



Strategy to Prevent of Falls and Fractures in an Ageing Population

Report of the National Steering Group

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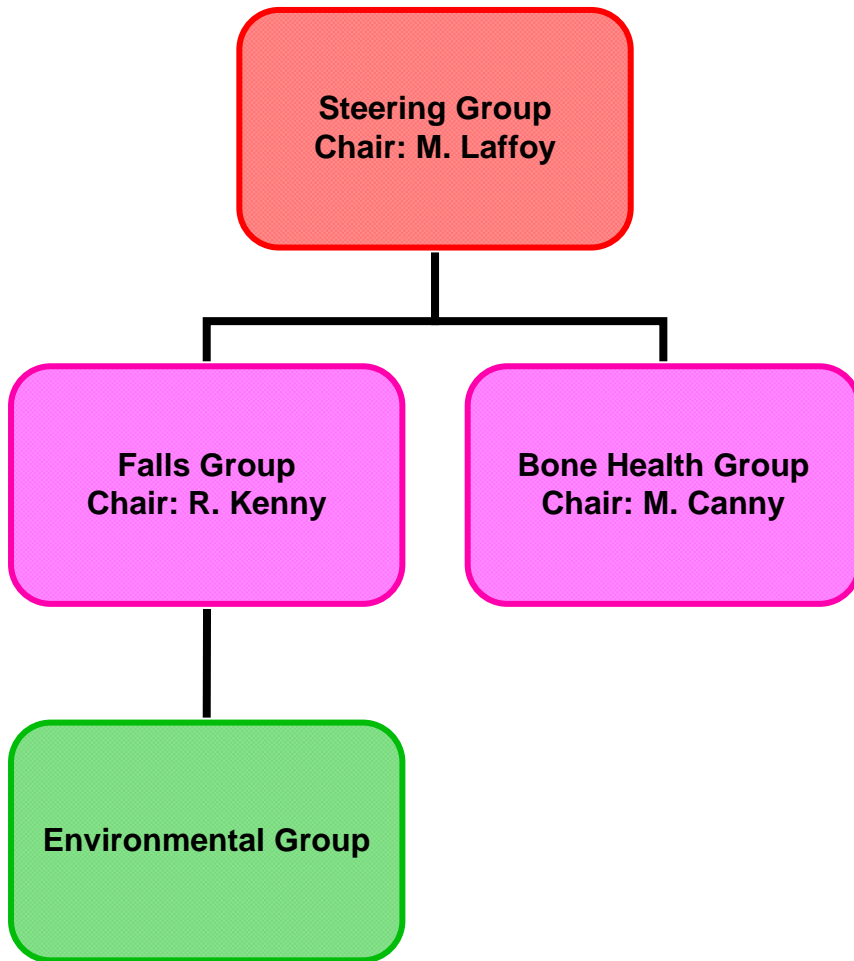
Presentation 4th December 2007

Terms of Reference

In our Ageing Population to Identify:

- 1. Components of a Fall / Fracture Prevention Strategy based on best practice.**
- 2. Extent of the problem of falls and osteoporosis; the impact on the health service including costs.**
- 3. Services currently in place to prevent falls and promote bone health.**
- 4. Consult with multidisciplinary stakeholders on the development of the strategy.**
- 5. Develop an integrated model of care for those at risk of falls and poor bone health including an evaluation framework.**

Methods



Research:

- **Epidemiology, Risk Factors, Service Utilisation, Guidelines, Models of Care**
 - **CSO and HIPE analysis**
1. **Economic Burden of Illness:** (Irish Centre for Social Gerontology)
 2. **Prescribing Trends:** (Pharmaco-Economic Centre, St. James)
 3. **Emergency Department Attendees:** Sligo and Mullingar
 4. **DXA research:** All acute hospitals
 5. **Environment and Injury**
 6. **Consultation Process**

Results: Three Themes

1. The Scale of the Problem:

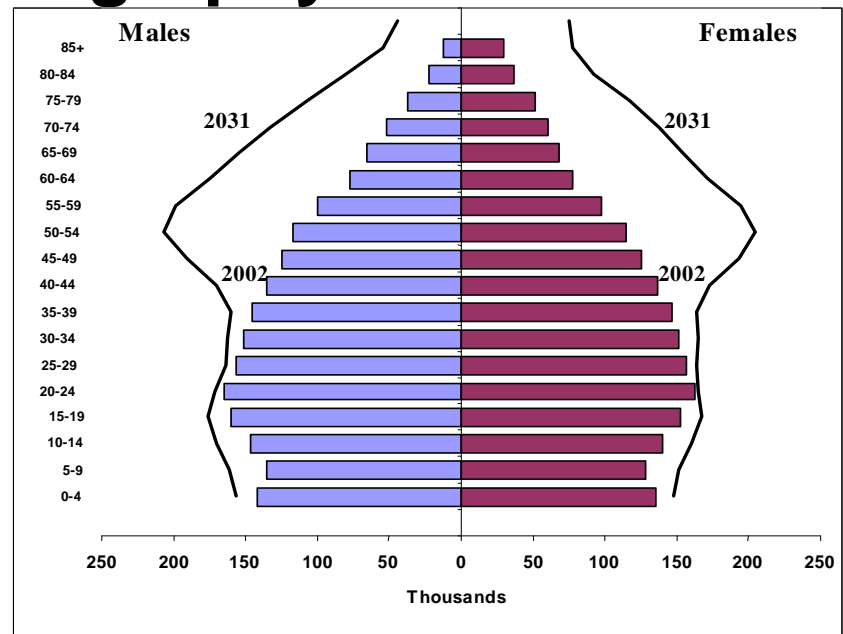
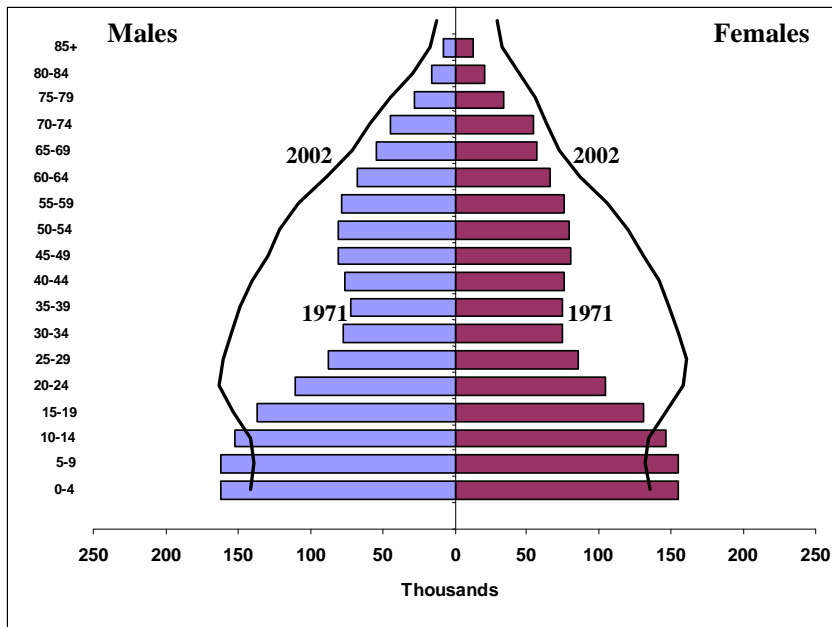
- **Epidemiology**
- **Costs**

2. The Challenge:

- **Risk Factors for Falls and Osteoporosis**
- **Picture of Current Services**
- **Best Practice for Intervention**

3. Strategy and Implementation

1. Scale of the Problem: Demography



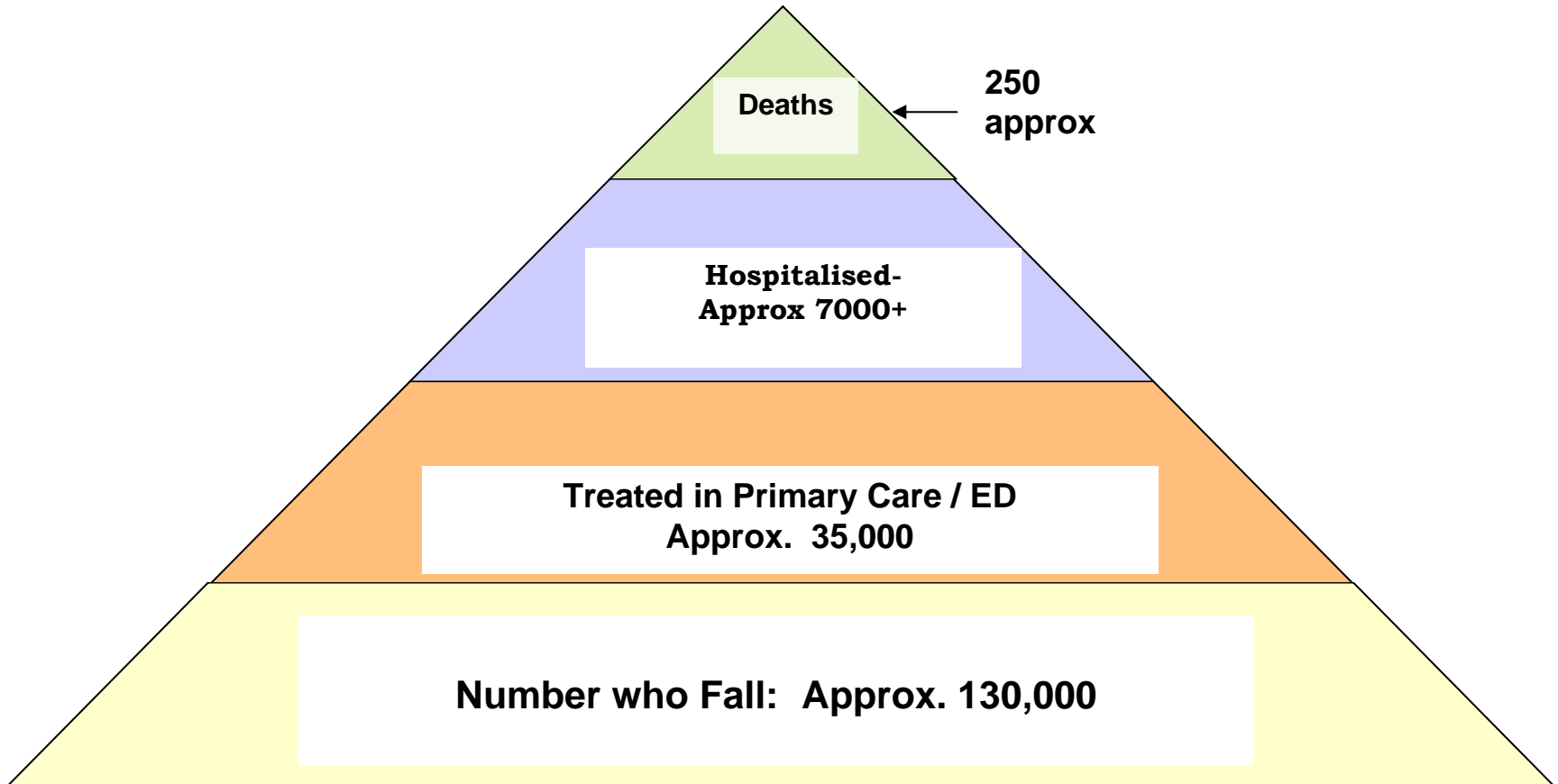
Fall related injuries are more common as we age and live longer. By 2031:

- Population will be 5 million
- One million 65 years and over – biggest increase in 80+ age group
- 50% in 80+ age group fall each year
- Older women are 65% of 80+ age group- they are at greatest risk.

Osteoporosis: most common metabolic bone disease; increases as the population ages - 1 in 3 women and 1 in 5 men.



Annual Health Burden of Falls for Older Irish People



Total Population 468,000

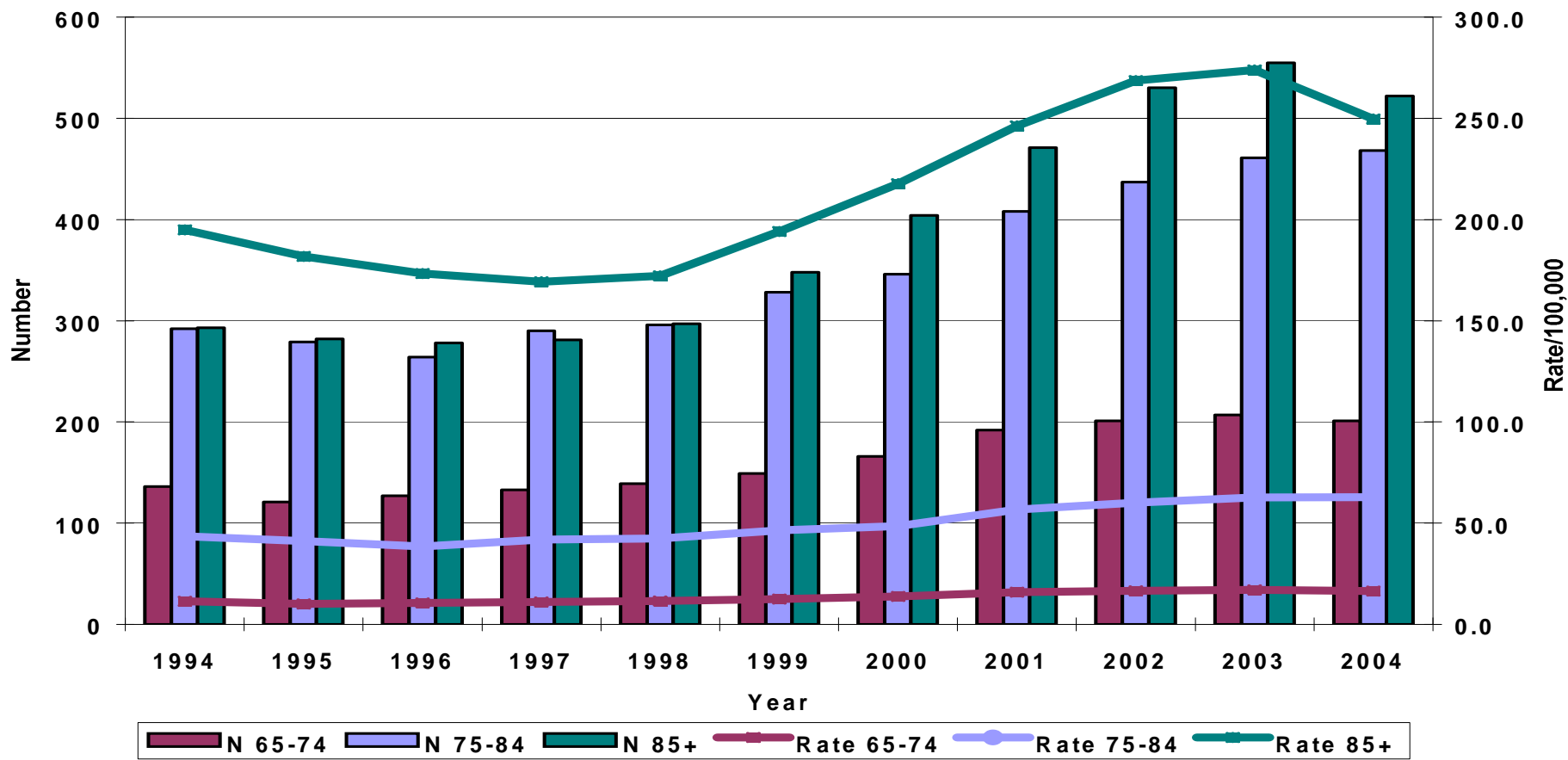


Projected Burden of Falls in Older People by 2031

	2006	2031
Population 65 years +	467,920 (11%)	1,002,280 (18%)
Number who fall: (30% > 65, 50% > 80)	130,000-148,000	320,000
Number who need treatment: 1 in 10 in 65 years+ group; 75% due to a fall	30,000 – 35,000	64,000-75,000
Number who need inpatient care (2-3% of the older population)	7,000 – 10,000	15,000-22,000
Deaths due to falls: (61.7 / 100,000 Pop.: EUNESE) (48.7 / 100,000 Pop.: CSO)	250-280	600+

Deaths due Accidental Falls Among People aged 65 Years and Over, Ireland, 1990-2004

(in 5 year Blocks; Numbers and Age-Specific Death Rates)



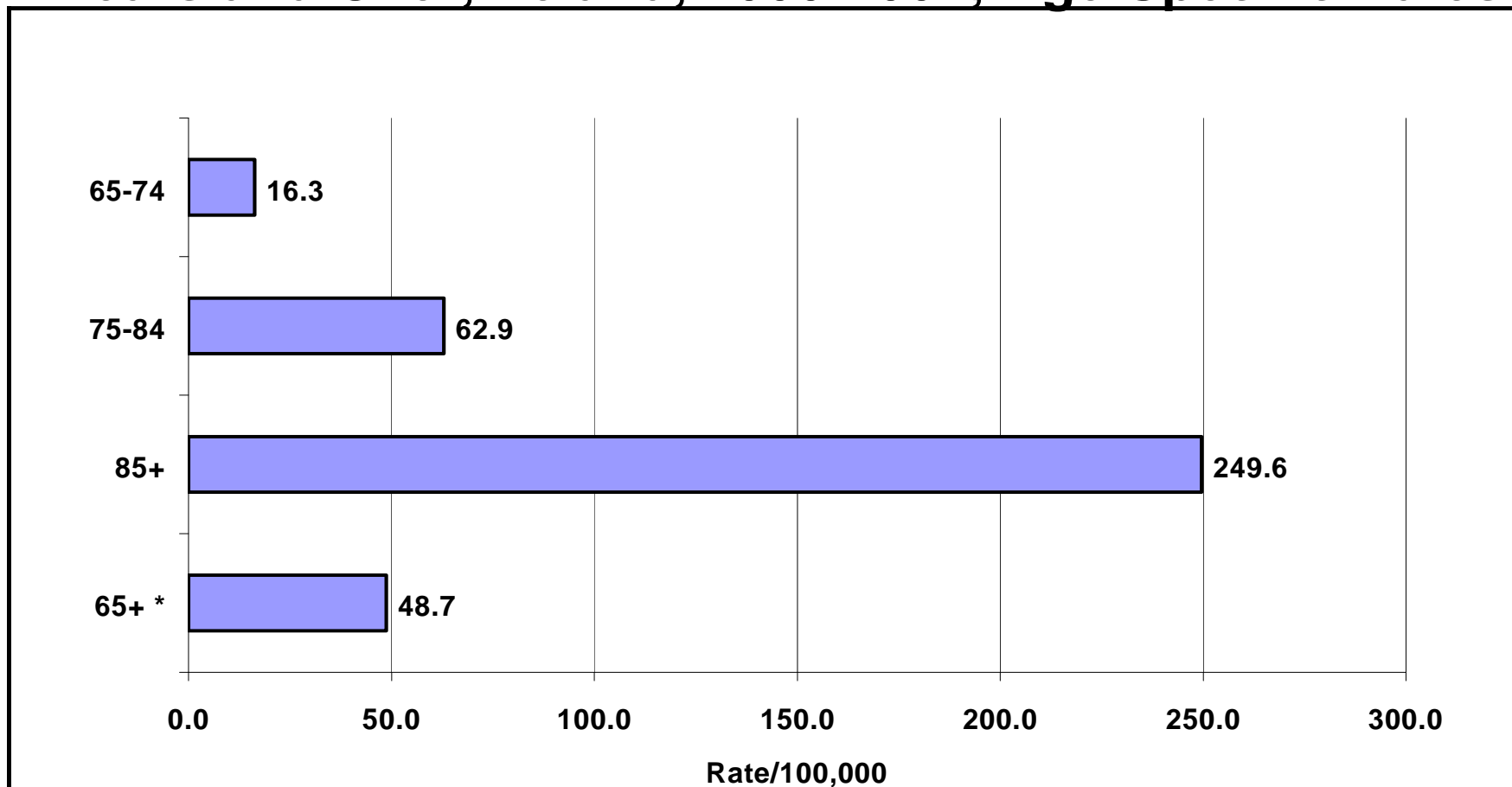
Year refers to the last year (e.g. 1994) of a five-year block (e.g. 1990-1994).

Accidental Falls=ICD-9 CM Codes E880-E886, E888.

Data Sources: PHIS 9 and CSO.



Deaths due to Accidental Falls Among People Aged 65 Years and Over, Ireland, 2000-2004; Age-Specific Rates



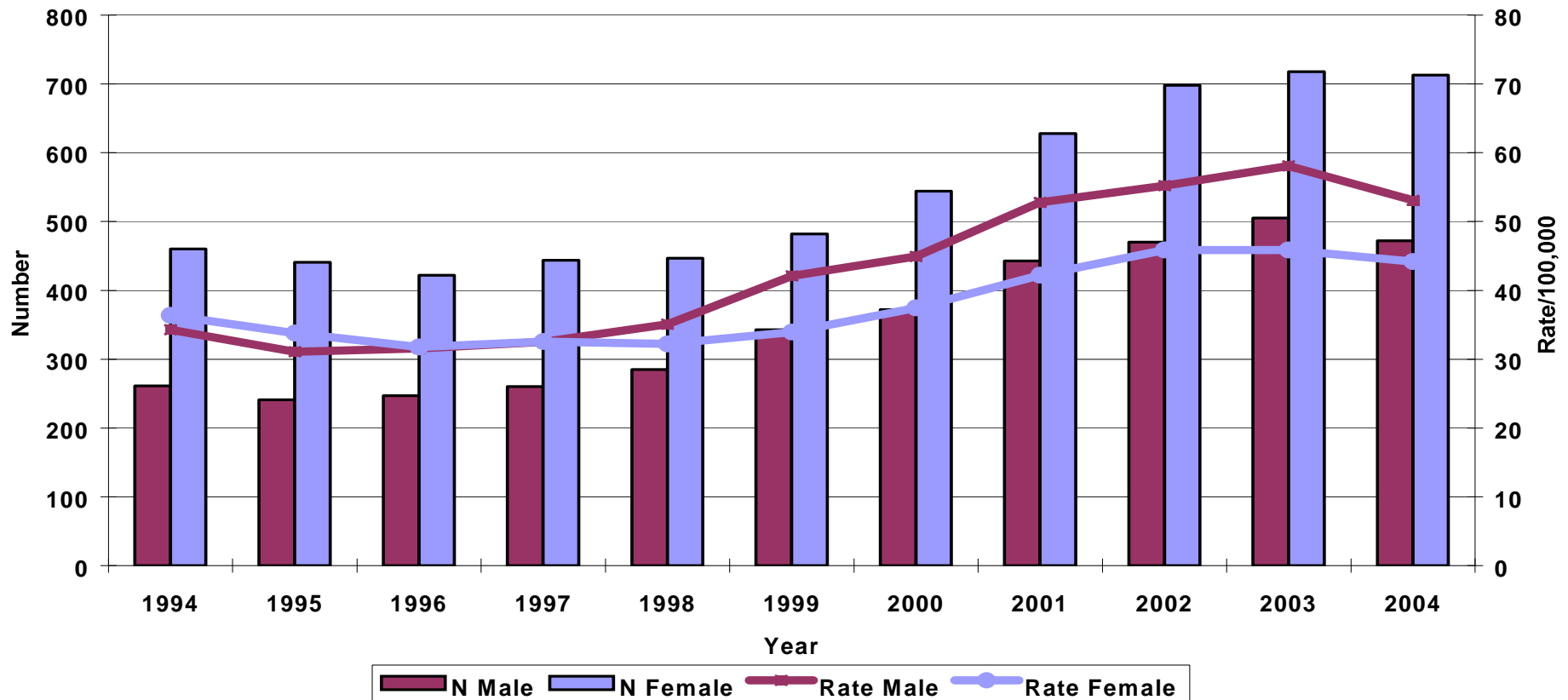
* Standardised to the WHO's European Standard Population.

Accidental Falls=ICD-9 CM Codes E880-E886, E888.

Data Sources: PHIS 9 and CSO.

Deaths Due to Accidental Falls Among People Aged 65 Years and Over by Gender, Ireland, 1990-2004

(in 5 Year Blocks Numbers and Age-Standardised Rates)



Year refers to the last year (e.g. 1994) of a five-year block (e.g. 1990-1994).

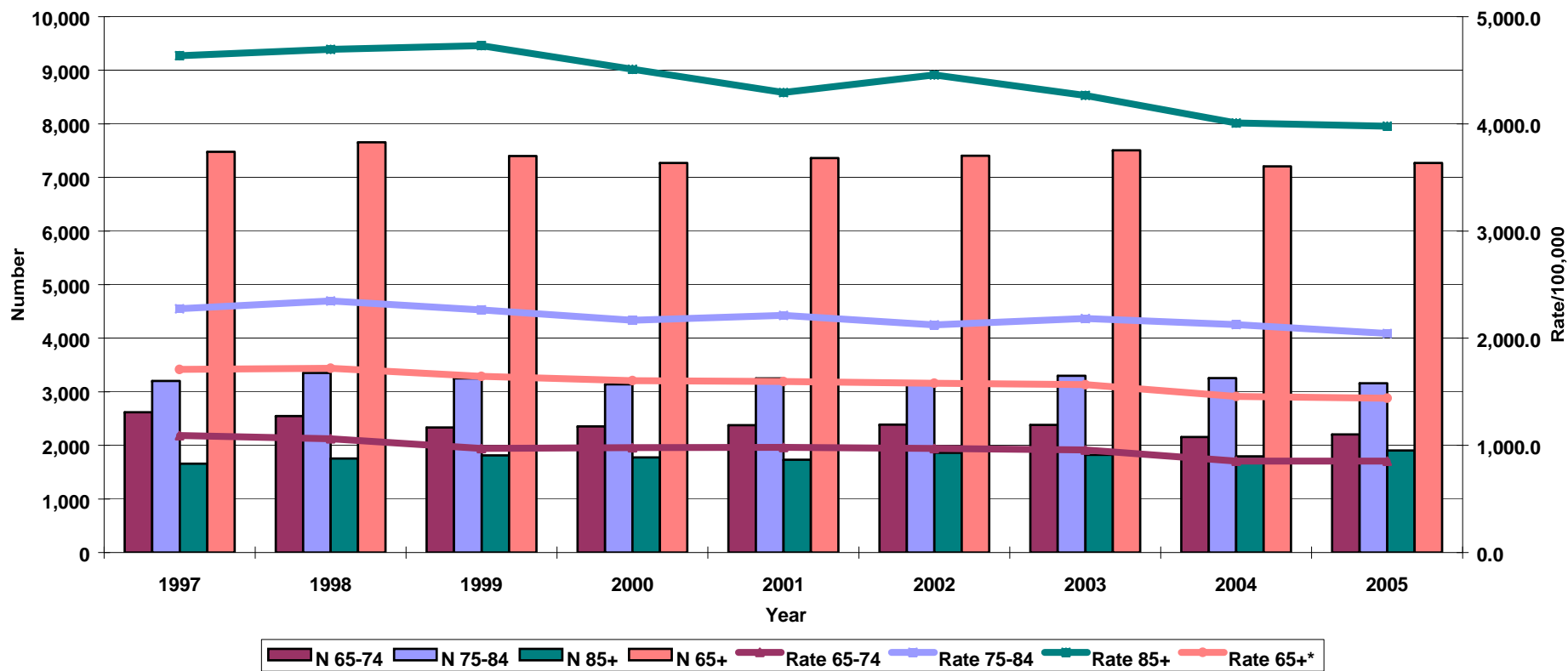
Rates standardised to the WHO's European Standard Population.

Accidental Falls=ICD-9 CM Codes E880-E886, E888.

Data Sources: PHIS 9 and CSO.



Inpatient Hospitalisations due to Fall- Related Injuries Among People aged 65 years and Over, Ireland, 1997-2005 (Numbers and Age-specific Rates)



* Standardised to the WHO's European Standard Population.

ICD-9 CM Codes 800-959 or ICD-10 AM Codes S00-T35 as principal diagnosis with ICD-9 CM Codes E800-886, E888 or ICD-10 AM Codes W00-W19 as secondary diagnosis respectively. ICD-9 CM Codes relate to 1997-2004 and ICD-10 AM Codes to 2005.

Data Source: HIPE & NPRS Unit, ESRI.



Hip Fracture Admissions, 2005

	Hip Fracture (N=2,774)
Age 75+	2,274 (82%)
Average Length of Stay	18.1 days
Average Inpatient cost	€12,610
Transfer to Nursing Home	928 (33.4%)
Discharged home	805 (29%)



Estimated Number of Irish People over 50 years with Osteoporosis

Age Group	Total Population	50+ Age group	% 50+ Age Group	*Estimated no. 50+ with osteoporosis	* % of total Pop
Male	2,121,171	537,149	12.7	*107,430	*5.0
Female	2,118,677	584,900	13.8	*193,017	*9.1
Total	4,239,848	1,122,049	26.5	*300,447	*7.0

“a systemic skeletal disease characterised by low bone mass and microarchitectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture”

Hospital Inpatients are the ‘tip of the iceberg’; In 2004: 6,113 hospital episodes with a diagnosis of osteoporosis (901 men - increased by 91% since 2000; 5,212 women - increased by 72% since 2000).



Burden to the Economy

- **Current costs are estimated at €402 million.**
- **If current trends continue it is estimated that costs will be:**
 - **€520 - €551 million by 2010**
 - **€922 - €1077 million by 2020**
 - **€1587 - €2043 million by 2030 ***
- **€24.8 million for osteoporosis medication****

*Brenda Gannon, Eamon O'Shea and Eibhlin Hudson
Irish Centre for Social Gerontology
National University of Ireland, Galway

** Pharmaco-Economic Centre St. James Hospital



2. The Challenge

Classification of Risk Factors for Falls

Extrinsic:

- Use of assistive devices
- Impaired ADL (activities of daily living)
- High level of activity (Community setting)
- Medication:
- Polypharmacy
- Psychotropic drugs
- Class 1a antiarrhythmic medications

Environmental:

- Environmental hazards
- Home hazards

Intrinsic:

- Muscle weakness
- History of falls
- Gait and balance deficits
- Visual deficit
- Arthritis
- Depression
- Cognitive Impairment
- Age >80 years
- Urinary incontinence
- Orthostatic or postprandial hypotension
- Dizziness
- Fear of Falling
- Limited activity (Institutional setting)
- Hearing (Institutional setting)

Risk Factors for Falls

AGS /BGS GUIDELINES

Risk Factor	Significant Total	Mean RR / OR	Range
Muscle weakness	10 / 11	4.4	1.5-10.3
History of Falls	12 / 13	3.0	1.7-7
Gait deficit	8 / 11	2.9	1.3-5.6
Balance deficit	8 / 8	2.9	1.6-5.4
Use of assistive device	6 / 12	2.6	1.2-4.6
Visual defect	3 / 7	2.5	1.6-3.5
Arthritis	8 / 9	2.4	1.9-2.9
Impaired ADL	8 / 9	2.3	1.5-3.1
Depression	3 / 6	2.2	1.7-2.5
Cognitive Impairment	4 / 11	1.8	1.0-2.3
Age > 80	5 / 8	1.7	1.1-2.5



Osteoporosis

“Systemic skeletal disease - by low bone mass - microarchitectural deterioration of bone tissue - increase in bone fragility - susceptibility to fracture”

- **Bone fragility due to low bone mass and the risk of ‘fragility fractures’ – fractures that occur as a result of mechanical forces that would not usually cause a fracture e.g. from a fall in the standing position.**
- **Osteoporosis is difficult to detect and often becomes evident only after a fracture has occurred.**
- **More than half of all fragility fractures occur in patients who would not be considered to have osteoporosis.**
- **There are a number of predictive risk factors for fracture associated with osteoporosis and poor bone health.**
- **Risk factors for osteoporosis can be grouped under two main headings:**
 - **Modifiable.**
 - **Non-Modifiable.**



Osteoporosis Risk Factors

(i) Non-modifiable

- Advanced age
- Female gender
- White / Asian race
- Family history of osteoporosis
- Family history of hip fracture
- Metabolic disorders affecting the skeleton
- Certain malignancies (myeloma, lymphoma)

(ii) Modifiable

- Smoking
- Low calcium intake
- Low vitamin D / sunlight exposure
- Sedentary lifestyle
- Low body weight
- Stress / depression
- Surgical or drug induced hypogonadism
- Glucocorticoid therapy

Secondary Causes

Endocrine

- Hypogonadism
- Hyperthyroidism
- Anorexia nervosa
- Type 1 diabetes mellitus
- Hyperadrenocorticism

Nutritional

- Malabsorption syndromes
- Vitamin D deficiency / resistance
- Calcium deficiency
- Alcoholism

Chronic medication therapy

- Glucocorticoids
- Thyroxine
- Anticonvulsants
- Loop diuretics
- GnRH agonists
- Aromatase inhibitors
- SSRI antidepressive drugs

Other

- Hypercalciuria
- Chronic Obstructive Pulmonary Disease
- Rheumatoid arthritis
- Organ transplantation



WHO Fracture Risk Assessment

- Age
- Previous fracture
- Family history of hip fracture
- Glucocorticoid use
- Current smoking
- Alcohol use > 2 units / day
- Rheumatoid arthritis
- Low BMI

- Diagnosis: BMD <2.5 s.d. below mean



Services in Ireland

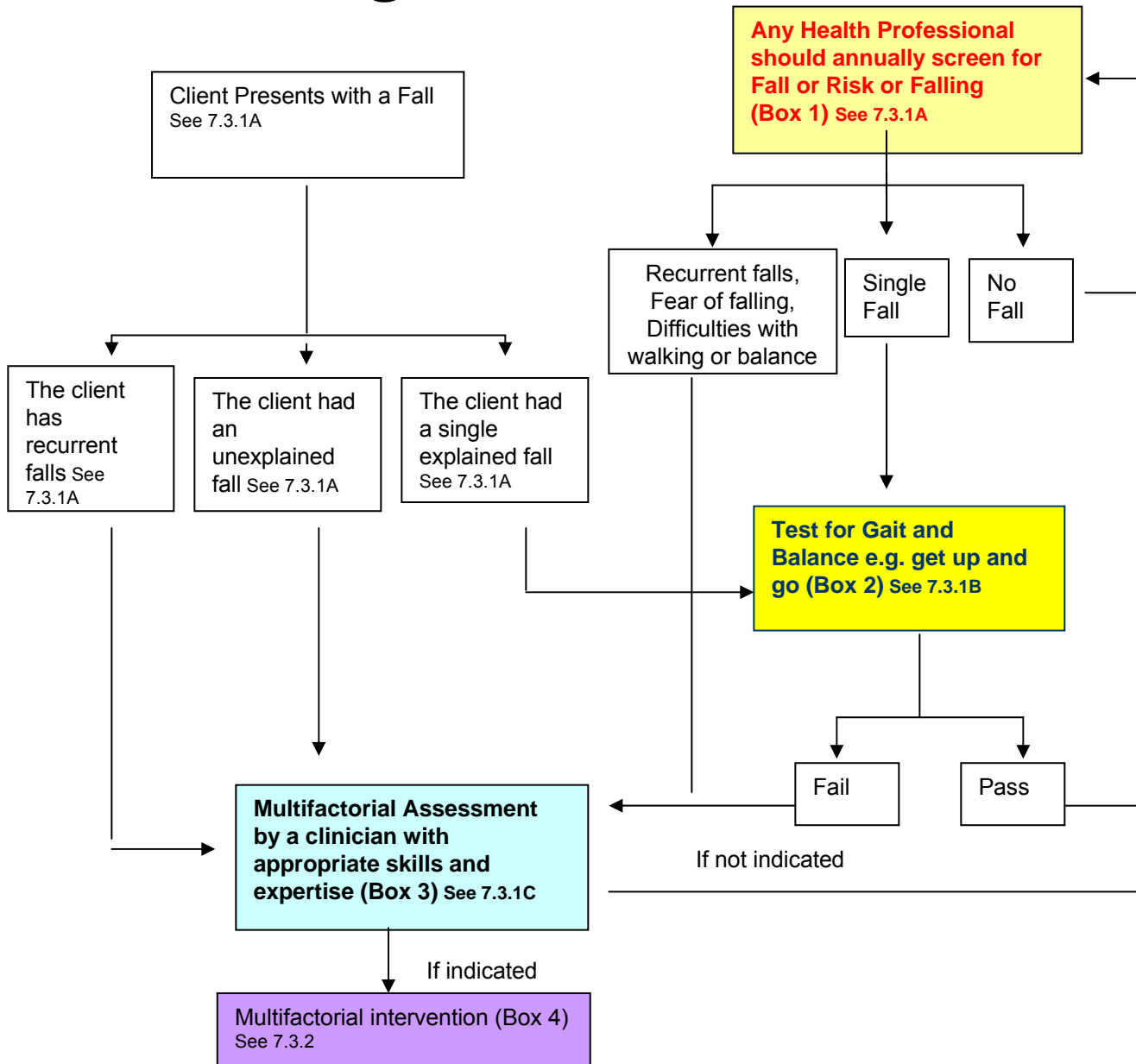
Falls

- **Prevention and assessment services are developing: community, hospitals, long-stay**
- **Not well structured or developed**
- **Regional variation**
- **Often due to efforts and enthusiasm of individual health professionals**
- **Most patients who fall do not receive a falls assessment service.**
- **ED Research – 1.4% had multifactorial assessment**

Bone Health

- **Prevention and management services developing**
- **Many services involved: health promotion, primary care, acute care and rehabilitation**
- **Some specialist services including fracture liaison services in place.**
- **Few examples of multifactorial approach integrating prevention and care**
- **DXA research: We have enough DXA machines for population needs**
- **Service not equitable**

Falls Algorithm



Multifactorial Assessment

- **Identify falls history**
 - **Review medication(s) and dose(s)**
 - **Assess:**
 - gait, balance, mobility and lower extremity joint function
 - Osteoporosis risk
 - Vision
 - Neurological function, muscle strength, proprioception, reflexes and tests of cortical, extrapyramidal and cerebellar function
 - **Examine cognitive function**
- **Assess:**
 - postural blood pressure
 - Heart rate, rhythm and evidence of structural heart disease
 - Blood pressure responses to carotid sinus stimulation if appropriate
 - Urinary incontinence
 - Vitamin D deficiency
 - Foot problems and footwear
 - **Assess:**
 - Home hazards
 - Older person's perceived functional ability and fear relating to falling
 - **Screen for depression**

Multifactorial Intervention

*Manage all known fall risk factors as identified
in the multifactorial assessment (A)*

- **Withdraw / minimise:**
 - Psychoactive medications
 - Other culprit medications
- **Prescribe and instruct on the use of assistive devices and Occupational Therapy**
- **Assessment of Vitamin D deficiency**
- **Arrange:**
 - Gait, Strength and balance training
 - Adaptation or modification of home environment
- **Treat / Manage:**
 - Osteoporosis
 - Visual abnormalities
 - Neurological disorders
 - Cognitive impairment
 - Depression
 - Postural hypotension
 - Other cardiovascular abnormalities
 - Functional disability
 - Fear of falling
 - Urinary abnormalities
 - Foot problems and footwear
 - Other relevant acute or chronic medical conditions



***Osteoporosis:
Prevention, Early Detection,
Treatment, Management***

Prevention

Treatment

Management

Bone Health Promotion

Public Awareness

Nutrition
Calcium / Vitamin D

Health Risks
Smoking
Alcohol
Caffeine

Physical Activity /Exercise

Early Detection / Risk Factors

Diagnosis

Guidelines for Selective Case Finding

Access / Provision of DXA Units

Type of Fragility Fracture
Osteoporosis Patient Profile

Non-pharmacological Intervention

Pharmacological Intervention

Benefits and Risks

Post Fracture Care

Integrated Care

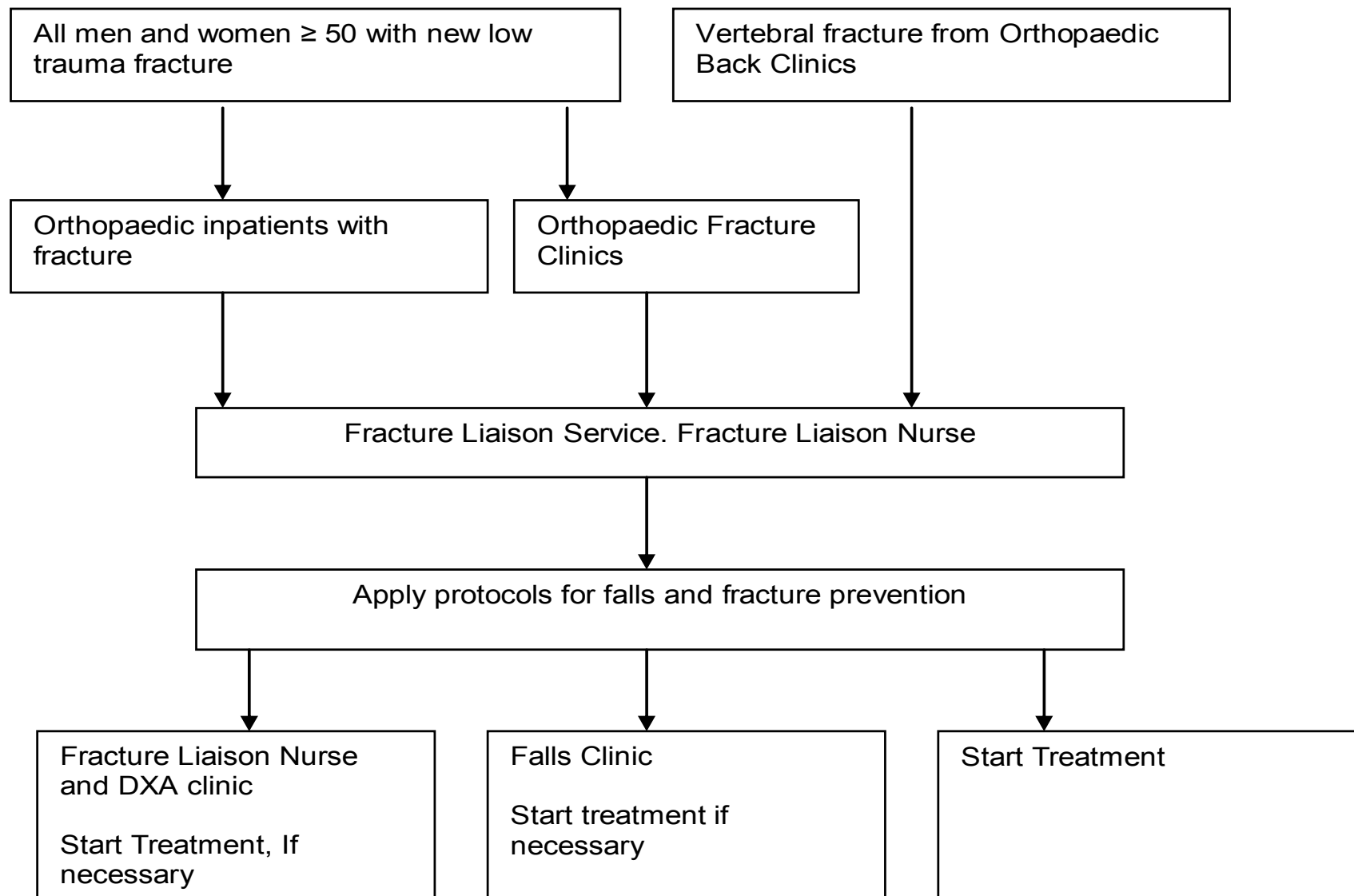
Self Management

Falls Prevention

Improved Osteoporosis Practice

Evidence Based Practice

Figure 7(b) 4.1: The Fracture Liaison Service Basic Model



Source: Adapted from the Belfast Fracture Liaison Model 2005.³³

3. Strategy and Plan

- Vision
- Mission
- 5 Principles
- 4 Goals
- 16 Recommendations
- Plan to Implement



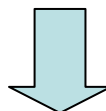
Vision

Life Free from Falls and Fractures in our Ageing Population



Mission

Work with Agencies to Implement and Evaluate the Strategy



Principles

Prevention is Priority

HSE provides Leadership

Evidence-based interventions

Equitable

Long-term



Goals

Greater Awareness

Build Capacity

Comprehensive service

Safer Environment



Objectives

Positive Ageing

Risk reduction

Physical Activity

Bone Health

National Steering Group

National Centre

Training

Research

Plan, Monitor, Audit

Implement Guidelines

•Primary Health Care

•Acute Setting

•Long Stay Units

Engage agencies

Balance risk between care process and arch. Design

Balance between Quality of Life and Health & Safety

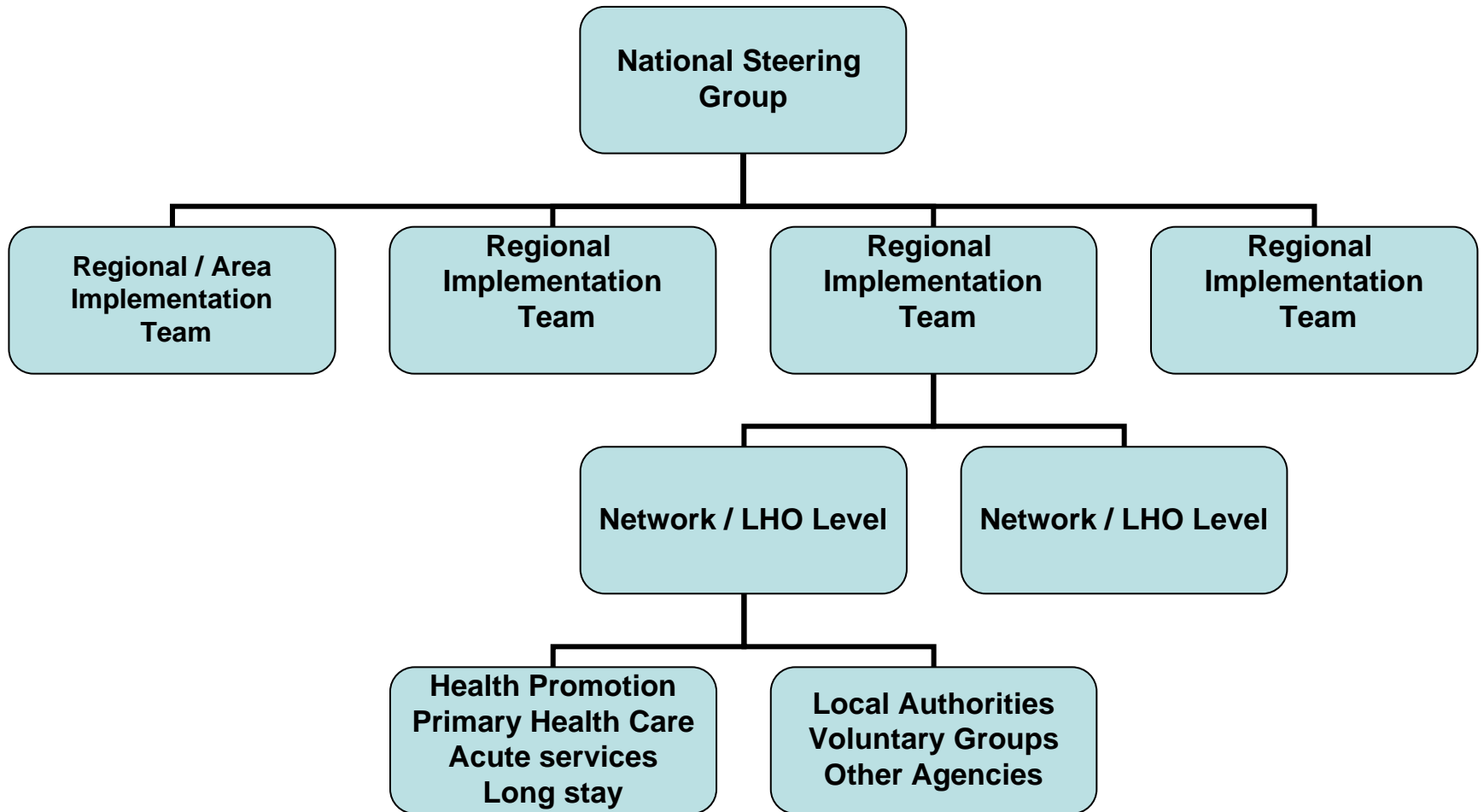
Role of Assistive Technology

Goal 3: Provide Services

Recommendation 15: BMD Testing

- **Implement WHO approach – case-finding**
- **Timely access to BMD (6 weeks)**
- **Implement quality assurance / accreditation**
- **Provide DXA service where Fall / Fracture service is based**
- **Short-term access to DXA- use existing DXA facilities to provide capacity**
- **Provide Bone protection for patients on long-term corticosteroids**

Approach to Implementation





Performance Measurement - Outcomes

Target: 20% decrease in Fracture Admission Rates in 65+ Age Group in 5 years

- **Death rates:**
 - Falls 65-74, 75-84. 85+
 - Hip Fracture
 - Head Injury
- **Hospitalisation:**
 - Hip fractures
- **ED attenders due to fall:**
 - % received MDT assessment
 - % received MDT intervention
- **Residential Care:**
 - % with fall policy
 - Hip fractures reported
 - % residents received yearly assessment
- **Fracture prevention:**
 - % fractures who received fracture assessment
 - Wait time for BMD
 - QA for BMD service



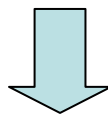
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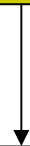
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Objectives

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National Steering Group
National Centre
Training
Research
Plan, Monitor, Audit

Implement Guidelines
•Primary Health Care
•Acute Setting
•Long Stay Units

Engage agencies
Balance risk: care process and arch. design
Balance - Quality of Life and Health & Safety
Assistive technology

High Level Goals

- 1. Increase awareness about the problem of falls and fractures in high risk groups, their families and communities, health personnel and policy makers.**
- 2. Build capacity among health personnel and communities to reduce falls and fractures in older people.**
- 3. Provide comprehensive, integrated fall / fracture prevention services in Primary, Secondary and Residential Care.**
- 4. A safer, friendlier physical environment is a priority.**

Goal 1: Increase Awareness

Recommendation 1: Promote positive ageing and well being

Recommendation 2: Minimise intrinsic and extrinsic fall risk factors;
modify clinical risks for osteoporosis

Recommendation 3: Physical Activity

Recommendation 4: Awareness among health personnel

Recommendation 5: Life-long approach to bone health.

Goal 2: Build Capacity

- | | |
|----------------------------------|---|
| <i>Recommendation 6:</i> | National Overview: National Centre for Falls and Fracture Prevention and Steering Group. |
| <i>Recommendation 7:</i> | Health personnel trained |
| <i>Recommendation 8:</i> | Research to lead to high quality services / best-practice and enhance skills. |
| <i>Recommendation 9:</i> | Cost-effectiveness measured |
| <i>Recommendation 10:</i> | Information and Audit is integral. |

Goal 3: Provide Services

Seamless: Health Promotion, Community, Hospital and Primary Care.

<i>Recommendation 11:</i>	<u>Implement Guidelines</u> and Standards of Care
<i>Recommendation 12:</i>	<u>Primary Health Care</u> central – multi-disciplinary Most interventions take place in the community Pharmacist role Continuing Professional Development
<i>Recommendation 13:</i>	<u>Acute Hospitals</u> Integrated Fall / Fracture Prevention Programme in each acute hospital Consultant led Multidisciplinary, dedicated Clinical Nurse Specialist Record and analyse all falls in hospital Tertiary / specialist services
<i>Recommendation 14:</i>	<u>Residential Long Stay Care</u> Fall Prevention Policy Residents have annual Fall Risk Assessment A Fall Risk Assessment on admission and when health status changes occur. Record / analyse / report all Falls

Goal 4: A Safer Environment

Recommendation 16:

- **Health sector works with other sectors to modify environments and improve design.**
- **Residential and acute health care facilities conform to legislated safety requirements.**
- **Regular audits of acute and long stay residential health settings take place to identify and modify physical hazards.**

Strategy and Implementation Plan

Vision: A Life Free of Falls and Fractures in our Ageing Population.

Mission: To Work with all Relevant Agencies to Implement and Evaluate this Strategy.

Principles:

1. The prevention of falls and fractures in older people is a priority for the HSE.
2. The HSE shows leadership and works in partnership with relevant agencies to deliver an integrated approach to fall and fracture prevention.
3. Evidence based multifactorial interventions are resourced, implemented, monitored and evaluated.
4. Fall and fracture prevention services are equitable to all.
5. A long term approach is taken.