



EVALUATING ACES KNOWLEDGE

PRE PRESENTATION



PRACTICE QUESTION:
IF YOU WOKE UP TOMORROW AS AN ANIMAL, WHICH OF THE FOLLOWING
WOULD YOU BE?



A



B

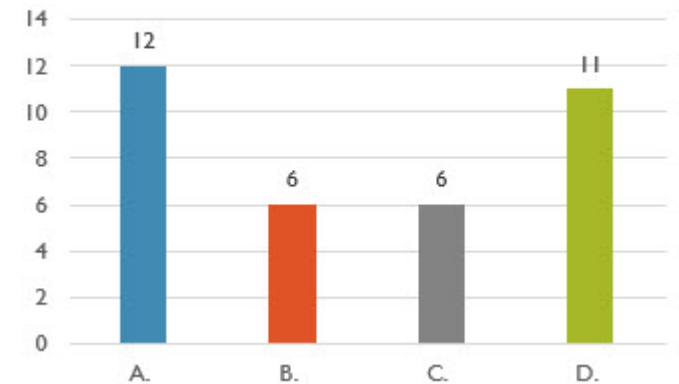


C



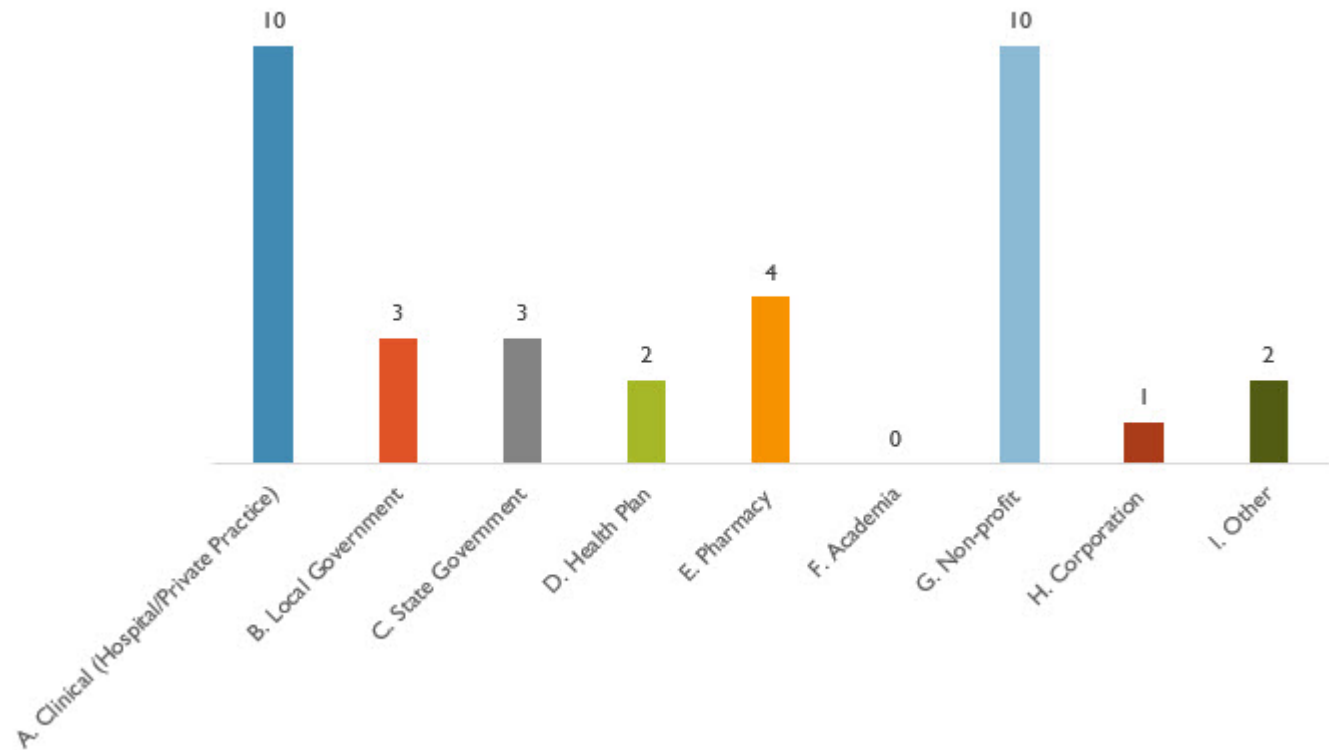
D

Practice Question:



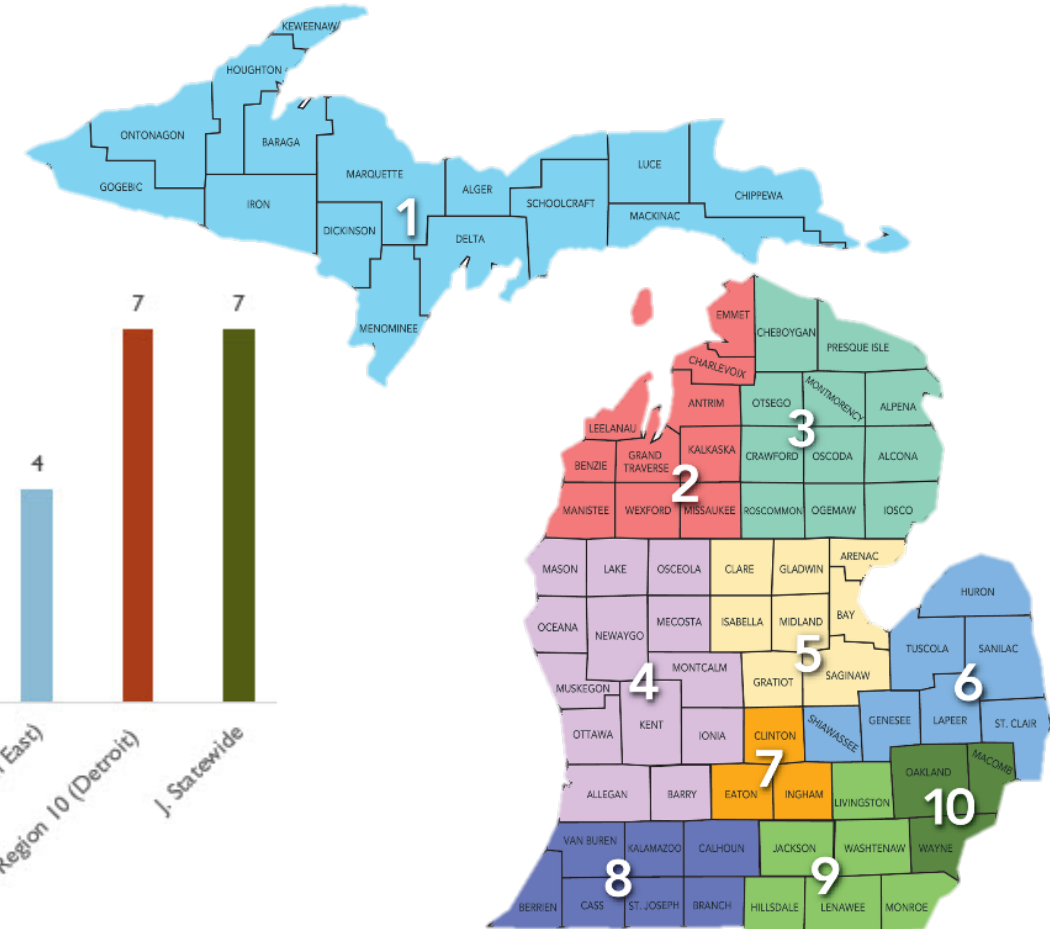
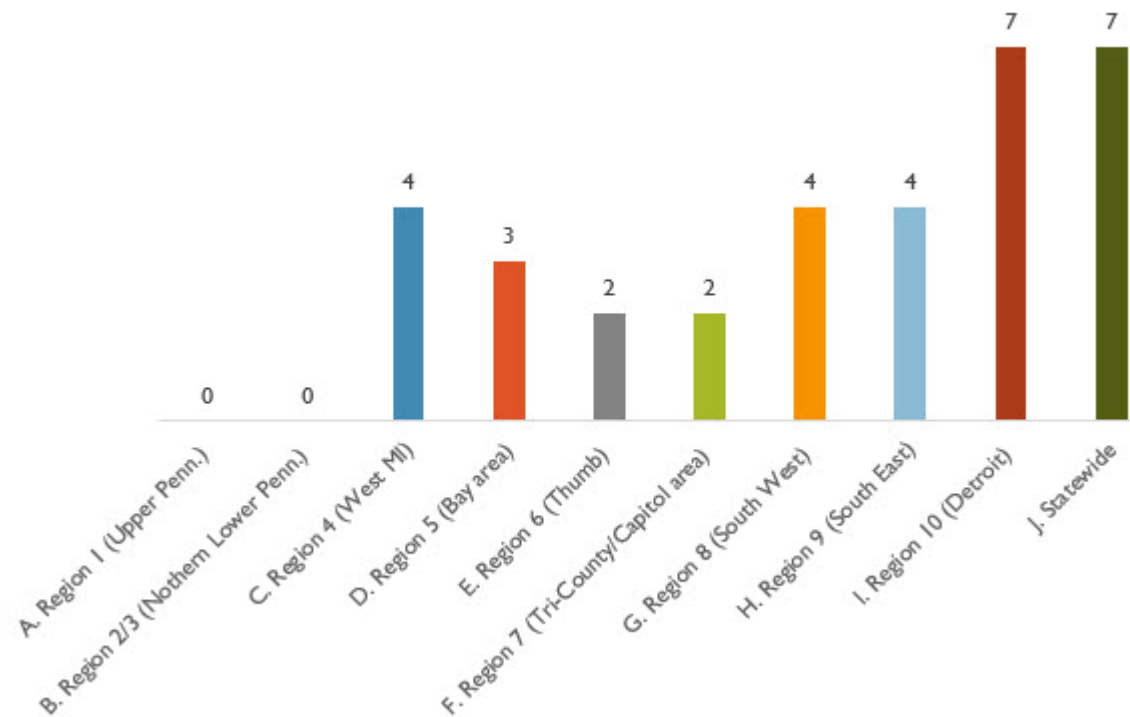
I.) WHICH ENTITY DO YOU PRIMARILY REPRESENT TODAY?

- A. Clinical (Hospital/ Private practice)
- B. Local Government
- C. State Government
- D. Health Plan
- E. Pharmacy
- F. Academia
- G. Non-Profit Organization
- H. Corporation
- I. Other



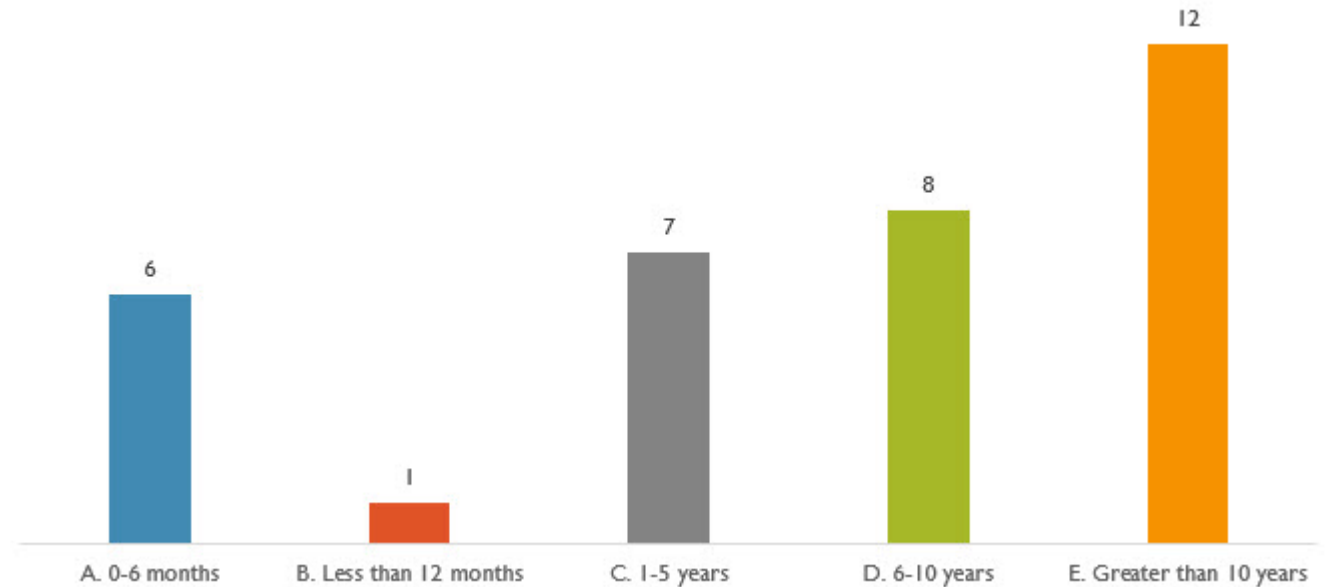
2.) WHICH PROSPERITY REGION DO YOU PRIMARILY REPRESENT?

- A. Region 1
- B. Region 2/3
- C. Region 4
- D. Region 5
- E. Region 6
- F. Region 7
- G. Region 8
- H. Region 9
- I. Region 10
- J. Statewide



3.) HOW LONG HAVE YOU BEEN PARTICIPATING IN ASTHMA-RELATED ACTIVITIES?

- A. 0-6 months
- B. Less than 12 months
- C. 1-5 years
- D. 6-10 years
- E. Greater than 10 years



4.) RATE YOUR FAMILIARITY WITH ACEs?

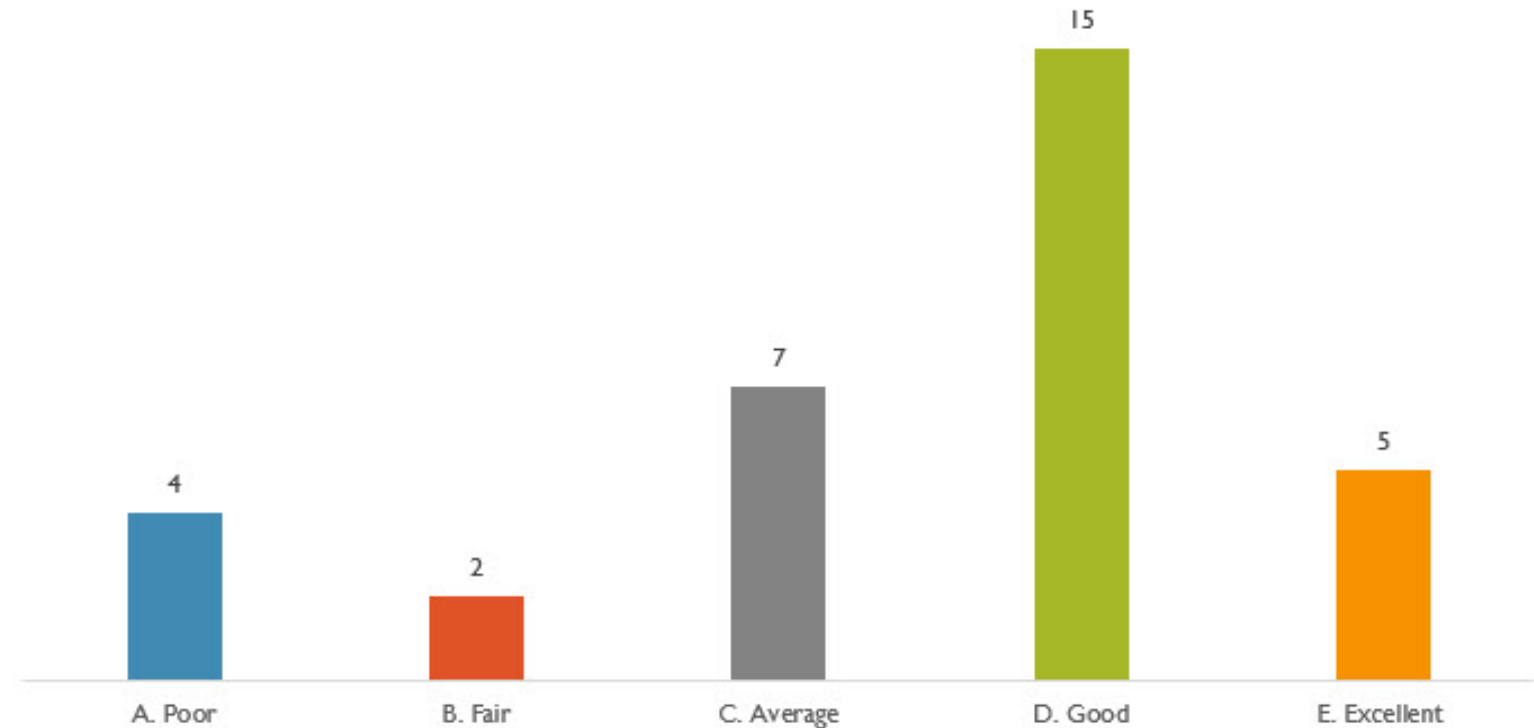
A. Poor

B. Fair

C. Average

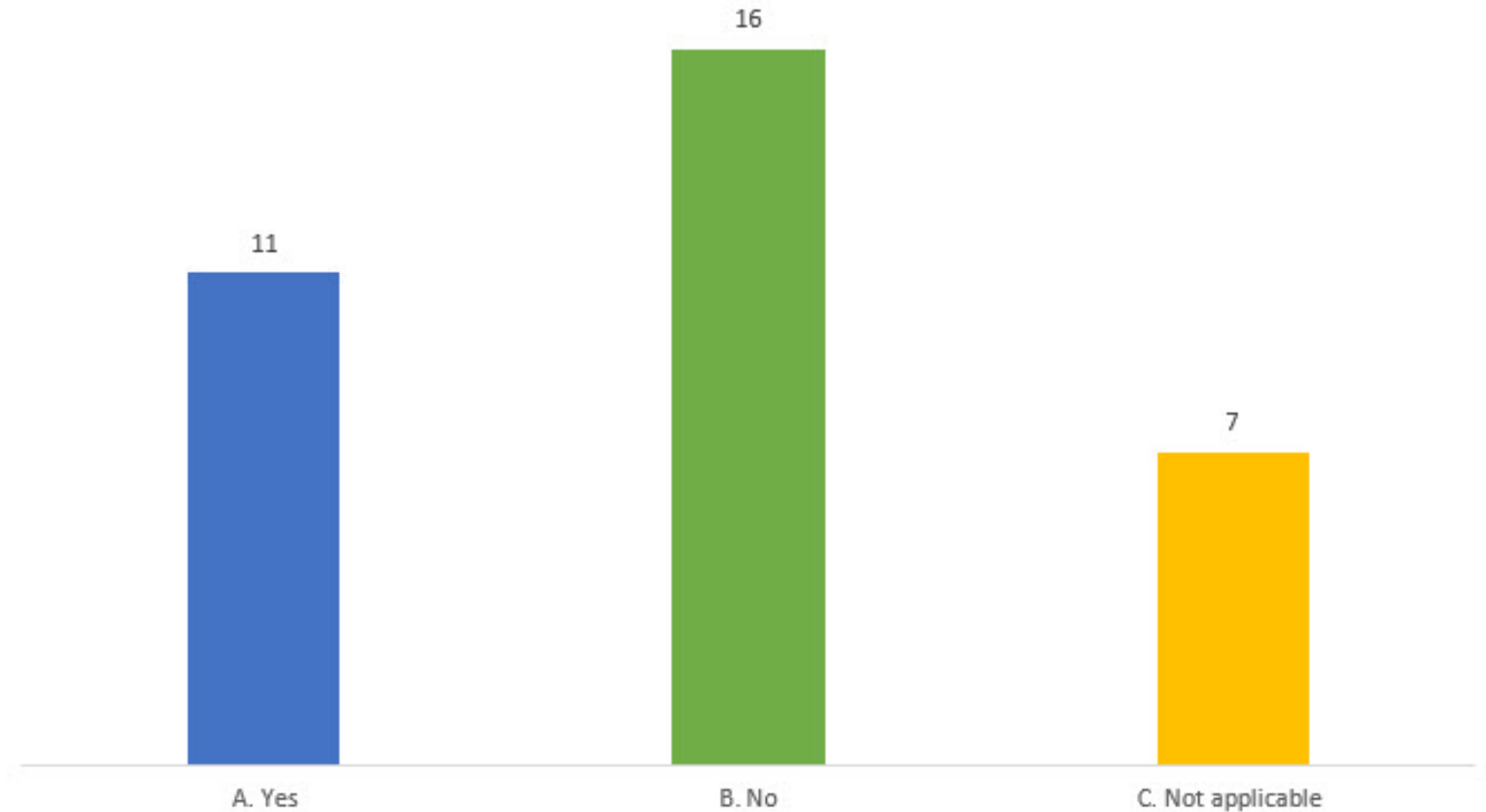
D. Good

E. Excellent



5.) DO YOU CURRENTLY USE ACEs IN YOUR PROFESSIONAL WORK?

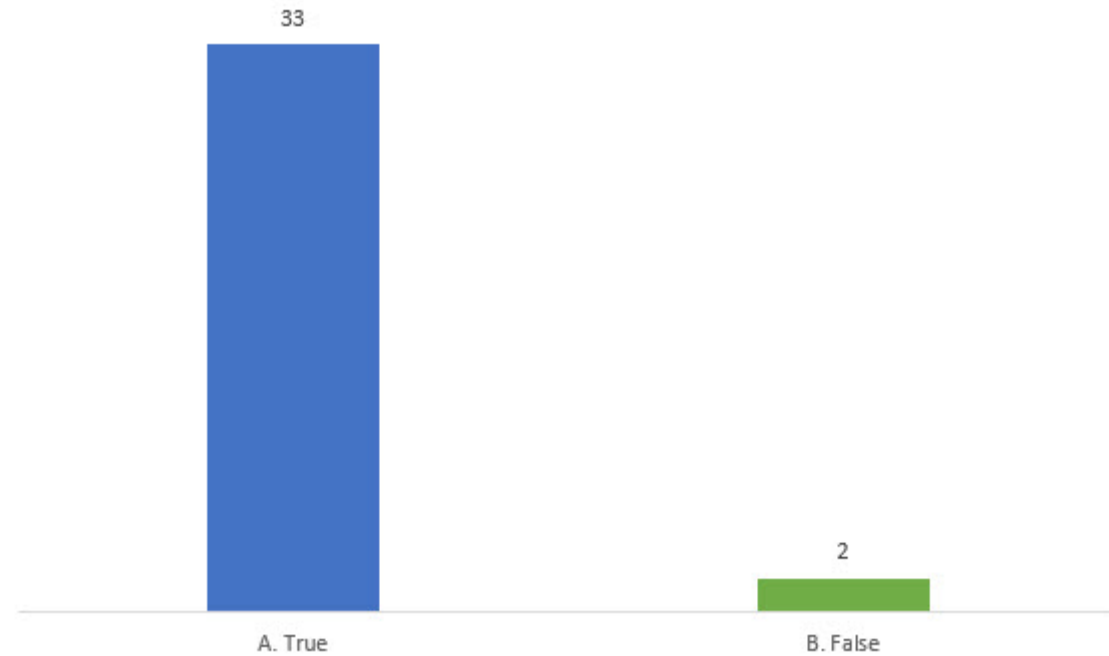
- A. Yes
- B. No
- C. Not Applicable



6.) THERE IS AN ASSOCIATION BETWEEN ACEs AND ASTHMA.

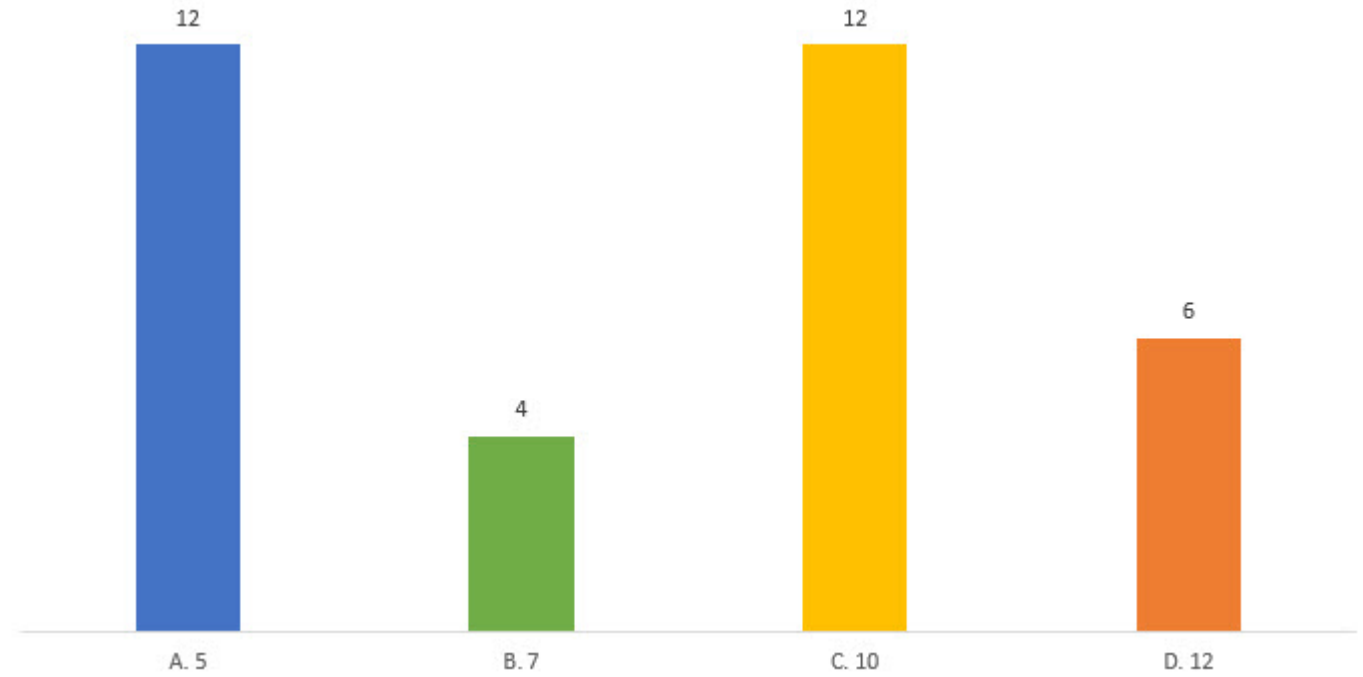
A. True

B. False



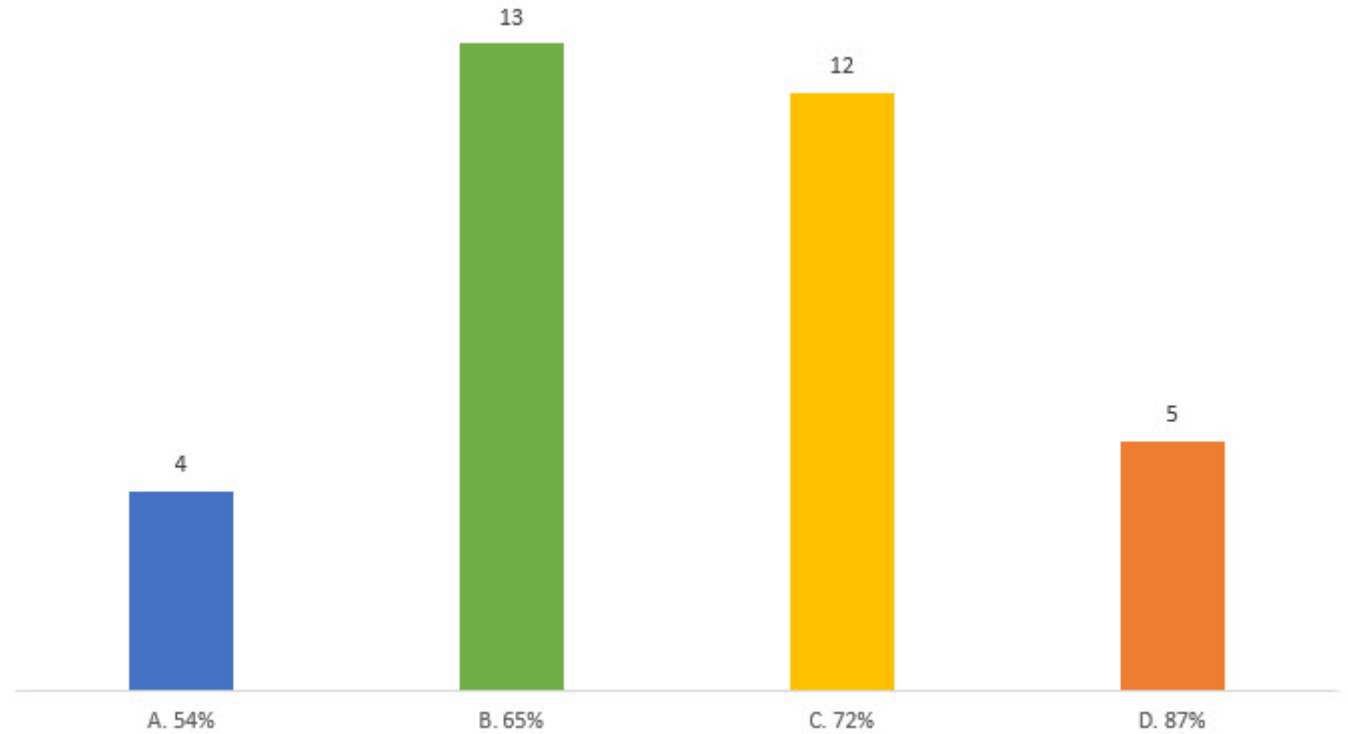
7.) HOW MANY TOTAL ACEs ARE THERE?

- A. 5
- B. 7
- C. 10
- D. 12



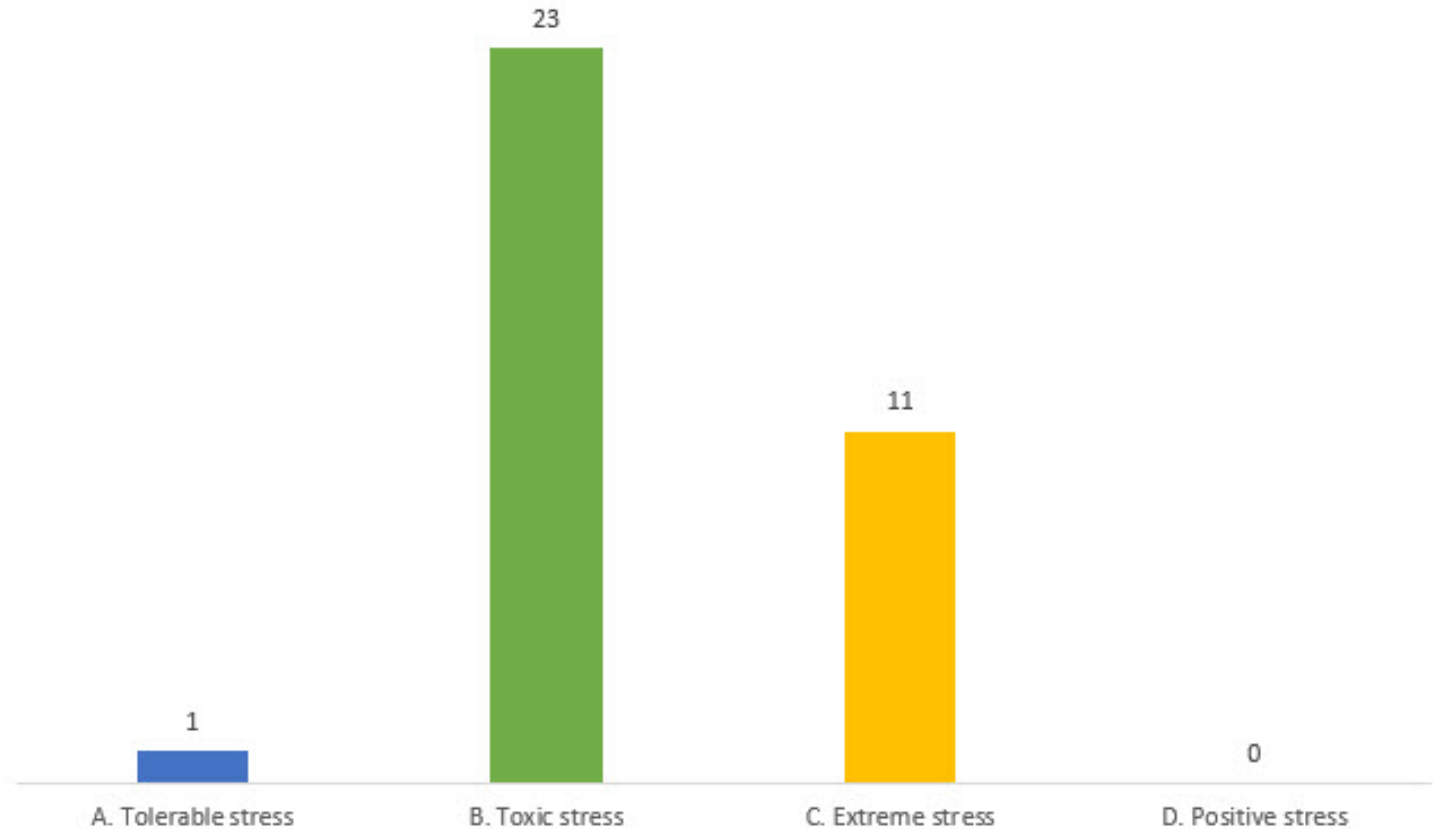
8.) WHAT PERCENT OF ACEs OCCUR TOGETHER?

- A. 54%
- B. 65%
- C. 72%
- D. 87%



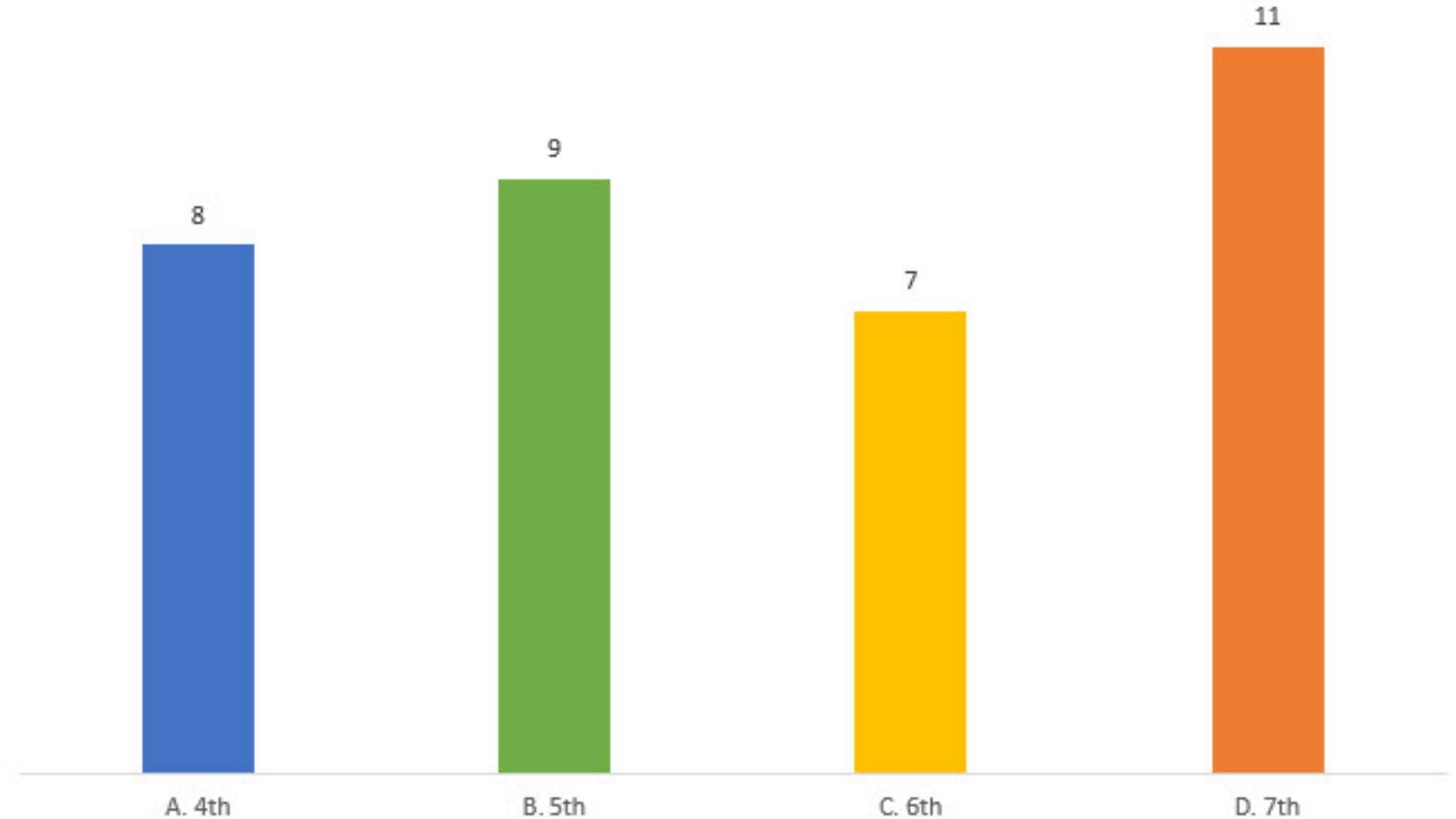
9.) WHAT TYPE OF STRESS HAS SIGNIFICANT EFFECTS ON BRAIN DEVELOPMENT AND IS RELATED TO ACEs?

- A. Tolerable stress
- B. Toxic stress
- C. Extreme stress
- D. Positive stress



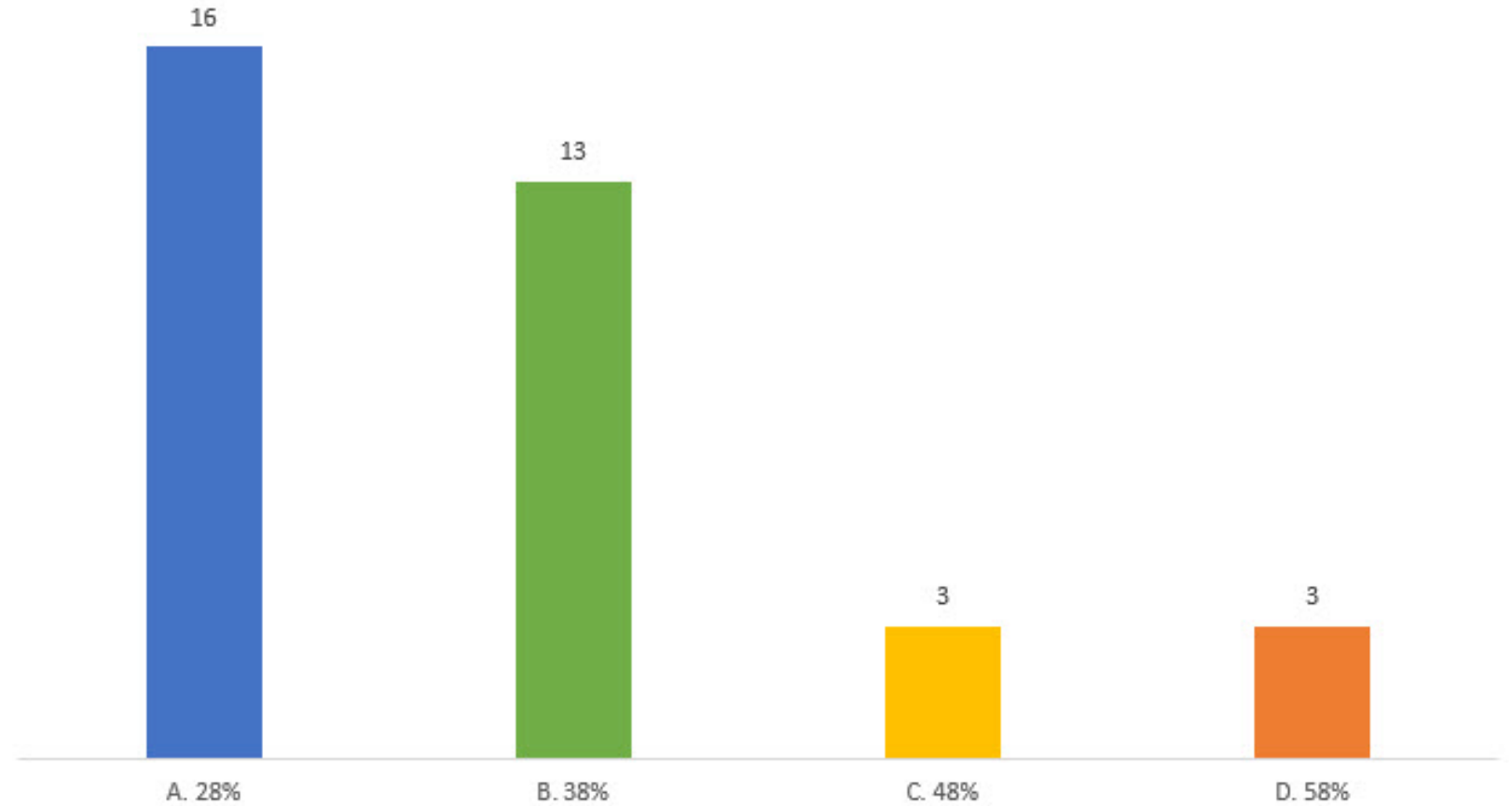
10.) MICHIGAN IS THE _____ HIGHEST STATE FOR ADULT CURRENT ASTHMA PREVALENCE?

- A. 4th
- B. 5th
- C. 6th
- D. 7th



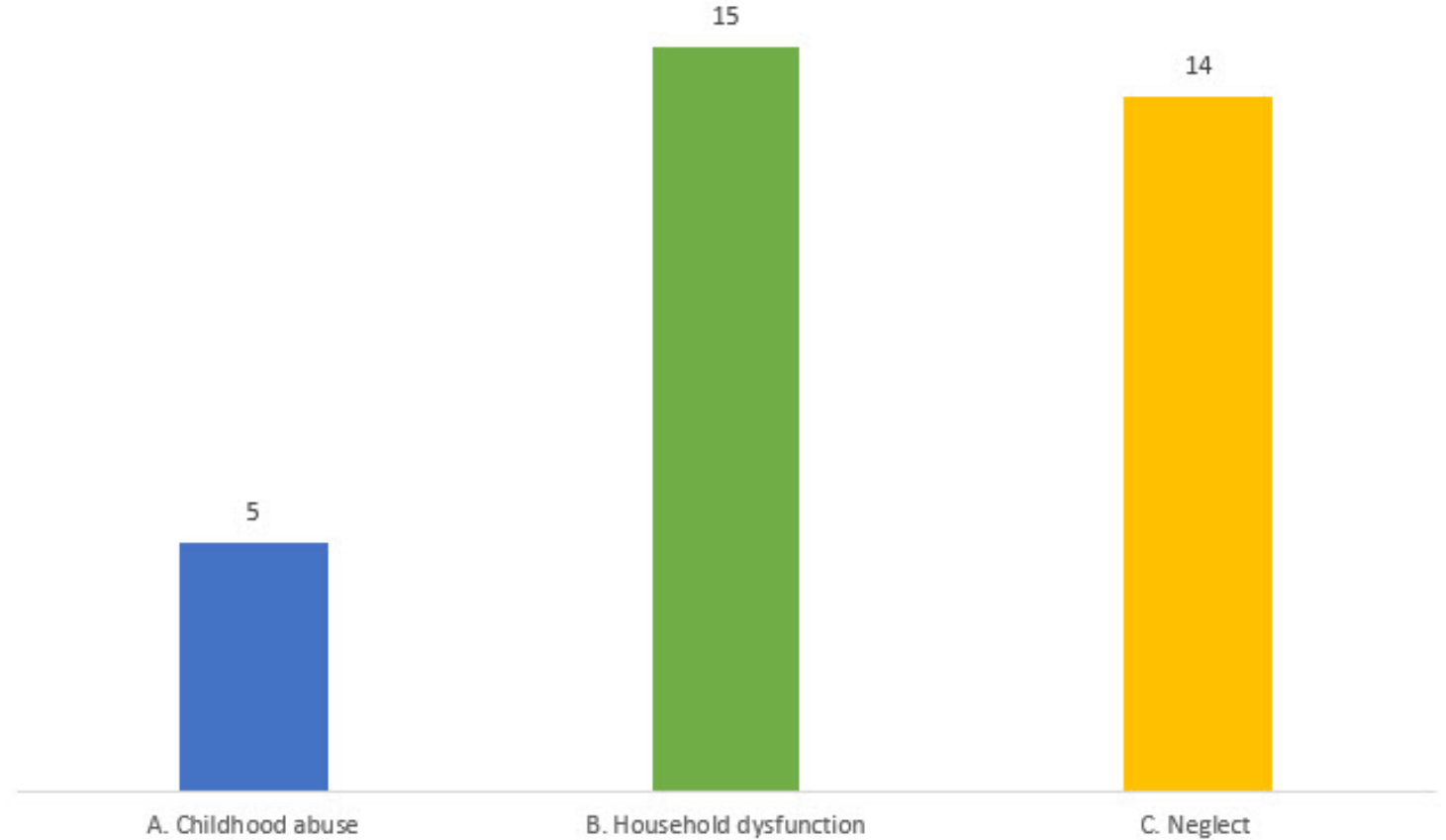
11.) ONE ACE INCREASES ODDS OF DEVELOPING ASTHMA BY:

- A. 28%
- B. 38%
- C. 48%
- D. 58%



12.) WHAT TYPE OF ACEs APPEAR TO HAVE THE GREATEST ASSOCIATION WITH ASTHMA?

- A. Childhood Abuse
- B. Household Dysfunction
- C. Neglect





**Building Self-Healing
Communities**

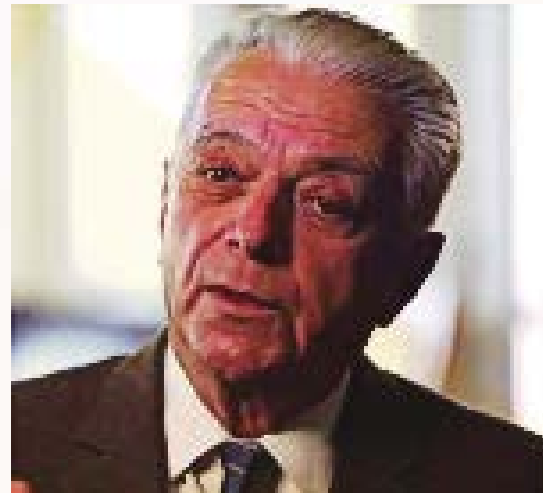


UNDERSTANDING
Adverse Childhood Experiences

01/12/14

NEWS

Early Adversity Increases Physical, Mental, Behavioral Problems, Scientists Report



Dr. Robert Anda & Dr. Vincent Felitti
Investigators

Centers for Disease Control & Prevention,
Kaiser Permanente Study

Over 17,000 study participants

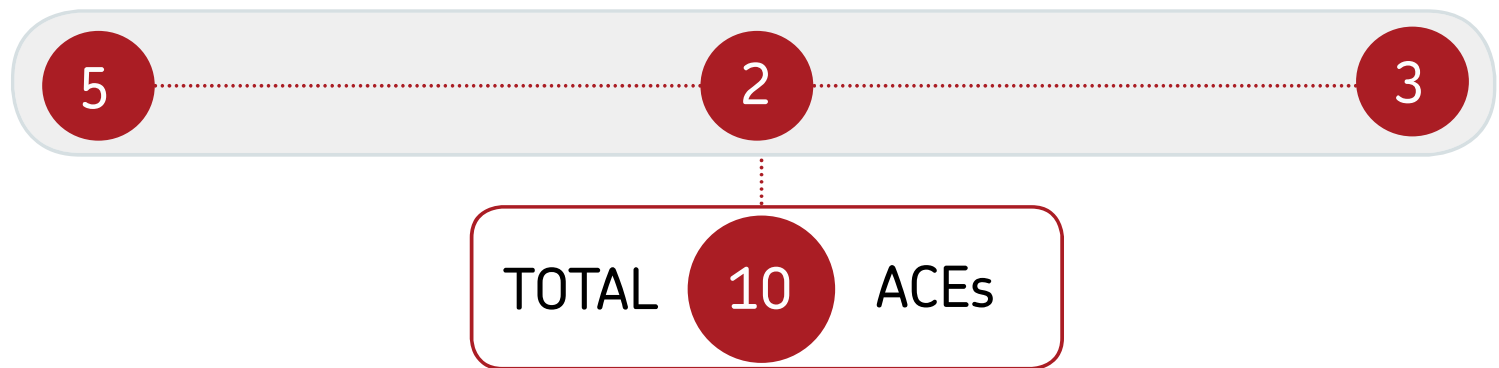
The ACE Study confirms, with scientific evidence, that adversity early in life increases physical, mental and behavioral problems later in life.

Adverse Childhood Experiences **ARE COMMON**

Household Dysfunction	
Substance Abuse	27%
Parental Sep/Divorce	23%
Mental Illness	17%
Battered Mothers	13%
Criminal Behavior	6%

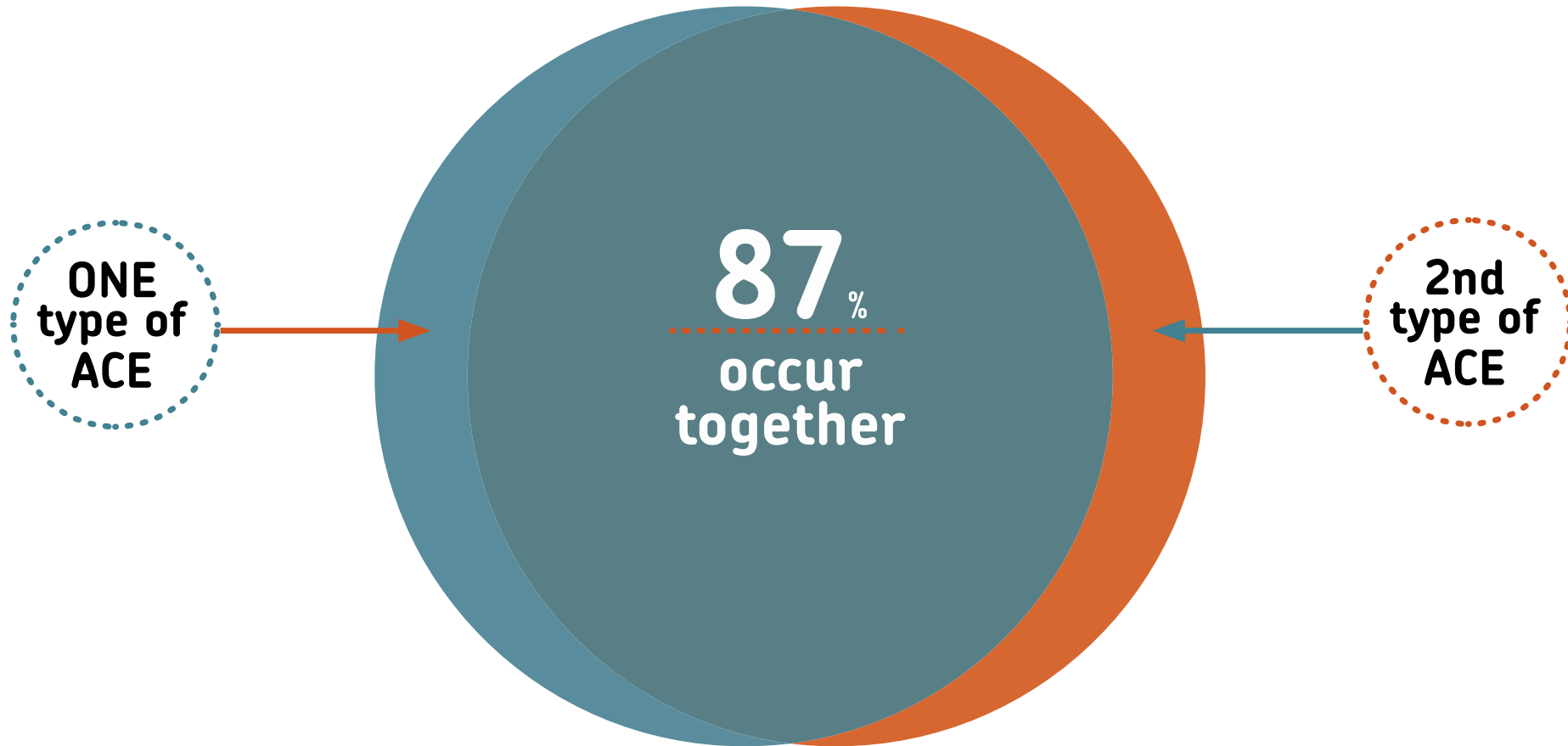
Neglect	
Emotional	15%
Physical	10%

Abuse	
Emotional	11%
Physical	28%
Sexual	21%

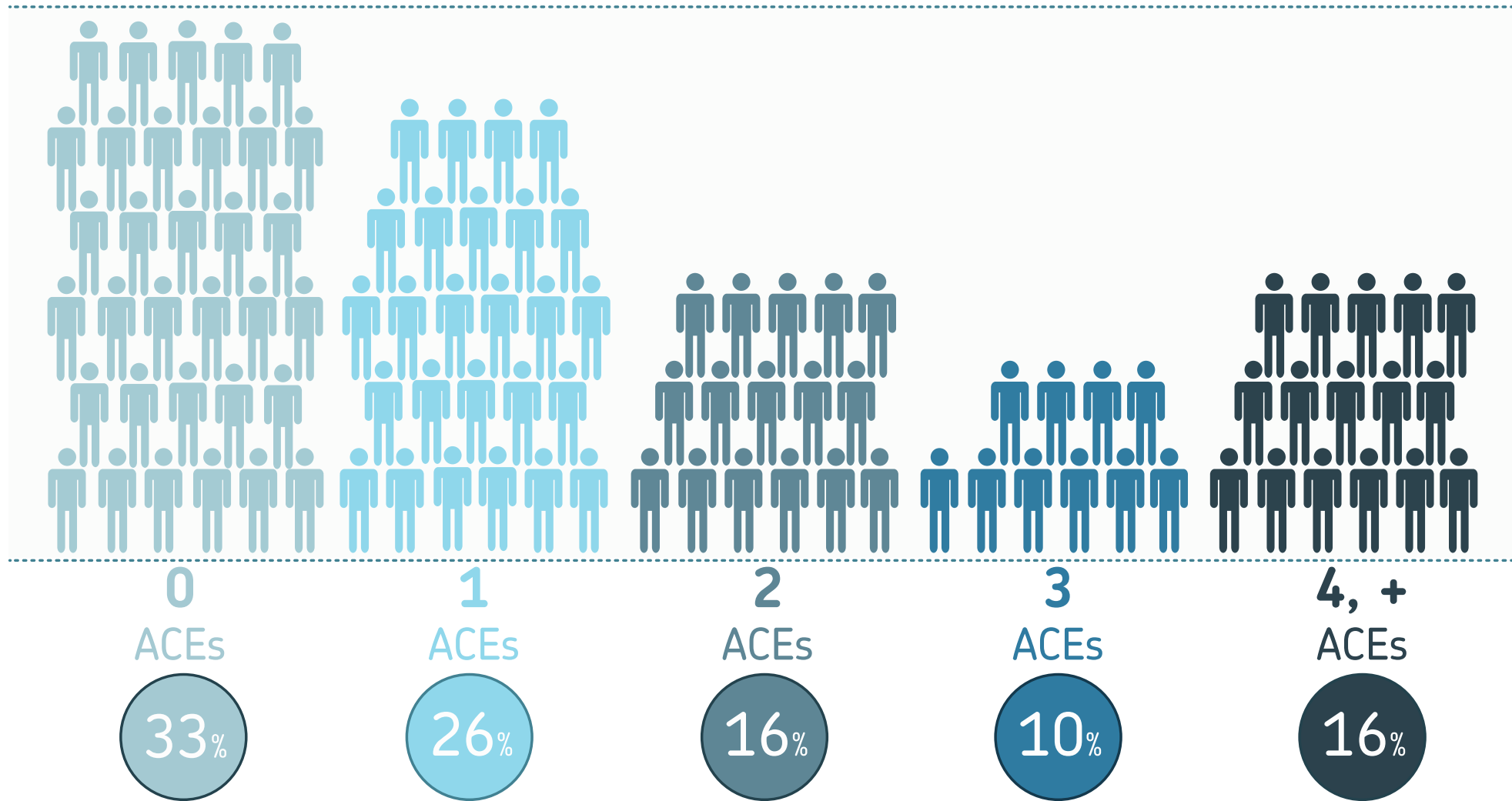


ACEs are Highly Interrelated:

Where One ACE Occurs,
There are Usually Others

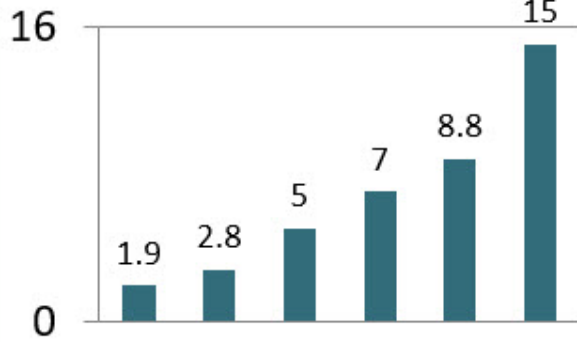


ACE Score = Number of ACE Categories

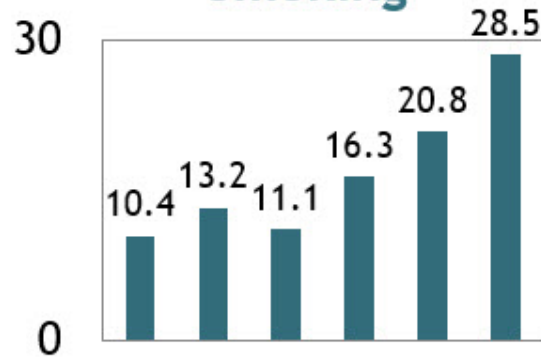


ACE Scores Reliably Predict Challenges During the Life Course

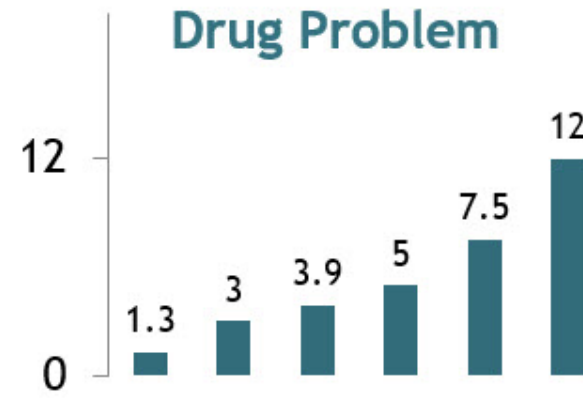
Anxiety



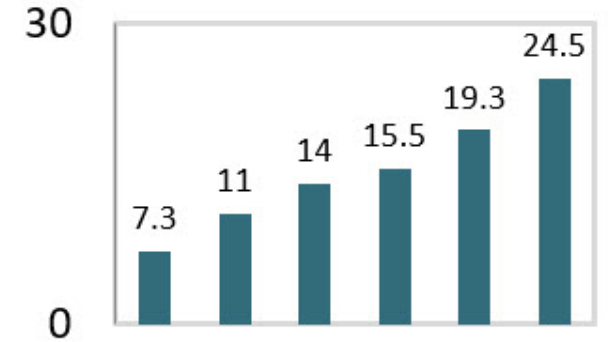
Smoking



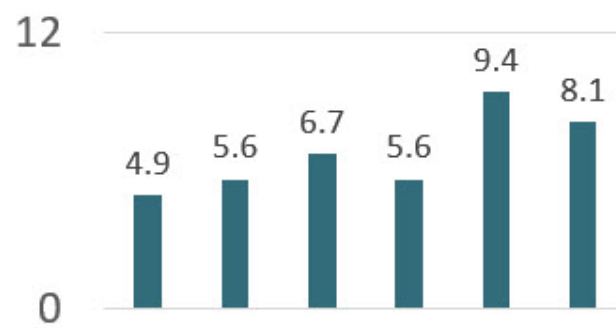
Drug Problem



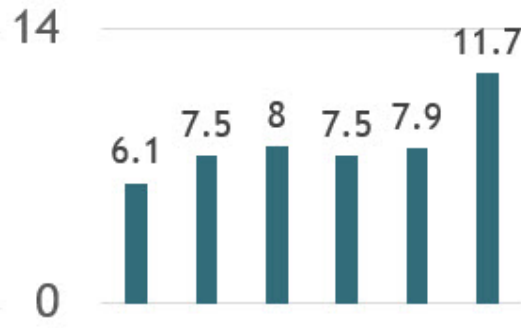
MH Treatment



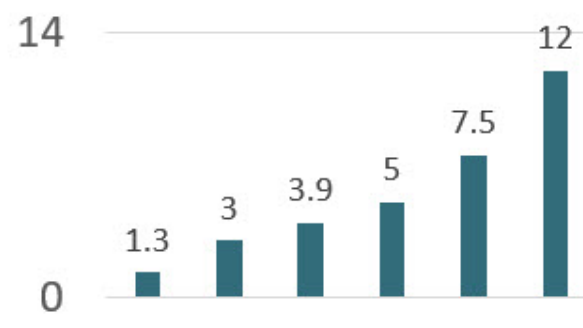
Cardio Vascular Disease



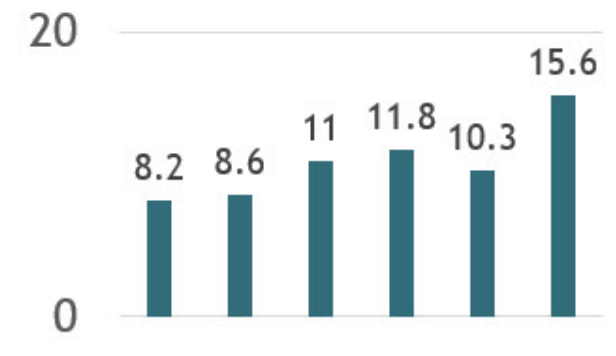
Diabetes



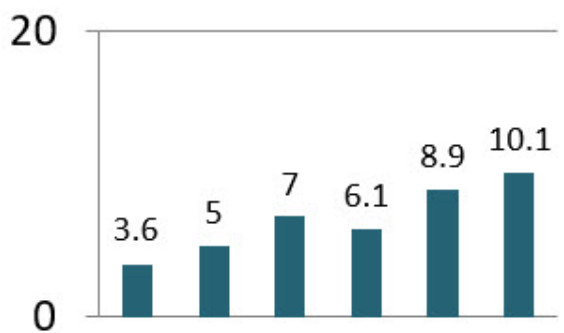
Asthma



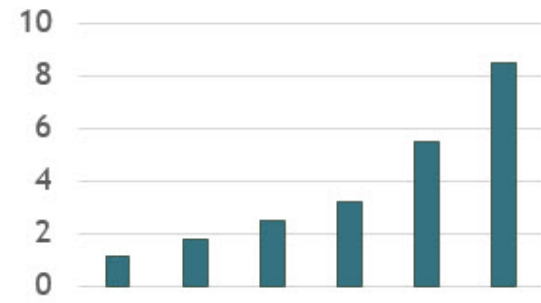
Cancer



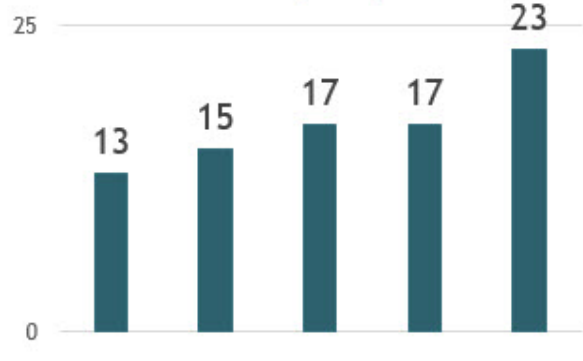
Work Injury/Illness



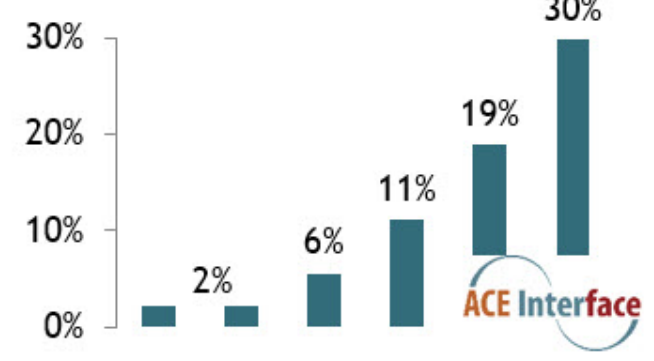
Missed 15 of 30 Work Days (MH)



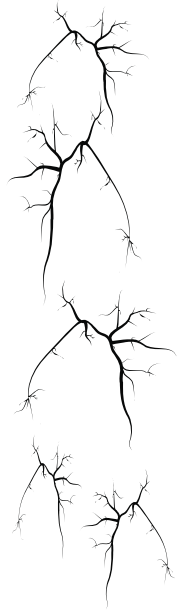
Unemployed



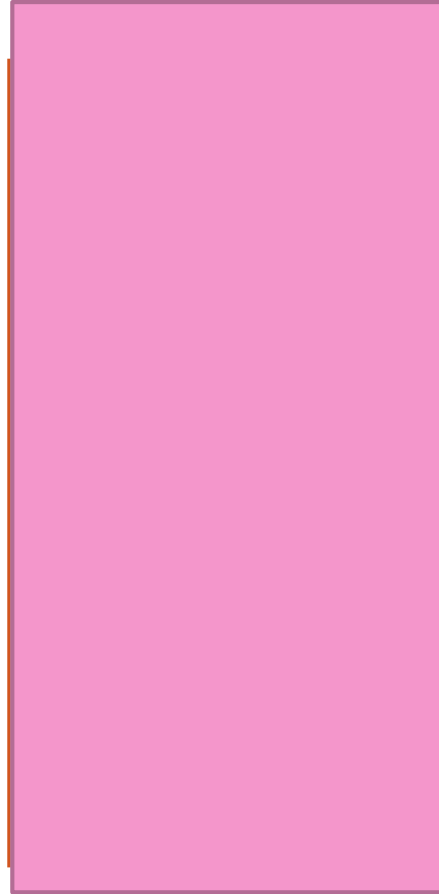
Homeless



SYNAPTIC DENSITY



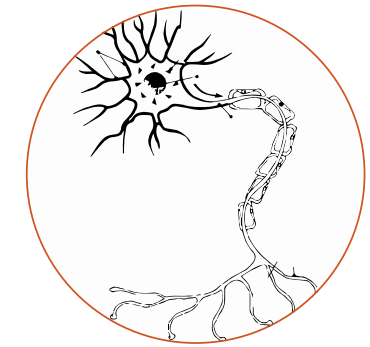
At Birth



Elementary Age

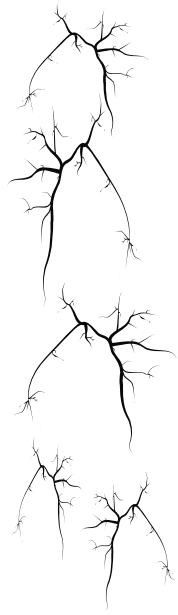


Puberty

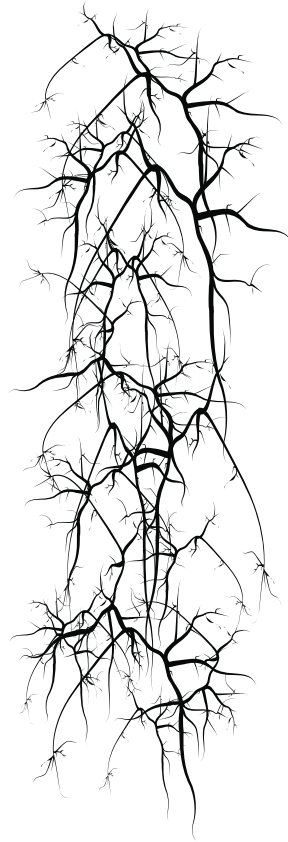


Neuron

SYNAPTIC DENSITY



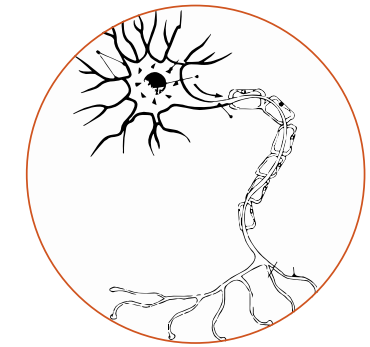
At Birth



Elementary Age



Puberty

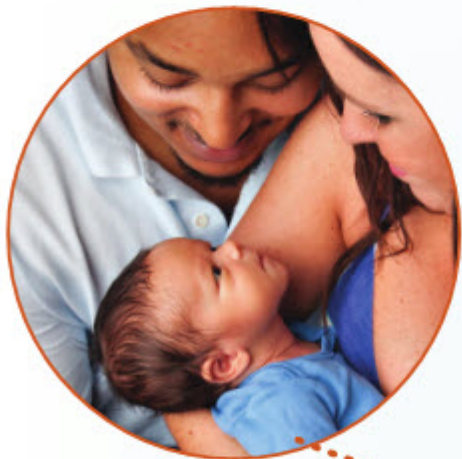


Neuron

STRESS

Interpretations Can Differ

set points in place by
EARLY ADULTHOOD



At Birth

SYNAPTIC DENSITY



Elementary Age



ACEs Influence Gene Expression

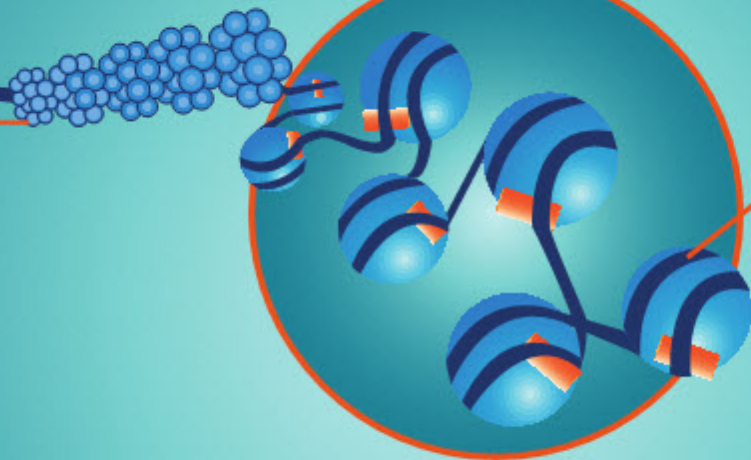
Epigenetics

Chromosomes

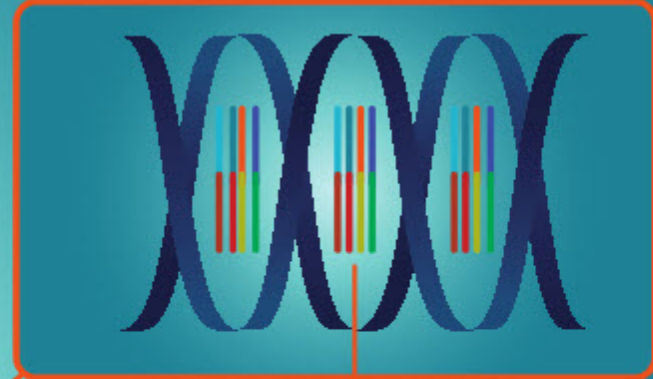


Chromosomes tightly packed DNA

Histones



DNA

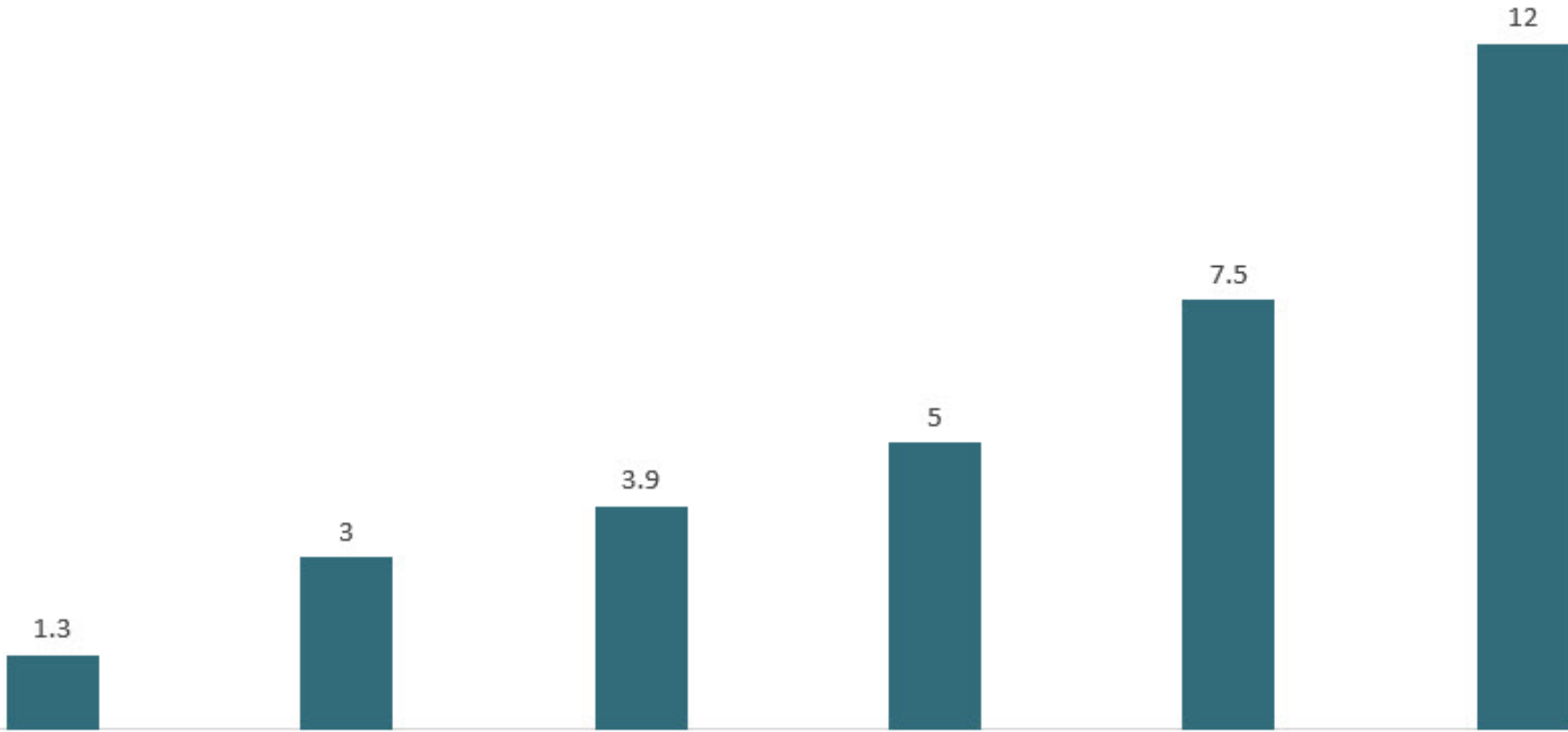


Gene

Asthma

14

0



ACEs and Asthma in Adulthood

Olivia Barth, MPH
Chronic Disease Informatics Epidemiologist
Michigan Department of Health and Human Services

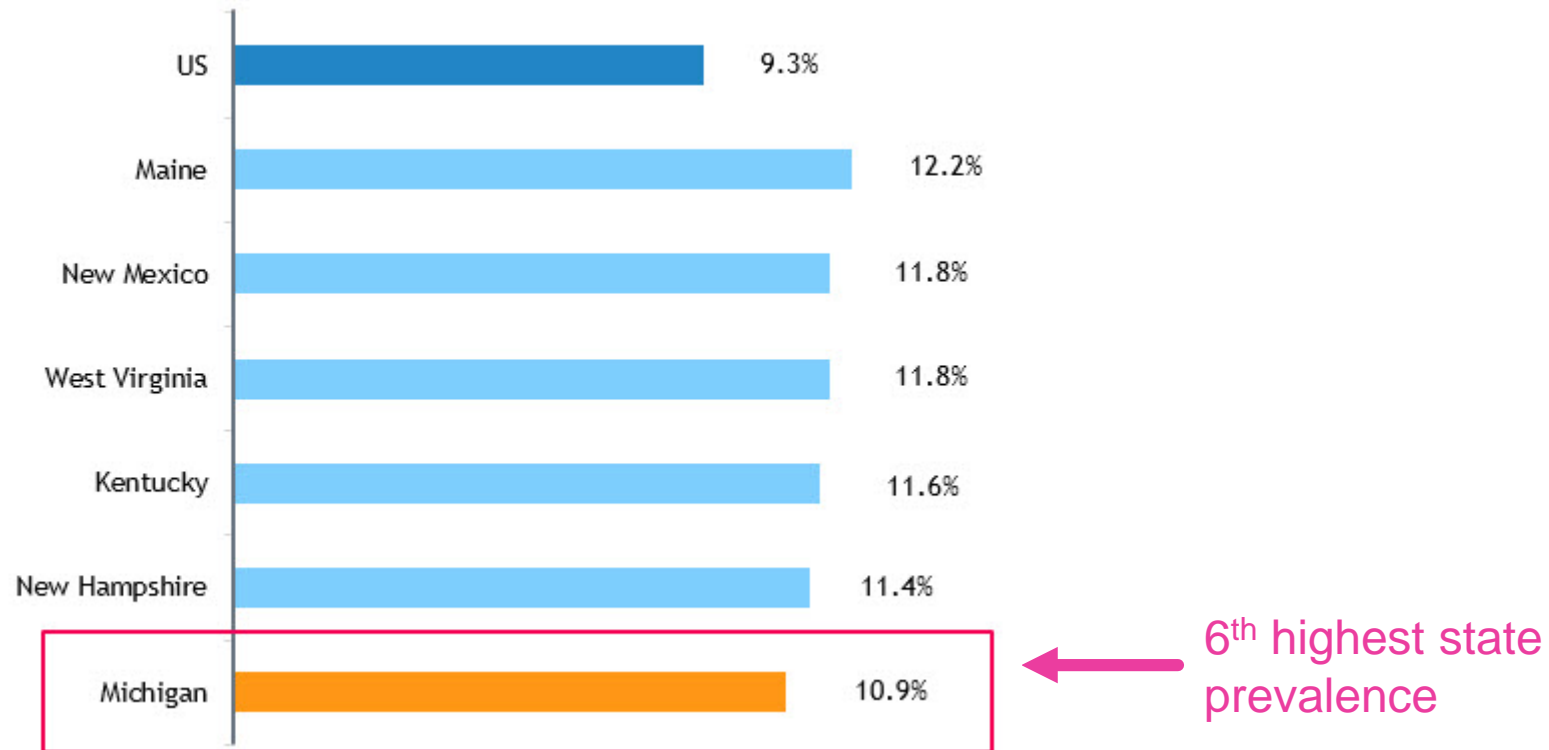
Adapted from: Barth, O. (2019). Childhood Adversity and Adult Asthma: Results from the Michigan BRFSS. Unpublished master's project, The University of Michigan, Ann Arbor, Michigan.

Early Adversity has Lasting Impacts



MI Asthma Burden

U.S. & States with the Highest Adult Current Asthma Prevalence, 2016



Data Source: CDC, National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health. BRFSS Prevalence & Trends Data. 2016. <https://www.cdc.gov/brfss/brfssprevalence/>.

Research Questions

1.

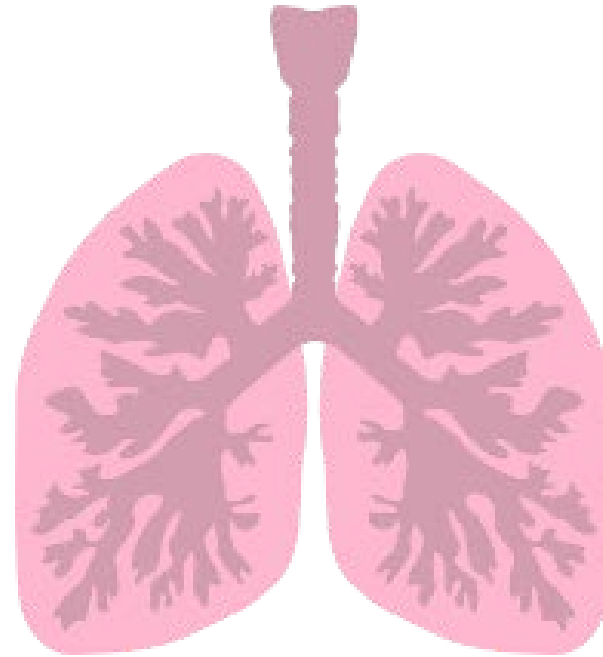
Is there an association between ACE score and asthma in a sample of Michigan residents?

2.

Does a dose-response relationship exist?

3.

Are there variations in the association between ACEs and asthma with consideration of ACE type?

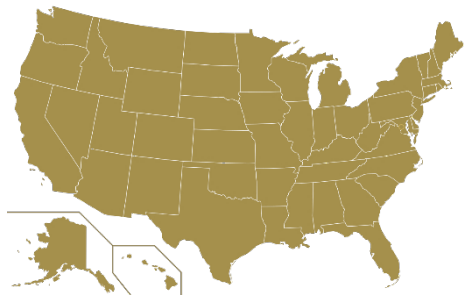


Behavioral Risk Factor Surveillance System (BRFS)

An annual, representative, state-based survey coordinated by CDC and designed to collect information on health practices and behaviors.

Inclusion of the ACE Module on the BRFSS:

Since 2009,
Most states have chosen to
include ACE questions on
their BRFSS.



www.cdc.gov/ace

Since 2013,
Michigan has included ACE
questions on the 2013,
2016, and 2019 MiBRFS.



www.michigan.gov/brfs

ACE Module:

	Questions	Responses
Household Dysfunction		
1.	Were your parents separated or divorced?	1, Yes 2, No
2.	Did you live with anyone who was depressed, mentally ill, or suicidal?	1, Yes 2, No
3.	Did you live with anyone who was a problem drinker or alcoholic?	1, Yes 2, No
4.	Did you live with anyone who used illegal street drugs or who abused prescription medications?	1, Yes 2, No
5.	Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	1, Yes 2, No
6.	How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	1, Never 2, Once 3, More than once
Childhood Abuse		
7.	Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	1, Never 2, Once 3, More than once
8.	How often did a parent or adult in your home ever swear at you, insult you, or put you down?	1, Never 2, Once 3, More than once
9.	How often did anyone at least 5 years older than you or an adult, ever touch you sexually?	1, Never 2, Once 3, More than once
10.	How often did anyone at least 5 years older than you or an adult try to make you touch them sexually?	1, Never 2, Once 3, More than once
11.	How often did anyone at least 5 years older than you or an adult force you to have sex?	1, Never 2, Once 3, More than once

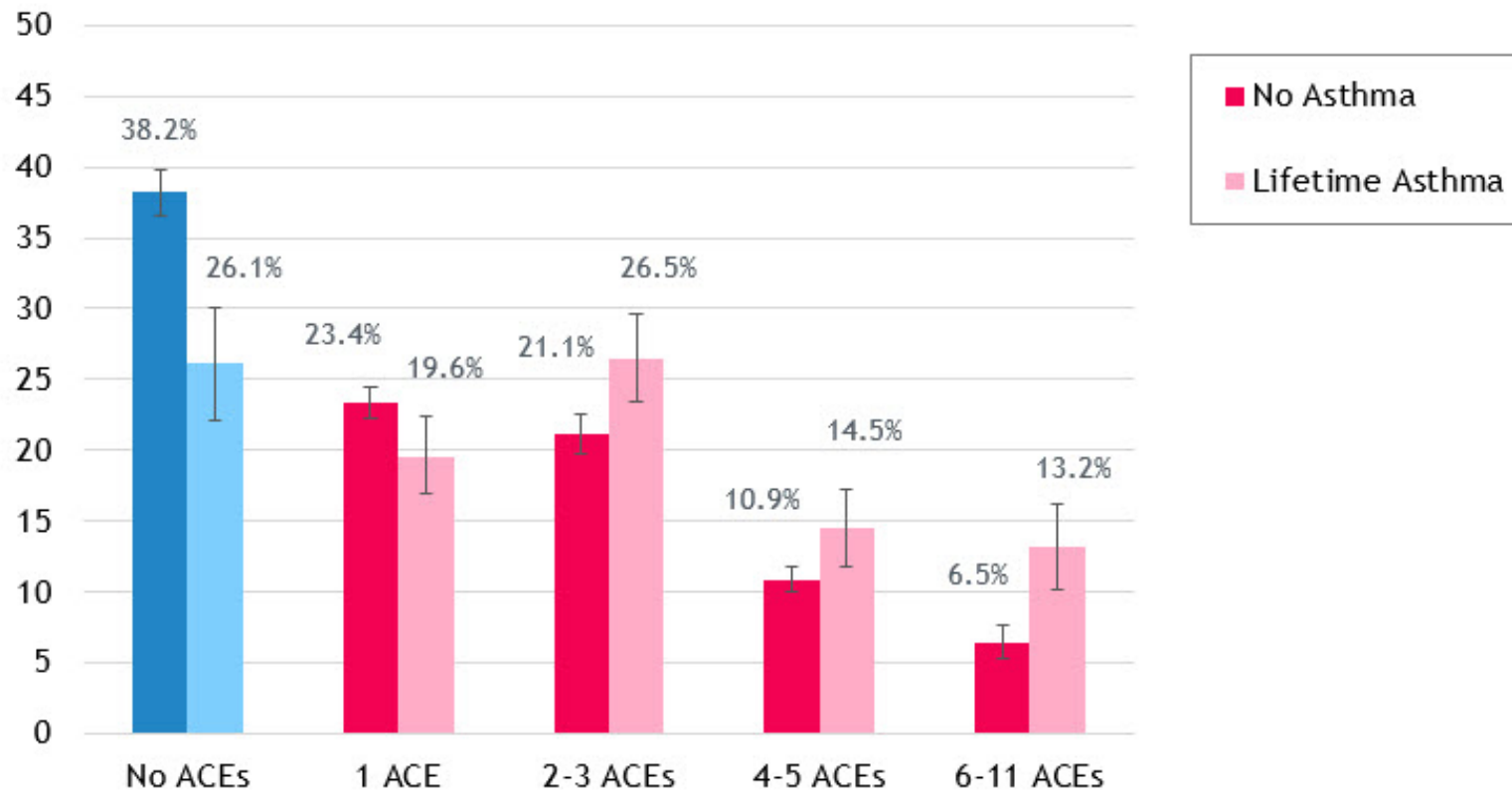
Data Source: Shared ACE questions between the 2013 and 2016 Michigan BRFSS.

On average,
Michiganders report
having experienced
1.8 ACEs...

but those with
asthma report an
average of
2.5 ACEs.

ACEs in Michigan

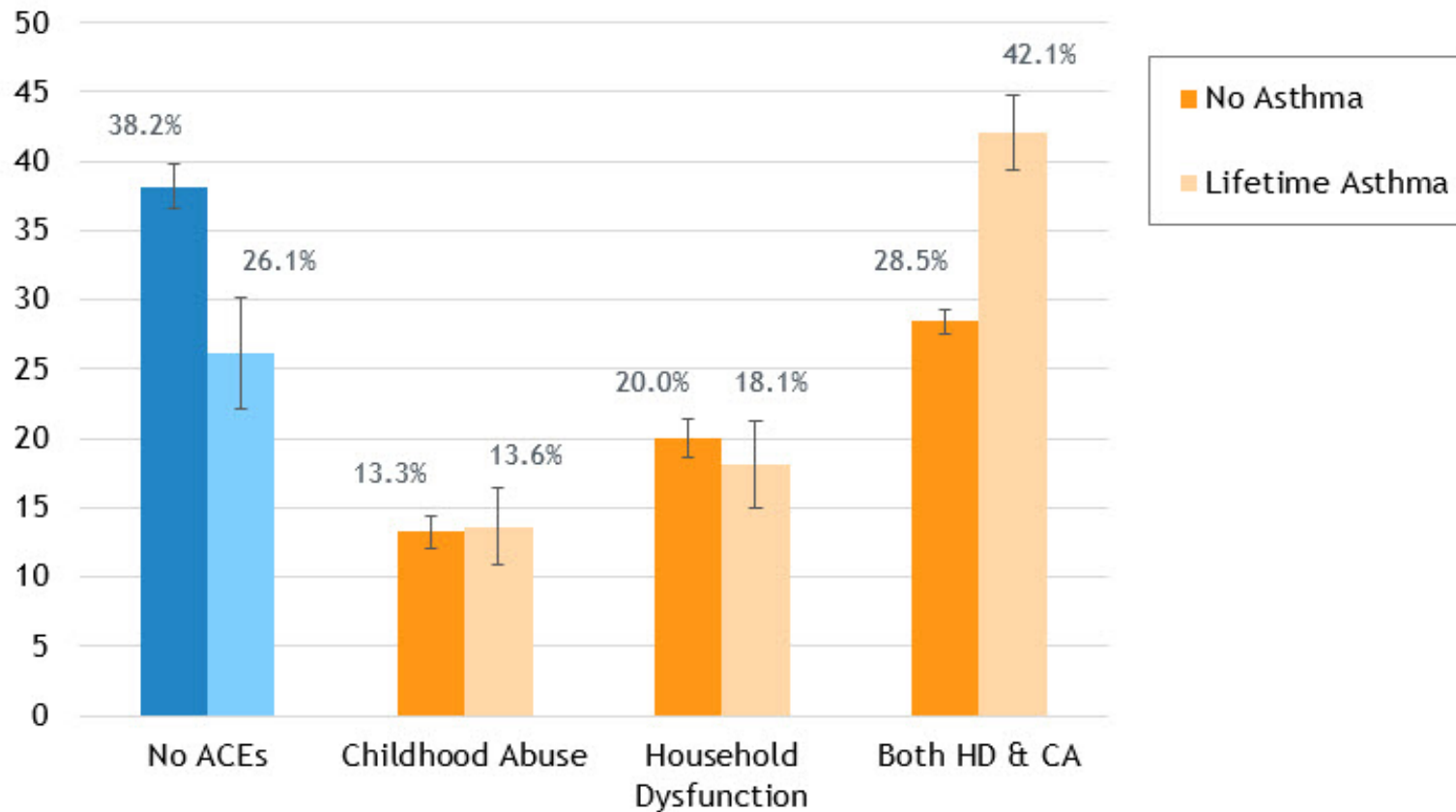
Proportion of ACE Scores Experienced by Asthma Status



Data Source: Michigan BRFSS, 2013 and 2016 combined.

ACEs in Michigan

Proportion of ACE Type Categories Experienced by Asthma Status



Data Source: Michigan BRFSS, 2013 and 2016 combined.

ACEs and Asthma: What we already know

Health condition	0 ACEs	1–3 ACEs	4–6 ACEs	7–9 ACEs
Fair or poor general health				
% (95% CI)	11.4 (10.5, 12.3)	13.5 (12.7, 14.4)	20.9 (18.9, 23.1)	28.9 (23.7, 34.7)
AOR (95% CI)	ref	1.4 (1.2, 1.5)	2.3 (1.9, 2.7)	3.5 (2.5, 4.9)
Frequent mental distress				
% (95% CI)	4.9 (4.3, 5.5)	9.8 (9.0, 10.6)	21.2 (18.9, 23.6)	32.4 (26.8, 38.5)
AOR (95% CI)	ref	2.0 (1.7, 2.3)	3.9 (3.2, 4.8)	6.0 (4.3, 8.2)
Diabetes				
% (95% CI)	8.6 (8.0, 9.3)	8.7 (8.0, 9.4)	8.1 (7.0, 9.4)	7.0 (5.1, 9.6)
AOR (95% CI)	ref	1.2 (1.1, 1.4)	1.4 (1.1, 1.7)	1.4 (1.0, 2.1)
Myocardial infarction				
% (95% CI)	4.0 (3.6, 4.4)	3.9 (3.5, 4.4)	3.5 (2.7, 4.4)	2.8 (1.7, 4.7)
AOR (95% CI)	ref	1.3 (1.1, 1.5)	1.6 (1.2, 2.2)	1.9 (1.1, 3.4)
Coronary heart disease				
% (95% CI)	4.5 (4.1, 5.0)	3.8 (3.5, 4.3)	3.1 (2.5, 3.8)	5.1 (2.8, 9.1)
AOR (95% CI)	ref	1.1 (1.0, 1.3)	1.4 (1.1, 1.8)	3.8 (1.9, 7.8)
Stroke				
% (95% CI)	2.8 (2.5, 3.2)	2.6 (2.3, 3.0)	2.4 (1.9, 3.2)	2.6 (1.6, 4.3)
AOR (95% CI)	ref	1.2 (1.0, 1.4)	1.4 (1.0, 2.0)	2.0 (1.1, 3.5)
Asthma				
% (95% CI)	7.2 (6.4, 8.0)	9.0 (8.3, 9.7)	13.6 (12.0, 15.4)	18.9 (14.7, 24.1)
AOR (95% CI)	ref	1.2 (1.1, 1.4)	1.8 (1.4, 2.1)	2.4 (1.7, 3.3)
Disability				
% (95% CI)	19.0 (18.0, 20.1)	22.8 (21.8, 23.9)	33.6 (31.2, 36.1)	44.4 (38.4, 50.5)
AOR (95% CI)	ref	1.4 (1.3, 1.6)	2.7 (2.4, 3.2)	4.7 (3.6, 6.1)

- Previous studies (from other states) have demonstrated an association between ACEs and asthma

Source: Gilbert, Leah K., et al. "Childhood adversity and adult chronic disease: an update from ten states and the District of Columbia, 2010." *American journal of preventive medicine* 48.3 (2015): 345-349.

*BRFS data from DC and ten states, including HI, ME, NE, NV, OH, PA, UT, VT, WA, and WI)

ACEs and Asthma: What we already know

Outcome ^a	ACE Count ^a	ACE Type			
		Household Dysfunction PR (CI)	Physical Abuse PR (CI)	Verbal Abuse PR (CI)	Sexual Abuse PR (CI)
<i>Asthma</i>					
Model 1	1.08 (1.04, 1.13)*	1.31 (1.07, 1.62)*	1.00 (0.75, 1.32)	1.54 (1.25, 1.91)*	1.25 (0.95, 1.65)
Model 2	1.07 (1.02, 1.13)*	1.23 (0.98, 1.53)	97.1 (0.72, 1.31)	1.43 (1.14, 1.79)*	1.18 (0.89, 1.58)
Model 3	1.06 (1.01, 1.12)*	1.22 (0.98, 1.51)	95.5 (0.71, 1.29)	1.40 (1.12, 1.76)*	1.13 (0.84, 1.52)

*BRFS data from Hawaii

- There may be differences in magnitude of association with asthma by ACE type

Source: Remigio-Baker, R., Hayes, D., & Reyes-Salvail, F. "Adverse Childhood Events are Related to the Prevalence of Asthma and Chronic Obstructive Pulmonary Disorder Among Adult Women in Hawaii". *Lung* 193.6 (2015): 885-891.

Methods: Measures

- **Exposure: Adverse Childhood Experiences**
 - By summed ACE score (0-11) divided into categories
 - By ACE type (None, Household Dysfunction, Childhood Abuse, or Both)
- **Outcome: Lifetime Asthma**
 - Defined as responding “yes” to ever being told by a doctor, nurse, or health professional that they had asthma.

Methods: Measures

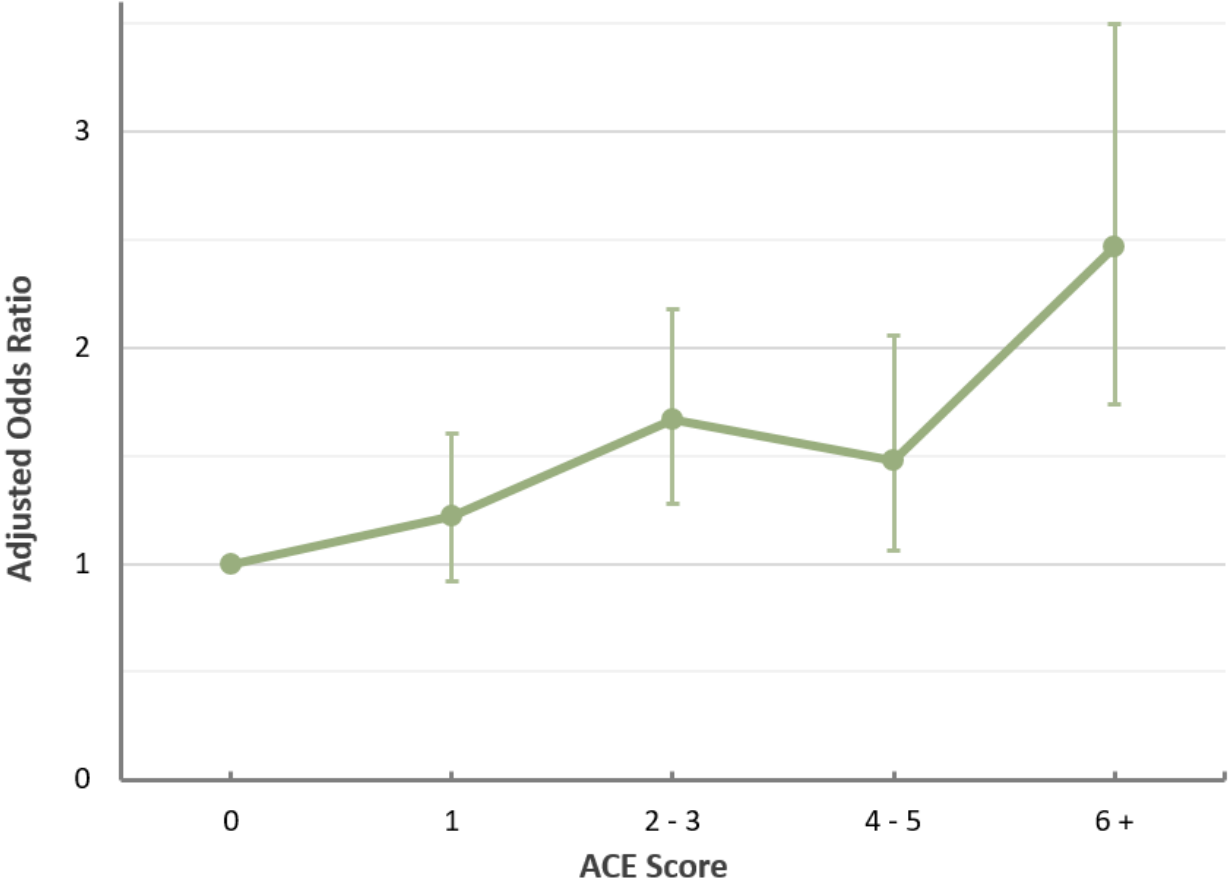
- Analyses conducted using SAS survey procedures
- Prevalence of ACEs was examined
- Associations were examined using logistic regression models
- Adjusted odds ratios included age, sex, race/ethnicity, household income, and education*

Descriptive Characteristics Among All Respondents and Among Those Ever Diagnosed with Asthma

	Weighted % (n)	
	Sample (n=6,961)	Lifetime Asthma
Total	--	15.4 (1,039)
Survey Year		
2013	51.9 (3,603)	53.1 (538)
2016	48.1 (3,358)	46.9 (501)
Race		
White, non-Hispanic	79.8 (5,844)	75.4 (823)
Black, non-Hispanic	13.0 (579)	16.6 (112)
Hispanic	3.0 (111)	3.1 (16)
Other, non-Hispanic	4.2 (336)	4.9 (76)
Sex		
Male	48.6 (3,077)	42.0 (379)
Female	51.4 (3,884)	58.0 (660)
Age		
18-44 years	43.0 (1,874)	50.8 (343)
45-64 years	36.0 (2,682)	33.7 (398)
65+ years	21.0 (2,356)	15.4 (291)
Education		
Less than high school	10.5 (333)	14.4 (75)
Graduated high school	29.6 (1,959)	26.4 (283)
Some college	35.2 (2,142)	36.7 (330)
Graduated college	24.8 (2,518)	22.5 (350)
Income		
< \$15,000	10.2 (547)	17.0 (144)
\$15,000 - \$24,999	16.1 (979)	21.4 (182)
\$25,000 - \$34,999	11.9 (758)	11.2 (105)
\$35,000 - \$49,999	15.1 (946)	14.6 (130)
> \$50,000	46.7 (2,805)	35.7 (353)

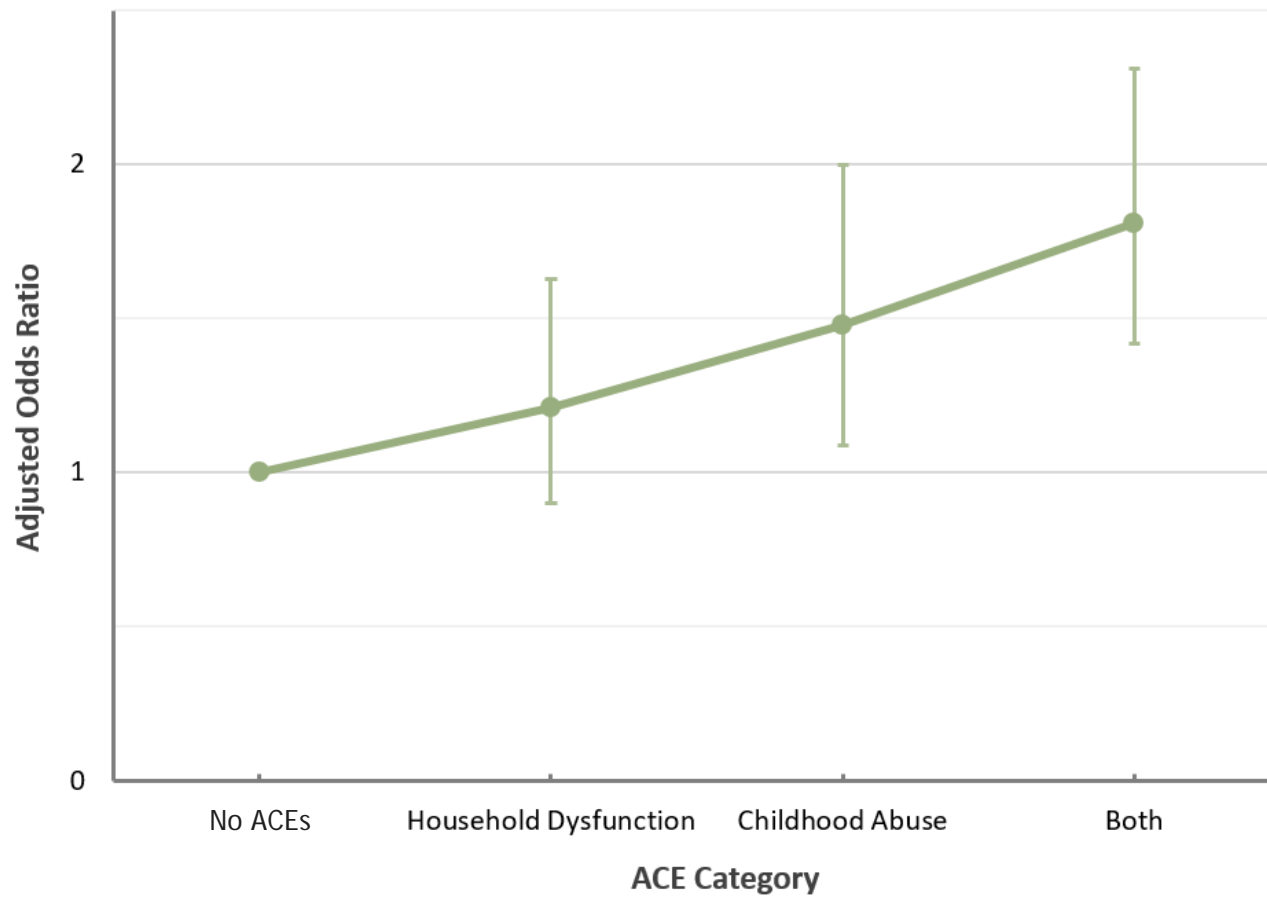
Data Source: Michigan BRFSS, 2013 and 2016 combined.

Association between ACEs and Ever Being Diagnosed with Asthma: By ACE Score



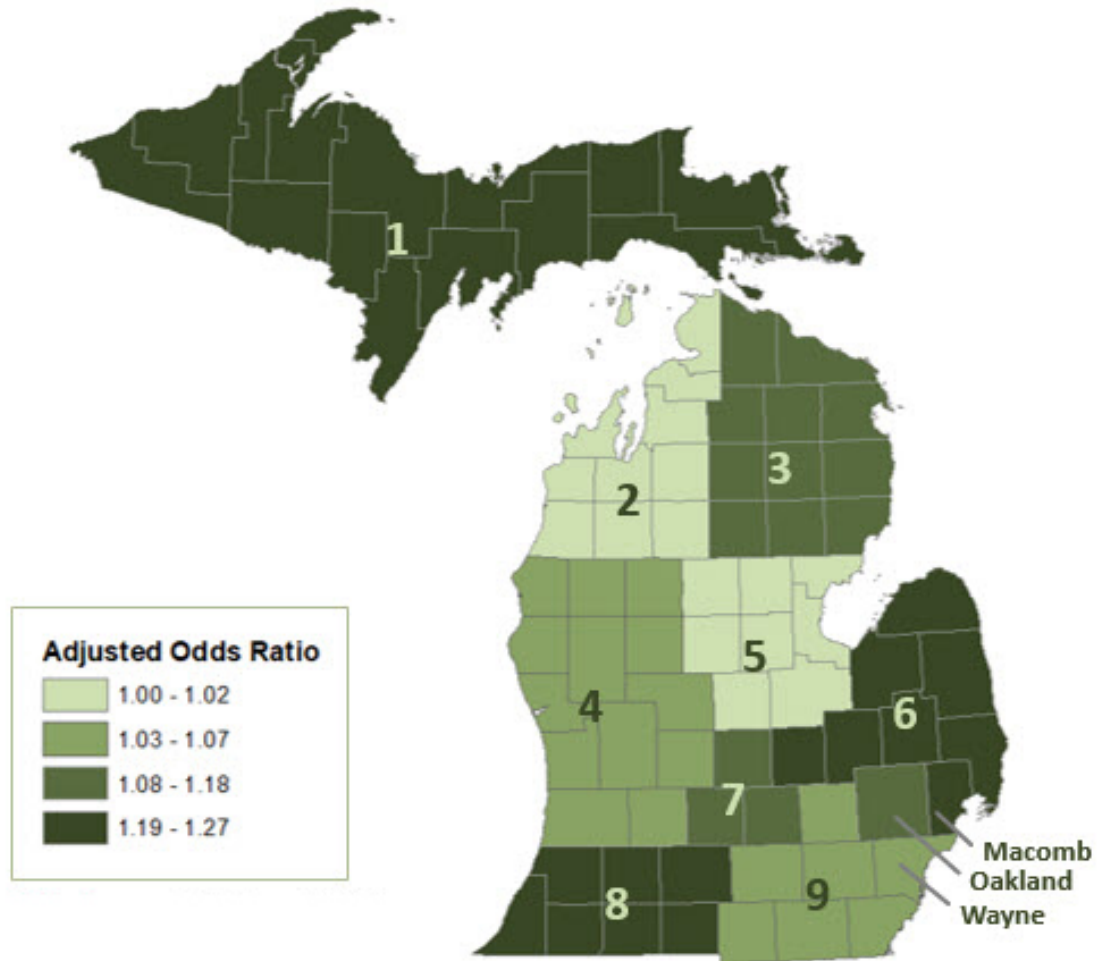
Data Source: Michigan BRFSS, 2013 and 2016 combined.

Association between ACEs and Ever Being Diagnosed with Asthma: By ACE Type



Data Source: Michigan BRFSS, 2013 and 2016 combined.

Variations in the Association between ACEs and Lifetime Asthma by Prosperity Region (and estimates for Macomb, Oakland, and Wayne)



Data Source: Michigan BRFSS, 2013 and 2016 combined.

Adjusted Odds Ratios of ACE Score and Ever Being Diagnosed with Asthma			
Region/County	OR	Region/County	OR
1 – Upper Peninsula	1.195*	8 – Southwest	1.221*
2 – Northwest	1.004	9 – Southeast Michigan	1.059
3 – Northeast	1.163	Macomb County	1.265*
4 – West Michigan	1.069	Oakland County	1.183*
5 – East Central Michigan	1.022	Wayne County	1.065
6 – East Michigan	1.226*		
7 – South Central	1.161	State of Michigan	1.122*

Summary

- The prevalence of ACEs in Michigan was slightly higher than those reported by other states.
- Results suggest an association between ACE exposure and increased odds of asthma
- They also suggest that exposure to only childhood abuse has a significant association with asthma, while exposure to only household dysfunction does not

Future Directions

- Additional ACE questions
- Social support questions
- Longitudinal data
- Closer look at ACE components and their individual influence



Credits

Thank you to all that provided support and guidance on this project, including:

Beth Anderson, MPH

Allison Murad, MPH

Belinda Needham, PhD, MA

Michigan Department of
Health and Human Services

University of Michigan School
of Public Health

Thanks!

Any questions?

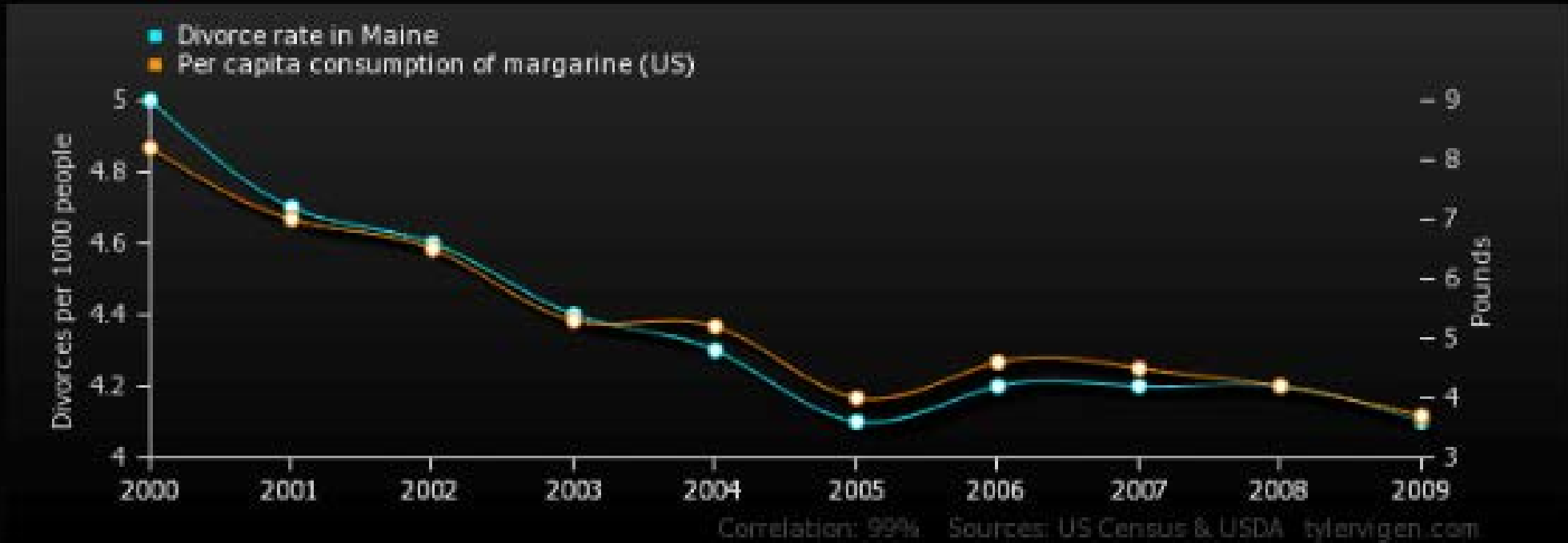
If you would like more information on the project, contact me at

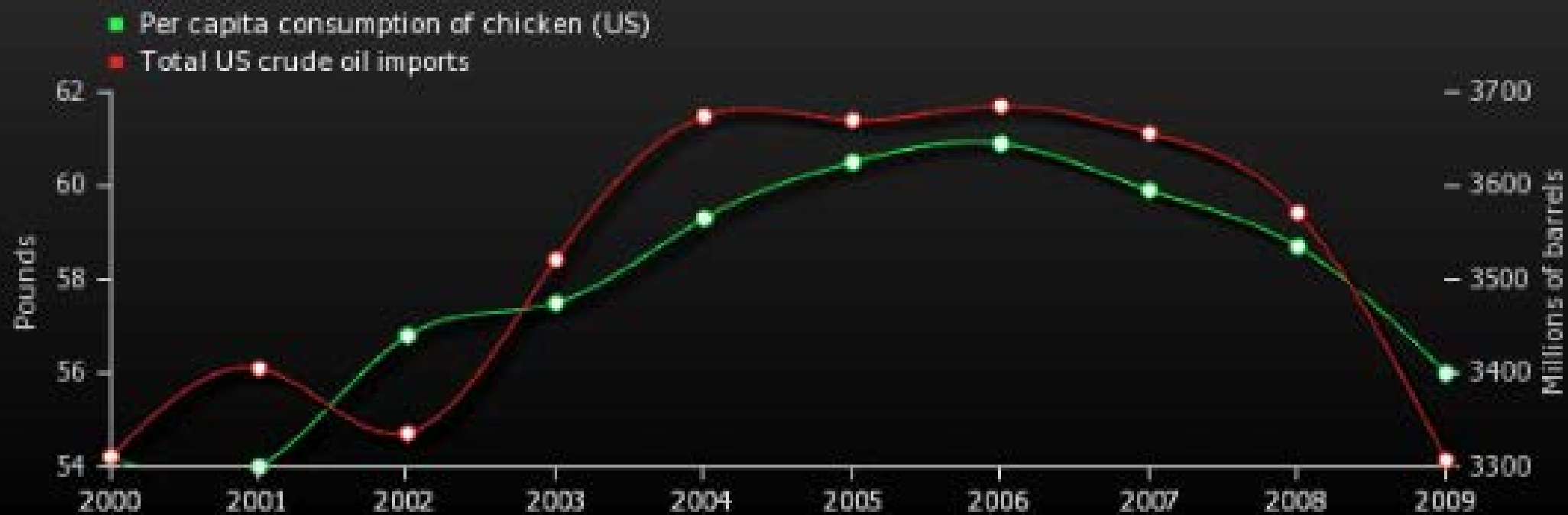
BarthO@michigan.gov

What known factors are associated with asthma risk?

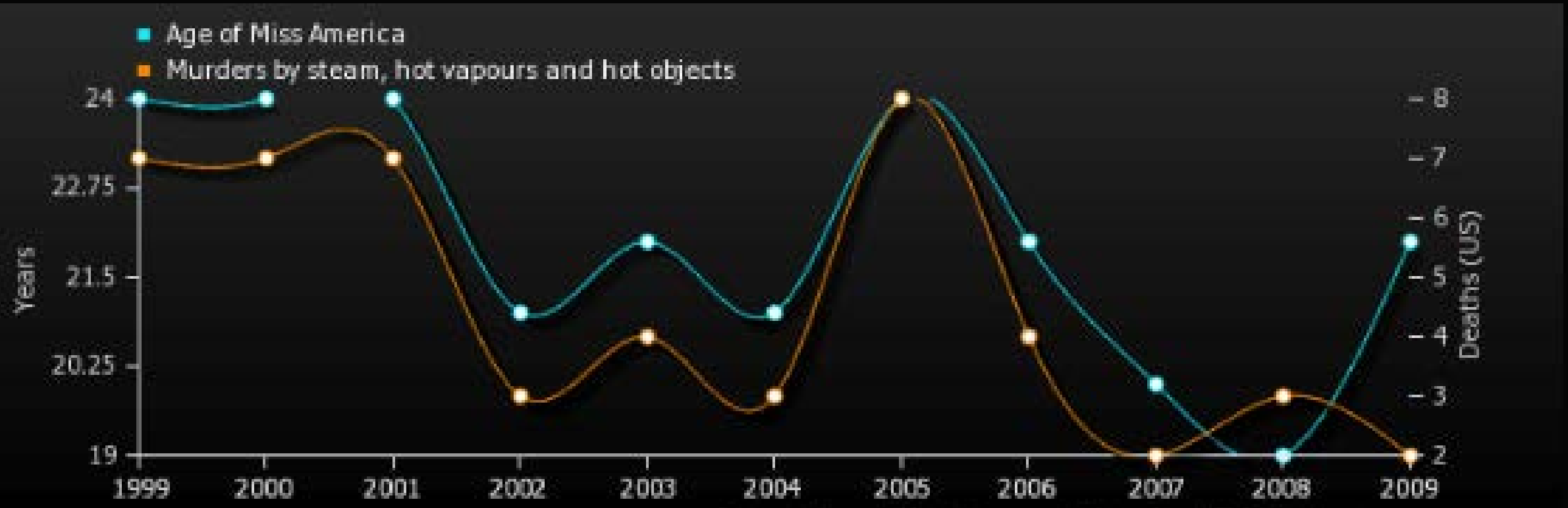
- ▶ Physical environmental factors, such as: pollution, mold, roach droppings, dust mites, etc
- ▶ Genetic
- ▶ Immunologic
- ▶ Rhinovirus infection

Association \neq Causation!





Correlation: 90% Sources: USDA & Dept. of Energy tylervigen.com



Correlation: 87% Sources: Wikipedia & CDC tylervigen.com

Adverse childhood experience and asthma onset: a systematic review

Daniel Exley, Alyson Norman and Michael Hyland

Affiliation: School of Psychology, University of Plymouth,
Plymouth, UK.

Eur Respir Rev 2015; 24: 299-305 | DOI: 10.1183/16000617.00004114

Results

- ▶ 12 studies, assessing data from a total of 31524 individuals, were identified that investigate the impact of a range of adverse childhood experiences on the likelihood of developing asthma
- ▶ Suggests: chronic stress exposure and maternal distress in pregnancy synergistic with known triggers such as traffic-related air pollution to increase asthma risk

Association between adverse childhood experiences in the home and pediatric asthma



Robyn Wing, MD^{*,†,‡}; Annie Gjelsvik, PhD[‡]; Mariann Nocera, MD^{*,†}; and Elizabeth L. McQuaid, PhD^{†,§}

** Departments of Emergency Medicine and Pediatrics, Section of Pediatric Emergency Medicine, Brown University/Hasbro Children's Hospital, Providence, Rhode Island*

† Warren Alpert Medical School of Brown University/Hasbro Children's Hospital, Providence, Rhode Island

‡ School of Public Health, Brown University, Providence, Rhode Island

§ Bradley/Hasbro Children's Research Center and Department of Psychiatry, Rhode Island Hospital, Providence, Rhode Island

- First and only current study to investigate specific ACEs experienced in the home and cumulative impact on childhood asthma prevalence
- Further supporting growing literature on psychosocial model of asthma development

Adverse Childhood Experiences (ACEs) and Asthma

- One ACE: Increases odds of developing asthma by 28%
- Odds increase with each additional ACE
- Four ACEs increases odds by what %?

73!%



“Stress should be viewed as a risk factor for asthma development and asthma exacerbations, much like tobacco smoke and dust mites.”

Dr. Robyn Wing – lead investigator on ACEs and Childhood Asthma Study

Table 2

Distribution of selected demographic, socioeconomic, and health characteristics in children 0 to 17 years old by reported ACEs, National Survey of Children's Health 2011

Variable	0 ACE, %	1 ACE, %	2 ACEs, %	3 ACEs, %	4 ACEs, %	≥5 ACEs, %	Total, % (N)
Total population	68.7	17.7	7.1	3.8	1.9	0.93	100 (92,427)
Asthma ever							
Yes	12.3	18.2	18.7	23.2	24.5	25.4	14.6 (13,049)
No	87.7	81.8	81.3	76.8	75.5	74.6	85.4 (79,378)
Sex							
Boys	51.3	51.3	49.8	50.6	50.3	52.2	51.2 (47,542)
Girls	48.7	48.7	50.2	49.4	49.7	47.8	48.8 (44,786)
Age (y)							
0–5	39.2	21.3	18.7	13.8	13.2	15.6	32.9 (29,119)
6–11	31.7	35.7	38.0	35.1	35.4	32.1	33.1 (29,911)
12–17	29.1	42.9	43.4	51.2	51.3	52.2	34.0 (33,397)
Race							
NH white	52.9	51.7	49.8	55.7	58.0	57.9	52.7 (60,383)
NH black	11.9	17.6	17.0	15.8	12.7	10.3	13.4 (8,592)
Hispanic	10.5	9.4	9.4	10.8	10.8	12.6	10.3 (10,178)
Other	24.7	21.3	23.9	17.7	18.5	19.2	23.6 (12,407)
Prematurity							
No	88.1	87.9	88.0	90.5	87.5	84.4	88.5 (81,419)
Yes	11.9	12.1	12.0	9.5	12.5	15.6	11.5 (10,398)
Poverty level							
<100%	18.7	25.2	29.5	32.1	35.5	35.7	21.7 (12,720)
100–200%	20.2	23.8	27.1	28.5	28.0	27.4	21.9 (15,139)
200–400%	28.9	29.0	28.1	26.8	28.0	26.2	28.7 (26,231)
>400%	32.2	21.9	15.3	12.6	8.5	10.7	27.7 (30,982)
Household education							
<HS	11.5	11.2	13.8	13.2	14.0	12.5	11.7 (5,464)
HS graduate	18.0	24.3	25.9	22.3	27.3	24.9	20.0 (14,110)
>HS	70.6	64.5	60.3	64.5	58.7	62.7	68.3 (72,304)
Smoking exposure							
No	82.0	68.8	58.0	54.0	48.7	48.5	76.0 (70,925)
Yes	18.0	31.2	42.0	46.0	51.3	51.5	24.0 (21,457)
Neighborhood safety							
Never or ST	12.3	14.3	17.5	16.7	18.4	17.0	13.3 (8,637)
Usually	29.5	30.1	32.5	34.5	34.3	32.1	30.1 (28,524)
Always	58.3	55.6	49.9	48.8	47.2	50.9	56.6 (91,940)

Abbreviations: ACE, adverse childhood experience; HS, high school; NH, non-Hispanic; ST, sometimes.

Asthma and Behavioral Health

- Asthma undermines the mental-emotional health of a child
- Consistent association between asthma and anxiety/depression
 - Possibly explained by biological and psychological mechanisms which may include inflammatory processes as well as the stress of having to live with a life-threatening condition



Family Functioning and Asthma Morbidity

- Family conflict is associated with greater number of hospitalizations for asthma
- Adolescents with higher levels of parental criticism respond better to inpatient program
- Several studies also show links between parental mental health problems and increased asthma among youth.

Asthma and Behavioral Health

- In one study, inner city children with more severe asthma had problems with peers, exhibiting more anxious and shy behavior
- The reverse is also true
 - Students with anxiety have increased severity of asthma symptoms and poorer asthma control
- There is also potential to confuse asthma and anxiety
 - Overuse of rescue medication can lead to cycle of asthma/anxiety

Link between ACEs and Asthma: the Evidence

- ▶ Cross-sectional and/or retrospective studies only
- ▶ Do ACEs act independently to increase risk of asthma onset?
- ▶ Or is the presence of other factors necessary for ACE to have impact?

Does association of smoking with ACEs explain increased risk of asthma?

[Public Health](#). 2018 Apr;157:62-68.
doi: 10.1016/j.puhe.2018.01.021.
Epub 2018 Mar 20.

Examining the association between adverse childhood experiences and smoking-exacerbated illnesses.

[Crouch E](#)¹, [Radcliff E](#)², [Strompolis M](#)³, [Wilson A](#)³.

Conclusion:

- ▶ **ACE exposure may influence risky health behaviors in adulthood, such as continued smoking even in the presence of illnesses that are exacerbated by smoking**
- ▶ **...Anti-smoking efforts might benefit from designing interventions and treatment plans that address ACE exposure**

What DO we know?

- ▶ No evidence of association between elevated cortisol and asthma onset

Does emotional upset cause asthma?

- ▶ 1993 metaanalysis found:
“substantial evidence for a relation between stress and both functional and enumerative immune measures in humans”
- ▶ Overall, however, evidence is somewhat weak
- ▶ Studies tended to be small

Occasional reviews

Review of psychosocial stress and asthma: an integrated biopsychosocial approach

Rosalind J Wright, Mario Rodriguez, Sheldon Cohen

Although consensus has emerged from the clinical, social science, psychological, and biological literature that psychosocial factors affect asthma morbidity in children, their role albeit equally important, determinants of asthma morbidity—for example, by influencing how children and their families perceive and manage their asthma. Although no clear causal

Does emotional upset change the immune system?

[BMC Pediatr.](#) **2018** Feb 23;18(1):83.

Systematic review of pediatric health outcomes associated with childhood adversity.

[Oh DL](#)¹, [Jerman P](#)², [Silvério Marques S](#)², [Koita K](#)², [Purewal Boparai SK](#)^{2,3}, [Burke Harris N](#)², [Bucci M](#)²

Results:

- ▶ **Meta-analysis: 35 studies included**
- ▶ **Exposure to childhood adversity was associated with alterations of immune and inflammatory response and stress-related accelerated telomere erosion**

Individual studies indicated alterations of immune and inflammatory response in children exposed to adversity

► In a sample of children exposed to their parents' psychiatric symptoms, Wyman et al and Caserta et al found that higher levels of symptoms were associated with enhanced natural killer cell response in children, suggesting that chronic stress may exert effects of cytotoxicity on the developing immune system.

► Wolf et al found that greater parental depressive symptoms at baseline predicted increases in children's profiles of asthma-relevant inflammatory markers (i.e. eosinophil cationic protein and interleukin-4), in both children with asthma and controls.

► In 3 cohorts of children, Copeland et al did not find an association between bullying or teasing and C-reactive protein levels (a marker of inflammation in the body)

Do ACEs cause asthma? Possibly!

Conclusion from Oh et al meta-analysis:

- ▶ Childhood adversity affects brain development and multiple body systems, and the physiologic manifestations are detectable in childhood
- ▶ The variability in children's response to adversity suggests complex underlying mechanisms, including the timing and severity of adversity, the experience of cumulative adversity, and the presence of protective factors
- ▶ Health care providers should...consider such exposure when evaluating the differential diagnosis of pediatric conditions such as ... asthma...

[BMC Pediatr.](#) 2018 Feb 23;18(1):83.

Systematic review of pediatric health outcomes associated with childhood adversity.

[Oh DL](#)¹, [Jerman P](#)², [Silvério Marques S](#)², [Koita K](#)², [Purewal Boparai SK](#)^{2,3}, [Burke Harris N](#)², [Bucci M](#)²

General Intervention: buffering the Toxic Stress response through 6 evidence-based domains



Questions?





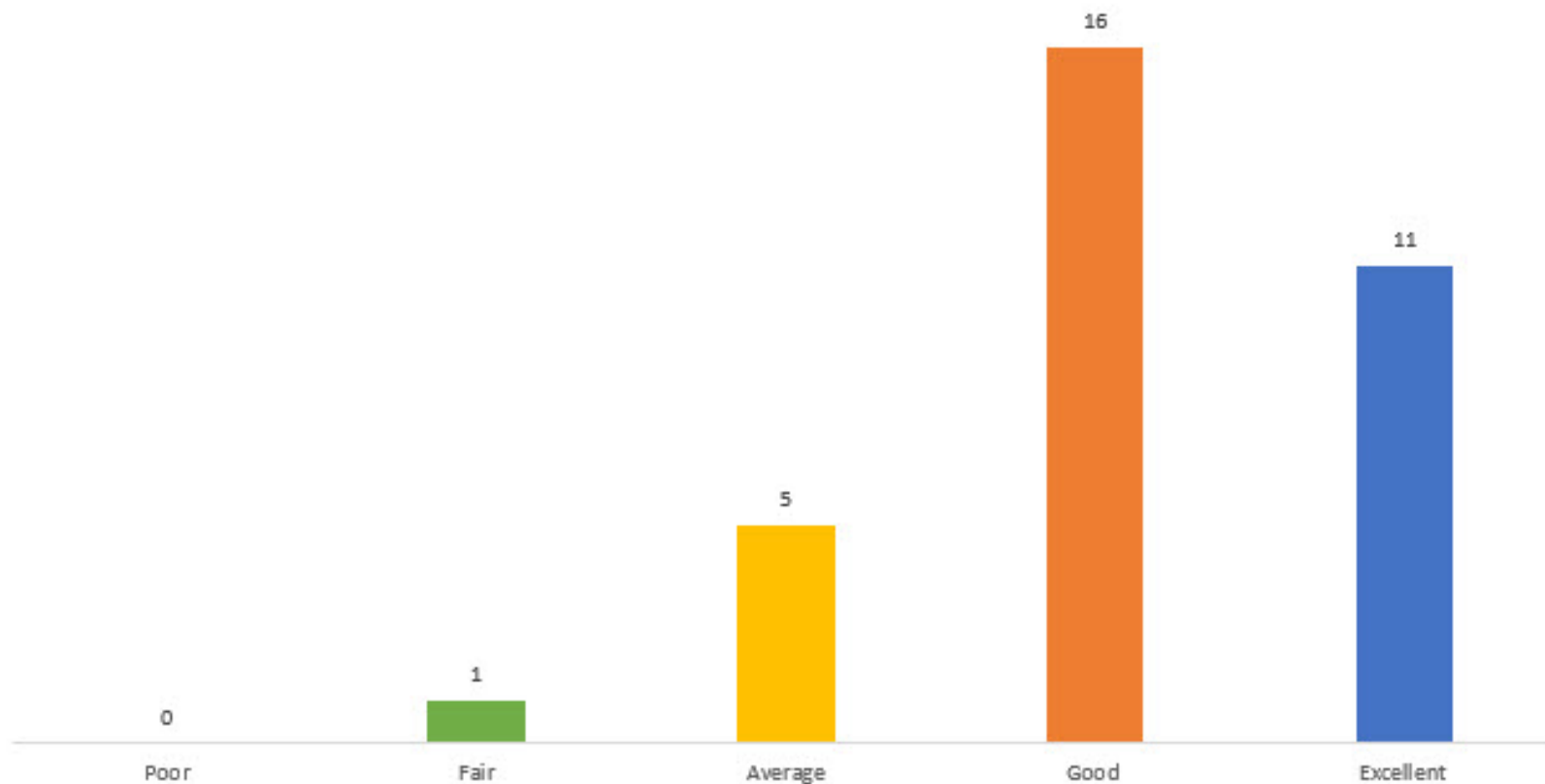
EVALUATING ACES KNOWLEDGE

POST PRESENTATION



13.) AFTER TODAY'S PRESENTATION, RATE YOUR FAMILIARITY WITH ACEs?

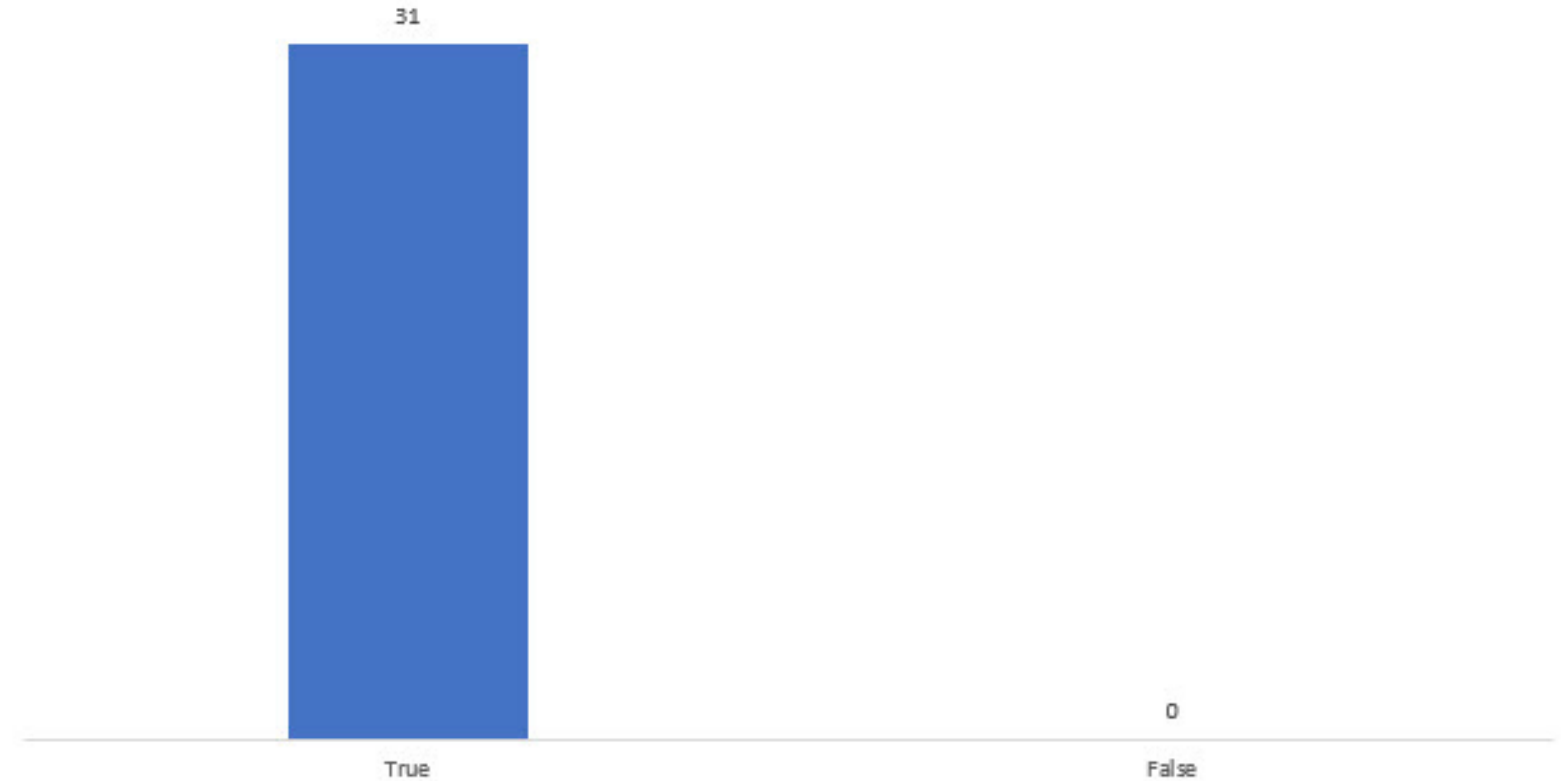
- A. Poor
- B. Fair
- C. Average
- D. Good
- E. Excellent



14.) THERE IS AN ASSOCIATION BETWEEN ACEs AND ASTHMA.

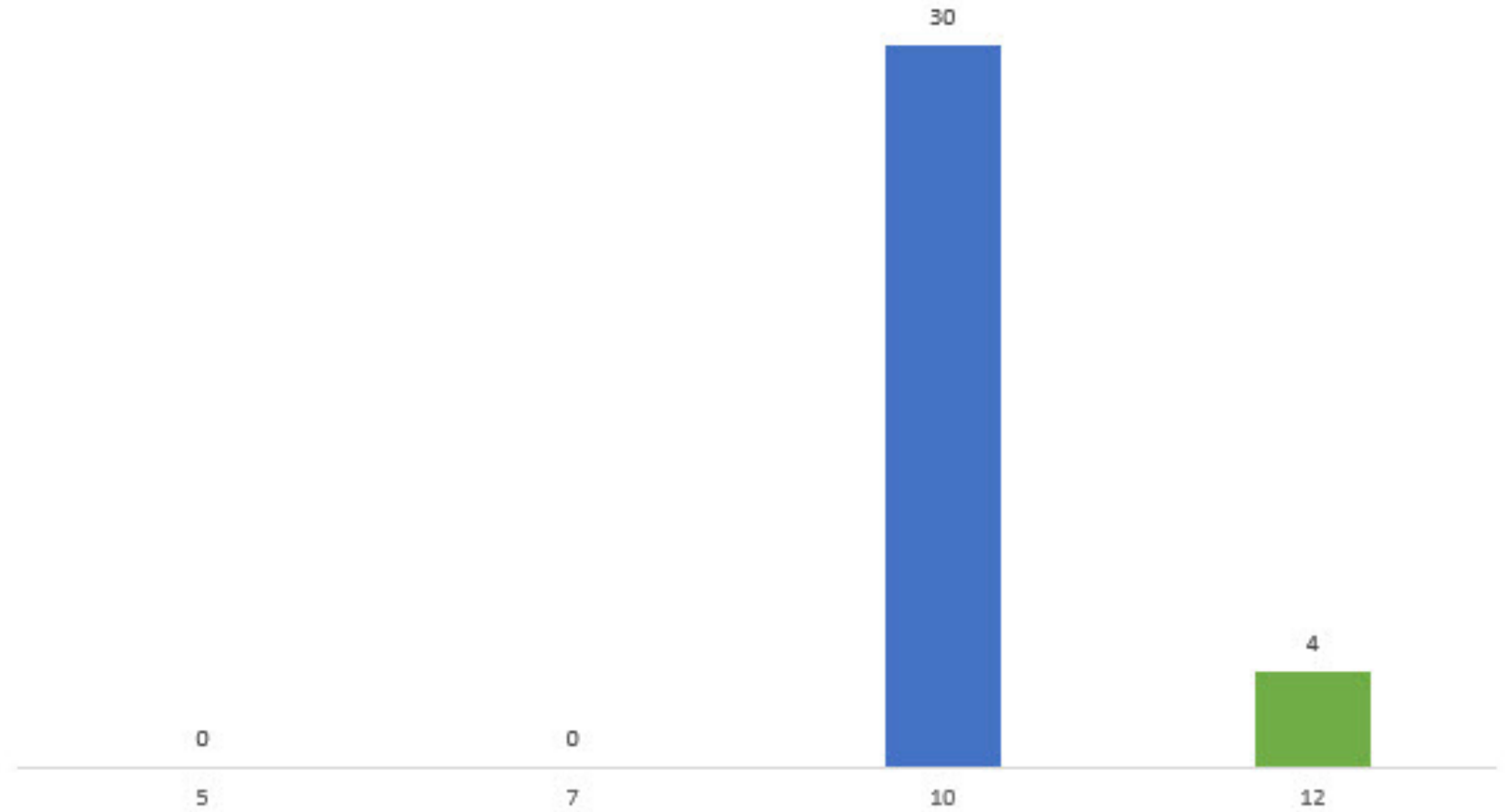
A. True

B. False



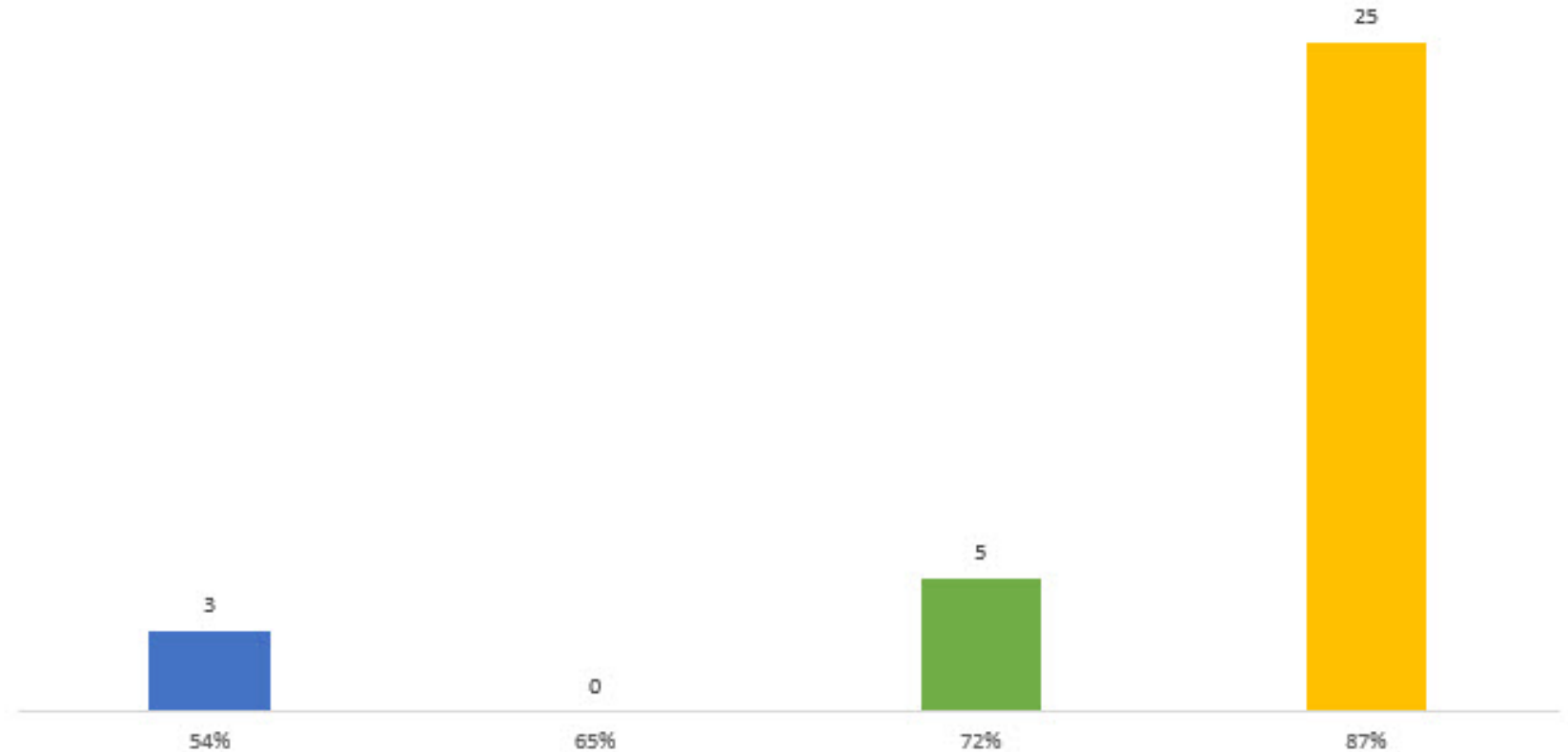
15.) HOW MANY TOTAL ACEs ARE THERE?

- A. 5
- B. 7
- C. 10
- D. 12



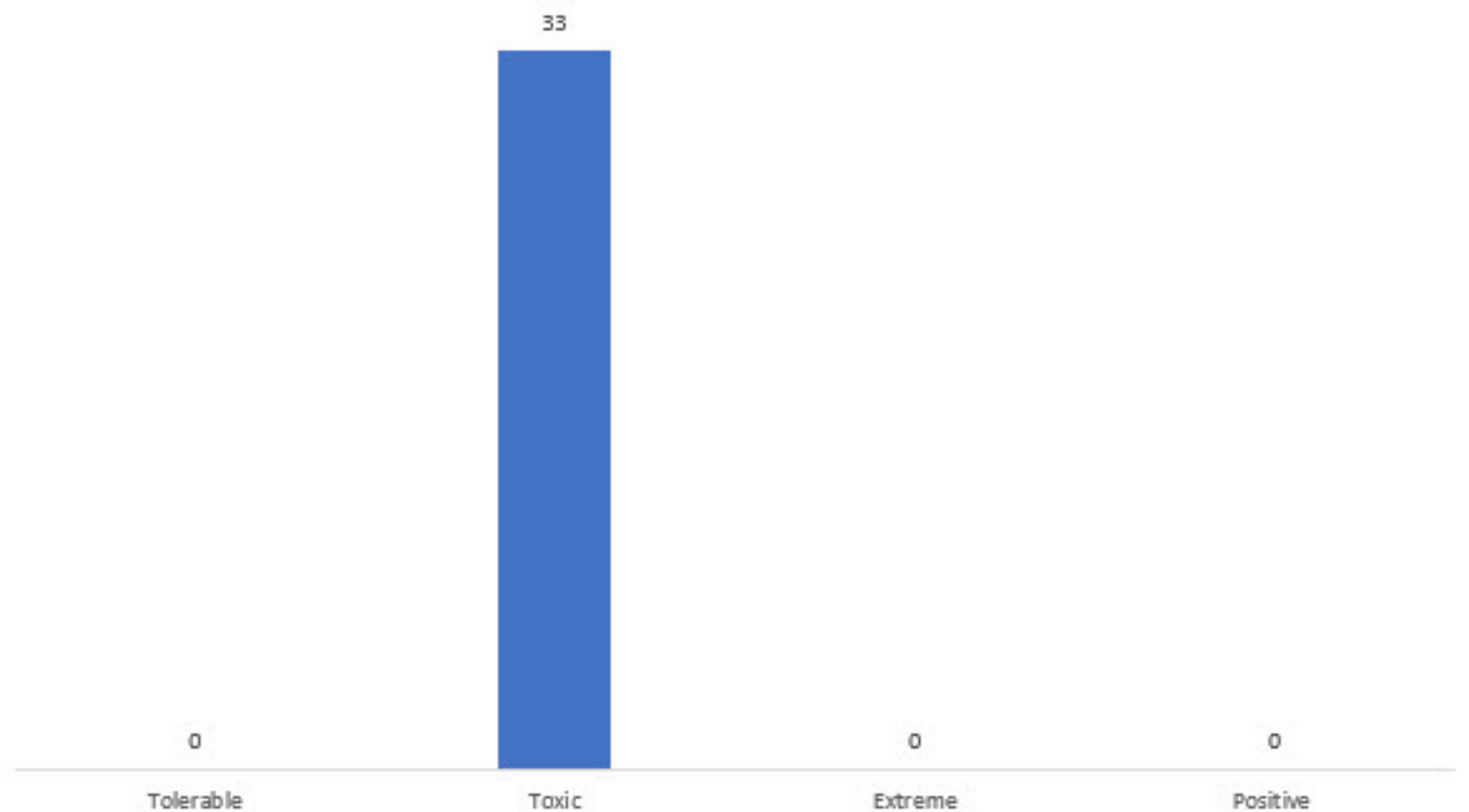
16.) WHAT PERCENT OF ACEs OCCUR TOGETHER?

- A. 54%
- B. 65%
- C. 72%
- D. 87%



17.) WHAT TYPE OF STRESS HAS SIGNIFICANT EFFECTS ON BRAIN DEVELOPMENT AND IS RELATED TO ACEs?

- A. Tolerable stress
- B. Toxic stress**
- C. Extreme stress
- D. Positive stress



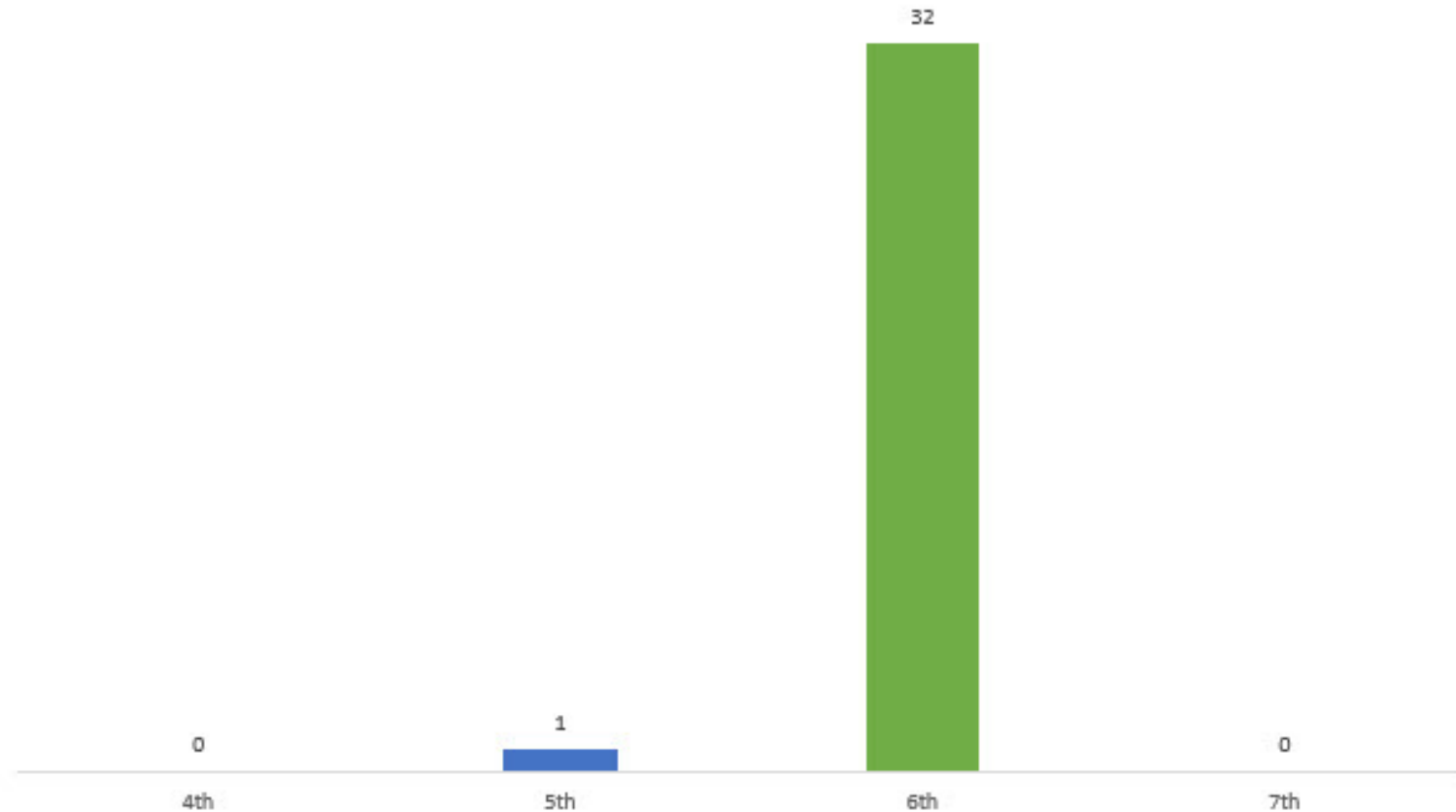
18.) MICHIGAN IS THE _____ HIGHEST STATE FOR ADULT CURRENT ASTHMA PREVALENCE?

A. 4th

B. 5th

C. 6th

D. 7th



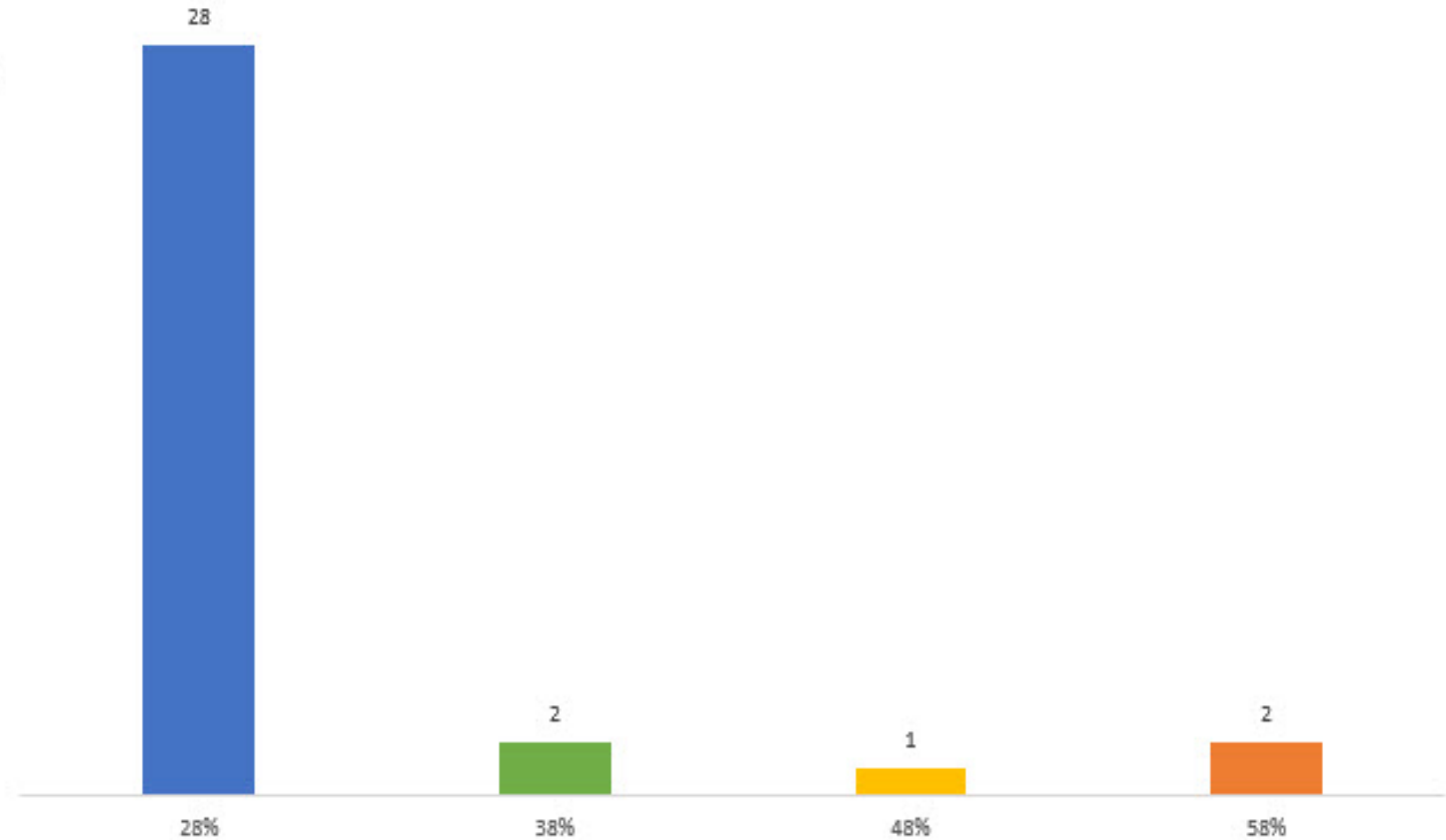
19.) ONE ACE INCREASES ODDS OF DEVELOPING ASTHMA BY:

A. 28%

B. 38%

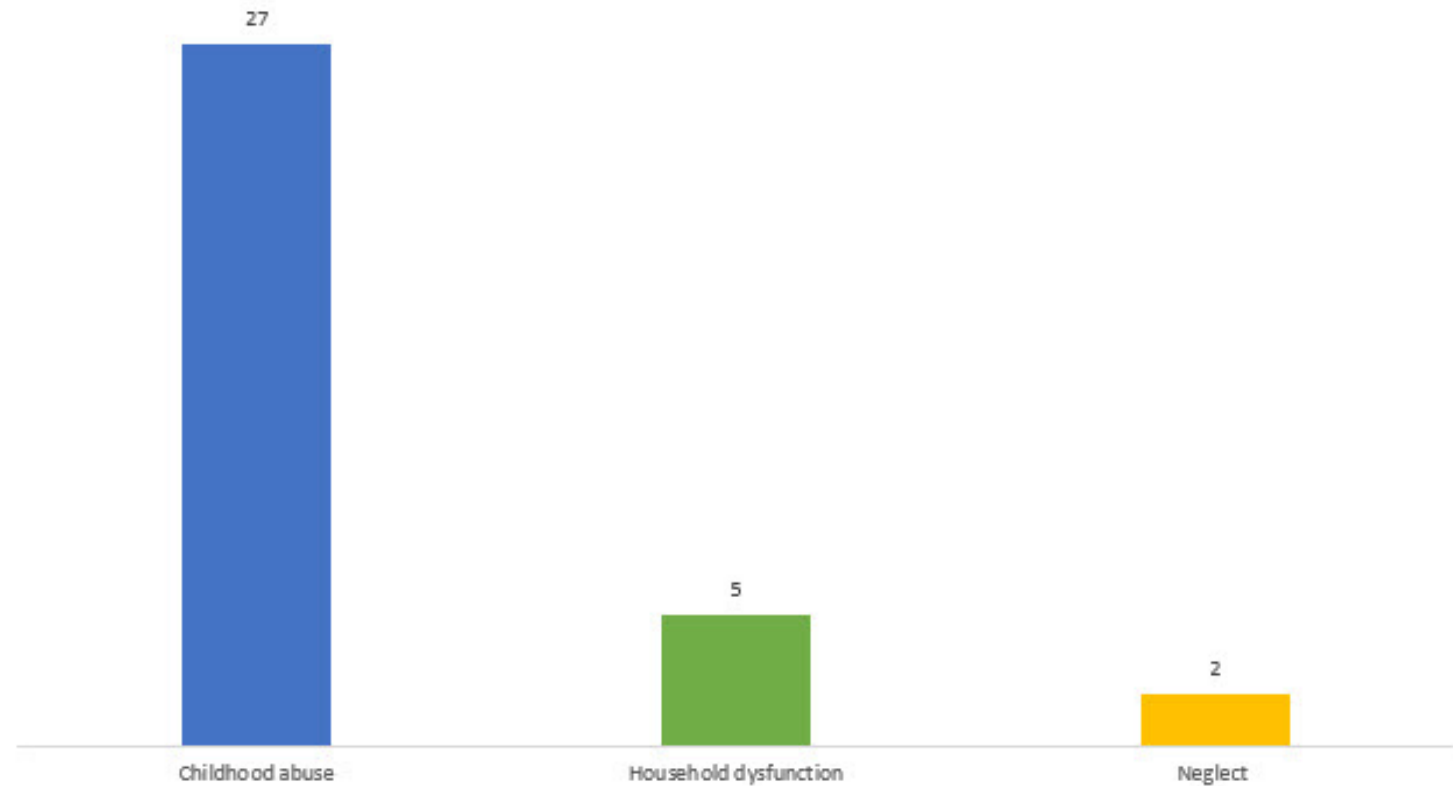
C. 48%

D. 58%



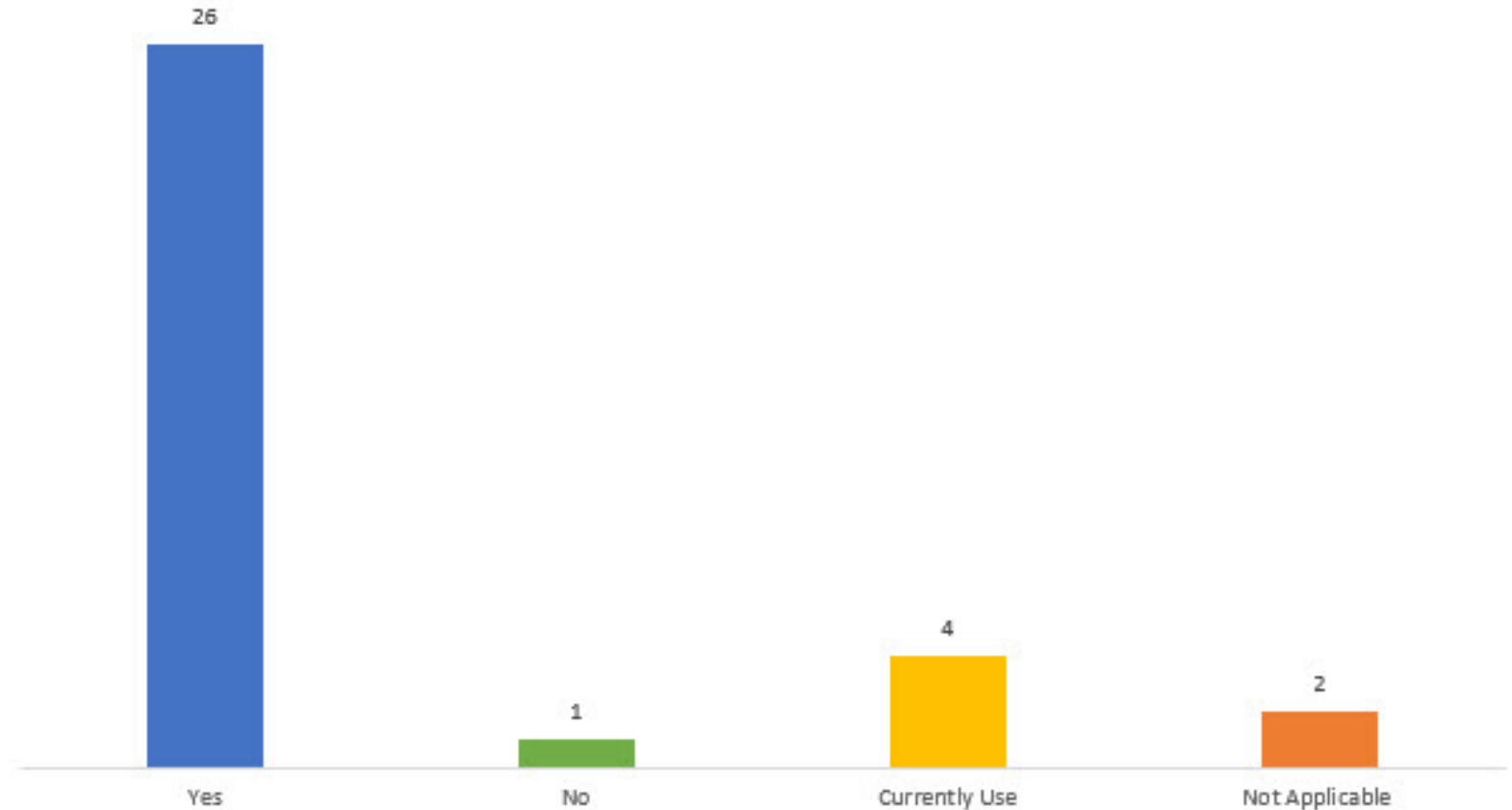
20.) WHAT TYPE OF ACEs APPEAR TO HAVE THE GREATEST ASSOCIATION WITH ASTHMA?

- A. Childhood Abuse
- B. Household Dysfunction
- C. Neglect



21.) AFTER TODAY'S PRESENTATION, DO YOU PLAN TO USE ACEs IN YOUR PROFESSIONAL WORK?

- A. Yes
- B. No
- C. Currently Use
- D. Not Applicable



IMPORTANT DON'T FORGET TO DEPOSIT YOUR CLICKER!



*Drop clickers in boxes at the door
or with MDHHS Staff!*