Background Parental physical activity (PA) is frequently investigated as a potential correlate of preschool-aged children's PA, yet there is little information about how the association between parent-child PA changes during the transition to formal schooling. We aimed to determine the association between objectively measured maternal and 6-year-old children's PA, exploring how this association differs by demographic and temporal factors; and 2) identify how this association changes during the transition to school (from 4–6 years).

Methods Data were from the UK Southampton Women's Survey. PA levels of 530 6-year-olds and their mothers were measured concurrently using accelerometry for up to 7 days. Two-level mixed-effects linear regression was used to model the association between maternal-child PA at age 6 [average activity intensity (ACC); minutes spent sedentary (SED); and in moderate and vigorous PA (MVPA)]. Interactions with demographic and temporal factors, and how the association differed across the day (morning (6–9am); school (9am-3pm) and evening (3–11pm)), were tested. Change in the association between maternal-child PA (at age 4 and 6, n=170) was also assessed.

Results At age 6, mother-child daily PA were positively associated at all activity intensities: ACC: β=0.24 [95% CI: 0.19, 0.30] counts per minute; SED: 0.23 [0.20, 0.26] minutes/hour; MVPA: 0.53 [0.43,0.64] minutes/hour. The association was stronger between mother-child PA at all intensities at the weekend (vs. weekdays: ACC: $\beta_{interaction}$=0.16 [95% CI: 0.06, 0.25] counts per minute; SED: 0.07 [0.02,0.12] minutes; MVPA: 0.44 [0.24,0.64] minutes). For SED, the mother-child association was stronger for children with older siblings (vs. none); for MVPA, the relationship was stronger for those who had both younger and older siblings (vs. none). Longitudinally, the mother-child association did not differ with age for SED and light PA (LPA); mother-child ACC and MVPA were significantly weaker at age 6 compared with age 4 (difference in ACC: −0.23 [-0.37,–0.10], MVPA: −0.16 [-0.31,–0.00]). This difference was driven by a weaker relationship in the mornings and during the school day (9–3pm).

Discussion Maternal-child PA levels are positively associated at age 6, with stronger associations at weekends, and in those with siblings in the home. From age 4 to 6 years, the mother-child ACC and MVPA association weakened. This may reflect decreasing co-participation with age, as children gain independence/engage in more structured PA at school. Different intervention foci may be needed before and after the transition to school, but family-based PA remains an important element of children's overall PA.

OP68 PHYSICAL ACTIVITY TRAJECTORIES AND PREDICTORS DURING THE TRANSITION TO OLD AGE

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10.1136/jech-2017-SSMAbstracts.67

Background Maintaining physical activity during later life is associated with optimal health; however, research on the long-term trajectories of physical activity into old age and their predictors has been limited. This study aimed to identify distinct 20 year trajectories of physical activity spanning from midlife to old age and predictors of physical activity trajectories.

Methods Participants were men drawn from the British Regional Heart Study, a prospective cohort study, involving 7735 men recruited from Primary Care Practices in 1978–80. Men were followed up after 12, 16 and 20 years, reporting physical activity levels (walking, cycling, recreational activity and sport/exercise), health status and socio-demographic characteristics. Group-based trajectory modelling was applied to identify distinct trajectories of physical activity and to examine the effects of predictor variables on trajectories. Predictors of trajectory group membership were examined using multinomial logistic regression. The effects of developing cardiovascular disease and changing employment status on trajectories were estimated for each trajectory group.

Results 7658 men (mean baseline age 50.2±5.8 years) providing valid questionnaire and physical activity data (of which 78% provided activity data at ≥2 surveys) were included in analyses. Three distinct trajectories of physical activity emerged: low decreasing (34.1%), low stable (45.8%) and moderate increasing (20.1%). Membership of the moderate increasing trajectory group was predicted by being married, having children, drinking alcohol and eating breakfast. Men with manual occupations, men residing in regions other than the South, men who were overweight/obese, men with doctor-diagnosed health conditions and men who smoked were less likely to be in the moderate increasing trajectory group. Being employed was associated with an increase in physical activity in the low decreasing group (β 0.43, p<0.001) but a decrease in the low stable (β −0.22, p<0.001) and moderate increasing groups (β −0.84, p<0.001). Development of cardiovascular-related conditions was associated with a decline in physical activity in the low decreasing (β −0.42, p<0.001) and low stable groups (β −0.13, p<0.05) but was not associated with any change in the moderate increasing group (β −0.06, p=0.34).

Conclusion This study highlights the heterogeneity in physical activity levels over time in older adults and that activity levels in midlife are likely to dictate trajectories into old age. Efforts to promote physical activity in later life may need to focus attention earlier in the lifecourse. The effects of retirement and cardiovascular disease on physical activity may depend on prior activity trajectories. Thus, different strategies may be needed in these groups.

Ageing 2

OP69 CIRCULATING N-3 POLYUNSATURATED-FATTY ACIDS AND THE MAINTENANCE OF HEALTHY AGEING IN OLDER ADULTS, THE CARDIOVASCULAR HEALTH STUDY

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10.1136/jech-2017-SSMAbstracts.68

J Epidemiol Community Health: first published as 10.1136/jech-2017-SSMAbstracts.68 on 2 September 2017. Downloaded from http://jech.bmj.com/ on May 18, 2021 by guest. Protected by copyright.

Background Maintaining healthy ageing (HA) is a crucial priority in older adults worldwide, given global population ageing, increased number of years living with disability, and the need for new treatments. Omega-3 polyunsaturated fatty acids (n3-PUFA) from seafood and plants exert favourable physiologic effects that could benefit HA. However, relationships between n3-PUFA and HA are not well-established, especially using serial biomarkers which provide highly objective measures.
Methods We investigated the longitudinal association between serial circulating n3-PUFAs and maintenance of HA in the Cardiovascular Health Study, evaluating 2342 older U.S. adults with mean age 75 years and successful HA to-date at baseline in 1992–93. Individual plasma phospholipid n3-PUFAs (expressed as% of total fatty acids) including alpha-linoleic acid (ALA), eicosapentaenoic acid (EPA), docosapentaenoic acid (DPA), and docosahexaenoic acid (DHA) were quantified using gas chromatography in 1992–93, 1998–99, and 2005–06. HA was defined as survival free of cardiovascular disease, cancer, lung disease, and severe chronic kidney disease, with no difficulties with activities of daily living and intact cognitive function (Mini-Mental State Examination $\geq 80^{th}$ percentile); dying with a lifetime meeting this criteria was also considered as HA. Events were centrally adjudicated or determined from medical records and diagnostic tests. Multivariable-Cox proportional hazards models with time-varying covariates evaluated the association between time-varying, cumulative average n3-PUFAs and unsuccessful HA.
Results During 22 years of follow-up, 267 (11%) participants experienced successful HA. After multivariable-adjustments, the interquintile range of total n3-PUFAs and seafood-derived n3-PUFAs was associated with lower risk of unsuccessful HA by 17% (0.74%–0.93 95% CI, p=*0.002*) and 16% (0.75%–0.94 95% CI, p=*0.002*), respectively. Individually, EPA, DPA and DHA each associated with lower risk of unsuccessful HA by 12% (0.80%–0.97 95% CI, p=*0.009*), 14% (0.77%–0.97 95% CI, p=*0.010*) and 15% (0.76%–0.96 95% CI, p=*0.009*), respectively. Plant-derived ALA levels were not significantly associated with HA. Sensitivity analyses including freedom from atrial fibrillation, milder chronic kidney disease, and diabetes within the HA definition did not appreciably alter results.
Conclusion Among older adults with mean age 75 years and HA to-date, a higher cumulative level of circulating seafood-derived n3-PUFAs (combined and individually), but not plant-derived ALA, was associated with maintainence of HA. These novel findings support guidelines for increased fish intake among older adults; and need for further investigations into plausible biological mechanisms and interventions for effects of n3-PUFAs on maintenance of HA.

OP70 WEALTH DIFFERENCES IN AGE-TRAJECTORIES OF BODY SIZE: FINDINGS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING

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10.1136/jech-2017-SSMAbstracts.69

Background While the obesity epidemic has devastating health consequences at all ages, underweight is also associated with an increased mortality risk. Lower socioeconomic status is associated with higher obesity rates and greater weight gain, but evidence from prospective studies in older adults is scarce. Our aim was to describe age-trajectories of body mass index (BMI) and waist circumference (WC) in a population-based study of older adults in England and to assess the association with wealth.
Methods Data come from a nationally representative sample of 3259 men and 3966 women aged 52y and over from the English Longitudinal Study of Ageing (ELSA) who had a measurement of BMI and WC on three occasions (2004–2005; 2008–2009; 2012–2013). We used latent growth curve modelling to estimate baseline status (intercept) and rate of change (linear slope) interpreted as the change per year. Intercept and slope were regressed on wealth tertile, and covariates (age, ethnicity, marital status, physical inactivity, smoking status and limiting long-standing illness). Gender- and age-specific (<70,≥70 y) models were fitted.
Results In the <70 y group, a man aged 60y in the richest wealth tertile had a baseline BMI of 27.7kg/m^2 and WC of 100.5 cm and a woman a BMI of 26.9kg/m^2 and WC of 88.2 cm. BMI increased by 0.04 kg/m^2 every year in men and 0.05kg/m^2 in women; and WC increased by 0.15 cm/year in men and 0.21 cm/year in women. Being in the poorest wealth group was associated with highest baseline BMI (28.7kg/m^2 for men and 29.4kg/m^2 for women) and WC (103.1 cm in men and 93.6 cm in women). However, there was no difference in the rate of change between those in the richest and poorest wealth tertiles. In the ≥70 y group, for a man aged 77y in the richest tertile, the baseline BMI was 26.7kg/m^2 and WC 100.0 cm and for a woman it was 26.3kg/m^2 and 88.7 cm. The rate of change was non-significant for both anthropometrics markers. An individual of the same age in the poorest tertile had higher baseline BMI and WC (man: 27.5kg/m^2 and 102.1 cm; woman: 28.1kg/m^2 and 92.1 cm).
Conclusion In this population-based study, BMI and WC increased significantly over time in both men and women until the age of 70, thereafter it remained stable. Less wealth was strongly associated with a higher BMI and WC at any given age, however the rates of change were similar, indicating that the socioeconomic gap associated with excess adiposity did not close with ageing.

OP71 THE EFFECT OF LONGITUDINAL CHANGES IN PHYSICAL AND MENTAL HEALTH ON CONTINUING SOCIAL PARTICIPATION IN OLDER IRISH ADULTS: ANALYSIS FROM THE IRISH LONGITUDINAL STUDY OF AGEING

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10.1136/jech-2017-SSMAbstracts.70

Background Social engagement and participation in leisure activities are recognised as beneficial to the physical and mental health and wellbeing of older adults and have been shown to lower the risk of negative health outcomes and early mortality. Identifying factors that constrain or enable social participation in older age can help to facilitate continuing engagement and thus improve future health outcomes. This study aimed to investigate the longitudinal relationship between accrual of chronic health conditions and changes in depressive symptoms and continuing social participation in community dwelling older adults over a 4 year period.

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