



Cost-effectiveness of a screen-and-treat strategy for postmenopausal osteoporosis in women with depressive disorders

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Background

- Screening strategies for osteoporosis are often not cost-effective
- Combination of measurement of bone mineral density with several risk factors increases sensitivity
- Which risk factors are to be used?
- Epidemiological studies: patients with **depression** often have a decrease of bone mineral density (BMD) and an increase of osteoporotic fractures.
- Risk factor 'depression' is considered controversial (why?)



Background

- Limited methodological quality: evidence was based on cross-sectional studies and case-control studies
- Recent meta-analysis: in studies with risk ratios as fracture outcomes, depression was associated with a 52% increase in risk ($P < 0.001$)
- Evidence: prospective cohort studies
- → Cost-effectiveness of a screening with DXA and treatment with bisphosphonates for depressed women at different ages compared with no screening

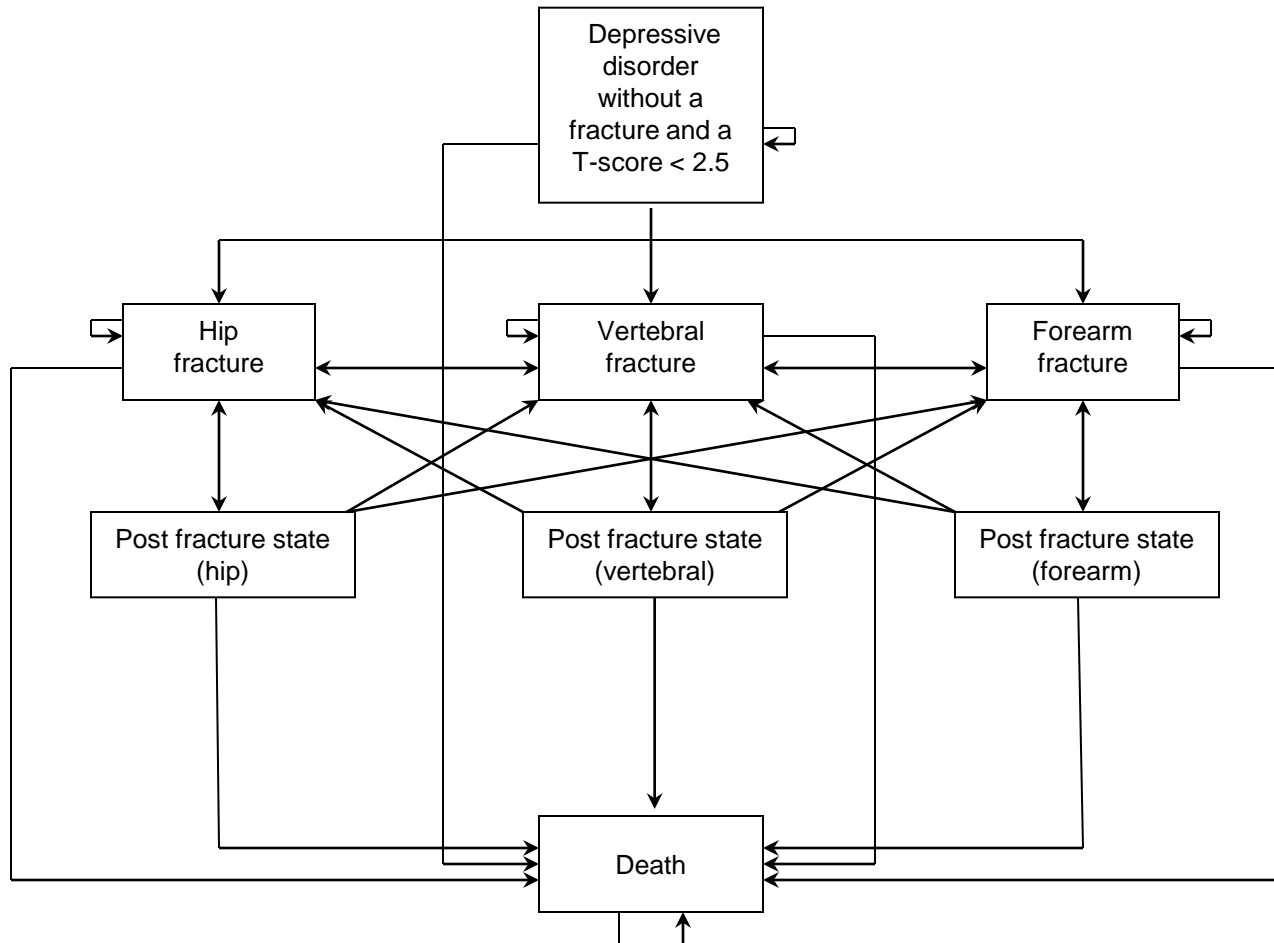
Wu et al. Depression, fracture risk, and bone loss: a meta-analysis of cohort studies. Osteoporosis Int 2010



Methods

- Cost-utility analysis for a cohort of women aged 50, 60, 70, and 80 years
- Markov model in Microsoft® Excel
- Cycle length: one year
- Time horizon: lifetime
- Perspective: statutory health insurance
- Data: public databases and literature
- Budget impact analysis

Health states



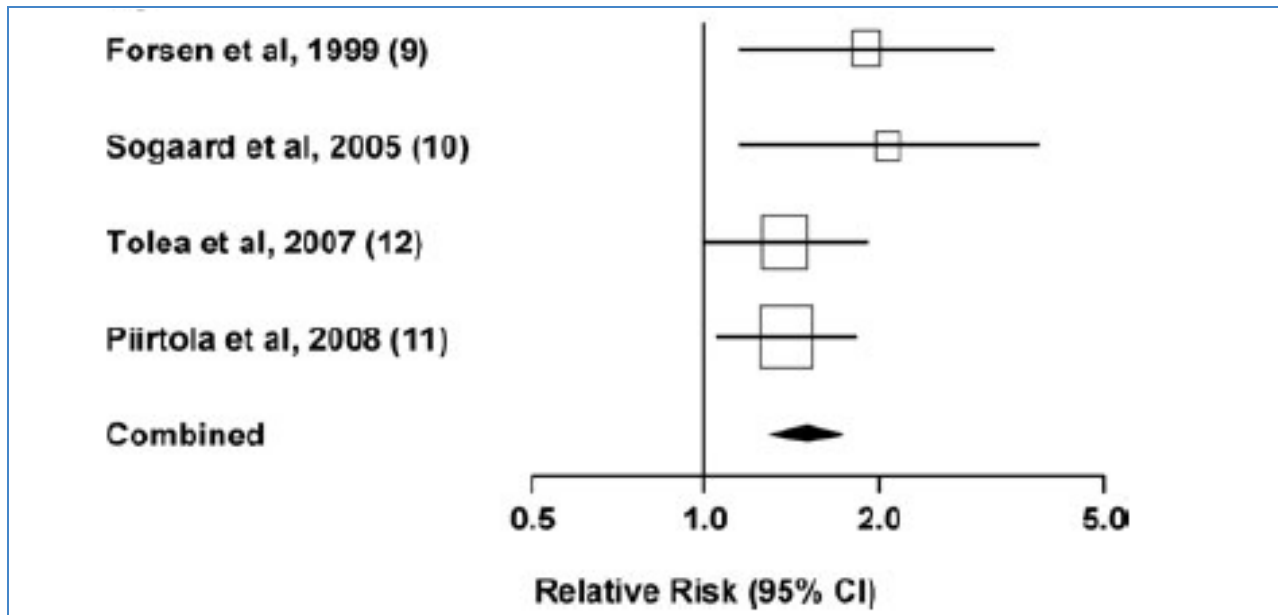


Data

- Incidence rate of fractures
- Risk increase for subsequent fractures
- Costs and HQoL for hip fractures*
- Efficacy of bisphosphonates
- Discount rate: 3%
- Association of depression with an increased fracture risk

Gandjour A, Weyler EJ (2006). Cost-effectiveness of referrals to high-volume hospitals: an analysis based on a probabilistic Markov model for hip fracture surgeries. *Health Care Manage Sci* 9:359-69

Clinical data: risk increase for hip fracture



Risk Ratio, 1.52; 95% CI, 1.26-1.85; P < 0.001



Results of the base-case analysis

Intervention	Control	Incremental Costs (€)	Incremental QALYs	Cost per QALY (€/QALY)
50-60				
Screening for women with depression	No screening	472	0.08	5748
	Screening for women with fractures	532	0.02	28 865
60-70				
Screening for women with depression	No screening	396	0.11	3449
	Screening for women with fractures	352	0.03	9664
70-80				
Screening for women with depression	No screening	224	0.13	1763
	Screening for women with fractures	178	0.02	8115
80-90				
Screening for women with depression	No screening	-92	0.15	dominates
	Screening for women	-144	0.00	dominates



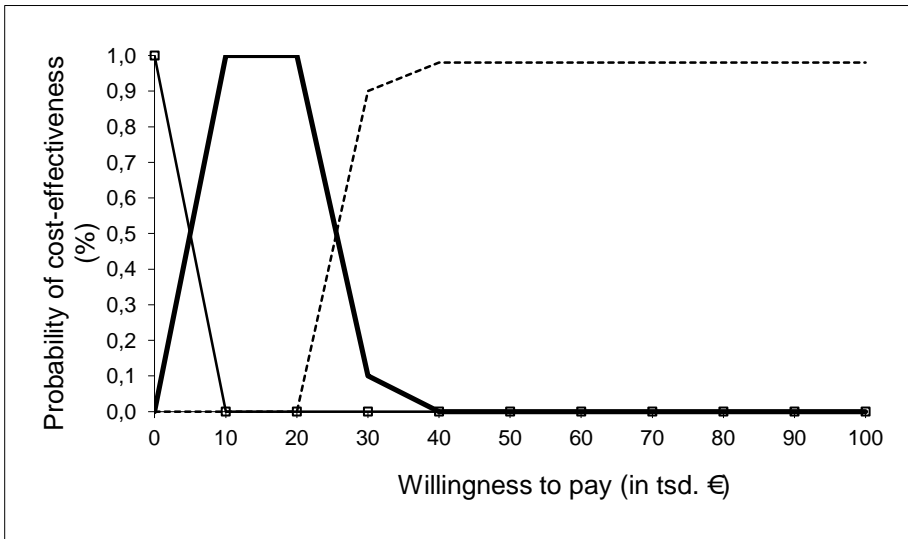
Budget Impact Analysis

Implementation of a screen-and-treat strategy for women with depressive disorders in Germany would result in costs of total **€2.2 million or 0.002%** of the SHI's total annual budget

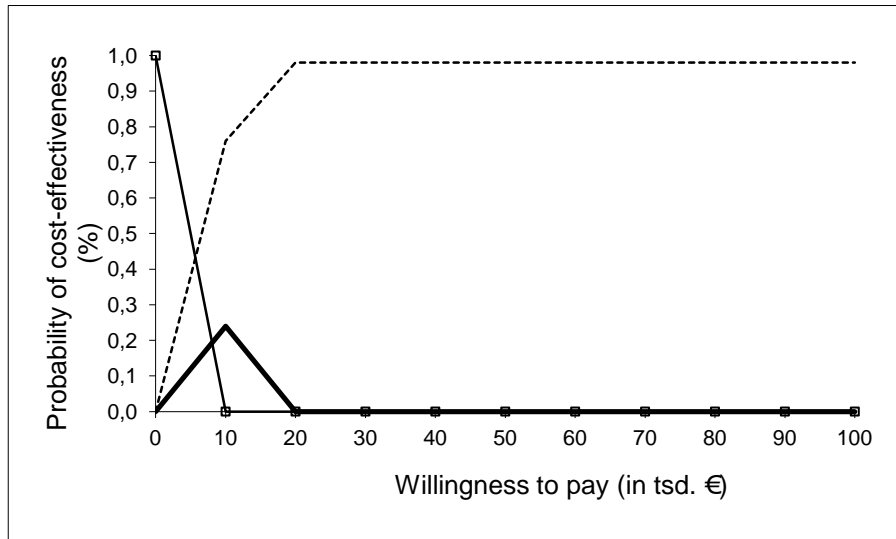
Cost-effectiveness acceptability curve

(--- = no screening, ···· = screening for depressed women, — = screening for women with fractures)

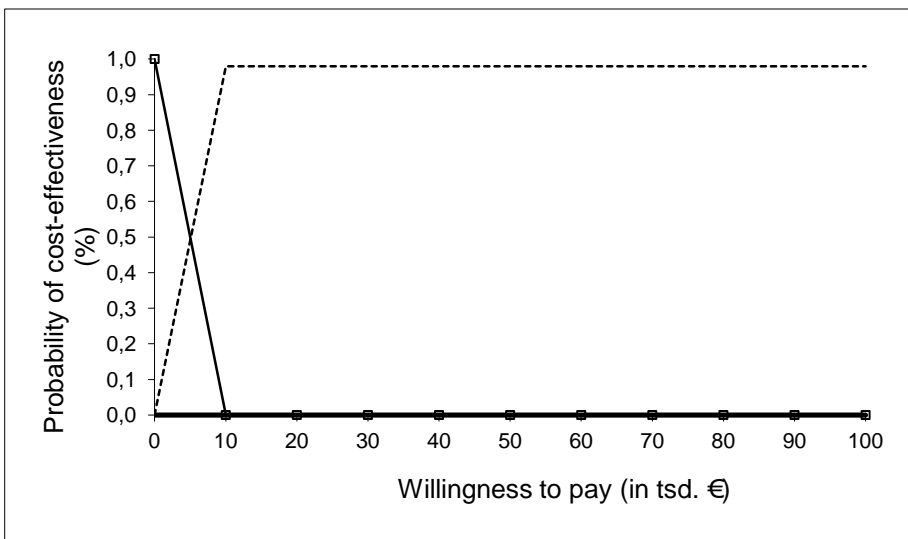
50-60



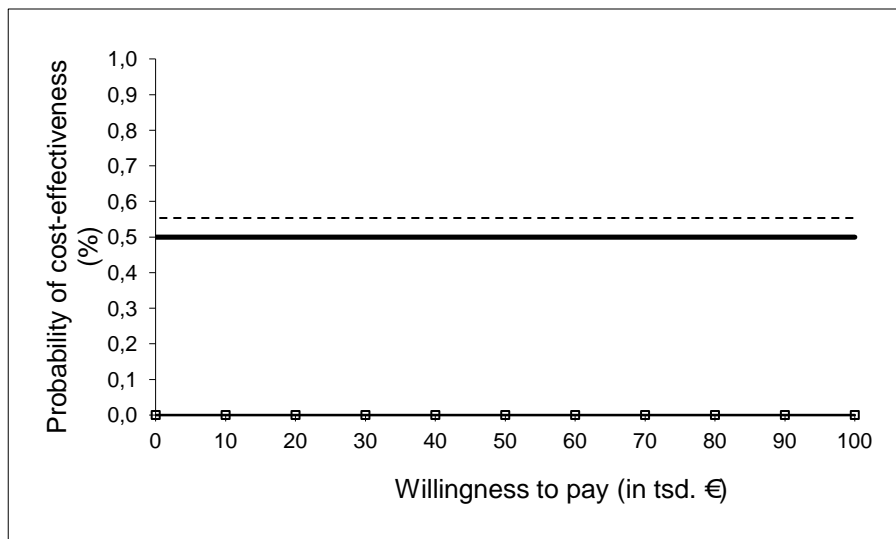
60-70



70-80



80-90



Strengths of the analysis

- Association of fracture risk due to depression was based on prospectively conducted cohort studies with 33,000 individuals
- Our analysis considered all initial screening costs and, long-term follow-up costs of hip fractures in Germany including costs of hip implants, revision surgery, transportation services, rehabilitation care, and long-term care.
- Our analysis considered an important trend in medical care for vertebral fractures. Compared with data used for our previous analyses, in Germany the proportion of inpatient treatment for vertebral fractures increased from 17% to 41%



Limitations

- Clinical data: heterogeneity of studies included in meta-analysis
- Clinical data: efficacy of bisphosphonates in depressed women
- Exact etiological relation between depressive disorders and osteoporosis (physiologic changes or the adoption of poor health behavior)
 - Most studies which have evaluated the association between osteoporosis and depressive disorders did not adjust for the potential relationship between antidepressants and drugs such as anticonvulsants or glucocorticoids
 - Confounding effect ?



Summary

- Depressive disorders might be of considerable value for decision making regarding the treatment of postmenopausal osteoporosis.
- Because of several limitations in the data used for the analysis funders should be careful in adopting depression as a strong risk factor for osteoporotic fractures



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**Vielen Dank für die
Aufmerksamkeit**