

ASSOCIATION BETWEEN SUNSCREEN METABOLITE AND WHITE BLOOD CELLS IN THE US POPULATION

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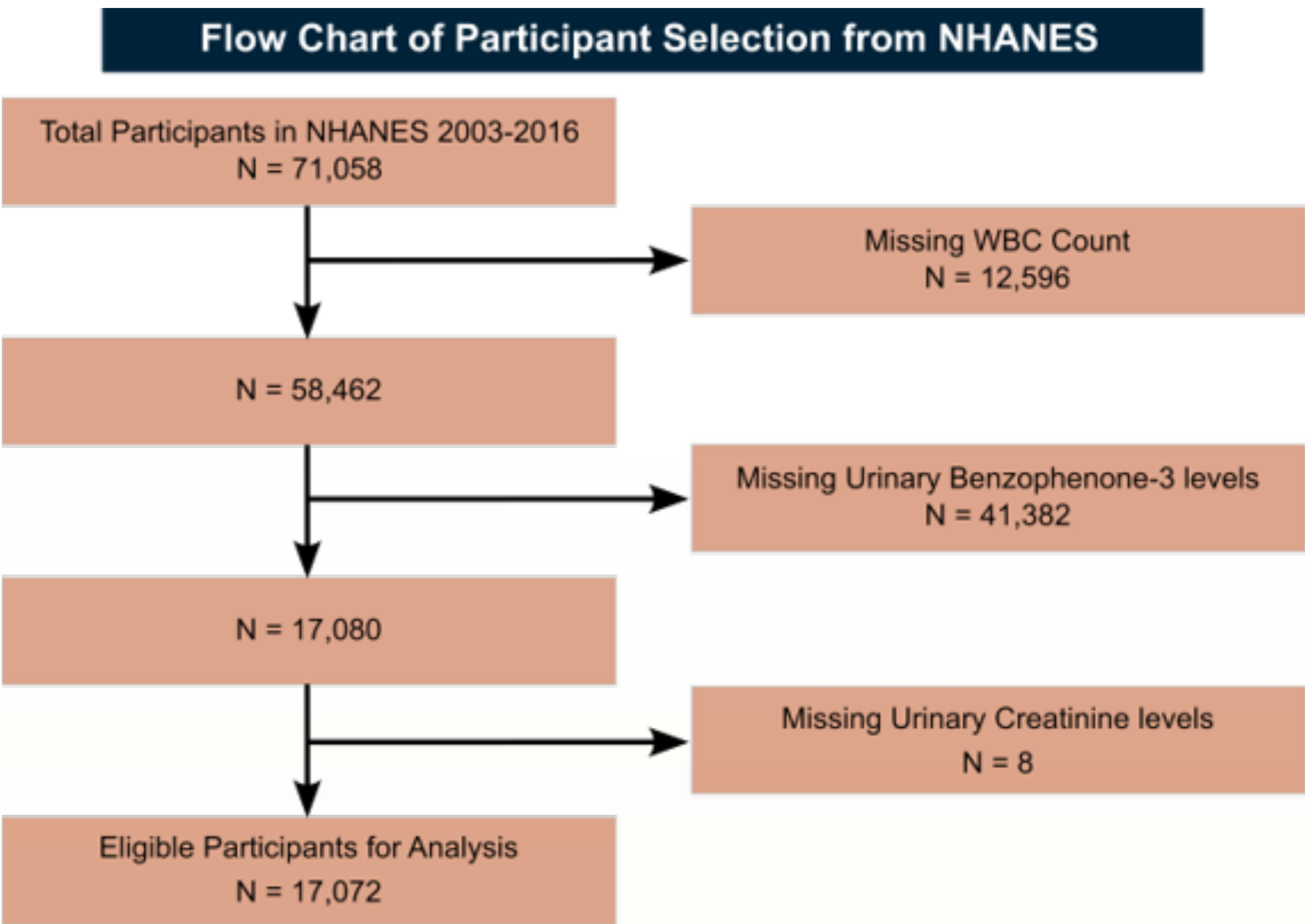
INTRODUCTION

- An organic UV filter, benzophenone-3 (BP-3) is widely used in sunscreens.
- The water resistance, minimal white cast after application, and non-greasiness of BP-3 containing sunscreens makes them appealing to users.
- BP3 is absorbed through the skin, excreted in the urine, and disrupts hormones.
- Animal models and in vitro human lymphocyte studies have shown that BP-3 has immunomodulatory effects and increases inflammatory cytokines.
- However, the association between BP-3 and white blood cells (WBC) using large cohort of the United States population has not been explored.

METHODS

- We used the continuous NHANES data from 2003-2016 (Flow chart).
- Urinary BP-3 and urinary creatinine were used to calculate creatinine-normalized urinary BP-3 (CnBP-3) to account for urinary dilution/concentration.
- We used survey-weighted linear regression models.
- Models were adjusted for age, gender, race, body mass index (BMI), smoking status, family income to poverty ratio (FIPR), highest level of education attained, sunscreen use, season, and survey cycle.

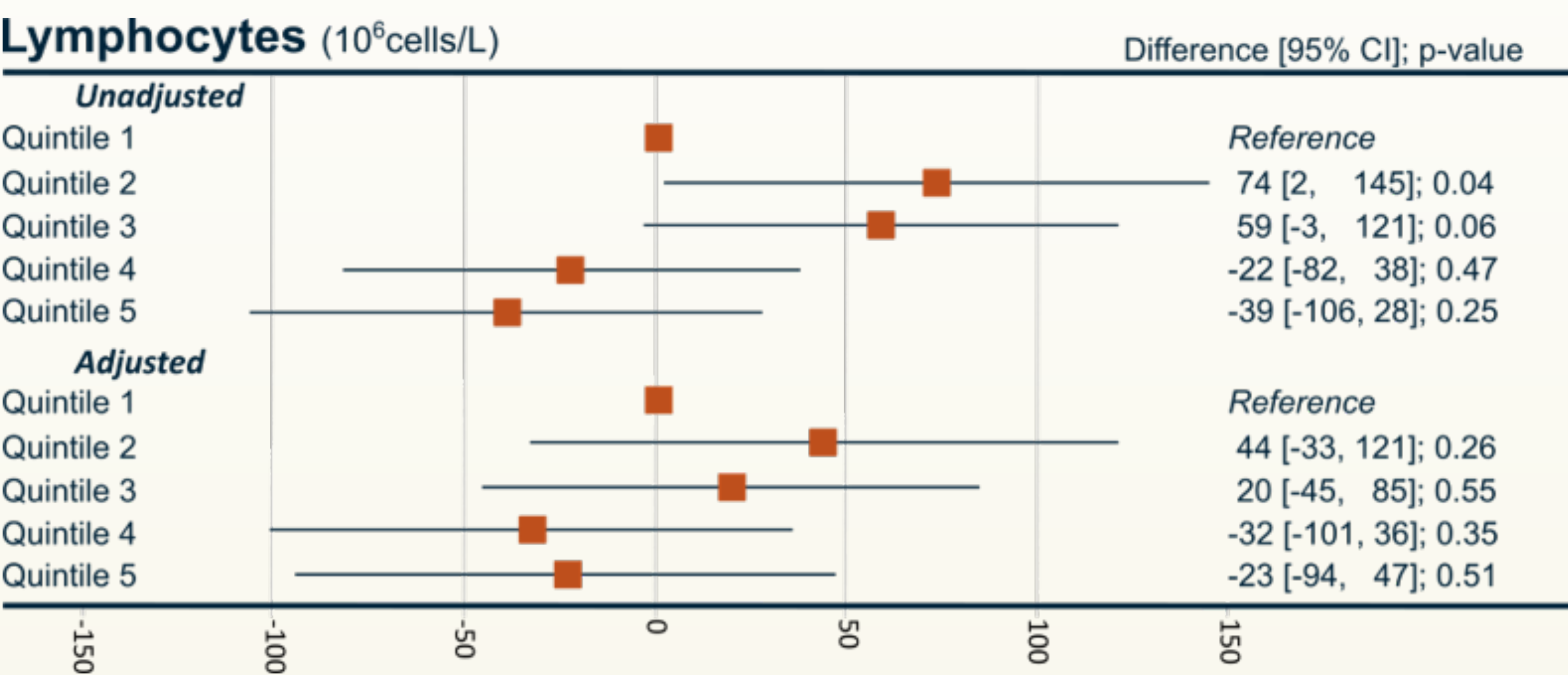
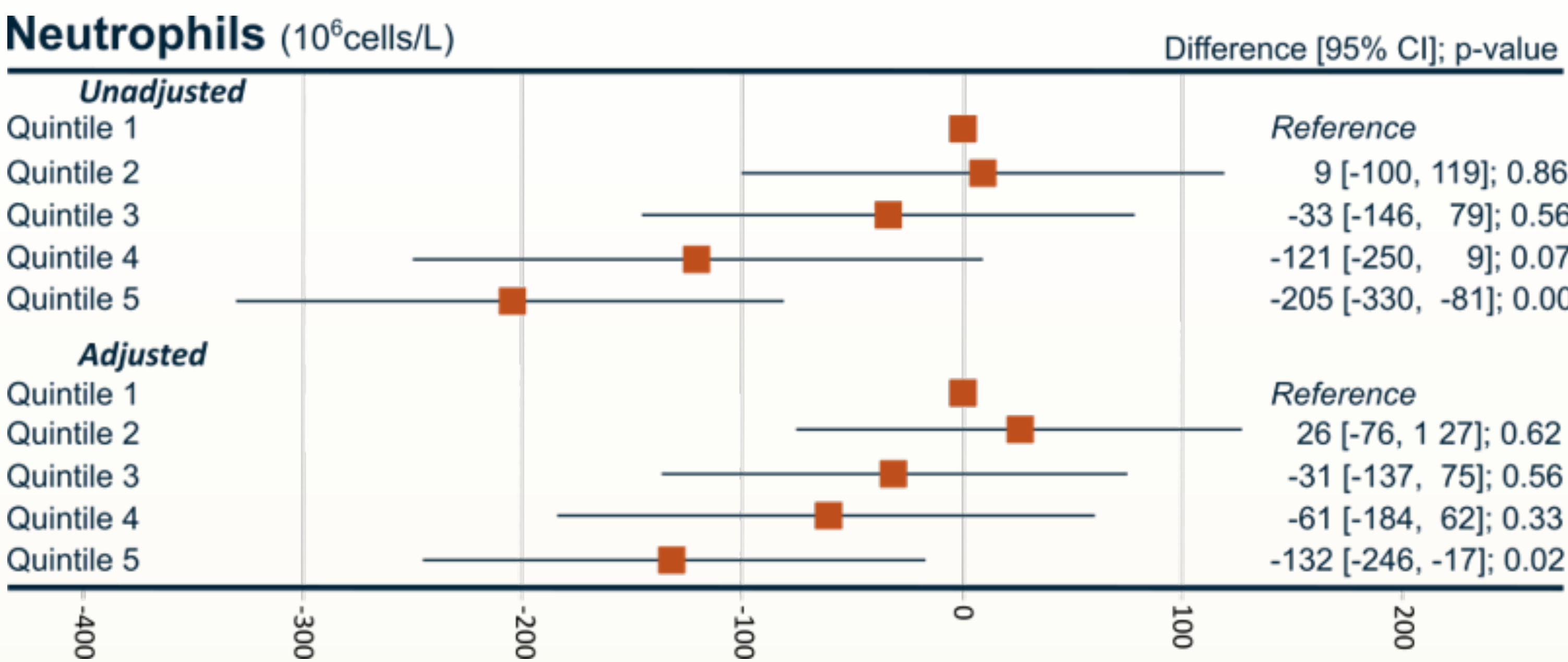
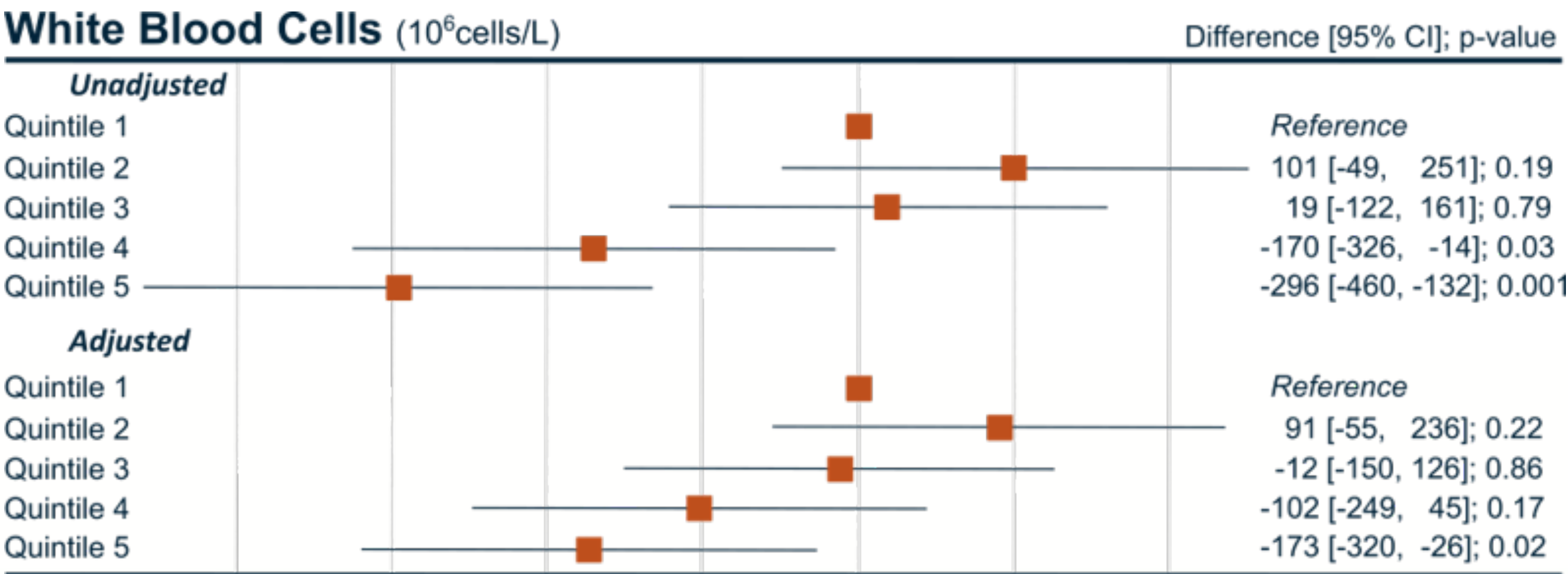
METHODS



RESULTS

- Of the 17,072 study participants, 8,564 (50.5%) were females, 6,602 (38.9%) were Whites, 3,870 (22.8%) were Blacks, and 4,903 (28.9%) were Hispanic.
- The mean (SD) age was 37.5 (22.7) years, and median (IQR) CnBP-3 was 12.2(44.9) $\mu\text{g/gm}$, and mean (SD), BMI was 26.6 (7.43).
- Mean (SD) WBC count was 7.22 (2.53), Neutrophil count was (4.15 (1.86), and Lymphocyte count was 2.25 (1.33).
- Of study participants, 2,453 (14.5%) were smokers, 2,557 (22.5%) were college graduates, 3,986 (25.4%) had FIPR of <1 , 3,509 (22.4%) had FIPR of >4 , and 2,739 (42.2%) reported using sunscreen regularly.
- Increased CnBP-3 levels were associated with statistically significant decrease in WBC and neutrophil counts, but not lymphocytes (Figures 1-3).

RESULTS



CONCLUSIONS

- We found that higher CnBP-3 levels were associated with statistically significant decrease in WBC and neutrophil counts, but not lymphocytes.
- Potential myelosuppressive or anti-inflammatory effects of BP-3 need further exploration .