



TERRAFORMING THE TEENAGE WASTELAND: YOUTH VIOLENCE, MENTAL HEALTH, AND STATE POLICY

Miguel "Mickey" De Jesus Soto – University of Puerto Rico at Mayaguez

Marisa "Ris" Flores – Montana State University at Bozeman

Carson "Car" Green – University of Hawaii at Hilo

Mentors:

Joseph "Joe" Cavanaugh, Ph.D., and Javier "Javi" Flores, M.S.

OUTLINE

- Describe datasets
- Explain outcome and explanatory variables
- Touch on analytic approach
- Share results
- Discuss conclusions

YRBSS DATA

- The Youth Risk Behavior Surveillance Survey (YRBSS) was developed in 1990 to monitor health behaviors that contribute markedly to the leading causes of death, disability, and social problems among youth and adults in the United States
- Surveys have been administered every two years since 1991, collectively sampling more than 4.4 million high school students
- Data are publicly available from the years 1991 to 2017

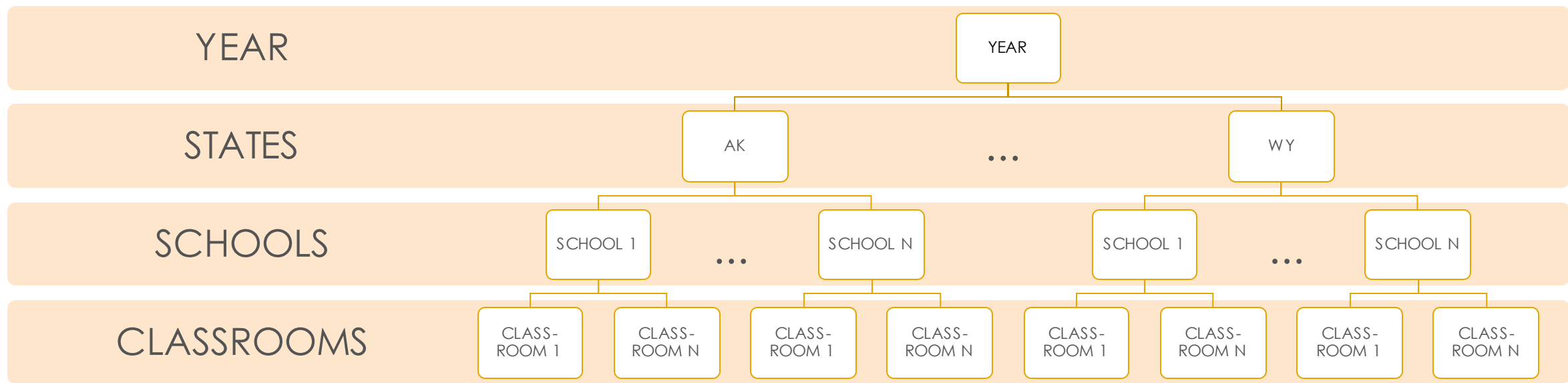
Q13. During the past 30 days, on how many days did you carry a **weapon** such as a gun, knife, or club **on school property**?

- A. 0 days
- B. 1 day
- C. 2 or 3 days
- D. 4 or 5 days
- E. 6 or more days

Q35. During the past 30 days, on how many days did you use an electronic vapor product?

- A. 0 days
- B. 1 or 2 days
- C. 3 to 5 days
- D. 6 to 9 days
- E. 10 to 19 days
- F. 20 to 29 days
- G. All 30 days

YRBSS – HIERARCHICAL SAMPLING DESIGN



ANTI-BULLYING LAW DATA

- The Anti-Bullying Law Data is a longitudinal dataset capturing anti-bullying laws in the 50 states and the District of Columbia from January 1, 1999 (when the first ever policy on anti-bullying was enacted) through January 1, 2018

- Publicly available dataset

<http://lawatlas.org/query?dataset=anti-bullying-laws>

- Created and maintained by The Policy Surveillance Program Staff housed at the Temple University Beasley School of Law

ANTI-BULLYING LAW DATA WEBSITE

Citations

x Iowa

1 results

Prev. Range

Law Amended

Next Range

9/3/15

2016

12/3/16

Answers Valid Range

Iowa

1997

7/1/07

2017

1/1/18

1. Does the state regulate bullying?

§ Yes

2. Does the law define bullying?

§ Yes

2.1. What is included in the definition of bullying?

§ • Aggressive behavior

• Reasonable person standard

2.2. Does the definition of bullying explicitly distinguish bullying from other acts?

• No

3. Does the law regulate cyberbullying?

§ Yes

OUTCOME VARIABLES

Outcomes (Binary)

- **Weapon:** Carried a weapon on school property, during the past 30 days
- **Physical Fighting:** Were in a physical fight on school property, during the past 12 months
- **Forced Sex:** Were ever physically forced to have sexual intercourse
- **Bullying:** Were bullied on school property, during the past 12 months
- **Cyber Bullying:** Were electronically bullied, during the past 12 months
- **Depression:** Felt sad or hopeless for two or more weeks during the past 12 months

EXPLANATORY VARIABLES

Explanatory Variables (Risk Factors)

- **Sexuality:** Sexual orientation
- **Weight Perception:** Self-perception of weight
- **Involvement:** Number of sports teams participated on within the last year
- **Sleep:** Hours of sleep on an average school night
- **Grades:** Grade description within the last year
- **Comp Score :** Comprehensive law score

WHAT IS COMPREHENSIVE SCORE?

- The anti-bullying law data is comprised of 122 questions that each assess various policy features
- Of these policy features, 31 were chosen by a team of legal content experts that most broadly encompass all domains of a good policy
- These 31 features were dichotomized and summed to create a composite comprehensive score, where higher scores are indicative of better state policy

Code to generate Comp Score:

```
comp score = SUM(of q1_regulate,  
q2_define, q10_cyberbul, ...  
q121_polrev, q122_noncom);
```

Questions

Question 1: **Does the state regulate bullying?**

Question Type: Binary - mutually exclusive

Variable Name: anti_regulate

Variable Values: 0, 1

Value Label: 0 = No

Value Label: 1 = Yes

Question 2: **Does the law define bullying?**

Question Type: Binary - mutually exclusive

Variable Name: anti_define

Variable Values: 0, 1

Value Label: 0 = No

Value Label: 1 = Yes

AIMS

- Assess the association of state comprehensive score with student violence and mental health outcomes over time
- Determine the "present-day" relevance of state comprehensive score and individual-level risk factors in teenagers
 - 2017 is the most recent year with available data
 - For this year, unique covariates have been recorded that are absent in many states throughout previous years, and we want to assess these covariates due to their relevance and timeliness
- Graphically model targeted risk factors to show relationships between selected explanatory variables and outcome variables
- Describe and analyze individual-level explanatory risk factors to draw inferences about at-risk student profiles

ANALYTIC APPROACH

- Data were analyzed using logistic regression because of the dichotomous nature of the outcome variables
- Logistic regression was used to fit multivariable models to characterize associations
- Logistic Regression Model:

$\log(\text{odds of outcome}) =$

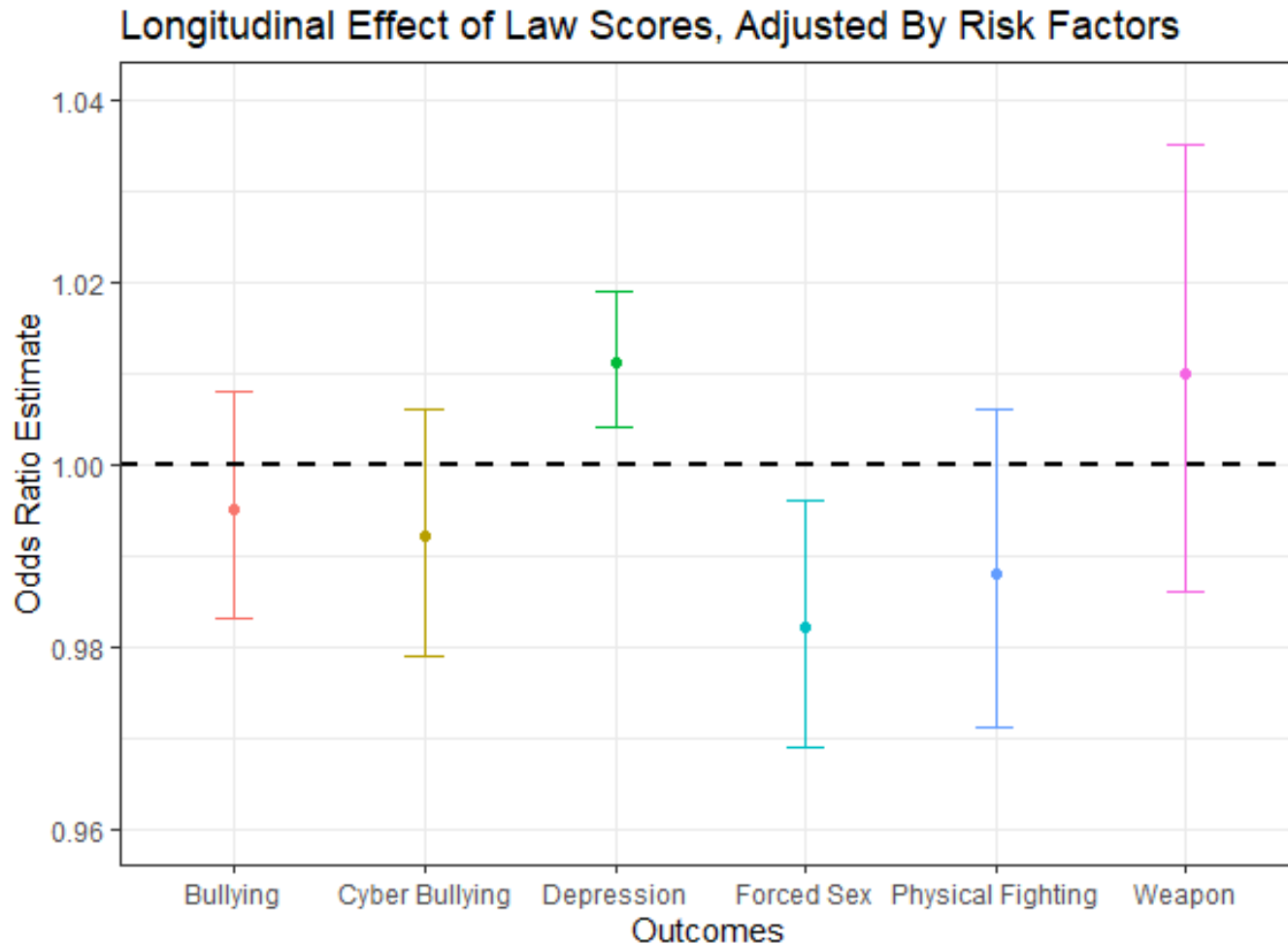
comp score + individual level risk factors + time^o

- The data were analyzed in SAS using PROC SURVEYLOGISTIC to accommodate the sampling design
- Results were graphically summarized in R

^oincluded in longitudinal model only

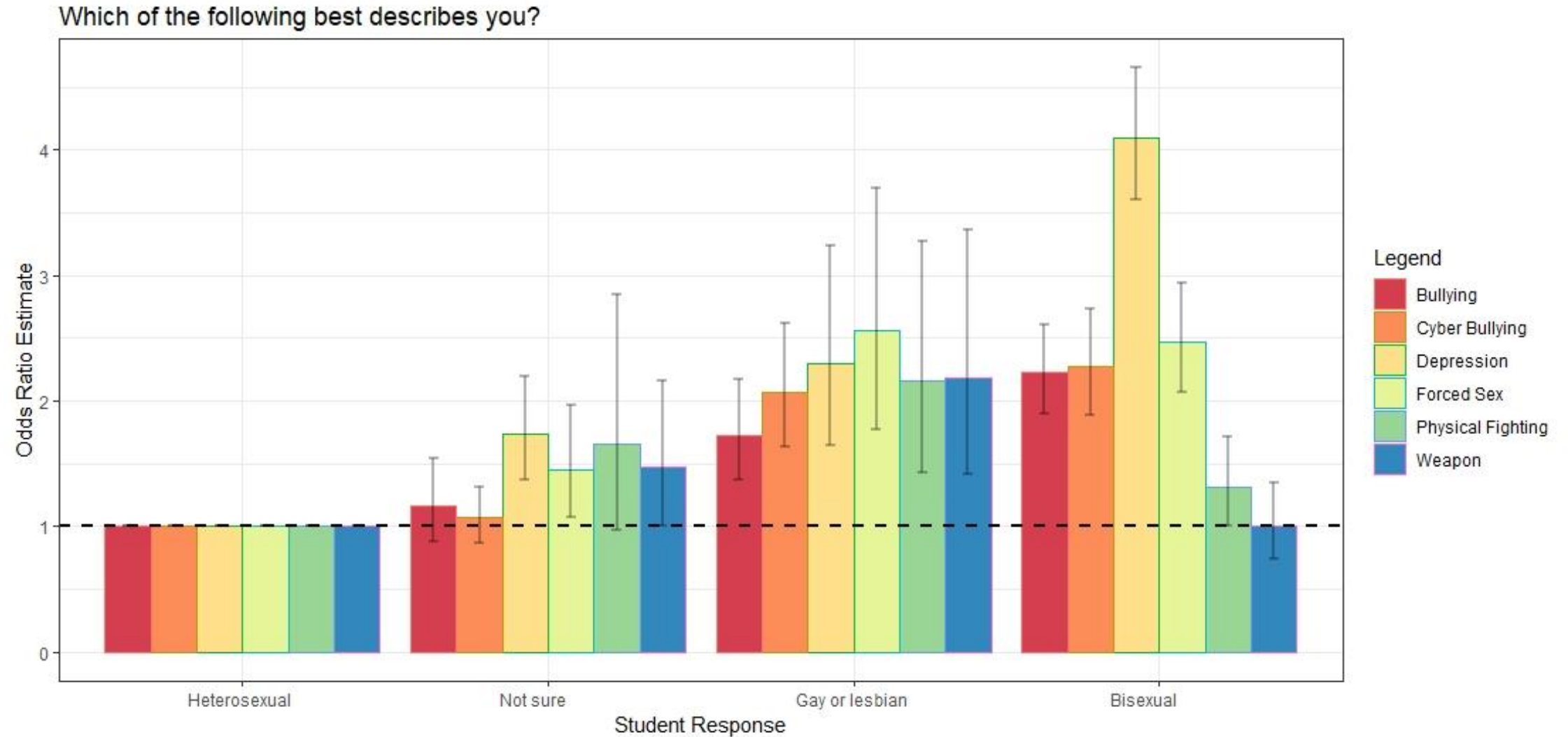
12/25

COMPREHENSIVE SCORE

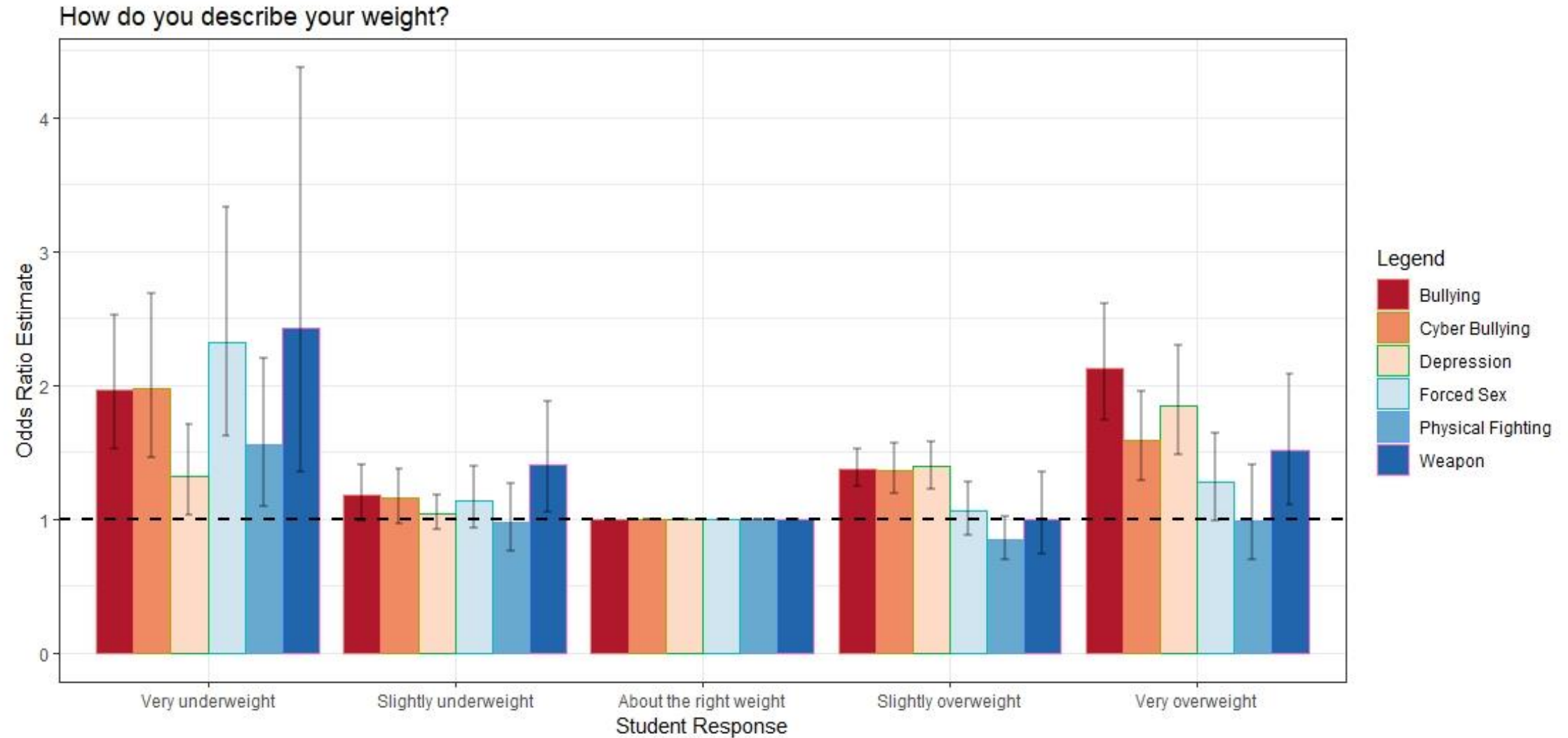


- The longitudinal comprehensive score ranges from 0 to 26 with a standard deviation of 6.64
- When considering a one-unit change in comprehensive score, the effect size of comprehensive score on each outcome is not practically meaningful

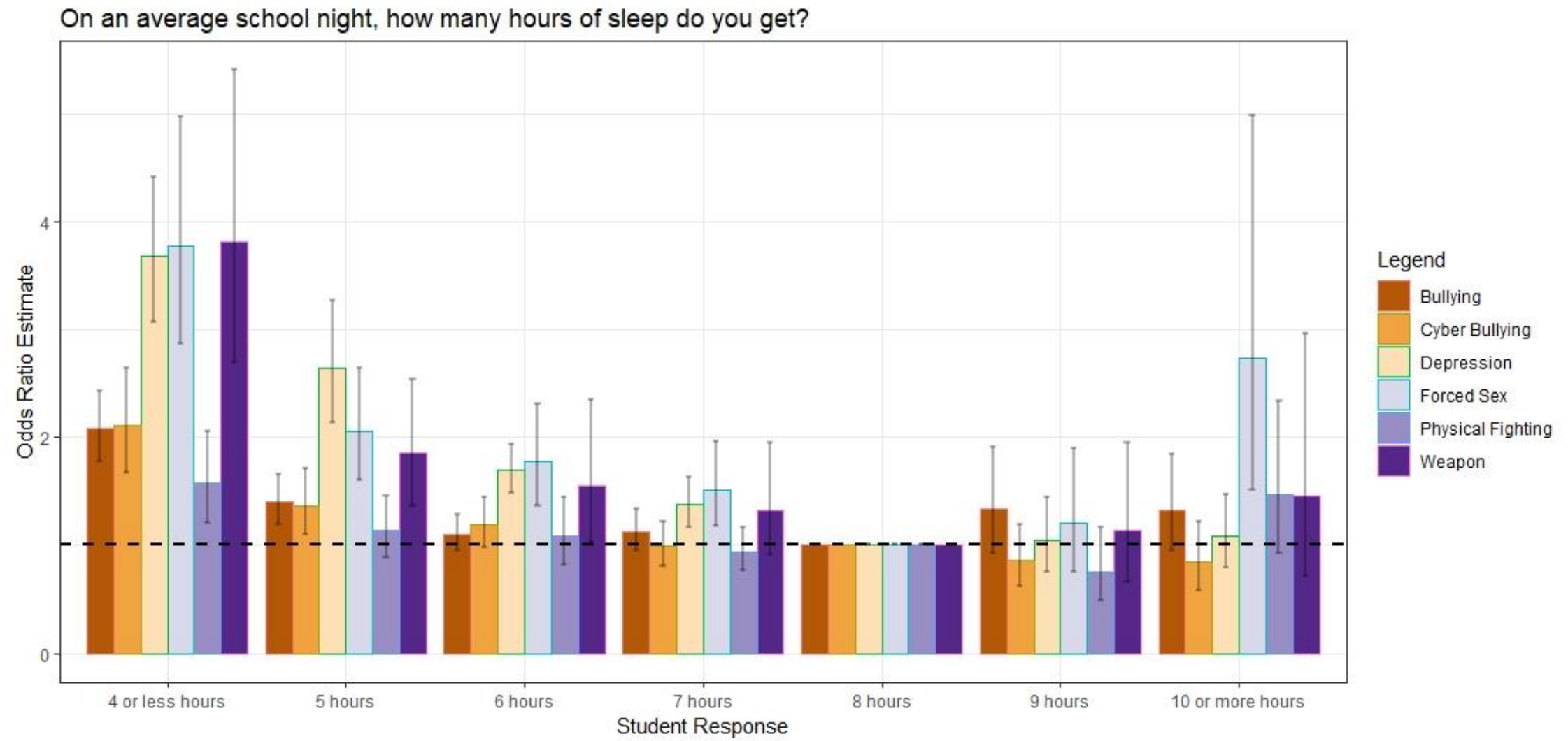
RESULTS - SEXUALITY



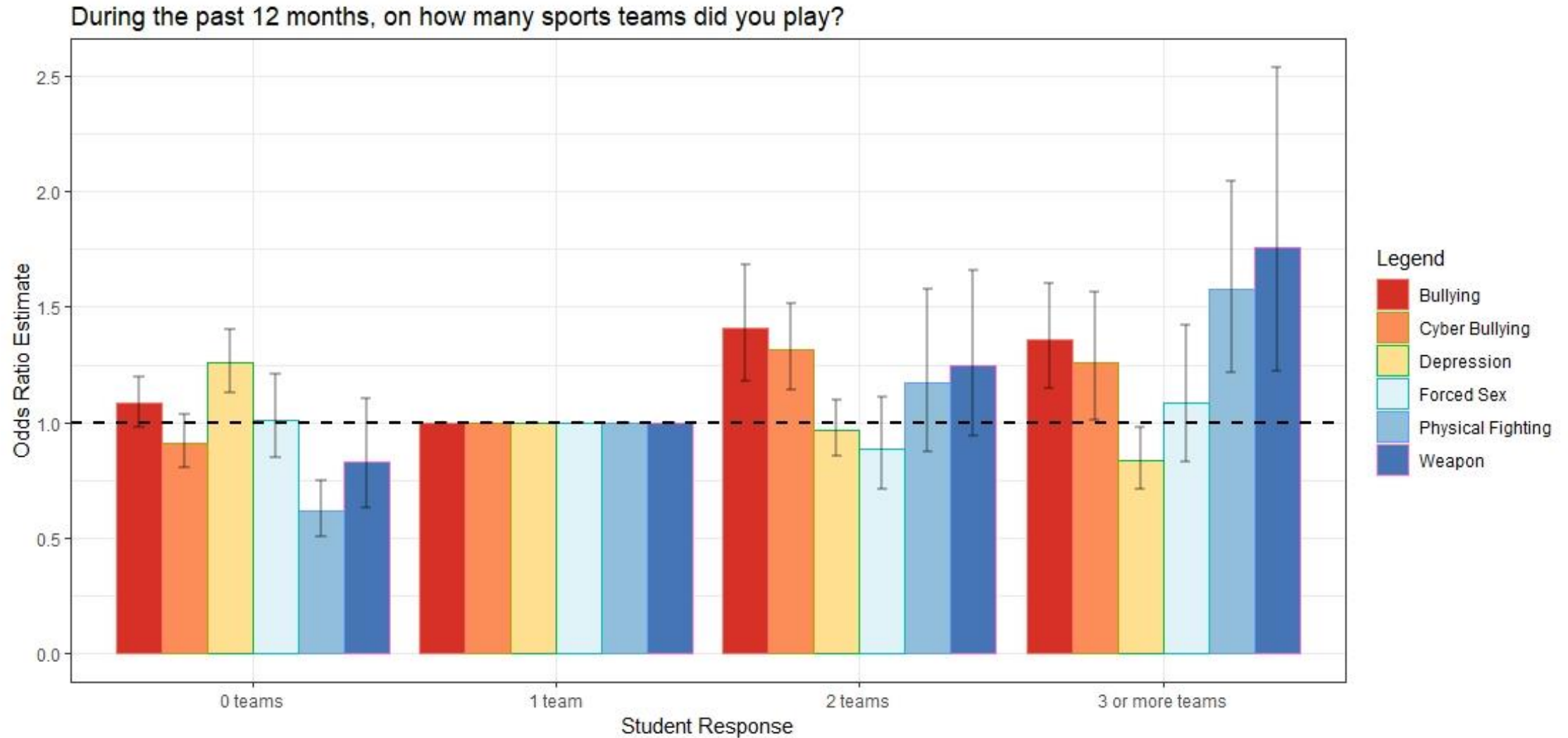
RESULTS – WEIGHT PERCEPTION



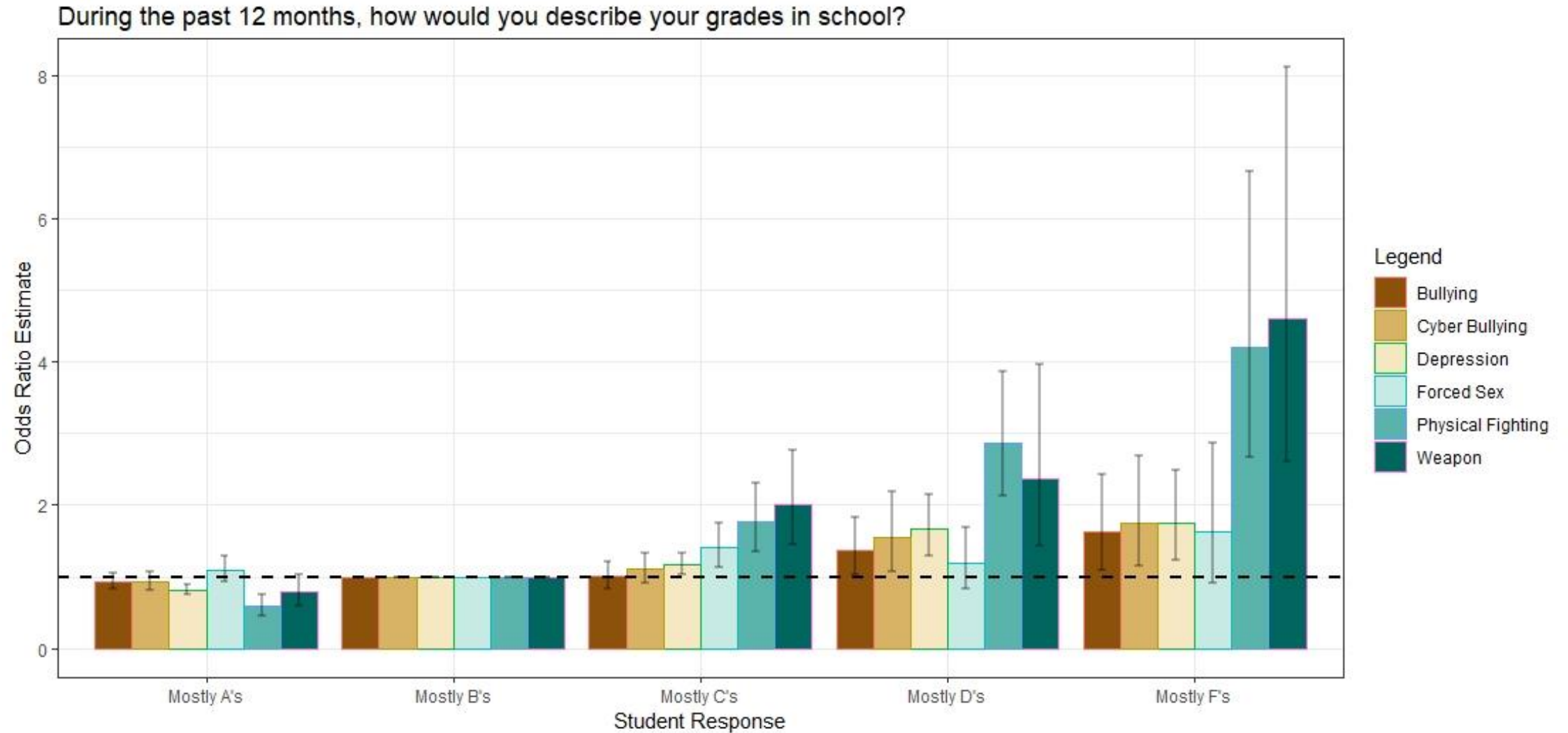
RESULTS – SLEEP



RESULTS – INVOLVEMENT



RESULTS – GRADES



RESULTS – PROFILING (LOWEST RISK PROFILE)

Student A

Bisexual
Slightly overweight
0 Sports teams
8 Hours of sleep
Mostly A's

Student B

Heterosexual
About right weight
1 Sports team
8 Hours of sleep
Mostly A's

Student C

Heterosexual
Slightly overweight
0 Sports teams
9 Hours of sleep
Mostly A's

Student D

Heterosexual
About right weight
2 Sports teams
8 Hours of sleep
Mostly B's

Student E

Heterosexual
About right weight
Sports teams ≥ 3
8 Hours of sleep
Mostly A's

Student F

Heterosexual
About right weight
0 Sports teams
Hours of sleep ≥ 10
Mostly A's

RESULTS – PROFILING (LOWEST RISK PROFILE)

Student A
Bisexual
Slightly overweight
0 Sports teams
8 Hours of sleep
Mostly A's $Pr = 0.99\%$

Weapon Carrying

Student B
Heterosexual
About right weight
1 Sports team
8 Hours of sleep
Mostly A's $Pr = 10.57\%$

Bullying

Student C
Heterosexual
Slightly overweight
0 Sports teams
9 Hours of sleep
Mostly A's $Pr = 1.49\%$

Physical Fighting

Student D
Heterosexual
About right weight
2 Sports teams
8 Hours of sleep
Mostly B's $Pr = 3.02\%$

Forced Sex

Student E
Heterosexual
About right weight
Sports teams ≥ 3
8 Hours of sleep
Mostly A's $Pr = 10.91\%$

Sadness/Depression

Student F
Heterosexual
About right weight
0 Sports teams
Hours of sleep ≥ 10
Mostly A's $Pr = 7.28\%$

Cyber Bullying

RESULTS – PROFILING (HIGHEST RISK PROFILE)

Student A

Bisexual

Very underweight

2 Sports teams

Hours of sleep ≤ 4

Mostly F's

Student B

Gay/Lesbian

Very underweight

Sports teams ≥ 3

Hours of sleep ≤ 4

Mostly F's

Student C

Bisexual

Very overweight

2 Sports teams

Hours of sleep ≤ 4

Mostly F's

Student D

Bisexual

Very overweight

0 Sports teams

Hours of sleep ≤ 4

Mostly F's

RESULTS – (HIGHEST RISK PROFILE)

Physical Fighting
Pr = 46.07%

Student B
Gay/Lesbian
Very underweight
Sports teams ≥ 3
Hours of sleep ≤ 4
Mostly F's

Weapon Carrying
Pr = 71.57%

Forced Sex
Pr = 24.77%

Cyber Bullying
Pr = 70.49%

Student A
Bisexual
Very underweight
2 Sports teams
Hours of sleep ≤ 4
Mostly F's

Bullying
Pr = 74.19%

Student C
Bisexual
Very overweight
2 Sports teams
Hours of sleep ≤ 4
Mostly F's

Sadness/Depression
Pr = 91.67%

Student D
Bisexual
Very overweight
0 Sports teams
Hours of sleep ≤ 4
Mostly F's

CONCLUSIONS

- After modeling adjusted longitudinal comp score, we saw no substantive difference from one in our odds ratio estimates, so we concluded that higher comprehensive state legislation scores are not meaningfully associated with our chosen outcomes
- From our cross-sectional models we drew conclusions about the strength and direction of selected risk factors with our chosen outcome variables
 - One of the meaningful associations we noticed was that as grades decrease, most odds of our outcomes increased
 - For all six outcome questions, the highest risk categories include "Mostly F's" and "4 or less hours" of sleep, and the common highest risk categories are "Bisexual", "Gay or Lesbian", and "Very Underweight"

FUTURE WORK

- When 2019 data is available, we will want to compare common risk factors between 2017 and 2019
- In the future, we would be interested in determining whether the high and low risk profiles have changed over time
 - This could be done by considering interactions of our risk factors with time

ACKNOWLEDGEMENT



College of
Public Health



UPR
Recinto Universitario de Mayagüez



MONTANA
STATE UNIVERSITY



UNIVERSITY
of HAWAII®
HILO

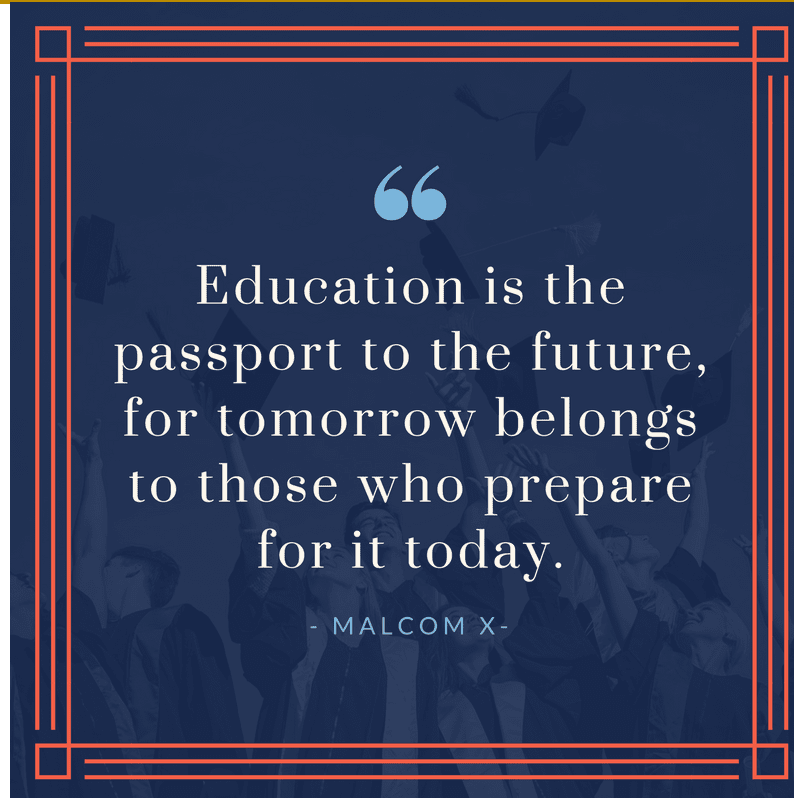
ISIB Program sponsored
by the National Heart
Lung and Blood Institute
(NHLBI), grant #HL147231.



National Heart, Lung,
and Blood Institute



QUESTIONS?



Music Recommendations:
Zombie by The Cranberries (Bad Wolves version is good too)
Baba O'Riley by The Who

Thank you for listening from the Car McRis Jovi group!

PREVALENCE OF OUTCOMES



Weapon: 4.55%

Physical Fighting: 7.29%

Forced Sex: 8.33%

Bullying: 20.13%

Cyber Bullying: 16.43%

Sadness/Depression: 30.99%

BASELINE RISK PROBABILITIES

Baseline Profile

Heterosexual

About the right weight

1 Sports team

8 Hours of sleep

Mostly B's

Probabilities for this baseline profile for each outcome:

Weapon: 1.51%

Physical Fighting: 6.25%

Forced Sex: 3.39%

Bullying: 11.28%

Cyber Bullying: 9.87%

Sadness/Depression: 15.28%

RESULTS – PROFILING (LOWEST RISK PROFILE)

Student A n = 13

Bisexual
Slightly overweight
0 Sports teams
8 Hours of sleep
Mostly A's

Student B n = 415

Heterosexual
About right weight
1 Sports team
8 Hours of sleep
Mostly A's

Student C n = 69

Heterosexual
Slightly overweight
0 Sports teams
9 Hours of sleep
Mostly A's

Student D n = 230

Heterosexual
About right weight
2 Sports teams
8 Hours of sleep
Mostly B's

Student E n = 332

Heterosexual
About right weight
Sports teams ≥ 3
8 Hours of sleep
Mostly A's

Student F n = 36

Heterosexual
About right weight
0 Sports teams
Hours of sleep ≥ 10
Mostly A's

RESULTS – PROFILING (HIGHEST RISK PROFILE)

Student A $n = 0$

Bisexual

Very underweight

2 Sports teams

Hours of sleep ≤ 4

Mostly F's

Student B $n = 3$

Gay/Lesbian

Very underweight

Sports teams ≥ 3

Hours of sleep ≤ 4

Mostly F's

Student C $n = 0$

Bisexual

Very overweight

2 Sports teams

Hours of sleep ≤ 4

Mostly F's

Student D $n = 3$

Bisexual

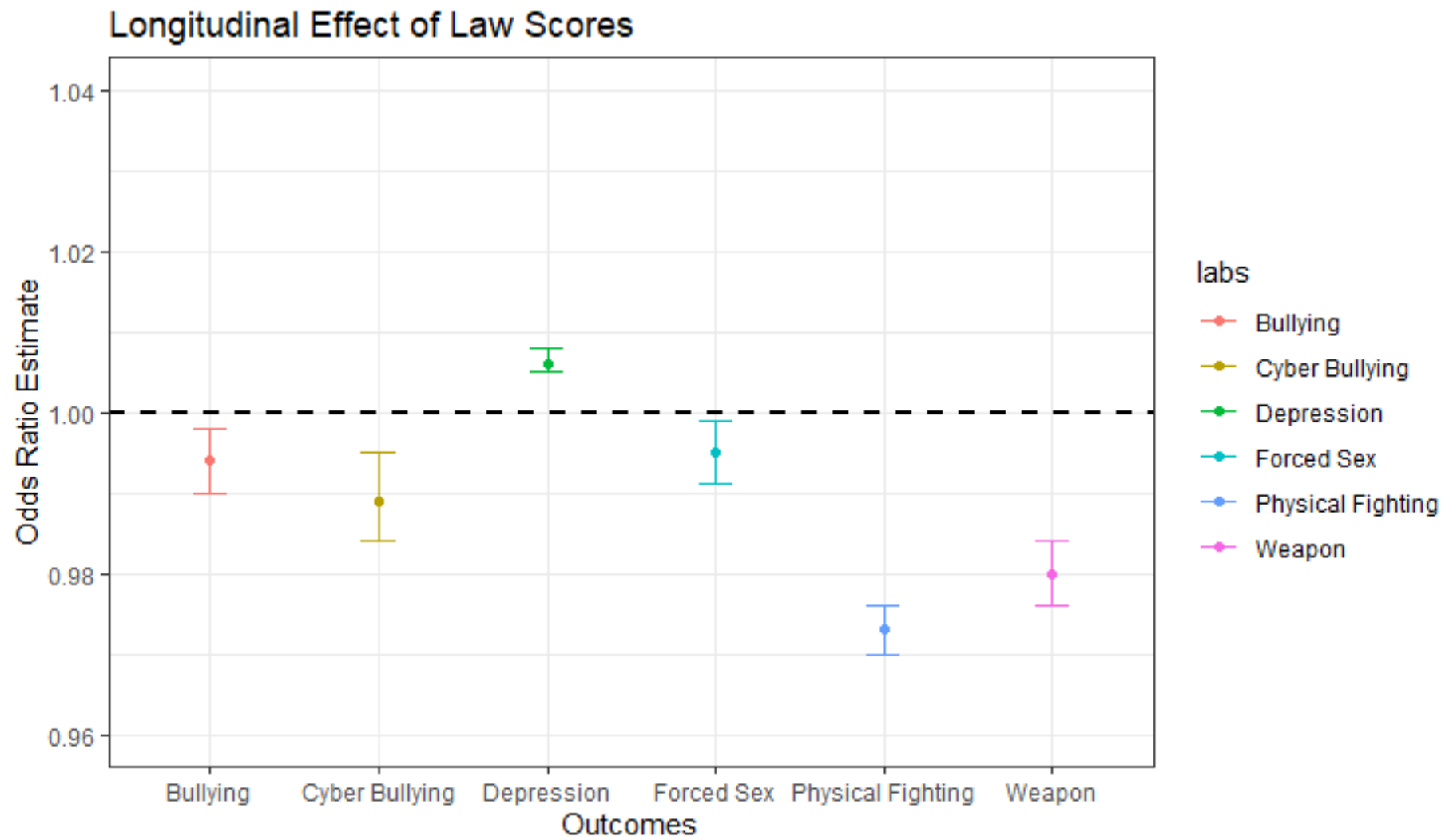
Very overweight

0 Sports teams

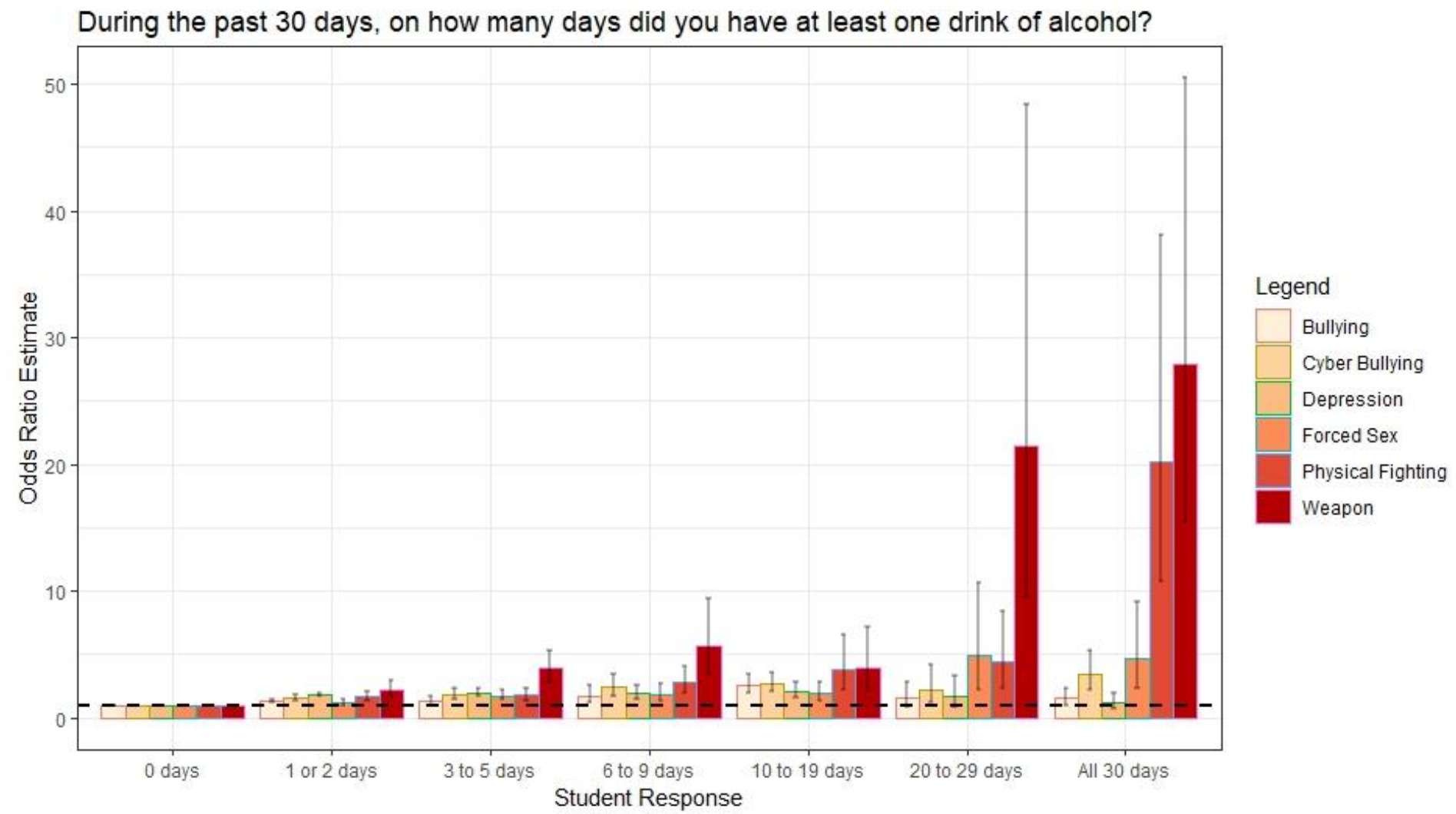
Hours of sleep ≤ 4

Mostly F's

UNADJUSTED



ADDITIONAL RISK FACTORS-ALCOHOL



ADDITIONAL RISK FACTORS-AGE OF FIRST SEXUAL INTERCOURSE

