Frailty in the UK

Avan Aihie Sayer

Academic Geriatric Medicine

MRC Lifecourse Epidemiology Unit

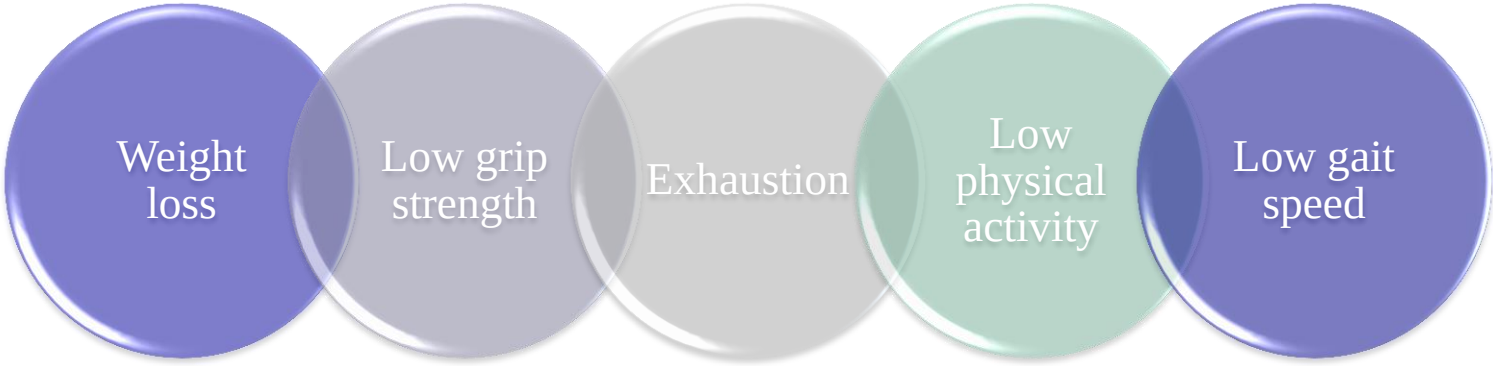
University of Southampton UK

Nutricia Frailty Workshop Toulouse 10 September 2013

Frailty v sarcopenia phenotype

Frailty is multisystem impairment associated with increased vulnerability to stressors operationalised as below

Fried et al J Gerontol A Biol Sci 2001



0/1 = Non-frail
2 = Pre-frail
3 + = Frail

Sarcopenia is the loss of muscle mass and strength or physical performance associated with increasing age

Cruz-Jentoft et al EWGSOP Consensus Guidelines Age Ageing 2010

Is either diagnosis likely?
Frailty burden in the UK data: Hertfordshire Cohort Study

UK Prevalence of frailty in community dwelling older people

- Syddall et al Age Ageing 2009 Prevalence of frailty - Fried criteria
  4.1% men 8.5% women aged 65 –74 years

UK Prevalence of sarcopenia in community dwelling older people

- Patel et al Age Ageing 2013 Prevalence of sarcopenia - EWGSOP criteria
  4.6% men 7.9% women mean age 67 years

UK Annual healthcare costs unknown

- But Janssen et al JAGS 2004 US National Surveys
  estimate sarcopenia alone costs $18 billion

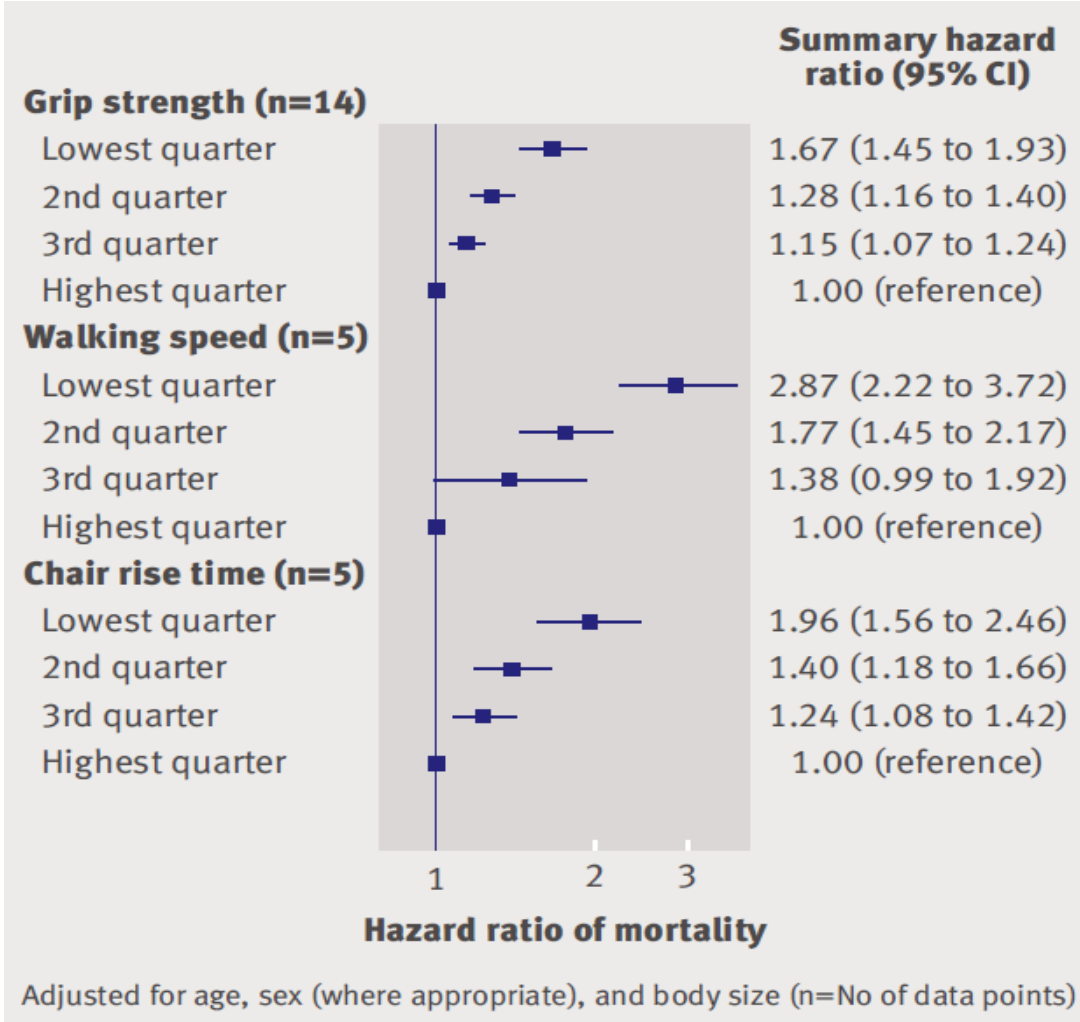
Component items of Fried Frailty in the Hertfordshire Cohort Study

N (%)	Men (N=320)	Women (N=318)
Unintentional weight loss (>10lb over the past year)	17 (5.3)	11 (3.5)
Weakness*	22 (6.9)	68 (21.5)
Self-reported exhaustion**	18 (5.6)	32 (10.1)
Slow walking speed***	63 (19.8)	63 (19.9)
Low physical activity[+]	85 (26.6)	69 (21.7)
Frail on the Fried score (presence of three or more of the above criteria)	13 (4.1)	27 (8.5)

*Grip strength ≤30kg men and ≤20kg for women
**The participant felt that everything they did was an effort for moderate amounts to most of the time in the past week
***Timed up and go 3 metre walk ≥3.82 seconds for men and ≥3.98 secons for women or test completed with use of a walking aid
[+]SF-36 physical functioning score in the bottom fifth of the sex-specific distribution (≤75 for men and ≤60 for women)

Syddall et al Age Ageing 2009;39:197-203.

Mortality v markers of muscle function: a systematic review and meta-analysis



Cooper R et al BMJ 2010;341:c4467

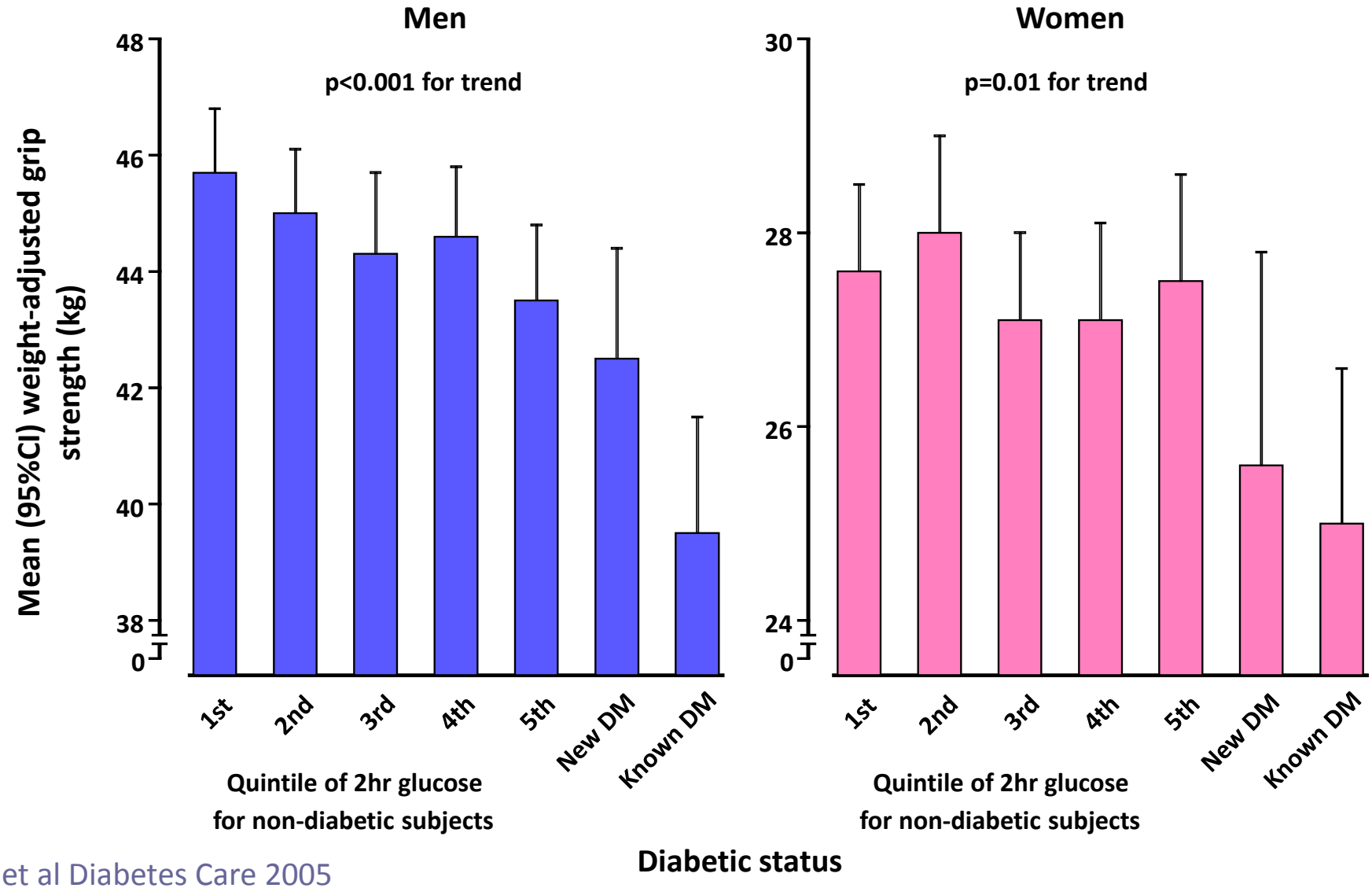
Morbidity v markers of muscle function: a systematic review

Measure of physical activity	Outcome			
	Fracture	Cognitive decline	Cardiovascular disease	Hospitalisation and institutionalism
Grip strength	++++eee--	+++	++-	e
Walking speed	++++-	++	++	++-
Chair rises	+++-	e	+-	e
Standing balance	+++e-	+-		+

Each indicator represents one study population.
plus = there was evidence that poorer performance on the specific test was associated with increased risk of specified outcome, e = equivocal association, minus = no evidence of association.

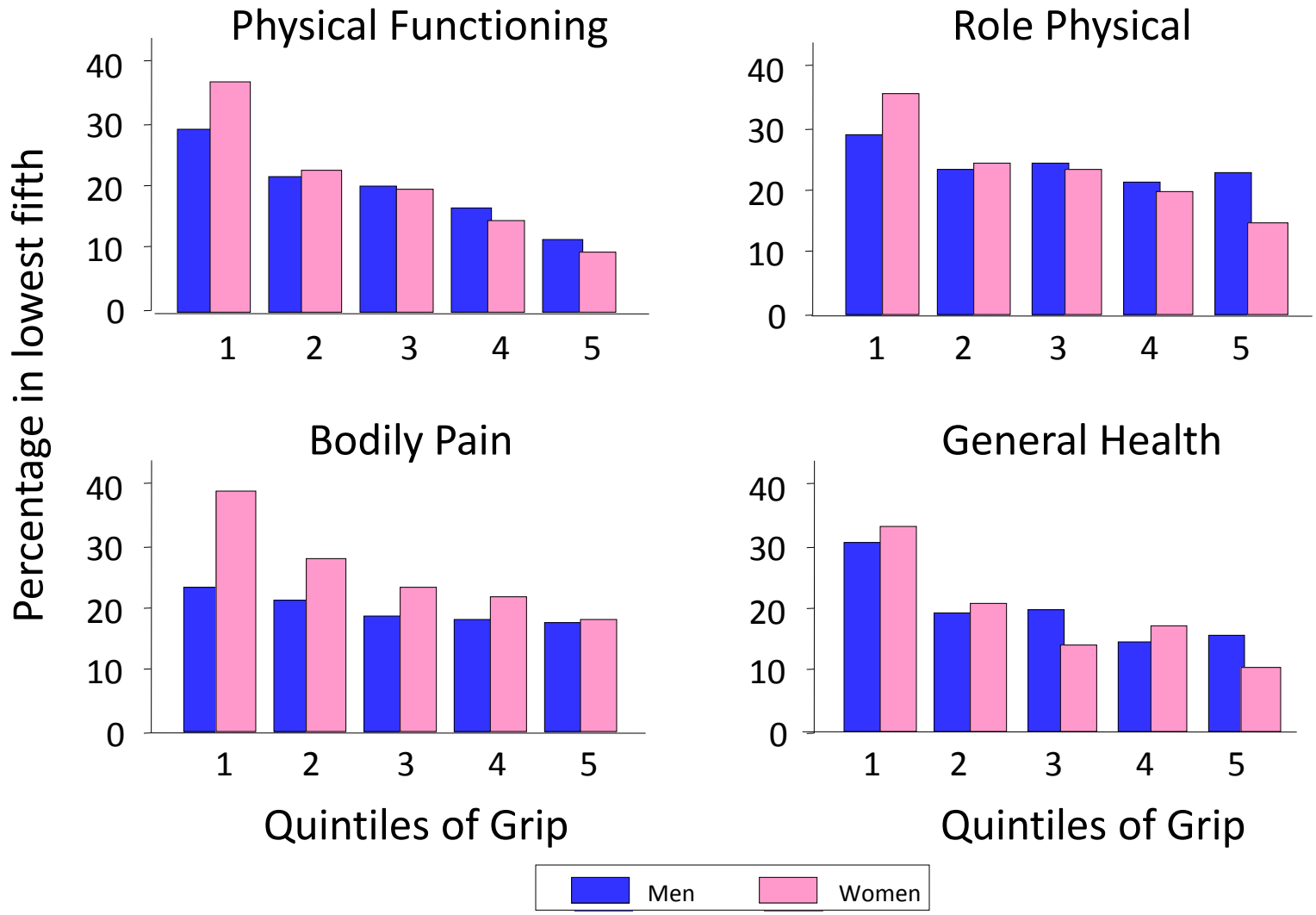
Cooper et al Age and Ageing 2011

Morbidity v markers of muscle function: association between diabetic status and grip strength



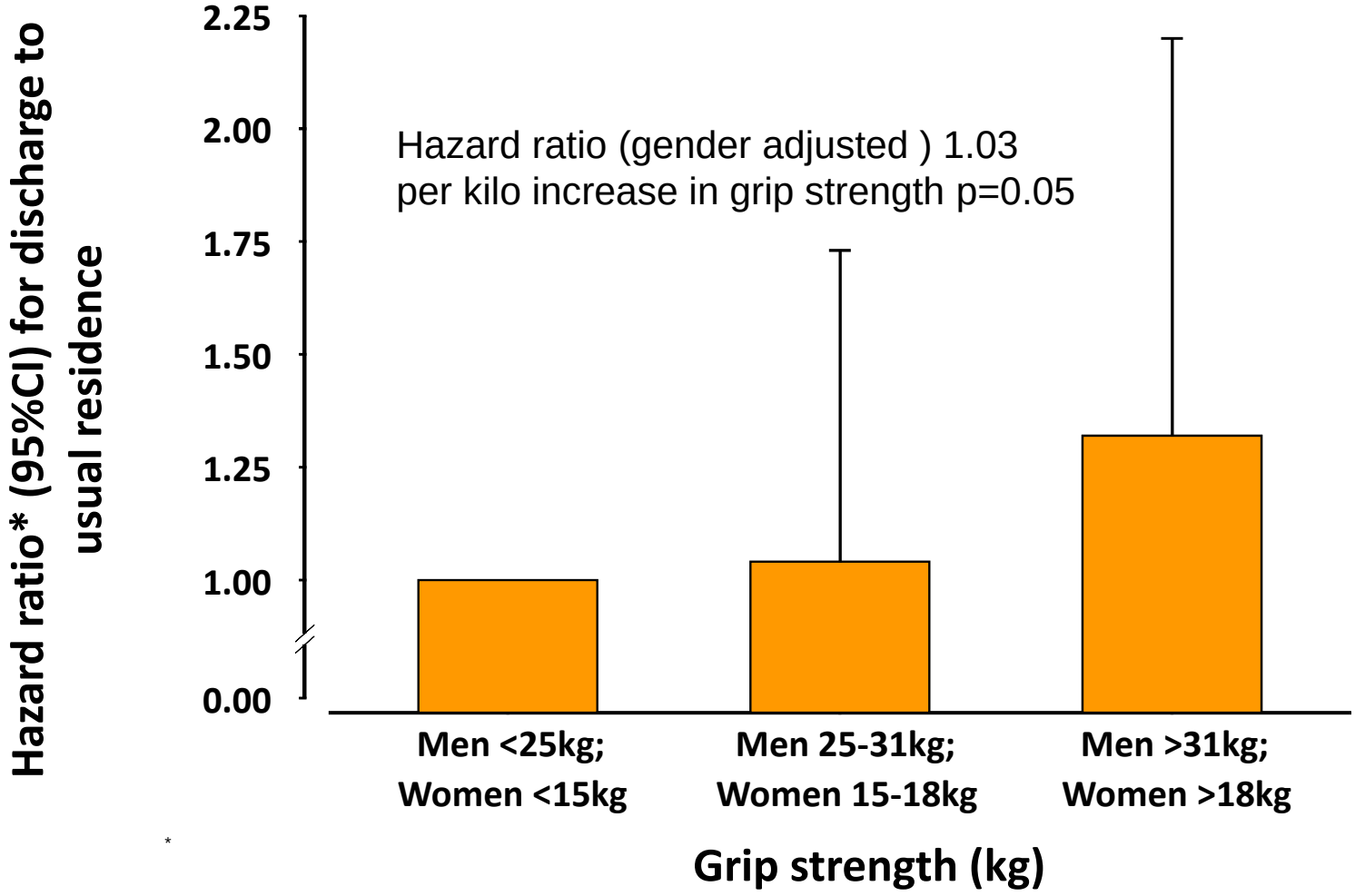
Sayer et al Diabetes Care 2005

HRQoL v markers of muscle function: association between SF-36 scores and grip strength



Sayer et al Age Ageing 2006

Receipt of healthcare v markers of muscle function: relationship between length of stay in hospitalised older patients and admission grip strength



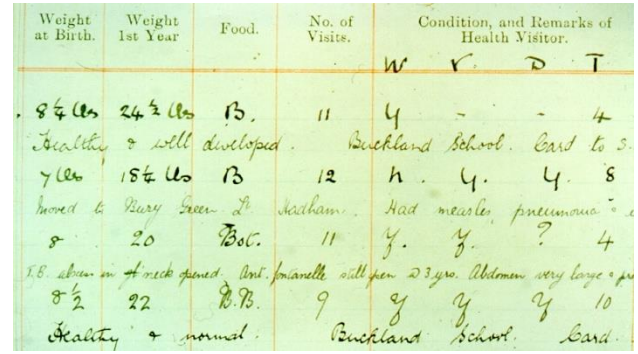
Kerr et al Age Ageing 2006

What are risk factors/interventions?
Major influences on skeletal muscle function

- Age, gender, adult size & body composition
- Physical activity particularly resistance exercise
- Diet
- Drugs
- Immune-endocrine axis
- Genes
- Lifecourse approach

Identifying risk factors to develop effective interventions: Hertfordshire Birth Cohort Studies

- Hertfordshire Ageing Study: 717 men & women born 1920 – 1930
- Hertfordshire Cohort Study: 3000 men & women born 1931-39
- Historical records weight at birth & one year
- Follow up for detailed characterisation of age-related disease and ageing phenotypes including frailty and sarcopenia
- Detailed characterisation of exposures including physical activity and diet

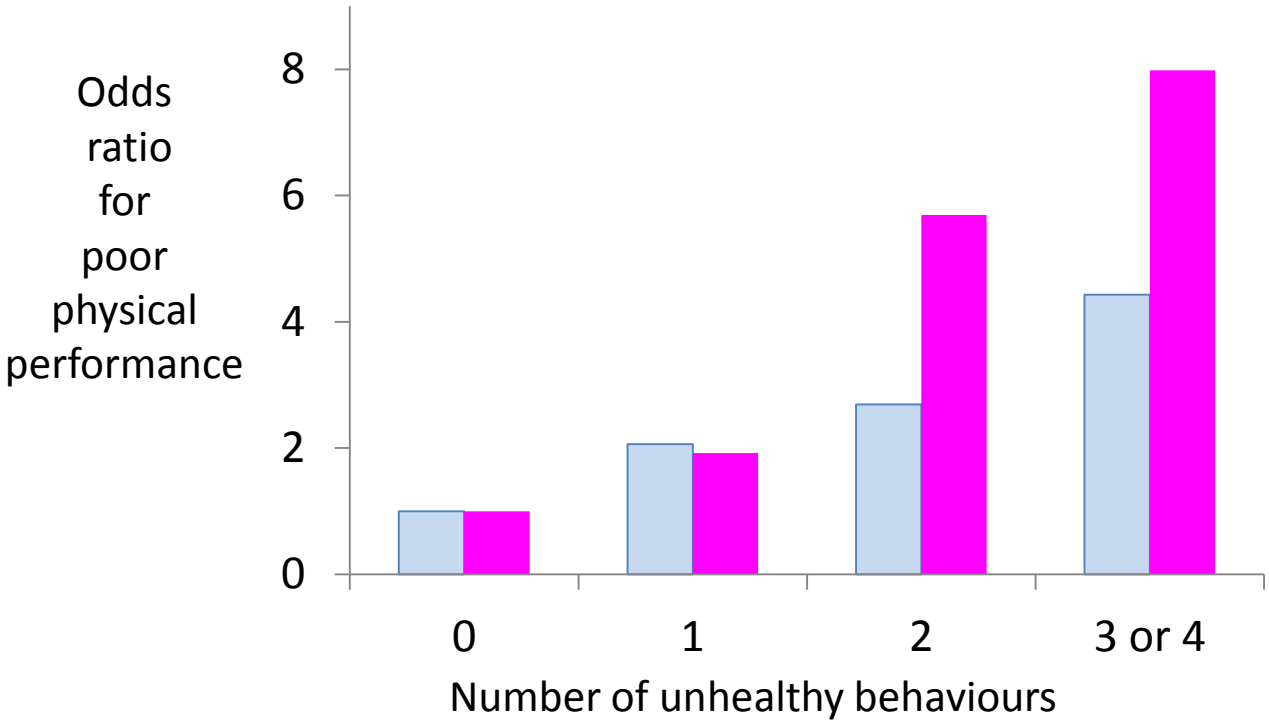


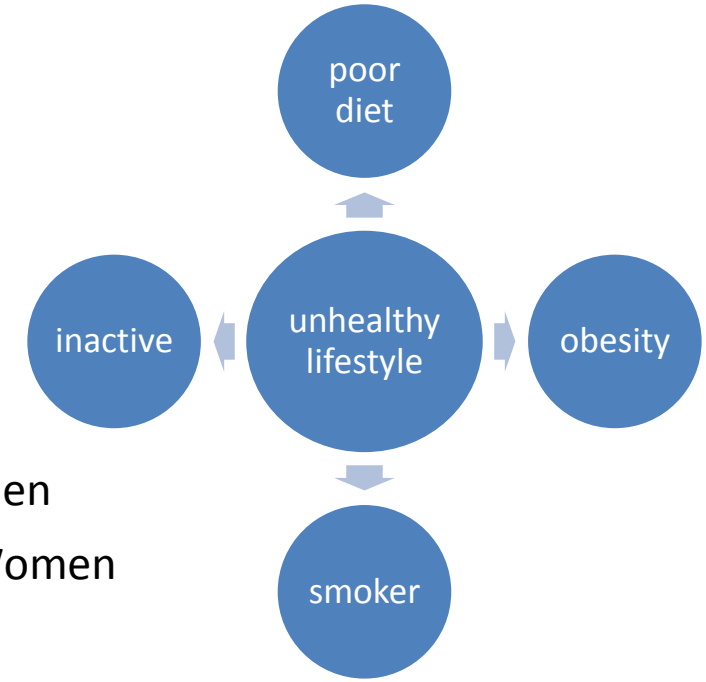
Weight at Birth.	Weight 1st Year	Food.	No. of Visits.	Condition, and Remarks of Health Visitor. W	V	D	T
8¼ lbs	24½ lbs	B.	11	4	-	-	4
Healthy & well developed. Buckland School. Card to S.							
7 lbs	18¼ lbs	B	12	h.	4.	4.	8
moved to Bury Green Ld. Hadham. Had measles, pneumonia							
8	20	Bol.	11	Y.	Y.	?	4
N.B. ulcer in left neck groined. Ant. fontanelle still open 2 3 yrs. Abdomen very large & pu							
8½	22	B.B.	9	Y	Y	Y	10
Healthy & normal. Buckland School. Card.							

Syddall HE et al Int J Epidemiol 2010

Syddall HE et al Int J Epidemiol 2005

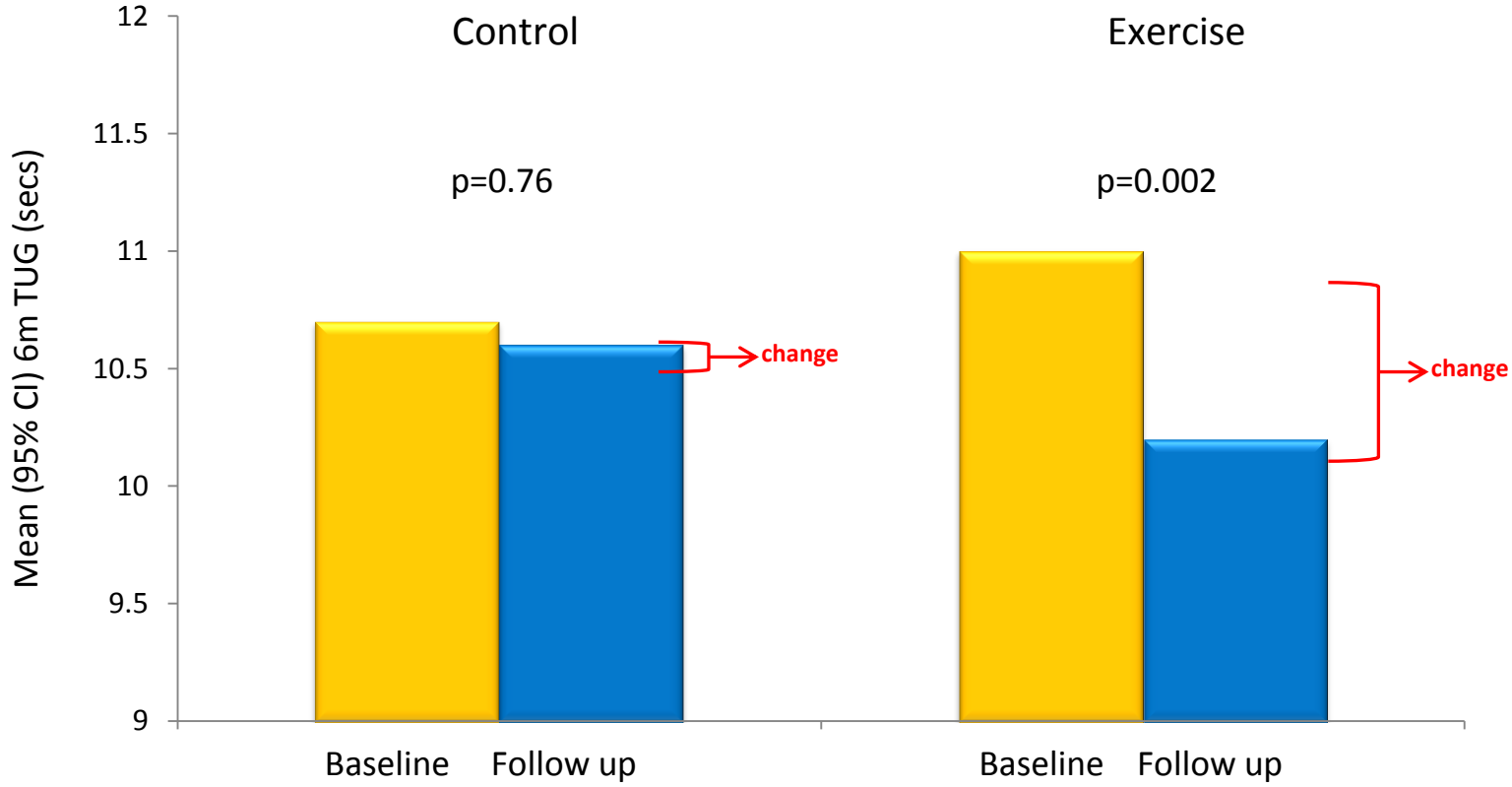
Unhealthy lifestyle in later life is related to worse physical performance: findings from the Hertfordshire Cohort Study





Robinson et al JAGS 2013 In press

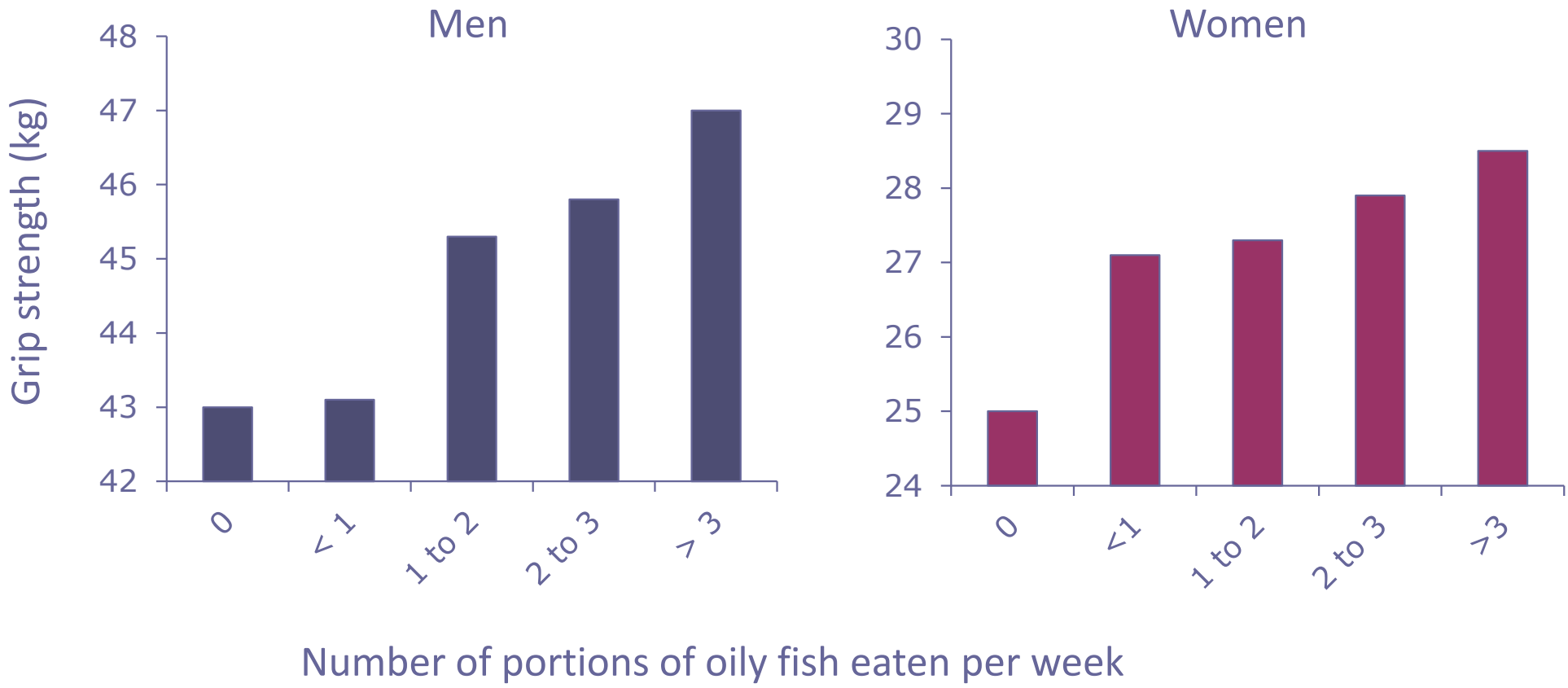
Aerobic exercise can improve physical performance in older people: a Hertfordshire Cohort Study randomised controlled trial



p=0.04 for difference in response between control and exercise intervention groups
p values above bars are from paired t-tests for change in TUG time within person, among controls and among the exercise group

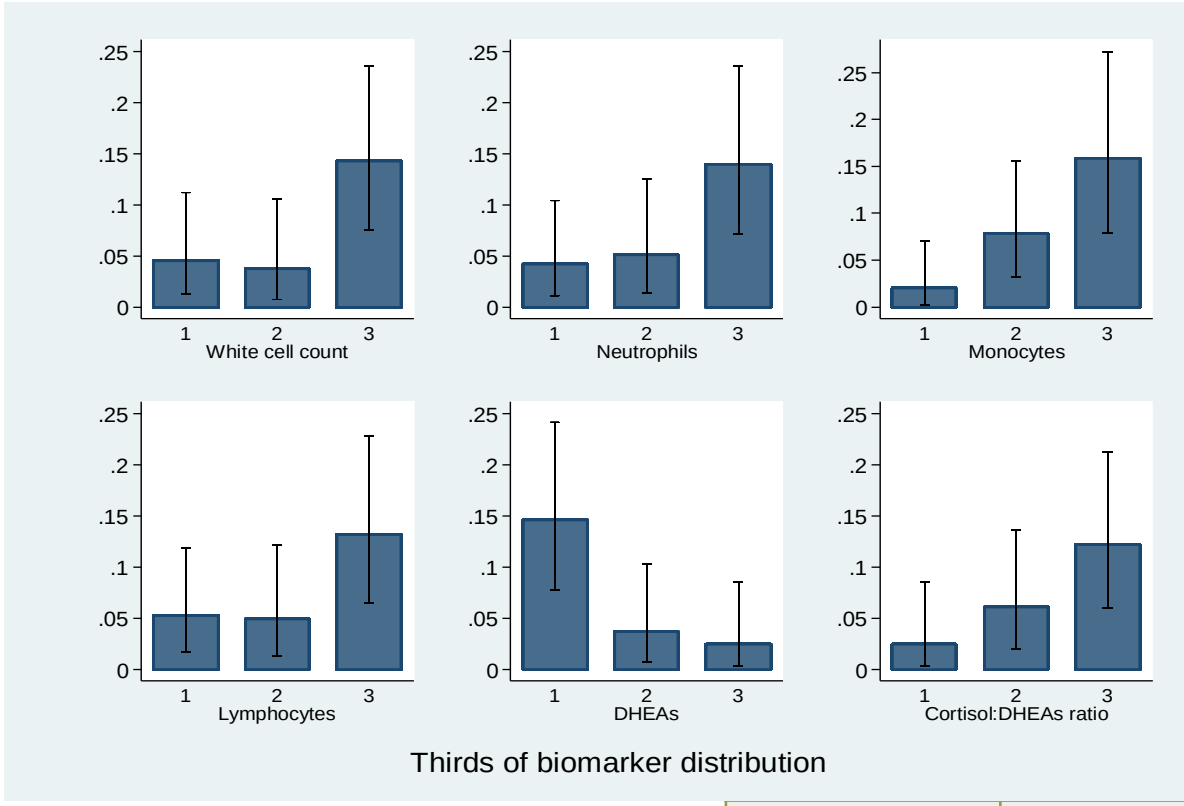
Denison et al JAGS 2013

Oily fish consumption is associated with muscle strength: findings from the Hertfordshire Cohort Study



Robinson et al JAGS 2007

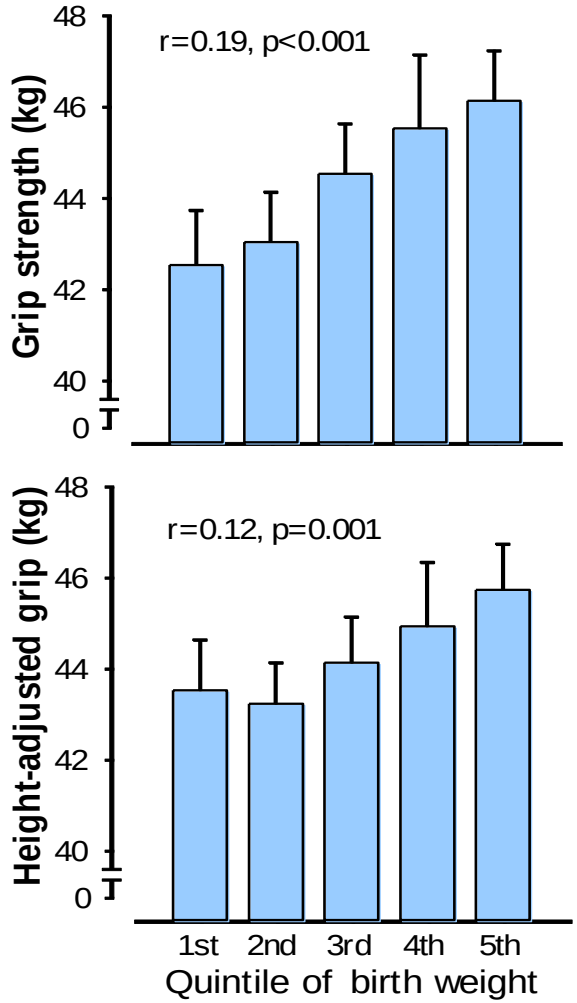
Immune-endocrine biomarkers predict frailty: findings from the Hertfordshire Ageing Study



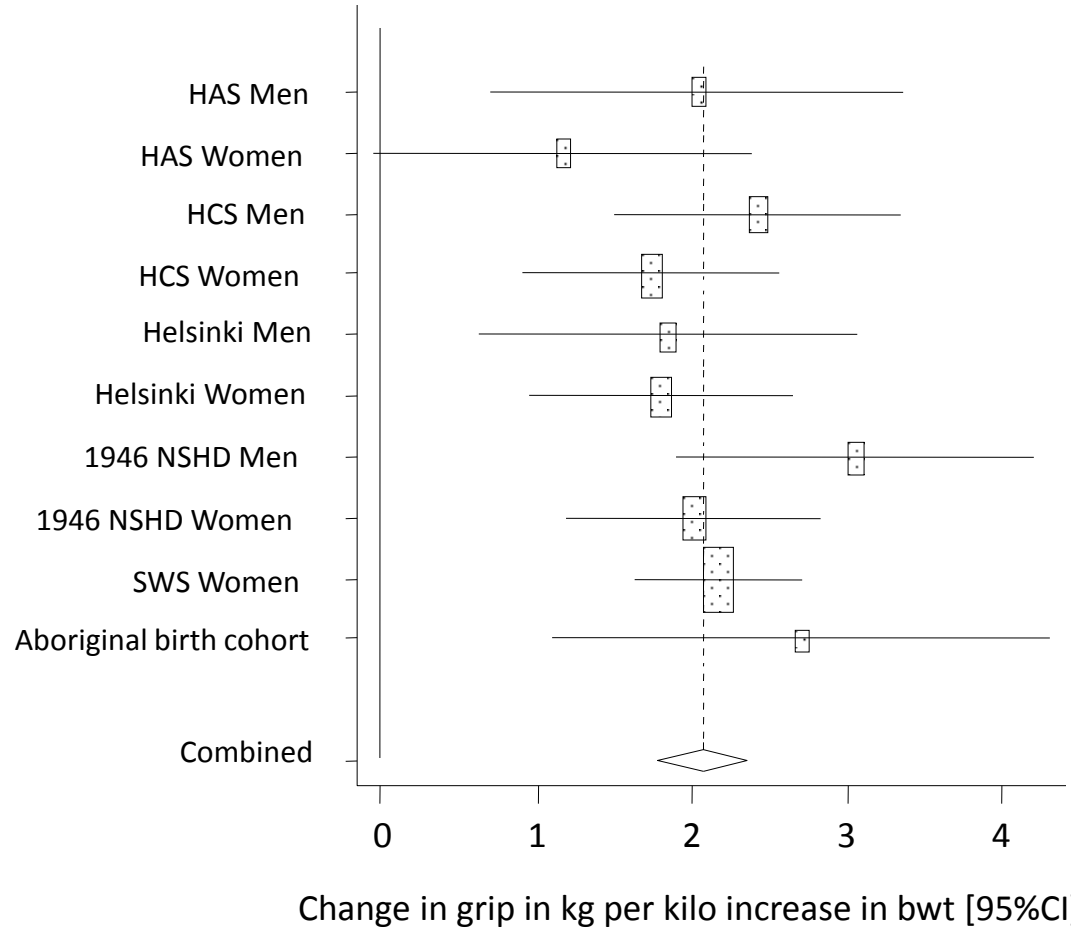
		White Cell Count	
		<6 x10^9/L	≥ 6x10^9/L
Cortisol: DHEAS	<0.172	2%	6.6%
	≥0.172	9.6%	17.1%

Baylis *et al.* AGE 2012

Is a life course approach helpful?
Associations between birth weight and grip strength



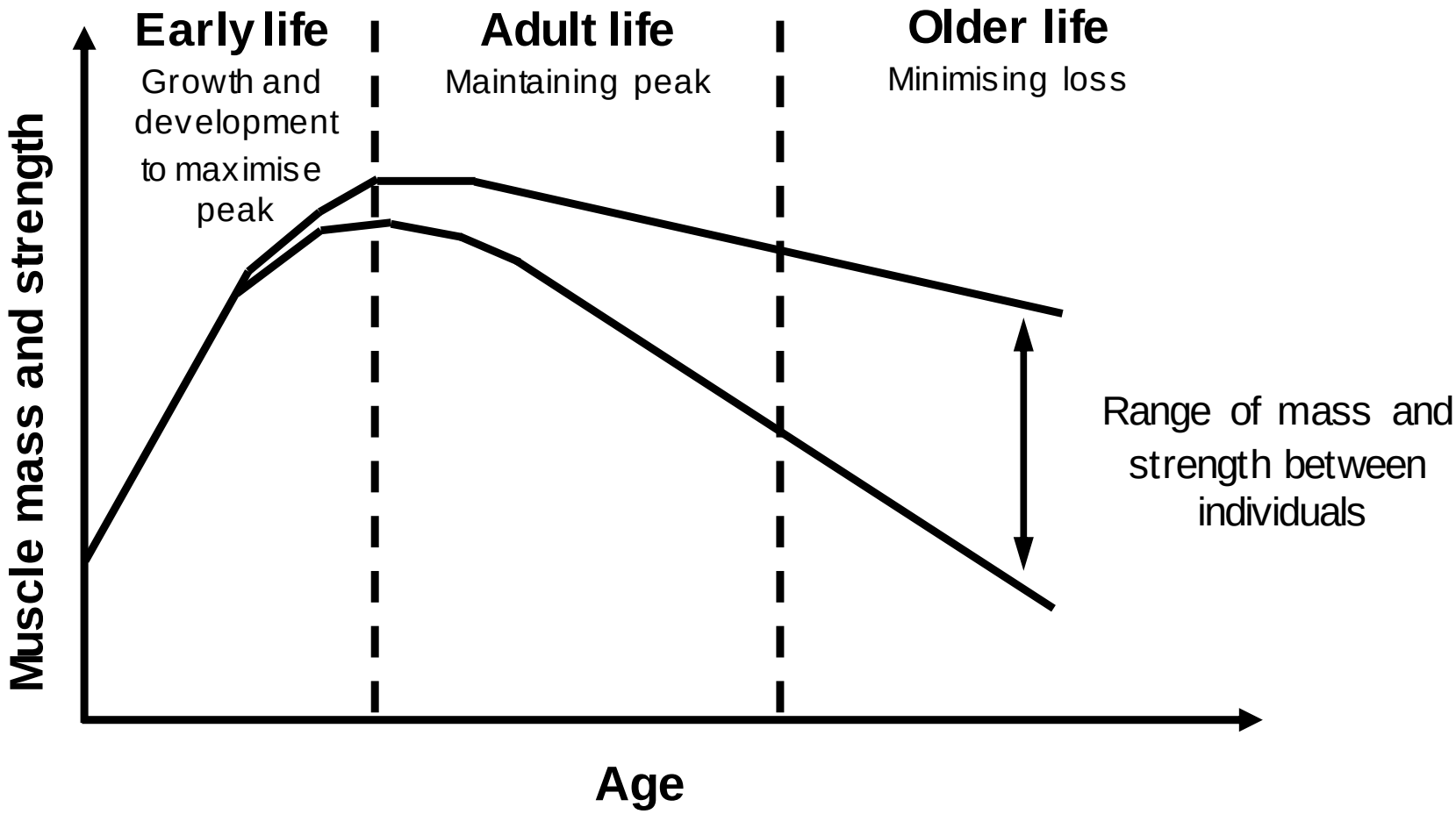
Sayer AA et al J Gerontol 2004



Sayer AA et al JNHA 2008

Dodds R et al JNHA 2012

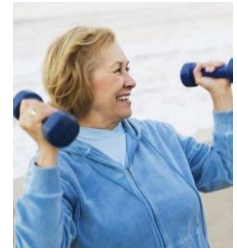
A lifecourse approach to skeletal muscle function



Sayer AA et al Age Ageing 2013

Relevance of the lifecourse approach to intervention

- Prediction: identifying individuals at risk
- Prevention: interventions across the lifecourse
- Treatment: novel agents



Sayer AA BMJ 2010