THE FIT STUDY

A Cluster Randomized-Controlled Trial of Body Mass Index (BMI) Screening & Reporting in Schools

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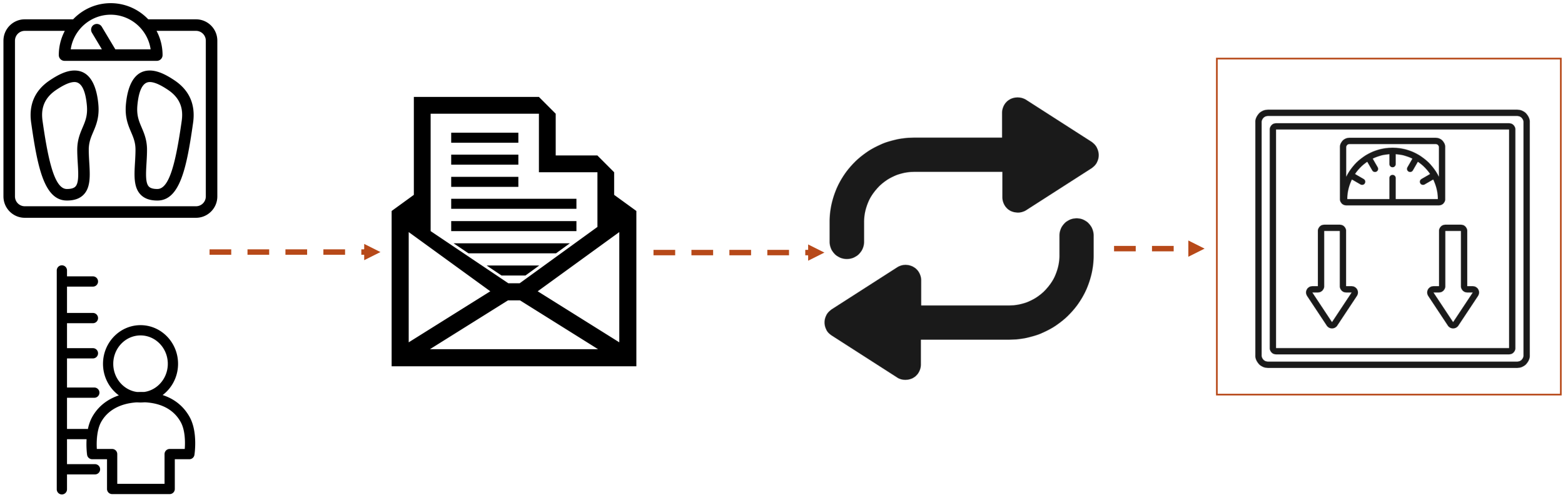
Background

Why school-based BMI screening and reporting?



Prevalence of BMI Screening & Reporting

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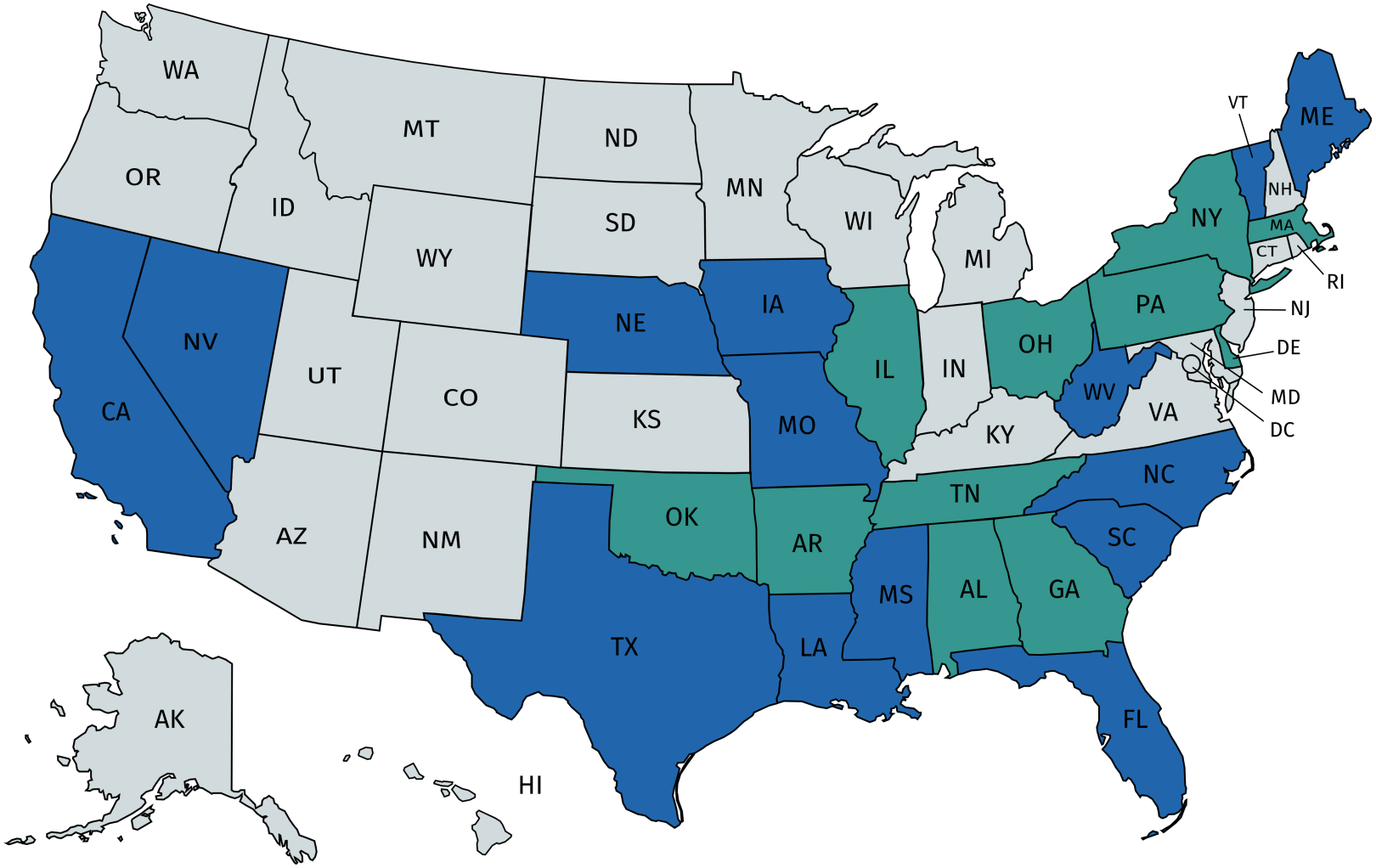
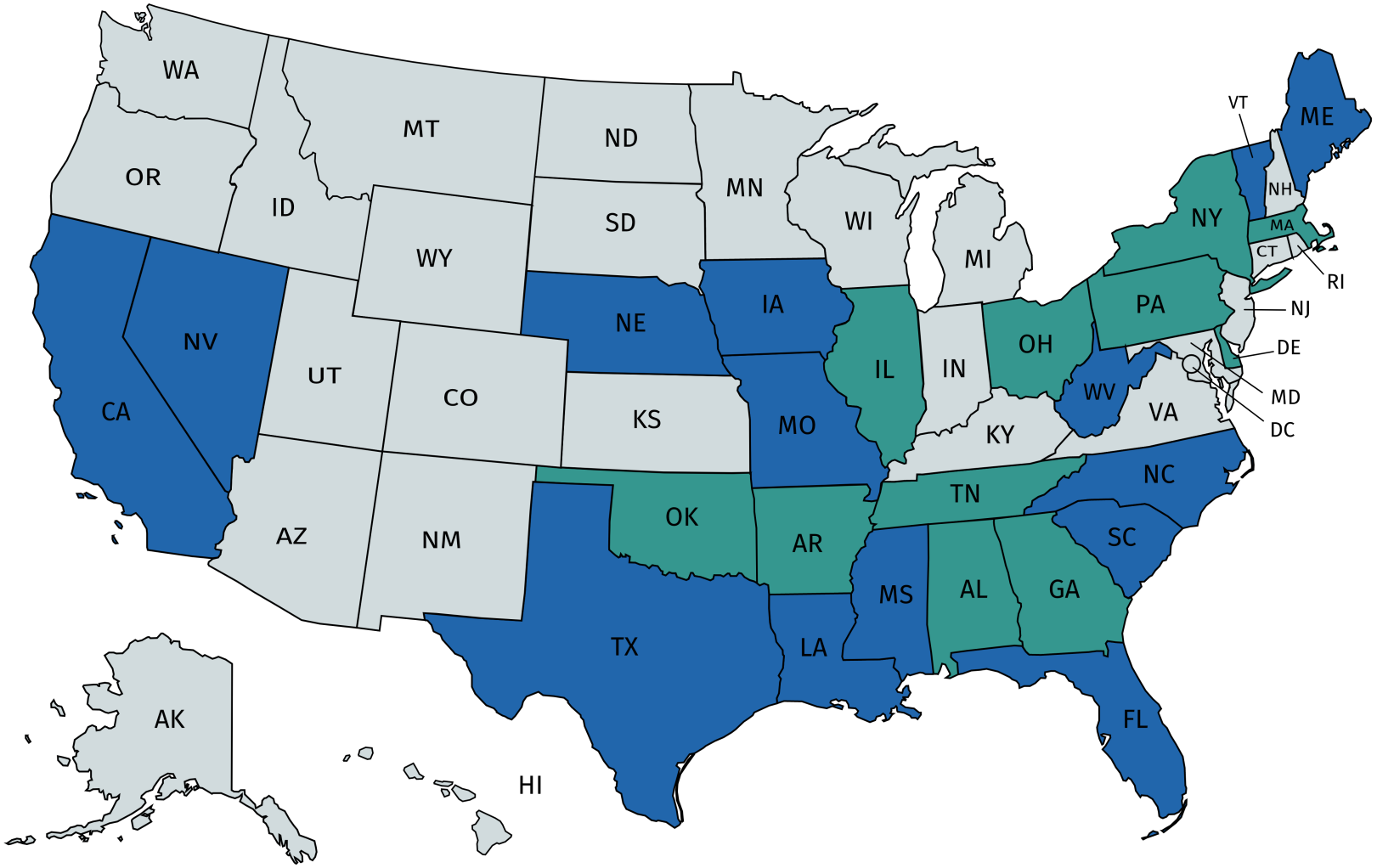


State requires BMI screening

70%

Prevalence of BMI Screening & Reporting



35%

State requires BMI screening & reporting

No existing studies demonstrate an effect of BMI reporting on weight status

Study	Design
Johnson 2006	Single-group longitudinal
Thompson 2009	Single-group longitudinal
Madsen 2011	Natural experiment
Li 2015	Natural experiment
Gee 2015	Repeated cross-section
Almond 2016	Regression discontinuity

Existing studies have limitations

- High numeracy and literacy of BMI reports
- Reports label children as “obese”
- No randomized trials

Parents and experts have raised concerns about potential unintended consequences

- Weight-based stigmatization
- Teasing
- Disordered eating

PR Backlash

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'Fat Letters' Sent Home To Students Spark Controversy In Massachusetts

CNN U.S. | World | Politics | Business | Opinion | Health | Entertainment | Style | Travel | Sports | Video Live TV U.S. Edition +

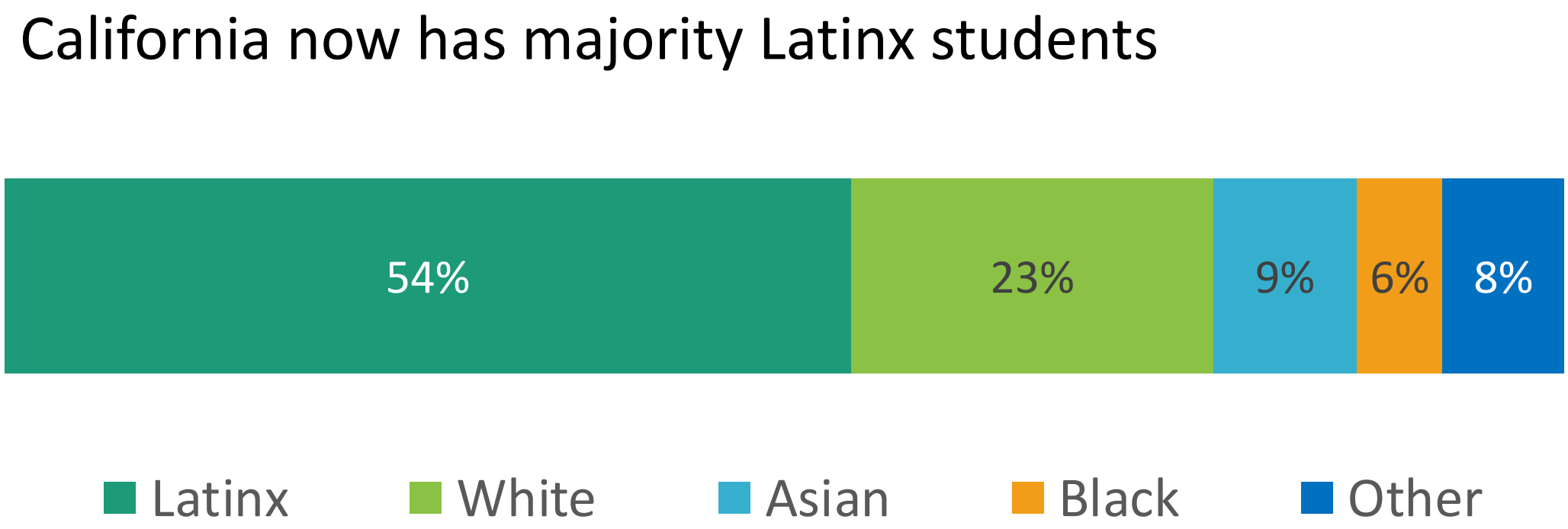
'Fat letters' from schools to parents are wrong

healthy weight range, you should talk with your child's doctor or nurse. He or she can give you

Mass. Stops Sending 'Fat Letters' On Student Weight

Obese _____

BMI reporting could have differential effects by race/ethnicity.



Study Design

The Fit Study: A 3-year cluster randomized controlled trial

Aim 1: Determine the impact of school-based BMI screening and reporting on childhood obesity and obesity disparities

Aim 2: Determine the extent to which BMI screening and reporting have unintended consequences among students

Madsen, Cont Clin Trials, 2017

District & School Enrollment

930 districts in CA

↓

16 districts eligible & screened

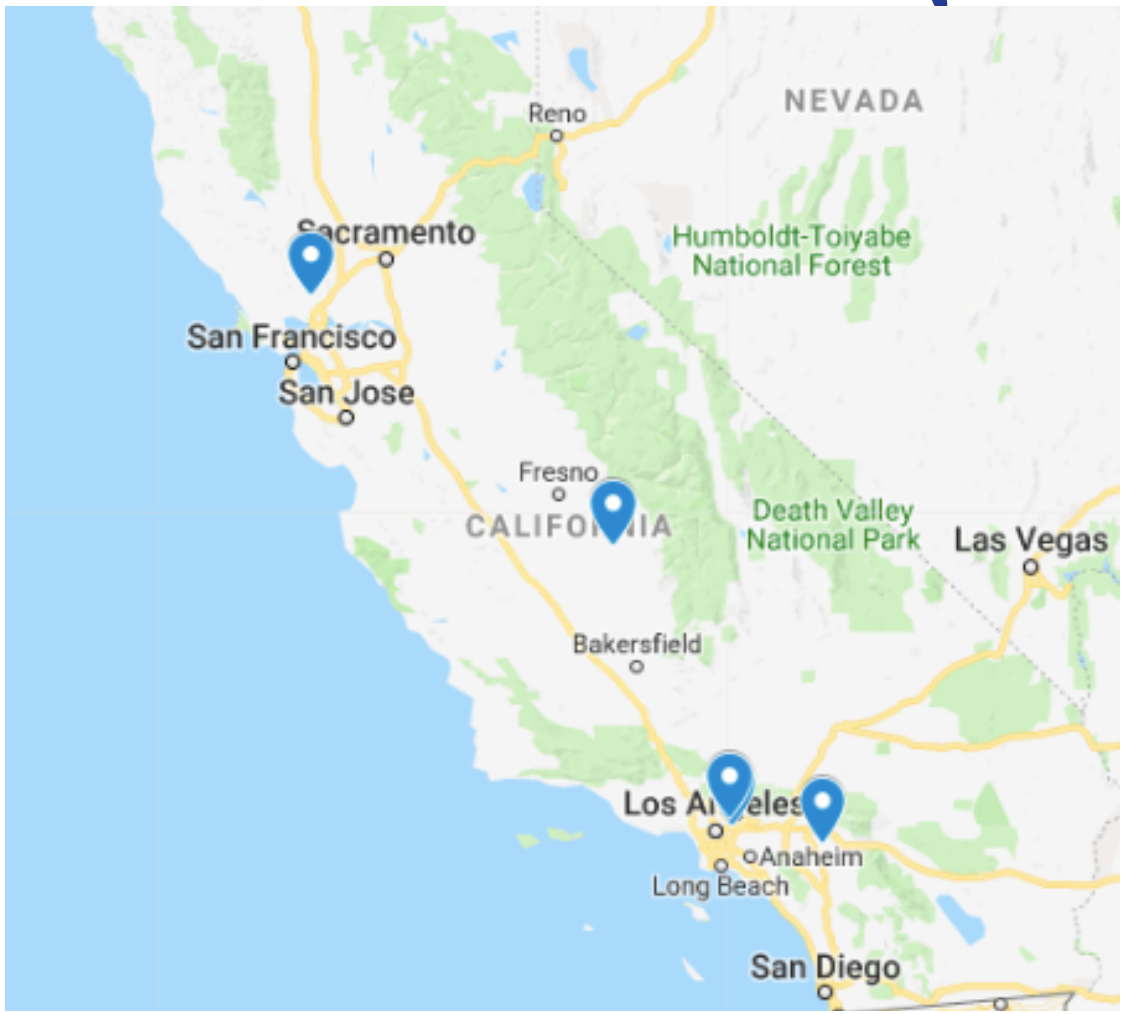
↓

5 districts enrolled

↓

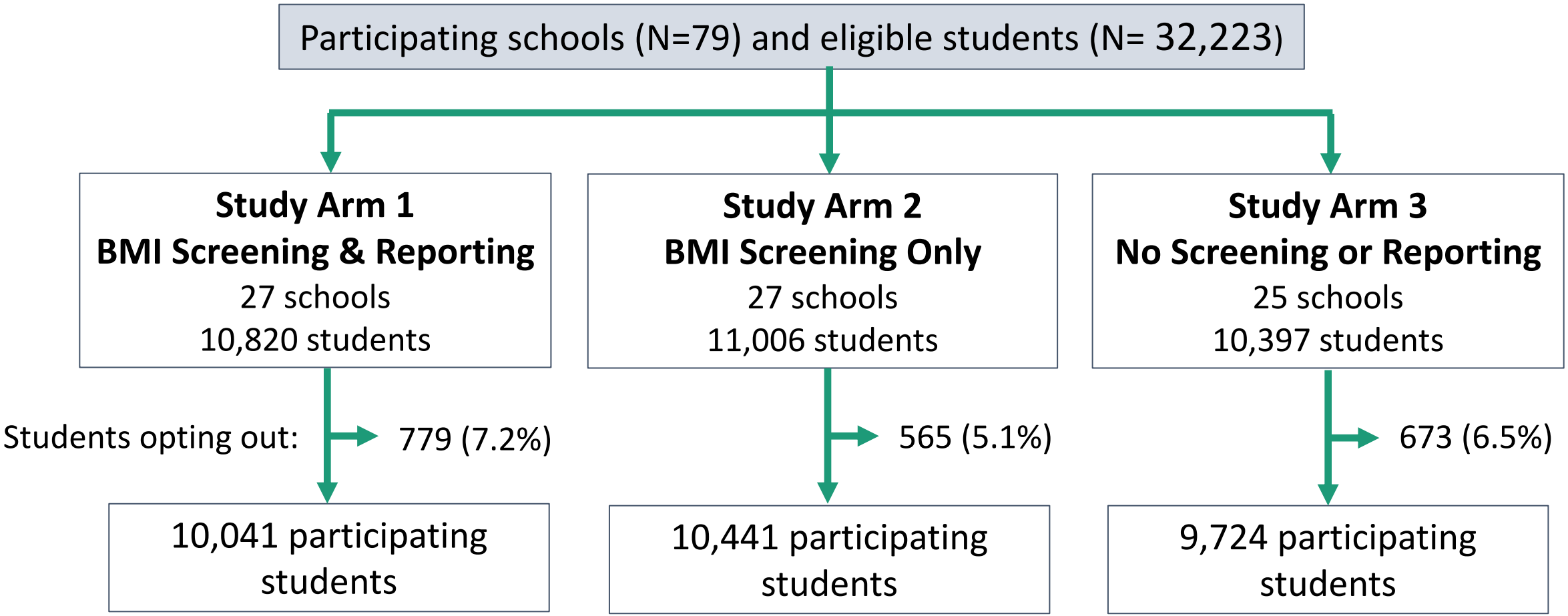
79 schools enrolled

70% of students eligible for Free or Reduced-Price Meals



Madsen, Cont Clin Trials, 2017

Randomization



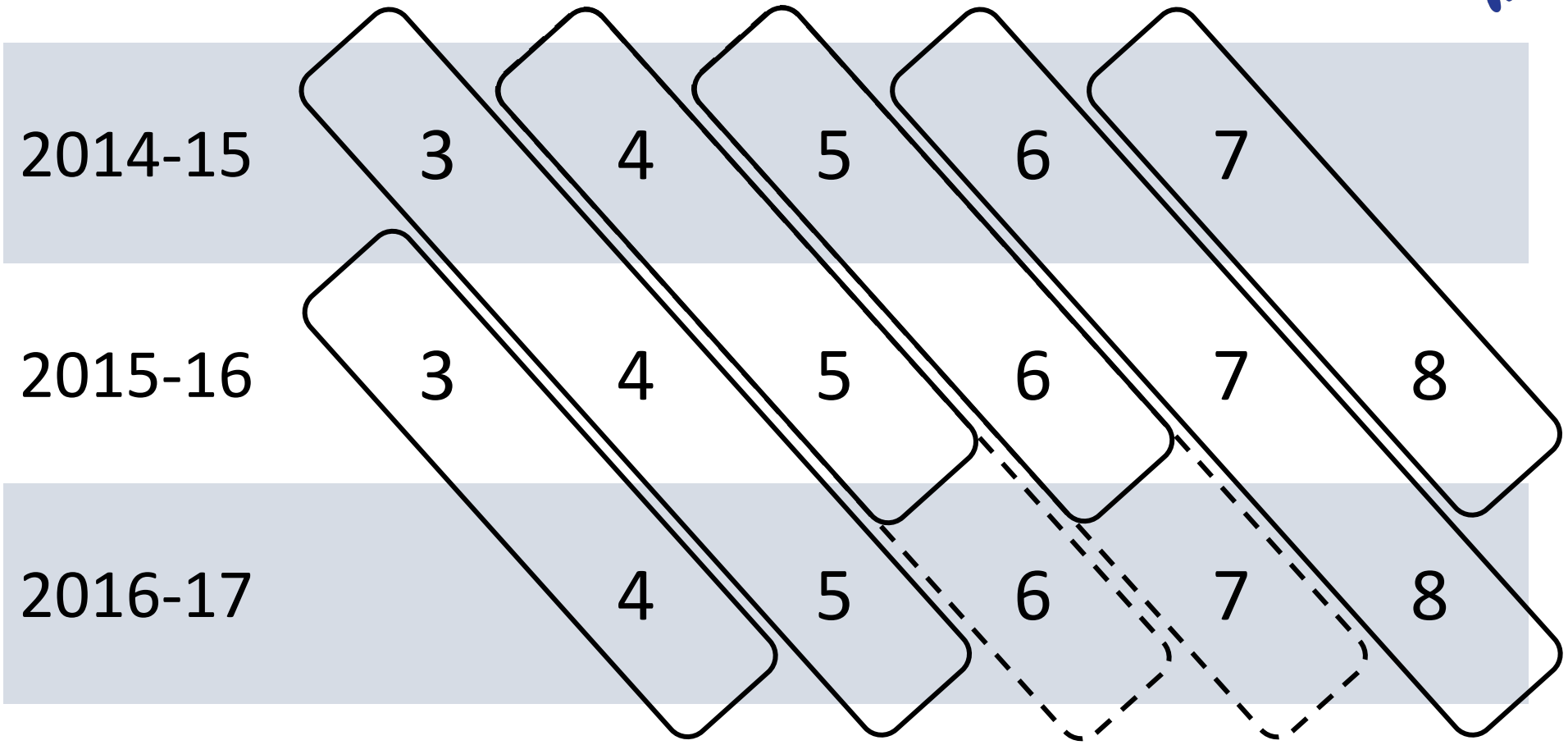
Madsen, Cont Clin Trials, 2017

Cohorts of Students

2014-15	3	4	5	6	7

Madsen, Cont Clin Trials, 2017

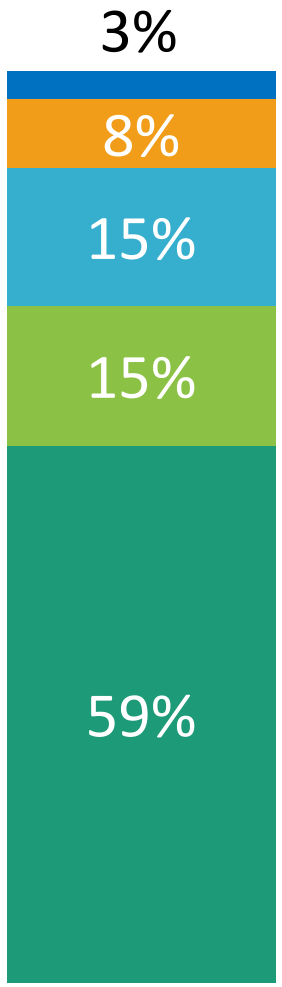
Cohorts of Students

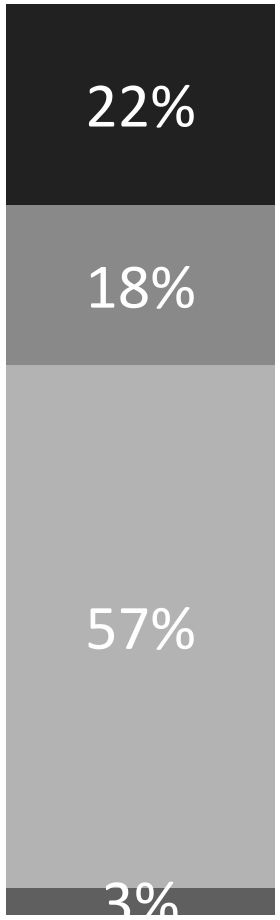


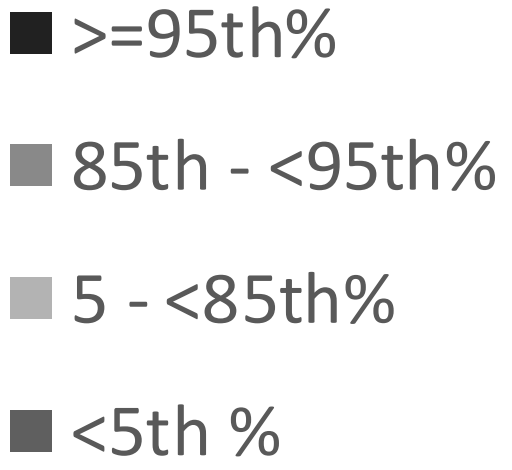
- - - - Cohorts at K-6 and K-8 schools only

Madsen, Cont Clin Trials, 2017

Snapshot of sample at baseline

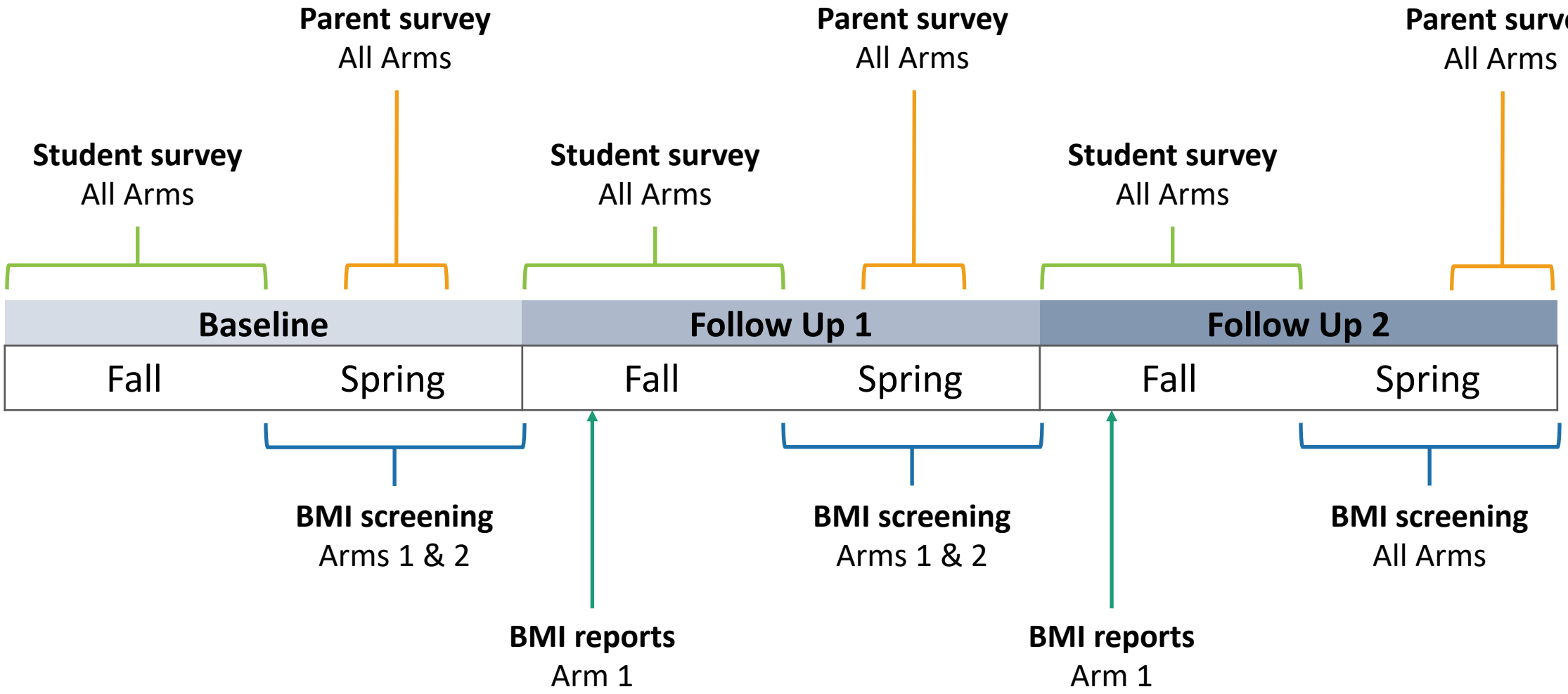






Madsen, JAMA Peds, 2020

Study Activities and Measures



Madsen, Cont Clin Trials, 2017

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BMI Report

Parent focus groups

Thompson, PCD, 2015

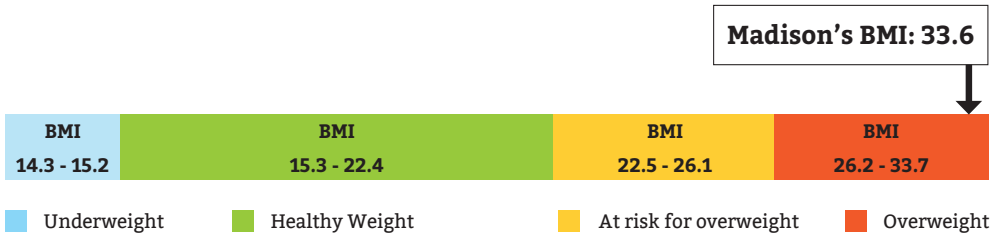
Parents wanted reports that

- Were visually appealing and picture-heavy
- Clearly defined BMI
- Avoided stigmatizing language like the word “obese”
- Included recommendations for actions that entire families, not just at-risk kids, could take

BMI Report (Front)

Your daughter, Madison Smith, was measured at school in March 2015. She was 5 feet 4 inches tall and weighed 197 pounds. **Madison's body mass index (BMI) was 33.6.**

BMI is a ratio of a child's weight to height. Doctors use BMI to see if a child's weight might be putting him or her at risk for health problems. The colored bar below shows BMI ranges for **13-year-old girls.** The arrow points to Madison's BMI, which places her in the **overweight range.**



Why does this matter?

Studies have shown that many overweight children already have high blood pressure, high cholesterol, or early signs of diabetes. Also, overweight children are more likely to become obese as adults, which can lead to serious health problems. If you have any questions or concerns about Madison's BMI, please share this letter with her doctor or our school health staff.

What can you do?

The good news is that even small changes can make a big difference in your child's health. **Turn the page** to see what you can do to keep your family healthy. You can also visit **www.choosemyplate.gov** for more tips and resources. All children, no matter what their weight, should be physically active and eat a healthy diet.

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Thompson, PCD, 2015

Infographic (Back)

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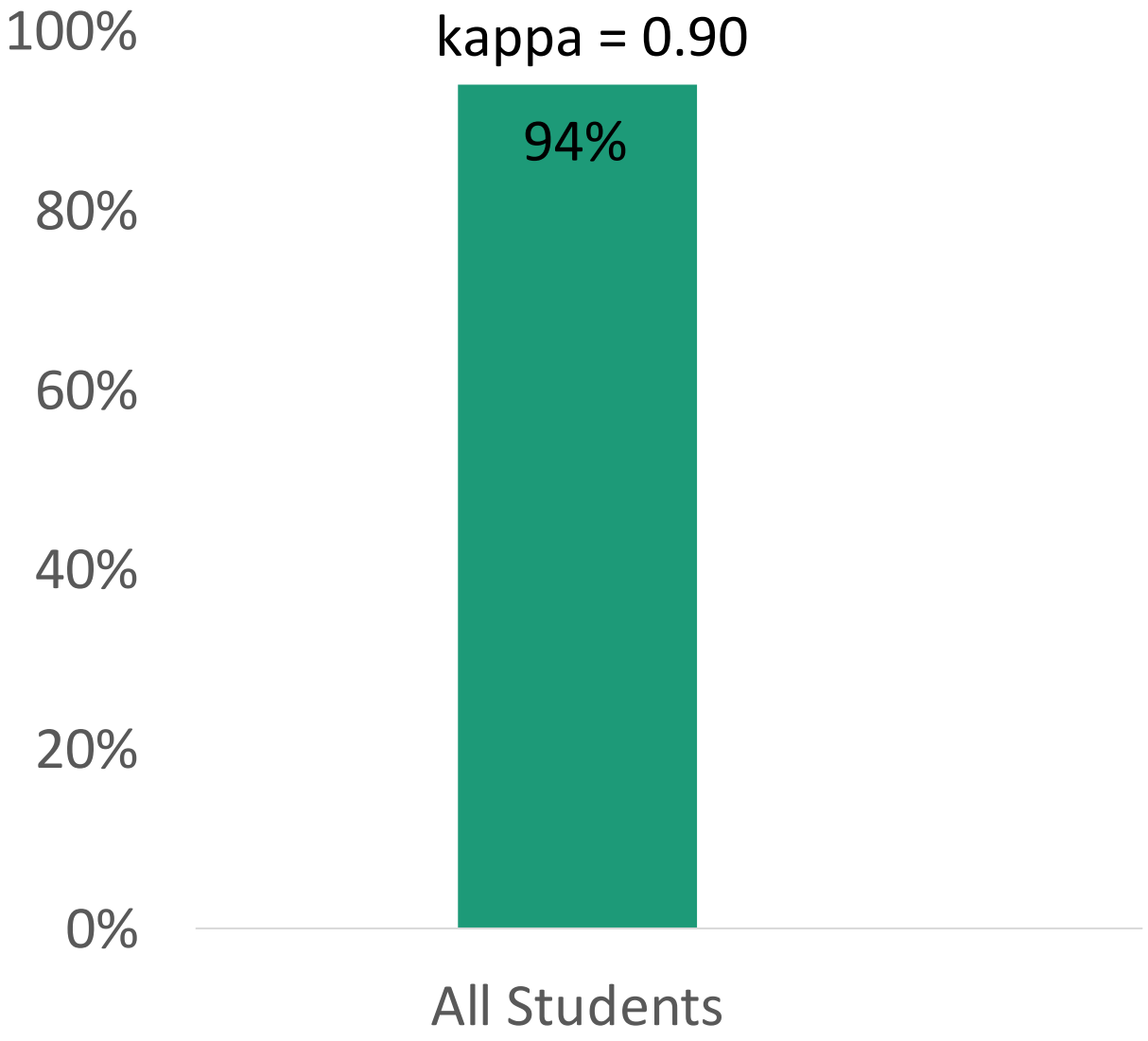
Thompson, PCD, 2015

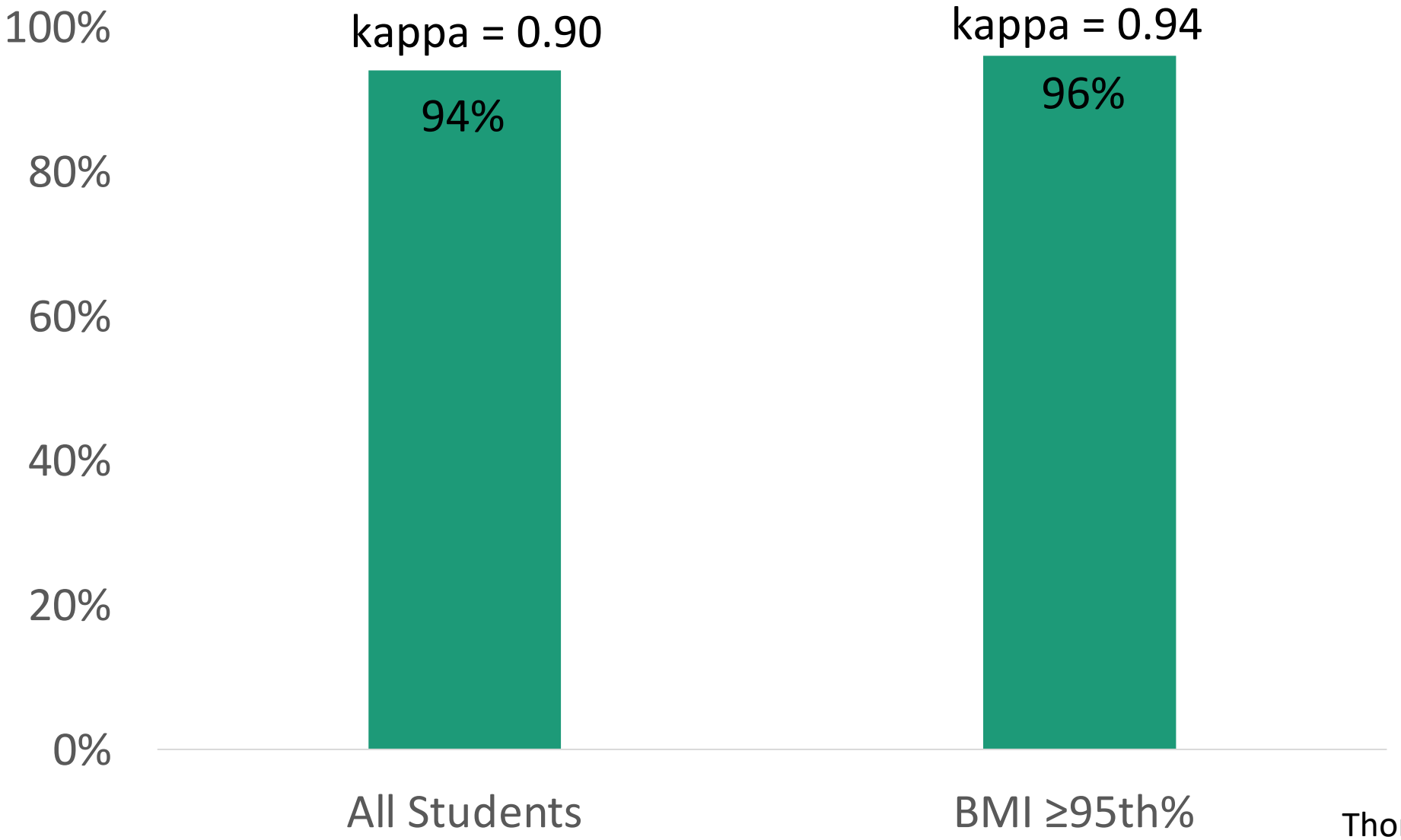
BMI Validation Study

Accuracy of weight status classification



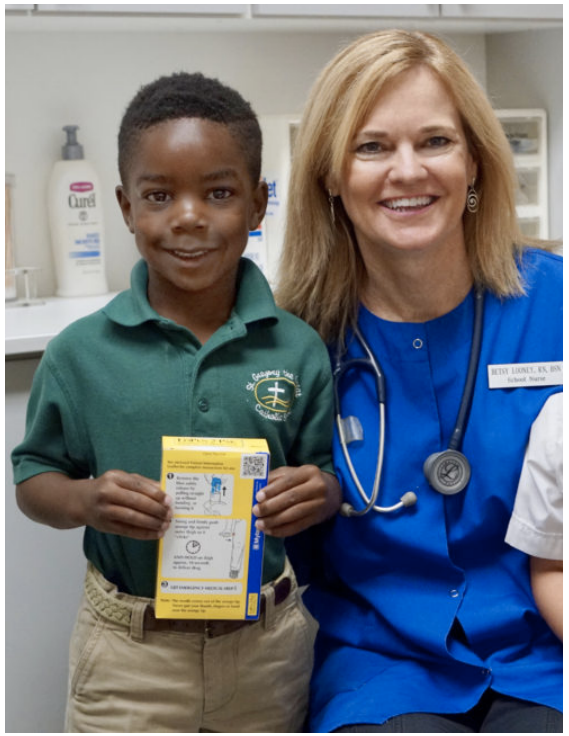
Thompson, J Sch Health, 2019

Accuracy of weight status classification



Thompson, J Sch Health, 2019

School staff conducted height/weight measurements on 4th-8th grade students with high accuracy



Thompson, J Sch Health, 2019

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AIM 1: Impact of BMI Reporting on Childhood Obesity and Obesity Disparities

Sample

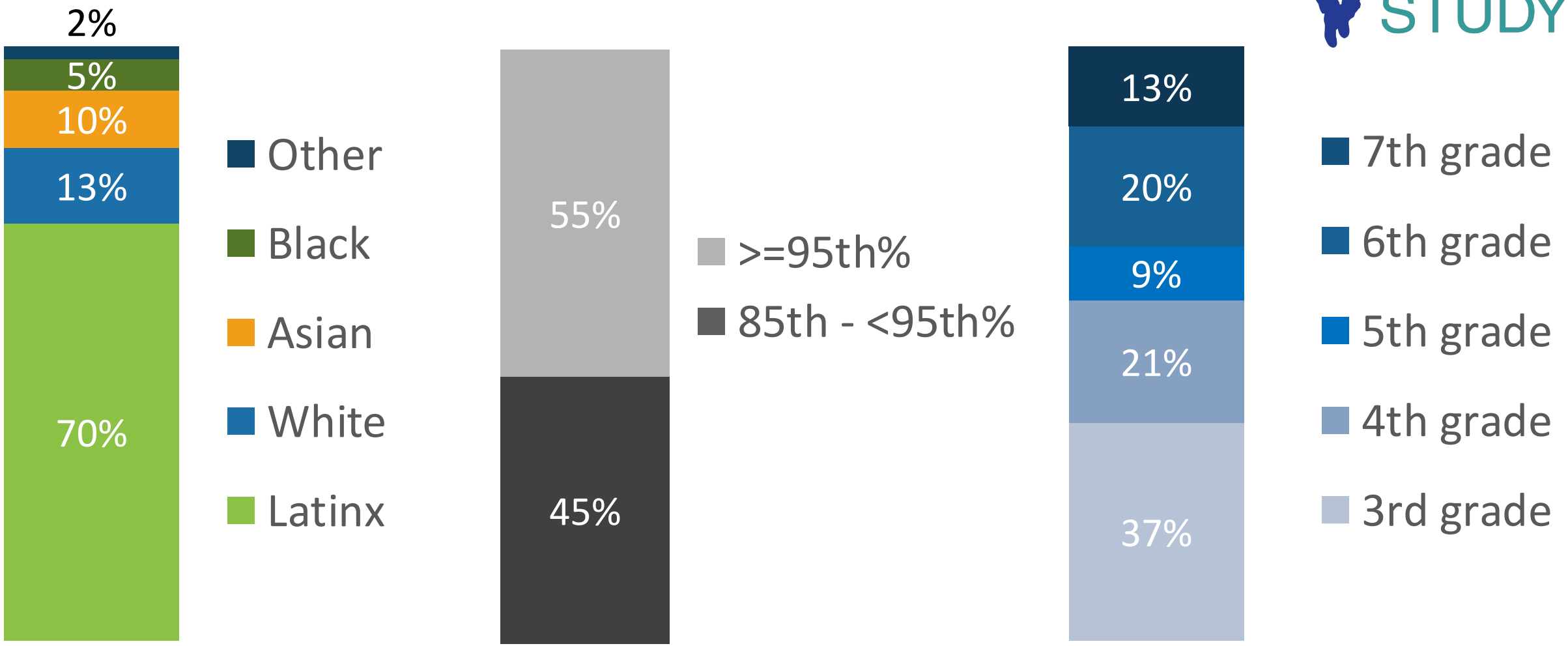
- Restricted to students with a baseline BMI ≥ 85th percentile

Study Arm 1 **BMI Screening & Reporting** (N = 3,214)	VS.	**Study Arm 2** **BMI Screening Only** (N=3,318)

Analyses

- Outcome: Change in BMI z-score
- Model: linear model with random intercepts for school and student
- Adjusted for: sex, race, district, grade, FRPM, year of study
- Models stratified by:
    - Younger (3rd-5th grade at baseline) vs. Older (6th-7th at baseline)
    - Latinx ethnicity vs. non-Latinx ethnicity
    - Male vs. female
- Complete case and multiple imputation (sensitivity analysis)

Demographics: ≥ 85th BMI percentile



Madsen, JAMA Peds, 2020

Results

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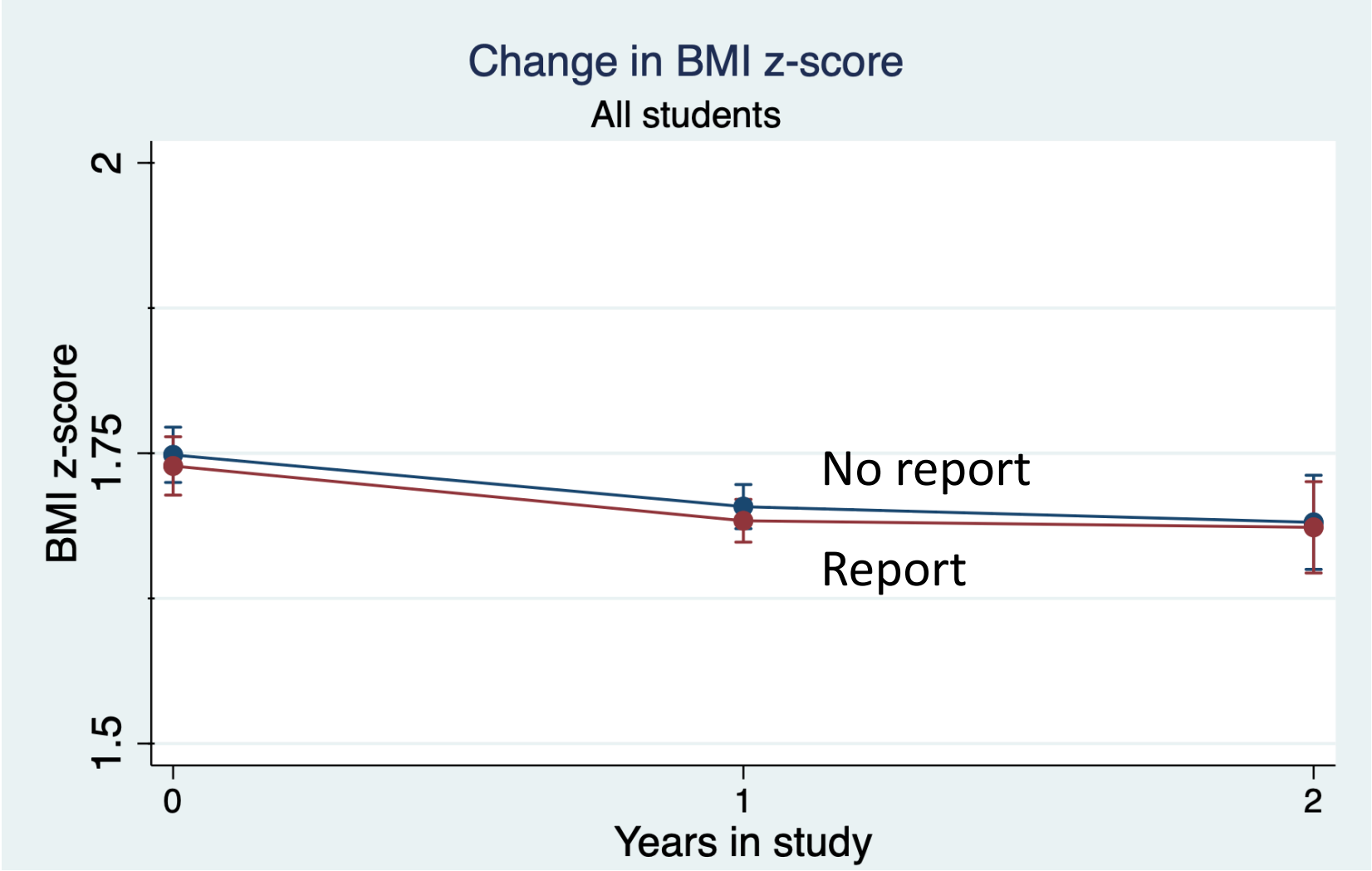
BMI reports did not reduce BMI z-score among students overall



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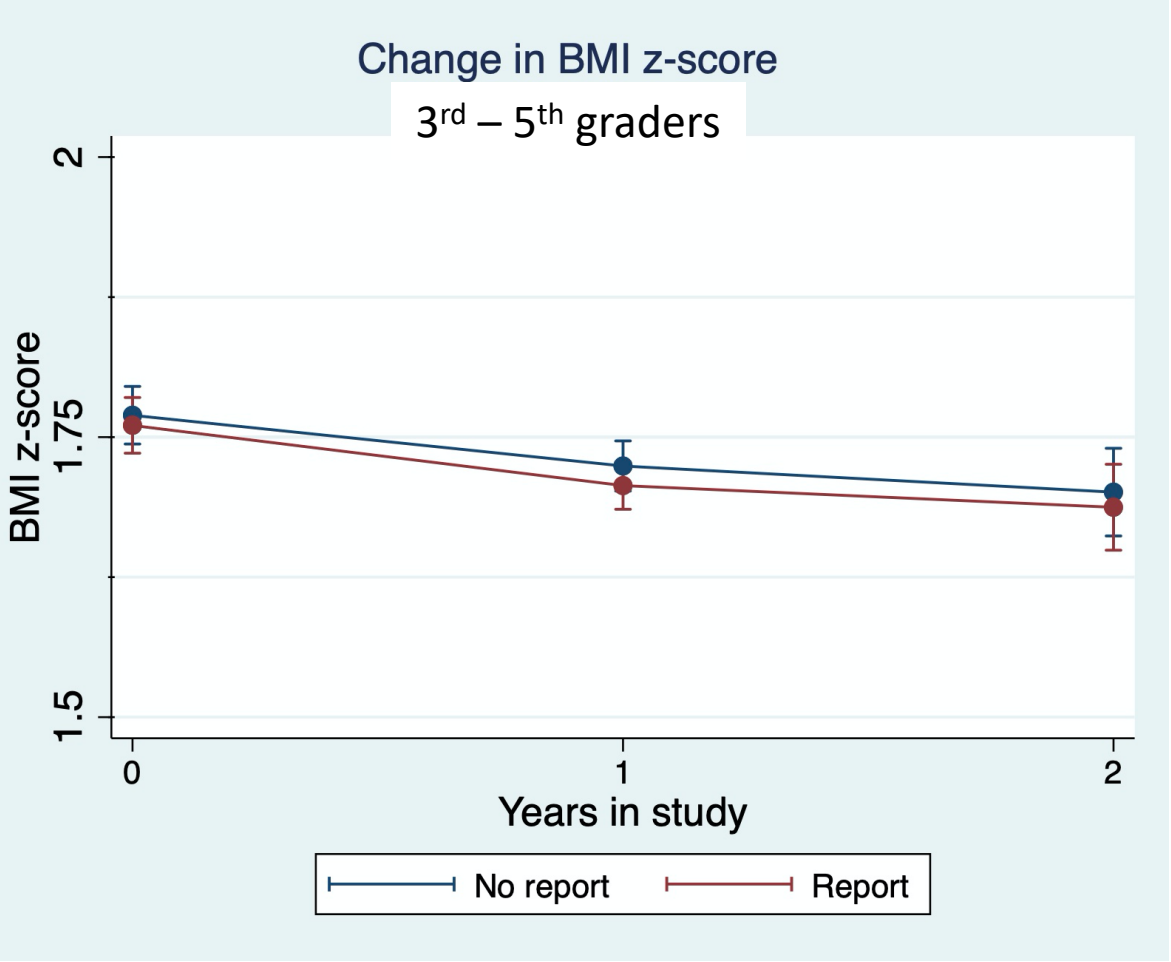
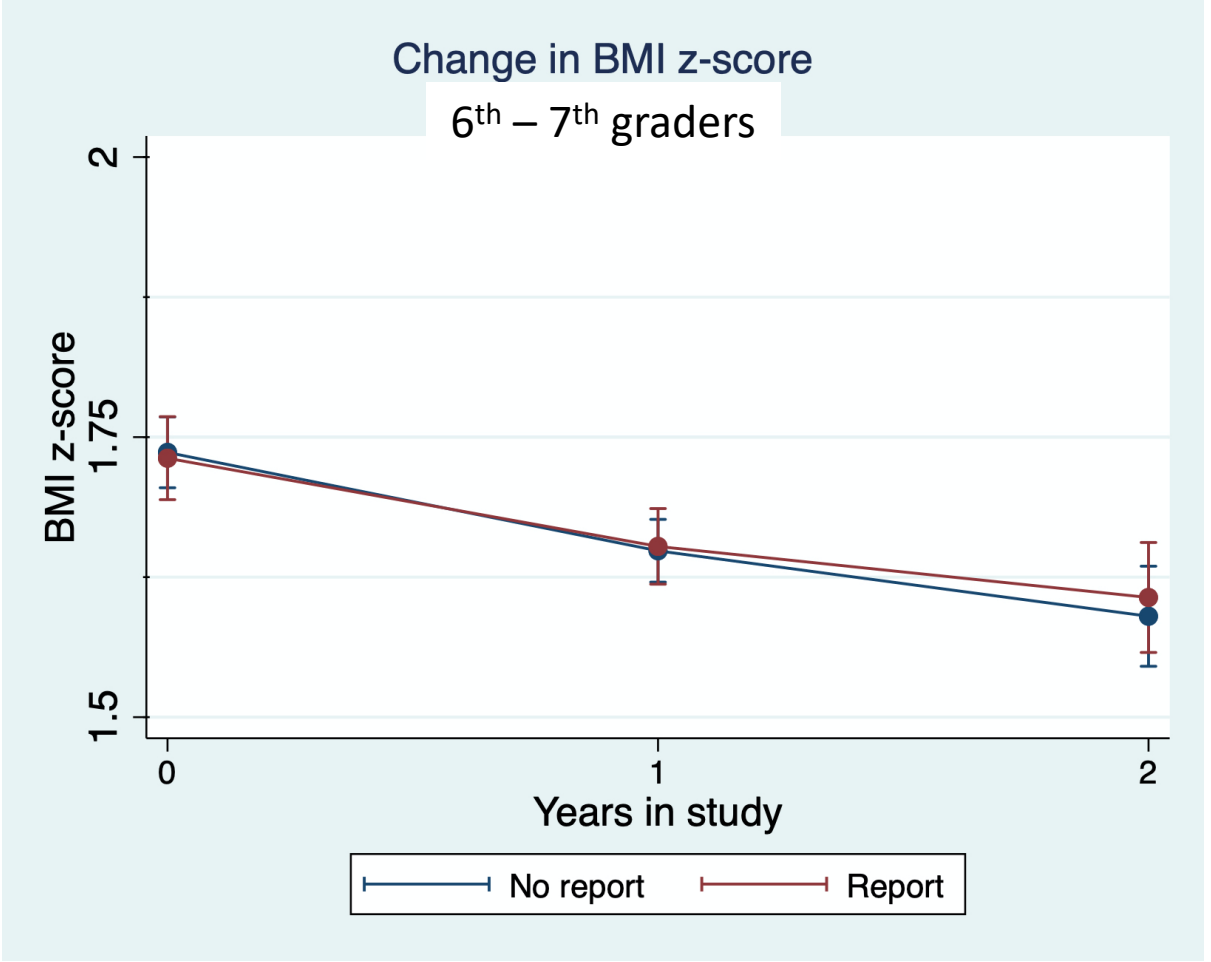
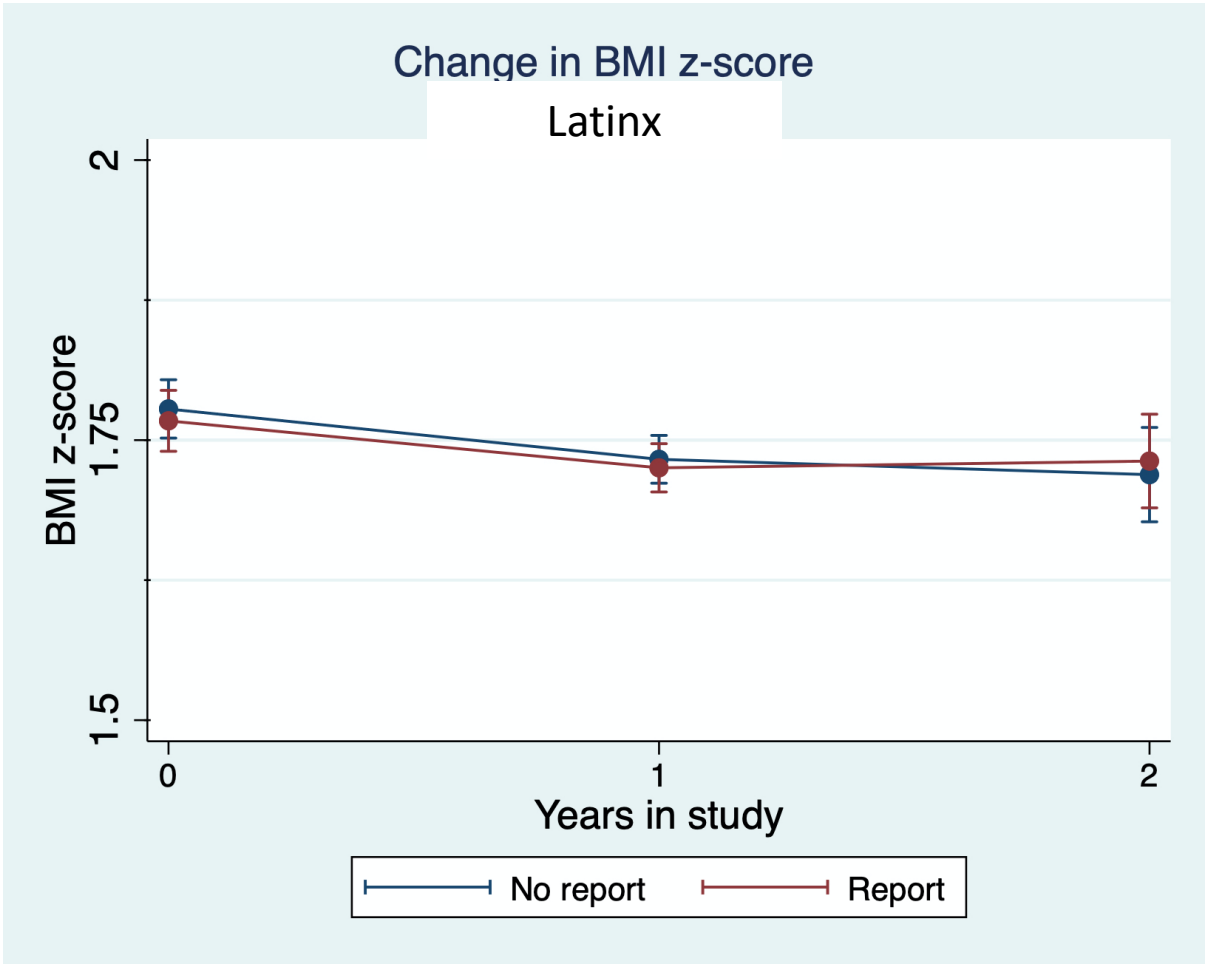
BMI reports did not reduce BMI z-score among younger or older students

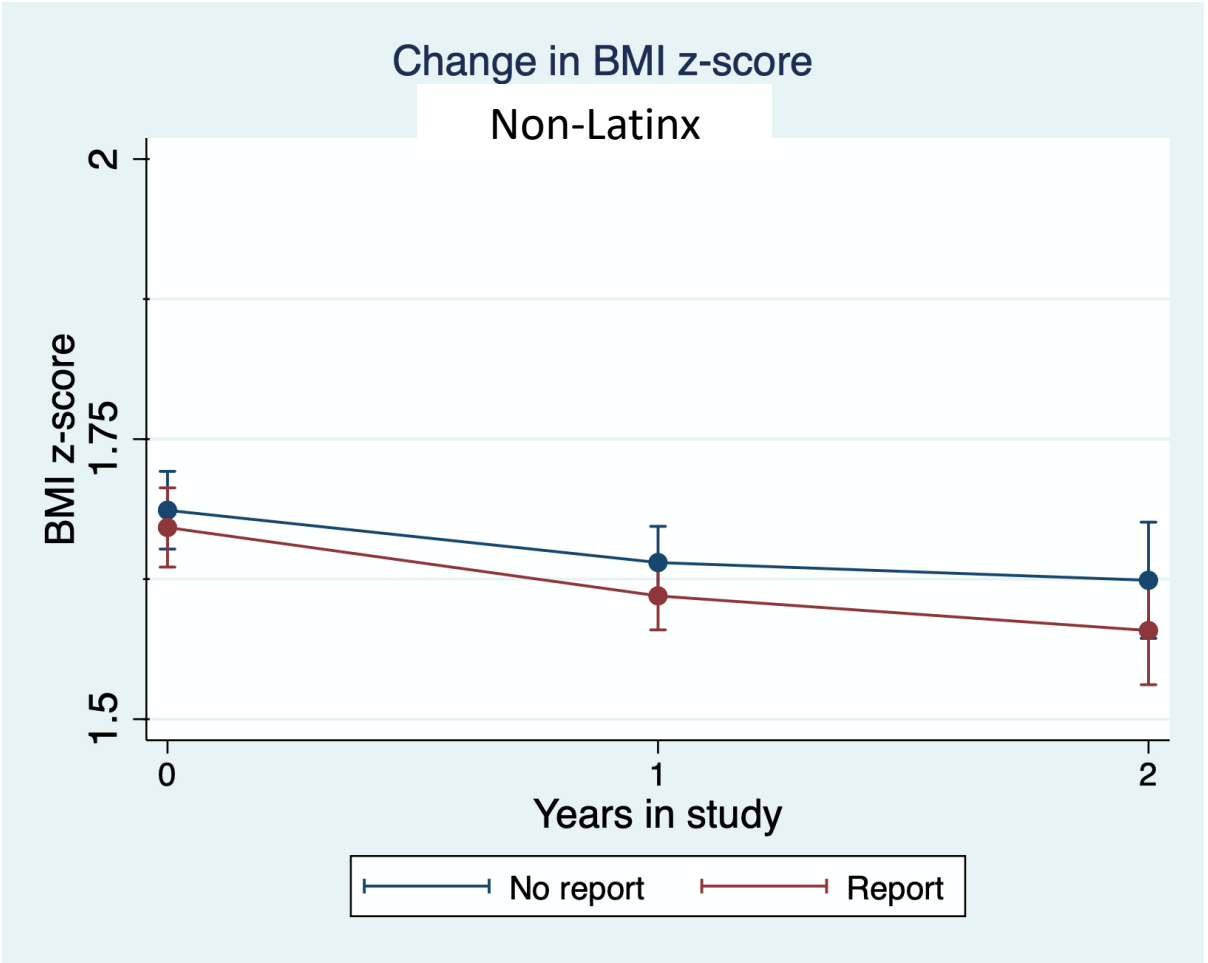




Madsen, JAMA Peds, 2020

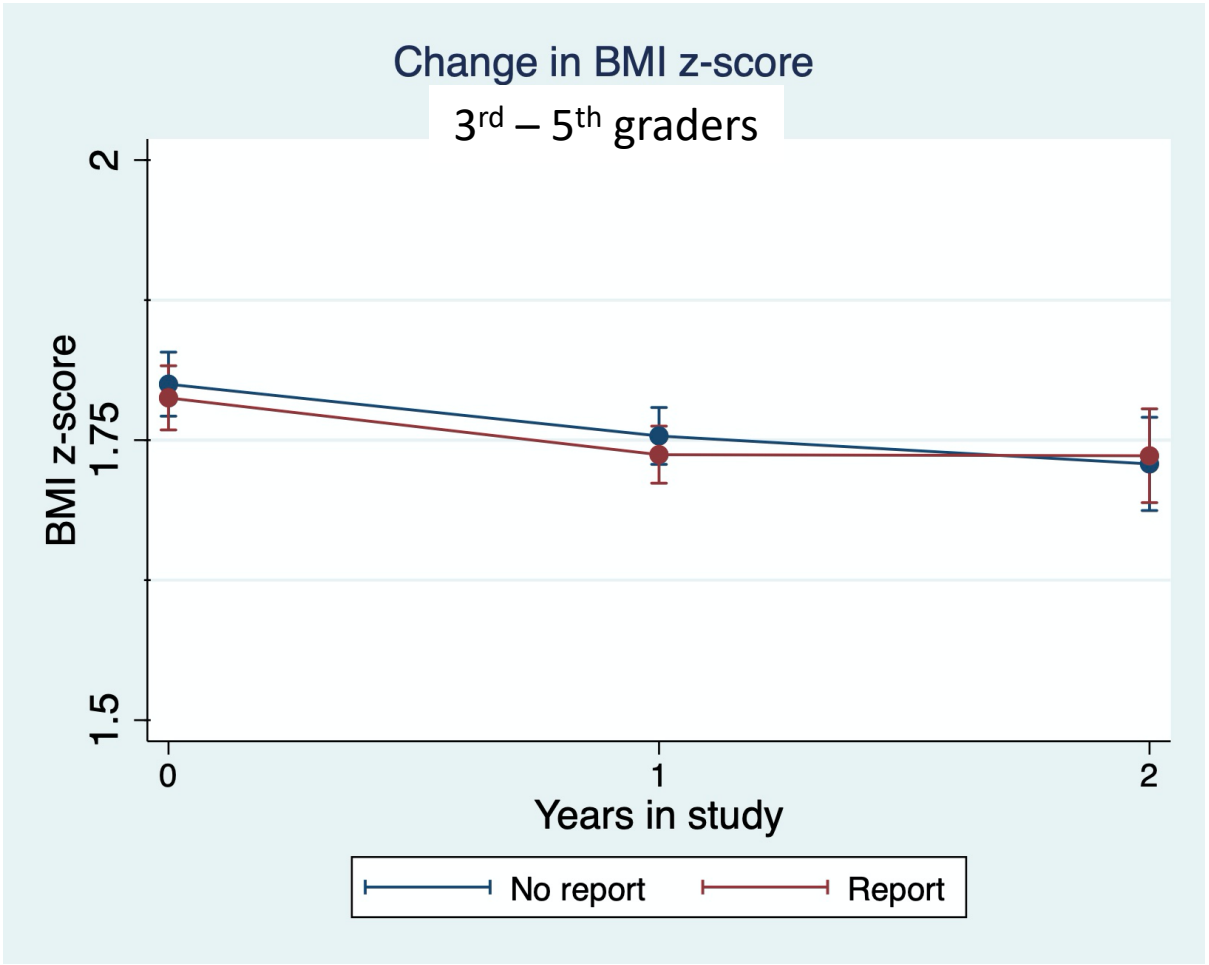
BMI reports did not reduce BMI z-score among Latinx or non-Latinx students

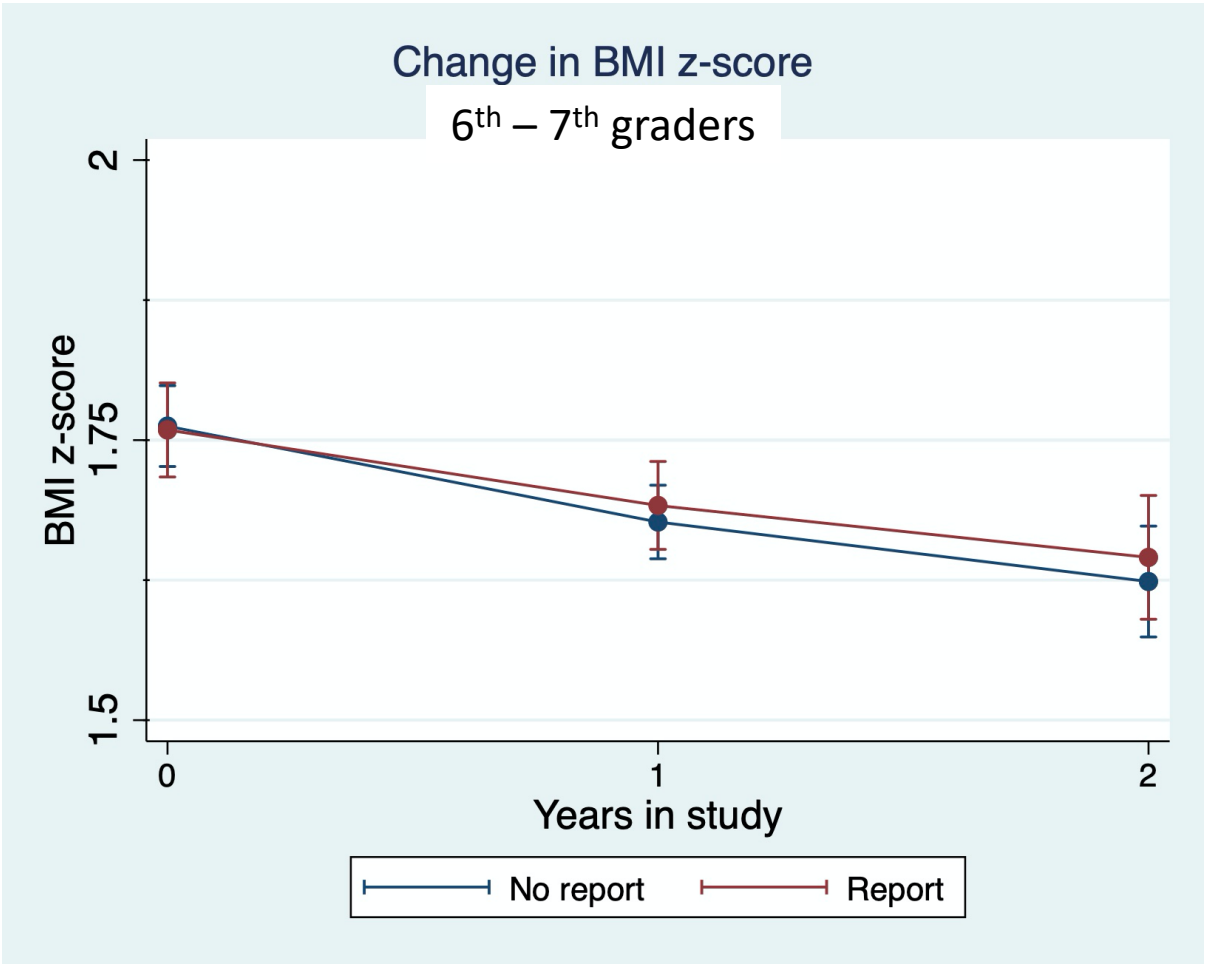




Madsen, JAMA Peds, 2020

BMI reports did not reduce BMI z-score among Latinx students in either age group



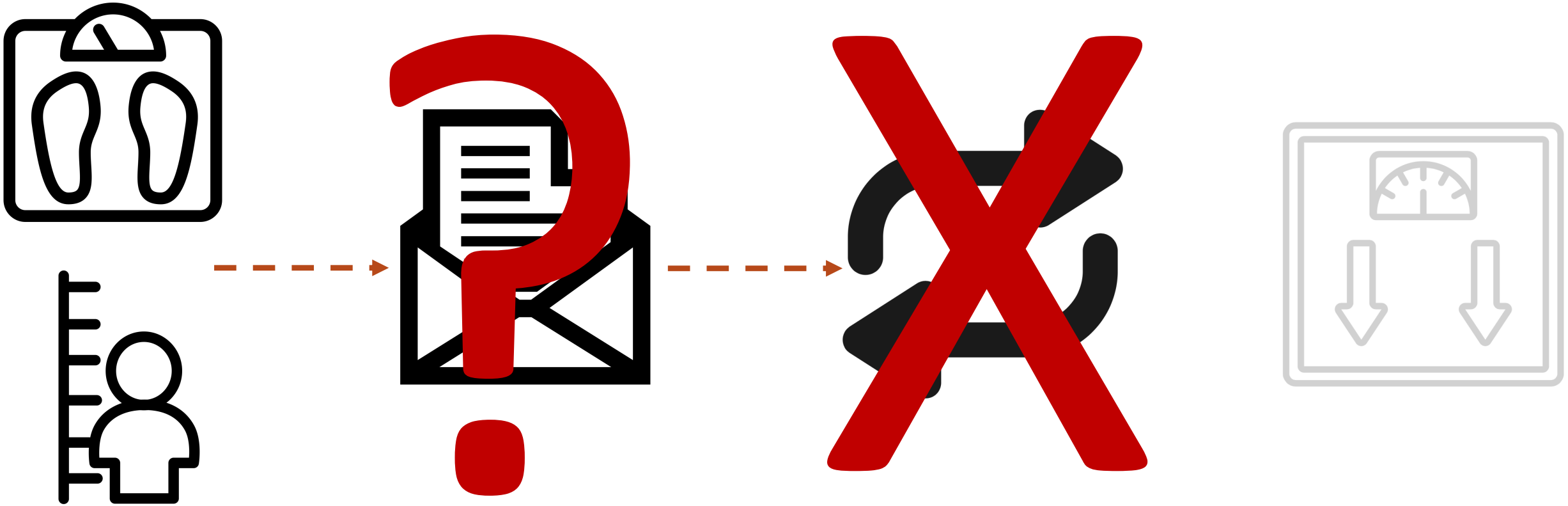


Madsen, JAMA Peds, 2020

Additional models

- No differences by sex
- Multiple imputation results similar

Why school-based BMI screening and reporting doesn't work



Linchey, HBPR, 2019 ; Thompson, Child Obes, 2019

AIM 2: Impact of BMI Screening on Unintended Consequences

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Student Weight Measurement Experience

Sample

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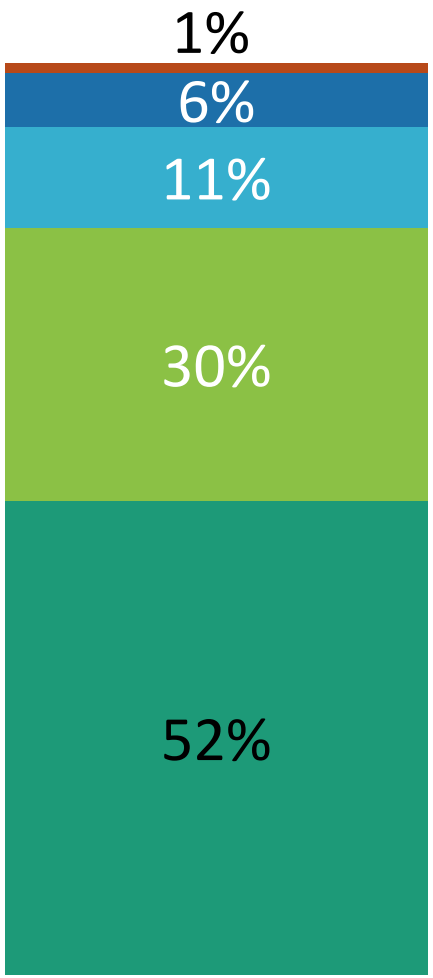
Study Arm 1
BMI Screening & Reporting

N=10,041 students

Study Arm 2
BMI Screening Only

N=10,441 students

Who Conducts Measurements?



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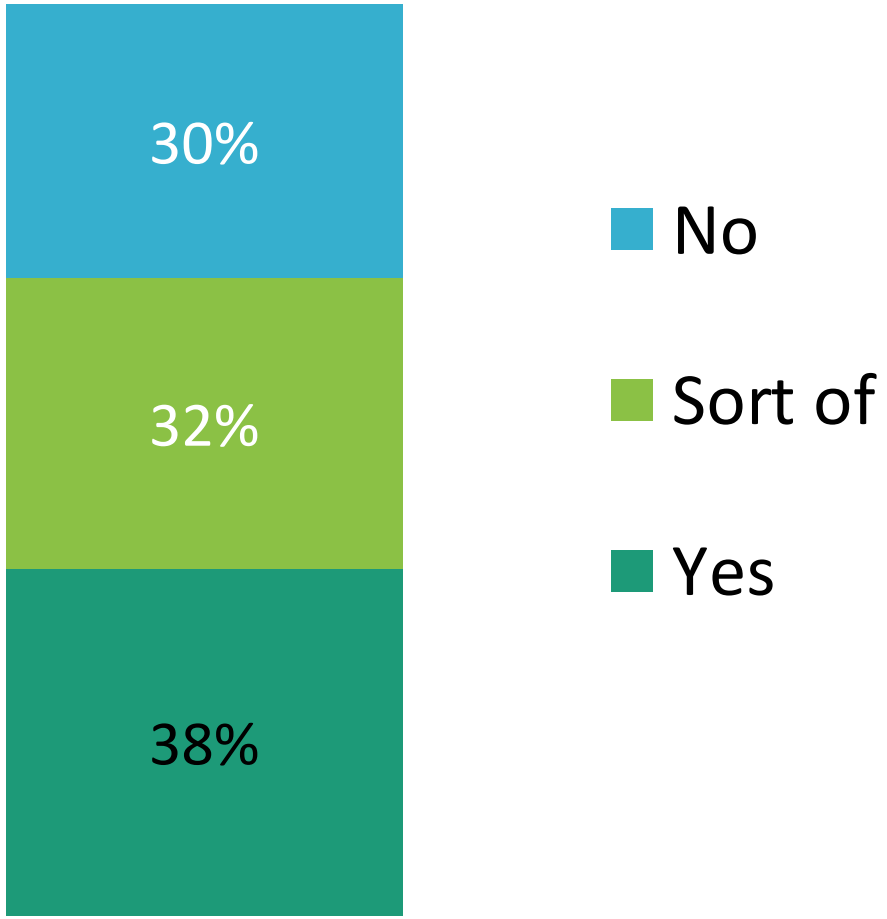
Can Other Students See Measurements?



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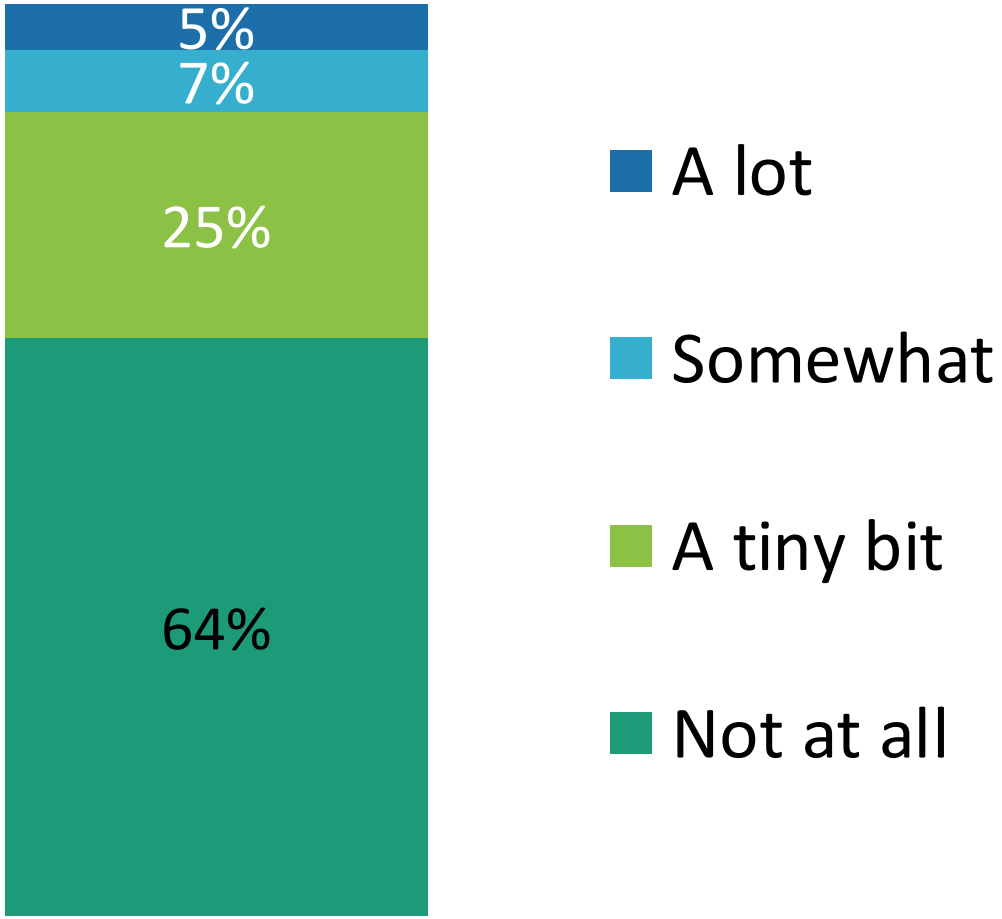
Are Students Bothered by Measurements?



Madsen, JAMA, 2020

Are Students Bothered by Measurements by Weight Satisfaction

Madsen, JAMA Peds, 2020

Impact of BMI Screening on Unintended Consequences

Sample

Study Arm 1
BMI Screening & Reporting

N=10,041 students

Study Arm 2
BMI Screening Only

N=10,441 students

VS.

Study Arm 3
No Screening or Reporting

N=9,724 students

Results

- Weight satisfaction decreased more among students who were weighed at school than among students not weighed at school.

- The setting matters in BMI screening

Madsen, JAMA Peds, 2020

Summary and Implications

Summary of major findings

- BMI reports from schools do not reduce pediatric obesity among 3rd through 8th grade students.

- The practice of BMI screening and reporting in schools is not without harm.

Implications for policy and practice

- Schools should not send home BMI reports to parents.

- Weighing students in schools may cause harm to students, including increased weight dissatisfaction.

- Schools should consider alternative interventions – specifically programs that have been proven to be effective – if they wish to improve student health.

Thank you

www.thefitstudy.org