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LETTER

Comment on: cost-effectiveness of denosumab for the treatment of postmenopausal osteoporosis

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Dear Editor

In Jonsson et al. [1], the relative risks (RRs) of fracture in a population with a T-score at or below a given threshold (e.g. ≤2.5 SD) were estimated as the average for all women at or below the threshold. For greater accuracy, the estimate might consider the average RR of fracture in a population with a T-score at or below the threshold and of the same age as the population in the analysed scenario (e.g. 70-year-old women). We have, therefore, revised the estimate of RRs at or below a T-score threshold. RRs of hip, vertebral, wrist and other fractures at model entry were updated from 2.33, 2.66, 1.46, 1.71 to 3.36, 3.19, 1.60 and 1.92, respectively, for the base case scenario. The proportion of 70-year-old women who are below a given BMD threshold will have a lower mean BMD than the corresponding proportion of all women, which increases the estimated RR of fracture. This consequently favours the comparator with the highest antifracture efficacy in each comparison. Note that the RR estimated at a specific T-score is not affected. The re-estimate affects Tables 4 and 5 and Figs. 2, 3, 5, the revised versions of which are shown here. The conclusions of the original manuscript [1] remain unchanged.

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Table 4 Base–case analysis for incremental cost-effectiveness (cost per life year and QALY gained)

	Denosumab vs. no treatment	Denosumab vs. generic alendronate	Denosumab vs. risedronate	Denosumab vs. strontium ranelate
Costs/patient (€)				
Morbidity cost difference	−2,181	−1,148	−1,403	−1,664
Treatment cost difference[a]	1,868	1,529	1,055	939
Cost in added life years	1,087	649	745	768
Total cost difference	774	1,030	397	43
Avoided fractures during 10 years/1,000 patients				
Hip fractures	−39	−20	−26	−32
Vertebral fractures	−62	−41	−45	−43
NNT to avoid one hip fracture	26	50	39	32
NNT to avoid one vertebral fracture	17	25	23	24
QALYs and life years/patient				
Life years gained (undiscounted)	0.068	0.040	0.046	0.048
Life years gained (discounted)	0.047	0.028	0.032	0.033
QALYs gained	0.084	0.049	0.057	0.060
Cost/life year gained	16,531	37,082	12,409	1,290
Cost per QALY gained (excluding CIALY)	Cost saving	7,764	Cost saving	Cost saving
Cost per QALY gained	9,250	20,976	6,998	710

Women aged 71 years with a T-score at or below −2.5 SD and 34% prevalence of prior vertebral fracture

NNT number needed to treat

[a] Including monitoring costs

Table 5 Other sensitivity analyses (€/QALY)

Scenario	Denosumab vs. no treatment	Denosumab vs. generic alendronate	Denosumab vs. risedronate	Denosumab vs. strontium ranelate
Base–case[a]	9,250	20,976	6,998	710
Discount rates (5%)	9,576	22,622	6,868	133
Discount rates (0%)	9,414	19,285	7,793	2,139
One year DAPS persistence	10,656	28,501	8,548	214
Perfect persistence for all treatments	6,902	58,449	6,817	Cost saving
Denosumab maximum offset time 2 years	14,157	33,103	14,254	6,278
All treatments maximum offset time 2 years	14,157	27,970	11,897	5,127
10-year modelling horizon	5,484	22,422	1,454	Cost saving
GIAEs[b] for alendronate/risedronate		20,976	6,998	–
Disutility from fractures decreased by 10%	9,819	22,256	7,426	755
20% of excess mortality attributable to fractures	4,886	18,231	2,267	Cost saving
10 year treatment duration	8,758	21,455	6,457	Cost saving
Mortality after hip and vertebral fractures 3 years	6,084	18,780	3,475	Cost saving
Mortality after hip and vertebral fractures 5 years	8,157	20,182	5,766	Cost saving

[a] The base case assumed discount rates of 3%, improved persistence for 3 years, max offset time of 5 years for all treatments, life-time horizon, no adverse events for any treatment, 5-year maximum treatment duration, 8 years of increased post-fracture mortality after hip and vertebral fractures

[b] Gastrointestinal adverse events

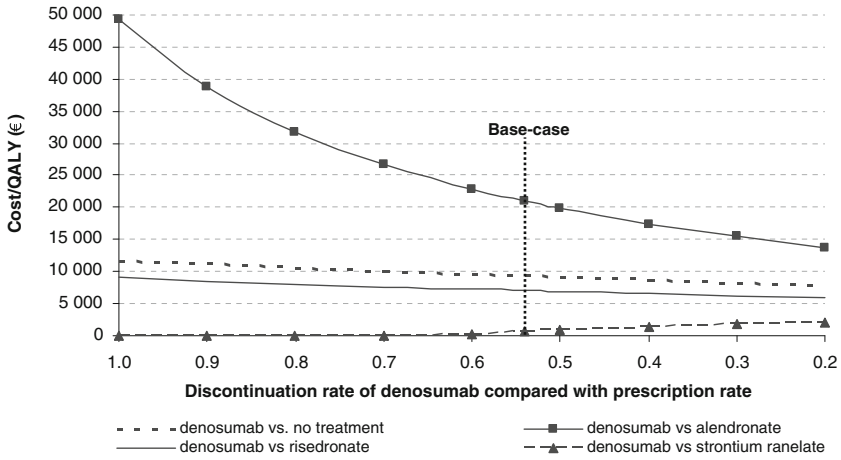

Fig. 2 Effect of variations in persistence of denosumab on incremental cost-effectiveness of denosumab versus comparators for the base case population

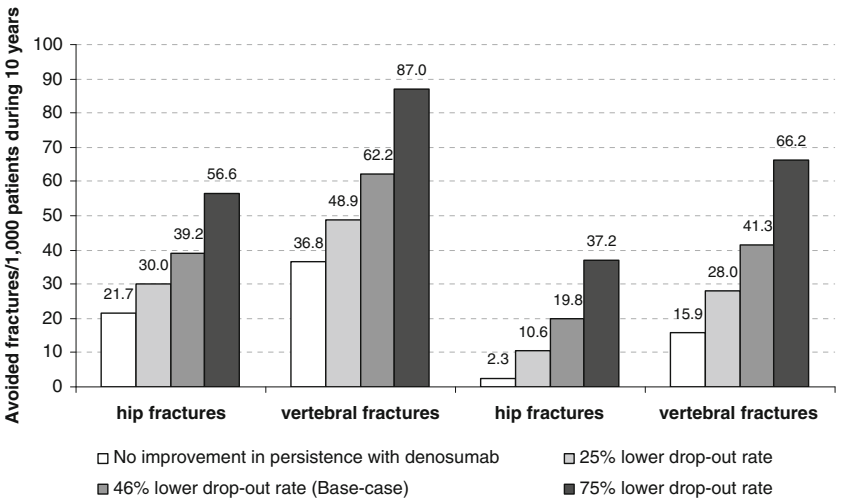

Fig. 3 Number of avoided fracture/1,000 patients from the base case population according to differences in persistence between denosumab and alendronate

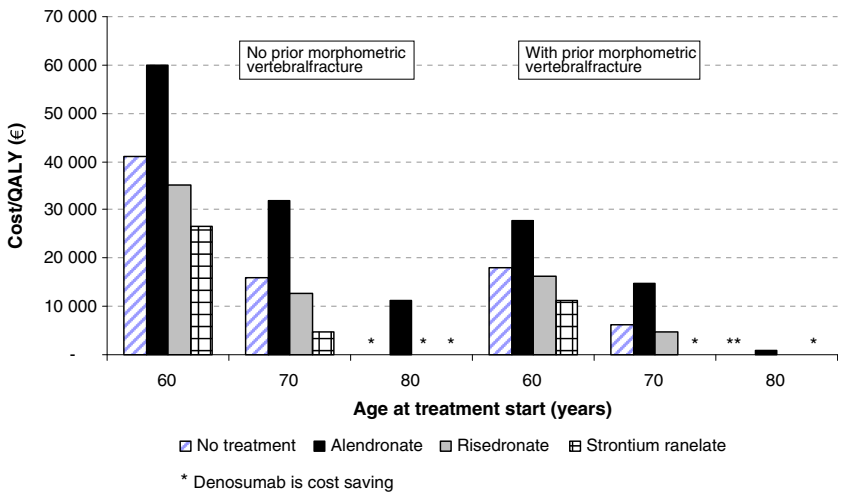

Fig. 5 The effect of age at start of treatment with or without a prior fracture (T-score at or below −2.5 SD) on the cost-effectiveness of denosumab vs. comparators

References

1. Jonsson B, Strom O, Eisman JA, Papaioannou A, Siris ES, Tosteson A, Kanis JA (2010) Cost-effectiveness of denosumab for the treatment of postmenopausal osteoporosis. Osteoporos Int 22(3):967–982