Cost effectiveness of romosozumab followed by alendronate versus teriparatide in the treatment of severe osteoporosis in Greece.

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Objectives

We evaluated the incremental cost-effectiveness of treatment with romosozumab for 12 months followed by alendronate for 12 months compared with teriparatide for 24 months in patients with severe osteoporosis [T-score <-2.5 and fragility fracture(s)] in Greece.

Population

The target patient population was post-menopausal women with severe osteoporosis at high risk of fracture. The patient population in the model was derived from the ARCH trial[1] [NCT01631214] which consisted of women that were on average 74.2 (7.5 SD) years old with a femoral neck T-score of -2.9 SD.

Methods

Study Design – Model Structure

A Markov model developed in Microsoft Excel and already accepted by NICE, England, and TLV, Sweden, was localized to the Greek setting from the perspective of the third-party payer (EOPYY). The model included five health states: at risk of fracture, hip fracture, vertebral fracture, non-hip-non-vertebral fracture, and dead. All patients entered the model in the at risk of fracture state and were followed for a lifetime horizon to account for short- and long-term cost and health effect consequences (Figure 1). Model robustness and base case assumptions were validated with univariate and probabilistic sensitivity analyses.

Inputs

Clinical inputs were derived from the ARCH trial[1], a systematic literature review, and a network meta-analysis. Cost inputs in 2022 Euros and life tables were obtained from Greek public sources.

Results were derived for a treatment period of 24 months. Discontinuation was factored in the model, and it was assumed that effect linearly decreases over time after discontinuation for a time equal to the time on treatment, as recommended by the ESCEO/IOF[2].

The model also assumed a persistence rate of 90% amongst patients on romosozumab for the 12-months treatment length.

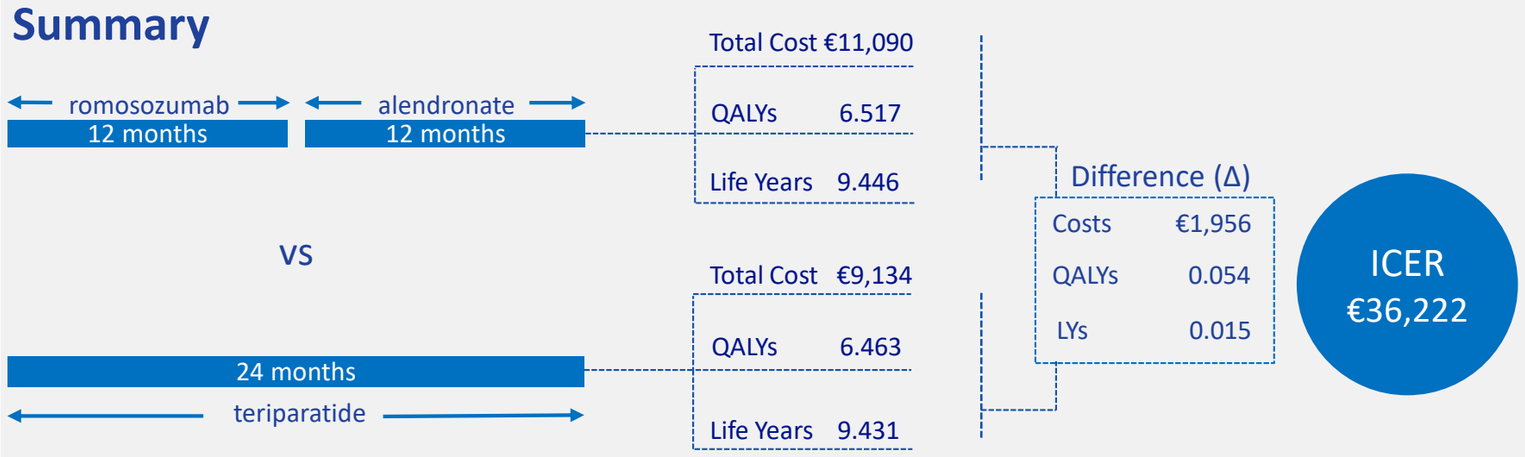
Results

- Compared with teriparatide, romosozumab followed by alendronate yielded 0.054 additional QALYs and 0.015 additional life-years (Table 1).
- Fracture-related medical costs were lower in the romosozumab + alendronate arm (-€298) (Table 1).
- The total incremental cost was €1,956 and cost per QALY was €36,222 (which is below the perceived willingness-to-pay threshold of approximately 3 times the per capita GDP of Greece; €51,219 in 2022; data refer to 2021) (Table 1).
- Sensitivity analyses confirmed robustness of our model results. There is 85% probability of the intervention being cost-effective compared with teriparatide, according to the perceived willingness to pay threshold in Greece (€51,219, in 2022; data refer to 2021) (Figure 2).

Conclusions

Treatment with romosozumab (12 months) followed by alendronate (12 months) was cost-effective compared to teriparatide (24 months) in postmenopausal women with severe osteoporosis in Greece.

Summary



Conclusion: Treatment with romosozumab for 12 months followed by alendronate for 12 months was cost-effective compared to treatment with teriparatide for 24 months in postmenopausal women with severe osteoporosis in Greece.

Figure 1 Model Structure

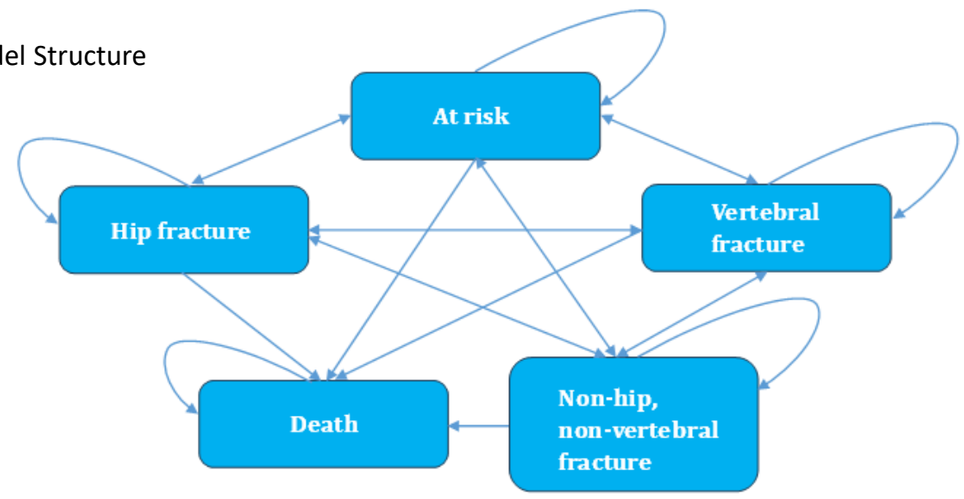
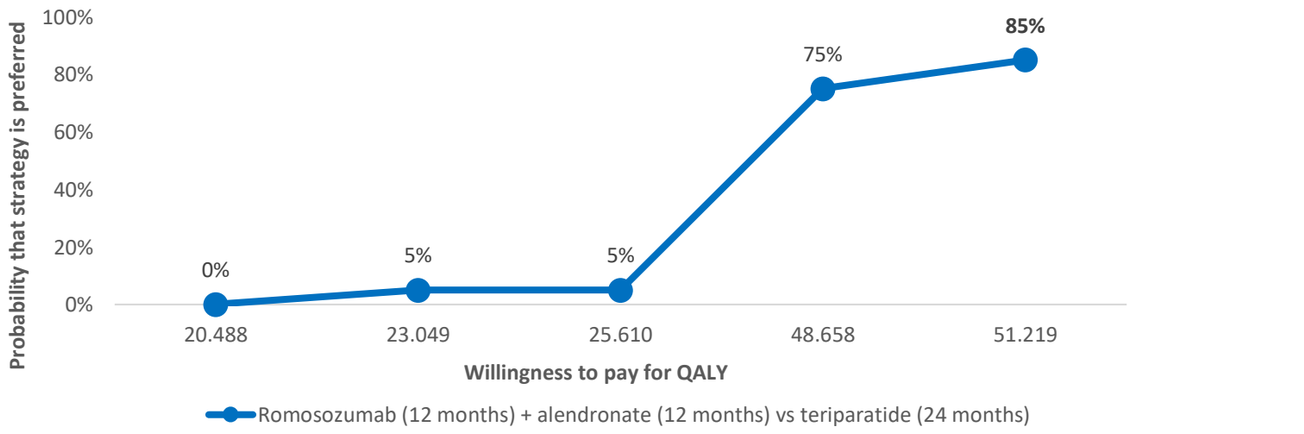


Table 1 Base-case results for comparison of romosozumab-to-alendronate vs teriparatide

Treatment with romosozumab for 12 months followed by alendronate for 12 months vs treatment with teriparatide for 24 months

	Romosozumab-to-alendronate	Teriparatide	Difference
Hospitalization cost	€4,453	€4,677	-€224
Outpatient cost	€1,484	€1,559	-€75
Fracture related medical cost	**€5,937**	**€6,236**	**-€298**
Drug cost: 1st treatment	€5,049	€2,855	€2,193
Drug cost: 2nd treatment	€42	€0	€42
Treatment management	€62	€42	€20
Intervention cost	**€5,153**	**€2,898**	**€2,255**
Total cost	**€11,090**	**€9,134**	**€1,956**
QALYs	6.517	6.463	0.054
Life years	9.446	9.431	0.015
Cost per life year			€130,400
Cost per QALY			€36,222

Figure 2 Cost-effectiveness acceptability Curve



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References: [1]Saag KG et al. NEJM. 2017 Oct 12;377(15):1417-1427. [2]Hiligsmann M et al. Osteoporos Int. 2019 Jan;30(1):45-57.

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