ACE–PREVENTION PAMPHLETS

GENERAL POPULATION RESULTS PAMPHLET 10
COST-EFFECTIVENESS OF INTERVENTIONS TO PREVENT FRACTURES

1.   MAIN MESSAGES

- Screening women aged 70-90 for osteoporosis followed by treatment with alendronate may be cost-saving. Screening and treatment with raloxifene is not cost-effective.

- Mass media campaigns to promote physical activity, already highly cost-effective based on effects via cardiovascular disease, diabetes and cancer, become even more so if a small reduction in fracture risks is included.

2.   BACKGROUND

Osteoporosis is characterised by low bone mineral density and micro architectural deterioration of bone tissue leading to an increase in bone fragility and risk of fracture. Hip fractures are the most important result of osteoporosis and falls; they frequently result in death. Given an aging population, the burden due to fractures in Australia is set to increase. We modelled the effects on fractures of the hip, spine, pelvis, clavicula/humerus (shoulder / upper arm), rib, wrist, hand, lower leg and foot.

3.   INTERVENTIONS

Two strategies to prevent osteoporotic fractures can be distinguished: a mass strategy and a 'high-risk' strategy. The mass strategy is aimed at the entire population, the high-risk strategy at persons with osteoporosis or osteopenia (mild osteoporosis). We reviewed the literature to identify interventions that reduce the risk of osteoporosis-related fractures and are applicable in the Australian context. We report on two types of interventions: screening for osteoporosis followed by treatment with one of two types of drugs, and a mass media campaign to increase levels of physical activity.

1. **Screening and treatment of osteoporosis among women:** Opportunistic screening for osteoporosis by GPs, by means of BMD measurement (DXA) and treatment for 5 years with either alendronate (a bisphosphonate) 70 mg/week, or with raloxifene (a selective oestrogen receptor modulator) 60 mg daily, plus calcium 500 mg/day, and vitamin D if deficient. The target group is women aged 70 to 90.

2. **Promotion of physical activity via mass media:** Media campaign to promote regular moderate-intensity physical activity (PA) targeting adults aged 25 to 60. The campaign makes use of television and print-media advertising, physician mail-outs and community-level support programs and strategies.

Other interventions worth further study include physical activity programmes targeting people with osteoporosis, environmental interventions that stimulate physical activity, prevention of falls by reducing psychotropic medication, adapting the home environment, cataract surgery or combinations of these, and (other) drugs.

4.   CHOICE OF COMPARATOR

Cost-effectiveness of the screening and treatment interventions is evaluated in comparison to a "do nothing" scenario. However, given low treatment rates for osteoporosis this is not much different from current practice. The physical activity intervention is evaluated in comparison to current practice.

5.   INTERVENTION COST-EFFECTIVENESS

The screening programme will to lead to health gains and may be cost-saving when treatment is with alendronate. Screening in combination with raloxifene treatment is not cost-effective; all results are above the $50,000/DALY threshold (Figure 1). Though it is widely prescribed for osteoporosis, raloxifene has only been proven effective to prevent vertebral fractures but not hip fractures. A proven reduction in the risk of breast cancer cannot compensate for that.

Figure 1. Cost-effectiveness of screening for osteoporosis among women aged 70-90 and subsequent treatment with alendronate or raloxifene, compared to no intervention.
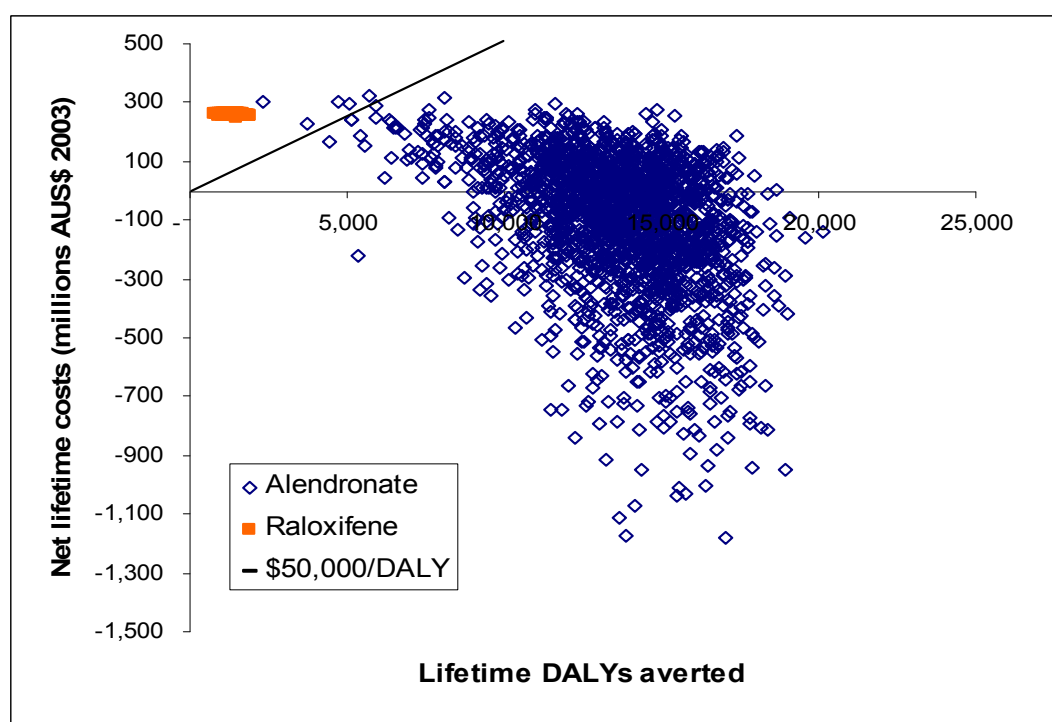
Table 1. Cost-effectiveness and probability of being cost-saving or cost-effective of osteoporosis screening interventions

Intervention	Median ICER (95% uncertainty interval)	Probability of being cost-saving	Probability of being under $50,000/DALY
Screening + alendronate	Cost-saving (cost-saving to $21,000)	63%	100%
Screening + raloxifene	$170,000 (140,000 to 230,000)	0%	0%

The physical activity intervention was already cost-saving based on its effect on cardiovascular disease, diabetes and cancer. (See ACE Prevention results on physical activity.) The fracture prevention-effect adds a modest 134 DALYs (+0.6%) and cost-savings of $4.5 million (7%). At older ages, when fracture risks are higher, the health gains from physical activity interventions are likely to be greater.

6.   CONCLUSIONS

Screening older women for osteoporosis followed by treatment with alendronate is effective and may be cost-saving. Screening and treatment with raloxifene is not cost-effective. Mass media campaigns to promote physical activity, already highly cost-effective based on effects via cardiovascular disease, diabetes and cancer, become even more so if a small reduction in fracture risks is included. The uptake of both interventions is likely to be greater among women with higher socio-economic status. Personnel shortages may limit the capacity for bone mineral density screening, especially in rural areas.

For more information on this topic area, please visit: **www.sph.uq.edu.au/bodce-ace-prevention**

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7.   ABOUT ACE-PREVENTION

To aid priority setting in prevention, the Assessing Cost-Effectiveness in Prevention Project (ACE-Prevention) applies standardised evaluation methods to assess the cost-effectiveness of 100 to 150 preventive interventions, taking a health sector perspective. This information is intended to help decision makers move resources from less efficient current practices to more efficient preventive action resulting in greater health gain for the same outlay.

PAMPHLETS IN THIS SERIES

Methods:
A.   The ACE-Prevention project
B.   ACE approach to priority setting
C.   Key assumptions underlying the economic analysis
D.   Interpretation of ACE-Prevention cost-effectiveness results
E.   Indigenous Health Service Delivery

Overall results
1.   League table
2.   Combined effects

General population results
1.   Adult depression
2.   Alcohol
3.   Blood pressure and cholesterol lowering
4.   Cannabis
5.   Cervical cancer screening, Sunsmart and PSA screening
6.   Childhood mental disorders
7.   Fruit and vegetables
8.   HIV
9.   Obesity
10. Osteoporosis
11.   Physical activity
12.   Pre diabetes screening
13.   Psychosis
14.   Renal replacement therapy, screening and early treatment of chronic kidney disease
15.   Salt
16.   Suicide prevention
17.   Tobacco

Indigenous population results
1.   Cardiovascular disease prevention
2.   Diabetes prevention
3.   Screening and early treatment of chronic kidney disease

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