Dr Ngaire Kerse

Head of School
Population Health
Faculty of Medical and Health Sciences
University of Auckland

Saturday, August 10, 2019 (Room 2)

14:00 - 14:55 WS #115: Improving Outcomes for Falls and Fracture in Older People

15:05 - 16:00 WS #125: Improving Outcomes for Falls and Fracture in Older People (Repeated)

Saturday, 10 August 2019

‘Falls in older people’

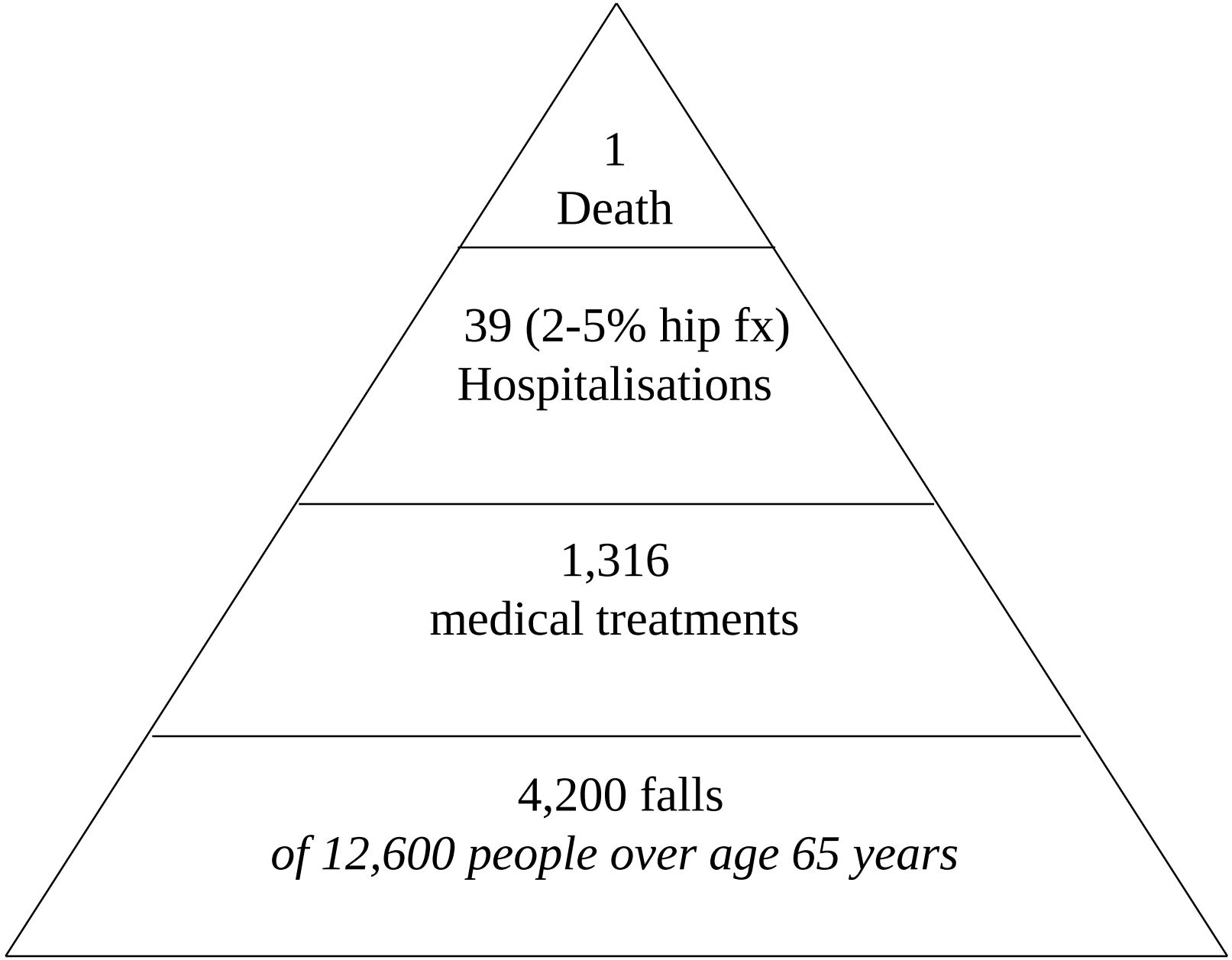
Ngaire Kerse, Joyce Cook Chair in Ageing Well.

Professor, General Practice and Primary Health Care and Head, School of Population Health

MEDICAL AND HEALTH SCIENCES

Bert – 85 yrs, lives alone

- Fell in the night in the loo, hit his head
- Comes the next day for stitching of the laceration
- Known prostate probs
- Doxazosin (ά1 blocker)
- Aspirin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Death
39 (2-5% hip fx)
Hospitalisations
1,316
medical treatments
4,200 falls
of 12,600 people over age 65 years

Falls – why?

- Top 3 injury related death in older people
  - falls, MVA, suicide
- Specific subgroups
  - Parkinsons disease, 6 x more likely to fall
  - Lewy body dementia, intolerant of psychotropics, injury 8 x more likely
- Injury is tip of iceberg, loss of function, independence
- They are in your office all the time

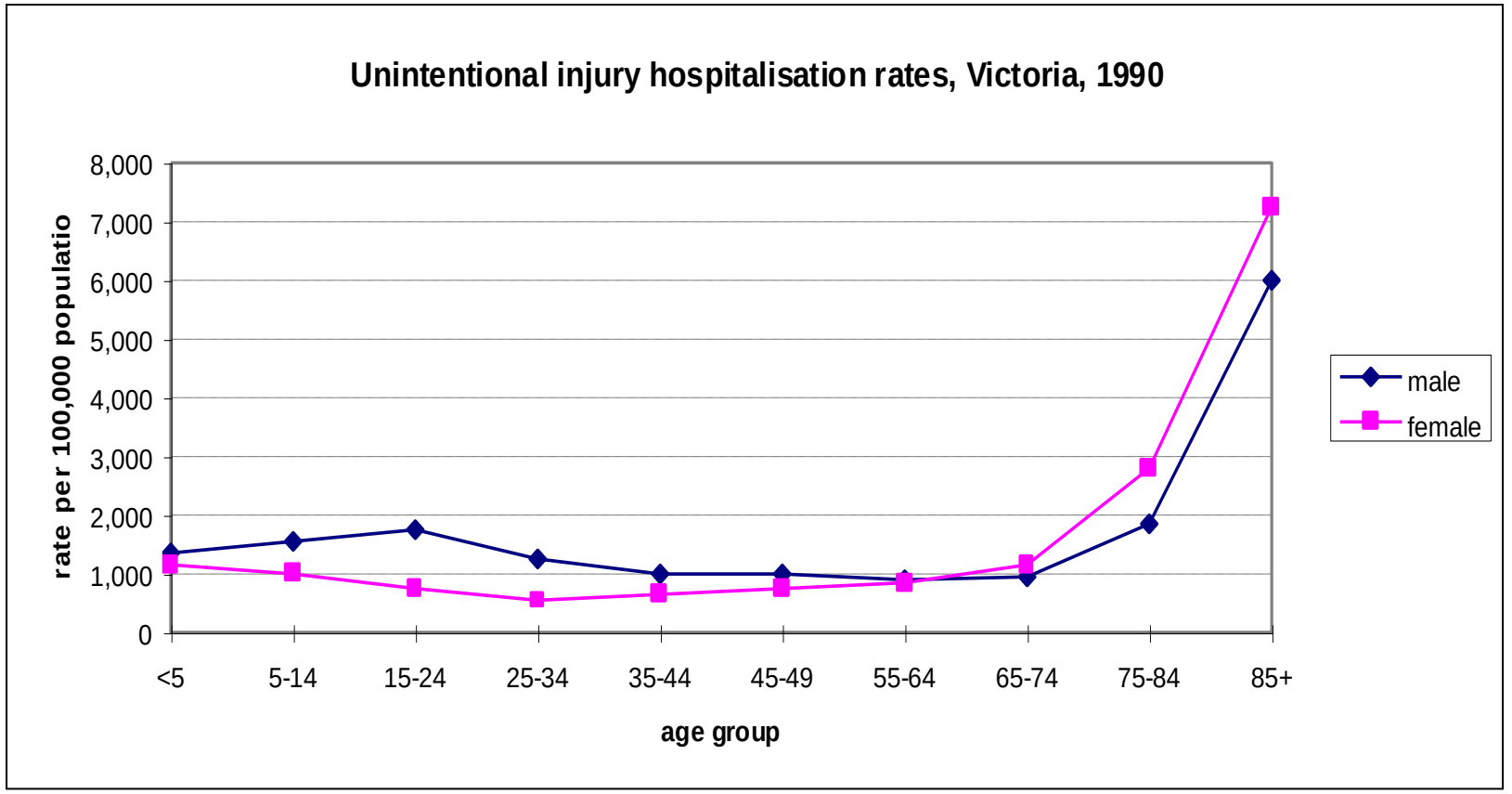
Falls and older people an ER series

- 20% of all older people presenting - fall
- Extrinsic – hazard
- Intrinsic – syncope, MI, Hgb, etc
- 10% alcohol
- 10% CVA, LOC, Sz

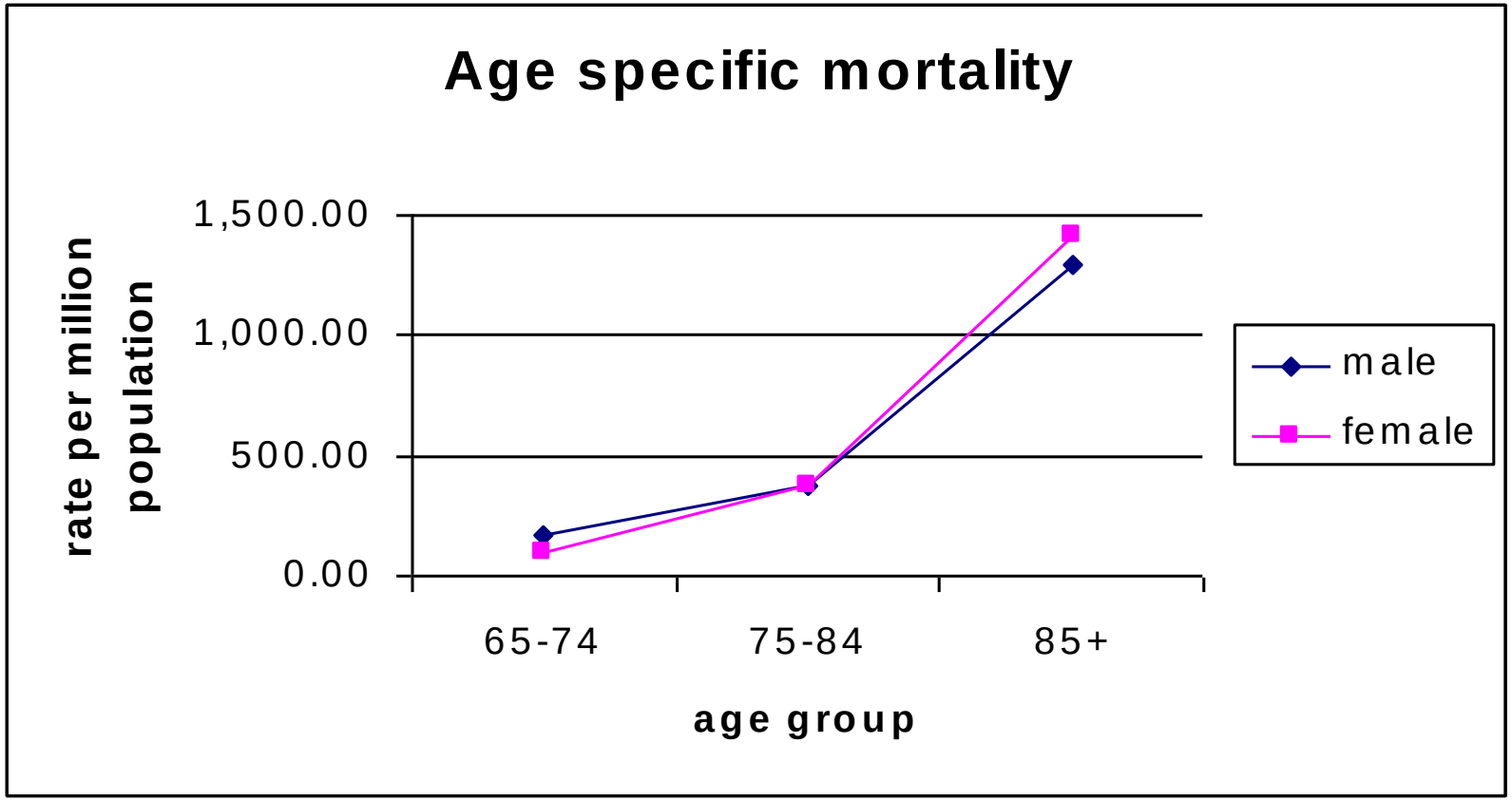
	Intrinsic	extr
• 50%	65-74	49%
• 60%	75-84	39%
• 64%	85+	38%

- 23% unclassified
- 70% injured
  - 36% fx, 36% (98) NOF
- 57% admitted
- 32 died, (4% of total)

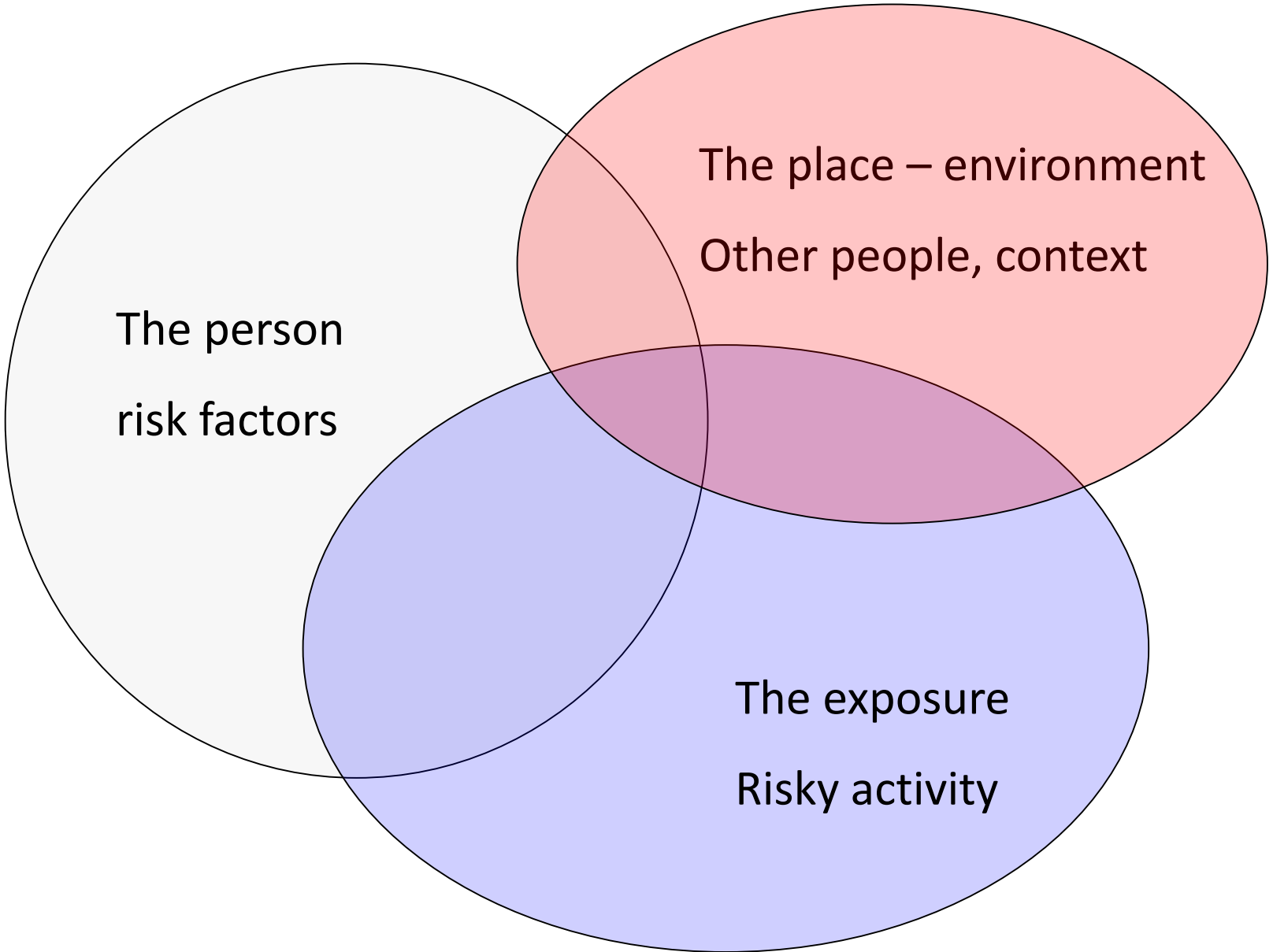
Hospitalisation



Mortality


Age specific mortality
rate per million population
1,500.00
1,000.00
500.00
0.00
65-74
75-84
85+
age group
male
female

The mechanism



Population and context – Res Care

Risk factor	*Res Care*	*Comm*
Prev falls	60%	30%
Use of assistive devises	80%	25%
Impaired ADL	100%	15%
Dementia	70%	6%
>80 year	70%	15%

Hot and cold falls

- Hot falls: acute medical problem
  - Infection
  - Cardiovascular event
  - Multifactorial
- Cold falls: non-acute
  - multifactorial

Hot fall: be a detective

- Is it new or old
- Are they acutely unwell
  - Intrinsic causes of falls, Stroke, MI, other CV, infection, constipation, dehydration
- Are they poisoned
  - Assume medication as a cause until proven otherwise, new mediation, interaction, adverse reaction
- Have they injured themselves


ORAL
PARACETAMOL
VALIUM
GEROVIT
INDOCID

Clinical evaluation- Hot fall

- Take a history,
  - Mechanism of fall
- do an examination
  - Postural hypotens
  - Gait and balance
  - Timed up and go
- Consider ALL meds
- ECG, Hb, MSU, U&Es
- Don’t forget injury

Management

- Treat any cause identified
  - Infection, cardiovascular, medications
  - Parkinsons disease, Lewy Body dementia
- Treat injury
- Expect loss of confidence ‘fear of falling’
- Restoration
- Prevent future falls

Bert – 85 yrs, lives alone

- Fell in the night in the loo, hit his head
- Stitched up
- Fell again
- Hb 77
- Gastric carcinoma

Joan – 78, rest home resident

- On your usual round, noted that Joan has had several falls
- Found on the floor, no injury
- Mild dementia, HTN
- Aspirin, Bendrofluazide

Definitions – cold falls

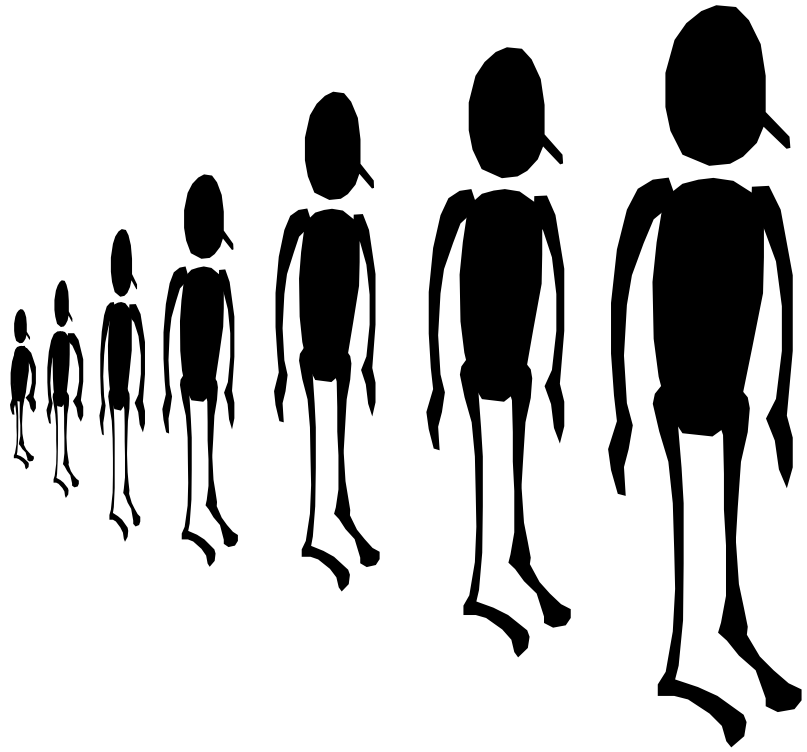
"a fall is an event which results in a person coming to rest inadvertently on the ground or other lower level, and other than as a consequence of the following: sustaining a violent blow, loss of consciousness, sudden onset of paralysis as in stroke, or an epileptic seizure"

Kellogg International Working group on prevention of Falls by the Elderly

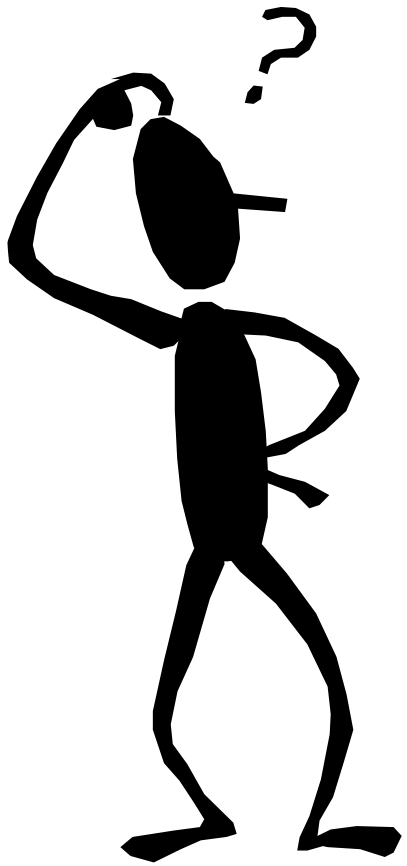
Florence Houghton,
ACOTA-Vic

Risk factors for falling:
Physical health

- Episode of serious illness
- Balance and gait impairment
- Reduced lower limb strength
- Hx arthritis, Parkinson’s disease
- Near-vision loss >20%
- Hearing loss, moderate
- Foot problem
- Urinary incontinence



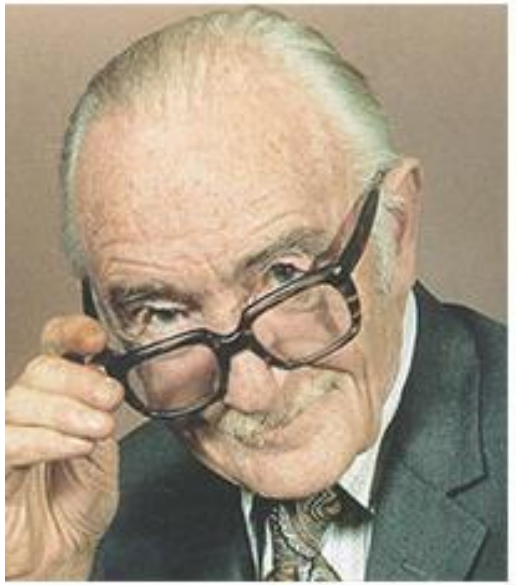
Risk factors; medications, mental health, hazards

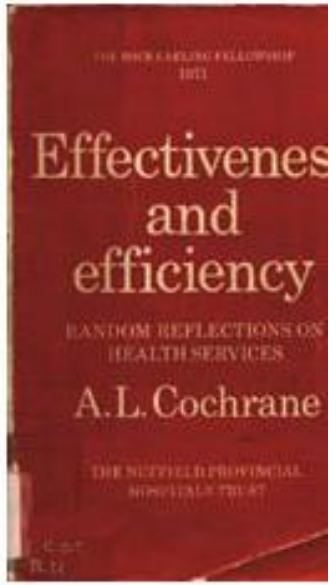


- Sedatives ↑↑↑
- >3 drugs↑
- Fear of falling↑↑↑
- Depression
- Impaired cognition
- >1 bedroom hazard
- Use of cane or walker

A Cochrane review

Definition of interventions and population group
Systematic search
Quality assessment
Data extraction
Meta-analysis





Successful prevention – community

(Gillespie, Cochrane review 2015)

159 trials, 79,193 people

- **multiple-component group exercise, (**RaR 0.71, 95% CI 0.63 to 0.82; 16 trials; 3622 participants (Stephen Lord, Cathie Sherrington)
- **multiple-component home-based exercise** (RaR 0.68, 95% CI 0.58 to 0.80; 7 trials; 951 participants and RR 0.78, 95% CI 0.64 to 0.94; 6 trials; 714 participants
- **Tai Chi** (RR 0.71, 95% CI 0.57 to 0.87; 6 trials; 1625 participants)
- **Multifactorial interventions, -** individual risk assessment, medication, environment, exercise (RaR 0.76, 95% CI 0.67 to 0.86; 19 trials; 9503 participants)
- **OT home assessment** for those with low vision and at high risk of falls

- **Prescribing modification** in primary care with patient engagement yes, review alone no.
- **Reduction of sedatives** *(Campbell 1999, JAGS)*
- Multifocal to single lens **glasses**: *better if doing things outside, worse if not*.
- First **cataract** extraction
- **Pacemaker** for those with carotid sensitivity
- **Antislip footwear** in the ice, **podiatry** for foot pain

- ***Not***
  - Education alone, cognitive behavioural strategies, patients with dementia.
  - Vit D except low sun exposure

Joan – 78, rest home resident

- Found on the floor, no injury
- Postural drop
- Crepitations L base
- Pneumonia, dehydrated
- Treated in the rest home, no further falls

Interventions for preventing falls in older people in **care facilities and hospitals** (Review)

Cameron ID, Dyer SM, Panagoda CE, Murray GR, Hill KD, Cumming RG, Kerse N

95 trials (138,164 participants),
71 (40,374) in care facilities,
24 (97,790) in hospitals

Variation in residential care

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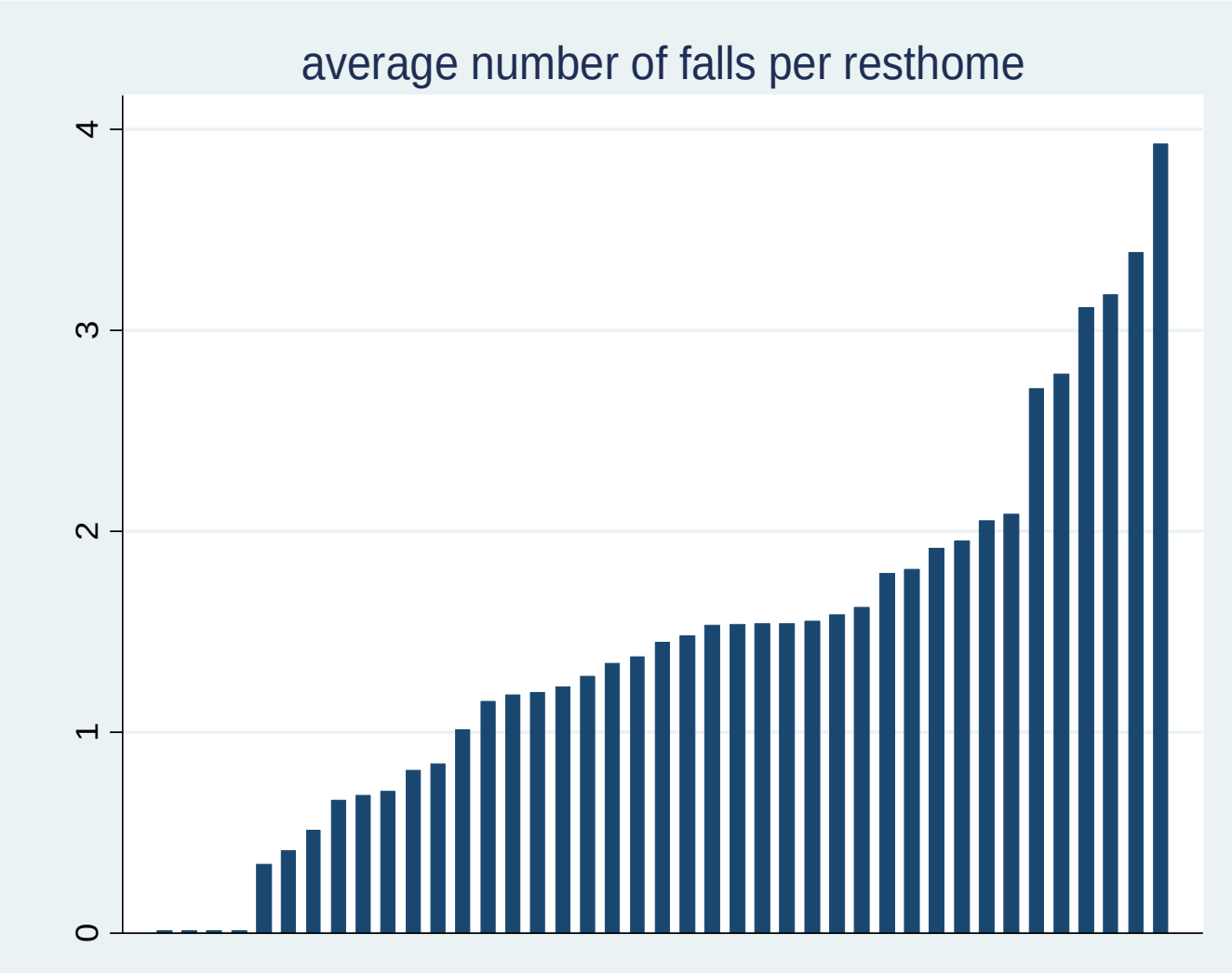
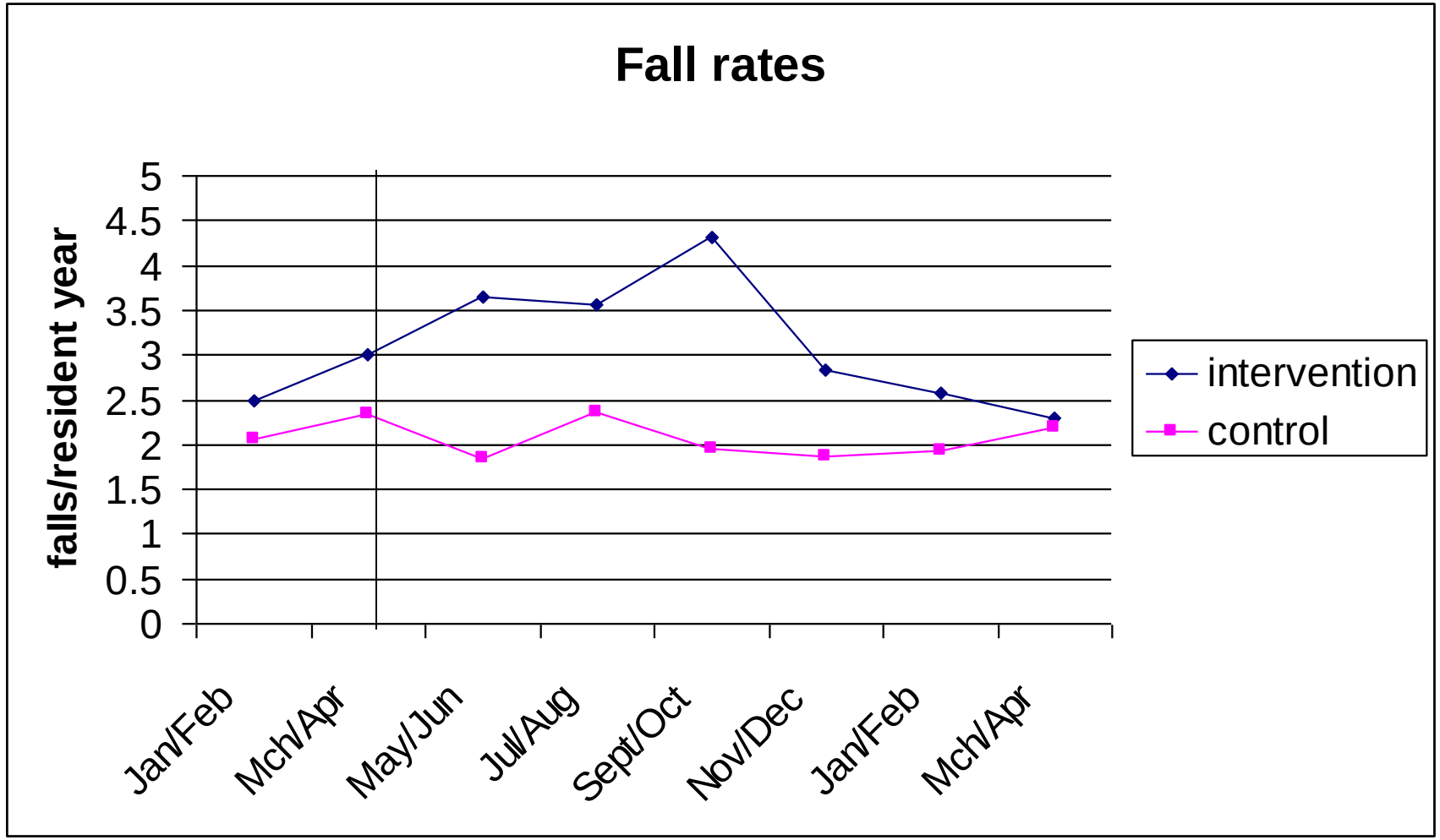


Intervention - *multidisciplinary falls risk assessment and falls logo*

Fall rates


Fall rates
falls/resident year
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Jan/Feb
Mch/Apr
May/Jun
Jul/Aug
Sept/Oct
Nov/Dec
Jan/Feb
Mch/Apr
intervention
control

Care facilities: Multifactorial interventions vs usual care,

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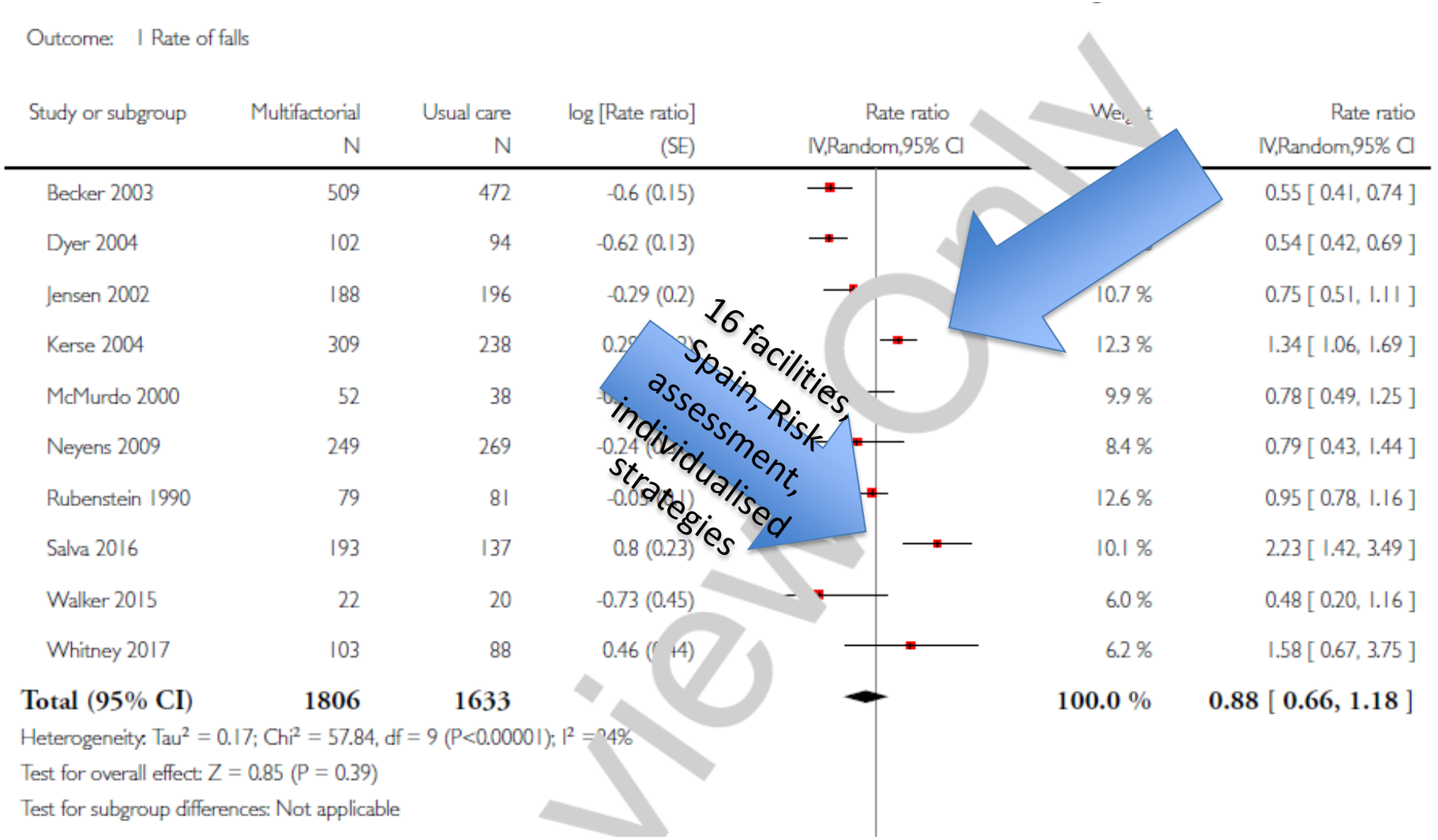

Outcome: 1 Rate of falls

Study or subgroup	Multifactorial N	Usual care N	log [Rate ratio] (SE)	Rate ratio IV,Random,95% CI	Weight	Rate ratio IV,Random,95% CI
Becker 2003	509	472	-0.6 (0.15)			0.55 [0.41, 0.74]
Dyer 2004	102	94	-0.62 (0.13)			0.54 [0.42, 0.69]
Jensen 2002	188	196	-0.29 (0.2)		10.7 %	0.75 [0.51, 1.11]
Kerse 2004	309	238	0.2		12.3 %	1.34 [1.06, 1.69]
McMurdo 2000	52	38			9.9 %	0.78 [0.49, 1.25]
Neyens 2009	249	269	-0.24		8.4 %	0.79 [0.43, 1.44]
Rubenstein 1990	79	81	-0.05		12.6 %	0.95 [0.78, 1.16]
Salva 2016	193	137	0.8 (0.23)		10.1 %	2.23 [1.42, 3.49]
Walker 2015	22	20	-0.73 (0.45)		6.0 %	0.48 [0.20, 1.16]
Whitney 2017	103	88	0.46 (4)		6.2 %	1.58 [0.67, 3.75]
Total (95% CI)	**1806**	**1633**			**100.0 %**	**0.88 [0.66, 1.18]**

Heterogeneity: Tau² = 0.17; Chi² = 57.84, df = 9 (P<0.00001); I² = 84%

Test for overall effect: Z = 0.85 (P = 0.39)

Test for subgroup differences: Not applicable

16 facilities, Spain, Risk assessment, individualised strategies

Care facilities: Multifactorial interventions vs usual care,

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Test for overall effect: Z = 0.85 (P = 0.39)

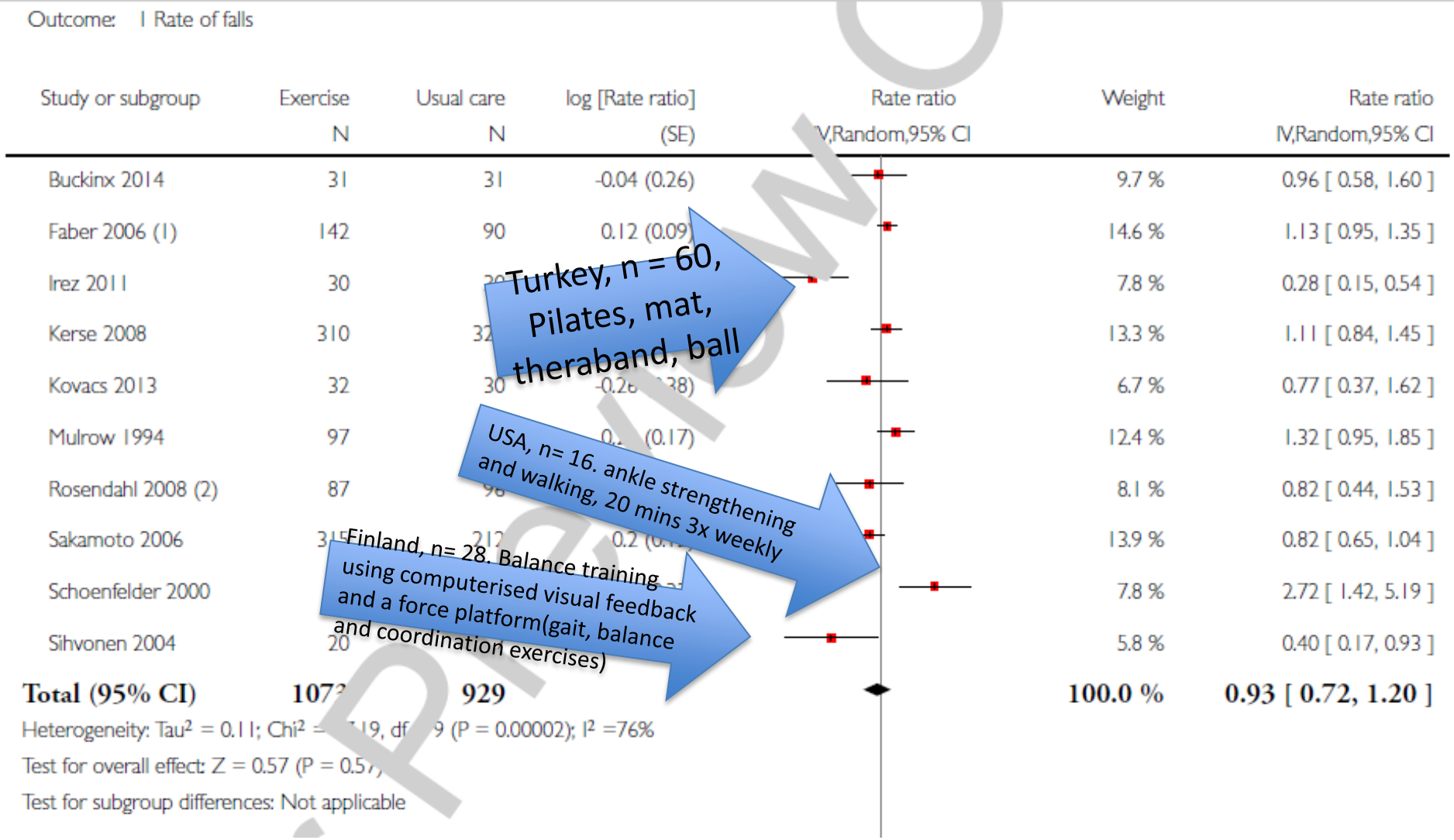
Test for subgroup differences: Not applicable

Success in residential care

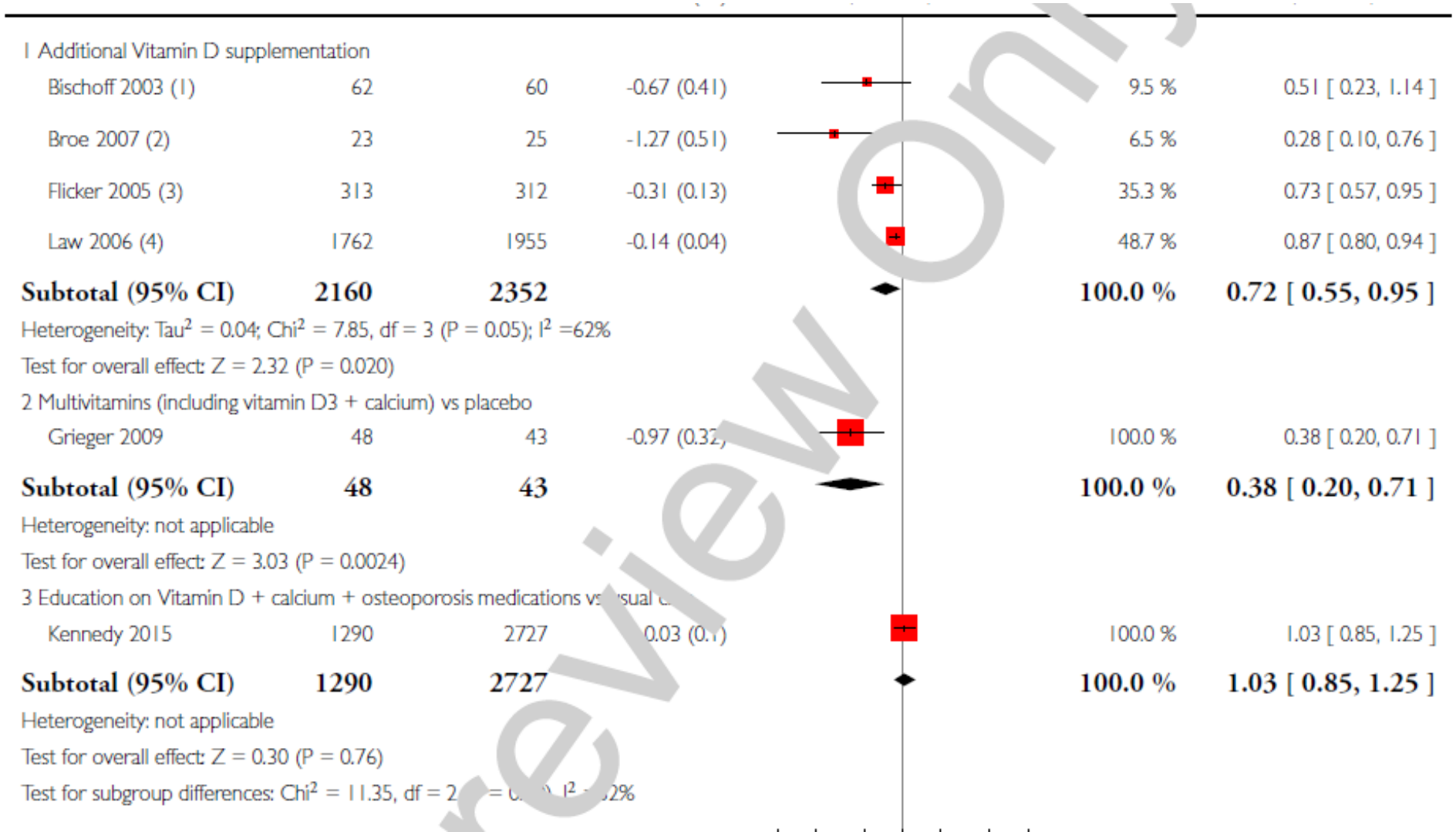
- Multifaceted
  - Staff and resident education
  - Balance and strength exercises
  - Environmental adaptations
  - Hip protectors
  - Resident choice
- Falls – 0.55 (0.41 – 0.75)
- Fallers & frequent fallers reduced
- Time to first fall increased
- Effective in those with dementia

C Becker et al J American Geriatrics Society 2003;**51**(3):306–13.

Care facilities: Exercise vs usual care, Rate of falls.



Care facilities: Vitamin D supplementation vs no vitamin D supplementation,



1 Additional Vitamin D supplementation					
Bischoff 2003 (1)	62	60	-0.67 (0.41)	9.5 %	0.51 [0.23, 1.14]
Broe 2007 (2)	23	25	-1.27 (0.51)	6.5 %	0.28 [0.10, 0.76]
Flicker 2005 (3)	313	312	-0.31 (0.13)	35.3 %	0.73 [0.57, 0.95]
Law 2006 (4)	1762	1955	-0.14 (0.04)	48.7 %	0.87 [0.80, 0.94]
Subtotal (95% CI)	**2160**	**2352**		**100.0 %**	**0.72 [0.55, 0.95]**
Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 7.85$, df = 3 (P = 0.05); I^2 =62%					
Test for overall effect: Z = 2.32 (P = 0.020)					
2 Multivitamins (including vitamin D3 + calcium) vs placebo					
Grieger 2009	48	43	-0.97 (0.32)	100.0 %	0.38 [0.20, 0.71]
Subtotal (95% CI)	**48**	**43**		**100.0 %**	**0.38 [0.20, 0.71]**
Heterogeneity: not applicable					
Test for overall effect: Z = 3.03 (P = 0.0024)					
3 Education on Vitamin D + calcium + osteoporosis medications vs usual c					
Kennedy 2015	1290	2727	0.03 (0.1)	100.0 %	1.03 [0.85, 1.25]
Subtotal (95% CI)	**1290**	**2727**		**100.0 %**	**1.03 [0.85, 1.25]**
Heterogeneity: not applicable					
Test for overall effect: Z = 0.30 (P = 0.76)					
Test for subgroup differences: Chi^2 = 11.35, df = 2					

Care facilities

- Vit D reduces falls, not fallers
- Exercise alone, inconsistent, low quality
- Risk assessment, ineffective alone
- Dementia care mapping, inconsistent
- Medication review, inconsistent
- Multifactorial strategies more effective in low level care, less effective in high level care.

Hewitt, JAMDA 2018

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- 16 care homes, mixed type
- **1481** total, Excl 15/30 on MMSE (296), palliative, unable (265), 679 refused, Enrolled **225** (25%) eligible; 10-15% drop out
- Attendance >60% of Sunbeam classes 1 hr 2x wk, 40% maintenance ½ hour 2x wk
- Physical function (SPPB) improved
- Fallers and falls reduced IRR 0.45 (0.17,0.74),
- Injury reduced 45% - sig not reported

HUR training apparatus

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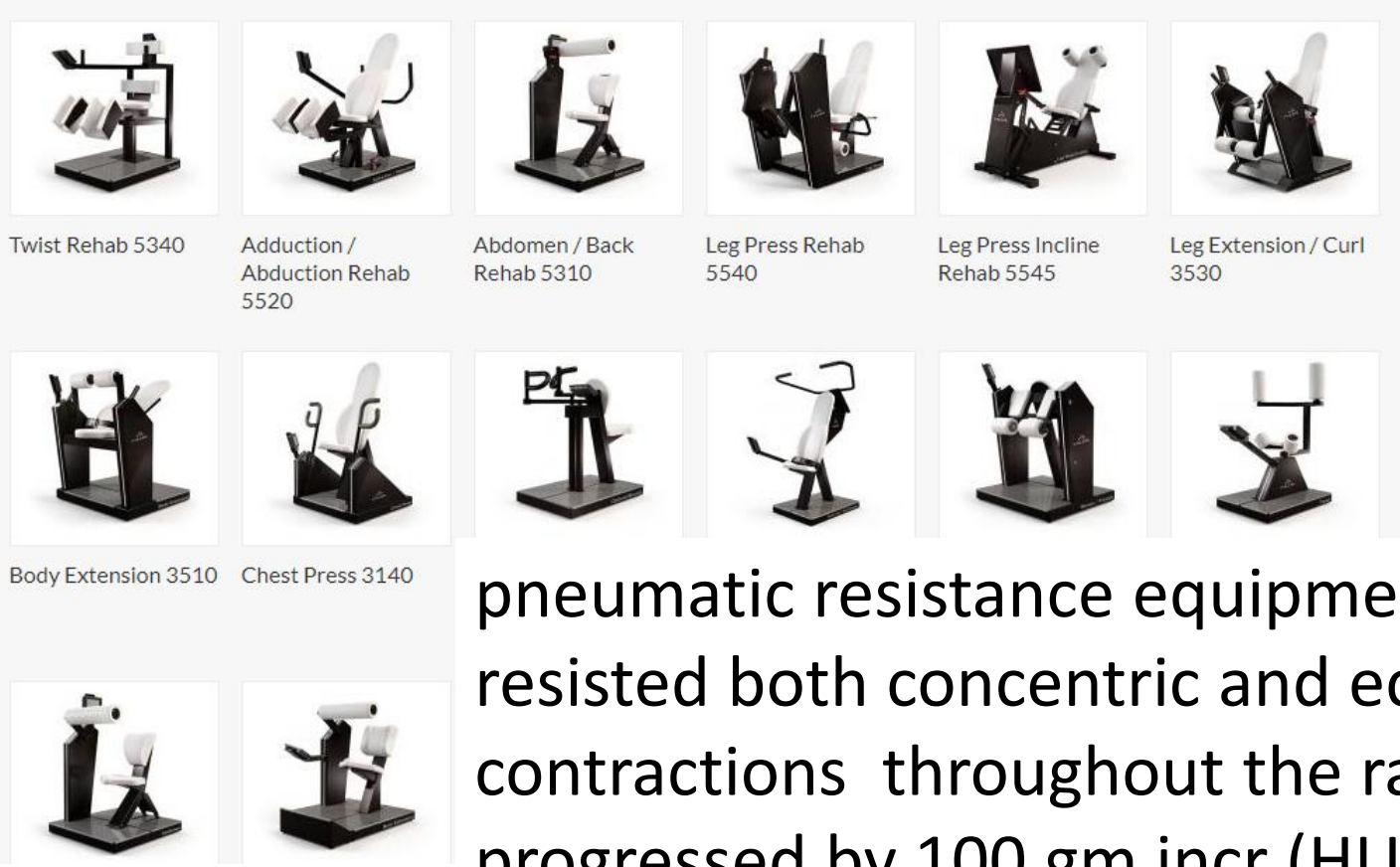
TH SCIENCES



10 reps x 3
1 hr 2x wk

Physio led
1 physio:5 res

6 m machines
6 m maintence

pneumatic resistance equipment that resisted both concentric and eccentric contractions throughout the range; progressed by 100 gm incr (HUR Health and Fitness Equipment). Run in a circuit with interspersed complex static and dynamic balance exercises, progressive.

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Falls and Fracture Prevention Health System Change at Scale

Ken Stewart

April 2019

ACC
PREVENTION. CARE. RECOVERY.
Te Kaporeihana Āwhina Hunga Whara

MINISTRY OF HEALTH
MANATU HAUORA

HEALTH QUALITY & SAFETY COMMISSION NEW ZEALAND
Kupu Taurangi Hauora o Aotearoa

Canterbury
District Health Board
Te Poari Hauora ō Waitaha

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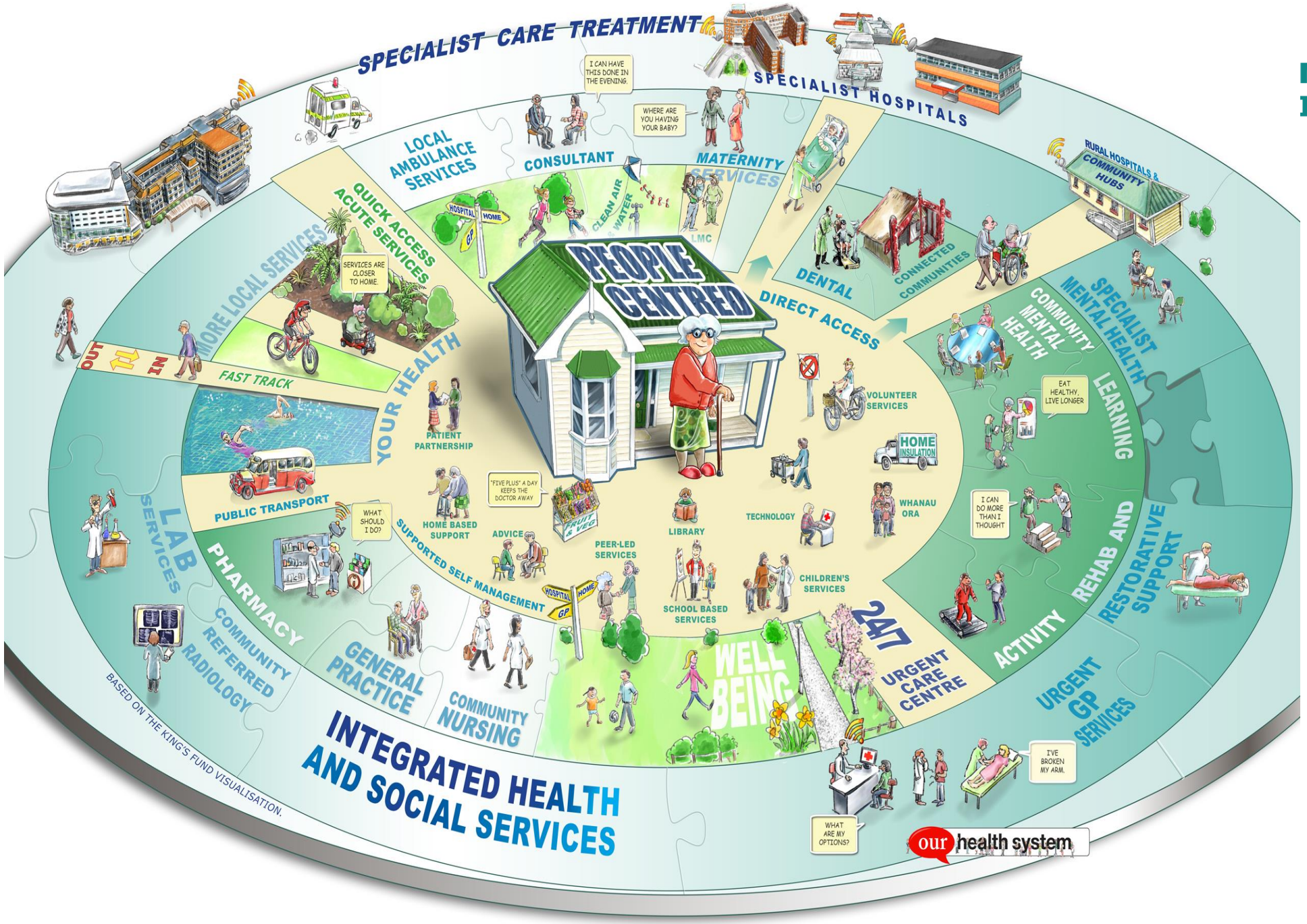
SPECIALIST CARE TREATMENT
SPECIALIST HOSPITALS
I CAN HAVE THIS DONE IN THE EVENING.
WHERE ARE YOU HAVING YOUR BABY?
LOCAL AMBULANCE SERVICES
CONSULTANT
MATERNITY SERVICES
LMC
RURAL HOSPITALS & COMMUNITY HUBS
QUICK ACCESS ACUTE SERVICES
SERVICES ARE CLOSER TO HOME.
HOSPITAL
HOME
GP
CLEAN AIR & WATER
DENTAL
CONNECTED COMMUNITIES
MORE LOCAL SERVICES
OUT
IN
FAST TRACK
PEOPLE CENTRED
DIRECT ACCESS
SPECIALIST MENTAL HEALTH
COMMUNITY MENTAL HEALTH
YOUR HEALTH
PATIENT PARTNERSHIP
VOLUNTEER SERVICES
EAT HEALTHY, LIVE LONGER
LEARNING
HOME INSULATION
PUBLIC TRANSPORT
"FIVE PLUS" A DAY KEEPS THE DOCTOR AWAY
FRUIT & VEG
WHANAU ORA
I CAN DO MORE THAN I THOUGHT
REHAB AND RESTORATIVE SUPPORT
HOME BASED SUPPORT
ADVICE
LIBRARY
TECHNOLOGY
WHAT SHOULD I DO?
LAB SERVICES
PEER-LED SERVICES
SUPPORTED SELF MANAGEMENT
CHILDREN'S SERVICES
SCHOOL BASED SERVICES
PHARMACY
COMMUNITY REFERRED RADIOLOGY
GENERAL PRACTICE
COMMUNITY NURSING
WELL BEING
24/7 URGENT CARE CENTRE
ACTIVITY
URGENT GP SERVICES
I'VE BROKEN MY ARM.
WHAT ARE MY OPTIONS?
INTEGRATED HEALTH AND SOCIAL SERVICES
BASED ON THE KING'S FUND VISUALISATION.
our health system

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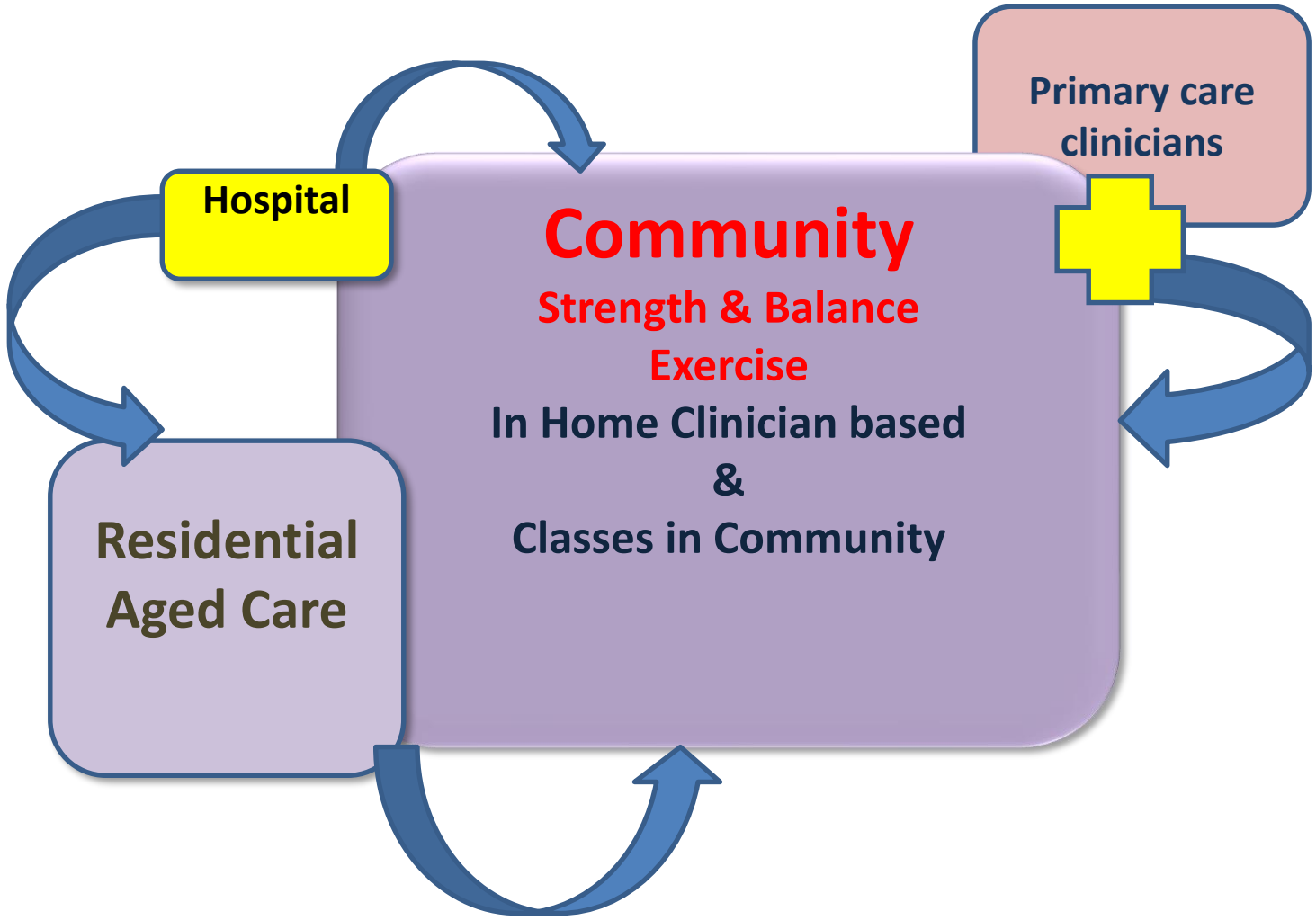
Primary Care Falls & Fracture prevention

What is **Best Practice**?


Primary care clinicians
Hospital
Community
Strength & Balance
Exercise
In Home Clinician based
&
Classes in Community
Residential Aged Care

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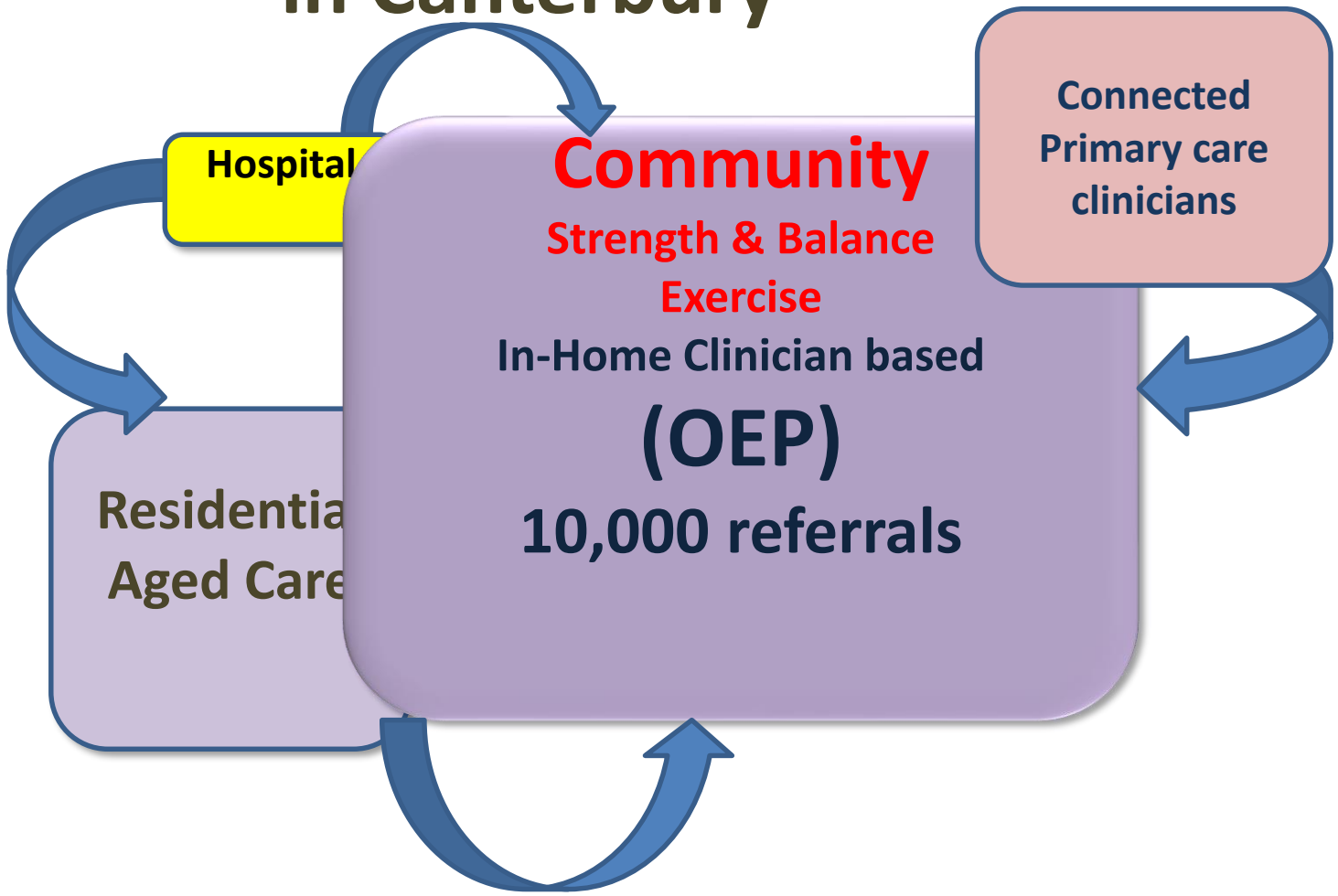
Exercise for Falls & Fracture Prevention in Canterbury



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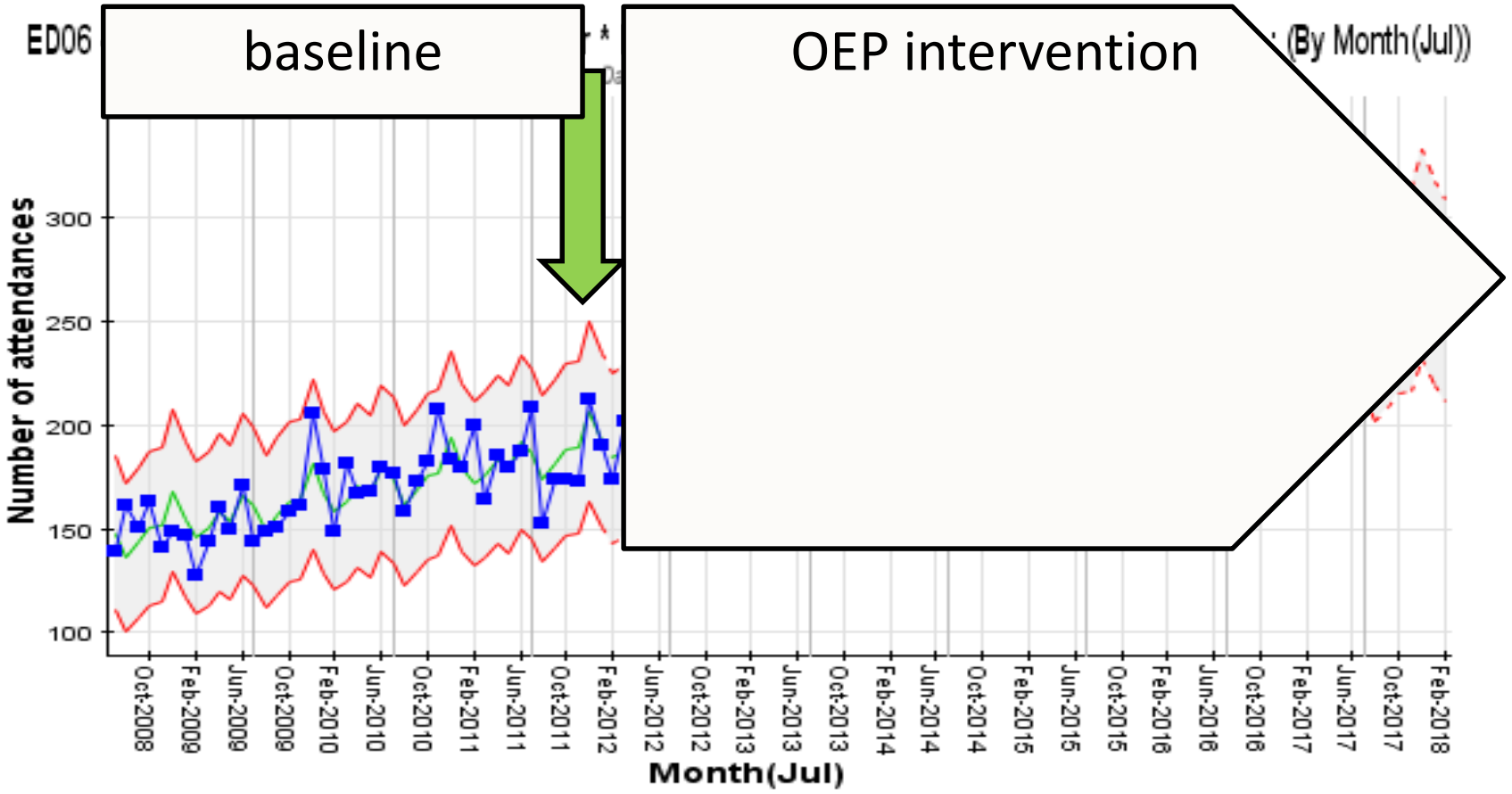
Number of fall injuries >75 years old presenting to Canterbury Emergency Department 2008-2017



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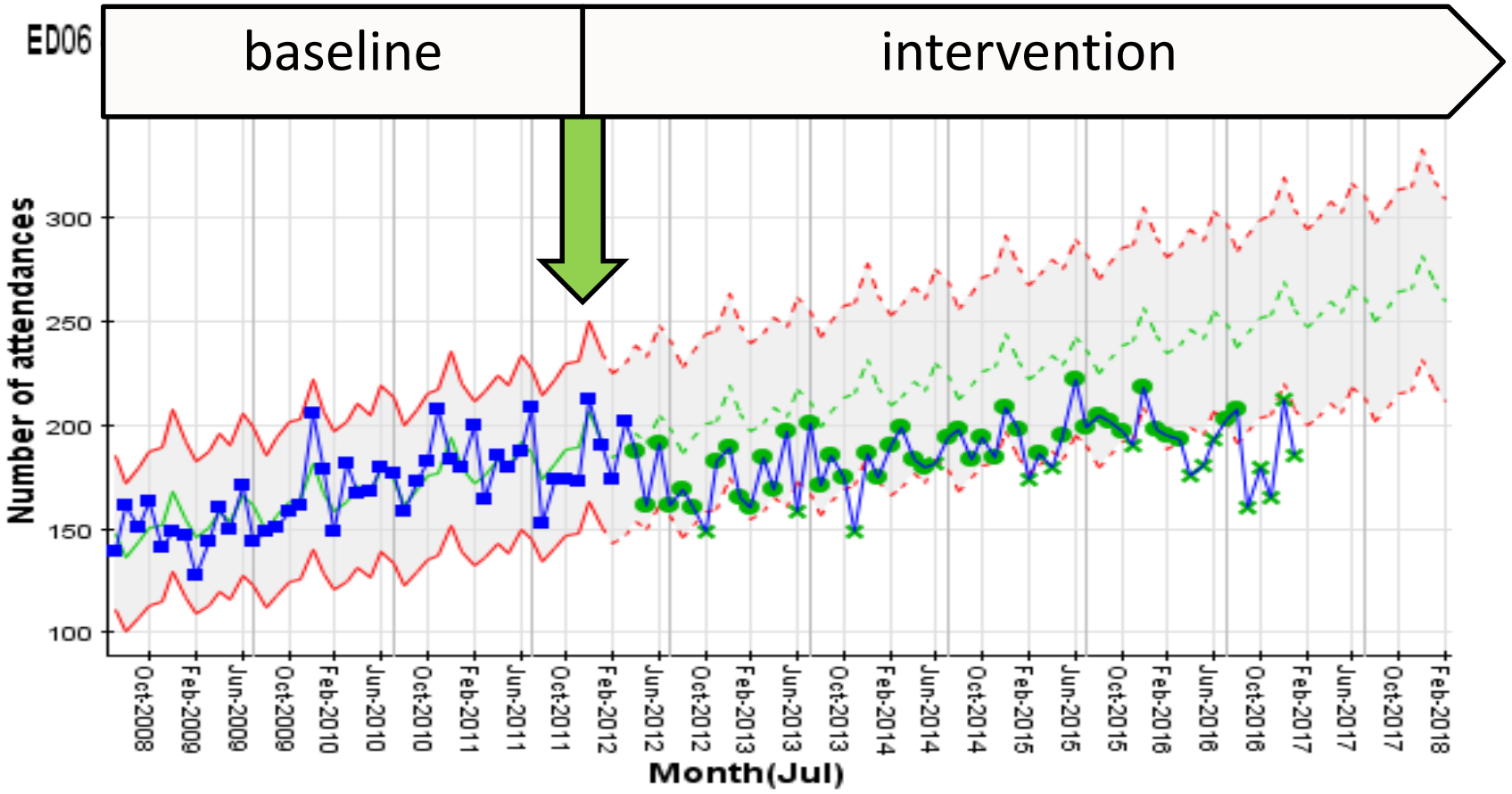

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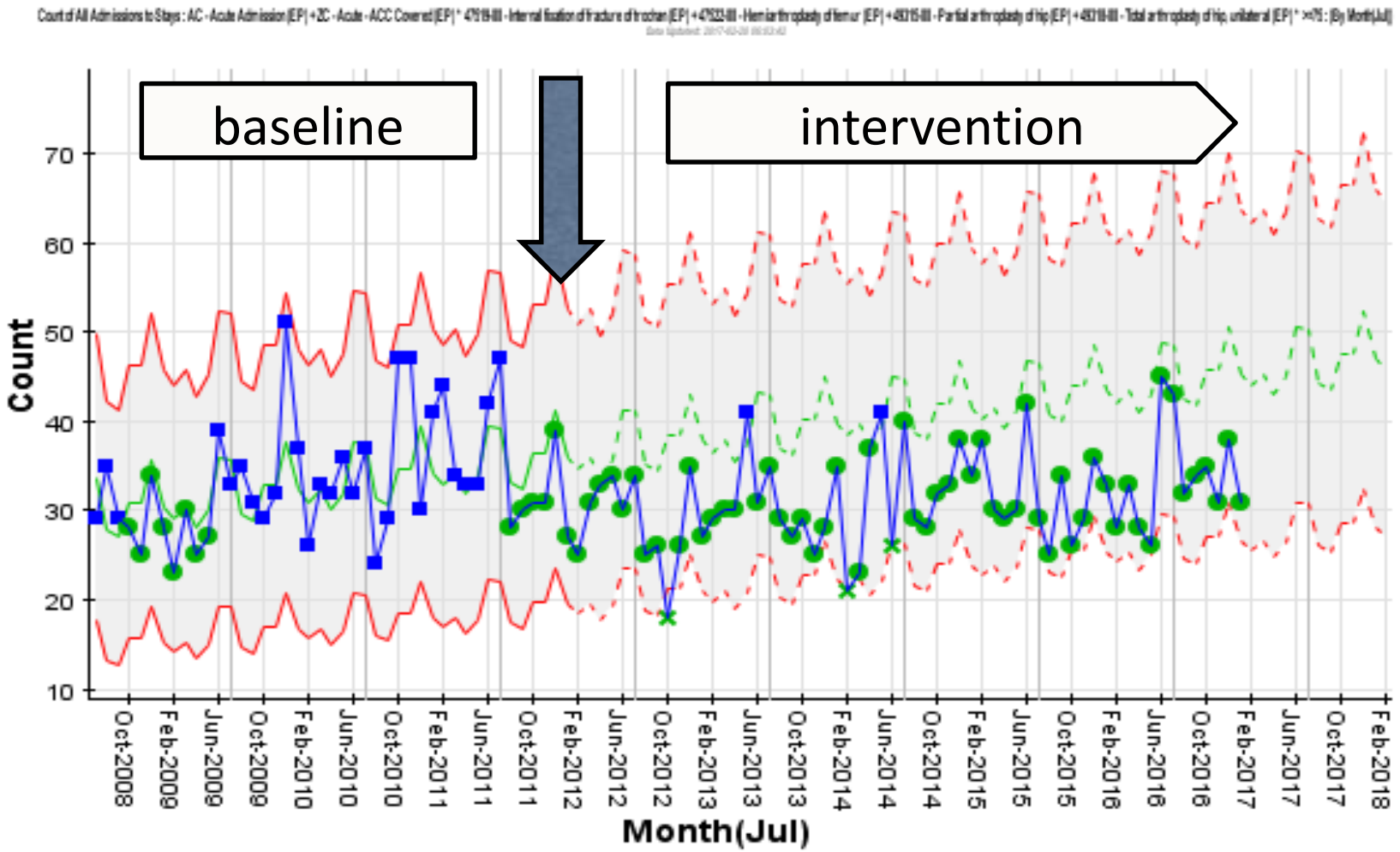
Canterbury Hospital admissions for a fractured hip >75 years old (serious harm fall) 2008-2017



Evidence into Practice
Health System Change at Scale

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Effective population approaches need to target those at risk…& at scale to achieve outcomes

People accessing effective services by year three
(~2020/21)

- **In home**: 15,000 per year
- **Community classes**: 100,000 places per year
- **Fracture Liaison Services**: 16,000 people on bisphosphonates per year

LIVE STRONGER FOR LONGER
PREVENT FALLS & FRACTURES

Full National Service Coverage

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Since LS4L alliance:
51,000 people in S&B classes
12,000 people receive in-home S&B
17,000 access fracture liaison service.

FLS, In-Home Strength and Balance

Community Group Strength and Balance

LIVE STRONGER FOR LONGER
PREVENT FALLS & FRACTURES

Beryl – 82 years, lives with husband

- Repeated falls with injury to head, elbow, shoulder
- Parkinson's disease, topples, freezes, festinates
- Carbidopa Levodopa 25/250 ½ 6 hrly

Beryl – 82 years, lives with husband

- Repeated falls with Parkinson's disease
- Help!
- Not ill, no MI, no infection
- Dosage adjustment, may be to 2 hourly
- Physiotherapy

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Conclusions

- Make sure about medical events
- Assume poisoning
- Context important to effectiveness.
- Targeting of populations
- Care with ensuring strategies work
- Attention to implementation
- People with dementia need more attention
- Refer for exercise classes, home safety

8TH BIENNIAL
Australian and New Zealand
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