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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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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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.

Methods Data from waves 1 (2009–2011, n=6051), 2 (2012, n=5487) and 3 (2014–2015, n=4623) of the Irish Longitudinal Study of Ageing (TILDA), a stratified probability sample prospective cohort, was analysed. Frequency of participation in seven social activities ('Go to films, plays, concerts', 'Attend classes or lectures', 'Travel for pleasure', 'Play cards, bingo or games', 'Go to pub', 'Eat out of house' and 'Participate in sport or exercise') was collected. Depressive symptoms were assessed using the 8-item Centre for Epidemiological Studies Depression (CESD) scale, and chronic disease count included self-reported doctors' diagnosis of cardiovascular (heart attack, angina, stroke, transient ischaemic attack, heart failure) and non-cardiovascular chronic conditions (high blood pressure, diabetes, arthritis, lung disease, osteoporosis). Multilevel mixed effects logistic regression modelling was employed to assess the effect of changes in 1) chronic disease count and 2) depressive symptoms on each item of social participation (defined as monthly participation or less) over three waves, adjusted for socio-demographic and health covariates.
Results Mean age at baseline was 63.2y and 46.9% of the sample were male. Rates of social participation remained stable across waves. Each additional chronic disease accrued was associated with decreased participation in 'Attend classes or lectures' (Odds Ratio (OR): 0.86, 95% CI: 0.74–0.99) and 'Participate in sport or exercise' (OR: 0.86, 95% CI: 0.77–0.97) and an increase in 'Go to pub' (OR: 1.28, 95% CI: 1.09–1.50). A one unit increase in depressive symptoms over time was associated with decreased participation in 'Participate in sport or exercise' (OR: 0.96, 95% CI: 0.93–0.99) only.
Conclusion This longitudinal analysis suggests that deterioration of physical and mental health may influence specific domains of social participation in community dwelling older adults. Holistic approaches to disease management and mental health interventions in older age should include programmes to facilitate and maintain social and leisure time activities.

OP72 RELIGIOUS ATTENDANCE, LONELINESS AND DEPRESSIVE SYMPTOMS IN MIDDLE AGED AND OLDER WOMEN IN IRELAND

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Background Evidence for an association between mental health and religiosity largely supports a positive effect of religiosity on mental health. However, there remains a lack of research into the underlying mechanisms of these associations involving other social and health factors, particularly in older women. We aimed to investigate causal pathways between religious attendance and depressive symptoms, and test whether this relationship is mediated by loneliness.
Methods We analysed three waves of The Irish Longitudinal Study on Ageing (TILDA) (2000011, 2012, 2014–2015), a stratified probability cohort of men and women aged over 50 resident in Ireland. A total of 3400 women were included in this analysis. A theoretical longitudinal model of religious attendance and depressive symptoms was tested using Structural Equation Modelling (SEM), adjusted for age, marital status, self-rated health, education and recent adverse life events. Log likelihood tests were used to compare model fit. Depressive symptoms were measured using the 8-item Centre for Epidemiologic Studies Depression Scale (CES-D) and loneliness with the UCLA Loneliness Scale. Religious practice and beliefs were also collected. Changes in religious attendance between waves were calculated. All analyses were conducted using Stata 14.
Results A majority of women attended religious services (86%) and 60% attended at least once a week at baseline, with a decrease in attendance at subsequent time points (85% and 57% at Wave 2; 84% and 55% at Wave 3). Mean (SD) depressive symptoms were 3.38 (4.07) at Wave 1; 3.19 (3.99) at Wave 2; and 3.62 (4.03) at Wave 3. Regular attendance at Wave 1 and Wave 2 predicted fewer depressive symptoms at Wave 2 (Incident Rate Ratio (IRR):0.81 95% CI:0.73–0.89) and Wave 3 (IRR:0.92 95% CI:0.86–1.00) respectively. When loneliness was included in the model, the effect of regular attendance remained unchanged between Wave 1 and Wave 2. The effect was attenuated, but not mediated, between Wave 2 and Wave 3 (IRR: 0.94 95% CI: 0.87–1.02). Depressive symptoms consistently predicted changes in attendance, with higher depressive symptoms predicting subsequent increased and decreased attendance.
Conclusion Longitudinal analyses of religious attendance and depressive symptoms suggest this is a complex relationship which is at least in part bidirectional. Evidence did not support loneliness as a mediator of this relationship. Analyses using other measures of religiosity may help further elucidate these associations.

Policy analysis

OP73 SYSTEMS SCIENCE FOR CARIBBEAN HEALTH: THE DEVELOPMENT OF A SYSTEM DYNAMICS MODEL FOR GUIDING POLICY ON DIABETES IN A RESOURCE LIMITED SETTING

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Background Type 2 diabetes (T2DM) is a major cause of morbidity and mortality in the Caribbean and a threat to development. Halting its rise by 2025, a WHO target, requires interventions addressing the determinants of unhealthy diet and physical inactivity. The objective of this project is to engage with stakeholders in the development of a system dynamics (SD) simulation model on the effect of different policy interventions on diabetes prevalence and mortality in the Caribbean.
Methods Following SD methodology, we used a mixed methods approach to combine interviews (n=13) with stakeholders from multiple sectors across four countries (Barbados, Belize, Jamaica, and Saint Vincent and the Grenadines) with existing data on regional NCD policy and quantitative evidence. An additional twenty-two interviews from stakeholders in 7 Caribbean countries that were conducted as part of an ongoing policy evaluation study were also reviewed. Participants were sampled from existing contacts and their referrals. Analysis was guided by iterative thematic analysis using a grounded approach.