

AN ASSESSMENT OF ANNUAL COSTS OF PATIENTS HOSPITALIZED FOR SPINAL TUMORS IN FRANCE: ANALYSIS USING THE PMSI DATABASE

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INTRODUCTION

In France, cancer-related costs represent a growing part of third-party payer expenses (10% in 2012, increased by 2.8% compared to 2011). All available options to reduce or at least stabilize the costs without decreasing the quality of patient care must be considered¹. Economic evaluation is therefore becoming increasingly important in the health technology appraisal of innovations in oncology, requiring accurate costing estimations. The burden of hospitalizations related to spinal tumors in France has not been recently evaluated. The objective of this study was to assess hospitalization costs of patients with spinal tumors in France.

METHOD

1. Data extraction

Study period: January 1st, 2012 to December 31st, 2013.

Design: Retrospective study of the PMSI-MCO 2012 database (French Medical Information System Program - Medicine, Surgery, Obstetric) which records diagnoses and procedures on all daycare and inpatient stays in private/public hospitals.

Data extraction:

All hospital stays in 2012 with spinal tumors were extracted from the PMSI, using International Classification of Diseases, 10th revision (ICD-10) codes to identify spinal tumors: C41.2 or C41.4 or C41.8 as principal/related diagnosis (PD/RD) or significantly associated diagnosis (SAD) for **primary tumors**; association of ICD-10 codes C79.5 and M49.5* as PD/RD/SAD or M49.5* alone as PD/RD for **secondary tumors**.

- C41.2 "Malignant neoplasm of vertebral column"
- C41.4 "Malignant neoplasm of pelvic bones, sacrum, and coccyx"
- C41.8 "Overlapping lesion of bone and articular cartilage"
- C79.5 "Secondary malignant neoplasm of bone and bone marrow"
- M49.5* "Collapsed vertebra in diseases classified elsewhere"

2. Patients and hospital stays selection at inclusion

An **algorithm** and a **medical review** considering ICD-10 codes and surgical procedures ("Classification Commune des Actes Médicaux", CCAM) were carried out to identify stays related to spinal tumors:

- Stays with primary tumors (C41.2 or C41.4 or C41.8) as PD/RD as well as stays combining codes C79.5 and M49.5*, one of which as PD/RD were automatically selected.
- A medical review in collaboration with a coding physician was deemed necessary when the following criteria were encountered: primary tumor codes as SAD only; C79.5 and M49.5* codes both as SAD; M49.5* code as PD/RD without any other spinal tumor code. This medical review aimed at excluding stays which were not directly related to spinal tumors.

3. Follow-up of patients

Patients were followed during one year from their first stay in 2012 (e.g. March 2012 to March 2013) with one and unique anonymous number. It allowed linkage between hospital stays and patients. An additional extraction of all their 2013 stays with spinal tumors was performed according to the algorithm above described. A similar medical review was conducted when deemed necessary.

4. Economic evaluation

Hospital costs were estimated from a healthcare payer's perspective. Associated costs during this period were added up: a total annual cost ("burden") as well as a mean annual cost per patient were calculated. Valuation was performed considering French official DRG (diagnosis related groups) tariffs for 2012 and 2013 expressed in 2014 Euro, as well as supplements.

RESULTS

1. Characteristics of patients

The study population comprised **9,415 stays in 3,284 patients** (Fig. 1).

Patients were 66 ± 19 years old on average (men: 63 ± 19 and female: 68 ± 19) and were mainly female (55%).

3 out of 4 patients were above 56 years old.

During the 1-year follow-up, 165 patients (5%) died at hospital. 338 patients (10%) presented a advanced multiple myeloma (defined as the presence of ICD-10 codes as PD/RD/SAD: C90* "Multiple myeloma and malignant plasma cell neoplasms").

2. Characteristics of stays

94% of stays occurred in public hospitals. Ambulatory stays (length of stay, LOS = 0 day) accounted for more than half of the stays (56%), mainly due to chemotherapy and radiotherapy sessions. Mean LOS associated with full hospitalizations (LOS > 0 days) was 11 ± 14 days.

An analysis of DRGs as well as of CCAM procedures gives information as regards to the type of management. Chemotherapy and radiotherapy accounted for 30% and 28% of stays, respectively (Fig. 2). Spine surgery, such as tumor excision, osteosynthesis or laminectomy was performed in 6% of stays. Overall, spine fracture management, whether surgical or medical, accounted for 30% of stays.

198 stays (2%) included admission in intensive care units (ICU). Mean LOS in ICU was 6 ± 9 days.

3. Burden of hospitalizations related to spinal tumors

The total annual cost of hospitalizations related to spinal tumors was €26 million (Fig. 3):

- DRGs taking into account outlier LOS + daily supplements + clinicians fees for the private sector represented €24 million, i.e. 94% of this burden;
- Expensive drugs and implants from the "Liste en sus" accounted for 6% of this burden.

The mean annual cost was €7,817 ± 8,858 per patient (N = 3,284 patients).

Figure 1. Flow Chart of study

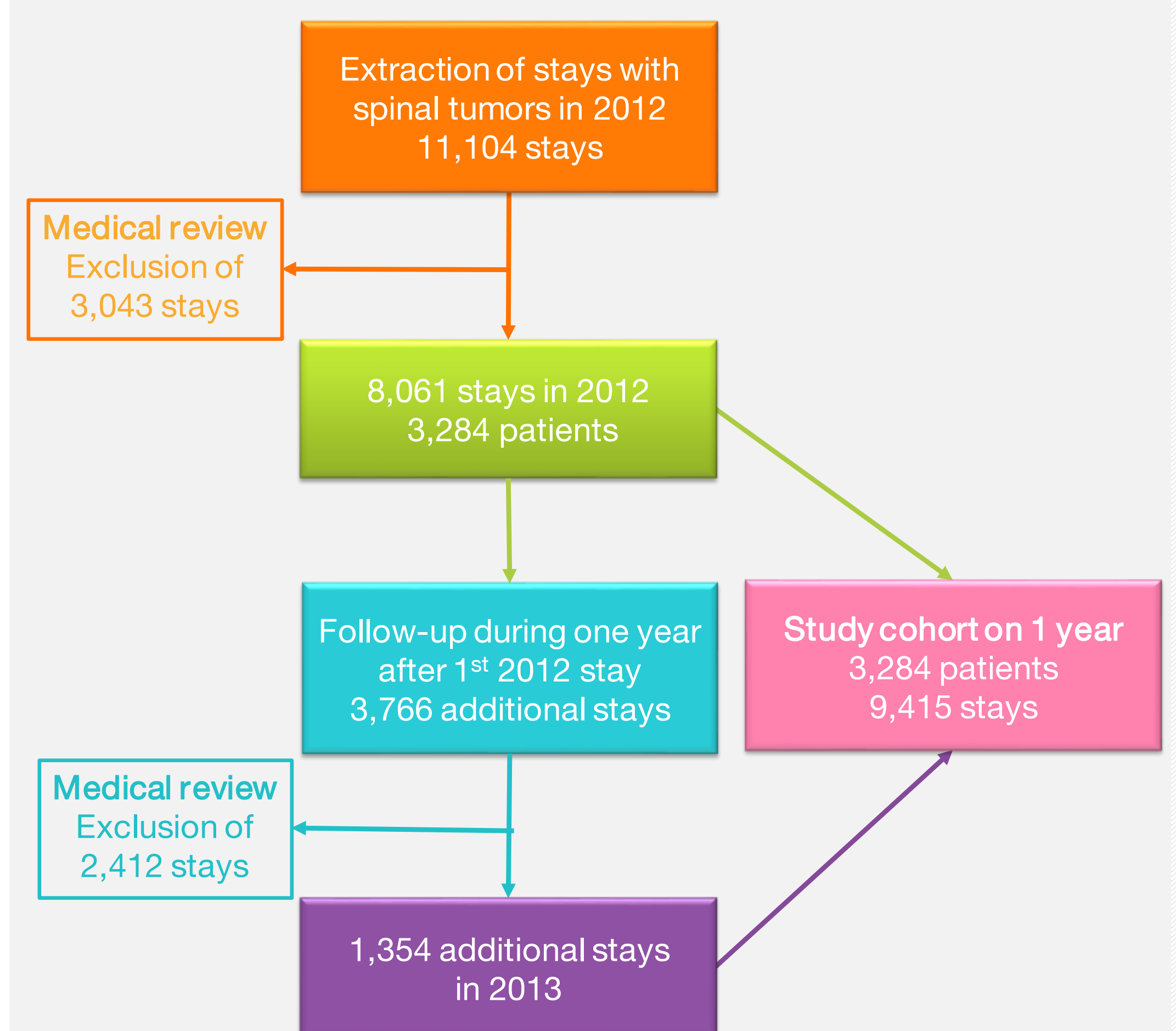


Figure 2. Type of management (N = 9,415 stays)

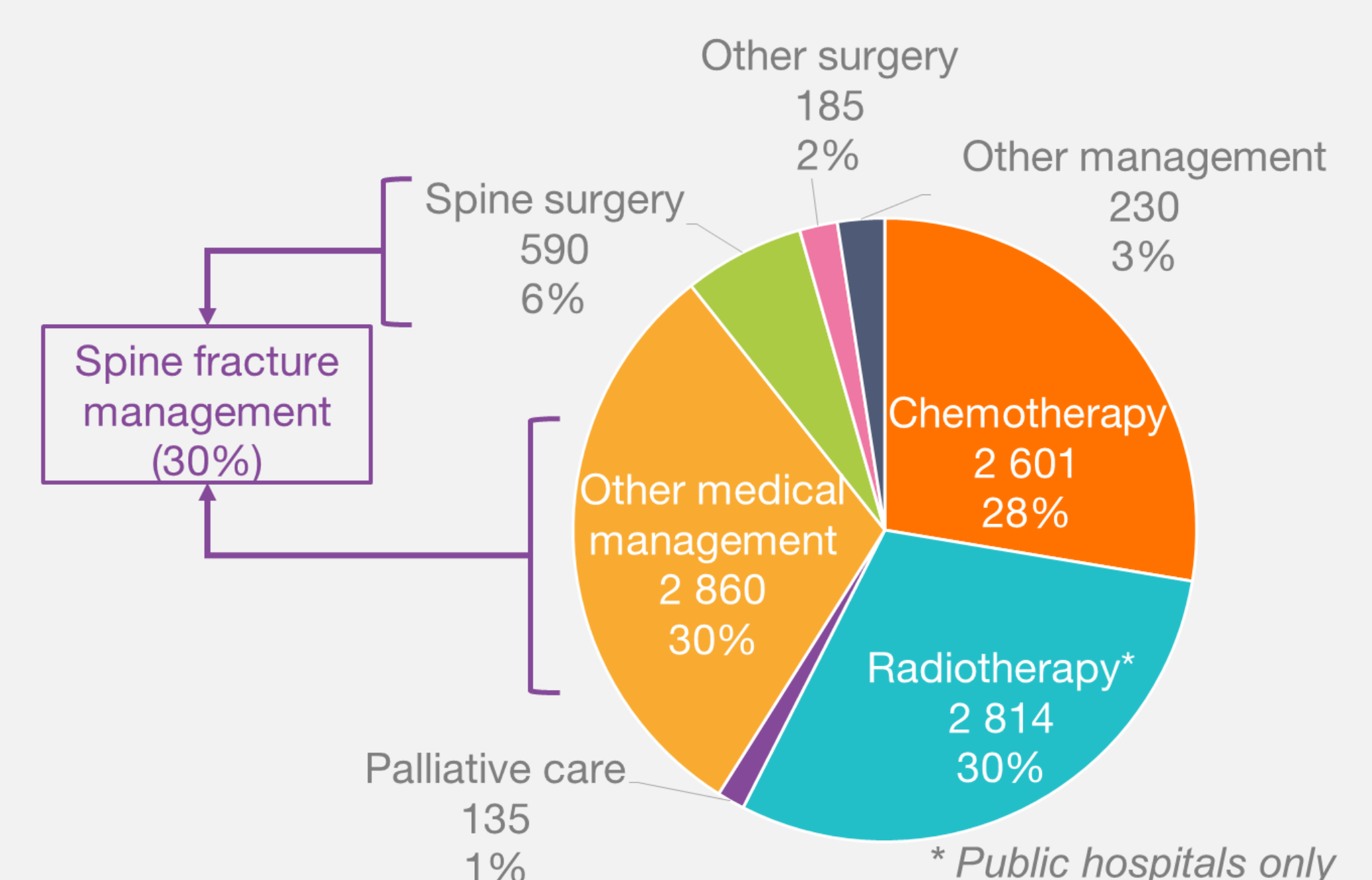
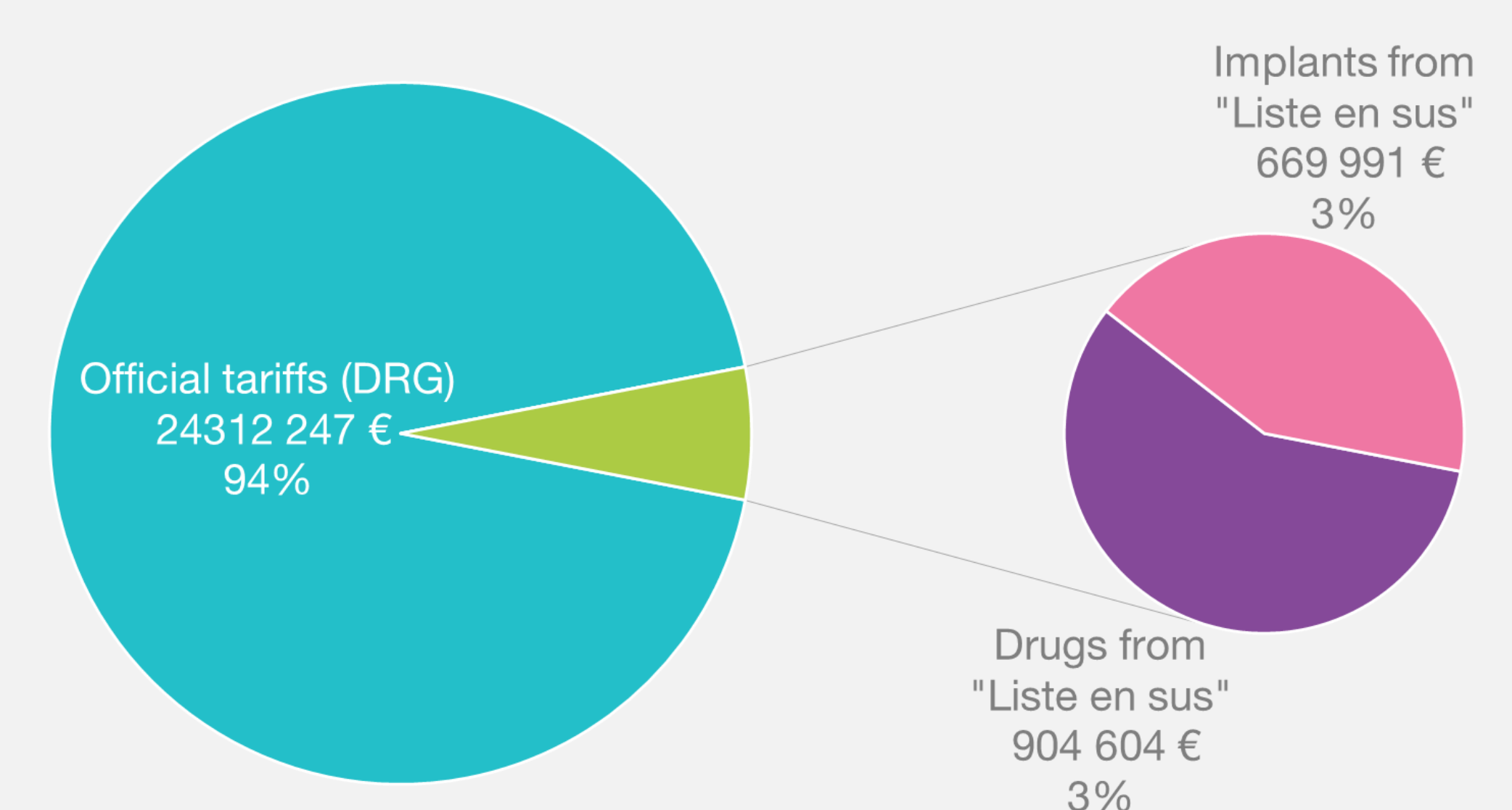


Figure 3. Total burden of spinal tumors



CONCLUSION

In 2012, 3,284 patients were hospitalized for spinal tumors. These spinal tumors led to a total of 9,415 hospitalizations during one year of follow-up. 75% of patients were 56 years and over.

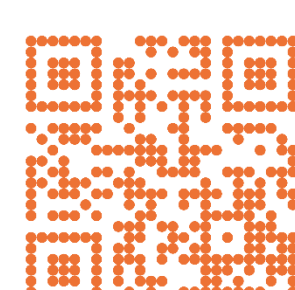
Chemotherapy and radiotherapy sessions accounted for more than half of stays. Hospital-related costs associated with spinal tumors were high: the total annual cost approximated €26 million, leading to a mean cost of more than €7,800 per patient.

The PMSI represents a comprehensive collection of all inpatient stays in France, intended to analyze hospital activity. However, it also allows economic research with some limitations to be considered: neither deaths occurring outside of the hospital are gathered, nor outpatient costs (treatment, outpatient visits, sick leave...). The burden of spinal tumors in France may therefore be underestimated.

New spinal tumors treatment modalities could decrease these costs.

References

(1) EOCD. Panorama de la santé 2011 : les indicateurs de l'OCDE. 2011.



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