

Economic Burden of Glioblastoma in Five European Countries: A Systematic Review

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INTRODUCTION

- Glioblastoma multiforme (GBM) is one of the most common and aggressive forms of solid brain tumour. It accounts for 48.6% of malignant central nervous system tumours and 14.5% of all central nervous system tumors¹
- GBM originates from astrocytic glial cells.² It represents almost 15% of primary brain tumours and 60–70% of gliomas.³ The global incidence of GBM is < 10 per 100,000 persons^{4,5}
- Like other cancers, the treatment of glioblastoma can be expensive. Funding this treatment and using resources can present a significant strain on the financial resources of a healthcare system

OBJECTIVES

- To identify comprehensive evidence on the economic burden of disease among patients with glioblastoma in five key European countries (France, Germany, Italy, Spain and the UK)

METHODS

- Searches were performed in Embase[®] and MEDLINE[®] via Embase.com to identify English-language articles published between 2012–2022
- Studies were screened per pre-defined inclusion criteria (Figure 1) by two independent researchers, with any discrepancies reconciled by a third
- Studies reporting cost and resource data were included in this systematic review
- Data on study characteristics, patient demographics and economic burden (costs/healthcare resource use) were extracted

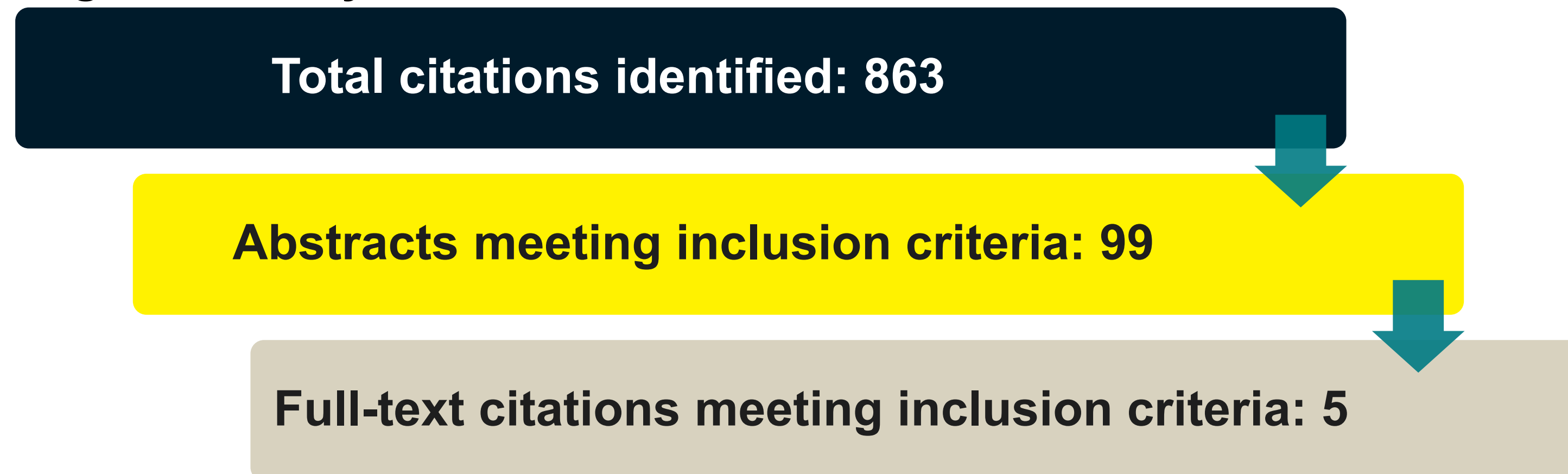
Figure 1: Inclusion criteria

Age	≥ 18 years
Disease	Glioblastoma multiforme
Study design	Economic burden studies
Countries	UK, France, Italy, Spain, and Germany
Language	English

RESULTS

- A total of 863 records were screened, five of which met the pre-defined eligibility criteria. Of these five, two were conducted in Spain and one each in England, France and Italy. A flow diagram of each phase of the systematic literature review is summarized in Figure 2

Figure 2: Study flow



England:

- A 5-year GlioCova project in England (2013–2018) found the median length of hospitalization in patients undergoing surgery or biopsy for GBM was 5 days (interquartile range = 6) and 3 days (interquartile range = 6), respectively¹⁰

France:

- Henaine et al.⁸ reported an increased trend in the mean total cost per patient with GBM from €53,368 (N = 49 patients) in 2004 (Group 1) to €70,201 (N = 73) in 2008 (Group 2) and €78,355 (N = 95) in 2011 (Group 3). A significant increase in total cost was observed by 2011 compared with 2004 (p-value: < 0.05). The key cost drivers were hospital care (75%, 59% and 60% in Groups 1, 2 and 3, respectively) followed by chemotherapy drug costs (11%, 30% and 29%, respectively)⁸ as shown in Figure 3

Italy:

- A study conducted by Pace et al. consisted of two separate patient groups: one comprising home-assisted patients and the second comprising patients living independently. Patients were assisted at home for a mean length of 182 days. The cost of hospitalization was higher in patients without home assistance (€24,076) compared with those patients with home assistance (€517)⁹

Table 1: Summary of included studies

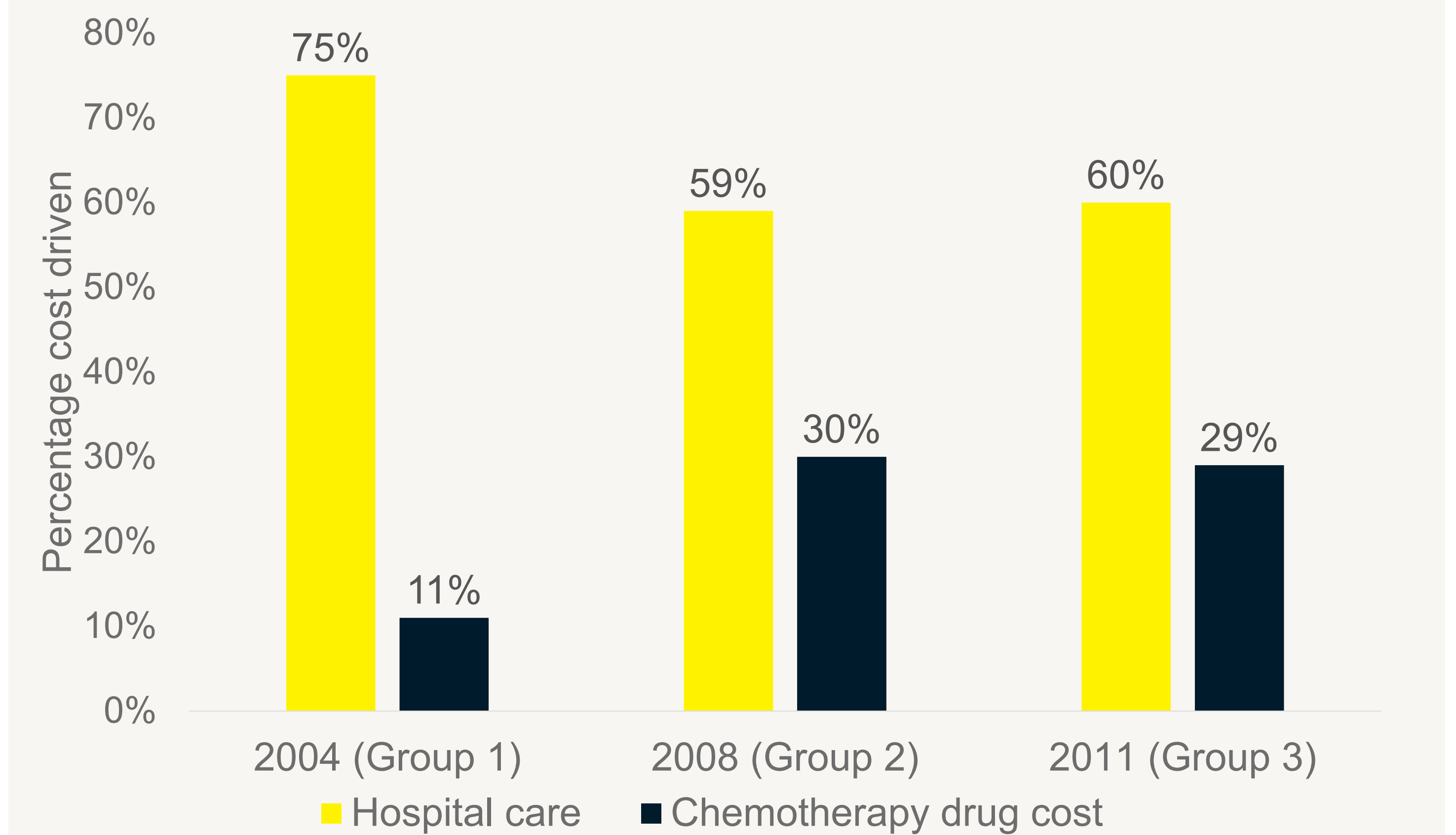
Study	Country	Cost year Perspective	Patient population	Cost/resource data
Mauricaite et al. (2021) ¹⁰	England	NR NR	Adult (≥ 18 years) patients with GBM	Median LOS: ▪ Undergoing surgery: 5 days (IQR = 6) ▪ Undergoing biopsy: 3 days (IQR = 6)
Henaine et al. (2016) ⁸	France	2014 Payer	Adult (≥ 18 years) patients with GBM	Mean total cost per patient: ▪ 2004 (Group 1): €53,368 ▪ 2008 (Group 2): €70,201 ▪ 2011 (Group 3): €78,355 p-value: < 0.05 (2011 vs 2004)
Pace et al. (2012) ⁹	Italy	NR Societal	Adult (≥ 18 years) patients with GBM	Hospitalization cost: ▪ Patients assisted at home: €517 ▪ Patients not assisted at home: €24,076
Balana et al. (2014) ⁷	Spain	NR NR	Adult (≥ 18 years) patients with GBM	Annual cost of temozolomide to society: €1.5 million
Ruiz et al. (2016) ⁶	Spain	2014 NR	Adult (≥ 18 years) patients with GBM	Second-line treatment: ▪ With BVZ/CPT-11: €629,277.57 ▪ Without BVZ/CPT-11: €16,771.29

Key: BVZ, bevacizumab; CPT-11, irinotecan; GBM, glioblastoma multiforme; LOS, length of stay; IQR, interquartile range; NR, not reported; vs, versus.

Spain:

- Ruiz-Sánchez et al. reported that the cost of second-line treatment with a bevacizumab/irinotecan regimen is significantly higher than treatment without bevacizumab/irinotecan regimen (€629,277.57 versus €16,771.29, respectively) and concluded that the economic cost of increasing survival by 4 months is too high for a public health system⁶
- A study conducted by Balana et al. in a Spanish setting reported an annual cost burden to society of €1.5 million for the treatment of GBM with temozolomide⁷

Figure 3: Cost drivers reported by Henaine et al.⁸



CONCLUSIONS

- Hospital care and an increasing demand for treatment for GBM by chemotherapy and monoclonal antibodies is associated with a significant economic burden
- There is limited economic-burden evidence for GBM in Europe. Therefore, more studies are needed to evaluate indirect costs to draw more meaningful inferences around total costs associated with GBM

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An electronic version of the poster can be viewed by scanning the QR code.