The Socioeconomic Burden of IDH-Mutant Grade 2 Glioma: Quantifying Patient and Caregiver Productivity Losses in Spain

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INTRODUCTION

- IDH-mutant grade 2 gliomas mainly affect adults aged 30–40 years, at the **peak of working and family life**[1].
- Despite an indolent course, >70% undergo malignant transformation within a decade; **radiotherapy/chemotherapy (RT/CT) remains the main therapeutic escalation tool**[2,3].
- The **social burden of these tumors and the current treatment had not been quantified in Spain**; the only comparable study (Denmark) covers patients only[4].

OBJECTIVE

To quantify **indirect costs and health-related quality-of-life (HRQoL) losses** of IDH-mutant grade 2 glioma in Spain from a broad societal perspective and identify key cost drivers relevant to HTA and treatment decision-making.

METHODS

- **Stage-based societal cost model** built on primary data from a **multidisciplinary expert panel (n=6)** and a **patient focus group (n=11)**, supported by the literature.
- Structured **expert consensus set**, per stage: **sick-leave duration** (patients and caregivers) and functional **dependency grade** driving informal care hours.
- **Productivity losses:** human capital method. **Informal care:** replacement cost. **HRQoL:** TTO utilities[5] valued at a Spanish willingness-to-pay threshold[6].
- **Out-of-pocket expenditure** mapped qualitatively.

Cost component	Method & source	Unit value
Patient leave (temporary)	Human capital; mean gross wage, age 35–44 (INE 2023)	28,105 €/year
Patient permanent disability	Permanent incapacity benefit (Social Security)	18,674 €/year
Caregiver leave	Human capital, same wage base	28,105 €/year
Informal care	Replacement cost, home-help tariff (IMSERSO 2023).	16.21 €/hour
HRQoL loss (intangible)	TTO utilities × WTP threshold (2016, CPI-updated)	28,250 €/QALY

Table 1. Valuation methods, sources and unit values.

Modeled care pathway: five consecutive stages

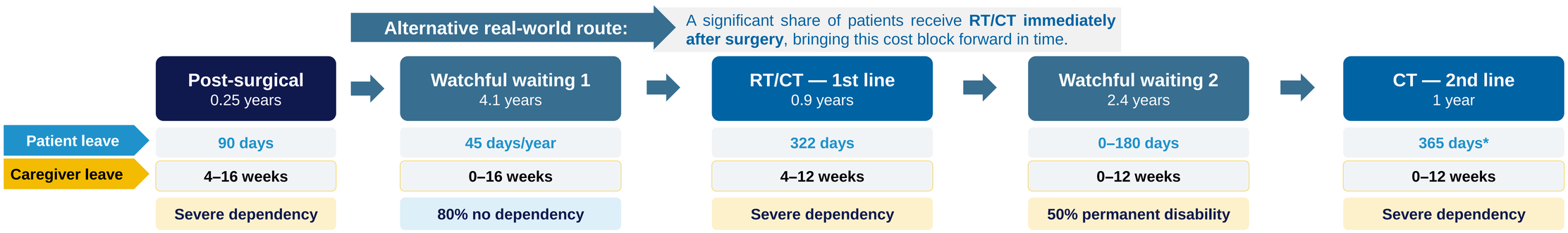

Figure 1. Expert-consensus pathway for a low-risk patient; stage duration, sick leave and dependency grade per stage. RT/CT = radiotherapy/chemotherapy.

*In Spain, permanent work incapacity is assessed after 365 days of temporary incapacity (EVI).

RESULTS

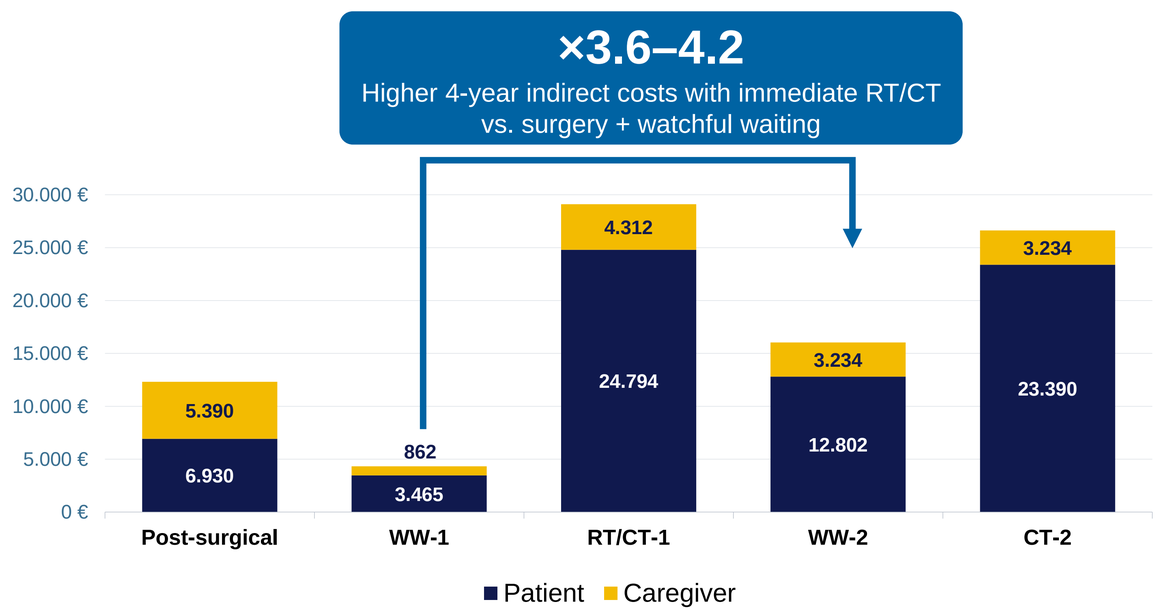

Figure 2. Annual productivity losses per patient by stage (€). Stages longer than one year shown as the cost of a single year. WW = watchful waiting.

KEYPOINTS

29,106 €
peak annual productivity loss (patient + caregiver) during first-line RT/CT

75–96 h/week
informal care from RT/CT onwards (1,216–1,556 €/week)

6,215 €
annual HRQoL loss per patient on chemotherapy

- Patient losses rose from **3,465 €/year** (WW-1) to **24,794 €** in the RT/CT-1 year and remained at **12,802 €/year** in WW-2.
- Monthly patient cost: **289 €** (WW-1) to **2,066 €** (RT/CT-1). **Surveillance never returns to baseline**: 1,067 €/month in WW-2 (×3.7 vs. WW-1), 1,336 € with caregivers.
- Stable disease without chemotherapy: HRQoL gain of **6,215 €/patient-year** (TTO 0.54 vs. 0.32)[5].
- Psychotherapy and cognitive rehabilitation **largely paid out of pocket** (45–70 €/session).

Cumulative first 4-year indirect costs	
Surgery + watchful waiting	21,137 €
Surgery + immediate RT/CT	76,461–87,746 €
Ratio	**×3.6–4.2**

Table 2. Cumulative 4-year productivity losses per patient.

Caregiver and family burden

- Caregivers add 3,200 to 4,300 €/year at RT/CT-1 and CT-2 (5,390 € post-surgery).
- Relatives become full-time caregivers in severe cases.

Drivers of the escalation

- 50% of patients cannot return to work after RT/CT-1 (permanent disability).
- **Cognitive impairment** in almost half of the patients: 40% employment rate vs. 73% in those without impairment.

Focus group validation (n=11)

- 2–3 months leave after each surgery; up to 2 years before permanent disability.
- Self-employed: income drops to zero while fixed costs continue.

CONCLUSIONS

- IDH-mutant grade 2 glioma imposes a **substantial indirect cost burden** on patients, caregivers and society.
- **RT/CT is the primary driver of cost escalation**, directly and through persistent post-treatment productivity losses.
- Strategies that **delay RT/CT while preserving disease control and HRQoL** generate significant societal value beyond their clinical benefit, strengthening the case for HTA evaluation.

Limitations: expert-consensus parameters (no patient-level data); human capital method; generic low-risk patient; direct healthcare costs excluded.

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