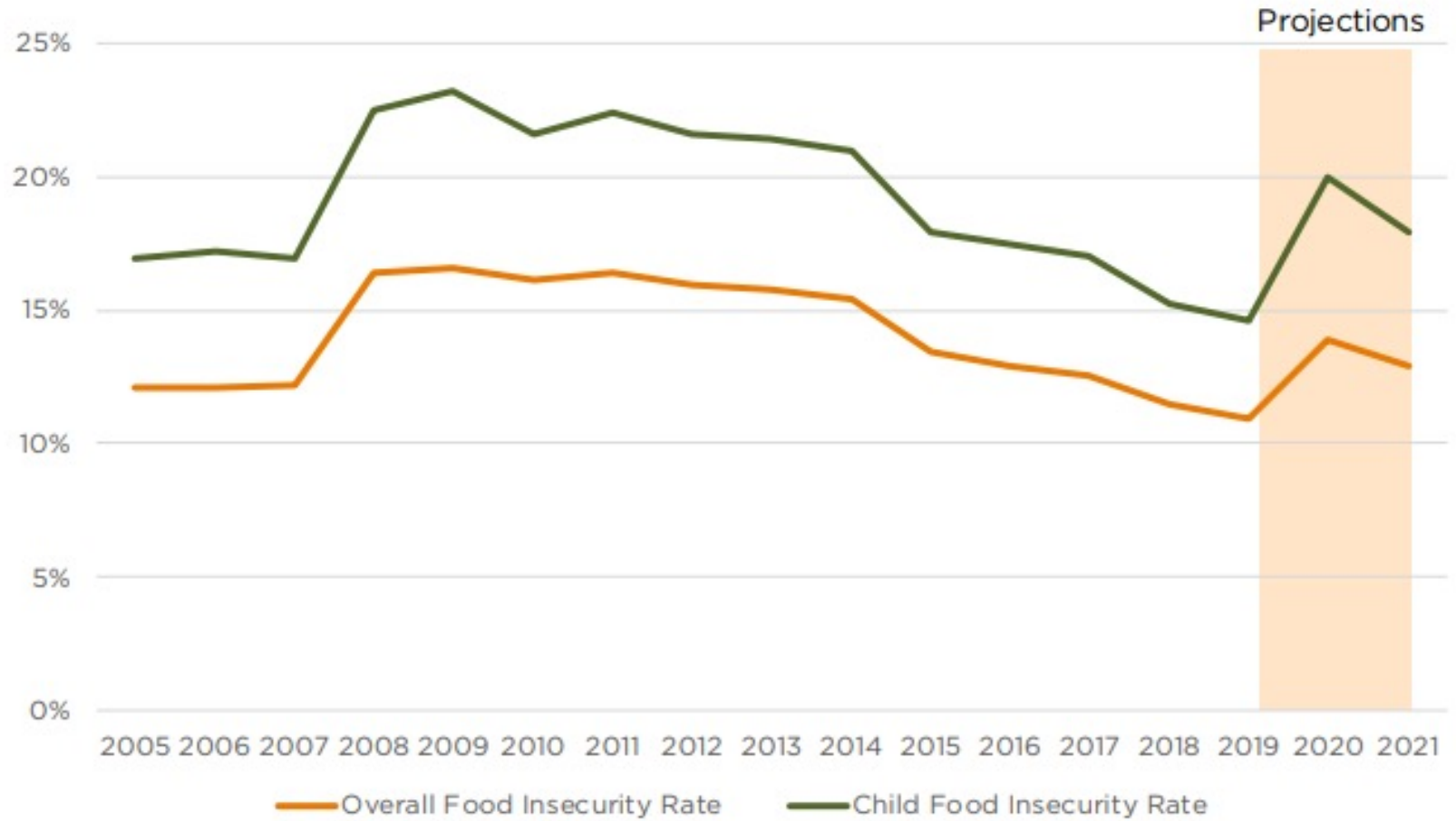


Food Insecurity and Suicidal Behaviors among U.S. High School Students

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Food Insecurity Trends & Projections

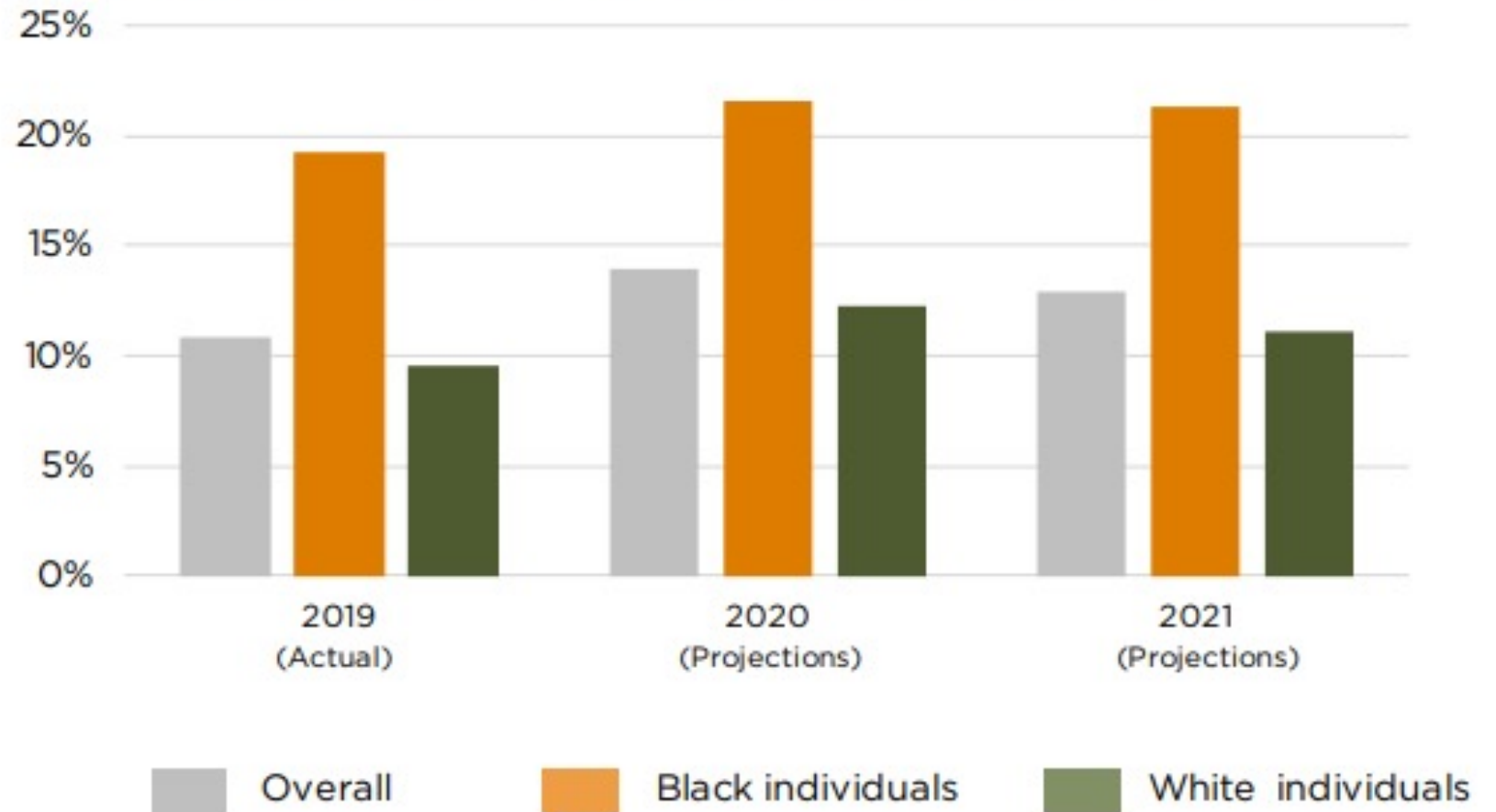


Source: https://www.feedingamerica.org/sites/default/files/2021-03/National%20Projections%20Brief_3.9.2021_o.pdf

Food
 Insecurity +
 COVID-19

Food Insecurity + COVID-19

Food Insecurity among Black and White Individuals



Source: https://www.feedingamerica.org/sites/default/files/2021-03/National%20Projections%20Brief_3.9.2021_o.pdf

Youth Risk Factor Behavior Surveillance System (YRBSS)

Includes national, state, territorial, tribal government, and local school-based surveys of representative samples of 9th through 12th grade students

- Behaviors that contribute to unintentional injuries and violence.
- Sexual behaviors related to unintended pregnancy and sexually transmitted infections, including HIV infection.
- Alcohol and other drug use.
- Tobacco use.
- Unhealthy dietary behaviors.
- Inadequate physical activity.

Youth Risk Factor Behavior Surveillance System (YRBSS)

- The YRBSS provides a unique opportunity to study food insecurity among adolescents
- YRBS standard questionnaire (national/state)
- Individual states can customize their questionnaire
 - In 2017, 11 states included YRBS' food insecurity question
 - Delaware, Hawaii, Idaho, North Carolina, North Dakota, Nebraska, Nevada, Pennsylvania, Rhode Island, Utah, and Virginia
 - Obtained a sufficiently high response rate
 - Had publicly available data (n=28,702)

Food Insecurity, Mental Health & Suicide

- Food insecurity is associated with increased mental health problems
 - Depression and anxiety
 - Using National Health Interview Survey data, a recent study estimates that compared with food-secure households:
 - 1) Youth in marginally HFS had a 1.26 (95% CI: 1.05, 1.52) higher odds of having a mental disorder with impairment; and 2) Youth in very-low HFS had higher odds of having a mental disorder with severe impairment [child OR: 2.55 (95% CI: 1.90, 3.43); adolescent OR: 3.44 (95% CI: 2.50, 4.75)] (Burke 2016)
- **Gaps in research**
 - Associations between food insecurity and suicidal behaviors among adolescents
 - Largely informed by non-U.S. or adult studies

Objective

- To evaluate the association between household food insecurity and mental health and suicidal behaviors over the past year among high school students.

Measuring Food insecurity

During the past 30 days, how often did you go hungry because there was not enough food in your home?

- A. 'Never'
- B. 'Rarely'
- C. 'Sometimes'
- D. 'Most of the time'
- E. 'Always'

= Food Insecure

Poor Mental Health

Measuring Poor Mental health & Suicidal Behaviors

During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?

- 'Yes'
- 'No'

Measuring Poor Mental health & Suicidal Behaviors

Considered or planned suicide

During the past 12 months, did you ever seriously consider attempting suicide?

- 'Yes'
- 'No'

During the past 12 months, did you make a plan about how you would attempt suicide?

- 'Yes'
- 'No'

Suicide Attempt

Measuring Poor Mental health & Suicidal Behaviors

During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?

- '0 times'
- '1 time'
- '2 or 3 times'
- '4 or 5 times' = Yes
- '6 or more times'

Methods

- In 2017, 11 states included YRBS' food insecurity question' (n=28,702)

	INCLUSION IN PHASE 1 (N=26, 962)	INCLUSION IN PHASE 2 (ADDS ATTEMPTED SUICIDE) (N=24,051)
COMPLETE DATA ON DEMOGRAPHICS	X	X
FELT SAD/HOPELESS	X	X
CONSIDERED SUICIDE	X	X
PLANNED A SUICIDE ATTEMPT	X	X
ATTEMPTED SUICIDE		X

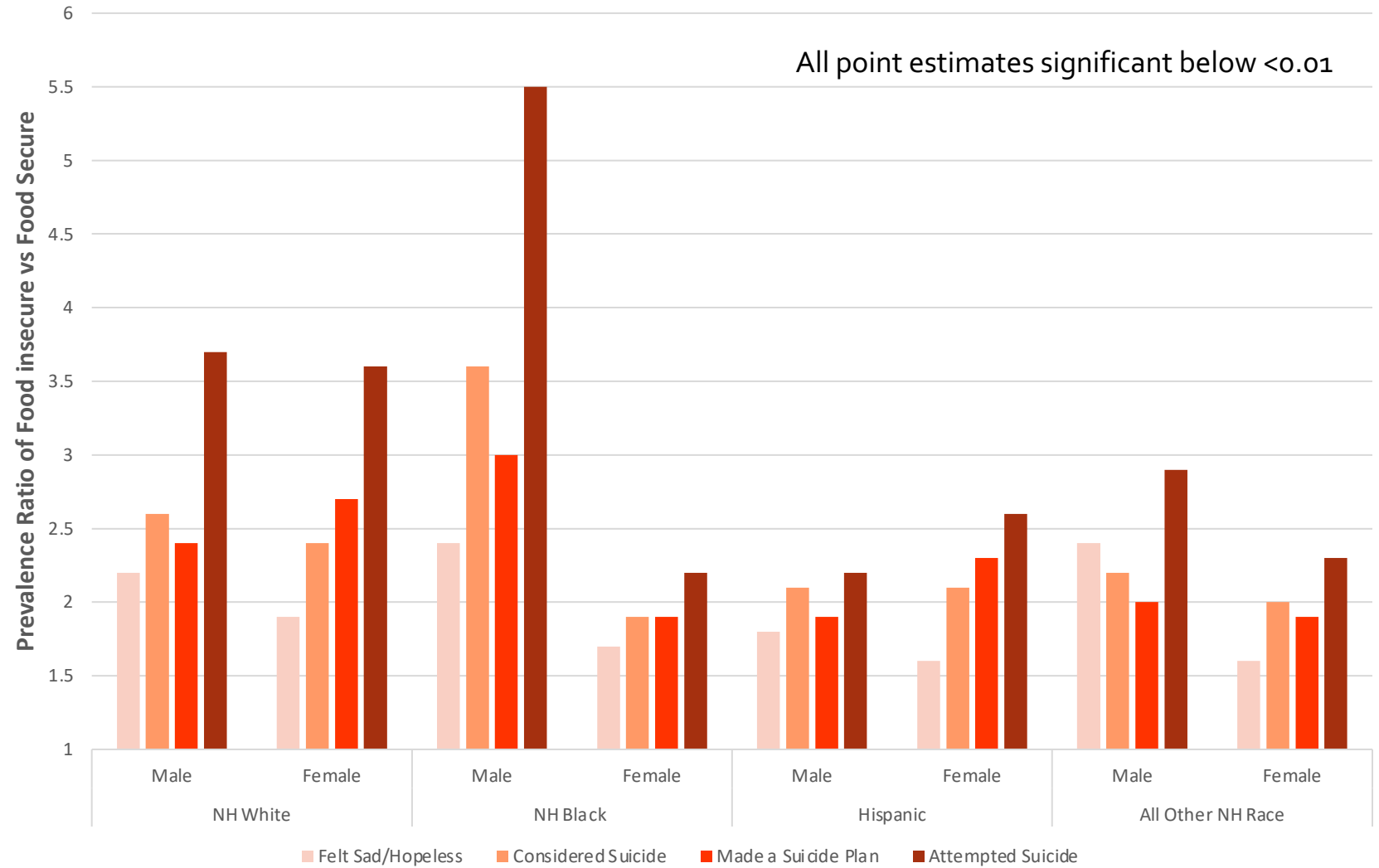
Methods

- Analyses were performed in 2020
- 11 states that conducted the 2017 Youth Risk Behavior Survey
- Complex survey design.
- Poisson regression models
 - Race/ethnicity and sex-stratified prevalence ratios
 - STATA software

Characteristic	Overall	Food Security Status ^b				P value ^c
		Food Insecure ^b		Food Secure ^b		
		(n=3579)		(n=21927)		
	% ^d	% ^d	(95% CI)	% ^d	(95% CI)	
Overall	N=26962	10.8	(9.9, 11.6)	89.2	(88.3, 90.1)	
Sex						0.0185*
Male	(49.9)	11.4	(10.4, 12.5)	88.6	(87.5, 89.6)	
Female	(50.1)	10.1	(9.1, 11.1)	89.9	(88.9, 90.9)	
Grade level						0.6725
9 th	(26.3)	10.7	(8.9, 12.5)	89.3	(87.5, 91.1)	
10 th	(25.8)	10.4	(9.1, 11.7)	89.6	(88.3, 90.9)	
11 th	(24.6)	11.5	(10.2, 12.8)	88.5	(87.2, 89.8)	
12 th	(23.4)	10.4	(9.1, 11.8)	89.6	(88.2, 90.9)	
Race/Ethnicity ^e						<.0001*
Black	(15.0)	14.3	(12.0, 16.6)	85.7	(83.4, 88.0)	
Hispanic	(14.8)	15.0	(13.5, 16.4)	85.0	(83.6, 86.5)	
White	(60.6)	8.1	(7.4, 8.9)	91.9	(91.1, 92.6)	
Other	(9.6)	15.4	(13.7, 17.1)	84.6	(82.9, 86.3)	
Felt Sad/Hopeless	(30.0)					
Considered Suicide	(16.2)					
Made a Suicide Plan	(13.5)					
Attempted Suicide	(7.4)					

Results

The Association of FI with Mental Health and Suicide Behaviors among Students



The association of food insecurity with mental health and suicidal behavior measure among male students

Characteristic	Overall 26962 ^d	Considered Suicide			Attempted Suicide ^c		
		(%) ^a	aPR ^b	95% CI	(%) ^a	aPR ^b	95% CI
White Males	(30.9)						
FI		(26.1)	2.6	(2.0, 3.4)**	(13.4)	3.7	(2.5, 5.5)**
FS		(9.7)	---	Ref	(3.5)	---	Ref
Black Males	(7.2)						
FI		(19.7)	3.6	(1.9, 6.9)**	(16.8)	5.5	(2.3, 13.3)**
FS		(6.4)	---	Ref	(3.3)	---	Ref
Hispanic Males	(7.3)						
FI		(20.4)	2.1	(1.5, 2.9)**	(13.4)	2.2	(1.3, 3.7)*
FS		(9.5)	---	Ref	(6.2)	---	Ref
Other Race Males	(4.8)						
FI		(21.4)	2.2	(1.6, 3.1)**	(12.9)	2.9	(1.7, 5.1)**
FS		(10.4)	---	Ref	(4.5)	---	Ref

^a Sample n is unweighted; Percentage is weighted

^b aPR= Prevalence ratio; Prevalence ratios are adjusted for state and grade

^c Analyzed separately using data set with 24,051 adolescents who had no missing data for all 4 suicidal behavior outcomes

^d Total sample of 26962 includes males and females of all races

^e All Hispanic students are included in the Hispanic category. All other races are non-Hispanic

*= <0.01 **=<0.0001 for p-value that summarizes results from Poisson regression model

The association of food insecurity with mental health and suicidal behavior measure among female students

Characteristic	Overall	Considered Suicide			Attempted Suicide ^c		
		(%) ^a	aPR ^b	95% CI	(%) ^a	aPR ^b	95% CI
White Females	(29.7)						
FI		(46.3)	2.4	(2.1, 2.7)**	(24.9)	3.6	(2.9, 4.5) **
FS		(18.5)	---	Ref	(6.7)	---	Ref
Black Females	(7.8)						
FI		(33.2)	1.9	(1.4, 2.6) **	(22.2)	2.2	(1.4, 3.5)*
FS		(17.3)	---	Ref	(9.9)	---	Ref
Hispanic Females	(7.5)						
FI		(43.4)	2.1	(1.7, 2.5) **	(27.5)	2.6	(2.0, 3.4) *
FS		(20.5)	---	Ref	(10.4)	---	Ref
Other Race Females	(4.8)						
FI		(43.4)	2.0	(1.6, 2.4)**	(25.3)	2.3	(1.7, 3.2)**
FS		(23.4)	---	Ref	(11.4)	---	Ref

^a Sample n is unweighted; Percentage is weighted

^b aPR= Prevalence ratio; Prevalence ratios are adjusted for state and grade

^c Analyzed separately using data set with 24,051 adolescents who had no missing data for all 4 suicidal behavior outcomes

^d Total sample of 26962 includes males and females of all races

^e All Hispanic students are included in the Hispanic category. All other races are non-Hispanic

*= <0.01 **=<0.0001 for p-value that summarizes results from Poisson regression model

Results Summary

- Out of 26,962 high school students across 11 states, 10.8% reported FI.
- Students experiencing food insecurity were found to have increased risk for all mental health and suicide behavior outcomes, regardless of their race/ethnicity or sex.

Results Summary

- Among males, food insecure non-Hispanic black students had the highest PRs for all outcomes
 - (PRs ranged from 2.4 (95% confidence interval [CI]: 1.7, 3.2) to 5.5 (CI: 2.3, 13.3)).
- Among females, food insecure non-Hispanic white students had the highest PRs for all outcomes
 - (PRs ranged from 1.9 (CI: 1.7, 2.1) to 3.6 (CI: 2.9, 4.5)).

Conclusions

- Consistent, statistically significant associations were found
- Students experiencing food insecurity had increased risk of all study outcomes irrespective of their race/ethnicity or sex
- Results concur with the few other studies conducted on this topic
- **Important implications considering COVID-19**

Conclusions

- *Need increased mental health services and prevention programs for high school students experiencing food insecurity, particularly targeting suicidal behaviors.*
 - Expand and/or redesign current U.S. school-based breakfast and lunch programs
 - Address barriers to high school student participation in school meals
 - Need for at-home services for food assistance to students?
 - Suicide prevention programs in schools
 - Social-emotional learning programs, promoting connectedness, parenting programs
 - Facilitate referrals and multifaceted social support systems for high school students

Strengths:

- The only study published within the last 18 years to use a large sample of U.S. high school students to analyze associations between FI and suicidal behaviors
- Used Poisson regression
- Measured individual FI

Limitations:

- Cross-sectional study
- No inclusion of important demographic factors: income
- Used a single item to assess food security
- Missing data across variables
- Included the 11 U.S. states that had publicly available data related to FI

Questions?



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