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## Racial/Ethnic Disparities in Meeting 5-2-1-0 Recommendations among Adolescents in the United States


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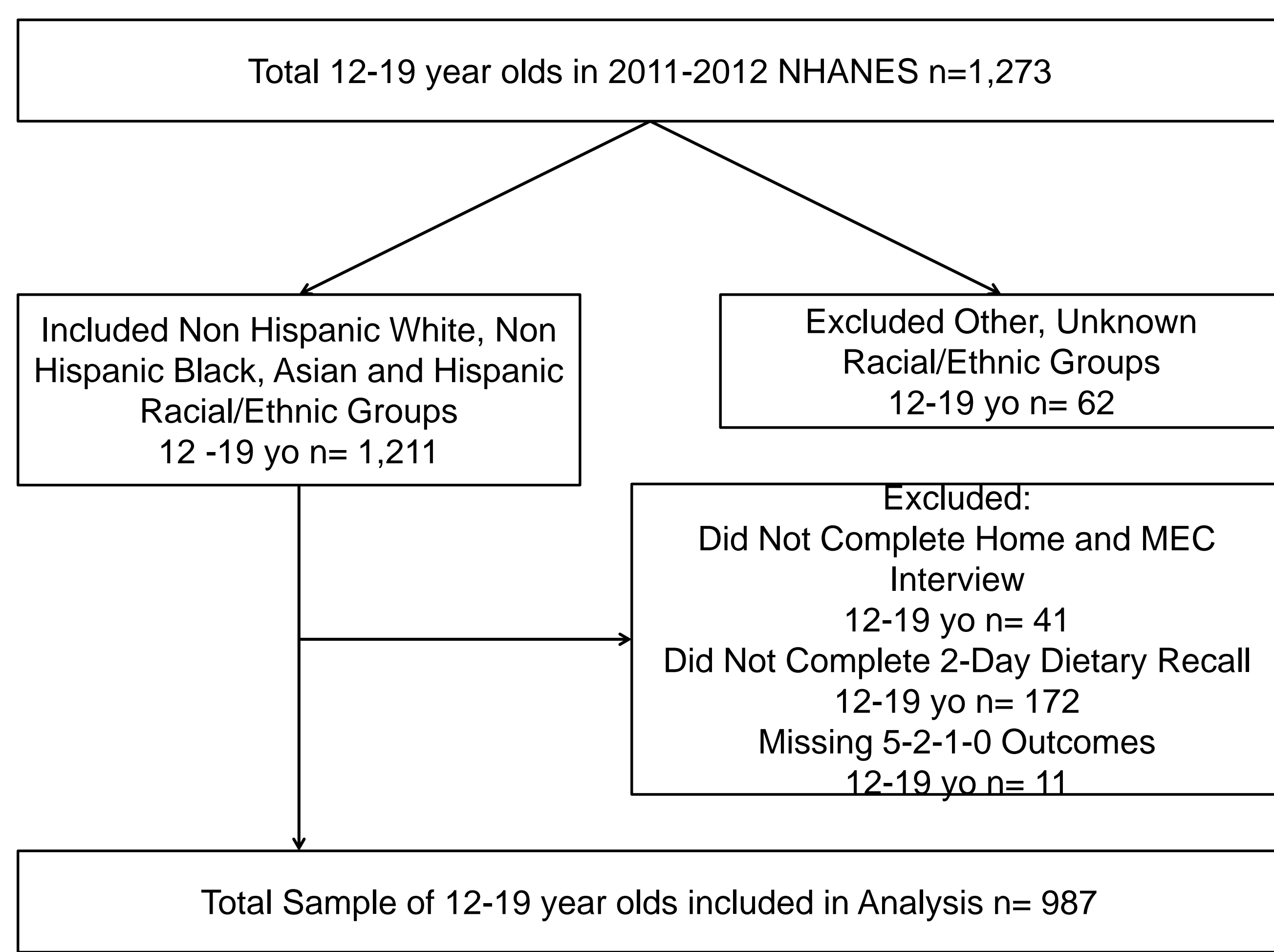
## INTRODUCTION

- Obesity rates among youth have tripled in recent decades, with one third of adolescents in the United States being overweight or obese.
- Obesity prevention through establishing healthy dietary and physical activity behaviors during adolescence is necessary to reduce future health consequences
- Understanding the uptake of national nutrition and physical activity recommendations in marginalized populations is important to reduce existing disparities in obesity.
- The 5-2-1-0 mnemonic represents four targeted behaviors for obesity prevention, including  $\geq 5$  servings of fruit and vegetables,  $\leq 2$  hours of screen time,  $\geq 1$  hour of physical activity, and 0 sugar sweetened beverages daily.
- Nationally representative estimates of adherence to 5-2-1-0 guidelines have not been examined since 1999 and contemporary estimates of racial/ethnic disparities in meeting these guidelines is not well established.

## STUDY AIMS

- To evaluate racial/ethnic disparities among adolescents in meeting the four daily 5-2-1-0 nutrition and activity targets in a nationally representative sample.

## FLOW CHART



## METHODS

### Data Source

- Cross sectional analysis using the most recently available NHANES continuous cycle data (2011-2012).
- NHANES is a national survey that uses a complex sampling design to represent the non-institutionalized U.S. population.
- Sample included adolescents ages 12-19 years old (n=987) in four self-reported racial/ethnic groups (non-Hispanic White, non-Hispanic Black, Asian, and Hispanic) who completed the household interview, mobile examination center (MEC) interview, both dietary recalls and had complete 5-2-1-0 information

### Measures

- The physical activity target was calculated based on the Global Physical Activity Questionnaire. Multiple questions about days and time per week one engaged in moderate and vigorous activity at work and for recreation were used to calculate daily minutes of physical activity.
- The screen time target was calculated from two questions: 1) "Over the past 30 days, on average how many hours per day do you sit and watch TV or videos?" and 2) "Over the past 30 days, on average how many hours per day do you use a computer or play computer games outside of work or school?"
- The fruit and vegetable and sugar-sweetened beverage targets were calculated from two days of 24 hour dietary recall surveys.
- Questions on race/ethnicity included: "Do you consider yourself to be Hispanic or Latino? What race or races do you consider yourself to be? Where do you/your ancestors come from?" Participant responses were coded into the following categories: Mexican American, other Hispanic, non-Hispanic White, non-Hispanic Black, Asian, and other/multi-racial. These were re-categorized as: non-Hispanic White, Hispanic, non-Hispanic Black, and Asian.
- Covariates included BMI percentile and sociodemographic characteristics: participant age, gender, parental marital status, household income-to-poverty ratio and parental education.
- Outcomes included meeting all targets, no targets, and individual targets.

### Analysis

- Appropriate two-year sample weights were applied in all analyses to account for the complex survey design and to yield a nationally representative sample.
- Frequency distributions of each variable were computed by racial/ethnic group.
- Bivariate differences in the proportion of each racial/ethnic group meeting each target behavior were assessed using chi-square tests.
- Multivariable logistic regression models were used to evaluate the association of race/ethnicity with each outcome.

## RESULTS

	Hispanic	Non-Hispanic Black	Asian	Non-Hispanic White
unweighted n	287	321	145	234
weighted n	7239949	5074189	1563516	18346265
Age (years)				
12-15	51.5	41.4	58.1	48.2
16-19	48.5	58.6	41.9	51.8
Gender: Girls	48.6	54.1	53.9	49.5
Parental Marital Status				
Married/Partnered	79.4	47.4	89.4	76.3
Never Married/Single	6.3	30.3	1.4	7.0
Divorced/Separated/Widowed	14.3	22.3	9.2	16.7
Parental Education Level				
<High School	48.8	19.1	17.1	18.8
High School Graduate	21.7	28.5	17.3	13.5
Some College	20.7	38.5	22.6	39.0
College Graduate	8.8	13.9	43.0	28.7
Income Poverty Ratio				
<1.0	41.1	41.6	14.7	16.0
1.0-3.0	39.5	35.9	48.0	38.5
>3.0	19.4	22.5	37.3	45.5
Overweight/Obese (BMI% $\geq 85$ )	35.2	39.2	23.6	31.9

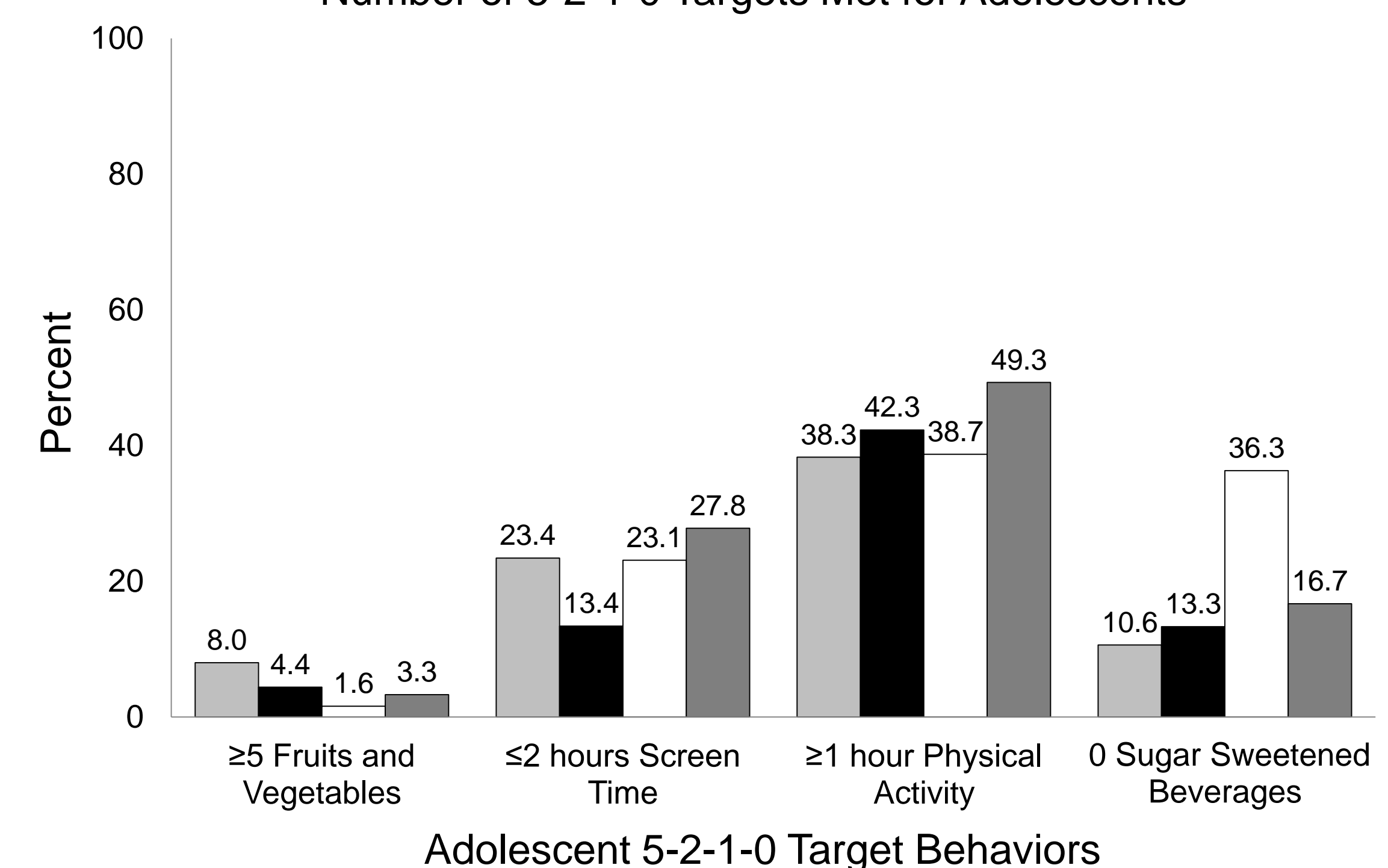
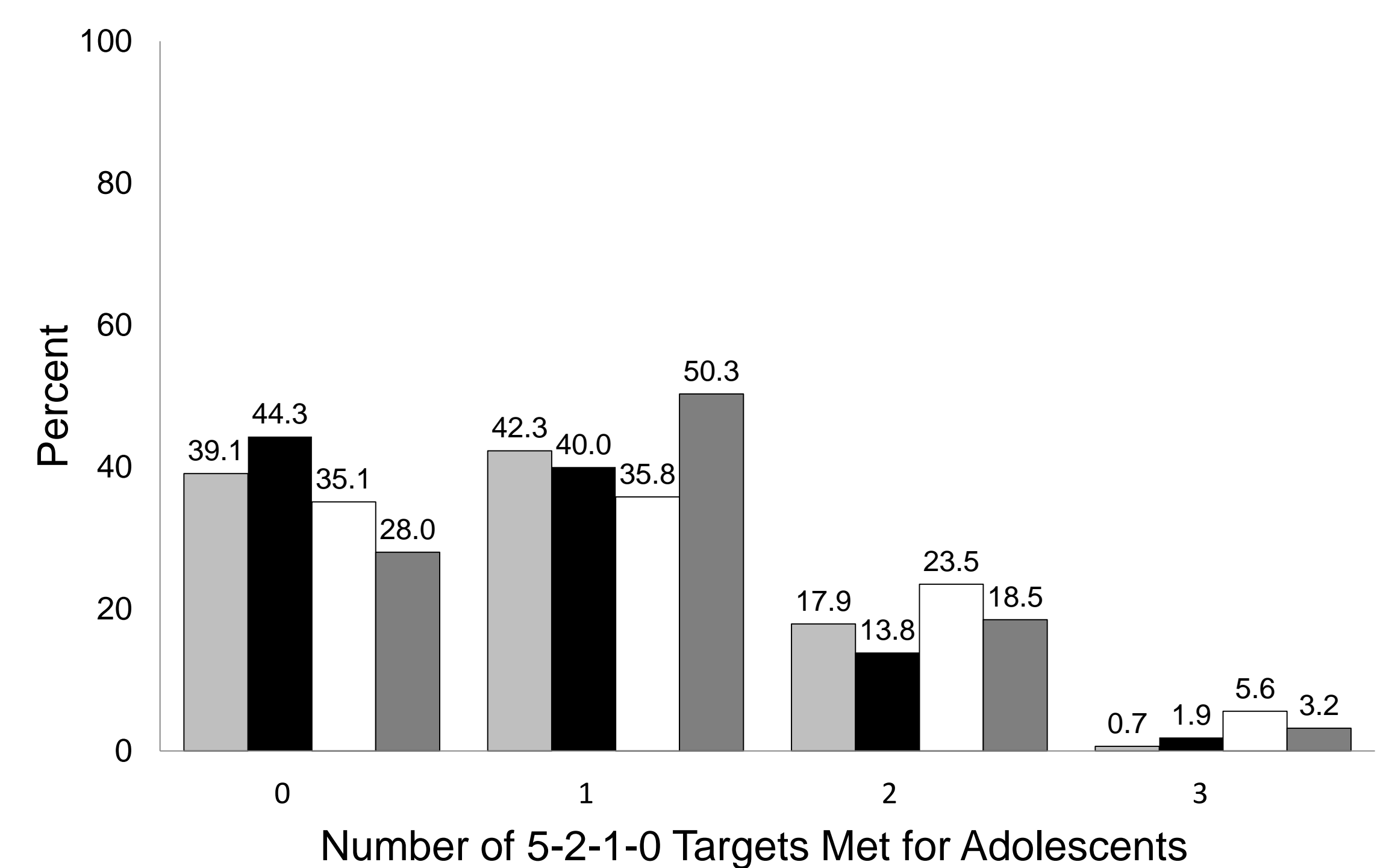
Logistic Regression Models of the Association of Race/Ethnicity with 5-2-1-0 Outcomes

	Hispanic		Non-Hispanic Black		Non-Hispanic Asian		Non-Hispanic White
	Unadjusted OR [95% CI]	Adjusted* OR [95% CI]	Unadjusted OR [95% CI]	Adjusted* OR [95% CI]	Unadjusted OR [95% CI]	Adjusted* OR [95% CI]	Ref.
$\geq 5$ Fruits and Vegetables	2.53 [0.75-8.57]	2.41 [0.64-9.02]	1.36 [0.32-5.80]	1.53 [0.38-6.19]	0.48 [0.06-3.94]	0.59 [0.06-5.54]	Ref.
$\leq 2$ hours Screen Time	0.79 [0.48-1.32]	0.65 [0.34-1.25]	0.40 [0.17-0.93]	0.48 [0.24-0.98]	0.78 [0.44-1.39]	0.80 [0.45-1.40]	Ref.
$\geq 1$ hour Physical Activity	0.64 [0.42-0.96]	0.67 [0.43-1.02]	0.75 [0.51-1.10]	0.85 [0.60-1.20]	0.65 [0.41-1.02]	0.58 [0.36-0.92]	Ref.
0 Sugar Beverages	0.59 [0.25-1.39]	0.70 [0.41-1.20]	0.76 [0.37-1.56]	0.86 [0.42-1.80]	2.84 [1.07-7.58]	3.31 [1.34-8.24]	Ref.
Met Zero 5-2-1-0 Goals	1.65 [0.98-2.81]	1.76 [1.04-2.98]	2.05 [1.40-2.99]	1.82 [1.04-3.17]	1.39 [0.94-2.07]	1.48 [1.08-2.04]	Ref.

\*Model Adjusted for: age, gender, body mass index, parental marital status, household income-to-poverty ratio

Percent of US Adolescents ages 12-19 years old in NHANES 2011-2012 meeting 5-2-1-0 recommended nutrition and physical activity target behaviors among different Racial/Ethnic groups.

■ Hispanic ■ Non-Hispanic Black □ Non-Hispanic Asian ■ Non-Hispanic White



## CONCLUSIONS

- Despite national initiatives, youth in the U.S. are far from meeting 5-2-1-0 targets. Racial/ethnic disparities exist, particularly among adolescents.