

Paper presented at the International Association of Gerontology and Geriatrics European Region Congress, Gothenburg, Sweden in May 2019.

## **Drivers of Frailty from Adulthood into Old Age: Results from a 27-year Longitudinal Population-Based Study in Sweden**

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**Background:** The frailty index (FI) is marker of biological age and a strong predictor of mortality and various health outcomes in old age. However, younger (old) subjects are less frequently studied, and the drivers of frailty across the whole adult lifespan are not well characterized. This study aimed at investigating the longitudinal trajectories of frailty from adulthood to late life and identifying the predictors for the level and rate of change in the FI.

**Methods:** We performed an age-based latent growth curve analysis in the Swedish Adoption/Twin Study of Aging (SATSA, n=1,842, aged 29-96 years at enrolment) using data from up to 15 measurement waves across 27 years. A 42-item FI, based on the Rockwood deficit accumulation model was used to assess the level of frailty at each wave. Those predictors that had repeated measurements available were treated as time-varying covariates.

**Results:** A bilinear two-slope model with an inflection point (intercept) at the age of 70 years provided the best fit to the data. A 2.5-fold increase in the rate of change in the FI was observed at the age of 70. Female sex, low leisure time physical activity, poor social support, high body mass index (BMI), low general cognitive ability and adoption at young age were associated with higher levels of FI at the inflection point. High social support was associated with higher rate of change in FI until the age of 70 years. Low physical activity and low BMI were associated with higher rate of change in FI after the age of 70 years.

**Conclusion:** Our study highlights the role of physical activity and BMI as predictors of the level and rate of change in frailty. The association between social support and change in frailty warrants further investigation.