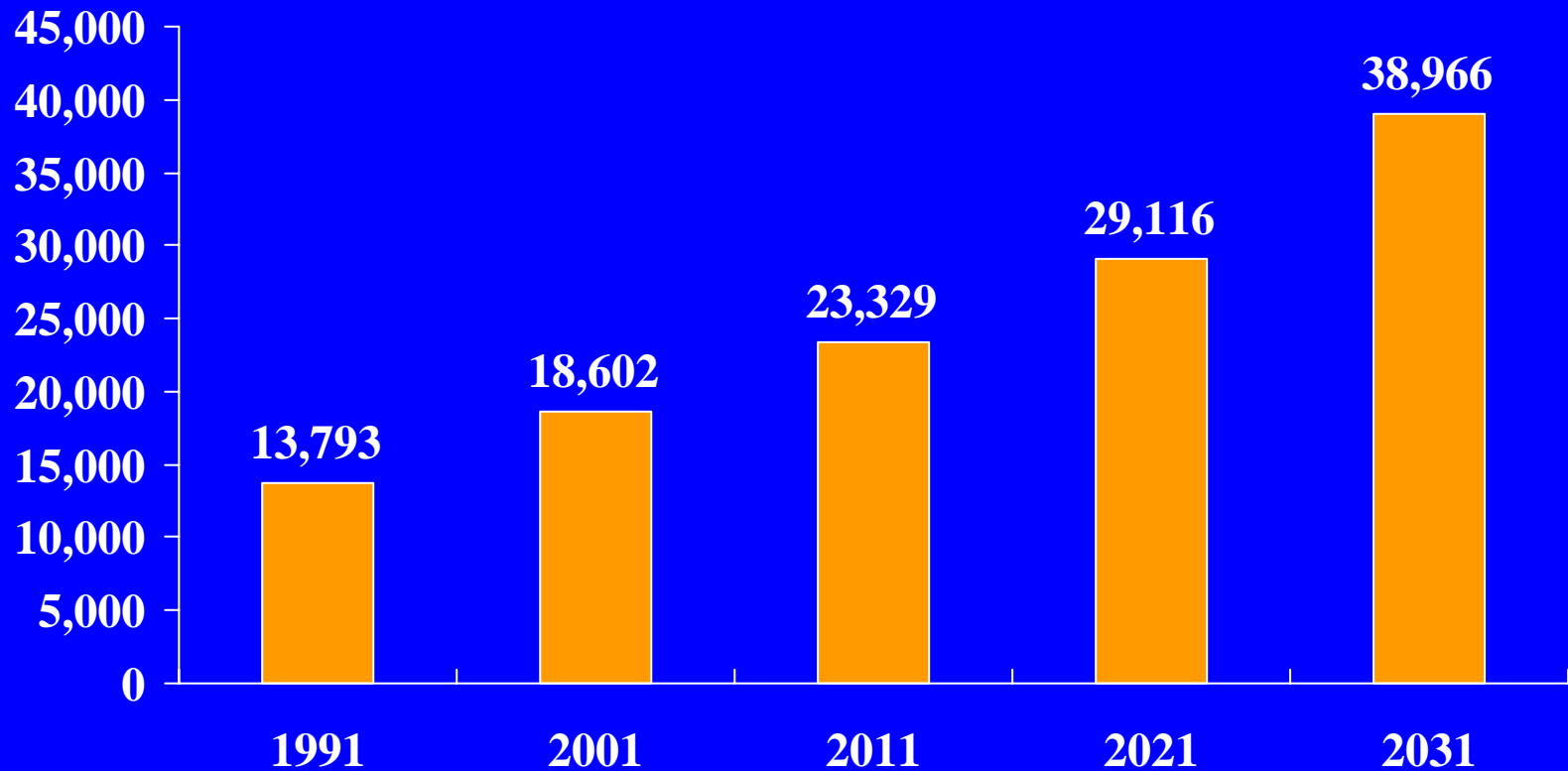


Hip Fractures

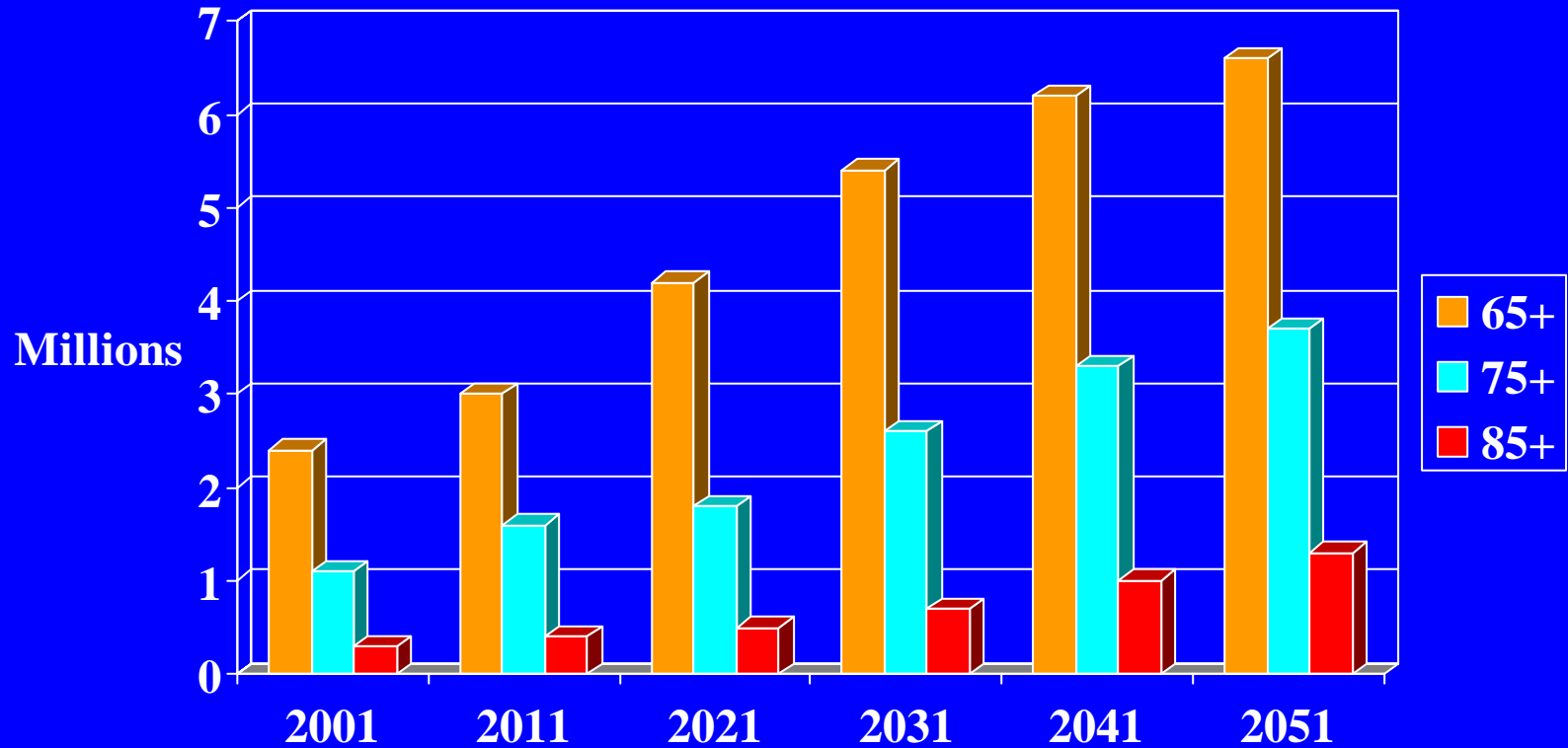
Controlling the Epidemic

Robert G Cumming
University of Sydney

Hip Fracture Projections Australia 1991-2031



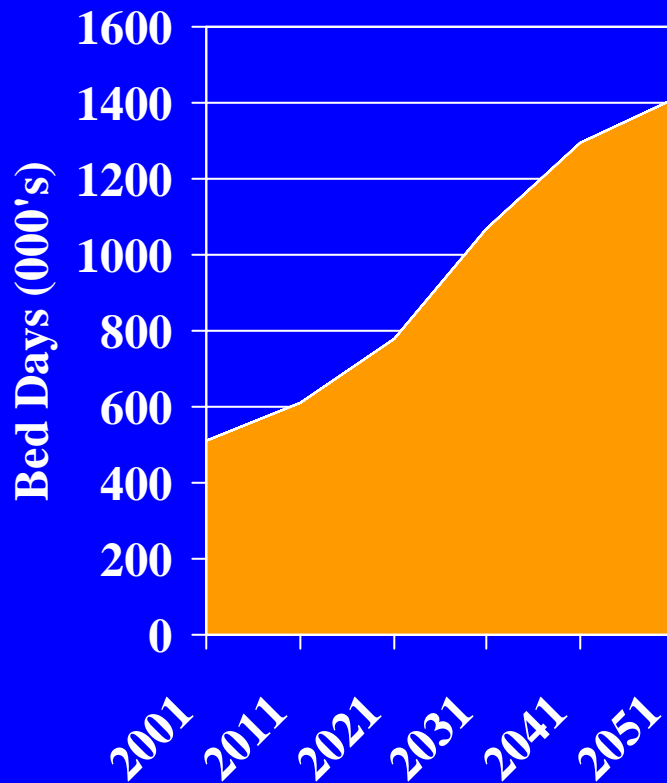
Population Projections Australia, 2001-2051



Fractures in Australia, 2001

<i>Fracture type</i>	<i>No. of fractures</i>
<i>All fractures</i>	93,752
<i>Hip</i>	18,005
<i>Vertebral</i>	13,060
<i>Colles</i>	10,669
<i>Proximal humerus</i>	6,740
<i>Pelvis</i>	3,666

Fall Injuries and Hospital Bed Days Projections for Australia



- Cost of fall injuries will increase from \$498m to \$1375m
- 2500 additional hospital beds required

Preventing Hip Fractures

- Falls prevention
- Screening for osteoporosis

Falls Prevention

Effective interventions

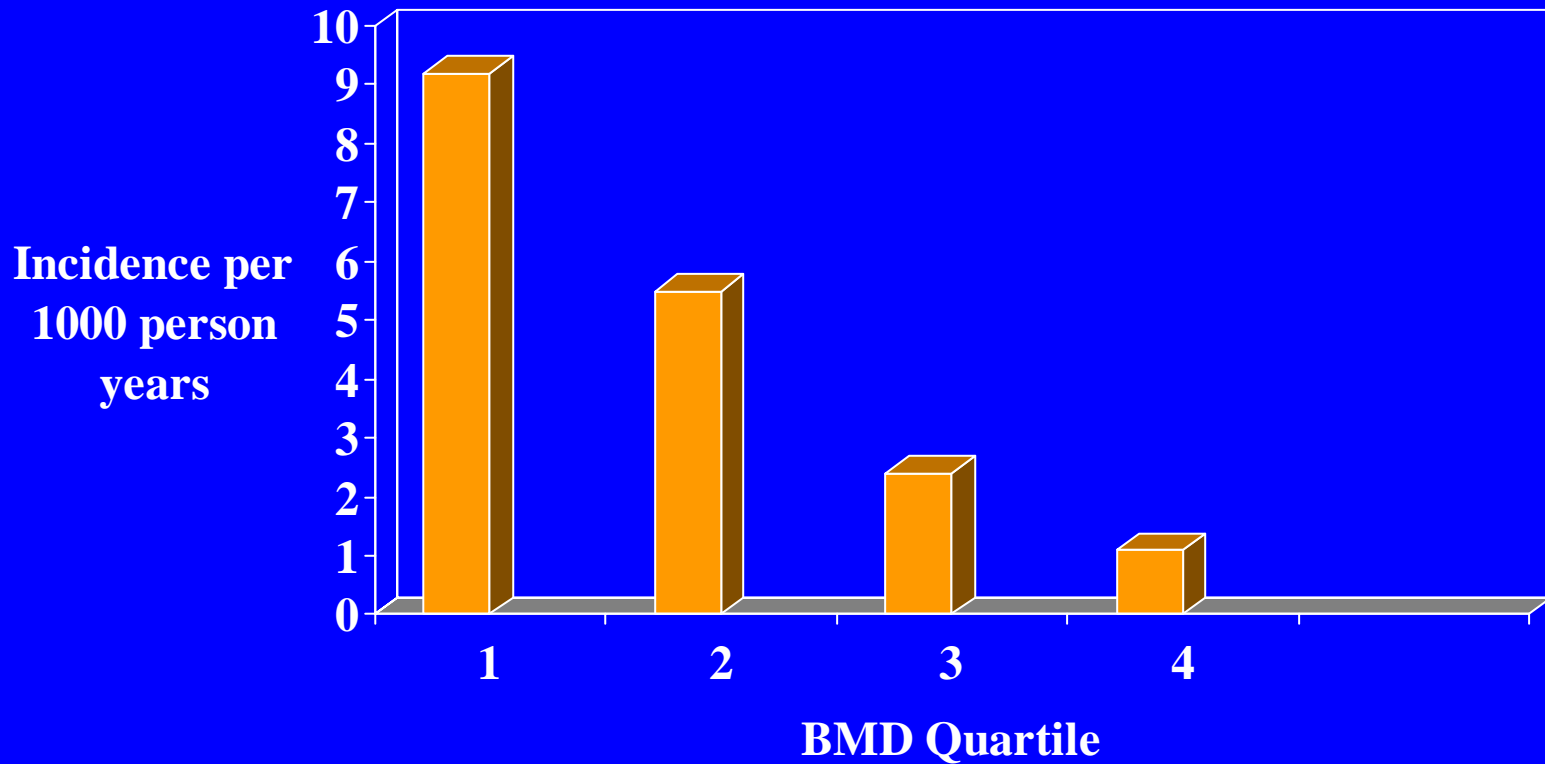
- Multidisciplinary team approach
- (Some) exercise programs
- Home modifications (by OTs)
- Reduced use of psychotropics
- Cataract surgery

Multidisciplinary Team Approach

The PROFET Study

- Medical assessment
 - physical examination
 - vision assessment
 - tests of balance
 - medication review
- Occupational therapy home visit
 - functional assessment
 - environmental hazards

Osteoporosis and Hip Fracture



Source: Cummings et al. Lancet 1993;341:72-75

**Should Australia Have an
Organised Osteoporosis
Screening Program?**

Bone Densitometry



Comparison of Screening Tests

Relative risks in women per SD change

Age group	BMD and hip fracture	DBP and Stroke	Cholesterol and IHD
40-49		2.1	1.5
50-59		1.8	1.4
60-69		1.7	1.2
70-79	2.6	1.4	

Source: Marshall et al. BMJ 1996;312:1254-9

RCT Evidence for Prevention of Hip Fractures

- Vitamin D and calcium (Chapuy, 1992)
- Alendronate (Black, 1996)
- Risedronate (McClung, 2001)
- HRT (Women's Health Initiative, 2002)

Calcium/Vitamin D and Hip Fractures

- RCT of 3270 French women living in nursing homes and “hostels”, mean age 85
- 1.2 gm calcium + 800 IUs vitamin D daily
- 28% reduction in risk of hip fracture

Bisphosphonates

Alendronate and risedronate are effective in women with:

- Osteoporosis
- Vertebral fractures and osteopenia

Cost-Effectiveness of Screening Base Model

- Screen all women at age 65 or 75 or 85 or 95
- Alendronate for 5 years for those with osteoporosis
- Assume 100% compliance
- Hip, wrist, vertebral and other fractures
- Death, nursing home admission, lower quality of life

Cost-Effectiveness of Screening

Cost per QALY

	Age 65	Age 75	Age 85	Age 95
Base	\$53,000	\$7,500	Cost-saving	Cost-saving
Fracture rates 40% lower	\$111,000	\$45,000	\$36,000	\$28,000
50% treatment adherence	\$107,000	\$43,000	\$27,000	\$9,000
Screening costs 30% higher	\$75,000	\$20,000	\$8,000	Cost-saving

Cost-Effectiveness of Screening Programs

PROGRAM	COST PER QALY
Bone densitometry (age 75)	\$7,500
Mammography	\$13,000
Faecal occult blood testing	\$24,000
Pap smears	\$44,500
Bone densitometry (age 65)	\$53,000





Controlling the Hip Fracture Epidemic

- Falls prevention strategies
 - implement now
- Screening and treatment of osteoporosis
 - assess cost-effectiveness and logistics
- Hip protectors
 - more research needed