

Ageing and HIV

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What is a Geriatrician doing???



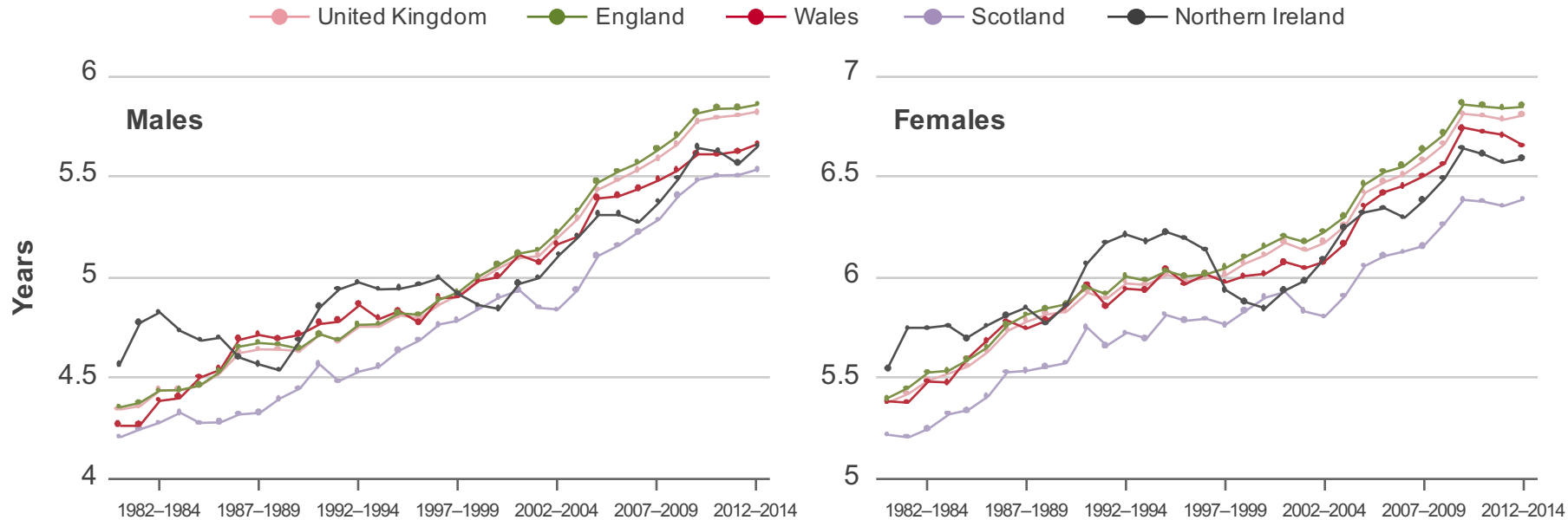
Ageing well with HIV



Life expectancy at age 65 – United Kingdom and constituent countries

	1980–1982		1997–1999		2012–2014	
	Males	Females	Males	Females	Males	Females
United Kingdom	13.0	16.9	15.2	18.5	18.4	20.9
England	13.1	17.0	15.3	18.6	18.6	21.1
Wales	12.5	16.6	14.9	18.2	18.0	20.5
Scotland	12.3	16.0	14.2	17.5	17.3	19.6
Northern Ireland	12.5	16.3	14.9	18.3	18.1	20.5

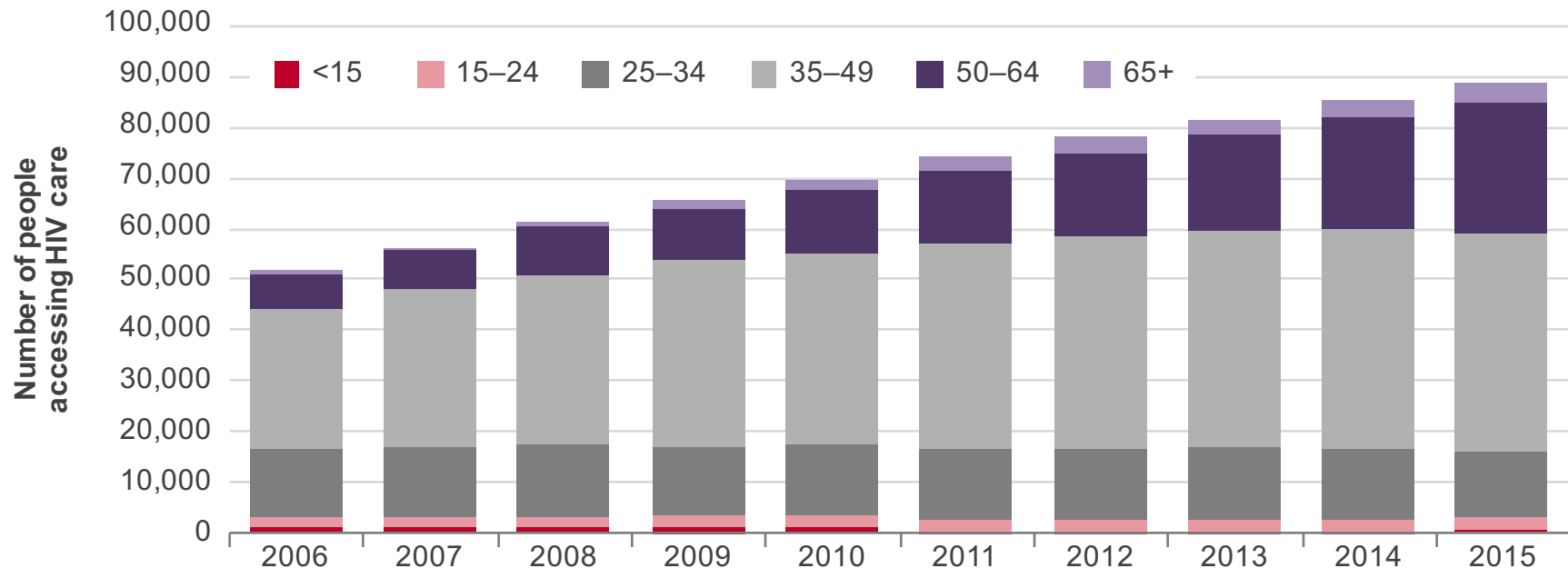
Life expectancy at age 85 – United Kingdom and constituent countries



Office for National Statistics. Life Expectancy at Birth and at Age 65 by Local Areas in England and Wales: 2012 to 2014. Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/bulletins/lifeexpectancyatbirthanddataage65bylocalareasinenglandandwales/2015-11-04>.

Demographics

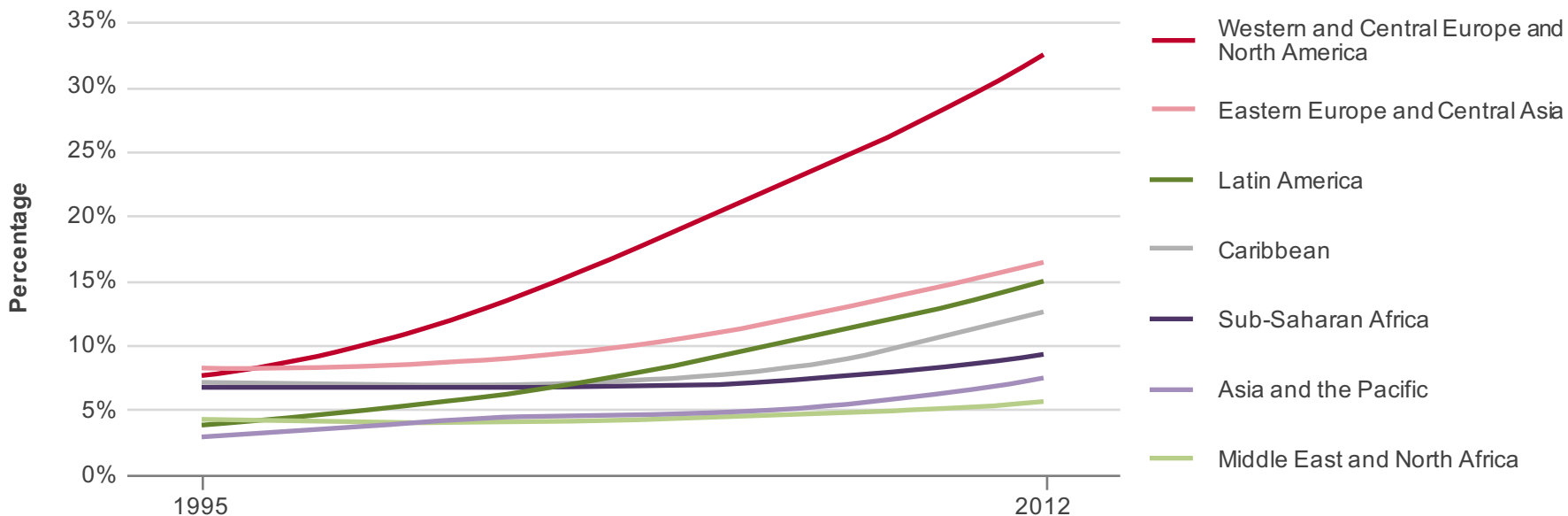
People diagnosed with HIV accessing HIV specialist care, by group: UK, 2006–2015



Public Health England. HIV in the UK – 2016 Report. Available from: <https://www.gov.uk/government/publications/hiv-in-the-united-kingdom>.

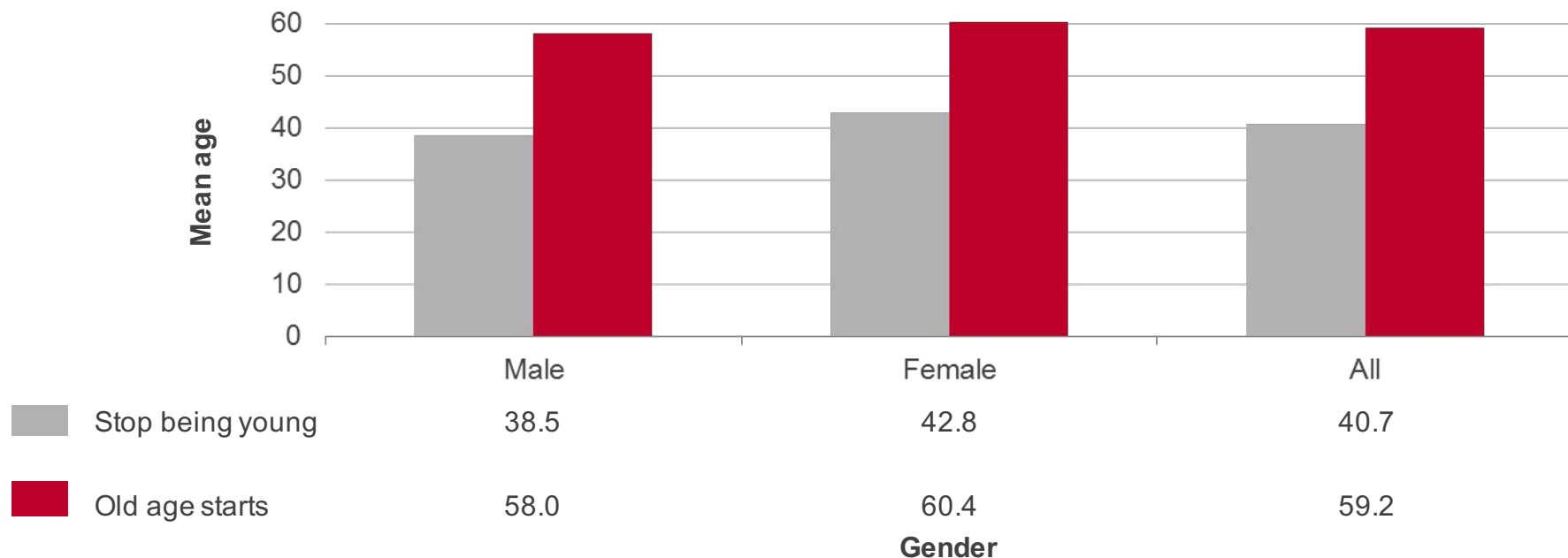
Global demographics

People aged 50 years or older, as a percentage of all adults 15 years or older living with HIV, by region, 1995–2012



What is old?

Mean age at which people are perceived to stop being young, and at which old age is perceived to start, by gender



Sweiry D and Willits M. Department for Work and Pensions, In-House Research. Attitudes to age in Britain 2010/11. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/214361/ihr7.pdf

Definitions

- There is no UN standard numerical criterion, but the UN agreed 60+ to refer to the older population¹
- Developing countries use the point at which active contribution is no longer possible²
- In reality: Combination. Chronological, social (i.e. change in work patterns), change in capabilities (i.e. invalid status)²

UN, United Nations

1. UN World Population Ageing 2015 Report. Available at: http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf [Accessed September 2017].

2. Goman M. Development and the Rights of Older People 1999. HAI (ed.) The Ageing and Development Report: Poverty Independence and the World's Older People, Earthscan, London, pp3–21.

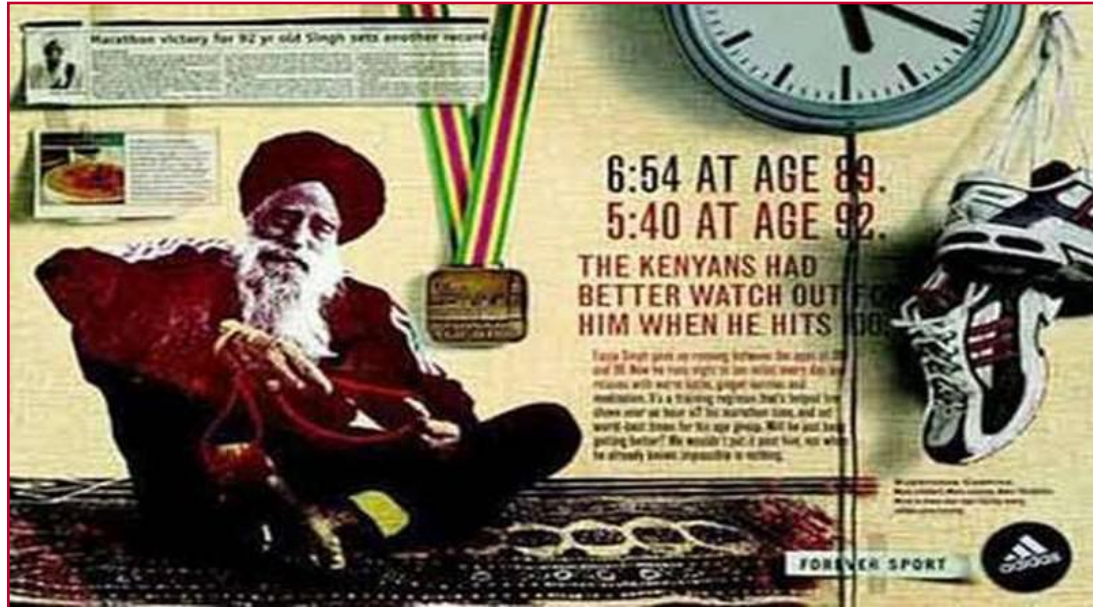
Normal ageing

Ageing is characterised by many combined changes^{1–3}

- Gradual reduction in height
- Weight loss due to loss of muscle and bone mass
- A lower metabolic rate
- Longer reaction times
- Declines in certain memory functions
- Declines in sexual activity
- A functional decline in hearing, olfaction, and vision
- Declines in kidney, pulmonary, and immune functions
- Declines in exercise performance
- Changes in endocrine axis

1. Craik FIM and Salthouse TA. (eds). 1992. Handbook of Aging and Cognition, Erlbaum, Hillsdale, NJ; 2. Spence AP. 1995. Biology of Human Aging; 3. Hayflick LJ. Gerontol A Biol Sci Med Sci 2004;59(6):B573–8.

Fauja Singh



Both 78 years!



Ageing successfully?? Frail??



Is age helpful in best care of older patients?

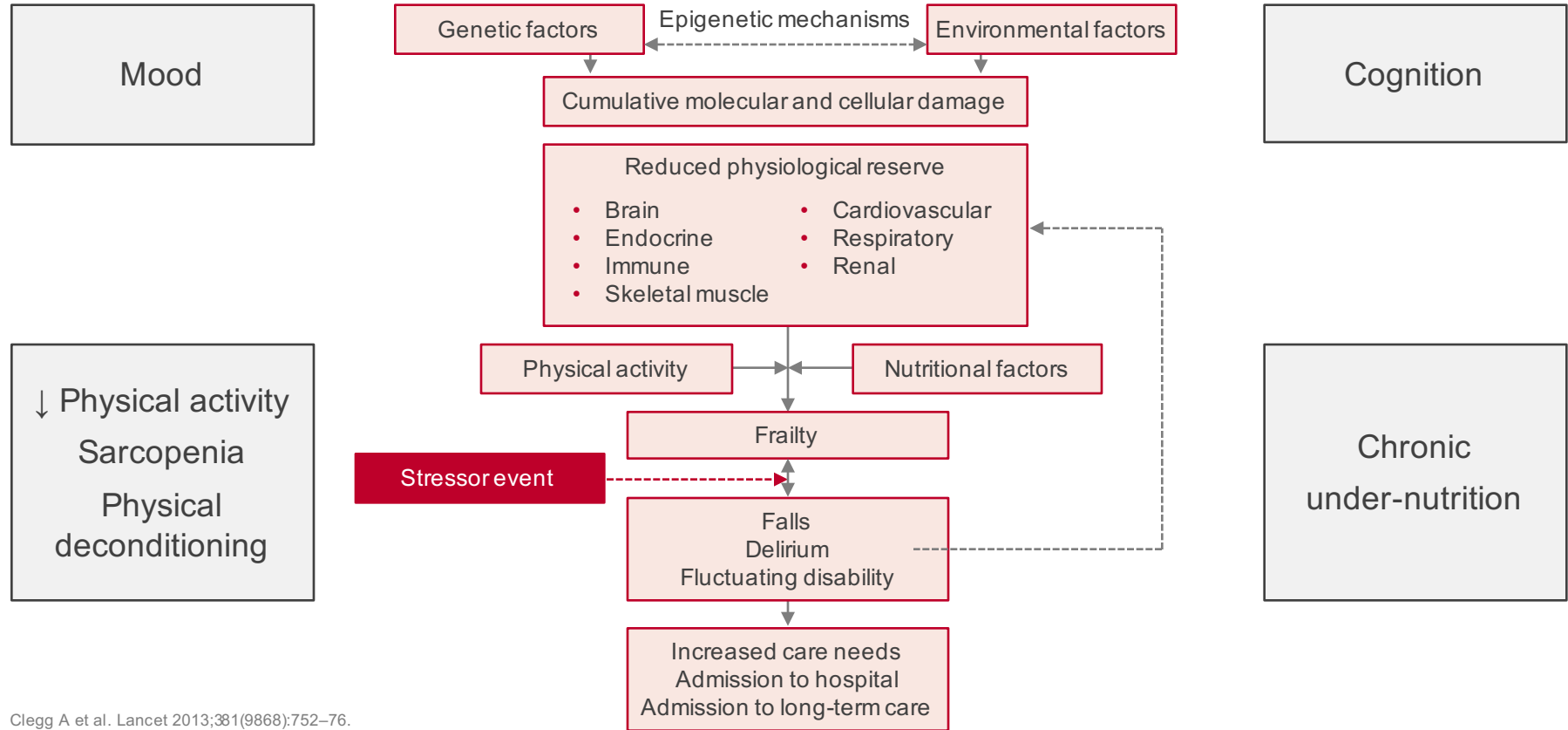
Frailty

What is frailty?

- Age-related decline in multiple physiological systems
- Threshold of homeostatic reserve reached, resulting in:
 - An ‘at risk’ state
 - Vulnerability to minor stressor events
- **Disproportionate changes** in health status:
 - From mobile to immobile
 - From lucid to confused
 - From independent (‘managing’) to requiring help
- An increased risk of adverse events

Underpins the ‘non-specific nature’ of some medical presentations in older adults

Schematic representation of the pathophysiology of frailty



Clegg A et al. Lancet 2013;381(9868):752–76.

Common presentations of frailty

- Fatigue, unintentional weight loss, frequent infections¹
- Falls (a non-faller may fall due to a minor stress event)¹
- Over time failure of postural and gait systems (vision, balance, muscle strength)²
- Unable to guarantee safe navigation of undemanding environments – spontaneous, recurrent falls may occur²
- Delirium: Present in 15–30% elderly patients on admission to hospital³
- Fluctuating disability ('good' and 'bad' days)¹

1. Chen X, Mao G and Leng SX. Clin Interv Aging 2014;9:433–41; 2. Eeles E and Low Choy N. Frailty and Mobility, in Theou O, Rockwood K (eds). Frailty in Aging. Biological, Clinical and Social Implications. Interdiscipl Top Gerontol Geriatr. Basel, Karger, 2015, vol 41, pp 107–20; 3. Inouye SK. Clin Geriatr Med 1998;14(4):745–64.

How do we define it?

- This is difficult
- No consensus definition exists
- Two major schools of thought:
 - The Frailty Phenotype – a frailty syndrome¹
 - The Frailty Index – a frailty state²



Images found in the public domain, no copyright

1. Fried LP et al. J Gerontol A Biol Sci Med Sci 2001;56(3):M146–56; 2. Rockwood K and Mitnitski A, Clin Geriatr Med 2011;27(1):17–26.

The Frailty Phenotype

Shrinkage	<i>Weight loss, unintentional, ≥ 10 pounds in one year, or at follow up of $\geq 5\%$ body weight in the prior year</i>
Weakness	<i>Grip strength in lowest 20% at baseline, adjusted for gender and BMI</i>
Poor endurance and energy	<i>Self report of exhaustion, identified from two questions on the CES-D</i>
Slowness	<i>Slowest 20% of population based on time to walk 15 feet, adjusted for gender and standing height</i>
Low physical activity	<i>A weighted score of kilocalories expended per week, with low activity if in lowest quintile for gender</i>

Scored as:

- 0 items = Robust
- 1–2 items = Pre-fail
- 3 or more = Frail

Criticism:

- Very physically focused
- Does not take in to account individual comorbidities
- Does not include cognition or mood
- Not easy to use clinically

Frailty Index

An alternative frailty model, which utilises a multi-dimensional approach where deficits accumulate across a range of functional, physical and cognitive domains (Rockwood and Mitnitski, 2011) as part of the Canadian Study of Health and Aging. Based on Comprehensive Geriatric Assessment (CGA)

- Deficit accumulation
 - Deficits = symptoms, signs, disease states, specific functional deficits
 - Markers of the decline in physiological reserve
 - The more you have the more likely you are to be frail
 - So if 10/40 deficits present, their FI = 0.25
 - Adverse outcomes proportional to deficits - more you have, worse you do
 - Cut off between fitness and frailty around 0.25
 - Upper FI threshold around 0.67, where any more leads to death










FI, frailty index

Rockwood K and Mitnitski A, Clin Geriatr Med 2011;27(1):17–26.

Frailty Index

- This is a favourable model:
 - Appears to fit with theory of declining physiological reserve
 - Idea of gradation of frailty rather than present or absent
 - Clear association with increasing frailty index and worse outcomes
 - Better predictor than actual age
- Drawbacks:
 - A large number of items needed – at least 30, so? easy to apply
 - Cut-offs may vary, at what point should we intervene?

Clinical Frailty Scale

	1	Very fit	People who are robust, active, energetic and motivated. These people commonly exercise regularly. They are among the fittest for their age
	2	Well	People who have no active disease symptoms but are less fit than category 1. Often, they exercise or are very active occasionally , e.g. seasonally
	3	Managing well	People whose medical problems are well controlled , but are not regularly active beyond routine walking
	4	Vulnerable	While not dependent on others for daily help, often symptoms limit activities . A common complaint is being “slowed up”, and/or being tired during the day
	5	Mildly frail	These people often have more evident slowing , and need help in high order IADLs (finances, transportation, heavy housework, medications). Typically, mild frailty progressively impairs shopping and walking outside alone, meal preparation and housework
	6	Moderately frail	People need help with all outside activities and with keeping house . Inside, they often have problems with stairs and need help with bathing and might need minimal assistance (cuing, standby) with dressing
	7	Severely frail	Completely dependent for personal care , from whatever cause (physical or cognitive). Even so, they seem stable and not at high risk of dying (within ~6 months)
	8	Very severely frail	Completely dependent, approaching the end of life. Typically, they could not recover even from a minor illness
	9	Terminally ill	Approaching the end of life. This category applies to people with a life expectancy <6 months , who are not otherwise evidently frail

	Description and classification	Outcomes (hazard ratio and 95% confidence interval for death and institutionalisation respectively)	Pros	Cons
Fred's Frailty Phenotype	<p>Frail = ≥ 3 characteristics</p> <p>Pre-frail = ≥ 2 characteristics</p> <p>Robust = none</p>	<p>1.17 (1.13–1.20)</p> <p>1.27 (1.19–1.35)</p>	<p>Four of the five items are objective (performance can be measured).</p> <p>Extensively validated to predict health outcomes.</p> <p>Correlation with physiologic markers of poor health outcomes including haemoglobin and pro-inflammatory markers.</p>	<p>Misclassification.</p> <p>Lack of consensus regarding nature and number of items.</p> <p>Does not stage degrees of frailty.</p>
Clinical Frailty Scale	<p>Classification on ordinal scale according to global clinical assessment</p>	<p>1.30 (1.27–1.33)</p> <p>1.46 (1.39–1.53)</p>	<p>Clinically feasible.</p>	<p>Requires additional data on feasibility and validity in clinical settings</p>
Frailty Index	<p>Number of health deficits present/number of possible health deficits</p>	<p>1.26 (1.24–1.29)</p> <p>1.56 (1.48–1.65)</p>	<p>Precise measurement.</p> <p>Reproducible across populations and disease states.</p>	<p>Cumbersome to use in clinical settings.</p>

Moorhouse P and Rockwood K. J R Coll Physicians Edinb 2012;42:333–40.

Other frailty rating scales

There are many!

- Edmonton Frail Scale¹
- FRAIL score²
- SHARE frailty index³
- Groningen Frailty Indicator⁴
- Tilburg Frailty Indicator⁵
- Study of Osteoporotic fractures⁶
- CGA based FI⁷
- Prisma 7⁸
- Clegg et al – electronic frailty index⁹

But:

- What should they include?
- Different for different specialities/interventions?
- Should social factors be included?
- What about cognition and mood?
- Should we use physical, self reported, objective, laboratory results, biomarkers (IL6, CRP)?
- Is the scale clinically applicable?

1. Rolfson DB. Age Ageing 2006;35(5):p526–9; 2. Morley JE et al. J Nutr Health Aging 2012;16(7):601–8; 3. Romero-Ortuno R and Soraghan C. BMJ Open 2014;4:e006645; 4. Steverink N et al. Gerontologist 2001;41:e236–7; 5. Gobbens RJ et al. Gerontologist 2012;52(5):619–31; 6. Li G et al. BMC Musculoskelet Disord 2017;18(1):46; 7. Rockwood K and Mitnitski A. Clin Geriatr Med 2011;27(1):17–26; 8. Raïche M, Hébert R, and Dubois MF. Arch Gerontol Geriatr 2008;47(1):9–18; 9. Clegg A et al. Age Ageing 2016;45(3):353–60.

Frailty in HIV

- There is a literature base around this now:
 - Mostly cross-sectional work
 - Embedded within some key longitudinal studies (MACS¹/VACS²/WIHS³)
 - European data: AgeHIV⁴ and POPPY⁵ (+ our study: FOAL⁶)
- Heterogeneity across the studies:
 - Populations
 - Younger cohorts (median age 39–57^{1–5}, 59.6 in ours⁶)
 - Frailty measures – most popular: Fried Frailty Phenotype
- Prevalence:
 - Min 3.9% to max 28.6%
 - To compare in HIV-ve: 9.9% in >65s and 4.1% in 50–64 (SHARE-FI)⁷

1. Korada SKC et al. Atherosclerosis 2017; pii: S0021-9150(17)31248-0; 2. Justice AC et al. Med Care 2006;44(8) Suppl 2:S13–24; 3. Terzian AS et al. J Womens Health (Larchmt) 2009;18(12):1965–74; 4. Schouten J et al. Clin Infect Dis 2014;59(12):1787–97; 5. Underwood J et al. HIV Med 2017;18(5):363–9; 6. Author's data on file – FOAL study; 7. Romero-Ortuno R et al. BMC Geriatrics 2010;10:57.

Why is frailty important?...

Because frailty causes problems (which are costly)

	Year	Country	Participants (n)	Length of follow-up (years)	Falls (HR/OR [95% CI])		Worsening disability (HR/OR [95% CI])		Hospitalisation (HR/OR [95% CI])		Care home admission (HR/OR [95% CI])		Mortality (HR/OR [95% CI])	
					Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty	Inter-mediate frailty	Severe frailty
Cardiovascular Health Study (CHS)	2001	USA	5317	7	1.12 (1.00–1.26)	1.23 (1.50–2.21)	1.55 (1.38–1.75)	1.79 (1.47–2.17)	1.11 (1.03–1.19)	1.27 (1.11–1.46)	NA	NA	1.32 (1.13–1.55)	1.63 (1.27–2.08)
Canadian Study of Health and Aging (CSHA)	2004	Canada	9008	5	NA	NA	NA	NA	NA	NA	2.54 (1.67–3.86)	2.60 (1.36–4.96)	2.54 (1.92–3.37)	3.69† (2.26–6.02)
Women's Health and Aging Study (WHAS)	2006	USA	1438	3	0.92 (0.63–1.64)	1.18 (0.63–2.19)	NA	NA	0.99 (0.67–1.47)	0.67 (0.33–1.35)	5.16 (0.81–32.79)	23.98 (4.45–129.2)	3.50 (1.91–6.39)	6.03 (3.00–12.08)
Study of Osteoporotic Fractures (SOF)	2008	USA	6701	4.5	1.23 (1.02–1.48)	2.44 (1.95–3.04)	1.89 (1.66–2.14)	2.79 (2.31–3.37)	NA	NA	NA	NA	1.54 (1.40–1.69)	2.75 (2.46–3.07)

HR, hazard ratio; NA, not available; OR, odds ratio

Clegg A et al. Lancet 2013;381:752–62

Is frailty permanent?...

- Not necessarily!
- Frailty does appear to be a dynamic process¹
- But... trajectory is mainly toward more frail states¹
- Based on FFP (Fried Frailty Phenotype)²:
 - If pre-frail:
 - Those scoring 1 – more likely to become non-frail
 - Those scoring 2 – more likely to progress to frail
 - If frail:
 - Those scoring 3 – best chance of becoming pre-frail
 - Those scoring 4 or 5 – more likely to progress to death
- Very rare to revert from frail to non-frail (0–0.9% chance)¹
- In most people, frailty is progressive

1. Gill TM et al. Archives of Internal Medicine 2006;166(4):418–23; 2. Fried LP et al. J Gerontol A Biol Sci Med Sci 2001;56:M146–56.

What can we do about it?

- **Fried¹:** Yes
 - Improve physical function
 - Improve nutrition
 - Improve psychological status
- **Rockwood²:** Yes
 - Ameliorate physical deficits
 - Improve physiological reserve
 - Treat medical conditions

1. Fried LP et al. J Gerontol A Biol Sci Med Sci 2001;56:M146–56; 2. Rockwood K and Mitnitski A. Clin Geriatr Med 2011;27:17–26.

Risk factors: Potential targets for intervention

- Alcohol misuse
- Cognitive impairment
- Falls
- Functional impairment
- Hearing problems
- Mood disorder
- Poor nutritional status
- Physical inactivity
- Obesity avoidance
- Polypharmacy
- Smoking
- Social isolation
- Loneliness
- Poor vision
- Incontinence

When to assess frailty

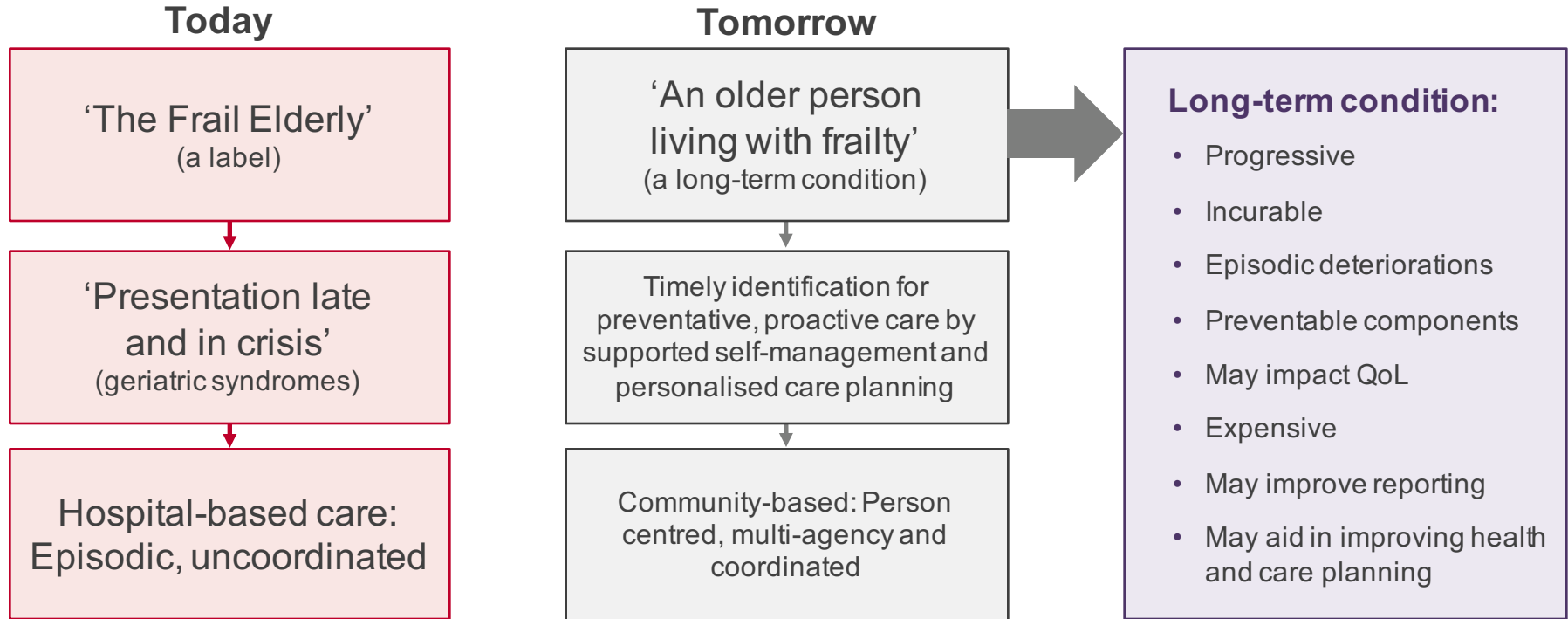
Any interaction with an older person and health or social care:

- Routine outpatients in ALL departments
- Social services assessments
- Review by community care teams
- Primary care review
- Home carers
- Ambulance crews



Why? Presence of frailty may alter risk/benefit of intervention

Different Model of Care



QoL. quality of life

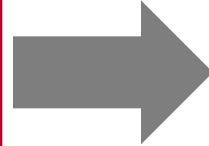
Youngm J. A primary-care based model for frailty, presented to the King's Fund, Innovations in the delivery of care for older people, 18th June, 2014.



- BGS best practice guidance for frailty
- Aimed at outpatient and community settings
- Acknowledges that frailty:
 - Varies in severity
 - Is a dynamic process that may be made better or get worse
 - Is not an inevitable part of ageing

How to assess

- Prisma-7 screening Q
 - Can be self completed
 - Can use based on premorbid status is unwell
- Walking speed
 - Less than 0.8m/sec
 - >5 secs to walk 4m
- TGUG
 - Over 10 seconds



- Prisma-7 (≥ 3 = frail)
 1. Age >85
 2. Male sex
 3. Any health problems that require you to limit activities?
 4. Do you need help on a regular basis?
 5. Any health problems that require you to stay at home?
 6. In case of need can you count on someone close to you?
 7. Do you regularly use a mobility aid to get about?

Comprehensive Geriatric Assessment (CGA)

Full CGA likely to take 1.5–2.5 hours

Common problems:

Falls
Cognition
Continence
Mood
Mobility
Weight loss/nutrition
Polypharmacy
Physical inactivity
Alcohol excess
Smoking
Visual loss
Social isolation and loneliness
Physical exam – eyes, ears, neuro – VITAL

Recognition of frailty in an individual

- Either by encounter screening or
- by frailty presentation (or by systematic screening – not yet recommended)

Holistic medical review including

- Identification and optimisation of medical illnesses plus onward referral to other specialists
- Individualised goal setting
- Drug setting
- Anticipatory care planning (which may include escalation plans, emergency plans, end of life care (EOLC) plans)

Geriatrician

Therapist or other
community care
team member

Specialist nurse

Older people's
mental health team

Individualised care and support plan

With details of personal goals, optimisation plans, escalation and emergency plans as well as advance care plans for some

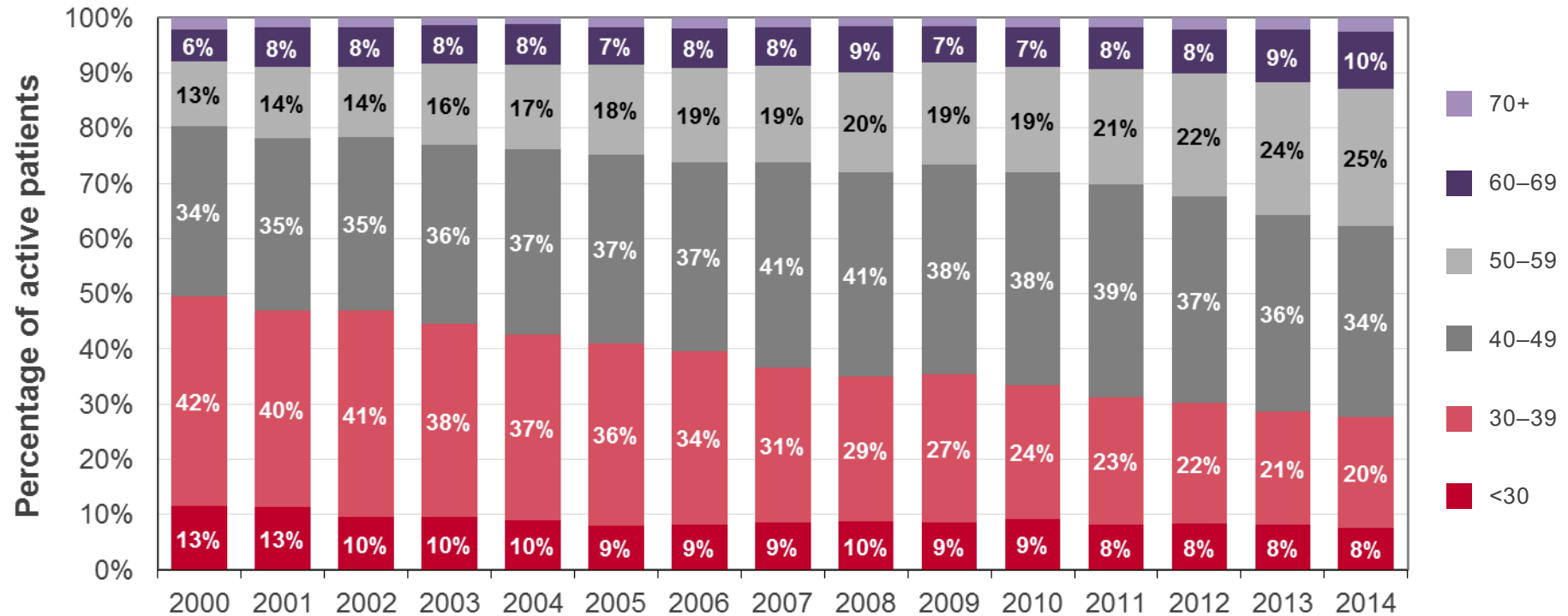
Holistic review likely to take 45–60 minutes

Capacity should be assessed

Care and support plan:

Named individuals
Health and social care summary
Optimisation and maintenance plan
Escalation plan
Urgent care plan
Advanced care plan

Age distribution of HIV patients in Brighton



BSUH Local Data. Unpublished.

Frailty prevalence and predictors in older adults with HIV

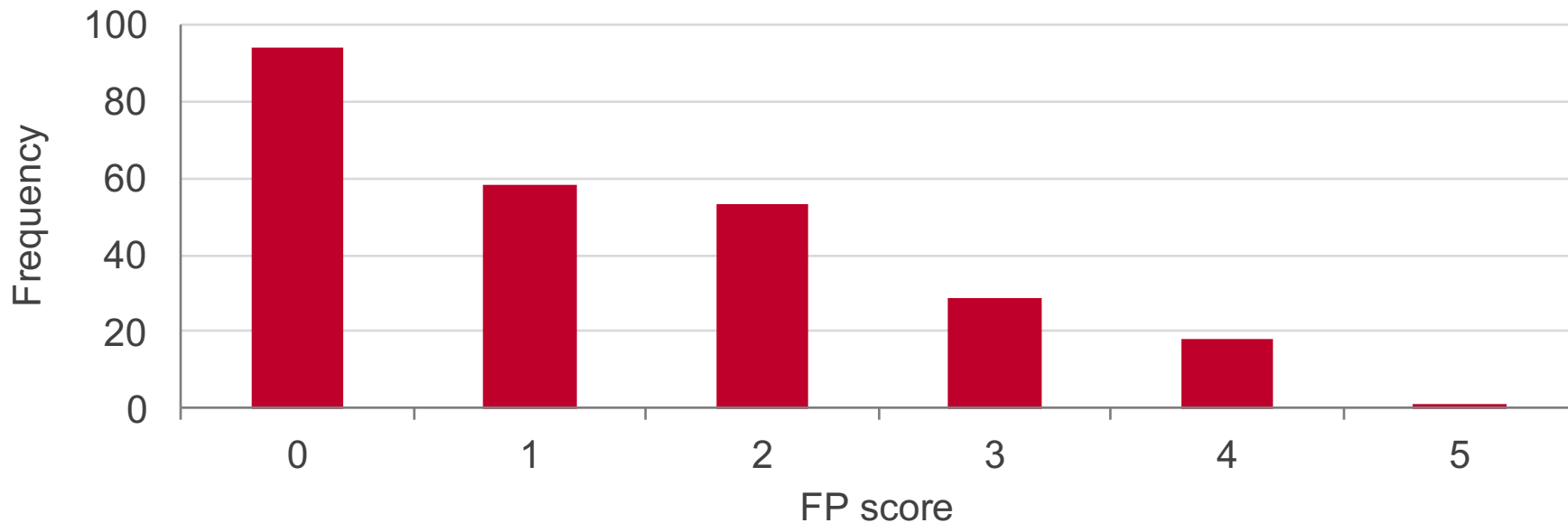
A prospective observational study recruited PLWHIV aged ≥ 50 from 5 HIV clinics across Sussex from October 2014–October 2015

- Frailty was defined by modified Fried Frailty Phenotype (FFP)
- Predictors of frailty were evaluated from collected demographic, clinical, HIV, psychosocial and functional parameters

Results

- 253 participants were recruited, of which 90.9% were male
- Median age was 59.6 (IQR 54.9–65.6)
- 48/253 met frailty criteria, giving a prevalence of 19% (95% CI 14.6–24.3)
- A further 111/253 (43.9%) were pre-frail
- 94/253 (37.1%) robust

How common was frailty?



FP, frailty phenotype

Levett T, Rusted J, and Wright J, Poster presented at the 22nd Annual Conference of the British HIV Association (BHIVA), Manchester, UK.

Associations with frailty (Frail and non-frail groups compared)

	Crude OR (95% CI)	aOR (95% CI)**	P-value**	Likelihood of frailty
Age by group (10yrs)	1.21 (0.77–1.90)	1.04 (0.63–1.71)	0.887	
Female	2.02 (0.78–5.24)	3.14 (1.09–9.05)	0.034	↑
Education (yrs)	0.87 (0.78–0.94)	0.88 (0.78–0.99)	0.040	↓
Financial insecurity	3.33 (1.39–7.98)	3.83 (1.37–10.70)	0.011	↑
CD4 <350	2.26 (0.95–5.37)	2.41 (0.96–6.04)	0.061	
HIV duration (yrs)	1.03 (0.99–1.07)	1.01 (0.96–1.05)	0.734	
Comorbidity count	1.63 (1.35–1.96)	1.67 (1.37–2.02)	<0.001	↑
Non-ARV drugs	1.39 (1.23–1.57)	1.26 (1.09–1.47)	<0.001	↑
Current smoking	2.00 (0.99–4.04)	2.10 (0.96–4.61)	0.063	
Depression	5.80 (2.30–14.63)	5.25 (1.87–14.77)	0.002	↑
Anxiety	4.63 (2.36–9.09)	4.80 (2.25–10.22)	<0.001	↑

**adjusted for age, gender, CD4 count, no. of comorbidities.

Levett T, Rusted J, and Wright J, Poster presented at the 22nd Annual Conference of the British HIV Association (BHIVA), Manchester, UK.

Falls

- 29 patients (30.9%) fell in the last month
- 65 patients (69.1%) reported recurrent falls.
- median number of falls was 2 (IQR 1–4)

	Non-faller N=159 (%)	Faller N=94 (%)	P-value
Age	59.9 (54.3–66.3)	59.6 (55.9–63.7)	0.594
Female	13 (8.2)	10 (10.6)	0.516
Education (yrs)*	13 (11–16)	12 (11–15)	0.073
HIV duration (yrs)*	12.9 (7.5–18.7)	16.5 (9.7–23.5)	0.007
CD4 <350	17 (10.7)	11 (11.7)	0.061
AIDS	41 (25.8)	37 (39.4)	0.024
Comorbidities*	2 (0–3)	3 (2–4)	<0.001
Frailty	12 (7.6)	36 (38.3)	<0.001
Pain	35 (22.0)	63 67.0	<0.001
Non-antiretroviral drugs*	2 (0–4)	4 (3–6)	<0.001
Depression	7 (4.4)	14 (14.9)	0.003
Anxiety	25 (15.7)	32 (34.0)	0.001
Walk speed (m/sec)**	1.16 (0.24)	1.01 (0.27)	<0.001
Weak grip	20 (12.6)	37 (39.4)	<0.001
Mobility poor	21 (13.2)	57 (60.6)	<0.001
Disability	5 (3.1)	19 (20.2)	<0.001

Levett T, Saxena O, and Wright J, Poster presented at the 22nd Annual Conference of the British HIV Association (BHIVA), Manchester, UK.

The Silver Clinic

- Indications for referral:
 - Patients over 50 years old
 - Multiple comorbidities
 - Polypharmacy
 - Difficulties coping at home
- The Silver Clinic team:
 - HIV physician
 - Geriatrician
 - HIV Clinical Nurse specialist
 - Pharmacist

The Silver Clinic

Pre-assessments: (HIV-CNS; pharmacist)

- Health: EQ-5D-5L
- Frailty: Frailty scale
- QUALY: OPQOL-brief
- Cognitive: MoCA
- Mental health: Hospital anxiety and depression questionnaire
- Medication review: MMOR
- Routine bloods: Including B12, folate, PSA, TSH

CNS, central nervous system; QUALY, quality-adjusted life year; OPQOL, older people's quality of life; MoCA, Montreal Cognitive Assessment; MMOR, major molecular response; PSA, prostate specific antigen; TSH, thyroid-stimulating hormone

The Silver Clinic

Clinical assessment:

1 clinic session a month, max 4 patients, 40 minutes per patient

Objectives:

- Polypharmacy and DDI
- Optimising the management of comorbidities
- Identifying, social and psychological problems
- Formulate health interventions
 - Medical: Investigations, referral to other specialties
 - Social: Occupational therapy, social services
 - Psychological: Referral to mental health
 - Others: Exercise interventions, peer support groups
- Improving quality of life with old age: Patient reported outcomes (PROMS)

Specialist care of older adults with HIV infection in the UK: a service evaluation



- **102** clinics responded
- **2** dedicated HIV ageing services
- **3** more in development

- **23%** reported a **NEED** for an ageing service
- **68%** felt dedicated guidance on monitoring and was needed

Insufficient numbers of older patients was the main reason for the lack of a current need for a dedicated HIV ageing service

Summary

- It's not age, it's frailty!
- How to define it
- Why it's important
- How to assess for frailty
- Strategy for intervention – FFF¹
- Importance of mood
- Importance of falls
- Prescribing – STOPP/START criteria²
- Individualised care!

FFF, fit for frailty; STOPP, screening tool of older people's prescriptions; START, screening tool to alert to right treatment

1. British Geriatrics Society. Fit for Frailty. Available at: www.bgs.org.uk/campaigns/fff/fff_full.pdf 2. O'Mahony D et al. Age Ageing 2015;44(2):213–8.

It's not about age – it's about individualised care



Acknowledgements

Silver clinic team:

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Tom Levett

