Background Maintenance of muscle strength with age enables independent living for longer and may protect against chronic disease. Developmental and adult factors are associated with level of adult grip strength but evidence about their influence on its decline is sparse. We used longitudinal data to test whether birthweight, motor and cognitive development and patterns of pubertal growth were associated with trajectories of adult grip strength, and operated independently or on the same pathways as adult factors.

Methods The sample comprised 3058 men and women (6975 observations) in the MRC National Survey of Health and Development, a population-based British birth cohort study with up to three measures of grip strength from 53 to 69 years. Developmental factors included birthweight, maternal reports of motor milestone attainment, childhood cognitive test scores, and growth parameters of size, tempo and velocity. Covariates included lifetime social class, and adult height, BMI, verbal memory test scores, educational qualifications, health conditions and behaviours. We fitted multilevel models with the intercept and slope as random effects, included a linear age term, controlled for adult height and tested for age and sex interactions with each factor; then adjusted the developmental factors for each adult factor.

Results In men, heavier birthweight and childhood weight, beginning to walk ‘on time’, and later puberty, and in women, earlier age at first standing, were associated with stronger grip strength (but not its decline) independently of other developmental and adult factors. In women, there was an association between higher childhood cognition and stronger grip strength (but not its decline) which was attenuated by education. Men of higher childhood cognition showed a slower decline in grip strength (by 0.068 kg/year, 95% confidence interval (CI) 0.024, 0.11 per 1SD, p=0.003); this latter association was attenuated by adult verbal memory which became increasingly positively associated with grip strength at later ages (by 0.10 kg/ year, 95% CI 0.061, 0.15 per 1SD, p<0.001). In contrast, the positive association between adult BMI and grip strength in men weakened (by −0.057 kg/ year, 95% CI −0.11, −0.0056 per 1SD, p=0.03).

Conclusion Patterns of growth, motor development and lifetime cognition have persisting associations with grip strength between midlife and old age. Associations with cognition strengthened over this 16 year period suggesting that grip strength increasingly reflects neural ageing processes. Interventions that promote muscle development by targeting developmental factors, or maintain muscle strength by targeting adult risk factors should increase the chance of an independent old age.
Background Frailty is recognised as an important public health concern among older people due to its detrimental consequences on health. Alcohol consumption may be a plausible risk factor for frailty. There is only limited evidence in the literature on association between alcohol and frailty, which is still controversial. Therefore we investigated the relationship between alcohol consumption and the risk of incident frailty.

Methods A total of 2544 community-dwelling older people aged ≥60 years from the English Longitudinal Study of Ageing were followed for incident frailty over four years according to alcohol consumption. Frailty was defined using Fried frailty phenotype criteria with slight modification according to data availability. Questionnaire data on alcohol consumption was grouped into non-drinkers, >0–7 units/week, >7–14 units/week, >14–21 units/week, >21 units/week. Multivariable logistic regression models were used to examine incident frailty risk.

Results Compared with those drinking >0–7 units per week (reference), those drinking >21 units per week were less likely to develop frailty (Odds ratio (OR)=0.45, 95% confidence interval (CI)=0.27–0.73, p<0.001) in the unadjusted model, however the association became non-significant in the fully adjusted model controlling for age, gender, smoking, education and wealth (OR=0.65, 95% CI 0.38 to 1.11, p=0.12). There was no significant difference in incident frailty risk in those drinking >7–14 and >14–21 units per week compared to >0–7 units per week in any models. Non-drinkers had worse health profile and higher incident frailty risk than drinkers (fully adjusted OR=1.63, 95% CI 1.07 to 2.48, p=0.02).

Conclusion In this cohort non-drinkers had a significantly higher risk of developing frailty compared to light drinkers (≥0–7 units per week). No significant associations were observed among drinkers. The true association between alcohol and frailty may have been affected by a ‘sick-quitter’ effect (i.e. drinkers who are ill health tend to reduce or cease alcohol use), which should be addressed in future research.