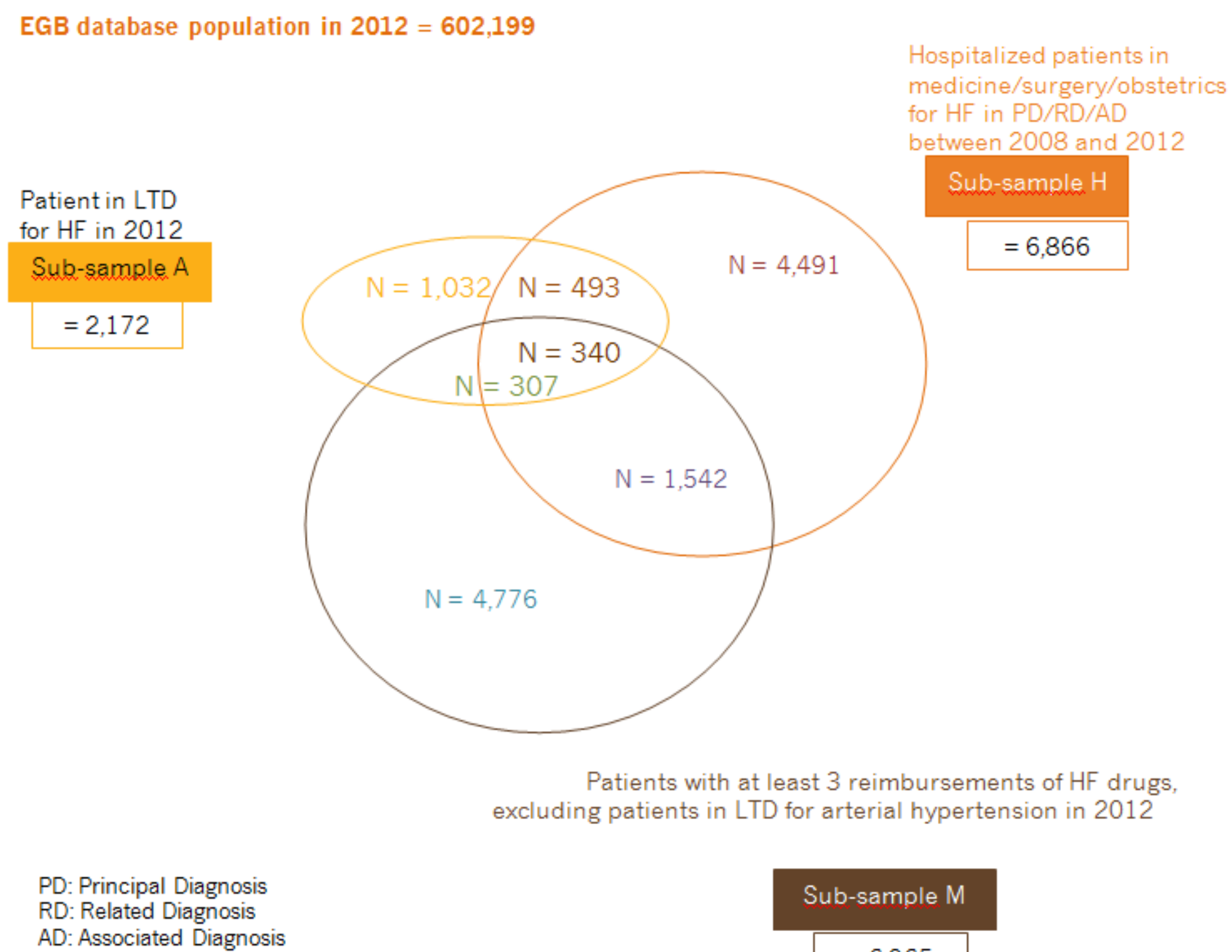
- Quantitative data were expressed as mean, standard deviation and median, and categorical data were described by their distributions and percentages.
- Comparisons were realized using ANOVA for quantitative data and Chi² test and Fisher's exact test for categorical data, with p-values <0.05 deemed significant.
- Statistical analyses were performed using SPSS V21 and SAS Enterprise Guide V4.3.

Results

Characteristics of study population (Figure 2)

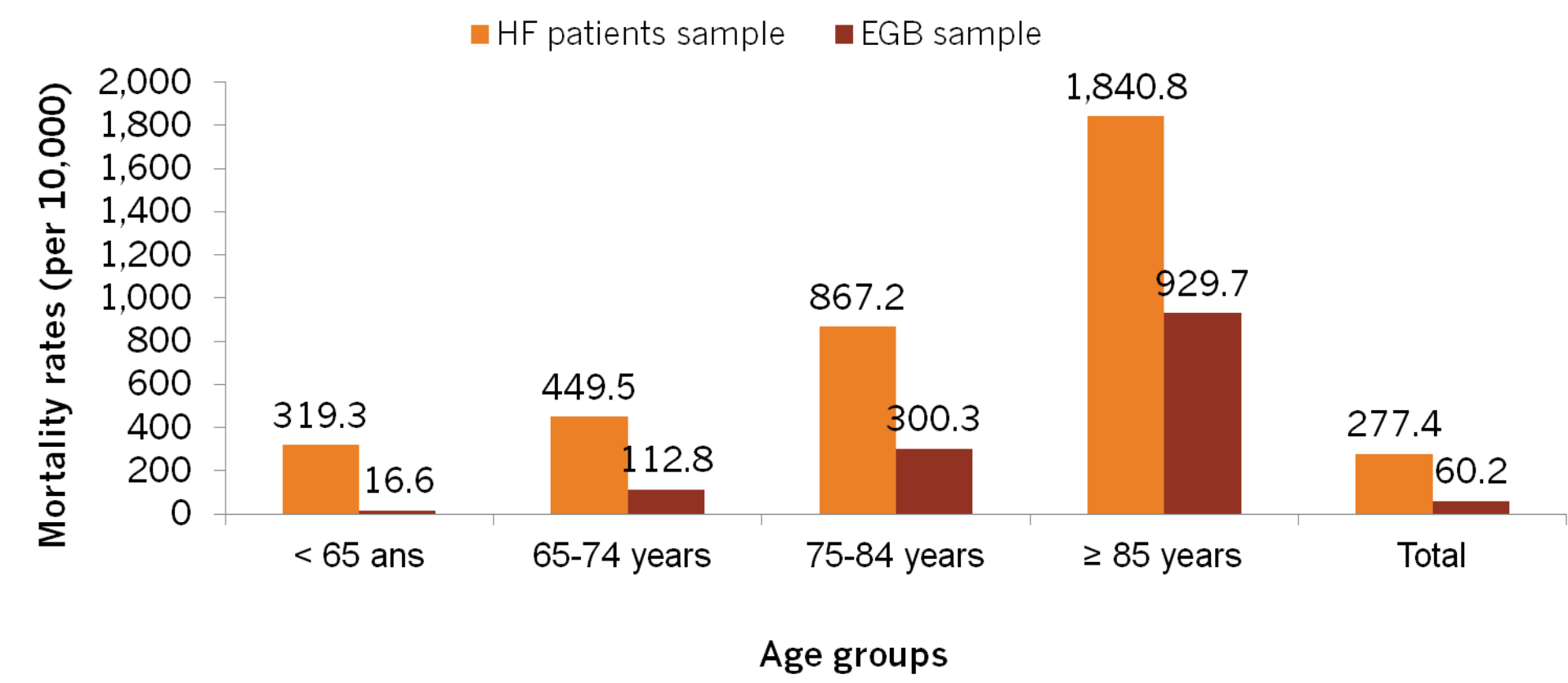
- In 2012, 12,981 patients were suffering from HF (2.2% of EGB population) divided into the 3 sub-samples.

Figure 2: Identification of HF patients according to selection criteria (N=12,981)



- 51.6% were men and mean age was 74.8±14.3 years, with more than 75% of the patients over 65 years.
- For a given age group, mortality rate was higher in patients with HF than in general EGB patients (Figure 3).

Figure 3: Comparison of mortality rates between study sample and EGB sample (per 10,000 persons)



- The annual age-standardized mortality rate was 4.6 higher than in EGB patients (277.36 vs 60.21 per 10,000 persons).

HF management

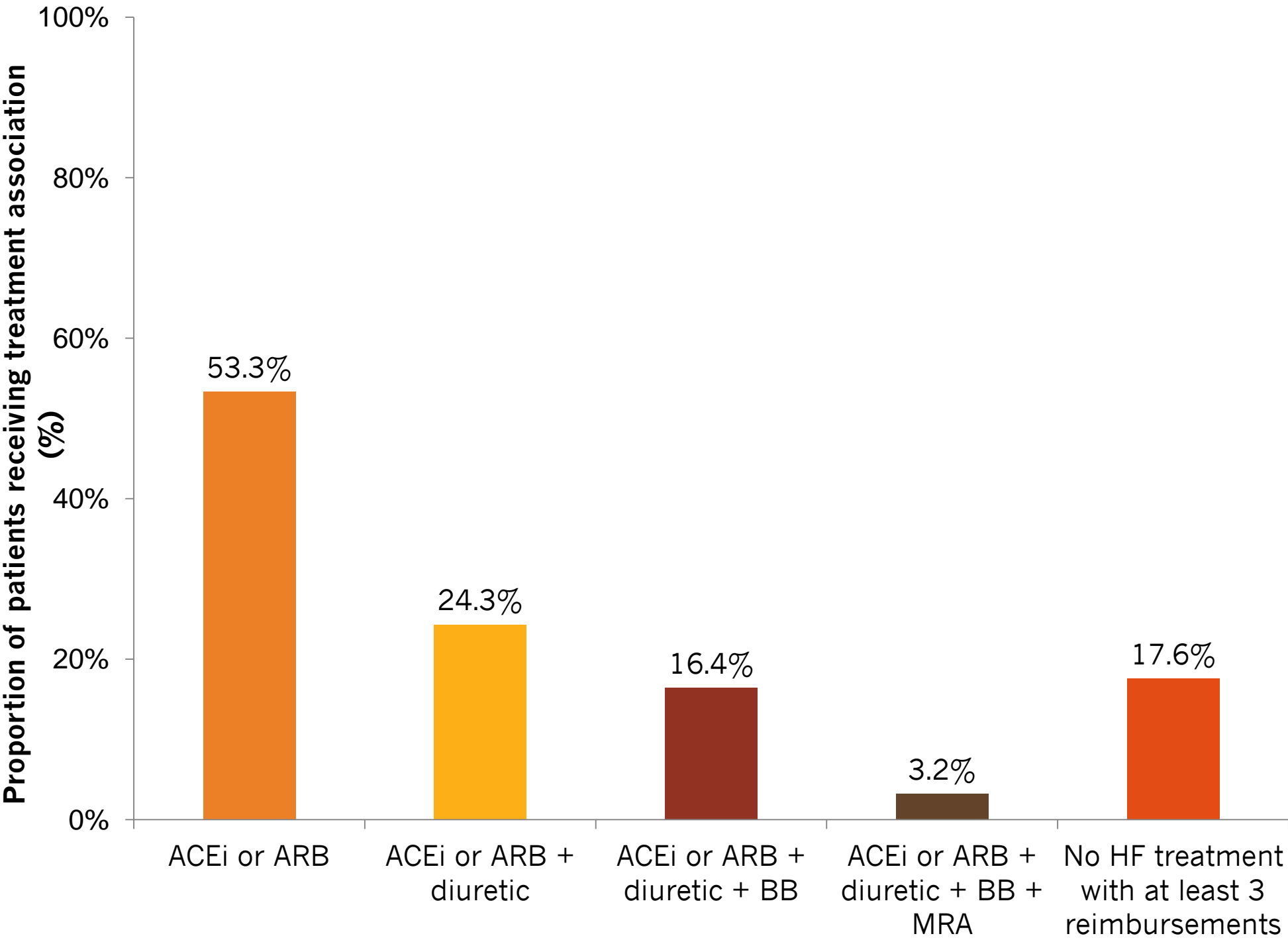
❖ Treatments

- French guidelines⁴ recommend the triple therapy including BB, angiotensin-converting-enzyme inhibitors (ACEi) / angiotensin-receptor-blockers (ARB) and diuretics as the gold standard treatment of systolic HF.
- HF recommended drugs were not prescribed to all patients and the recommended triple therapy (BB+ACEi/ARB+diuretics) was only prescribed to a few of them (16.4%) (Table 1; Figure 4).
- 17.6% of the patients were not treated with any HF treatment with at least 3 reimbursements.
- BB and ACEi were mostly prescribed for patients <65 years (respectively 74.9% vs 56.1% and 53.9% vs 35.9%).
- Recommended triple therapy was more prescribed for patients ≥65 years (17.3% vs 13.5%).

Table 1: HF treatments prescribed in association or not with other treatments

HF drugs	Total (N=12,981)
At least 3 reimbursements associated or not – Nb (%)	
BB	7,833 (60.3)
Diuretics	5,973 (46.0)
ACEi	5,193 (40.0)
ARB	1,804 (13.9)
Mineralocorticoid Receptor Antagonist (MRA)	1,346 (10.4)
Ivabradine	309 (2.4)
Digitalis	1,074 (8.3)
Implantable Cardiac Defibrillator (incidence rate)	87 (0.7)

Figure 4: HF treatment associations prescribed (at least 3 reimbursements associated or not) (N=12,981)



Discussion / Conclusion

Main limitations of this study are related to the use of the EGB database:

- limited detailed clinical information regarding clinical parameter and paraclinical examination results (eg: ejection fraction, NYHA class...),
- difficulties to identify LTD population: some HF patients might have not been recorded in LTD code 5 with chronic HF diagnosis, because they could already be recorded in another LTD code due to comorbidities,
- no data available about cardiologist consultations in hospital,
- classical limitations regarding the validity of data coding, such as coding of diagnoses.

Despite these limitations, results are consistent with other reports:

- HF prevalence estimated from this study was 2.2%, in accordance with literature^{6,7}. Patients characteristics were also similar to those retrieved in literature^{8,9,10,11}.
- Patients were not optimally managed for their HF, with a limited healthcare resource use. Despite a high rate of hospitalization, cardiologist visits remain at a very low frequency in this HF population,
- Better referring these patients to cardiologists should improve their management and optimize drugs prescription as recommended in the guidelines.

❖ Visits

- During study period, most of patients visited a general practitioner (GP) (93.1%) on a regular basis (9.3 visits per year) but only a few of them visited an office-based cardiologist (37.0% - 0.67 visit per year), despite French Health Authority (HAS) recommendations⁵ of at least 1 visit per year. 5.4% of the patients have not visited any doctor.
- Patients with at least one visit to a cardiologist were younger (73.4 vs 75.6 years) and more likely to follow the recommended triple therapy (20.1% vs 14.3%) than patients who didn't visit a cardiologist.

❖ Hospitalizations

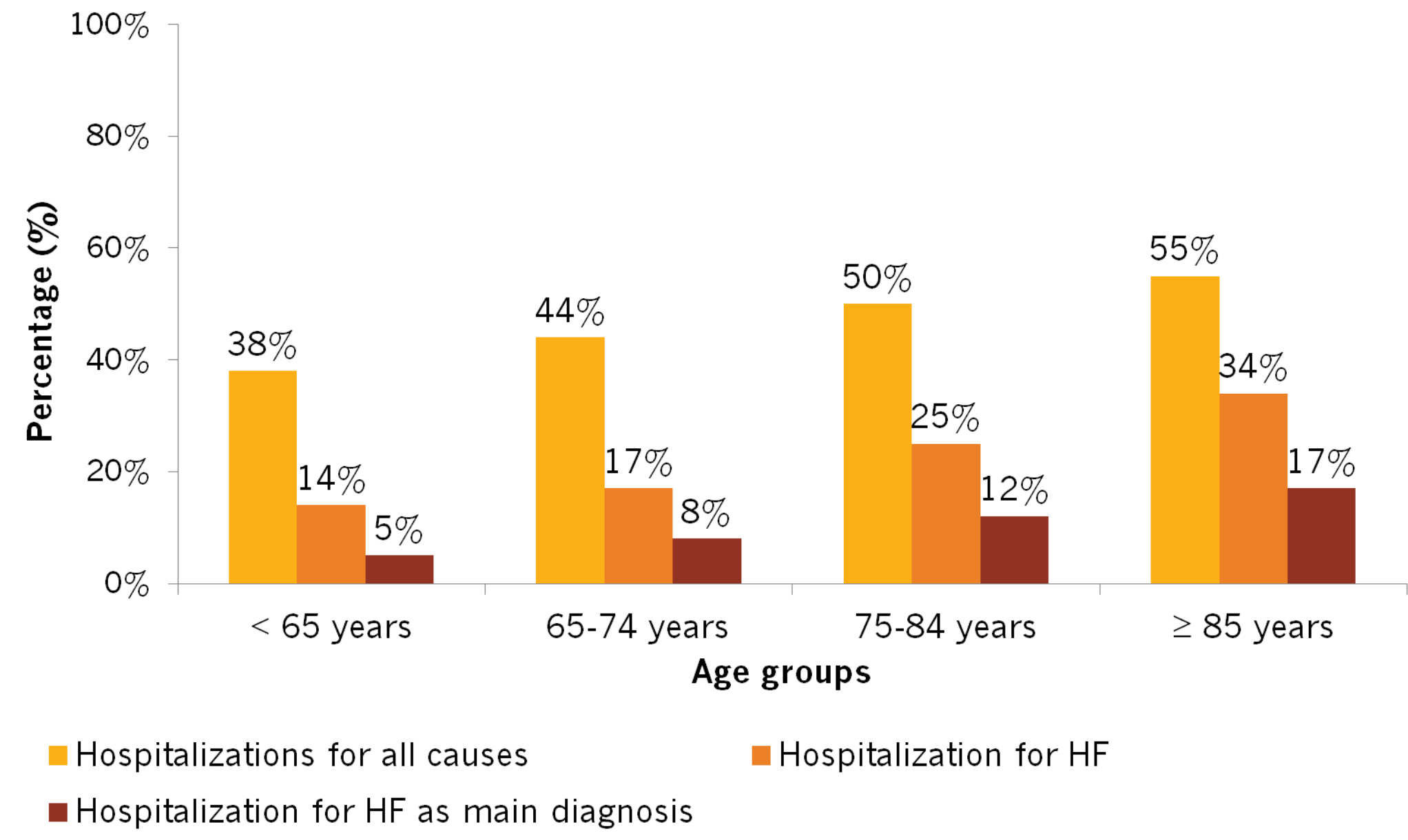
- Almost half of the patients (47.3%) were hospitalized within the year (1.3 stays per year on average), with a quarter of these stays related to HF (27.0%).
- Patients were less frequently hospitalized for HF than for all causes (1.5 vs 2.7 stays per patient and per year), but over a longer period (10.4 days vs 6.2) (Table 2).

Table 2: Hospital stay characteristics

Hospitalization for HF	Total (N=3,047)
Number of hospital stay per patient and per year, mean (SD)	1.5 (1.1)
Length of hospital stay, mean (SD)	10.4 (11.4)
Hospitalization for all causes	Total (N=6,146)
Number of hospital stay per patient and per year, mean (SD)	2.7 (7.4)
Length of hospital stay, mean (SD)	6.2 (9.3)

- Older patients were most frequently hospitalized, whatever the reason, and over a longer period (Figure 5).

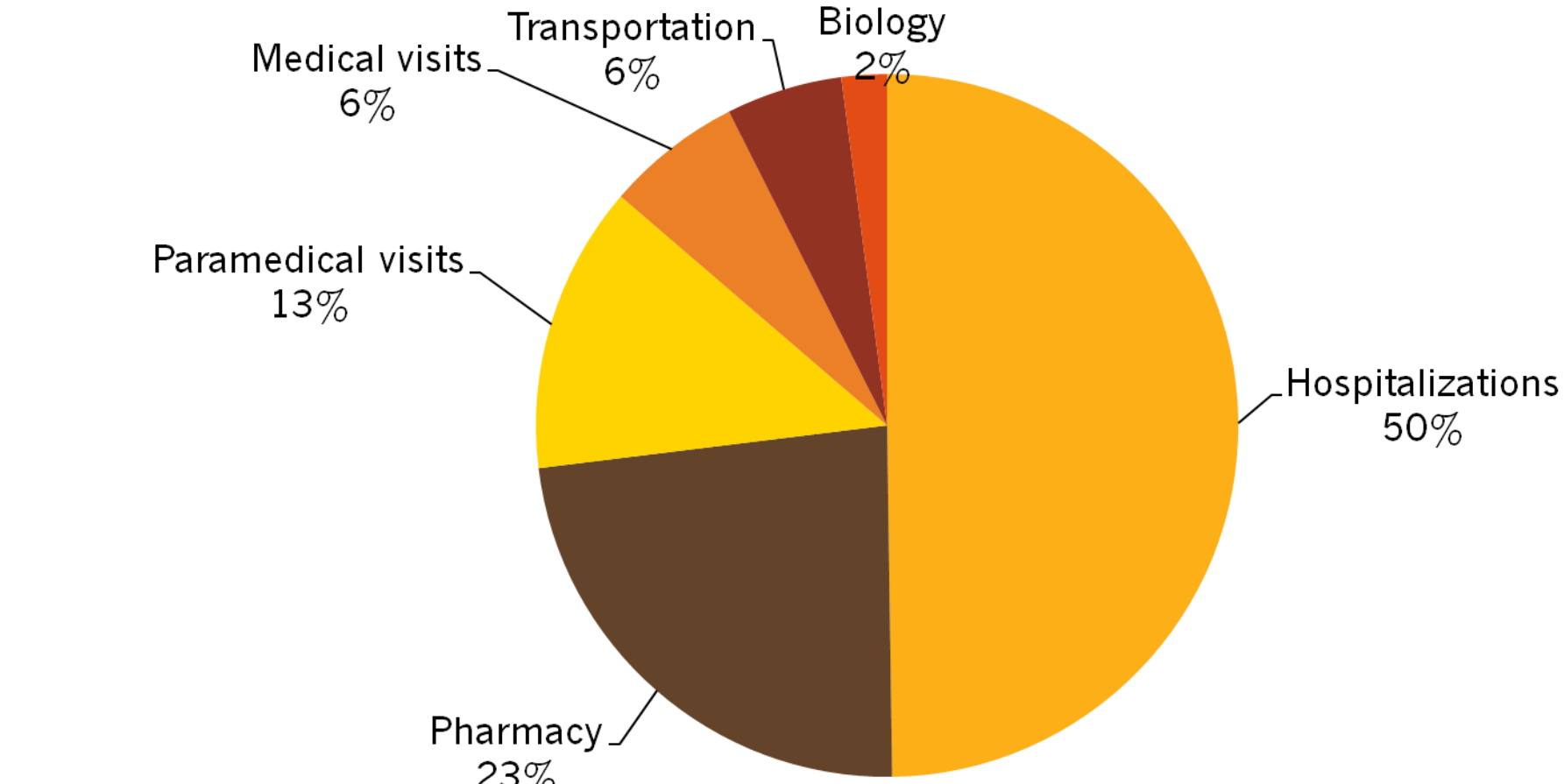
Figure 5: Proportion of patients with at least 1 hospitalization in 2012



Economic analysis

- Total annual amount of reimbursement was 55 M€ for outpatient care and 47 M€ for hospital care.
- Annual mean cost of outpatient care was 4,273€ per patient.
- Total annual average healthcare cost was 7,956€ per patient, mostly driven by hospitalizations (3,683€; 50%), pharmacy (1,723€; 23%), paramedical visits (980€; 13%) and medical visits (463.9€; 6%) (Figure 6).

Figure 6: Distribution of total healthcare costs



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