



HEALTH BEHAVIORS AND ACADEMIC RISK:

Examining the Healthy Youth Survey in King County Students

June 2016

Executive summary

- *Health Behaviors and Academic Risk* provides an in-depth look at 23 health-risk behaviors among King County middle and high school youth. It shows how the risk of failing academically (making grades of mostly Cs, Ds, or Fs) relates to specific health-risk behaviors.
- About 1 in 5 King County school-aged youth (grades 8, 10, and 12) are at risk of failing academically.
- Demographic inequalities exist both in academic risk and among 23 health-risk behaviors examined. Compared to the county average, some demographic groups have consistently higher rates of health-risk behaviors.
- Students reporting ≥ 6 health-risk behaviors (from the larger set of 23) are twice as likely as students reporting 0 or 1 to be at academic risk.
- Among King County middle and high school students, 9 health-risk behavior categories are significantly linked to academic risk, including:
 - Having inadequate nutrition (no breakfast or low fruit/vegetable consumption)
 - Drinking sugary beverages
 - Being obese
 - Being sedentary (low physical activity or excessive screen time)
 - Experiencing food insecurity
 - Using alcohol, cigarette, e-cigarette or marijuana
 - Feeling depressed
 - Ever having sexual intercourse
 - Having inadequate dental care
- A range of interventions can be implemented to create healthy school environments where students are healthy and ready to learn.

23 health-risk behaviors examined in this report

- **Healthy Eating and Active Living**
 - Not eating breakfast
 - Low fruit and vegetable consumption
 - Sugary beverage consumption
 - Food insecurity
 - Insufficient exercise
 - Excessive screen time
- **Physical Health**
 - Insufficient sleep
 - Obesity
 - Missing school due to asthma
 - Inadequate dental care
 - Sexual Initiation
- **Mental Health and Substance Use**
 - Depressive feelings
 - Feeling unsafe in school
 - Being bullied
 - Cigarette use
 - E-cigarette use
 - Marijuana use
 - Alcohol use
- **Unintentional Injury and Violence-related Behaviors**
 - Driving after drinking
 - Riding with a drinking driver
 - Texting while driving
 - Riding with a texting driver
 - Carrying a weapon

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Background: Why is health important for academic success?

- Students spend about half their waking hours in school.
- Institute of Medicine sees “schools as the heart of health”¹ for obesity prevention.
- Research shows strong impact on academic success of school-based interventions for improving health.³
- Study by University of Washington researchers found that Washington State schools with lower rates of substance abuse also had higher scores on the Washington Assessment of Student Learning.⁴

“The academic success of America’s youth is strongly linked with their health.”²



Health and education are linked: Academic success may predict adult health outcomes

- If, between 1996 and 2002, death rates had been the same for adults (ages 18-64) with at least 1 year of college education and those with high school education or less, an average of 195,619 deaths per year in the U.S. may have been avoided.⁵
- This is 8 times more than the number of lives that could have been saved by medical advancements:

“If medical researchers were to discover an elixir that could increase life expectancy, reduce the burden of illness, delay the consequences of aging, decrease risky health behavior, and shrink disparities in health, we would celebrate such a remarkable discovery.

***Robust epidemiological evidence suggests that
education is such an elixir.”⁶***

How health behaviors affect academic success

Health behaviors can affect⁷:

- Concentration and memory
- School attendance
- Feeling connected to teachers and peers
- Engagement in school activities

"[Children]...who face violence, hunger, substance abuse, unintended pregnancy, and despair cannot possibly focus on academic excellence.

*There is no curriculum brilliant enough to compensate for a hungry stomach or a distracted mind."*⁸

-National Action Plan for Comprehensive School Health Education, 1992

What is known from a prior Washington State analysis of 8th and 10th grade students

Analyzed the association between **13 health-risk behaviors** and **academic achievement** in Washington State overall using 2006 data⁹:

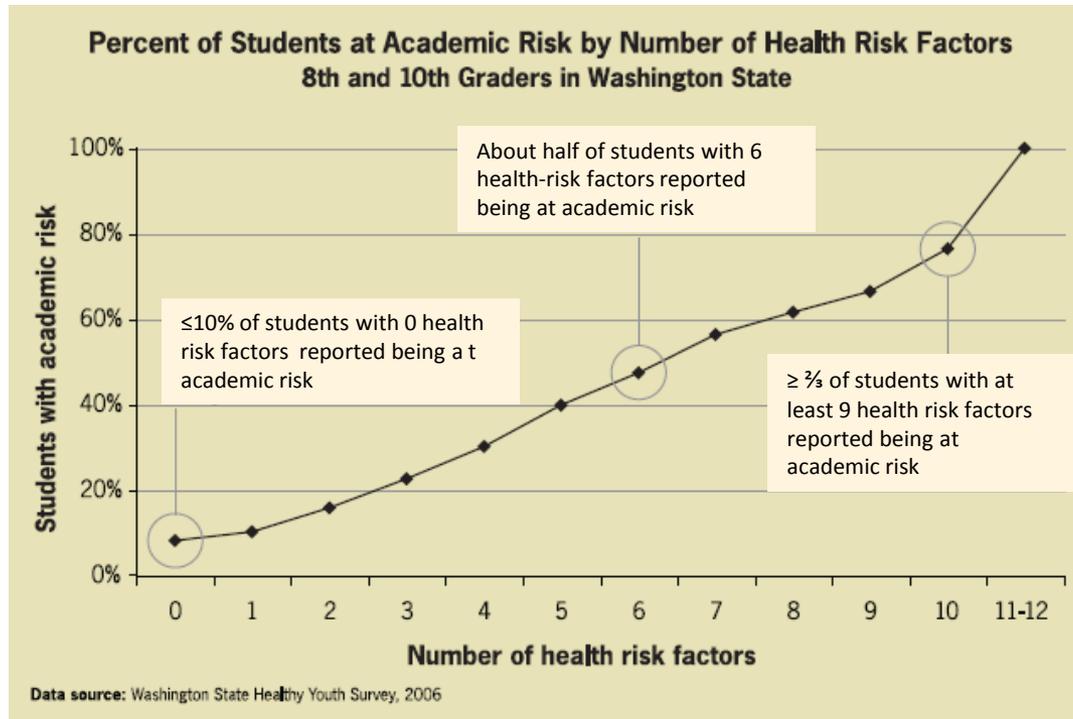


Chart obtained from: Diley, J. *Research Review: School-Based Health Interventions and Academic Achievement*. Washington State Department of Health, Washington State Office of the Superintendent of Public Instruction, and Washington State Board of Health; Sep, 2009.

Increasing number of health-risk behaviors



Increasing rate of being at academic risk (mostly C's or lower); 7% increase per additional health-risk behavior

Goals of this report

- Explore the relationship between health-risk behaviors and academic risk, using the school-based Healthy Youth Survey.
- Expand the prior Washington State analysis with updated data for King County students, including new variables based on literature.
- Describe the distribution of health-risk behaviors associated with academic risk by demographics and place in King County.
- Examine the relationship of multiple health-risk behaviors on academic risk among King County students.

Data analysis approach

- Defined academic risk as reporting receiving grades of mostly C's, D's or F's in school.
- Combined 2012 and 2014 data from the Healthy Youth Survey for grades 8, 10, and 12.
- Computed frequency of each health-risk behavior by demographics:
 - Grade, gender, sexual orientation, race/ethnicity, maternal education, King County region
- Estimated strength of relationship between each of 23 health-risk behaviors and academic risk.
- Combined 23 health-risk behaviors into health-risk categories for multivariate modeling.
- Determined relationship of health-risk behavior categories on academic risk when taking into account other factors.

Results

23 Health-risk behaviors examined

– detailed data available in technical appendix

Healthy Eating and Active Living

- Not eating breakfast
- Low fruit and vegetable consumption
- Sugary beverage consumption
- *Food insecurity*
- Insufficient exercise
- Excessive screen time

Physical Health

- Insufficient sleep
- Obesity
- Missing school due to asthma (previous WA State analysis used severe asthma)
- *Inadequate dental care*
- *Sexual Initiation*

Legend

13 health-risk behaviors included in WA State analysis (2006 data)

10 newly identified health-risk behaviors (from literature review and/or emerging public health issue)

Continued on next page

23 Health-risk behaviors examined (continued) – detailed data available in technical appendix

- Mental Health and Substance Use

- Depressive feelings
- Feeling unsafe in school
- *Being bullied*
- Cigarette use
- *E-cigarette use*
- Marijuana use
- Alcohol use

- Unintentional Injury and Violence-related Behaviors

- *Driving after drinking*
- *Riding with a drinking driver*
- *Texting while driving*
- *Riding with a texting driver*
- *Carrying a weapon*

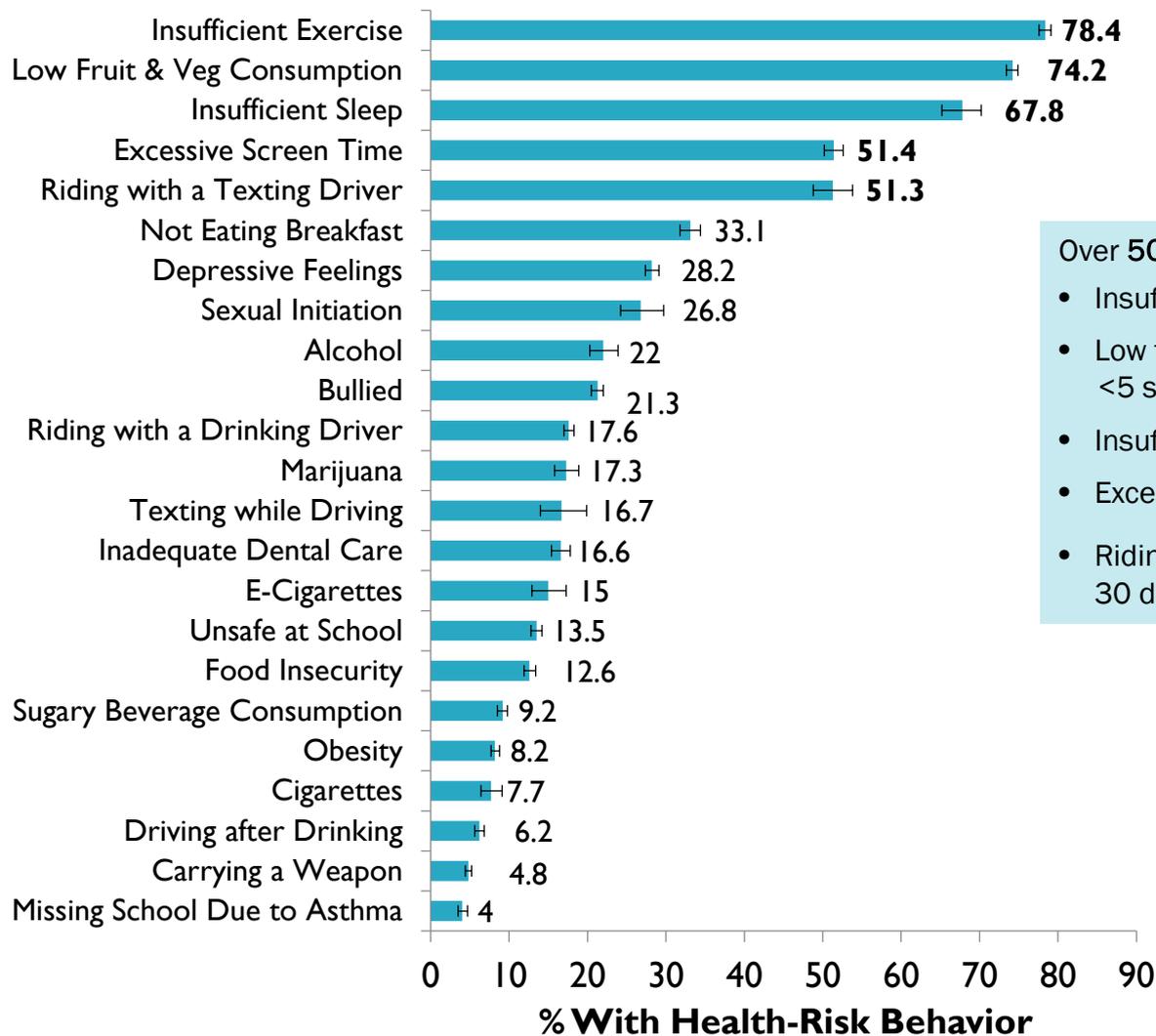
Legend

13 health-risk behaviors included in WA State analysis (2006 data)

10 newly identified health-risk behavior (from literature review and/or emerging public health issue)

Health-Risk Behaviors among King County Students

Rates of health-risk behaviors among school-age youth (grades 8, 10, 12) in King County, WA: 2012 & 2014 average

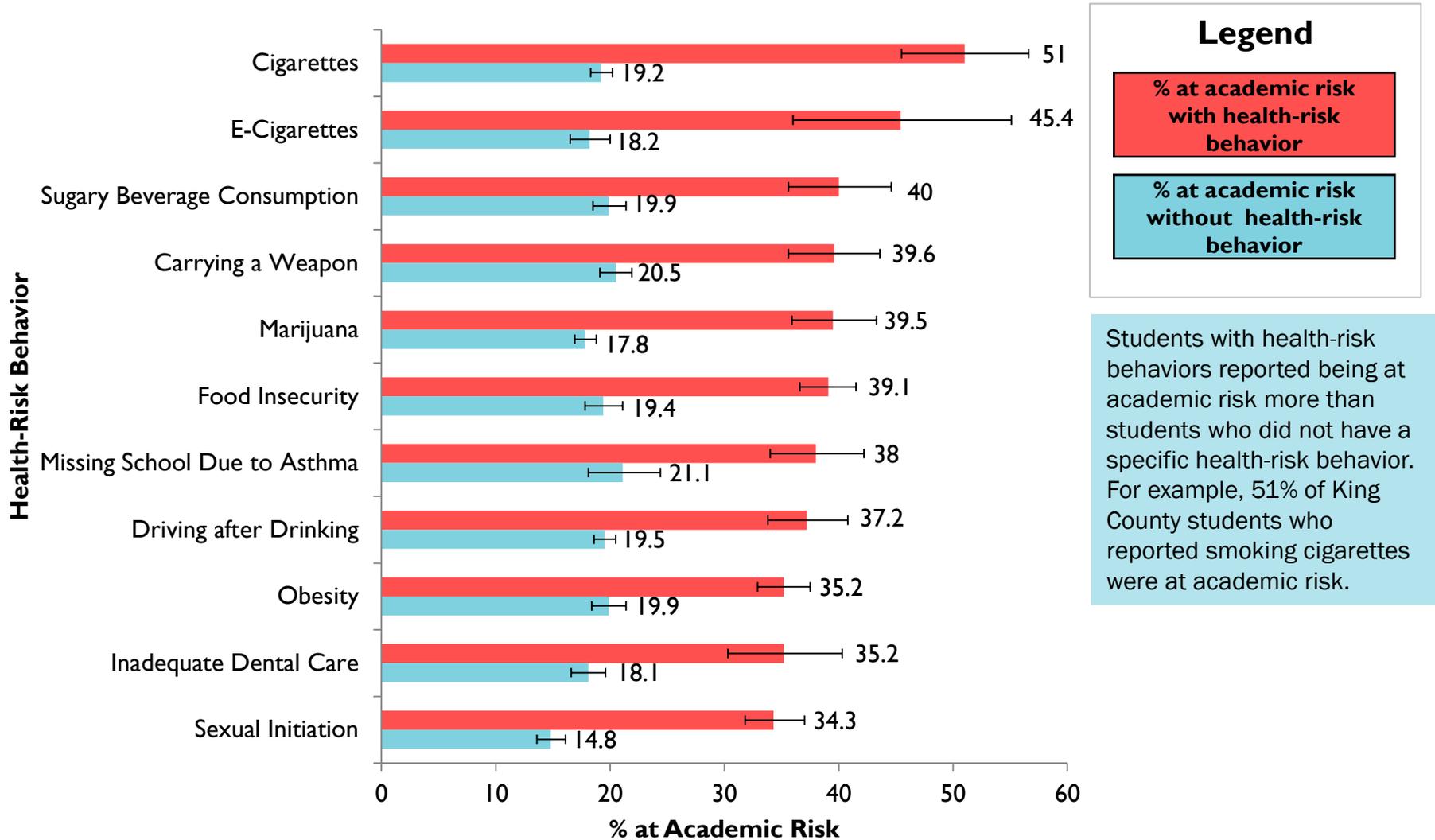


Over 50% of King County students report:

- Insufficient exercise: <60 min/day
- Low fruit and vegetable consumption: <5 servings/day
- Insufficient sleep: <8 hours/day
- Excessive screen time: >3 hours/day
- Riding with a texting driver ≥ 1 day in past 30 days

 : Confidence interval shows range that includes the true value 95% of the time.

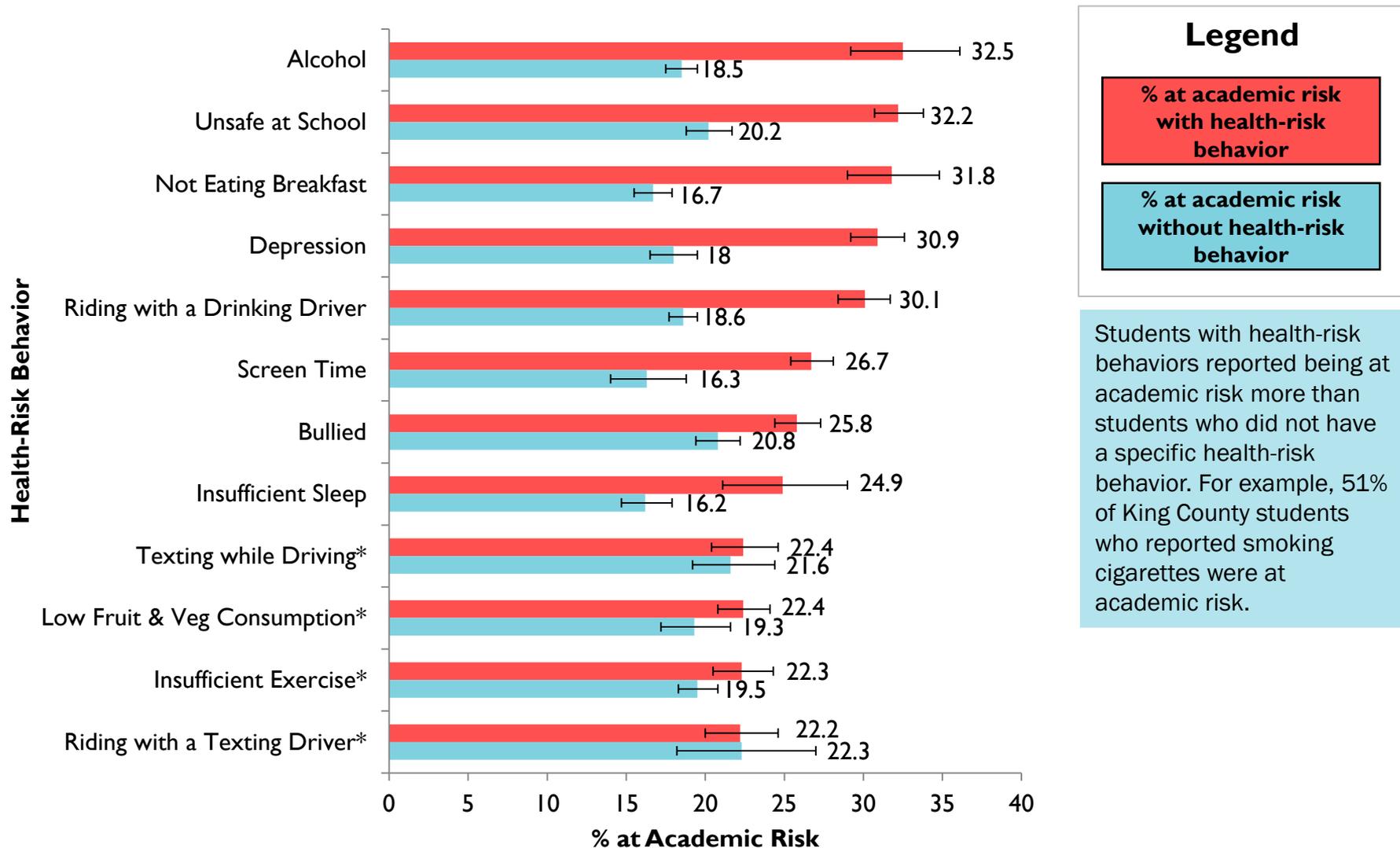
King County, WA students (grades 8, 10, 12) at academic risk with and without health-risk behavior: 2012 & 2014 average



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: Confidence interval shows range that includes the true value 95% of the time.

King County, WA students (grades 8, 10, 12) at academic risk with and without health-risk behavior (cont'd): 2012 & 2014 average



*No significant difference between percentages at academic risk with and without health-risk behavior.

—: Confidence interval shows range that includes the true value 95% of the time.

Person and Place Disparities in Health-Risk Behaviors

Groups where ≥ 6 health-risk behaviors are better or worse than the King County average: 2012 & 2014 average

Grade

- 8 (↑)
- 10
- 12 (↓)

Gender

- Female
- Male

Sexual Orientation*

- Bisexual (↓)
- Gay or Lesbian (↓)
- Heterosexual

Race/Ethnicity

- AIAN
- Asian (↑)
- Black (↓)
- Hispanic (↓)
- Multiple
- NHPI (↓)
- White (↑)

Maternal Education

- < High School (↓)
- High School (↓)
- Some College
- College or more (↑)

Region

- East (↑)
- North (↑)
- South (↓)
- Seattle

Legend

Significantly better than King County (↑)

No significant difference

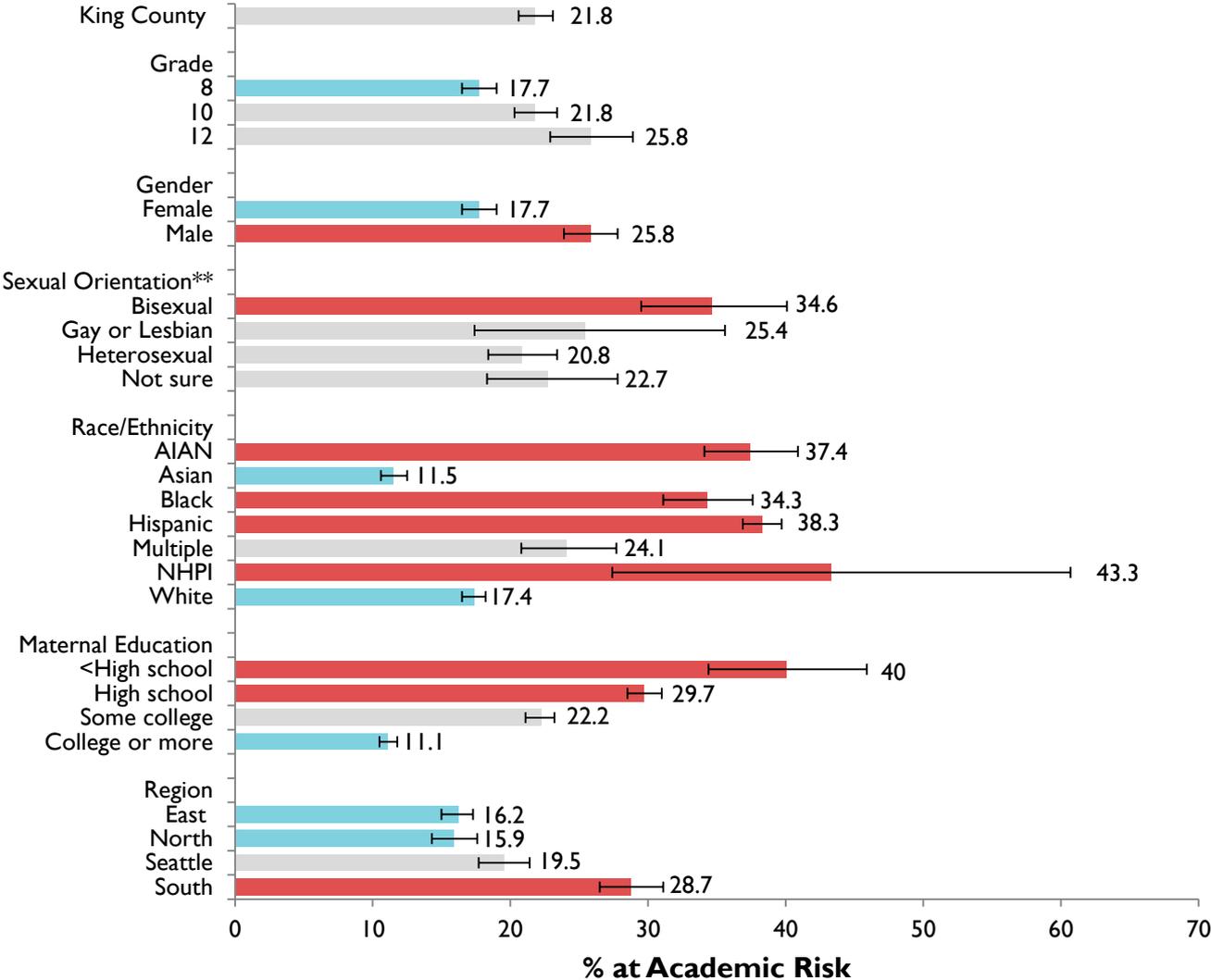
Significantly worse than King County (↓)

23 health-risk behaviors for various demographic groups were compared with King County average. Variations exist in social groups that had ≥ 6 health-risk behaviors that were better or worse than King County average.

* Total of 22 health-risk factors examined, unable to include sexual initiation due to how sexual orientation status was defined. Sexual orientation first asked in 2014. Directly asked on half of surveys (Form A); responses of "Not sure" were excluded. Inferred sexual orientation on remaining half of surveys (Form B) derived from answers to questions about with whom respondent had sexual contact (excludes those who responded "No sexual contact") and respondent's gender.

Academic Risk by Person and Place Characteristics

Academic risk* by person and place: 2012 & 2014 average



Legend

- Significantly better than King County
- No significant difference
- Significantly worse than King County

- Overall, **21.8%** of students in King County are at **academic risk**, with inequities by person and place.
- Significantly worse for males, students of color (other than Asians), students identifying as bisexual, and students whose mothers have less than a high school education.
- Significantly worse for students living in South King County

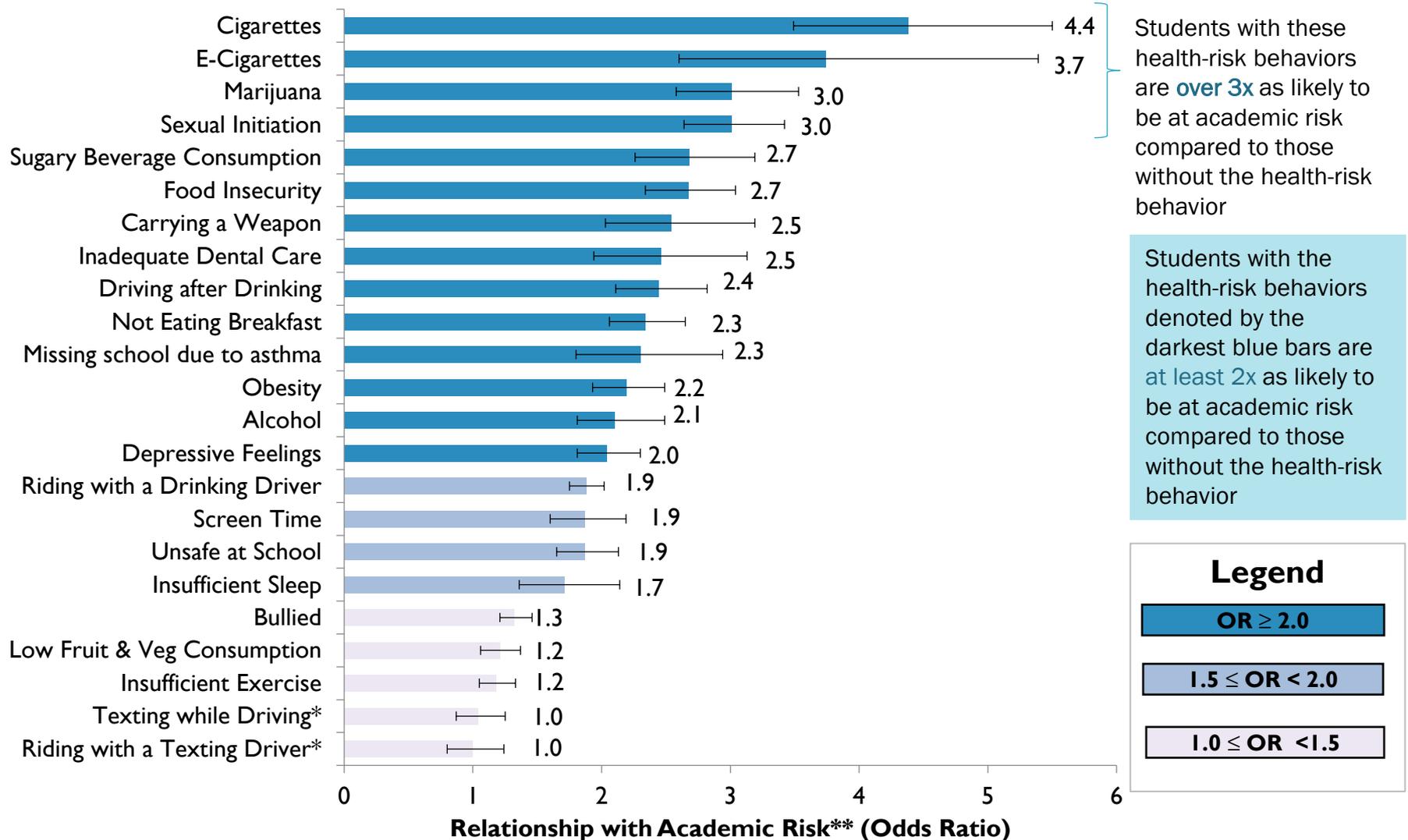
— : Confidence interval shows range that includes the true value 95% of the time.

*Academic risk defined as reporting receiving mostly C's, D's or F's in school.

**Sexual orientation only asked in 2014 and among half of the respondents.

Relationship Between Health-Risk Behavior and Academic Risk

Link between 23 specific health-risk behaviors and academic risk, King County, WA (grades 8, 10, 12): 2012 & 2014 average



—|—|: Confidence interval shows range that includes the true value 95% of the time.

*Not statistically significantly associated with academic risk (at p=0.05).

**Does not take into account student's grade, gender, race/ethnicity, mother's education, or King County region.

9 health-risk behavior categories strongly associated with academic risk – King County, WA, 2012 & 2014 average

Students who reported behaviors in the following health-risk categories were at greater academic risk than those who did not report these behaviors.

Health-Risk Behavior Category*	Odds Ratio	Lower 95% CI	Upper 95% CI
Depressive feelings	1.8	1.6	2.1
Sexual initiation	1.8	1.6	2.1
Inadequate dental care	1.7	1.4	2.0
Sugary beverage consumption	1.6	1.3	2.0
Substance use (alcohol, cigarette, e-cigarette or marijuana)	1.6	1.4	1.9
Sedentary behavior (insufficient exercise or excessive screen time)	1.5	1.2	1.9
Food insecurity	1.5	1.2	1.8
Obesity	1.5	1.2	1.8
Inadequate diet (low fruit/veg or not eating breakfast)	1.4	1.2	1.6

Definitions and Interpretations:

Odds Ratio (OR) is a measure of the strength of the relationship between the health-risk behavior category and academic risk.

OR = 1 : Health-risk behavior category is not related to academic risk

OR > 1: Health-risk behavior category is positively related to academic risk

Confidence Interval (CI) is the range of values that includes the true value 95% of the time.

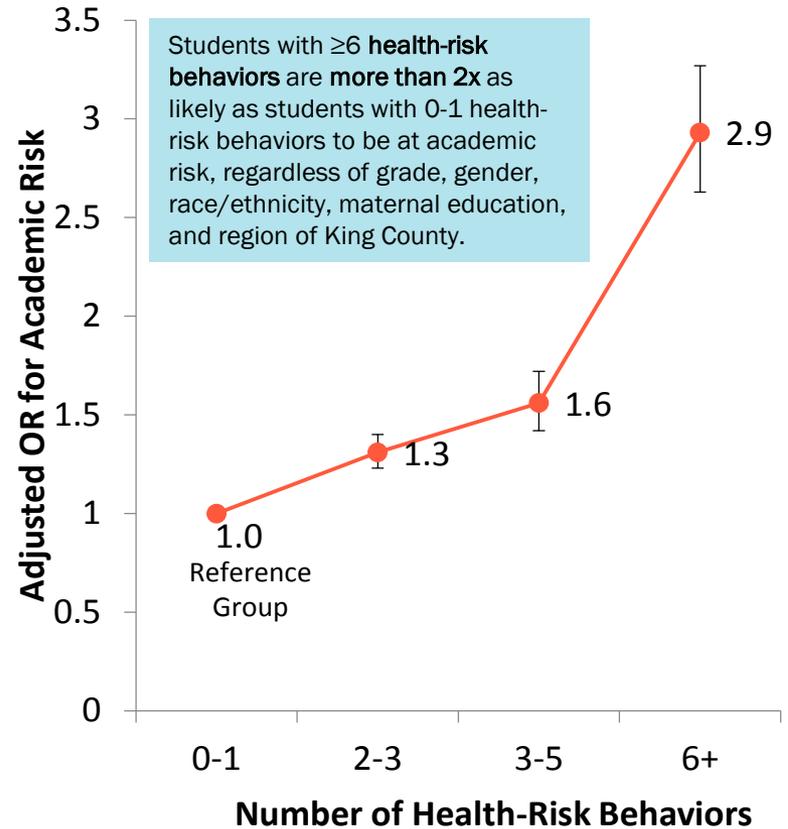
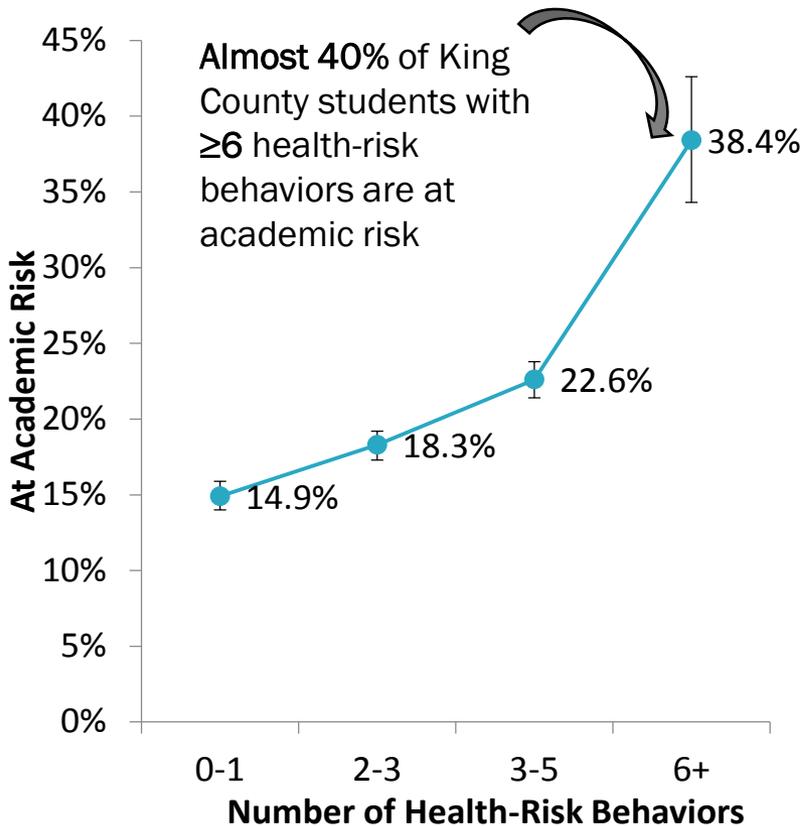
For these estimates, a CI that does not include 1 means the relationship between the health-risk category and academic risk is not likely due to chance.

*For multivariate analysis (see Technical Appendix), the original 23 health-risk behaviors were combined into health-risk categories. Student demographics include: grade, gender, race/ethnicity, mother’s education, and King County region.

Overall, increasing number of health-risk behaviors increases likelihood of being at academic risk

Percentage of King County students at academic risk by number of health-risk behaviors¹

Relationship² between number of health-risk behaviors¹ and academic risk



Notes:

1. Category cut points for number of health-risk behaviors based on quartiles.
2. Odds Ratio (OR) adjusted for grade, gender, race/ethnicity, mother's education, and King County region.
3. : Confidence interval shows range that includes the true value 95% of the time.

Conclusions

Summary

- Students with a higher number of health-risk behaviors were more likely to be at academic risk, consistent with findings from previous WA State analysis and other research.
- As seen in previous WA State data, the following health-risk behaviors are strongly linked to academic risk among King County youth:
 - Depressive feelings
 - Sugary beverage consumption
 - Substance use (alcohol, cigarette, marijuana)
 - Sedentary behaviors (≥ 3 hours of screen time, insufficient exercise)
 - Obesity
 - Inadequate diet (low fruit and vegetable consumption, not eating breakfast)
- Three health-risk behaviors not in the 2006 analysis of WA State data were strongly related to academic risk among King County students, regardless of other health-risk behaviors and student demographics:
 - Sexual initiation
 - Inadequate dental care
 - Food insecurity

Summary (cont'd)

- Among the initial 23 health-risk behaviors, some that were not in the final statistical model may also be relevant to academic risk, these include:
 - Carrying a weapon
 - Feeling unsafe at school
 - Being bullied
 - Having insufficient sleep
 - Missing school due to asthma
- Regardless of academic risk, more than 50% of King County youth report:
 - Riding with a texting driver,
 - Insufficient sleep,
 - Excessive screen time,
 - Insufficient exercise, or
 - Eating fruits and vegetables fewer than 5 times/day

Limitations/Challenges

- Health-risk behaviors and academic achievement were based on self-report.
- Not all survey questions were asked on the same forms; students in the same classroom completed different survey forms.
 - Wording of soda question changed in 2014.
 - Sexual orientation question was only asked on half of surveys (Form A); inferred sexual orientation on other half of surveys (Form B) may not be comparable.
- Cannot make causal conclusions from results.
- Did not examine potential protective factors that could mitigate the impact of health-risk behaviors.
- Statistical modeling is imperfect.
 - Relationships with other (unmeasured) variables not accounted for.
 - Exploratory analysis did not adjust for multiple comparisons or all factors related to academic risk and health-risk behavior (e.g. sexual orientation).
 - Mother's education is an imperfect proxy for socioeconomic status.

Strengths

- Examined 23 health-risk behaviors.
 - Added 10 new behaviors not in 2006 WA State analysis.
 - Included emerging public health issues (texting and driving; e-cigarettes/vape pen use).
- Sample represents a group of economically and demographically diverse public school students.
- Finding of strong relationship between health-risk behaviors and academic risk even after controlling for demographic and place characteristics (grade, gender, race/ethnicity, mother's education, and region of the county).
- Data for public school students in King County are timely and local.
- Findings are consistent with other similar studies.

Implications: What does this mean?

- Schools can be a place for a healthy start. *CDC Guide to Community Preventive Services*, which conducts rigorous reviews of health interventions, found strong evidence to recommend school-based or linked:
 - Dental sealant delivery programs
 - Programs to reduce youth violence
 - Enhanced physical education to increase physical activity
- Nutrition and physical activity can be important components of programs to improve academic achievement.
 - Student participation in school breakfast program is associated with increase academic grades and standardized test scores, reduced absenteeism, and improved cognitive performance (e.g., memory).^{10, 11-17}
 - More participation in physical education class has been associated with better grades, standardized test scores, and classroom behavior (e.g., on-task behavior) among students.¹⁸⁻²¹
- Strong relationships between academic risk and cigarette or e-cigarette use highlight the importance of addressing tobacco and vapor product use among students.
- More rigorous research is needed on possible causal relationships between improving health behaviors and academic achievement.*
- Future analysis could examine the association between health-risk behaviors and high school graduation rates.

*This includes other environmental factors such as social support that may mediate the link between health and academic risk.

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Appendix

See [Technical Appendix](#) for detailed data on individual health-risk behaviors and complete description of methodology.

Data Source:

- The Healthy Youth Survey (HYS) is administered to 6th, 8th, 10th and 12th graders in Washington State public schools every two years (beginning in 2002).

Confidence Intervals:

- Error bars on graphs represent 95% confidence intervals, which is the range of values that includes the true value 95% of the time.
- If confidence intervals of two groups do not overlap, the difference between the groups is considered statistically significant meaning chance is not a likely explanation for the difference.

Odds Ratios (OR):

- A measure of the strength of the relationship between two factors, in this report, health-risk behaviors and academic risk.
- OR = 1: no relationship OR > 1: positively related OR < 1: inversely related