

### Census tract-level association between racial composition and life expectancy among 492 large cities in the United States



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**Purpose:** Non-Hispanic black communities in the US experience below-average life expectancy (LE). However, little is known about how the magnitude of these inequities vary between major US cities. We sought to understand variability in the relationship between percent of census tract residents who were non-Hispanic black and tract-level LE.

**Methods:** We obtained census tract-level estimates of LE in 492 large US cities from the US Small Area Life Expectancy Estimates Project and combined them with socio-demographic data from the American Community Survey. We fit a multilevel linear null model to partition the variance in LE between the tract, city, and state levels. We estimated a random slope model to quantify the degree to which the association between percent non-Hispanic black and LE in census tracts varied between cities.

**Results:** In a null model, 10% of LE variation was at the state level, 21% at the city level, and 69% was within cities at the tract level. Detroit and Flint, Michigan, both majority-black cities, had the lowest city-level average LE estimates (>5 years below average), and Chicago had the widest range for tract LEs (30.1 years). Nationally, a 10-point increase in tract percent non-Hispanic black was associated with 1.1 years shorter LE (95% CI: 1.0, 1.1). However, there was considerable variation in this association (standard deviation for random slope = 0.29).

**Conclusions:** The magnitude of inequalities in LE by tract racial composition varied considerably between cities. Further research to understand this variability can inform efforts to address urban health inequities.

### Association between smoking status and homocysteine levels and possible effect modification by cholesterol and estradiol



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**Introduction:** Environmental and dietary exposures alter the levels of homocysteine in the human body; however, little is known about the association of smoking status with homocysteine levels. This study aimed to examine the association of smoking status with homocysteine levels and to determine whether the association is modified by estradiol or cholesterol.

**Methods:** Data (n=4,580) were obtained from National Health and Nutrition Examination Survey 2003-2004 with analysis done in 2018 on adults aged  $\geq 20$  years. The outcome was homocysteine; smoking status exposure was categorized as current, former or never smoker. Current smoker defined as a person who smoked  $\geq 100$  cigarettes in their lifetime and at least once in the last month; former smoker- one who had smoked  $\geq 100$  cigarettes and had quit smoking at the time of the interview; never smoker- adult who never smoked cigarettes in their lifetime or less than 100 cigarettes in their lifetime. Generalized linear models were used to examine the associations between smoking status and homocysteine levels, while assessing the impact of estradiol and cholesterol. Estradiol was stratified as low (<10 pg/ml), normal (10-40 pg/mL), and high (>40 pg/ml). Cholesterol level was stratified as normal (<200mg/dl) or high ( $\geq 200$ mg/dl).

**Results:** 1044 (22.8%), 1241 (27.1%), and 2295 (50.1%) were current, former, and never smokers, respectively. Former smokers had higher mean levels of homocysteine, compared to current smokers and never smokers [ $10.24 \pm 5.82$   $\mu\text{mol/L}$  vs.  $9.78 \pm 5.26$   $\mu\text{mol/L}$  vs.  $8.79 \pm 3.88$   $\mu\text{mol/L}$ ]. Comparing individual means using Tukey's method, there were statistically significant differences between former smokers and never smokers [(former smokers: 0.20 CI: 0.03, 0.38), (current smokers: 0.14 CI: -0.03, 0.31)]. After adjusting for age, sex, ethnicity, education, and income level, homocysteine levels did seem to differ by smoking status [(former smokers: 0.10 CI: -0.09, 0.28), (current smokers: 0.18 CI: 0.00, 0.36)]. Estradiol and cholesterol did not

moderate the association between smoking status and homocysteine levels ( $p > 0.05$ ).

**Conclusion:** Homocysteine levels did differ among smoking groups after adjusting for confounders. It is important not to initiate smoking due to the risk factors of elevated homocysteine levels.

### Leukocyte telomere length and cardiovascular disease mortality among U.S. adults: effect modification by race



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**Purpose:** To examine the association of leukocyte telomere length (LTL) – a well-established biomarker of aging – with cardiovascular disease (CVD) mortality in a nationally representative sample of US adults aged 18-84 years and whether race is an effect modifier.

**Methods:** In the National Health and Nutrition Examination Survey in 1999-2002, LTL was measured from 7,596 participants aged 18-84 years. We classified participants based on sex-, age-, and race/ethnicity-specific LTL quartile. Death from CVD and survival time were obtained by linking to the National Death Index up to 12/31/2015. We used Cox proportional hazards regression to estimate the risk of CVD mortality by LTL quartile adjusting for socio-demographics, active and passive smoking, body mass index, and CVD diagnosis. We examined the effect modification by race through interaction terms and stratification analysis.

**Results:** Over up to 16 years of follow-up, 351 CVD deaths (4.6%) occurred with an average of 7.7-year survival time. The shortest quartile of LTL (4.32-4.96 kilobase) was associated with 36% higher CVD mortality (adjusted hazard ratio [HR]: 1.36, 95% CI: 0.87-2.14), compared to the longest LTL quartile (5.53-11.27 kilobase). The association was significant in non-Hispanic African Americans (HR: 2.23, 95% CI: 1.11-4.47), but not in other race/ethnicity groups (HR: 1.26, 95% CI: 0.80-2.01). These associations were similar when we only included deaths from coronary heart diseases.

**Conclusion:** Short LTL was associated with increased CVD mortality in non-Hispanic African Americans, but not in non-Hispanic whites.

### Toward a better understanding of PrEP-related behavior: PrEP awareness, past and current use, and intent to use PrEP in the future among HIV-negative MSM in three US cities, 2018



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**Purpose:** HIV pre-exposure prophylaxis (PrEP) use is increasing among men who have sex with men (MSM), and prevention specialists need ongoing understanding of use prevalence and associated variables.

**Methods:** A 2018 convenience sample of MSM was recruited online and through community venues in Atlanta, Detroit, and New York City. We analyzed demographic variables of race/ethnicity, age group, education level, and city, in association with PrEP awareness, current and ever use, and intent to use PrEP in the future.

**Results:** In the analytic sample of HIV-negative MSM (n=641), 47% were men of color and 43% were age 18-29 years old. Nearly all (97%) of the men were aware of PrEP, 30% were currently using it, 37% had ever used it, and 79% intended to use PrEP in the future. Black and Hispanic/Latino (vs white) MSM had lower odds of having heard of PrEP (AOR=0.42 [95% CI=0.18-0.98] and AOR=0.28 [95% CI=0.12-0.68] respectively), and black (vs white) men had lower odds of intending to take PrEP in the future; there were no racial/ethnic differences in current and ever use of PrEP ( $p > .05$ ). Detroit (vs Atlanta) had lower odds of having heard of PrEP, current and ever use, and intent to use PrEP; differences were also found by age group and education level.

**Conclusion:** We found broad awareness and notable use of PrEP, and most men intended to use PrEP in the future. These 2018 findings are encouraging for PrEP implementation, however important sociodemographic differences exist and MSM could benefit from more targeted messaging.