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Effect modification of familial longevity on the association between kidney dysfunction, cardiovascular disease, and mortality

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OBJECTIVES/GOALS: Objective: To examine whether familial longevity modifies the relationship between chronic kidney disease (CKD) and cardiovascular disease (CVD) in older adults. Goals include assessing the impact of familial longevity on 1) CVD prevalence, 2) CVD incidence, and 3) mortality among individuals with CKD. METHODS/STUDY POPULATION: An observational, longitudinal study. We examined 1,236 Ashkenazi Jewish adults (ages 65–94) from the LonGenity cohort. Estimated glomerular filtration rate (eGFR) was the independent variable, calculated using the CKD-EPI equation 2021. CVD prevalence, incidence, and mortality were our outcomes. CVD was defined as a composite of MI, PCI, CABG, or stroke. Exceptional longevity was defined as living past 95 years, grouping participants into OPEL (offspring of parents with exceptional longevity, n = 576) and OPUS (offspring of parents with usual survival, n = 604). Stratified logistic regression and Cox proportional hazards models assessed eGFR's association with CVD, testing effect modification through eGFR × OPEL interaction terms. Median follow-up was 5.5 years. RESULTS/ANTICIPATED RESULTS: A significant association was observed between eGFR and CVD prevalence in OPUS, but not in OPEL. No significant link was found between eGFR and CVD incidence or mortality in either group. Familial longevity did not modify the association between eGFR and CVD prevalence, nor the composite of CVD incidence and mortality, as the interaction term was nonsignificant. The LonGenity cohort's health status may have influenced these results due to selection and survivor biases, limiting generalizability. Further research is needed to clarify familial longevity's role in kidney function and cardiovascular outcomes. DISCUSSION/SIGNIFICANCE OF IMPACT: Our findings suggest that kidney function, as measured by eGFR, may be associated differently with cardiovascular risk in those with and without familial longevity. The study highlights potential limits of familial longevity in modifying CVD risk associated with CKD, underscoring the need for tailored CVD prevention strategies.

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ABCD Study Child Opportunity Index Factor Structure: The association between environment and cognitive performance

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OBJECTIVES/GOALS: The neighborhoods children grow up in are critical drivers of social, emotional, and cognitive development. This study utilized factor scores of environment, education, and socioeconomic variables in the Adolescent Brain Cognitive Development Study (ABCD) and its association with cognitive functioning in youth. METHODS/STUDY POPULATION: This study used ABCD (n = 9,543) linked external data, cognitive performance, and self-reported data from youth (ages 9–10) and their caregivers. We utilized four factor scores of the Child Opportunity Index 2.0 (COI), including socioeconomic attainment, poverty, neighborhood enrichment, and child education. Furthermore, this study investigated the association between the COI factors and youth cognitive functioning via the NIH Toolbox. Covariates included age, sex, county level crime rates, perceptions of neighborhood threat, parent education, and family income; site and family relationship were held as random effects. RESULTS/ANTICIPATED RESULTS: Increased Socioeconomic Attainment and Child Education factor scores were distinctly associated with increased cognitive performance across all subscales and composite scores that include aspects of overall cognitive ability, executive functioning, and learning and memory. Increased poverty factor scores were significantly associated with decreased cognitive performance across all substances and composite scores. Finally, increased neighborhood enrichment factor scores were significantly associated with increased oral reading recognition task scores only and no other cognitive task. DISCUSSION/SIGNIFICANCE OF IMPACT: Findings suggest distinct dimensions of neighborhood opportunity associated with aspects of cognition. The present study can help to inform public health efforts and policy on improving modifiable built and natural environmental structures that may aid in supporting cognitive development.

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A computational phenotype for carbapenem-resistant Enterobacterales and extended-spectrum beta-lactamase-producing Enterobacterales infections to support electronic health record-based surveillance efforts

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OBJECTIVES/GOALS: The objective of this project was to develop electronic health record-based algorithms, or computational phenotypes, for carbapenem-resistant Enterobacterales (CRE) and extended-spectrum beta-lactamase-producing Enterobacterales (ESBL) infections based on public health surveillance case definitions. METHODS/STUDY POPULATION: We analyzed electronic health records (EHR) from a retrospective cohort of patients within the University of Colorado Health System. We detected CRE and ESBL infections using a set of string-matching algorithms for bacterial organism, specimen source, and antibiotic susceptibility test results. Infections were limited to the first case of each organism per patient in a 30-day period. We conducted manual chart review on a subset of cases and non-cases for validation purposes. We then performed a descriptive analysis to examine demographic characteristics of patients with CRE and ESBL infections including sex, age, infection type, and organism. All analyses were conducted using R statistical software. RESULTS/ANTICIPATED RESULTS: There were 634 CRE infections from 2013 to 2023, with the majority from urine (n = 448, 70.7%) or blood specimens (n = 56, 8.8%). Over half of CRE case-patients were female (n = 362, 57.1%). The mean age was 65.0 years. Most isolates were identified as Enterobacter cloacae

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