

2021 Adverse Childhood Experiences

**BRFSS Prevalence
Estimates for
Pennsylvania Adults**

December 2022



pennsylvania
DEPARTMENT OF HEALTH

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Introduction

Adverse Childhood Experiences (ACEs) are negative life events or experiences that occur before the age of 18. A strong relationship has been found between the number of ACEs and the risk for serious health problems in adults, such as increased risky behaviors and chronic diseases. This illustrates the idea that the environment, choices, and experiences, in addition to genetics, all impact health and well-being.¹

To better understand the prevalence of ACEs in Pennsylvania, as well as their impact, the Pennsylvania Department of Health collected statewide data on ACEs in the 2021 **Behavioral Risk Factor Surveillance System (BRFSS)** annual telephone survey. Analysis of the data collected in 2021 is presented on the following pages, as well as steps Pennsylvania can take to combat ACEs.

Methods

The ACE score, a sum of the categories of ACEs reported by participants, is used to assess cumulative childhood stress. This score is determined through a survey that assesses exposure to ACEs. In this survey, exposure to any categorical ACE condition is counted as 1 point. If a person experienced none of the conditions in childhood, their ACE score is zero. It is important to note that the ACE score does not measure the severity or frequency of each ACE. It reflects only the number of different types of ACEs an individual was exposed to as a child.¹

The BRFSS was used to determine ACE scores in Pennsylvania. The BRFSS is a system of health-related telephone surveys sponsored and supported by the Centers for Disease Control and Prevention (CDC) and conducted throughout the United States. These surveys collect national and state-specific data regarding health-related risk behaviors, chronic health conditions, and use of preventive services for citizens age 18 and older.²

The survey content includes demographic groupings for age, race/ethnicity, gender, income, education, employment, marital status, and health care coverage, which allow estimates for major risk populations.

Pennsylvania contracts with the University of Pittsburgh to manage the sample of telephone numbers provided to Pennsylvania by the Population Health Surveillance Branch (PHSB) at the CDC. The university conducts the interviews with eligible respondents who have access to landline and cell phones and files the data from the interviews with PHSB. The data are then weighted, by the CDC, to each state's population characteristics prior to releasing the record-level data to individual states.

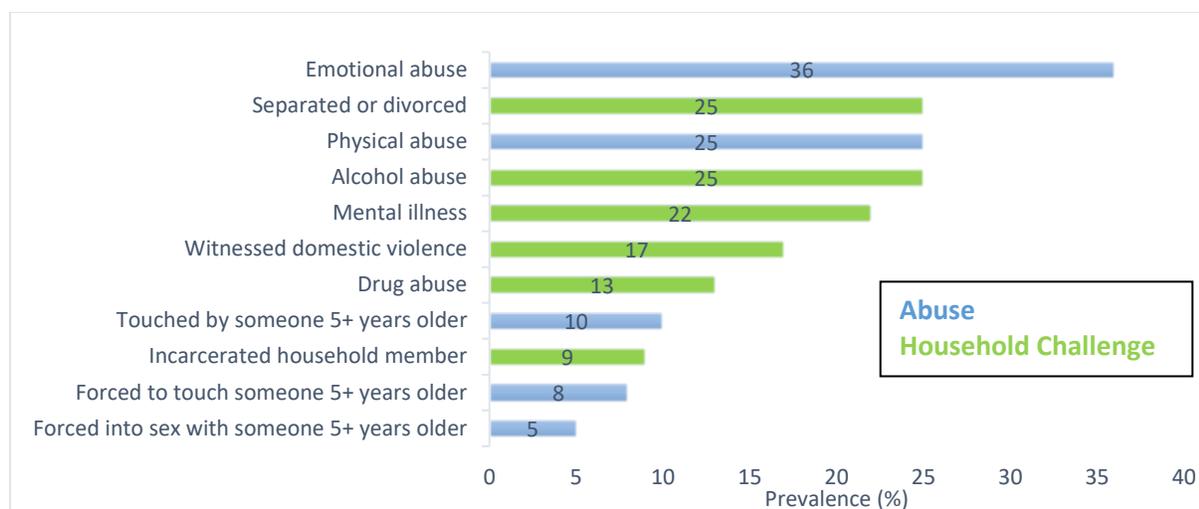
Table 1 in Appendix B compares selected characteristics of the final interview sample for the 2021 BRFSS to the 2020 population estimates for the adult population of Pennsylvania. The observations used to calculate the estimates were weighted to account for differences between the population and the distribution of age, sex, race, Hispanic origin, marital status, home ownership, type of telephone, and education characteristics of the sample.

The design of the BRFSS allows for individual state analysis. The Pennsylvania Department of Health (DOH) is permitted to include a limited number of questions in the survey each year and collaborates with DOH programs to select these questions. In 2021, the adverse childhood experience (ACE) CDC module of questions was included. The ACE module was adapted from the original CDC-Kaiser Permanente ACE Study.¹

Through the ACE module, respondents were asked if they experienced any of the following types of ACEs: emotional abuse, physical abuse, sexual abuse, intimate partner violence, household substance abuse, household mental illness, parental separation or divorce, and incarcerated household member.¹ This report provides an analysis of 2021 ACE questions by select demographics.

Results

Figure 1: Prevalence (%) Estimates (N=6,419) of Individual ACEs in Pennsylvania, 2021



Source: Centers for Disease Control [Adverse Childhood Experiences \(ACEs\) \(cdc.gov\)](https://www.cdc.gov/aces/)

Figure 1 illustrates the prevalence estimates for individual ACEs in Pennsylvania, as determined through analysis of BRFSS 2021 data. Eleven questions about ACEs were included in this BRFSS 2021 Pennsylvania survey (see Appendix C).

Emotional abuse accounts for the most ACEs in the commonwealth at a prevalence of 36%. These categories are similar to the national BRFSS ACE data, which found that emotional abuse is the ACE with the highest prevalence nationally.³

The following table includes prevalence estimates of similar individual ACEs from **Figure 1**. The estimates in **Tables 1 and 2** are from states who chose to run the ACE module any year from 2011-2014 (n=214,157). This is the most recent national study, but 2021 estimates for Pennsylvania compare favorably with the results of this national study.

Table 1: Prevalence of ACEs by Category for Participants Completing the ACE Module on the 2011-2014 BRFSS

ACE Category	Women	Men	Total
	Percent	Percent	Percent
ABUSE			
Emotional abuse	33.9%	34.9%	34.4%
Physical abuse	17.5%	18.4%	17.9%
Sexual abuse	16.3%	6.7%	11.6%
HOUSEHOLD CHALLENGES			
Intimate partner violence	18.2%	16.8%	17.5%
Substance abuse	28.7%	26.3%	27.6%
Mental illness	19.2%	13.7%	16.5%
Parental separation or divorce	27.8%	27.5%	27.6%
Incarcerated household member	7.3%	8.6%	7.9%

Table 2: Prevalence of ACEs by Sex for Participants Completing the ACE Module Nationally on the 2010 BRFSS

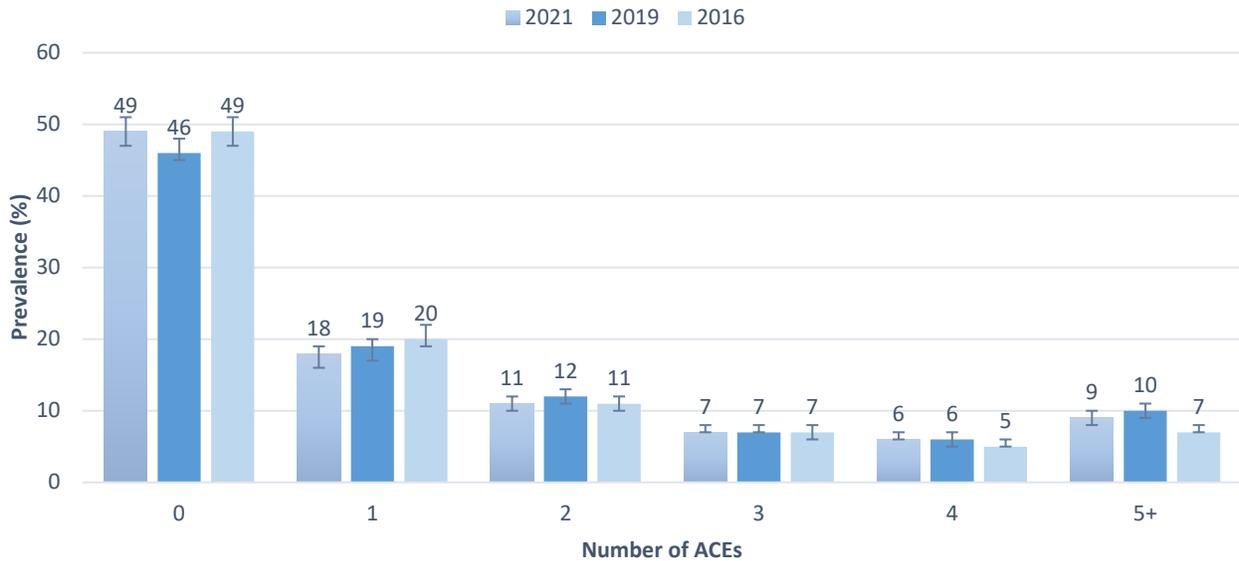
Number of Adverse Childhood Experiences (ACE Score)	Women	Men	Total
	Percent	Percent	Percent
0	37.6%	39.3%	38.5%
1	22.7%	24.5%	23.5%
2	12.9%	13.9%	13.4%
3	9.0%	8.6%	8.8%
4 or more	17.8%	13.7%	15.8%

Note: Reports and articles that use data from other years and/or other states may contain different estimates.

Source: Merrick, M.T., Ford, D.C., Ports, K. A., Guinn, A. S. (2018). [Prevalence of Adverse Childhood Experiences From the 2011-2014 Behavioral Risk Factor Surveillance System in 23 States](#).external icon JAMA Pediatrics, 172(11), 1038-1044.

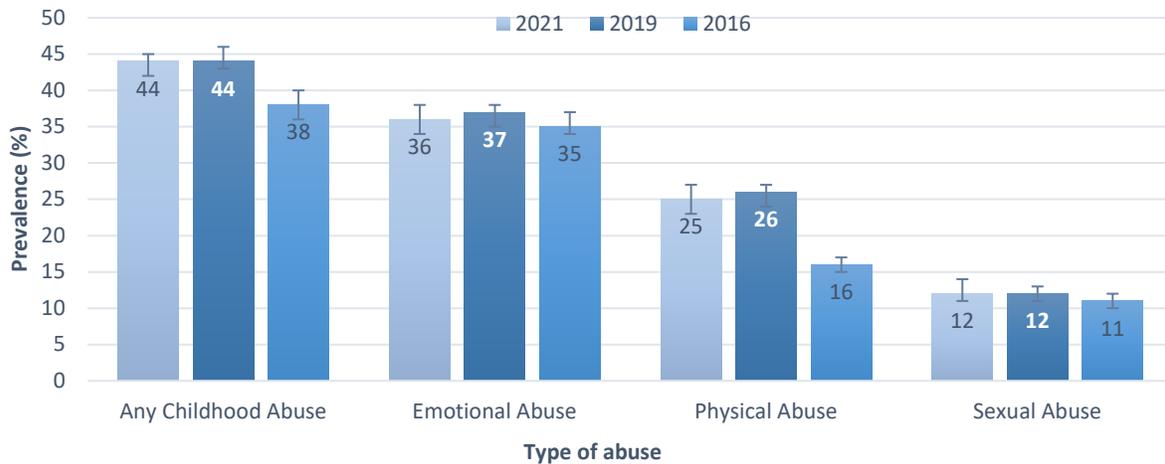
As determined from the 2021 BRFSS data, 51% of Pennsylvania adults experienced one or more ACEs (**Figure 2**). Of these adults who experienced ACEs, 44% indicated that these experiences were forms of childhood abuse (**Figure 3**). Tables displaying ACE scores by demographic are displayed in Appendix B.

Figure 2: Prevalence (%) Estimates (N=6,419) of ACEs by ACE Scores, Pennsylvania adults, 2016, 2019, & 2021



Note: Prevalence estimates may not add to 100 due to rounding.

Figure 3: Prevalence (%) Estimates (N=6,419) of ACEs by Type of Abuse, Pennsylvania adults, 2016, 2019, & 2021



Two questions were used in analysis of any childhood abuse. Forty-four percent answered “yes” to either of the following two questions:

- Not including spanking, (before age 18), how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?
- How often did a parent or adult in your home ever swear at you, insult you, or put you down?

Thirty-six percent of Pennsylvania adults reported on the 2021 survey that, during childhood, they experienced emotional abuse. The following question was asked in analysis of emotional abuse:

- How often did a parent or adult in your home ever swear at you, insult you, or put you down?

Twenty-five percent of Pennsylvania adults reported on the 2021 survey that, during childhood, they experienced physical abuse. The following question was asked in analysis of physical abuse:

- Not including spanking, (before age 18), how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?

Twelve percent of Pennsylvania adults reported on the 2021 survey that, during childhood, they experienced sexual abuse. The following questions were used in analysis of sexual abuse:

- How often did anyone at least 5 years older than you or an adult ever touch you sexually?
- How often did anyone at least 5 years older than you or an adult try to make you touch them sexually?
- How often did anyone at least 5 years older than you or an adult force you to have sex?

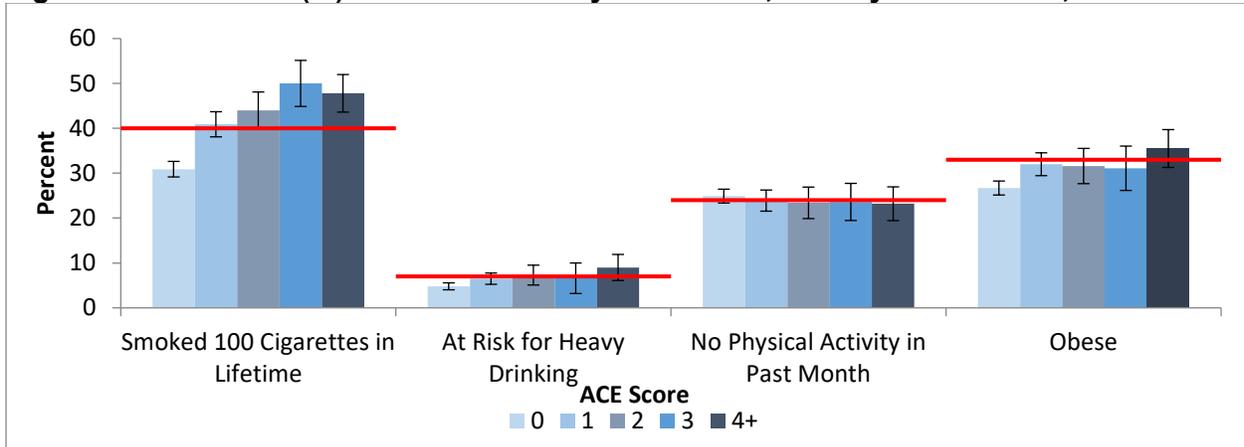
The risk of health problems and risky behaviors increase as the number of ACEs increases. Risks of smoking, drinking, and obesity are known to increase when people have been exposed to higher numbers of ACEs.¹ It is observed that Pennsylvanians with higher ACE scores are more likely to be obese and to have smoked 100 cigarettes in their lifetime (**Figure 4**). In response to the high prevalence of ACEs throughout Pennsylvania, the DOH has implemented programs to support adults who had ACEs and identify and address such experiences early in childhood. For example, to decrease the prevalence and risk of child abuse and child sexual abuse, the Violence and Injury Prevention Program in DOH funds the implementation of The Pennsylvania Coalition Against Rape’s program, Parents in the Know, through county municipal health departments. Parents in the Know consists of four 2-hour interactive sessions to help parents and guardians develop and improve skills to prevent child sexual abuse.^{4,5}

The Wolf Administration has taken several steps to address the prevalence of ACEs in Pennsylvania. Through the Office of Advocacy and Reform (OAR), the Trauma-Informed PA [plan](#) was created to guide the commonwealth in being trauma-informed and healing-centered.

The plan addresses ACEs as part of the broader concept of trauma by tying ACEs to strategies focused on the prevention of trauma.

Additionally, OAR, in partnership with DOH and the Department of Human Services, is participating in a National Governors Association (NGA) learning collaborative on addressing ACEs. Through the collaborative, NGA provides technical assistance on developing strategies to prevent and mitigate childhood traumas associated with ACEs.

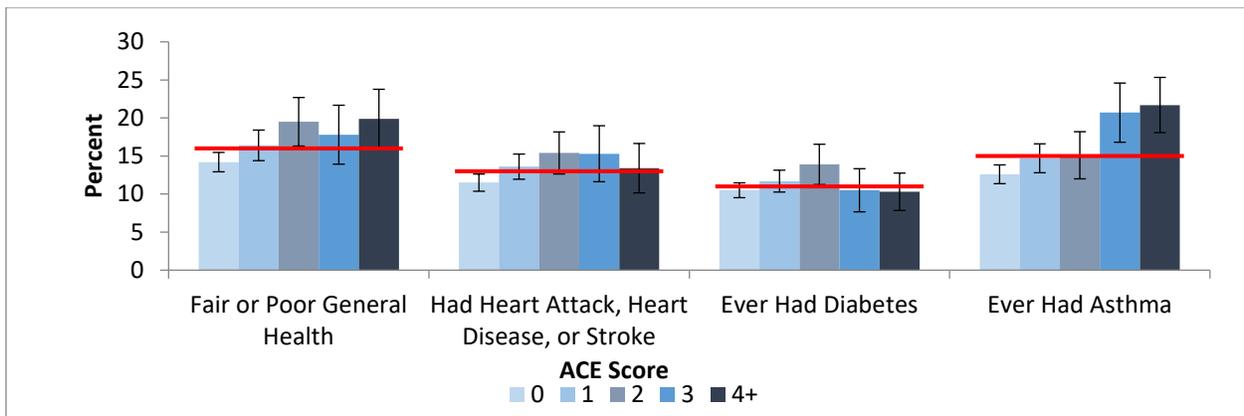
Figure 4: Prevalence (%) of Risk Factors by ACE Score, Pennsylvania adults, 2021



Note: The red line for each risk factor indicates the Pennsylvania prevalence estimates.

From the Pennsylvania BRFSS 2021 data, it is observed that individuals with higher ACE scores are more likely to indicate they have fair or poor general health and higher prevalence of cardiovascular problems (**Figure 5**). Additionally, a correlation between asthma and ACE score is evident specifically among Pennsylvanians. These results are in line with national findings that ACE scores predict increased odds of reporting a health problem.⁶

Figure 5: Prevalence (%) of Chronic Disease by ACE Score, Pennsylvania adults, 2021



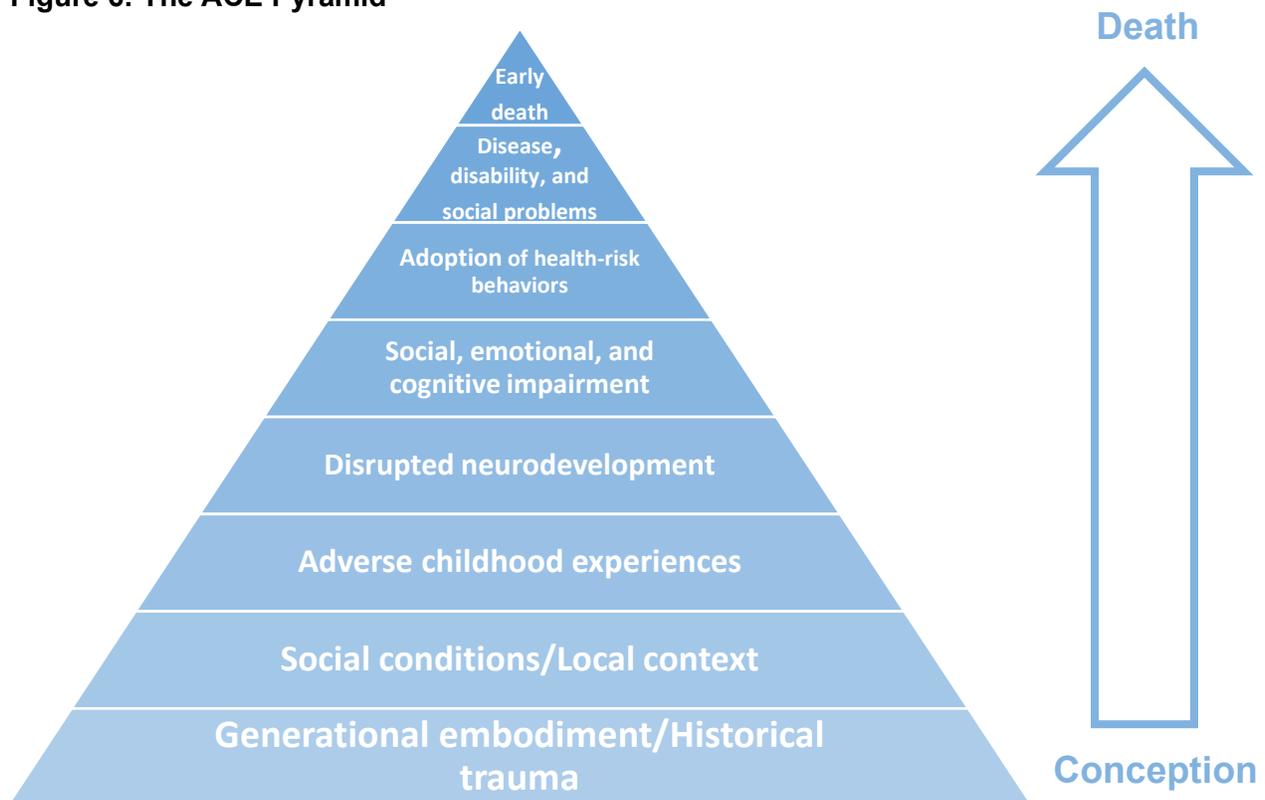
Note: The red line for each risk factor indicates the Pennsylvania prevalence estimates.

Discussion

Positive interactions with caring adults in early childhood build the foundation of a healthy lifestyle. Conversely, negative interactions may contribute to a stressful childhood environment and create impediments to the achievement of a healthy lifestyle. For a child who experiences trauma such as abuse and neglect, the stress can become toxic and affect brain development. The impact of ACEs ultimately disrupts healthy development, which can impair learning capacity, reduce the ability to regulate emotions and respond to adversity, affect decision-making skills, and hinder the ability to form healthy relationships. Those suffering from toxic stress were more likely to have suffered from abuse, neglect, parental substance abuse, or family violence. A child's ability to cope with stress may be hindered if frequent, prolonged and toxic stress occurs and positive support doesn't exist. High levels of stress can influence a child's development and can have lasting effects that can lead to risky behaviors and an increased prevalence of chronic disease.^{6,7}

The 1998 CDC-Kaiser Permanente ACE Study identified a strong correlation between traumatic experiences in childhood and the emergence of risky behaviors as they grow into adulthood.¹ This ACE Pyramid (**Figure 6**) shows how ACEs have a strong influence on the development of risky behavioral factors throughout life. Brain development is affected by harmful childhood experiences which can alter emotional, social, and cognitive development. People may turn to risky behaviors, such as smoking or drinking, to compensate for feelings of stress and depression that may be due to exposure to ACEs. These behaviors, in turn, can lead to a higher prevalence of other risky behaviors and chronic disease.

Figure 6: The ACE Pyramid



Source: CDC ACE Study (<https://www.cdc.gov/violenceprevention/acestudy/about.html>)

Combatting ACEs

Many segments of society can contribute to reducing ACE exposure in childhood. The implementation of education regarding ACEs and the advocacy for greater understanding of youth risk factors are good places to start.

Although ACEs alone have a tremendous impact on a child's development, how well this child deals with these past experiences largely depends on his or her individual ability to adapt to or recover from stress. Frequency or intensity of ACEs certainly have a major effect on shaping individuals, but a child's temperament and ability to adapt to stressful situations can limit the magnitude of their effects. Children need to be educated on ways to manage their stress and successfully cope with life's many challenges. This skill of resilience can be developed over time. Parents and youth can use resilience to cope with stressful situations, help form trustworthy relationships, make positive social connections, and access help and resources, when needed, from a variety of support networks.⁸

The CDC's Division of Violence Prevention developed the following 5 strategies for preventing child abuse and neglect that address the population level needs to support families and prevent ACEs:⁹

1. strengthen economic supports to families;
2. change social norms to support parents and positive parenting;
3. provide quality care and education early in life;
4. enhance parenting skills to promote healthy child development; and
5. intervene to lessen harms and prevent future risk.

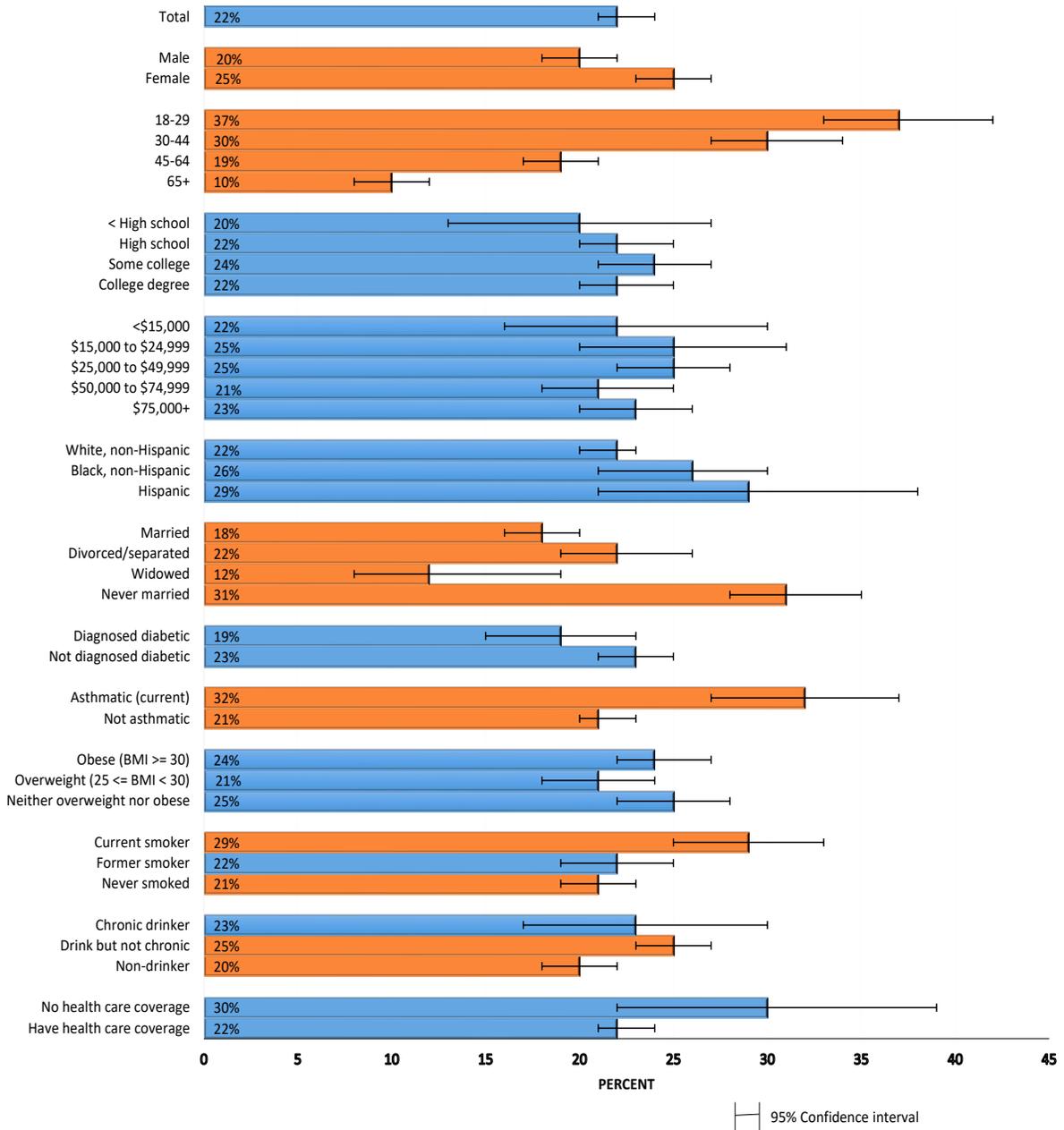
More information on these strategies and approaches to implementation can be found in CDC's technical manual, "Preventing child abuse and neglect: A technical package for policy, norm, and programmatic activities".¹⁰

Citations

1. Felitti, V. J., et al. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine*, 14(4).
2. “About BRFSS”. (2014). *National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health*. <https://www.cdc.gov/brfss/about/index.htm>
3. “Behavioral Risk Factor Surveillance System ACE Data”. (2019). *National Center for Injury Prevention and Control, Division of Violence Prevention*. [Adverse Childhood Experiences \(ACEs\) \(cdc.gov\)](https://www.cdc.gov/violenceprevention/aces/).
4. “Violence and Injury Prevention”. (2019). *Pennsylvania Department of Health*. <https://www.health.pa.gov/topics/programs/violence-prevention/Pages/Violence-Injury%20Prevention.aspx>.
5. “Parents in the Know”. (2018). *Pennsylvania Coalition Against Rape*. <https://pcar.org/parents-know>.
6. Montgomery, A. E., et al. (2013). Relationship among adverse childhood experiences, history of active military services, and adult outcomes: Homelessness, mental health, and physical health. *American Journal of Public Health*, 103(Suppl 2): S262-268.
7. De Bellis, M. D., Zisk, A. (2014). The biological effects of childhood trauma. *Child and Adolescent Psychiatric Clinics of North America*, 23(2): 185-222.
8. “Adverse Childhood Experiences and the Lifelong Consequences of Trauma”. *American Academy of Pediatrics*. https://www.aap.org/en-us/Documents/ttb_aces_consequences.pdf.
9. “About Adverse Childhood Experiences”. (2019). *National Center for Injury Prevention and Control, Division of Violence Prevention*. [Child Abuse and Neglect Prevention |Violence Prevention|Injury Center|CDC](https://www.cdc.gov/violenceprevention/childabuseandneglect/).
10. Fortson, B., et al. (2016). Preventing child abuse and neglect: A technical package for policy, norm, and programmatic activities. *Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention*.

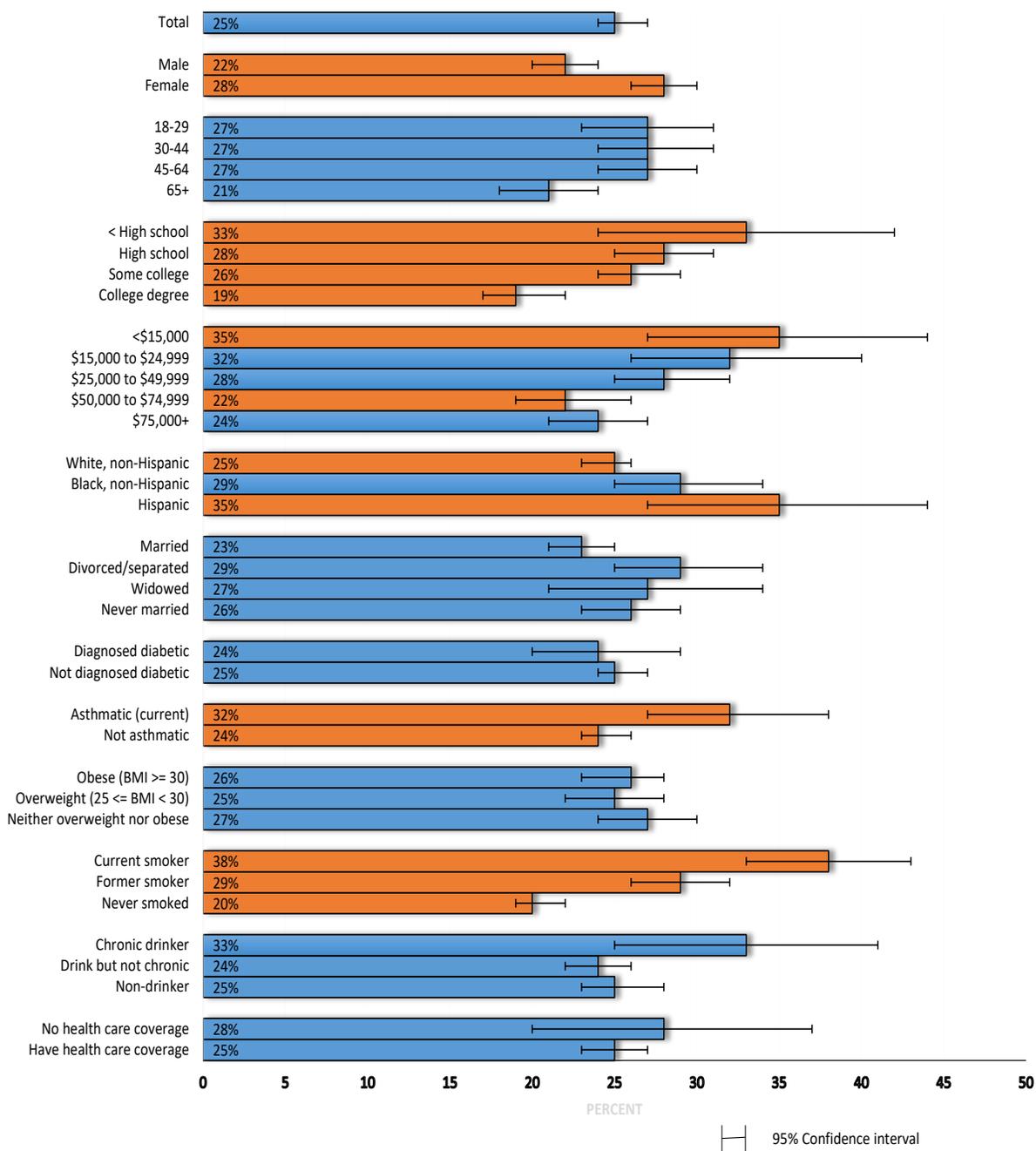
Appendix A: ACEs Prevalence Estimates by Question, BRFSS, Pennsylvania, 2021

Chart 1: Did you live with anyone who was depressed, mentally ill, or suicidal?*



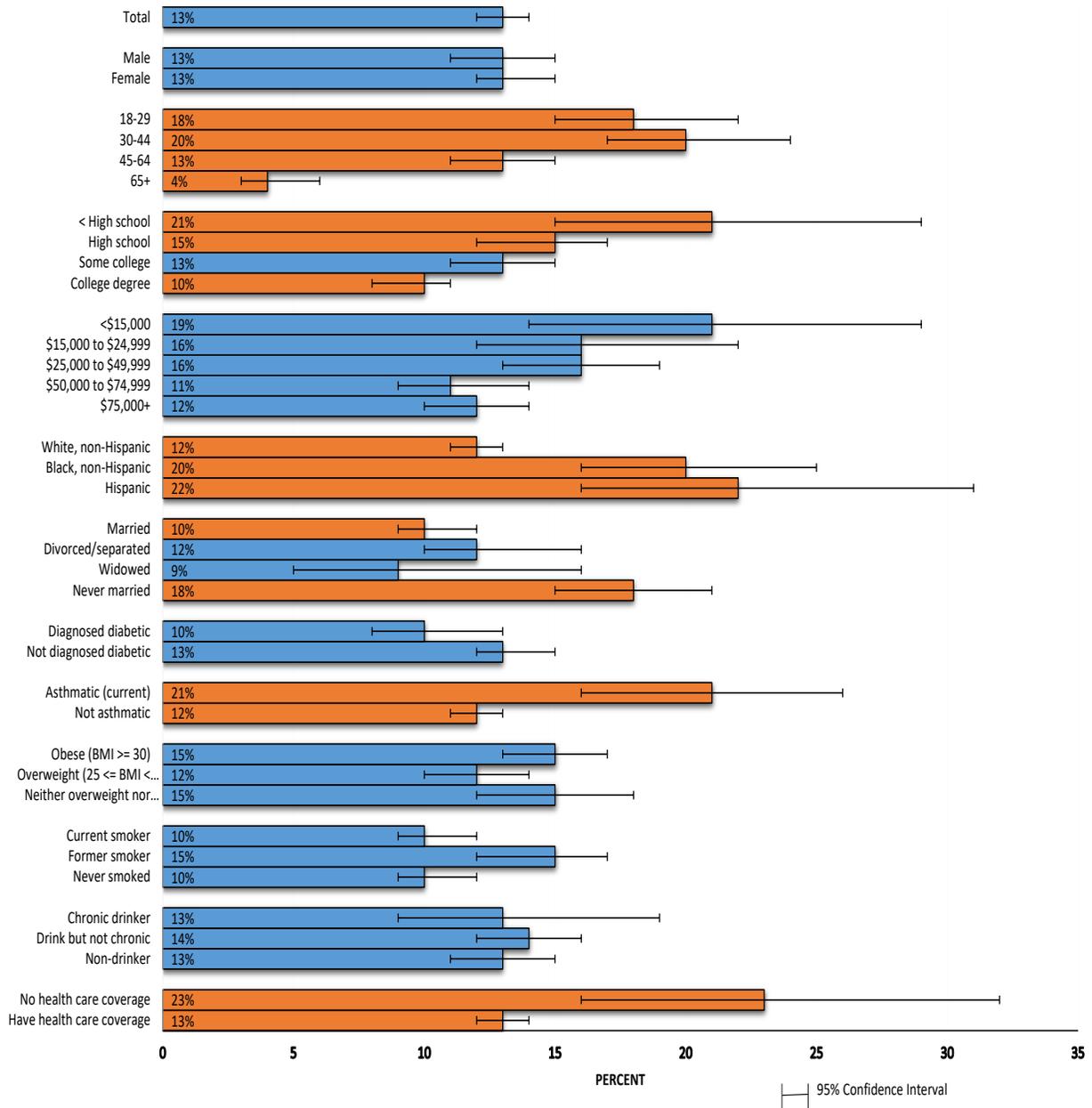
* Demographics with significant differences displayed with orange bars

Chart 2: Did you live with anyone who was a problem drinker or alcoholic?*



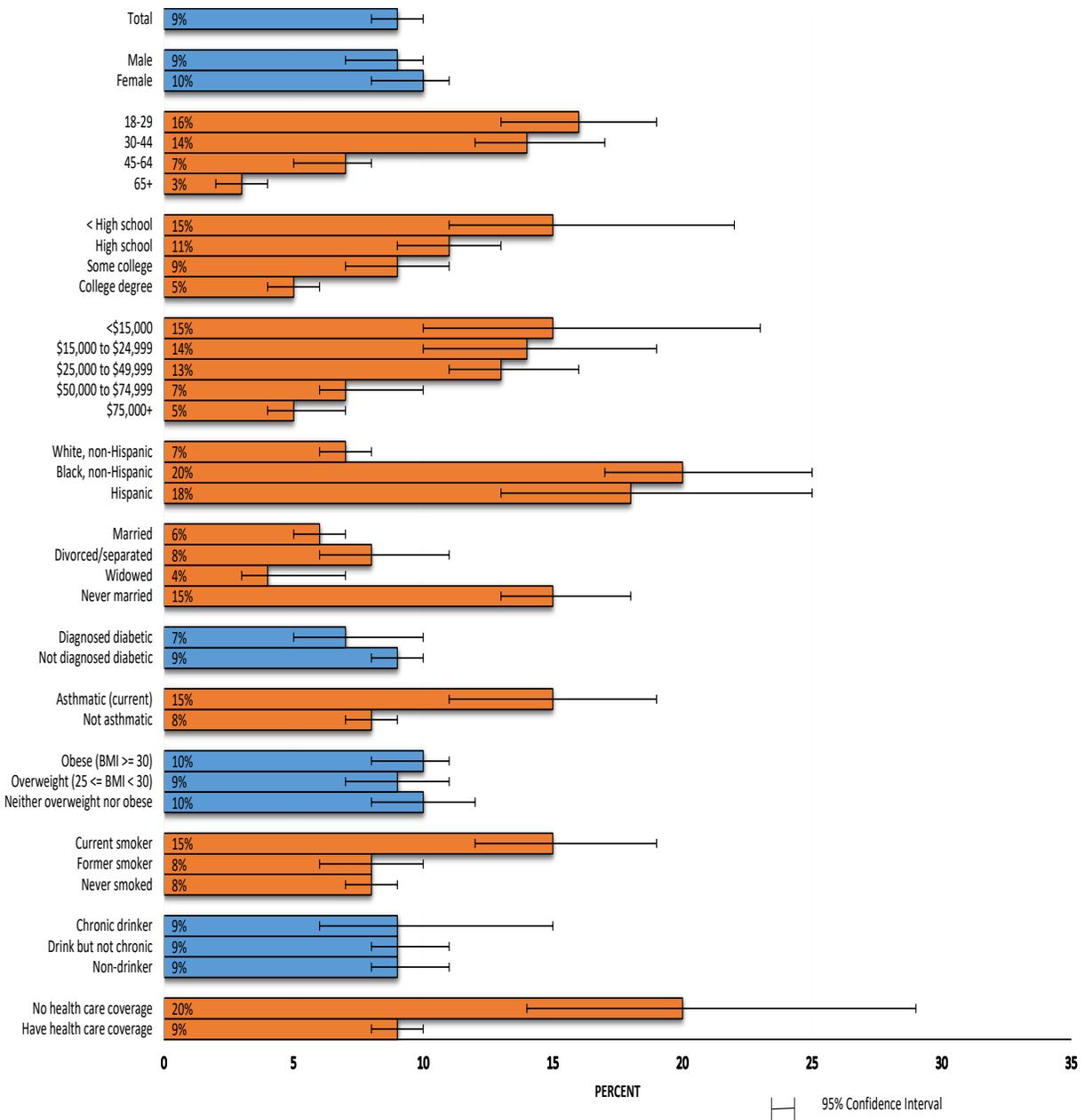
* Demographics with significant differences displayed with orange bars

Chart 3: Did you live with anyone who used illegal street drugs or who abused prescription medications?*



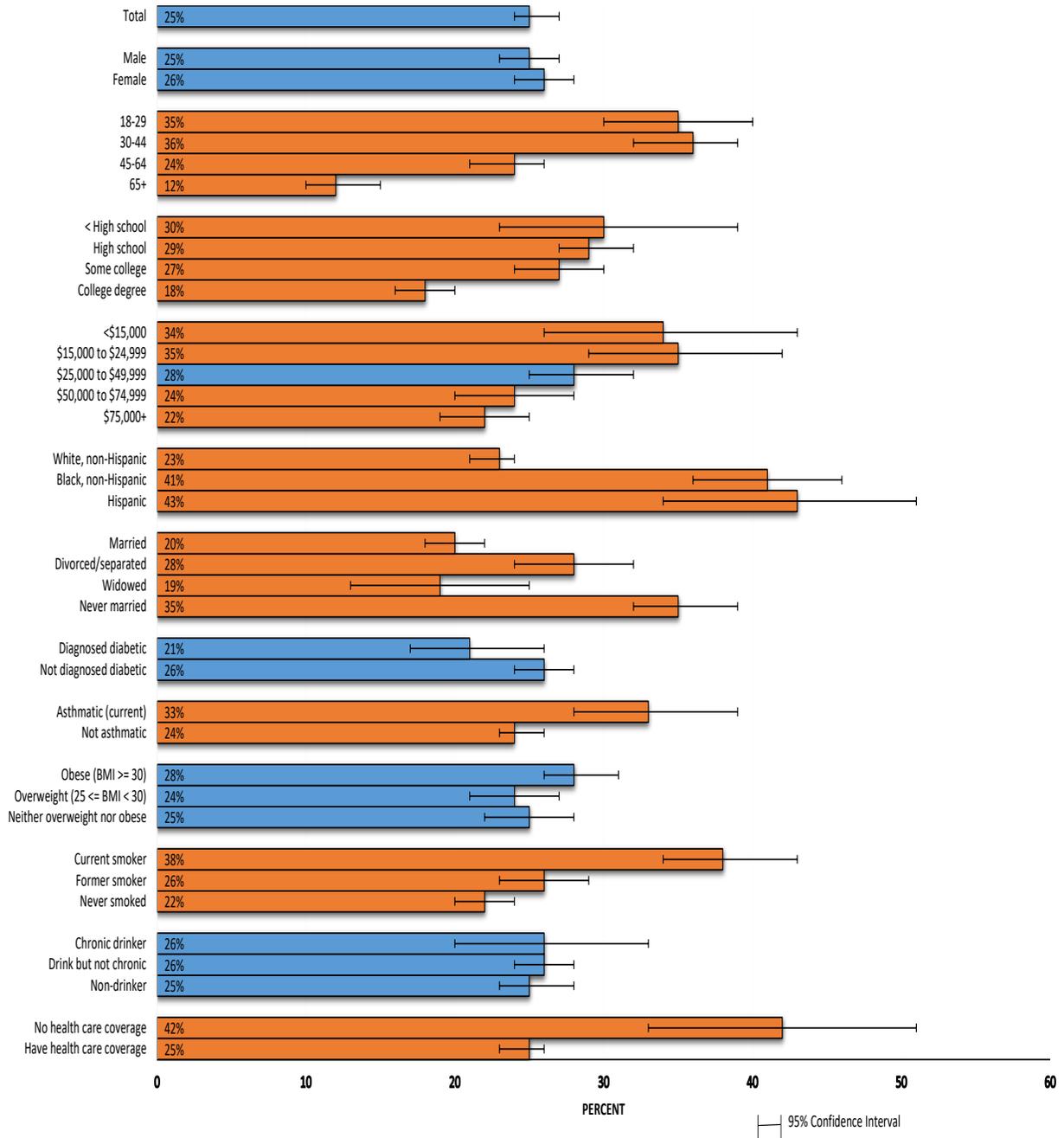
* Demographics with significant differences displayed with orange bars

Chart 4: Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?*



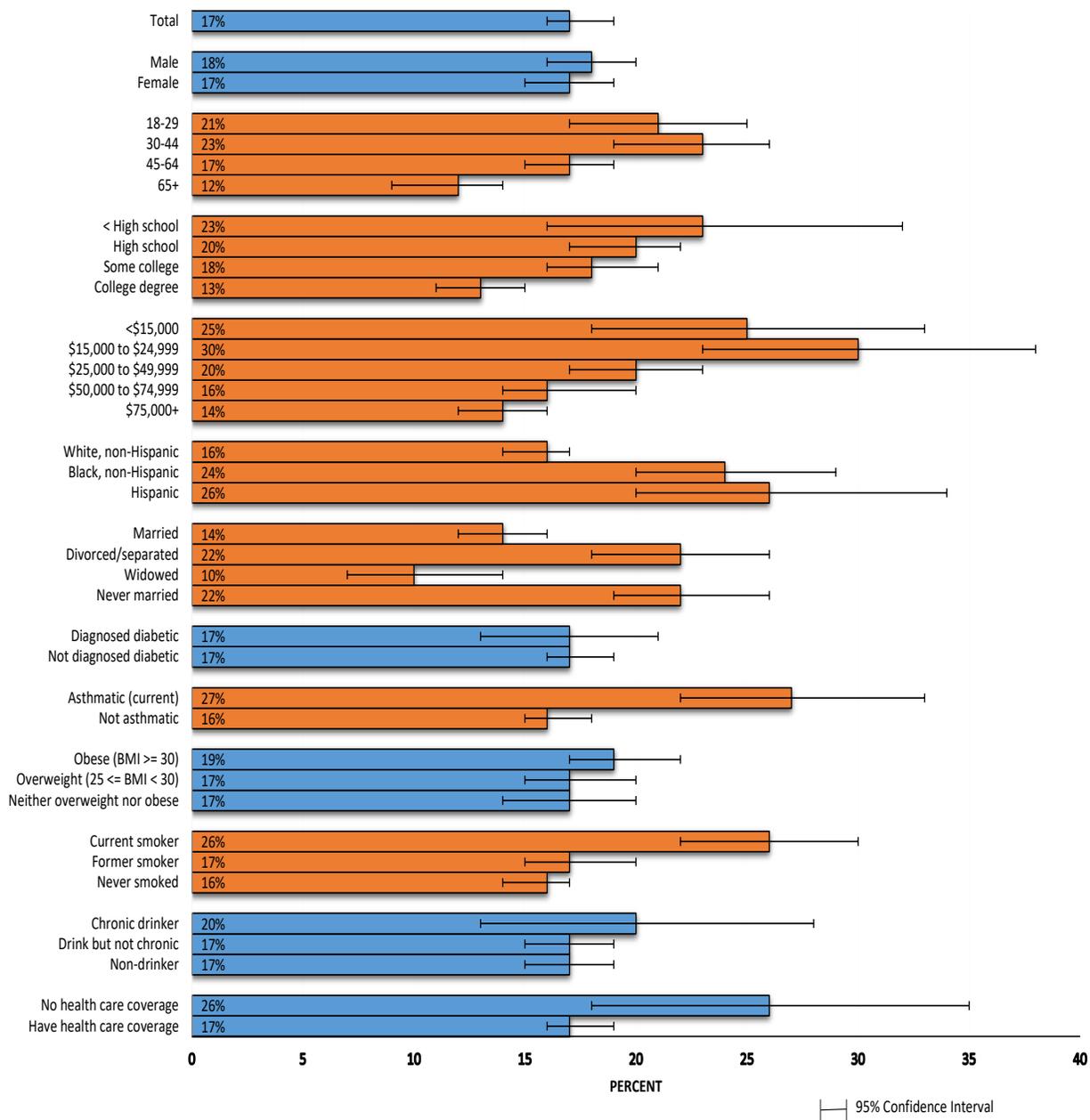
* Demographics with significant differences displayed with orange bars

Chart 5: Were your parents separated or divorced?*



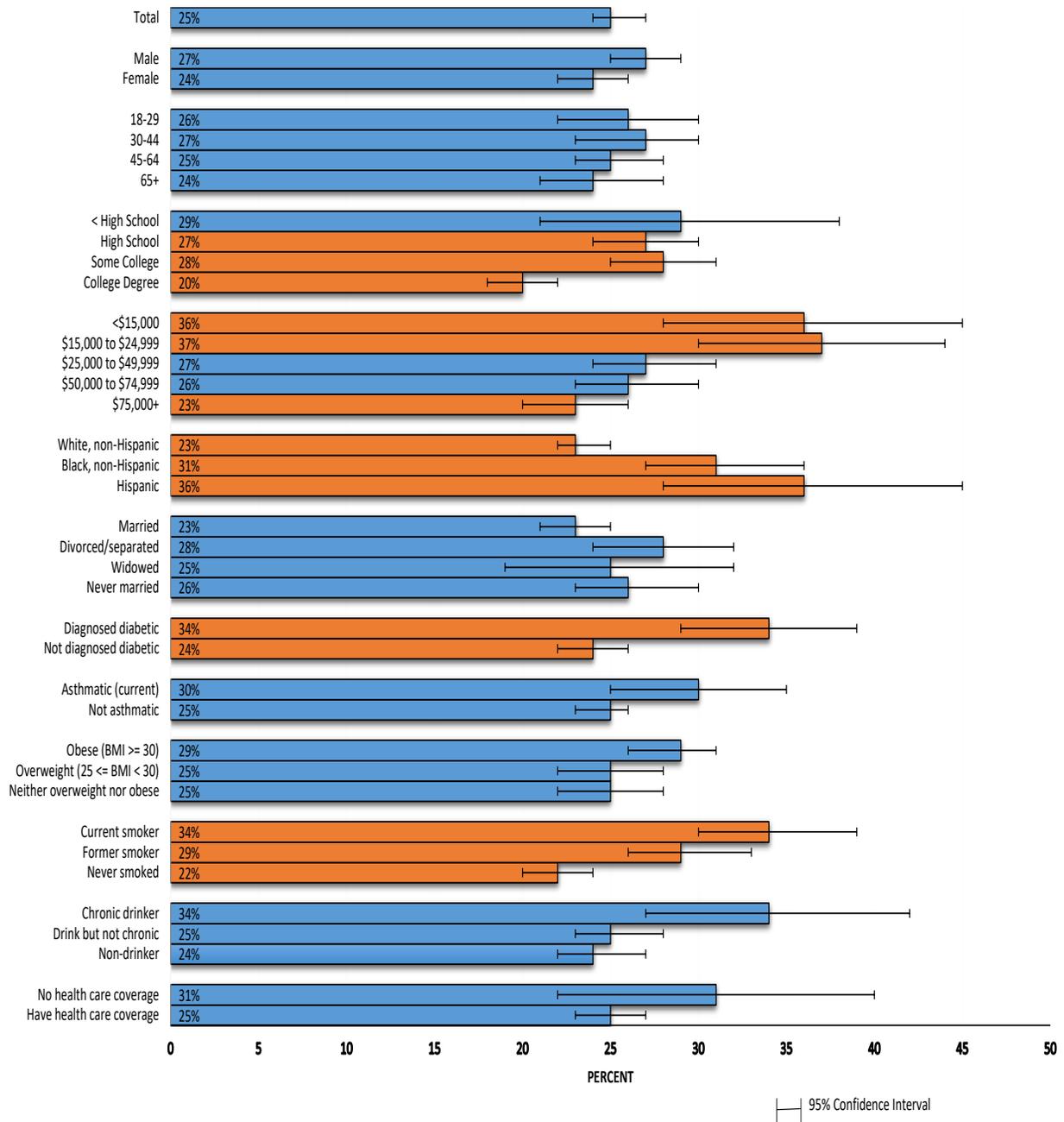
* Demographics with significant differences displayed with orange bars

Chart 6: How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?*



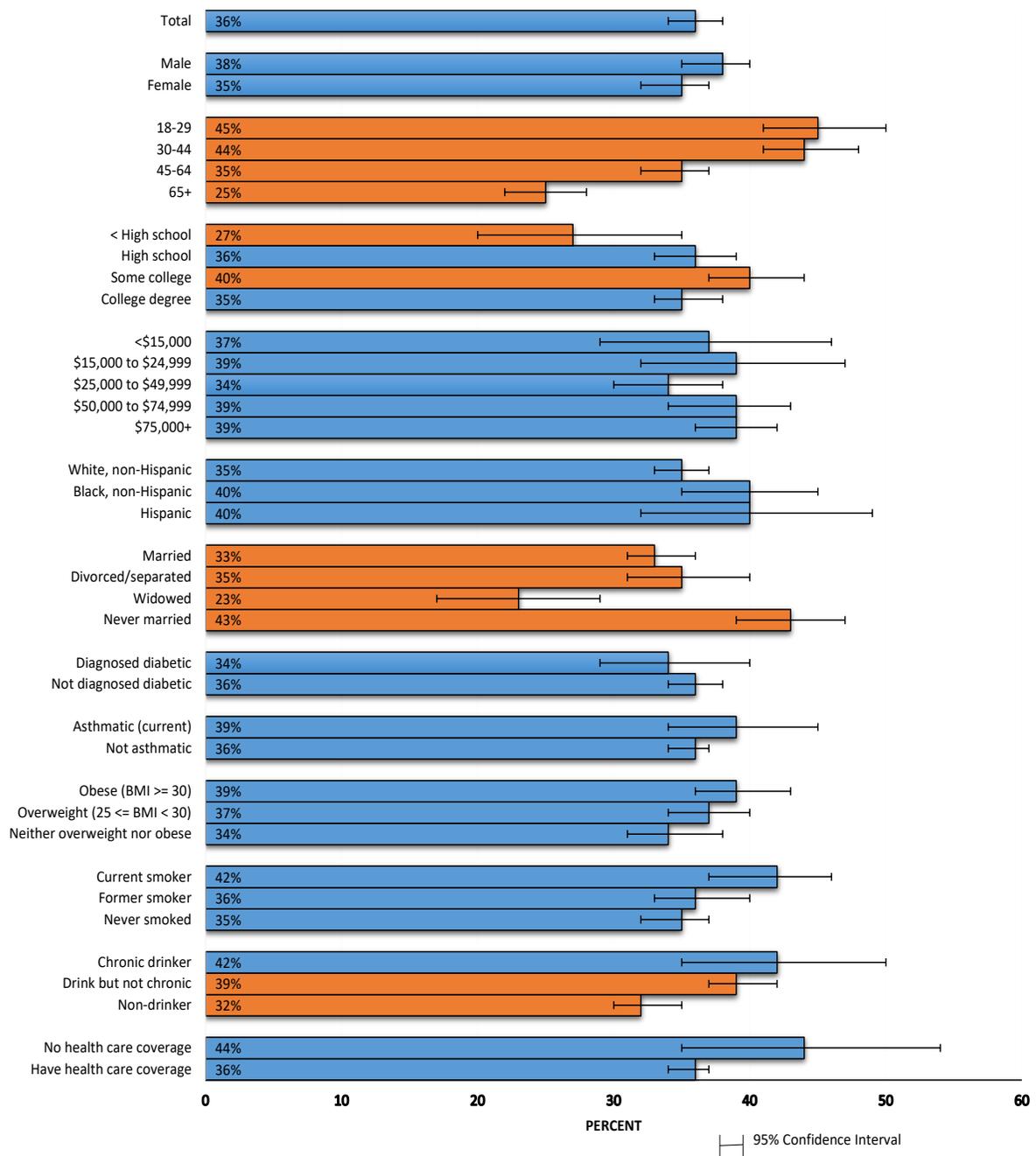
* Demographics with significant differences displayed with orange bars

Chart 7: Not including spanking, (before age 18), how often did a parent of adult in your home ever hit, beat, kick, or physically hurt you in any way?*



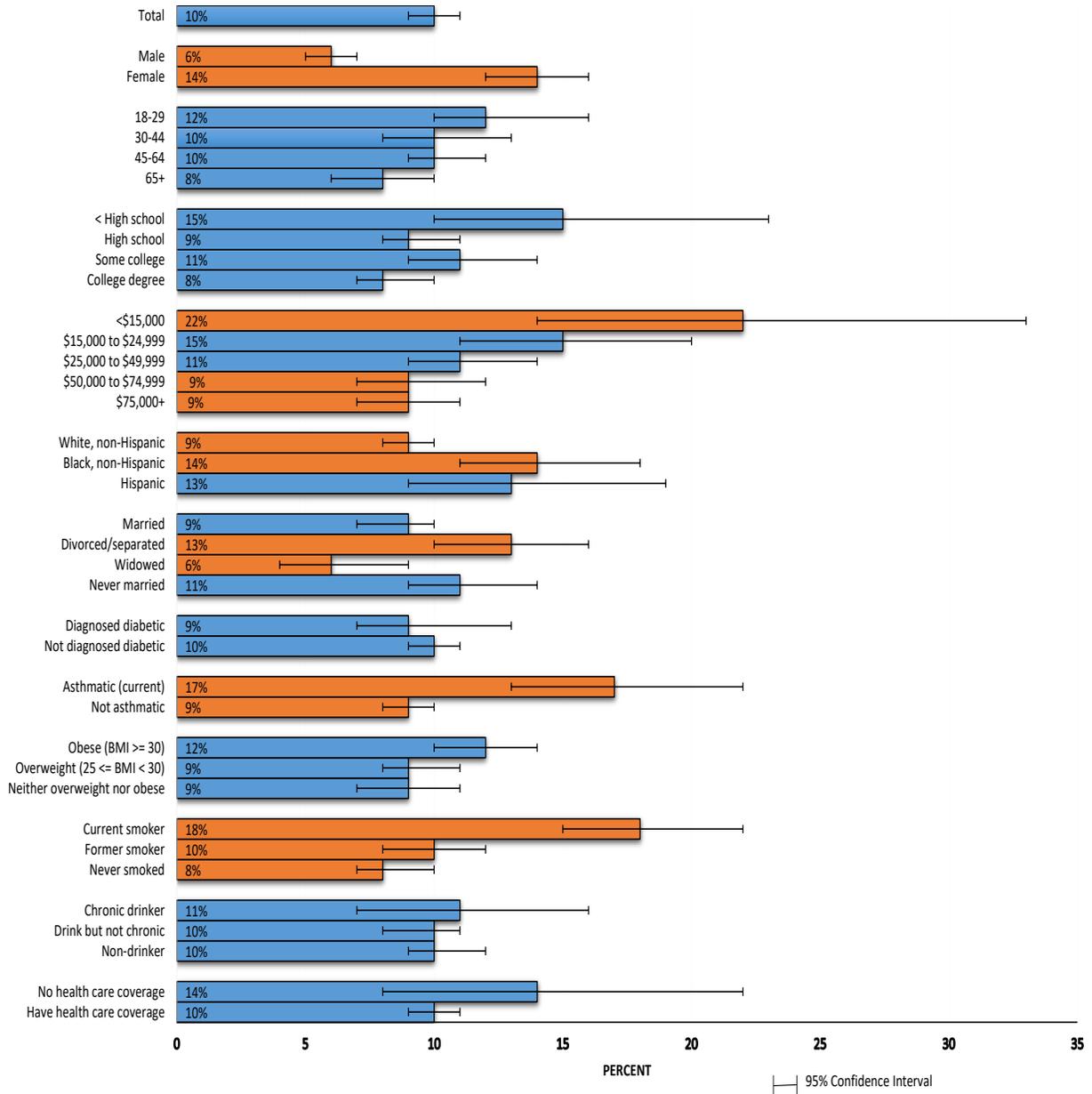
* Demographics with significant differences displayed with orange bars

Chart 8: How often did a parent or adult in your home ever swear at you, insult you, or put you down?*



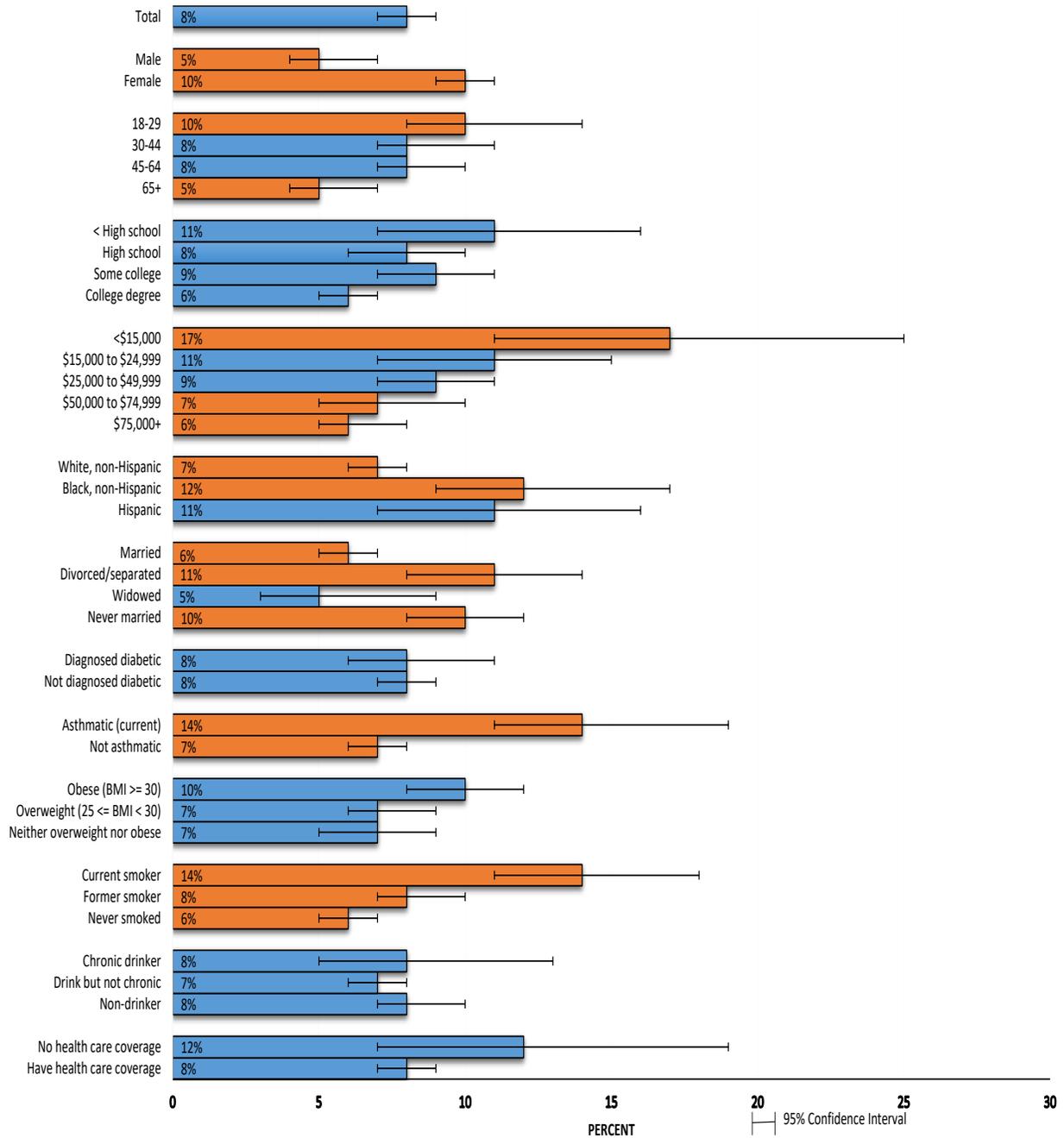
* Demographics with significant differences displayed with orange bars

Chart 9: How often did anyone at least 5 years older than you or an adult ever touch you sexually?*



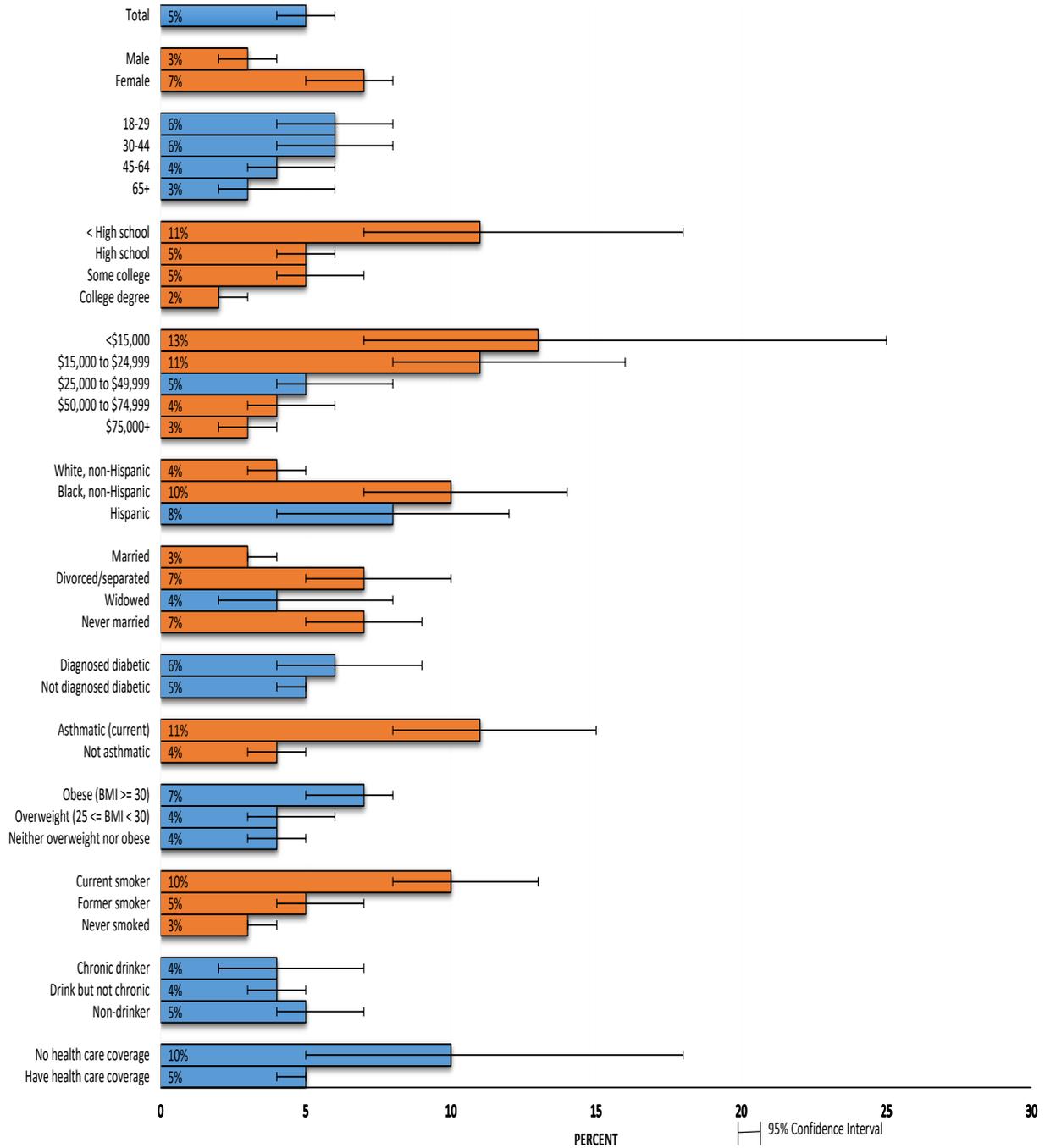
* Demographics with significant differences displayed with orange bars

Chart 10: How often did anyone at least 5 years older than you or an adult try to make you touch them sexually?*



* Demographics with significant differences displayed with orange bars

Chart 11: How often did anyone at least 5 years older than you or an adult force you to have sex?*



* Demographics with significant differences displayed with orange bars

Appendix B: Demographic Characteristics of BRFSS and ACE Scores, 2021

Table 1: Distribution of 2021 Pennsylvania BRFSS Survey Sample and 2020 Pennsylvania Adult Population Estimates for Selected Characteristics

		2021 BRFSS Survey Sample		2020 Population Estimates	
		Number	Percent	Number	Percent
All adults		6,419	100	10,145,303	100
Sex	Male	3,072	47.9	4,912,920	48.4
	Female	3,347	52.1	5,232,383	51.6
Race	White	4,973	77.5	8,254,046	81.4
	Black	766	11.9	1,060,314	10.5
	Other	481	7.5	830,943	8.1
	Unknown/refused	199	3.1	N/A	N/A
Hispanic origin	Yes	343	5.3	639,135	6.3
	No	5,994	93.4	9,506,168	93.7
	Unknown/refused	82	1.3	N/A	N/A
Age	18-24	551	8.6	1,155,285	11.4
	25-34	861	13.4	1,693,816	16.7
	35-44	955	14.9	1,502,784	14.8
	45-54	1,005	15.7	1,651,599	16.3
	55-64	1,189	18.5	1,806,715	17.8
	65-74	1,053	16.4	1,317,854	13.0
	75+	650	10.1	1,017,250	10.0
	Unknown/refused	155	2.4	N/A	N/A

Notes: Race data include Hispanics.

Population estimates allocate unknowns, so they are included in demographic categories.

This is further indicated by the use of "N/A" or not applicable for the 2020 population estimate "Unknown/refused" entries.

Table 2: ACE Scores by Select Demographic, Pennsylvania adults, 2021

Demographic	No ACEs	1 ACE	2 ACEs	3 ACEs	4 ACEs	5 or more ACEs
	% (95% CI)					
Total	49 (47-51)	17 (16-19)	11 (11-12)	7 (7-8)	6 (6-7)	9 (8-10)
Male	51 (48-53)	18 (16-19)	11 (9-12)	8 (7-9)	6 (5-8)	7 (6-8)
Female	47 (45-50)	17 (16-19)	11 (10-13)	7 (6-8)	7 (6-8)	10 (9-12)
18-29	46 (42-50)	16 (13-19)	10 (8-12)	7 (6-9)	8 (6-11)	13 (10-16)
30-44	47 (43-50)	14 (12-16)	11 (9-14)	7 (5-8)	8 (6-11)	14 (12-16)
45-64	47 (45-50)	19 (17-21)	11 (10-13)	9 (8-11)	6 (5-7)	8 (6-9)
65+	54 (50-57)	21 (18-24)	11 (10-14)	6 (5-8)	5 (4-7)	3 (2-4)
< High school	56 (48-63)	13 (9-20)	7 (5-11)	4 (3-7)	9 (5-16)	11 (7-15)
High school	46 (43-49)	17 (15-19)	12 (11-14)	7 (6-9)	7 (5-8)	10 (9-12)
Some college	46 (43-49)	18 (16-20)	11 (9-13)	7 (6-9)	7 (6-8)	10 (9-12)
College degree	52 (49-54)	19 (17-21)	10 (9-12)	8 (7-10)	6 (5-7)	5 (4-7)
<\$15,000	43 (35-52)	15 (9-24)	10 (6-15)	11 (8-17)	4 (2-7)	16 (11-22)
\$15,000 to \$24,999	43 (37-49)	15 (12-19)	11 (7-16)	8 (5-12)	10 (6-17)	13 (10-18)
\$25,000 to \$49,999	45 (42-49)	17 (14-20)	12 (10-15)	7 (6-9)	7 (5-9)	11 (9-14)
\$50,000 to \$74,999	47 (43-51)	18 (15-22)	12 (9-15)	9 (7-11)	5 (4-8)	8 (7-11)
\$75,000+	46 (43-48)	20 (18-23)	12 (11-14)	7 (6-9)	8 (6-10)	7 (6-9)
White, non-Hispanic	49 (47-51)	18 (17-20)	11 (10-13)	7 (7-8)	6 (5-7)	8 (7-9)
Black, non-Hispanic	39 (35-44)	16 (13-19)	13 (10-16)	9 (7-12)	10 (8-13)	13 (10-16)
Hispanic	50 (42-57)	14 (10-19)	8 (5-12)	5 (3-8)	10 (5-17)	14 (10-20)
No health care coverage	47 (39-55)	13 (9-18)	9 (5-16)	7 (5-12)	9 (5-15)	15 (10-22)
Have health care coverage	49 (47-51)	18 (17-19)	11 (10-12)	7 (7-8)	6 (6-7)	8 (8-9)

Appendix C: 2021 Adverse Childhood Experience Questions

The following were asked during in the 2021 Pennsylvania Behavioral Risk Factor Surveillance System (BRFSS) survey. All questions refer to the time before the respondent was 18 years of age.

Question 1

Did you live with anyone who was depressed, mentally ill, or suicidal?

1. Yes
2. No
7. Don't know/Not sure
9. Refused

Question 2

Did you live with anyone who was a problem drinker or alcoholic?

1. Yes
2. No
7. Don't know/Not sure
9. Refused

Question 3

Did you live with anyone who used illegal street drugs or who abused prescription medications?

1. Yes
2. No
7. Don't know/Not sure
9. Refused

Question 4

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
7. Don't know/Not sure
9. Refused

Question 5

Were your parents separated or divorced?

1. Yes
2. No
8. Parents not married
7. Don't know/Not sure
9. Refused

Question 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
7. Don't know/Not sure
9. Refused

Question 7

Not including spanking (before age 18), how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way?

1. Never
2. Once
3. More than once
7. Don't know/Not sure
9. Refused

Question 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
7. Don't know/Not sure
9. Refused

Question 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
7. Don't know/Not sure
9. Refused

Question 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
7. Don't know/Not sure
9. Refused

Question 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
7. Don't know/Not sure
9. Refused

Appendix D: Technical Notes

Technical Notes:

Demographics with significant differences identified by non-overlapping confidence intervals are displayed as orange bars in Appendix A. Demographic categories are gradients of the same color and are grouped together. The 95% confidence interval error bars are included.

Confidence intervals are a way to measure sampling error and define the range of values where percentages estimated by multiple samples of the same population would be found (95% of the time). The size of the confidence interval is directly related to the probability of selection and characteristics of the people surveyed within the universe being sampled. Comparisons should only be made within the same demographic (male vs. female, current smoker vs. non-smoker, etc.) because comparisons across demographics may not be between independent groups (education vs. income, demographics are likely correlated).