

incident CHD, on average 1.9% by each ACE. Estimated hazards of CHD are more likely to depend on ACEs combinations than counts of ACEs. For instance, those who experienced three ACEs (financial hardships, early-life parental separation, and hospitalisation) had 1.52 times higher hazard (95%CI: 1.10 to 2.12), while those who had four ACEs (poor parental attachment, financial hardships, parental harsh punishment, and early-life parental separation) had 1.31 times higher hazard (95%CI: 1.03 to 1.67), than those did not have ACEs.

**Conclusion** The findings of this study show that there is incremental risk of CHD in ACEs combinations. As the ACEs are more likely to co-occur, even if an individual ACE had no associations with increased risk of CHD, it is crucial to intervene in ACEs holistically. By taking away all types of ACEs, we estimated that 13% probability of developing CHD could be eliminated. This finding can be scientific evidence for early childhood framework for intervention to reduce health inequalities over life course, which are originated in early life.

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## Non-Communicable Disease: Multi-Morbidity

OP27

### SOCIODEMOGRAPHIC AND LIFESTYLE PREDICTORS OF INCIDENT HOSPITAL ADMISSIONS WITH MULTIMORBIDITY IN A GENERAL POPULATION 1999–2019: THE EPIC-NORFOLK COHORT

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**Background** The ageing population and prevalence of long-term disorders with multimorbidity is a major health challenge worldwide. Patients with multimorbidity account for a disproportionately high share of healthcare workload and costs and experience reduced wellbeing and quality of life. The associations between comorbid conditions and mortality risk are well established; however, few prospective community-based studies have reported on prior risk factors for incident hospitalisations with multimorbidity. Our study examines the independent associations for a range demographic, lifestyle and physiological determinants and the likelihood of subsequent hospital incident multimorbidity using a prospective community-based cohort of middle-aged and older men and women resident in Norfolk, UK. We explore demographic, lifestyle and physiological exposures including age and sex, body mass index, cigarette smoking, alcohol intake, educational attainment, occupational social class, physical activity, plasma vitamin C, total cholesterol, systolic blood pressure and common prevalent diseases.

**Methods** Incident hospital admissions with multimorbidity were examined in 25014 men and women aged 40–79 in EPIC-Norfolk, a British prospective population-based study initially recruited in 1993–1997 and followed-up until 2019. The determinants of incident multimorbidity, defined as Charlson Comorbidity Index  $\geq 2$ , were examined in multivariable models for the 10-year period 1999–2009 and

repeated with independent measurements in a second 10-year period 2009–2019.

**Results** Between 1999–2009 18179 participants (73% of the population) had a hospital admission. Baseline 5-year and 10-year incident multimorbidity were observed in 11% and 21% of participants respectively. Age per 10-year increase OR 2.13 (95% CI 2.03–2.23) and male sex OR 1.28 (95% CI 1.17–1.39) predicted incident multimorbidity over 10 years. In the subset free of the most serious diseases at baseline, current smoking OR 1.71 (95% CI 1.53–1.91), BMI  $>30$  kg/m<sup>2</sup> OR 1.37 (95% CI 1.24–1.51) and physical inactivity OR 1.09 (95% CI 1.00–1.18) were positively associated and plasma vitamin C (a biomarker of plant food intake) per SD increase OR 0.88 (95% CI 0.84–0.91) inversely associated with incident 10-year multimorbidity after multivariable adjustment for age, sex, social class, education, alcohol consumption, systolic blood pressure and cholesterol. Results were similar when re-examined for a further time period 2009–2019.

**Conclusion** Age, male sex and potentially modifiable lifestyle behaviours including smoking, physical inactivity and low fruit and vegetable intake were associated with increased risk of future incident hospital admissions with multimorbidity.

OP28

### MULTIMORBIDITY AND FIT NOTE RECEIPT IN WORKING AGE ADULTS WITH LONG-TERM HEALTH CONDITIONS

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**Background** Research on sickness absence has typically focused on single diagnoses, despite increasing recognition that long-term health conditions are highly multimorbid and clusters comprising coexisting mental and physical conditions are associated with poorer clinical and functional outcomes. The digitisation of sickness certification in the UK offers an opportunity to address sickness absence in a large primary care population.

**Methods** Lambeth Datanet is a primary care database which collects individual level data on GP consultations, prescriptions, Quality and Outcomes Framework (QOF) diagnostic data, sickness certification (fit note receipt) and demographic information (including age, gender, self-identified ethnicity, and truncated postcode). We analysed 326,415 people's records covering a 40-month period from January 2014 to April 2017.

**Results** We found significant variation in multimorbidity by demographic variables, most notably by self-defined ethnicity. Multimorbid health conditions were associated with increased fit note receipt. Comorbid depression had the largest impact on first fit note receipt, more than any other comorbid diagnoses. Highest rates of first fit note receipt after adjustment for demographics were for comorbid epilepsy and depression (HR 4.0; 95% CI 3.4–4.6), followed by chronic pain and depression (HR 3.9; 95% CI 3.5–4.4) and cardiac condition and depression (HR 3.9; 95% CI 3.2–4.7).