

Introduction & Objective

Health technology assessment (HTA) agencies assess the economic value of therapies to inform reimbursement decisions.

Denosumab is a safe and effective biologic approved to prevent skeletal-related events (SREs) associated with certain cancer. However, the **high cost of reference biologic products can limit reimbursement and patient access.**

The availability of **lower-cost biosimilars** has the **potential to reduce budget impact and expand access** to effective treatment.

Objective: To conduct a literature review to assess the cost-effectiveness and global reimbursement status of denosumab.

Methods

Economic Assessments

Literature searches from January 2019 to December 2025 were conducted in MEDLINE to identify economic assessments of denosumab in oncology. The following terms were searched:

- Budget impact
- Cost-effect*
- Cost-utility
- Cost-consequence
- Cost per responder
- Economic

Reimbursement Assessments

The NAVLIN database¹ was used to assess the reimbursement decisions in the following countries:



HTA decisions were classified using the following categories:

- full reimbursement (according to label)
- partial reimbursement (e.g., based on disease severity)
- do not recommend

Results: Economic Assessments

70 records were identified and screened for inclusion, resulting in **five relevant studies** that reported the economic impact of denosumab in oncology. Results included four cost-effectiveness analyses and one budget-impact model (**Table 1**).

Two studies were conducted in the United States, while the remaining were economic assessments in Europe (n=1), Turkey (n=1), and India (n=1).

Included studies assessed the **cost-effectiveness of denosumab for the prevention of SREs and fractures** in multiple myeloma, breast, prostate, and lung cancer.

Table 1: Distribution of pharmacoeconomic analyses, by type and region

	Cost-effectiveness analysis	Budget impact model
United States	✓	✓
Europe [†]	✓	
Turkey	✓	
India	✓	

[†]European countries included Austria, Belgium, Greece, and Italy

Four studies demonstrated **cost-effectiveness or cost savings** of denosumab for the prevention of SREs and fractures in cancer.⁵

⁵An analysis from an Indian societal perspective found denosumab reduced SREs and improved quality-adjusted life years (QALYs), however high drug cost caused denosumab to exceed the willingness to pay (WTP) threshold to be considered cost-effective versus zoledronic acid (ZA).²

United States

A 2025 budget impact model found the **introduction of a denosumab biosimilar** from a payer perspective over a five-year period led to:

- **Cost savings of \$38,677,606 USD or \$0.59 USD per member per month** when switching from reference denosumab.^{3,†}
- In a medium biosimilar uptake scenario,[‡] **998 additional patients could be treated.**^{3,‡}

Over a lifetime time horizon, denosumab is **cost-effective compared to ZA in the prevention of SREs in solid tumors** from both the **societal** (\$70,730/QALY gained) and **payer perspective** (\$104,778/QALY gained).^{4,**}

Turkey

Overall, denosumab showed **better efficacy versus ZA in preventing SREs**, particularly in breast and prostate cancer, but was associated with higher costs. **Incremental costs per prevented SRE** ranged from **\$1,420 USD** in prostate cancer to **\$12,525** in lung cancer.⁶

[†]Results are reflective of denosumab biosimilar uptake for reference products Xgeva (oncology) and Prolia (osteoporosis) indications in the US. [‡]Biosimilar conversion rates of 57.30% for Xgeva and 81.79% for Prolia by year 5. ^{**}Denosumab was cost-effective at a standard WTP threshold of \$150,000 USD/QALY.

Europe

In a **lifetime cost-effectiveness analysis** of denosumab versus ZA for SRE prevention in **multiple myeloma**:

- **Denosumab was associated with QALY gains** in all four countries (range: 0.19 in Austria to 0.24 in Belgium).⁵
- Despite higher drug costs, **denosumab was cost-effective in all four countries** (range: €27,228/QALY in Italy to €6,982/QALY in Greece).⁵
- Using 1–3-times the GDP per capita to inform WTP thresholds, **probabilistic analyses** found denosumab was **50% to 96% likely to be cost-effective versus ZA.**⁵

Results: Reimbursement Assessments

Globally, **denosumab is fully reimbursed in most countries for most oncology indications**, including bone metastases from solid tumors and unresectable giant cell tumor of bone (GCTB, **Figure 1**).¹

Figure 1: Summary of reimbursement restrictions for denosumab by country and oncology indication



In the UK, denosumab is **partially reimbursed** for patients with **bone metastases from breast cancer and solid tumors**, other than prostate. NICE specifically does not recommend denosumab in adults with bone metastases from prostate cancer due to insufficient cost-effectiveness and limited additional clinical benefit.⁷

Denosumab is **not reimbursed for multiple myeloma** in Australia and France due to lack of clinical efficacy and/or concerns regarding the incremental cost-effectiveness.^{8,9}

For **unresectable GCTB**, denosumab is **fully reimbursed by some countries** (Australia, France, and Italy), and not reimbursed in Poland due to lack of clinical efficacy.¹⁰

Conclusion

- Across multiple regions, **denosumab demonstrates favorable cost-effectiveness** driven by reductions in SRE-associated costs. However, **reimbursement and patient access to denosumab vary across countries**, in part due to affordability and budget impact considerations.
- Given the strong influence of cost-effectiveness on HTA and reimbursement decisions, **the use of denosumab biosimilars** may provide much-needed **cost savings and improved patient access** to effective SRE prevention in oncology.

Conflict of Interest: KS is an employee of Fresenius Kabi, a manufacturer of biosimilars. NJ, KC, and MAG are employees of EVERSANA, a company that receives consulting fees from Fresenius Kabi.

Abbreviations: AUS = Australia; CAN = Canada; FRA = France; GCTB = giant cell tumor of bone; GDP = gross domestic product; HTA = health technology assessment; IRL = Ireland; ITA = Italy; NICE = National Institute for Health and Care Excellence; POL = Poland; QALY = quality-adjusted life year; SRE = skeletal-related event; SWE = Sweden; UK = United Kingdom; US = United States; USD = US dollar; WTP = willingness-to-pay; ZA = zoledronic acid. **References:** 1. NAVLIN Global Pricing and Market Access Database (2024), Accessed: January 2026. 2. Wadhwa et al. (2024) *JCO Glob Oncol*; 10: e2300396. 3. Flanagan et al. (2025) *J Med Econ*; 28(1): 2027-2038. 4. Stopeck et al. (2020) *J Med Econ*; 23(1): 37-47. 5. Terpos et al. (2019) *J Med Econ*; 22(8): 766-776. 6. Aliyev et al. (2025) *J Clin Med*; 14(18): 6469. 7. NICE (2012) TA265. Available at: www.nice.org.uk/guidance/ta265. 8. PBAC (2019) Denosumab Public Summary Document. Available at: <https://www.pbs.gov.au/medicinesstatus/document/189.html>. 9. HAS (2024) Xgenva (Denosumab). Available at: https://www.has-sante.fr/jcms/p_3518652/en/xgeva-denosumab-oncology. 10. AOTMiT (2015) Recommendation No. 45/2015 of the President of AOTMiT. Available at: <https://bip.aotm.gov.pl/zlecenia-mz-2015/829-materialy-2015/3996-047-2015-zlc>

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