

# NOPREN Drinking Water Working Group

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**Research Letter**

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# **Association of Caloric Intake From Sugar-Sweetened Beverages With Water Intake Among US Children and Young Adults in the 2011-2016 National Health and Nutrition Examination Survey**

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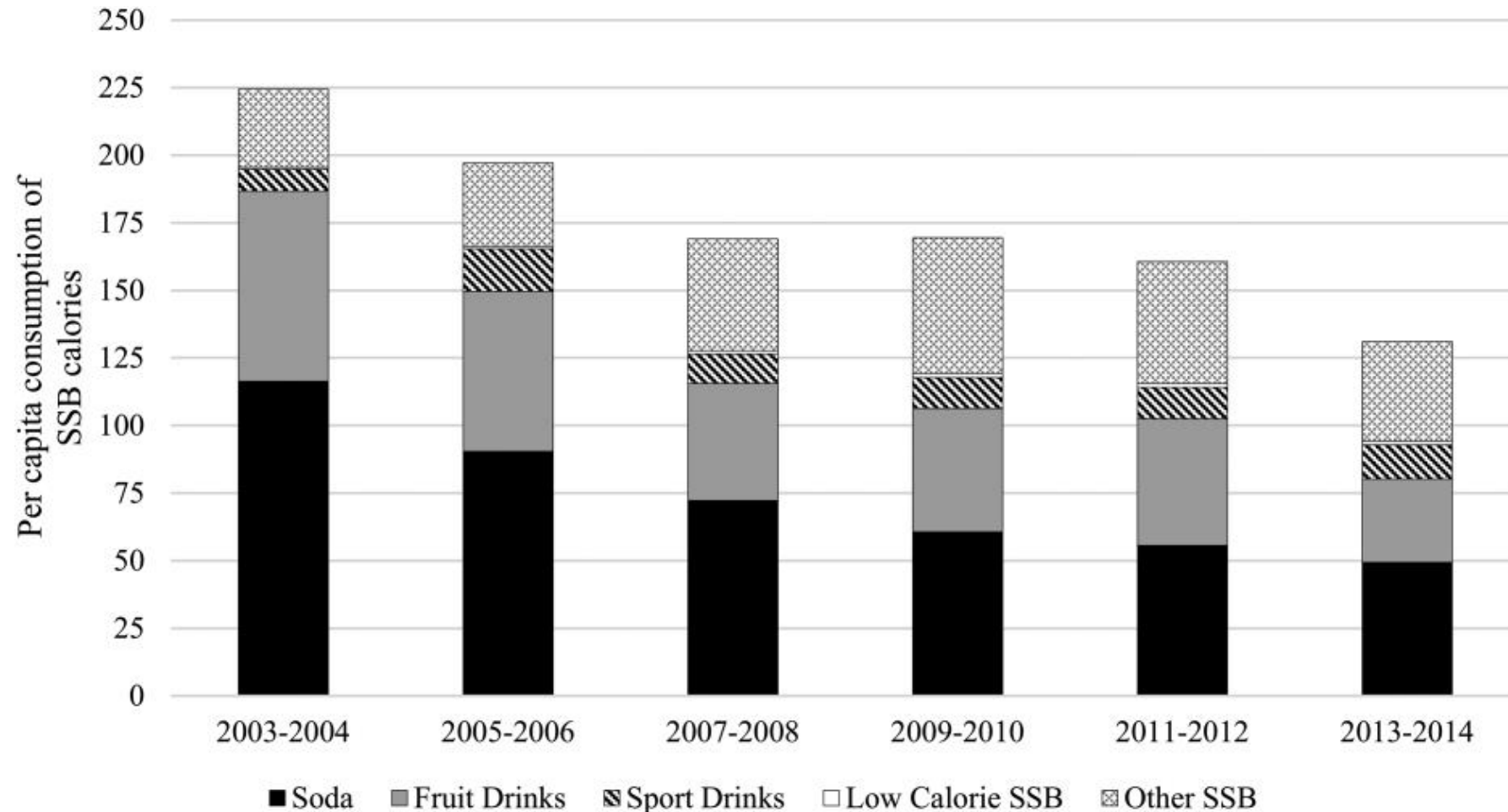
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# Why are sugar-sweetened beverages important?

- Sugar-sweetened beverage consumption has been linked to many negative health conditions, such as weight gain, cavities, and type 2 diabetes.
- The 2015-2020 Dietary guidelines for Americans recommend reducing added sugars consumption to less than 10% of calories per day.

# Declining SSB intake for kids since 2003



# Water as a key potential intervention point

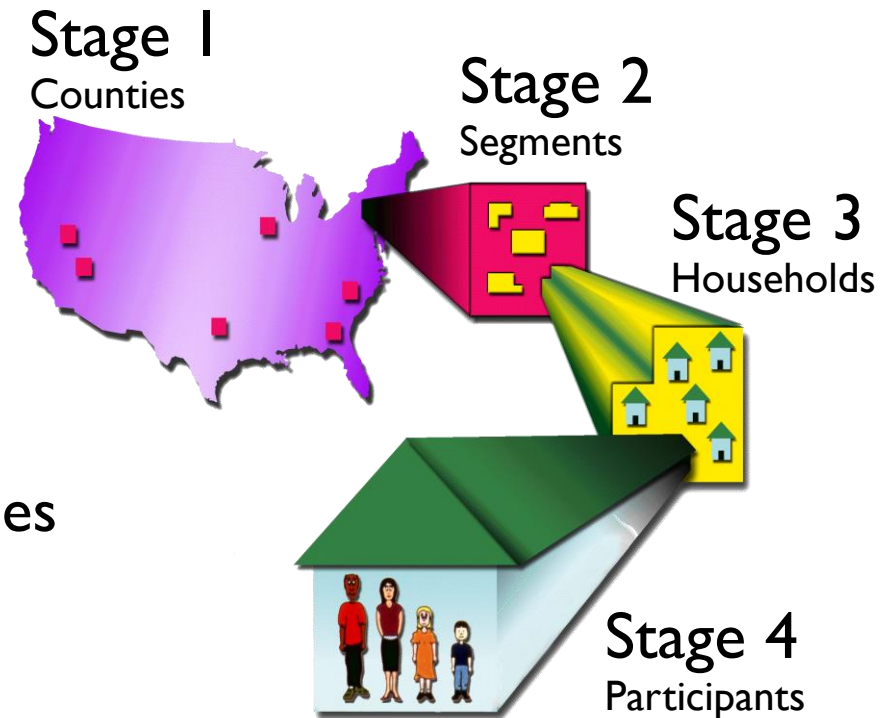
- Substituting water for SSBs may reduce total energy intake (Wang et al., 2009)
- School-based interventions to displace SSBs by increasing water access were associated with decreased body mass index (Schwartz et al. 2016)
  - However, how water consumption in daily life is associated with children's caloric intake from SSBs is unclear.

# Aims

- To assess what percentage of children and young adults did not consume water on a given day
- To test whether the number of calories and percentage of total energy intake from SSBs differed among US children by water intake status on a given day.

# Data Source: National Health and Nutrition Examination Survey (NHANES)

- Conducts interviews and examinations to assess the health and nutritional status
  - Representative of civilian, non-institutionalized, household population in the US
- Complex, multistage, probability sampling design
- Study sample:
  - $n = 8,400$  children 2-19 years
  - 2011-12 through 2015-16 survey cycles



# Water Intake and SSB Measures

- 24 hour dietary recall
  - Water from all foods and liquids
- Water intake outcomes:
  - Plain water (% >0ml from tap and bottled)
- Sugar-sweetened beverages (SSBs) included:
  - regular soda,
  - fruit drinks (incl sweetened bottled waters and fruit juices and nectars with added sugars),
  - sports and energy drinks,
  - sweetened coffees and teas,
  - other SSBs (including horchata and sugar cane beverages).
- SSBs do not include diet drinks [defined as approximately, < 40 kcal/240 mL of the beverage]; 100% fruit juice; beverages sweetened by the participant, including coffee and teas; alcohol; or flavored milks.



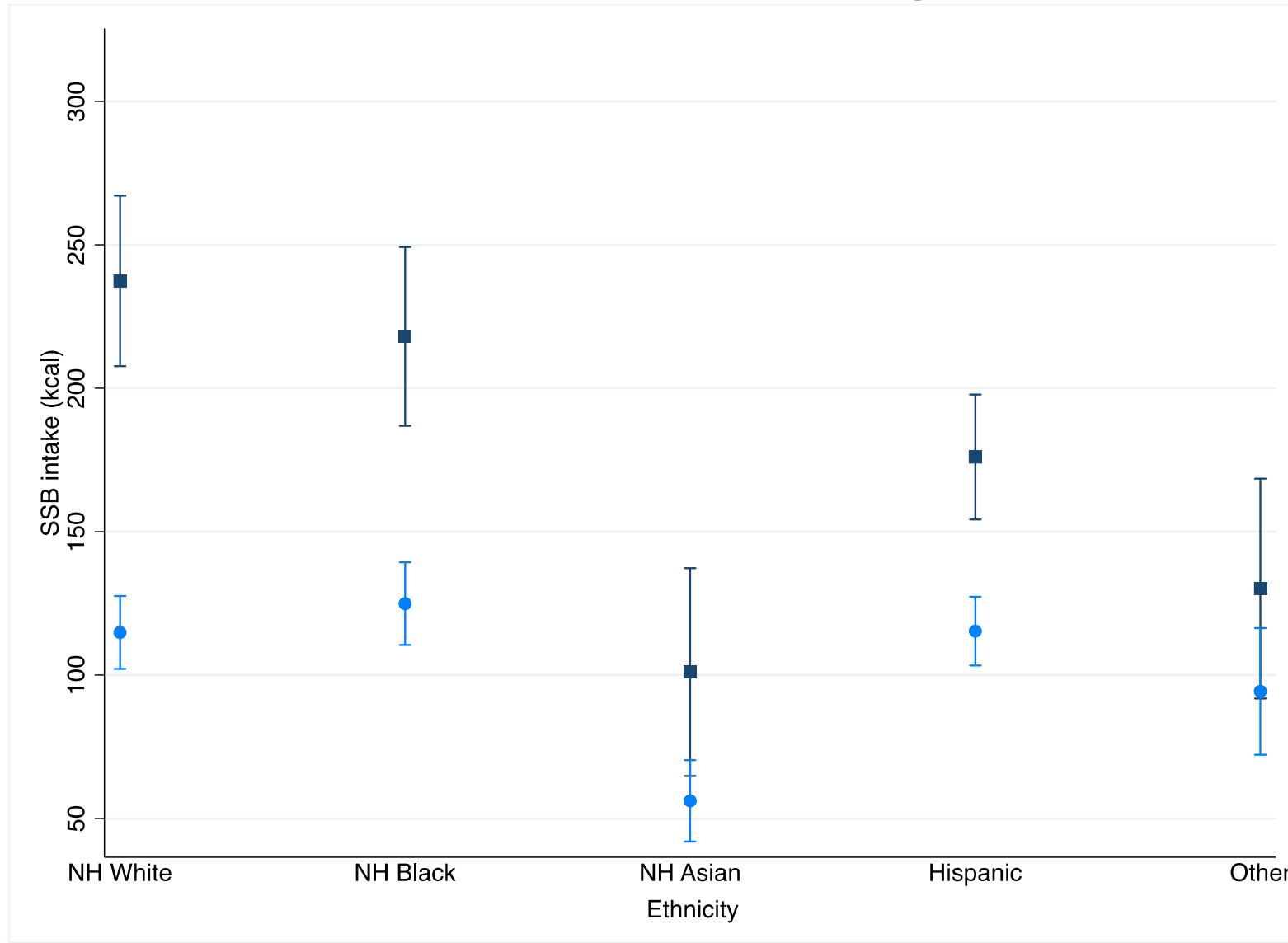


**79.7%** (SE, 1.0%) of children reported drinking plain water

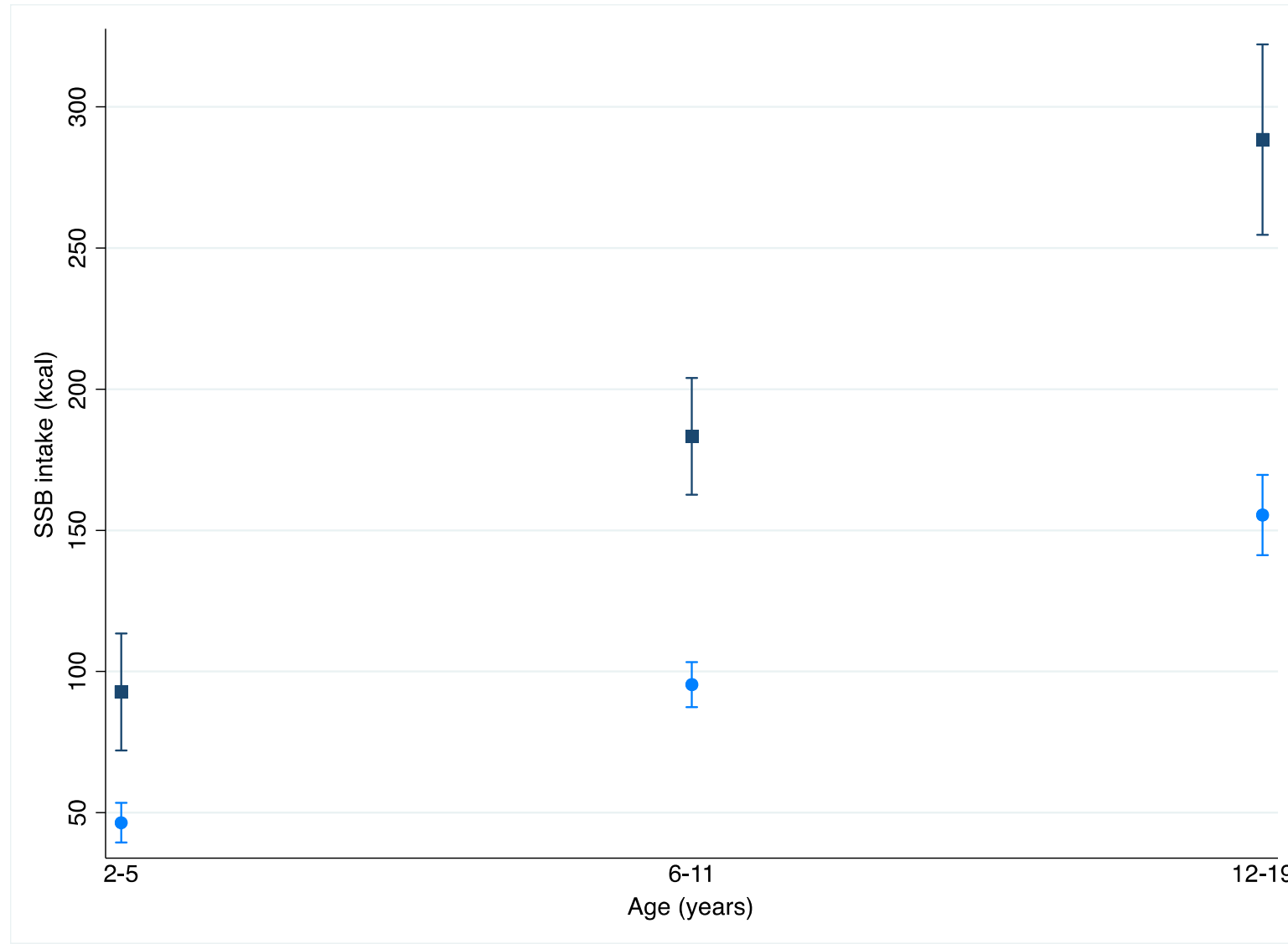
Which means:

**20%** of US kids didn't drink water on a given day

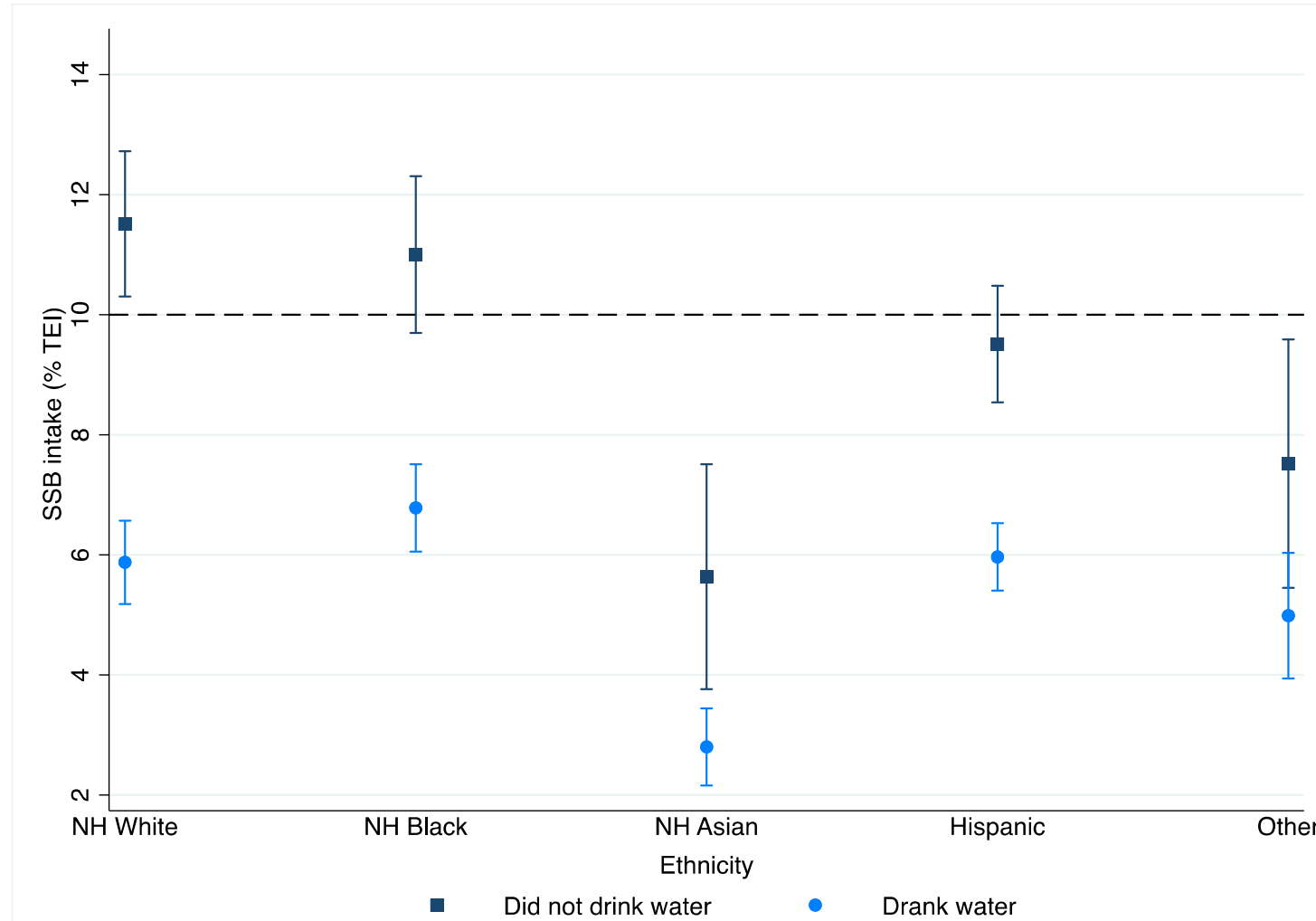
Overall effect of 93 kcal difference, but significant interaction between water drinking status and ethnicity



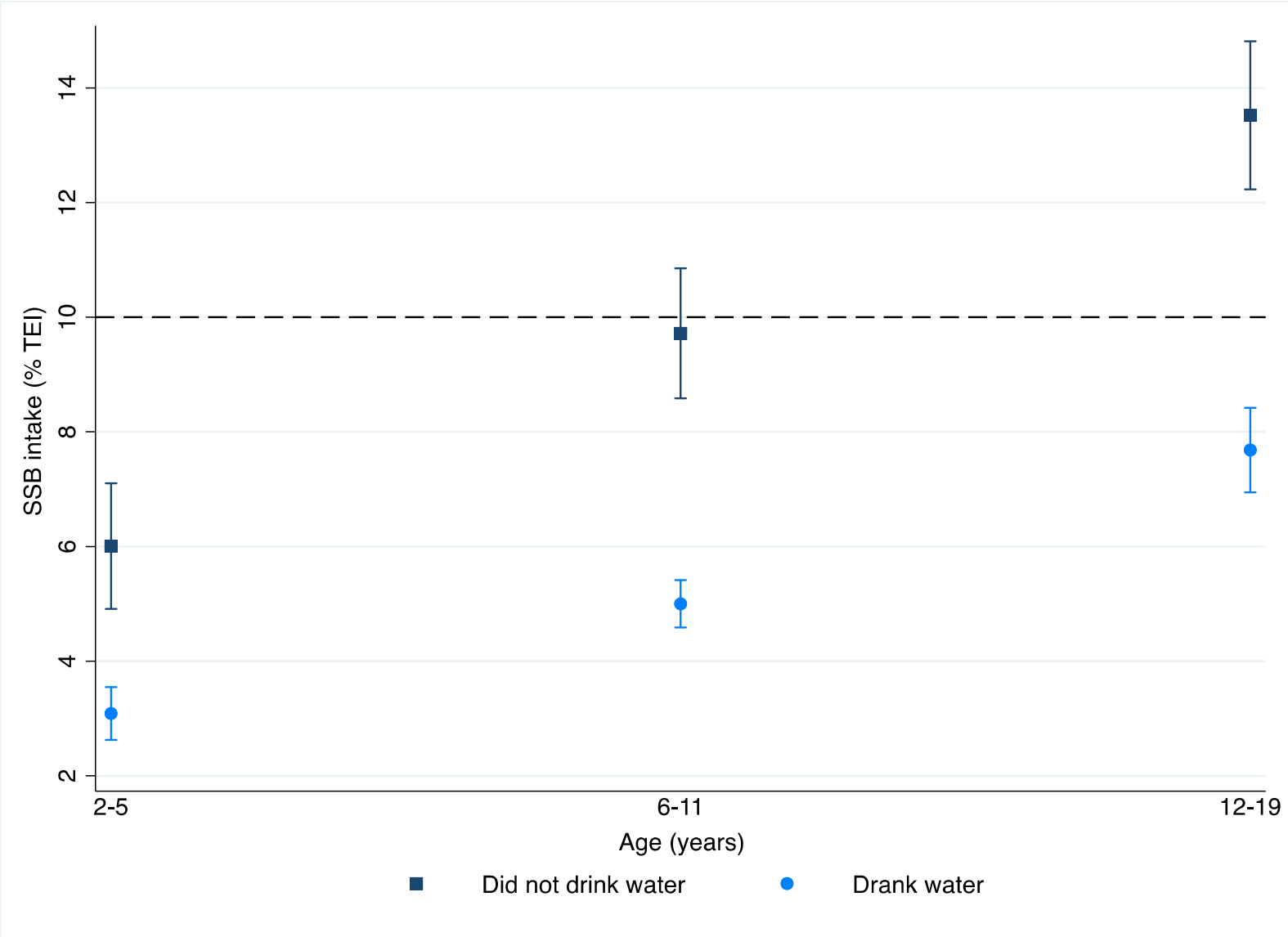
# Significant interaction between water drinking status and age group – larger gap for 12-19 yr olds



Not drinking water was associated with 4.5% more calories from SSBs, NH white and black children consumed more than 10% of total calories from SSBs



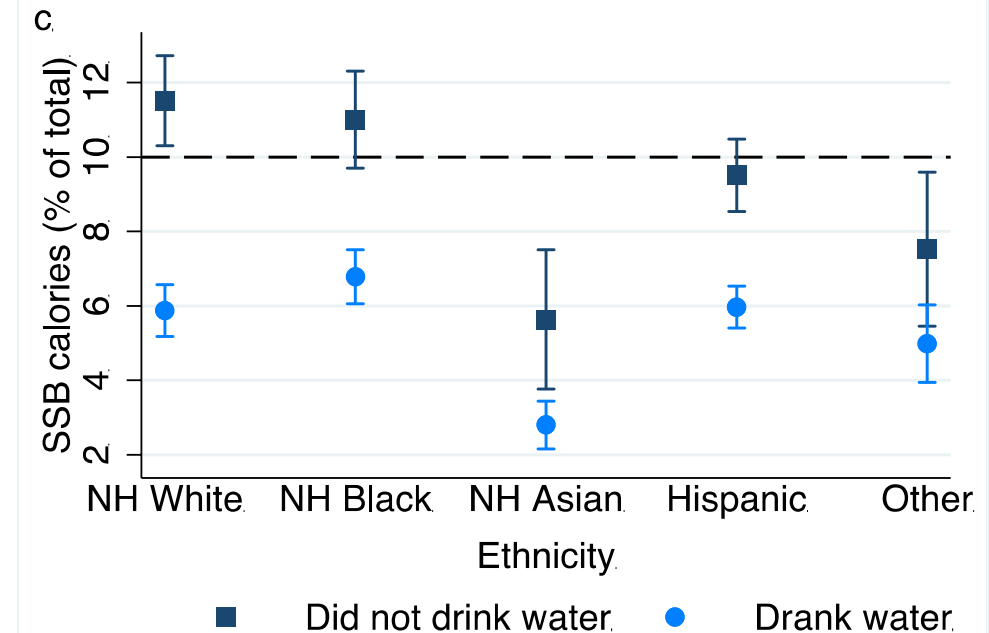
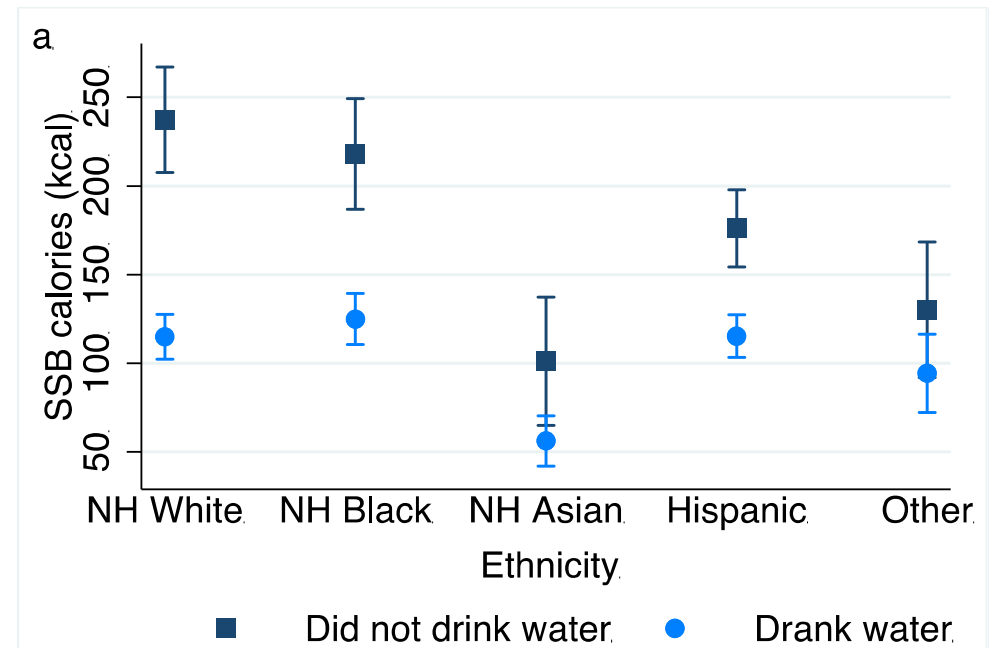
# 12-19 year olds consumed more than 10% of total calories from SSBs



# Summary:

20% of US kids don't drink water on a given day

Those who don't drink water consume **twice as many calories** from sugary drinks as water drinkers and this varies across groups



US children and young adults should  
drink water every day to help avoid  
excess caloric and sugar intake

# Acknowledgements

- Co-authors:
  - Hilary Bethancourt, PhD (Penn State Univ.)
  - Lori Francis, PhD (Penn State Univ.)

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## Sensitivity analyses: Day 2

- Main effect for Day 2 (n=7,161) using day-2 dietary weights:
- Not drinking water was associated with
  - 102 kcal (SE=21.2) more
  - 5.6% (SE=0.6) more total caloric intake