Long-term lower fracture rate and cost reduction by graded fracture prevention in a controlled primary care study

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Background

Fragility incidence is high in Scandinavian countries, causing disability, mortality, and high healthcare costs in older adults. Although primary care–based prevention may reduce fracture risk and healthcare use, long-term evidence remains limited.

Aim: Can a graded primary care prevention programme reduce long-term fragility fractures and hospital care costs among Swedish women aged over 70 years, 2002-2021?

Conclusion

A graded population-based fracture prevention programme with high participation in primary care over 20 years show

- fracture rate reduction
- substaintial cost saving

Findings support more primary care evaluations on

- population nudging with broschure on fall-prevention
- risk group directed fracture prevention on fall-prevention, physical exercise, and osteoporosis management

Methods

In this controlled population based fracture prevention cohort study 1233 (of 1501) women >70 years old answered a home questionnaire on hip fracture risk in 2002. Participation rate was 82%.

Intervention was given to women in the Vislanda district 2002-2004.

A. All 434 women received a practical fall-preventive brochure.
B. 103 (of the 434) women reported ≥2 of 4 clinical risk factors for hip fracture (age >80 years, weight <60 kg, prior fragility fracture, and fall last year):
   i. 65 received nurse home visits and 20 did group trainings led by physiotherapist, focused on exercise and fall-prevention.
   ii. 37 who also had low heel bone mineral density (BMD) received bisphosphonate prescription by physician.

Controls included 799 age-matched women in two similar districts. Fragility fractures were identified from radiology reports 2002-2021. All fragility fractures were analyzed in Poisson regression.

Primary care intervention costs (personnel, osteoporosis medication, travel, materials) were compared with savings in hospital care for fractures being prevented over 20 years. All costs and savings were transformed into present day value in €2026 currency.

Points for discussion

1. What do we lose when prevention focuses on medication, without improving muscle strength, balance and self-confidence in movement? How should methods in fall-prevention, exercise, and osteoporosis diagnose and medication be combined?
2. How can we identify high fracture risk; at hip, pelvis or spine?
3. How can this long-term fracture and cost saving study be used by decision-makers, to transfer hospital investments to primary care?

Results

Over 20 years, 856 fragility fractures were recorded: 261 among the intervention women (60%) and 595 among controls (74%). The 434 women in the intervention group had lower fracture incidence rate ratio(IRR) = 0.79 (95% CI: 0.67–0.92), i.e, estimated 68 prevented fractures in primary care, see Figure 1.

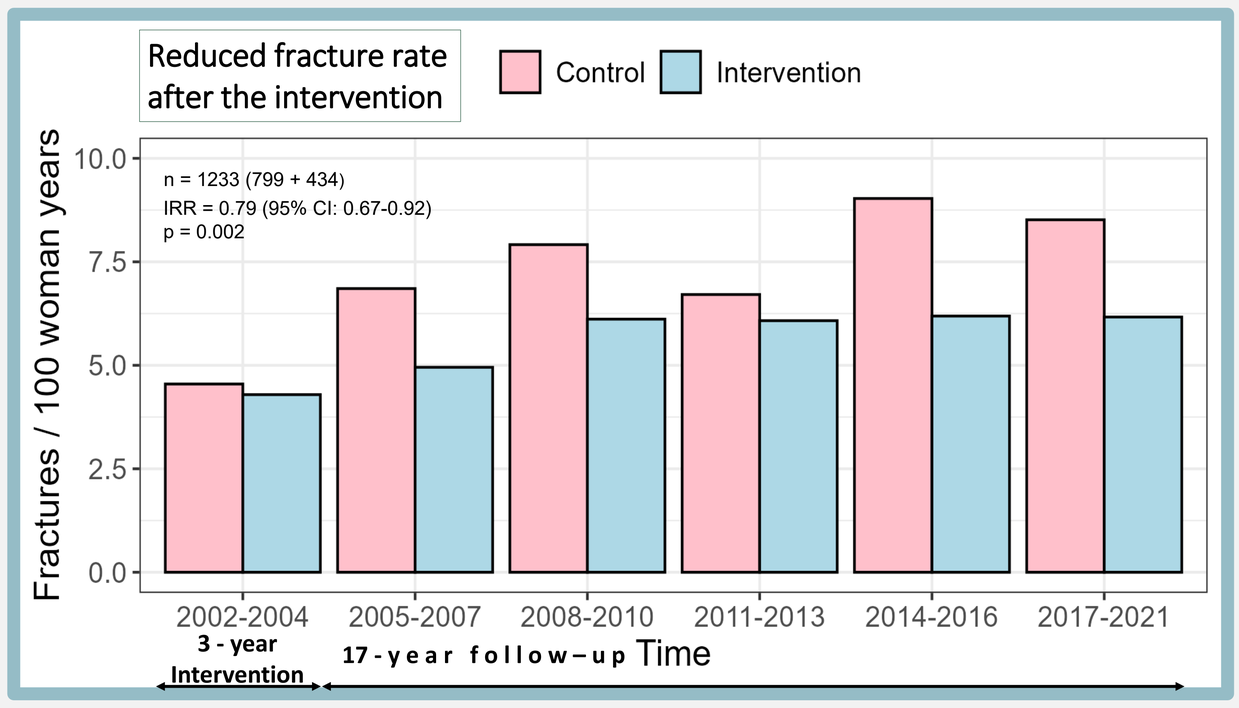

Figure 1: Fracture rate was 21% lower after intevention, i.e, 68 fragility fractures prevented in the primary care in 434 women followed for 20 years.

Total programme costs in primary care were estimated at €133,300.
With the current hospital care cost of €5,600 per fragility fracture, an estimated 59 hospital-treated fractures were prevented (after excluding nine prevented vertebral fractures not requiring hospital care), the hospital cost saving was estimated to €329,700, see Figure 2.
This resulted in the net saving of €196,500 and a Benefit-Cost ratio 2.47.
Quality-of-life or survival gains were not included in the cost analysis.

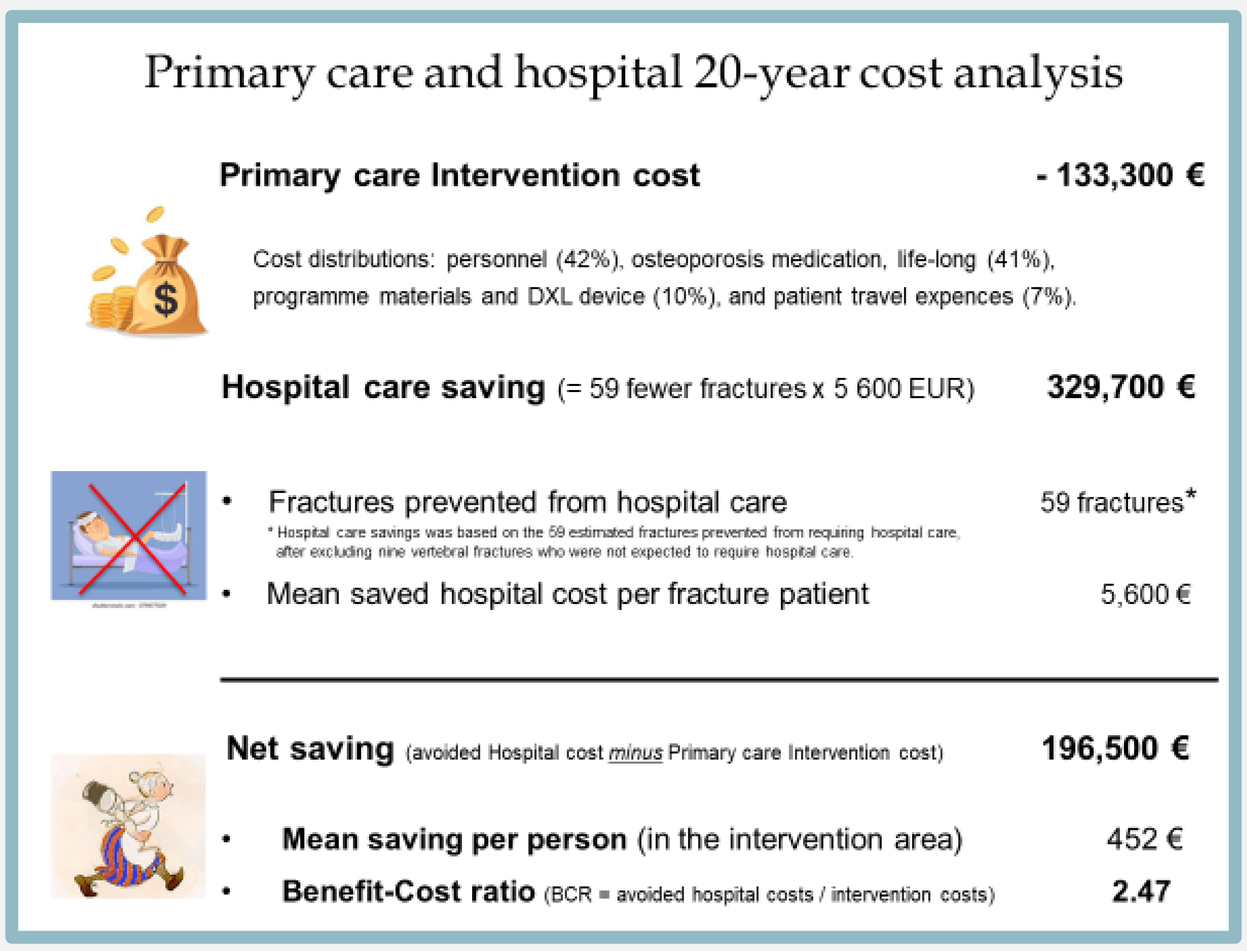

Figure 2: Primary care and hospital care cost analysis after 20-year fracture prevention for 434 women in Vislanda district, Sweden

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2. Sjölander, M, … , Albertsson, D. (2025). *Reduced Risk of Recurrent Fragility Fractures After a Primary Care–Based Fracture Prevention Intervention: A 20-Year Non-Randomized Controlled Follow-Up Study in Women Aged 70–100.* Scandinavian Journal of Primary Health Care 44(1):1-16.