

**Understanding and Responding to Adverse Childhood Experiences  
in New York State**

**May 2018**

*Report developed by the New York State Department of Health, Office of Alcoholism and Substance Abuse Services and Office of Mental Health*

# Understanding and Responding to Adverse Childhood Experiences in NYS

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# Understanding and Responding to Adverse Childhood Experiences in New York State

## Executive Summary

### Background

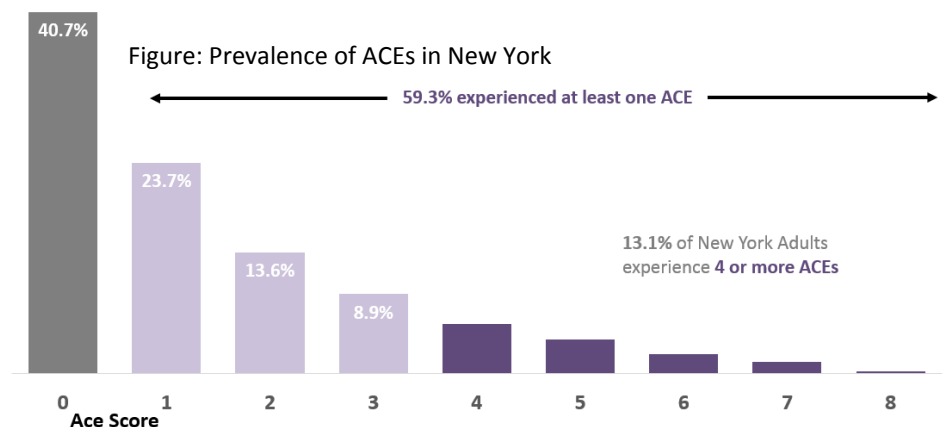
Adverse Childhood Experiences (ACEs) are potentially traumatic events in childhood that can have negative, lasting effects on health and well-being throughout life and to the next generation.<sup>1</sup> These experiences range from physical, emotional, or sexual abuse to parental divorce or incarceration, or violence, or substance abuse, or mental illness among others. The traumatic experiences are referred to as “toxic stress” because they can affect brain architecture and brain chemistry.<sup>2</sup> In the seminal ACEs Study by the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente, researchers Felitti and Anda were among the first to quantify the effects of ACEs on negative health outcomes later in life such as obesity, alcoholism and depression in adults.<sup>1</sup> The study retrospectively looked at ACEs among more than 17,000 Kaiser Permanente members in San Diego. Findings showed that two-thirds of the study participants reported having at least one ACE, and one in eight reported having four or more ACEs. The higher the number of ACEs experienced, the higher the risk of having negative health risk behaviors and outcomes such as obesity, ischemic heart disease, chronic obstructive pulmonary disease (COPD), suicide, substance use disorder, and depression.<sup>1,2,3</sup> Subsequently, a growing body of research has shown that ACEs can be prevented, and reduced, and that traumatic effects of ACEs can be reversed by building and strengthening resilience.<sup>4,5</sup>

### Methods

In 2016, for the first time, the New York State (NYS) Department of Health (DOH) collected regional and state-level ACEs data from over 9,000 adults through the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS<sup>6</sup> is an annual statewide telephone survey of adults developed by the CDC and administered by DOH. The BRFSS is designed to provide information on behaviors, risk factors, and utilization of preventive services related to chronic and infectious diseases, disability, injury and death among the non-institutionalized, civilian population aged 18 years and older. ACEs were examined both individually, and scored as a sum of total ACEs. An ACE score prevalence of 3 or more ACEs was examined among key demographics, along with the effects on selected health risk behaviors and outcomes, and the clustering or co-occurrence of multiple ACEs.

### Key Findings

ACEs are common in NYS. Six out of 10 adults (59.3 %) reported having experienced at least one ACE, and 13.1% reported 4 or more ACEs. Most reported ACEs are: emotional abuse (24.6%), parental separation (23%) and substance abuse in the home (22.2%).



ACE scores are significantly lower among adults aged 65 years and older. ACE scores of 3 or more are higher among those who identified as Lesbian-Gay-Bisexual-Transgender (LGBT) and people with household incomes less than \$15,000, and lower for those who graduated from college or technical school. Adults in households with children are more likely to have reported ACEs than households that had no children. ACEs are higher among women, Hispanics and multiracial groups, though not statistically significant due to small sample size in the survey.

Participants who reported three or more ACEs are six times more likely to report being depressed, four times more likely to report HIV risk behaviors, three times more likely to have arthritis or be current smokers, and twice as likely to be obese, ever have asthma or report binge drinking.

ACEs occur in clusters. Abuse related ACEs were strongly correlated with each other, as was domestic violence with household member substance use. Reporting of incarceration as part of ACEs was correlated strongly with substance abuse and mental illness in the home.

### ***Action Steps***

Five action steps are recommended.

- 1 Facilitate cross-sectoral engagement in developing, implementing and evaluating the action plan**  
Share the ACEs data and report with a variety of sectors including survivors of ACEs, healthcare providers, local health departments, schools and after school programs, law enforcement community-based organizations, social services, mental health and substance treatment agencies, to develop a robust plan of action that will be included in the Prevention Agenda 2019-2024, the state health improvement plan.
- 2 Offer technical support on best practice to prevent, reduce and respond to ACEs**  
Disseminate a list of evidence-based and best practice program and policy interventions, and offer guidance on how to track changes in policy, attitudes and behaviors due to these efforts.
- 3 Support alignment of actions to address ACEs**  
ACEs science is about the prevalence and consequences of ACEs, and what to do to prevent them or mitigate their impact. Facilitate working with partners to integrate the science of ACEs in their programs and policies.
- 4 Strengthen capacity for training and communications**  
Work with partners on ACEs culturally-sensitive training and to develop a communication strategy, and use existing web platforms to share experiences and lessons learned.
- 5 Collect data and information on ACEs and resilience periodically**  
Continue to collect ACEs data with other health risk behaviors and outcomes such as substance use, obesity, mental illness, tobacco use, injuries, disabilities to inform policy and program to support healthier communities. In addition, collect information on change brought about policies and program that address ACEs and build resilience.

## Detailed Report

### 1. Why focus on ACEs?

Adverse Childhood experiences (ACES) are potentially traumatic events that can have negative, lasting effects on health and well-being.<sup>1</sup> These experiences range from physical, emotional, or sexual abuse, parental divorce, or living at home with someone who was incarcerated, abused substances, or had a mental illness.

Some stress in life is normal, and even necessary for development. However, when a child experiences “strong, frequent, or prolonged activation of the body’s stress response systems in the absence of the buffering protection of a supportive, adult relationship”,<sup>2</sup> this stress may turn toxic. The traumatic experiences are referred to as “toxic stress” because they can affect brain architecture and brain chemistry. A growing body of research has quantified the prevalence of toxic stress in children with negative behavioral and health outcomes, such as obesity, alcoholism, and depression later when they grow into adults, and to the next generation.<sup>1,2,3</sup> A CDC study found the total lifetime estimated financial costs associated with one year of confirmed cases of child abuse and neglect is approximately \$124 billion.<sup>4</sup> ACEs can be prevented, reduced, and traumatic effects of ACEs can be reversed by building and strengthening resilience.<sup>5,6</sup>

### 2. The ACE Study

The term “ACE”, was coined in 1998 following the release of the seminal large-scale Adverse Childhood Experiences’ Study by the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente. Led by researchers Dr. Vincent Felitti and Dr. Robert Anda, the ACE Study surveyed 17,337 adult patients of Kaiser Permanente in San Diego, California for 10 ACEs: childhood stressors, such as physical, emotional and sexual abuse, emotional and physical neglect, household substance abuse and mental illness, parental discord, witnessing domestic violence, and incarceration in the home.<sup>1</sup>

This methodology was different from most at that time as it examined the contributions of several forms of abuse with health outcomes. The ACE Study was one of the first epidemiologic studies demonstrating that exposures to each of the ten categories of childhood abuse, neglect, and family dysfunction are common, cumulative and are highly interrelated.<sup>1</sup>

Patients were asked about their medical history and traumatic experiences in childhood. Most of the participants were white (74.8%) and had attained a college-level education or higher (75.2%). The study found that ACEs were common among study participants. Almost two-thirds (63.9%) of participants reported having at least one adverse childhood experience.<sup>1</sup> One in eight participants (12.5%) reported having four or more ACEs. Moreover, researchers found that high ACE scores significantly increased the risk for poor health outcomes and negative health behaviors among study participants.<sup>1</sup> Additionally, there was a strong dose-response relationship between ACEs and poor outcomes. As the number of ACEs increased, the risk of negative health outcomes increased as well. In fact, subsequent studies have found that the life expectancy of a person with six or more ACEs is 20 years shorter than a person with no ACEs.<sup>4</sup>

### 3. New York State BRFSS ACEs Methodology

The BRFSS is an annual statewide telephone survey of adults developed by the CDC and administered by DOH. The BRFSS is designed to provide information on behaviors, risk factors, and utilization of preventive services related to the leading causes of chronic and infectious diseases, disability, injury and death among the non-institutionalized, civilian population aged 18 years and older.<sup>7</sup>

The 2016 Expanded BRFSS survey was designed to collect county-level data and used a larger sample that included three parts: 1) core questions that are asked by every state; 2) optional CDC modules, and 3) state-added questions. The ACEs questions were one of the optional modules included in the 2016 Expanded BRFSS survey. To maximize the topics included in the survey, there were three questionnaire versions used, each of which included the core questions. Each version was used by approximately 10,000 respondents statewide. While the ACEs module was part of the 2016 Expanded BRFSS, it was only included in one of the questionnaire versions and due to sample size issues, data are reported at regional and state levels.<sup>8</sup>

The New York State BRFSS ACEs module (Figure 1) consisting of 11 questions was administered for the first time in 2016. The 11 questions assessed eight categories of ACEs: three related to childhood abuse, and five related to household dysfunction. The BRFSS ACEs module does not include questions related to childhood neglect, and NYS did not add these on to the survey.

Data collected are “weighted” to address non-response or non-coverage bias, and adjusted to reflect the number of people in the state who are 18 years and older based on standard valid statistical methodology. An ACE score is a tally of the number of “yes,” “once” or “more than once” for questions in each category. In the instance of “emotional abuse”, the response is

**Adverse Childhood Experiences Module**

**Household dysfunction**

*Mentally ill household member*

1. Did you live with anyone who was depressed, mentally ill or suicidal? [Yes/No]

*Substance abuse in household*

2. Did you live with anyone who was a problem drinker or alcoholic? [Yes/No]
3. Did you live with anyone who used illegal street drugs or who abused prescription medications? [Yes/No]

*Incarcerated household member*

4. Did you live with anyone who served time or was sentenced to serve time in a prison, jail or other correctional facility? [Yes/No]

*Parental separation/divorce*

5. Were your parents separated or divorced? [Yes/No]

*Violence between adults in household*

6. How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up? [Never/Once/More than once]

**Childhood abuse**

*Physical abuse*

7. 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. [Never/Once/More than once]

*Emotional abuse*

8. How often did a parent or adult in your home ever swear at you, insult you or put you down? [Never/Once/More than once]

*Sexual abuse*

9. How often did anyone at least 5 years older than you or an adult touch you sexually? [Never/Once/More than once]
10. How often did anyone at least 5 years older than you or an adult, force you to have sex? [Never/Once/More than once]
11. How often did anyone at least 5 years older than you or an adult, try to make you touch them sexually? [Never/Once/More than once]

Figure 1: BRFSS ACEs Module Questions

counted as an ACE if the response is “more than once”. The highest ACE score in the ACE module is eight as there are eight categories.

ACE scores were computed for those who completed the ACEs module with affirmative or negative responses. Persons who refused, missing, or unknown to the question set were excluded. These scores were categorized into three levels ‘0 ACEs’, ‘1-2 ACEs’, and ‘3+ ACEs’, for analysis with pertinent demographics, behaviors, and health outcomes. Information on ‘4+ ACEs’ is presented in some places for comparability to other studies, however the threshold of ‘3+ ACEs’ was generally used for the ‘upper bound’ category to increase statistical power, consistent with reports of limited sample size.

Logistic regression is a statistical method to check for independent associations between one variable and outcome while being able to control for other variables that may play a role in the outcome. Here, logistic regression was used to see the effects of having an ACE score of 3 or more (vs no ACE score) independent of race, ethnicity, income, education, age and gender. Odds ratios, which show the odds of the outcome happening among people with 3 or more ACEs compared to no ACE score, are presented for risk behaviors and health conditions for which there was a statistically significant (a p-value of less than .05) effect.

### **3.1 BRFSS ACEs Module: Notes to keep in mind**

When reviewing data from the BRFSS ACEs module, note that:

- BRFSS estimates apply only to adults 18 years and older
- Data does not apply to individuals without telephone service, those who reside on military bases or within institutions or who are unable to complete a telephone survey
- BRFSS prevalence estimates are self-reported and subject to bias due to respondents’ inability or unwillingness to provide information about their behaviors or characteristics
- ACEs data only measures categories of ACEs, not frequency or severity of each ACE

### **3.2 Three questions explored with BRFSS ACEs data**

Three questions were explored with the BRFSS ACEs data: 1) What is the prevalence of ACEs ? (2) How are ACE categories connected? (3) How do ACEs affect health outcomes and risk behaviors?

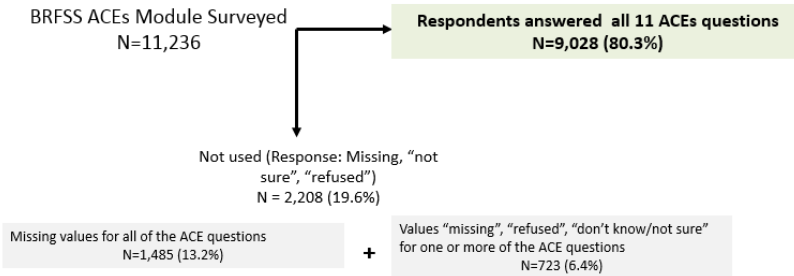


## 4. NYS BRFSS ACEs Findings

### 4.1 BRFSS ACEs Module Response

NYS 2016 BRFSS survey combined landline and cellphone weighted response rates was 36.3% for a

total response of 35,334.<sup>9</sup> The questionnaire with the ACEs module was used with 11,236 residents. Of these, 80.3% (n=9,028) answered all 11 ACEs questions and were included in the analysis. Of the 19.6% (n=2,208) excluded, 14.1% (n=1,586) dropped off the telephone call before getting to

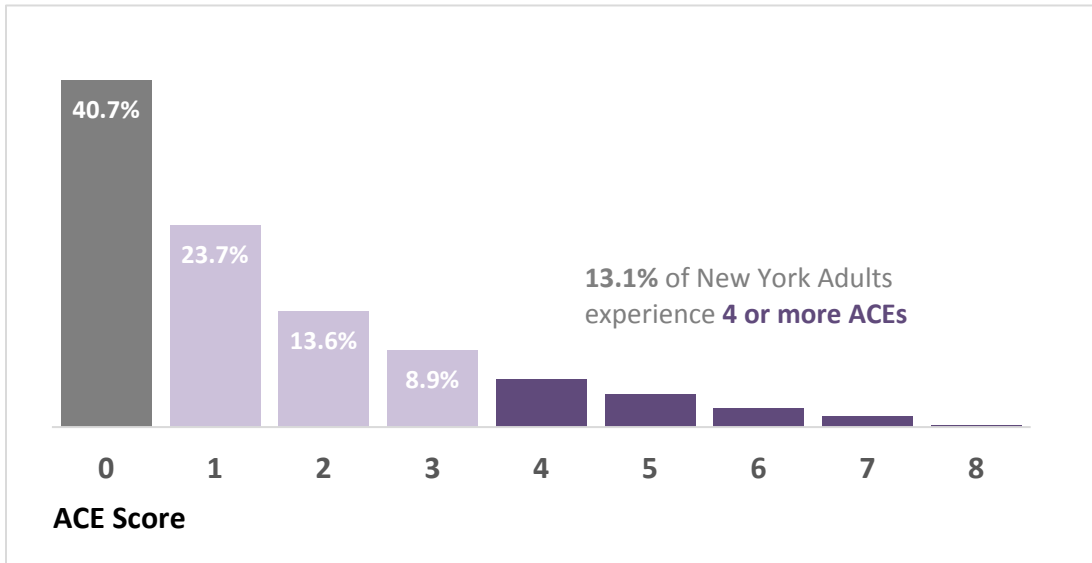


**Figure 2: 2016 BRFSS ACE Module Response**

the ACE questions, and 5.5% (n=622) provided partial responses, that is responses were missing, “refused” to answer, or responded with “don’t know/not sure”. (Figure 2)

### 4.2 Prevalence of ACEs in NYS

#### A. ACEs are common in NYS.



About six out 10 adults, 59.3%, in NY report experiencing at least one ACE, and 13.1% experienced 4 or more ACEs. (Figure 3)

**Figure 3: Prevalence of ACEs in NYS, 2016 BRFSS**

### B. Most reported ACEs

Emotional abuse, parental separation/divorce, and substance abuse are the most reported ACEs.

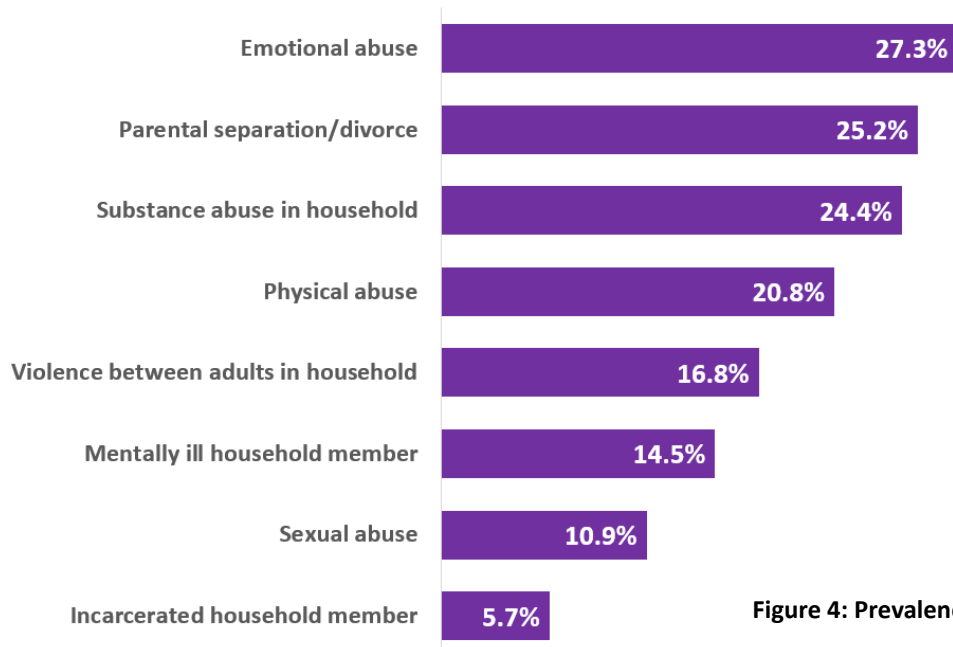


Figure 4: Prevalence of ACEs types

### C. ACEs Demographics

ACE scores are significantly lower in the 65 years and older age group (Figure 5). ACE scores of 3 and greater are higher among people with household incomes less than \$15,000, and lower for those who graduated from college or technical school. Adults in households with children are more likely to have reported ACEs than households that had no children. ACEs are higher among women, Hispanics and multiracial groups, though not statistically significant.

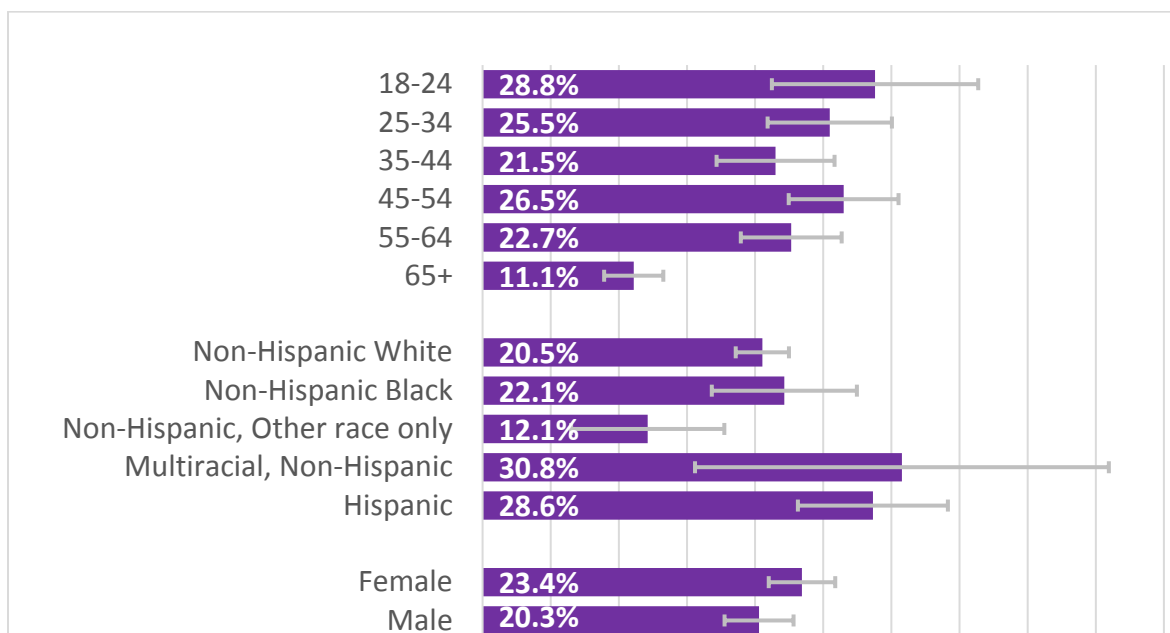


Figure 5: Among Adults (Age 18+ Years) in New York State with ACE Scores ≥ 3

### D. Prevalence of ACEs by sexual orientation/transgender status

An ACE score of 3 or higher is significantly higher among the LGBT group (36.3%) as compared to the heterosexual group (21.6%) as seen in Figure 6.

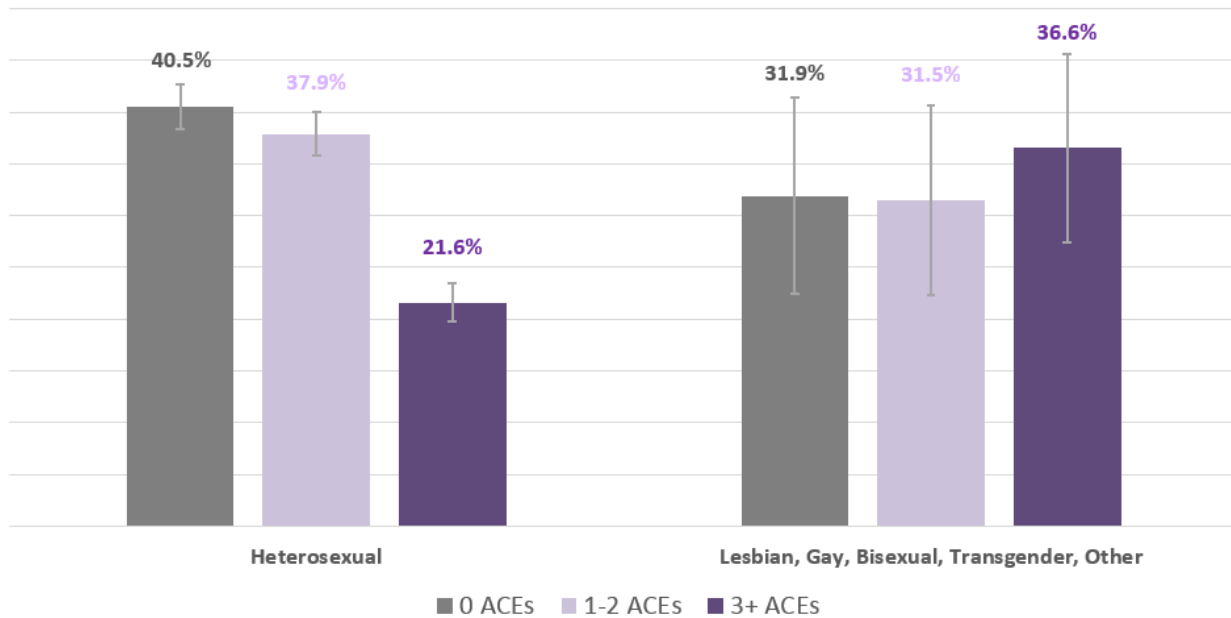


Figure 6: Prevalence of ACE Score by sexual orientation/transgender status

### E. Prevalence of ACEs by Income groups

An ACE score of 3 and more is highest among the household income group of less than \$15,000 at 30.3%, and stayed consistent at 21% across other income groups as seen in Figure 7.

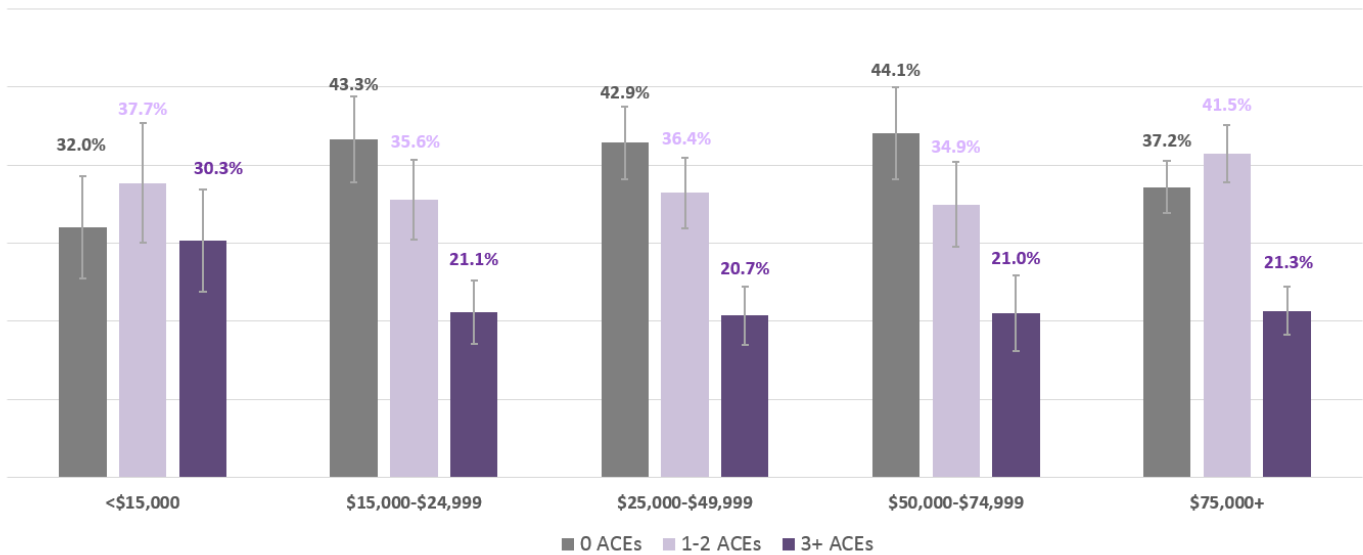


Figure 7: Prevalence of ACEs by Income

### F. Prevalence of ACEs by Educational Level

An ACE score of 3 or higher is higher among those who did not graduate from college or technical schools at 26.1%, and lowest for college or technical school graduates at 16.8% as shown in Figure 8.

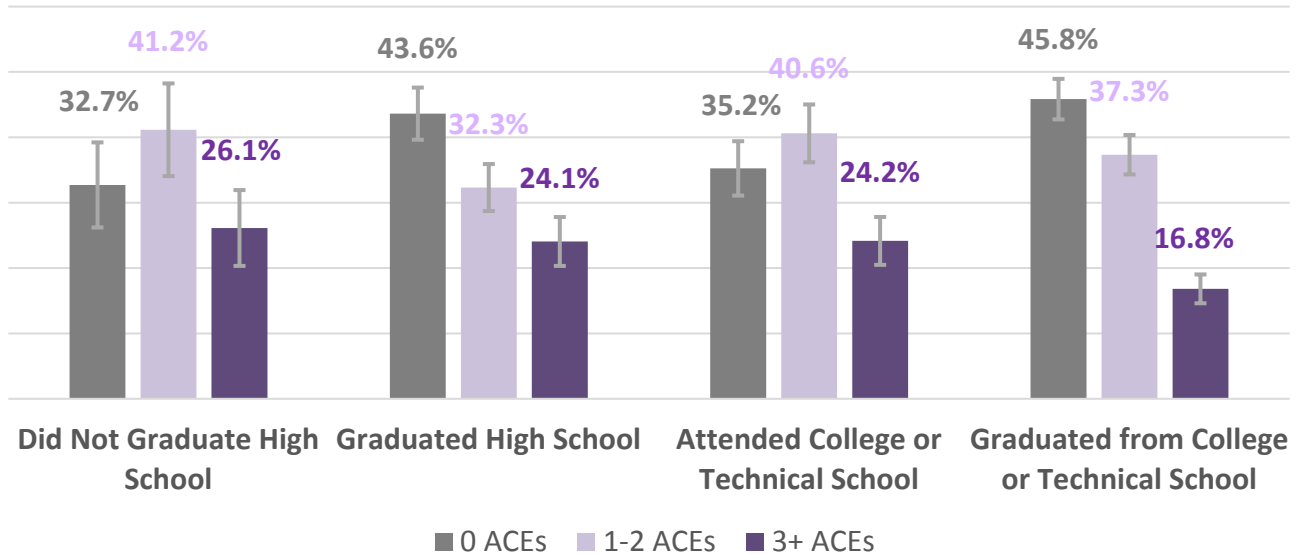


Figure 8: Prevalence of ACEs by Educational Level

### G. Prevalence of ACEs by number of children in the household

The prevalence of 3 or more ACEs in households with children is between 23.7% to 25.2%, and is higher than in households with no children (20.4%) (Figure 9).

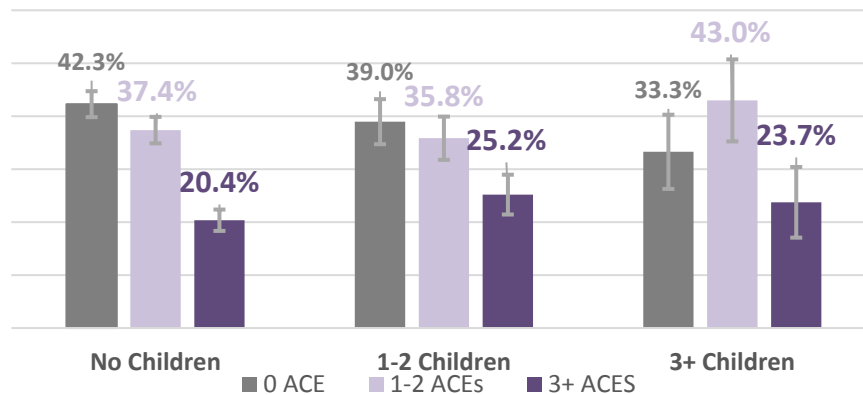


Figure 9: Prevalence of ACEs compared among household by number of children in the household

### H. Prevalence of ACEs by Delivery System Reform Incentive Payment (DSRIP) Region

ACEs were analyzed by DSRIP regions. DSRIP is the main mechanism by which the states is restructuring the health healthcare delivery system by reinvesting in the Medicaid program. While there were no significant differences, ACE Scores of 3+ are higher (23.7%) and ACE Scores of 0 (49.5%) are higher in the Tug Hill Seaway. New York City reported slightly lower percentage of ACE 3+ score (19.7%).

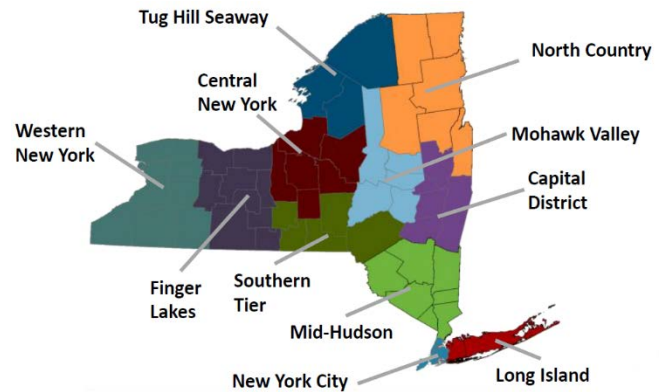


Figure 10: Delivery System Reform Incentive Payment (DSRIP) Regions in NY

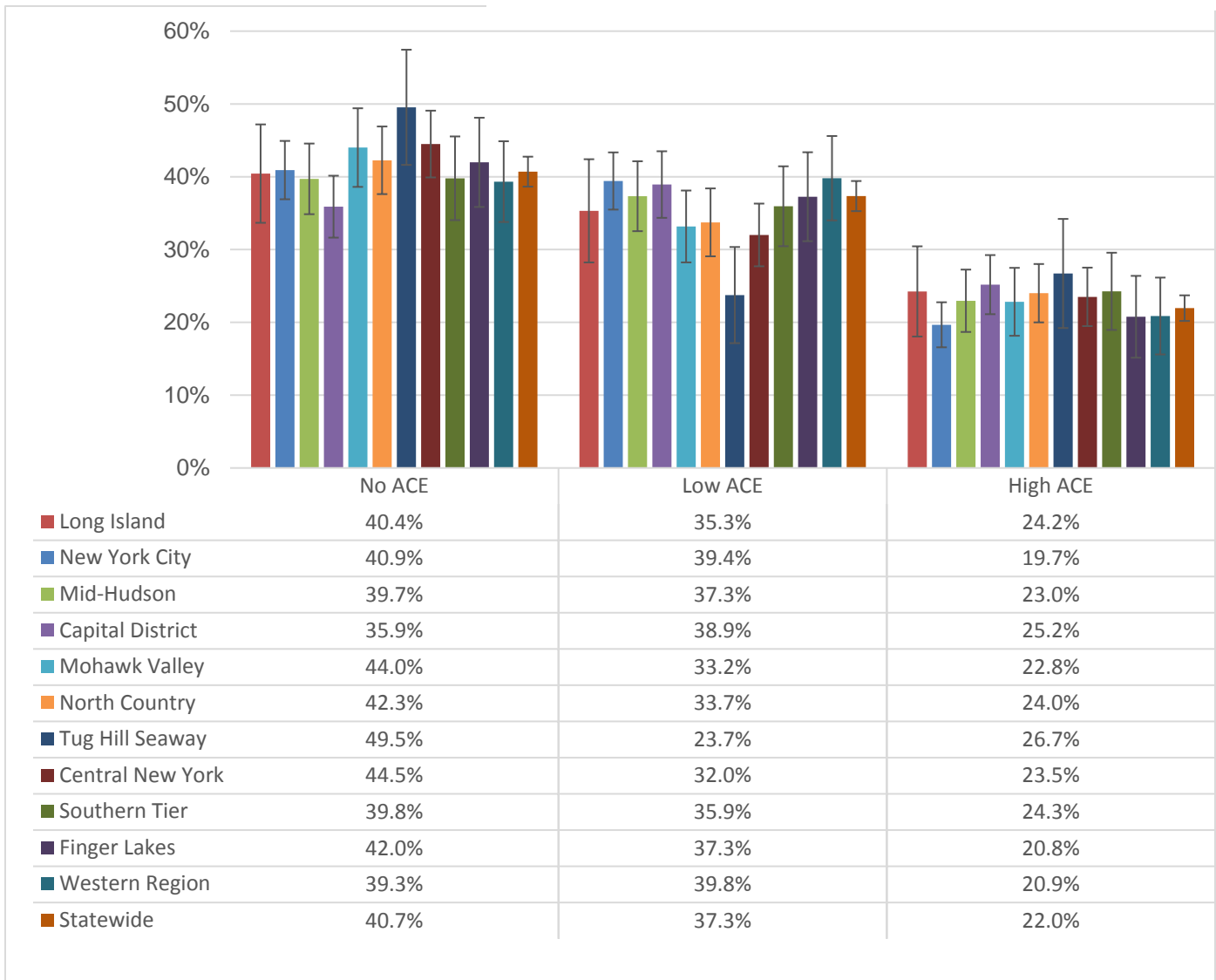


Figure 11: Prevalence of ACEs by DSRIP regions in NYS

### Prevalence of ACEs by DSRIP Region and Urbanicity

There are no significant differences in ACE scores between urban and rural areas within DSRIP regions

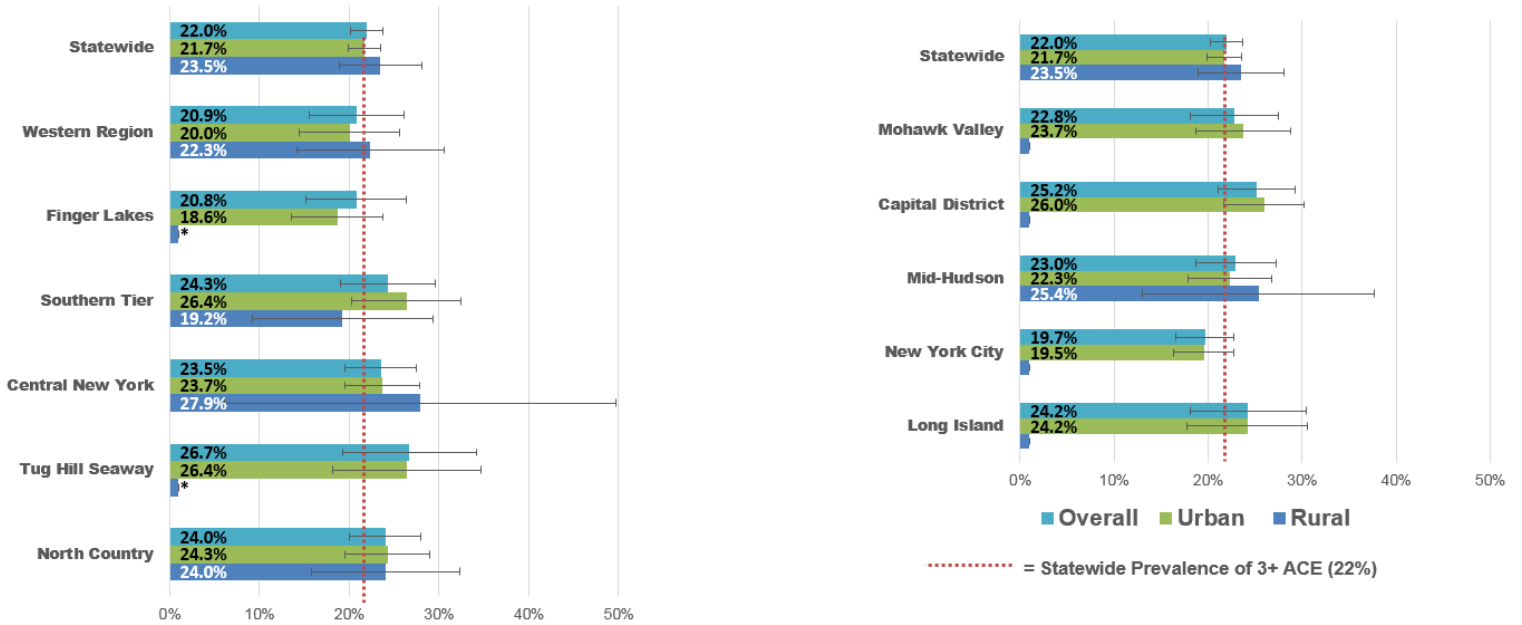


Figure 12: Prevalence of 3+ ACEs by DSRIP Regions and Urbanicity among adults (age 18+ Years) in New York State

### 4.3 ACEs and Health conditions or risk behaviors

Several health outcomes have increased odds of occurrence among individuals with 3 or more ACEs. A person with an ACE score of 3 or more is 6 times more likely to be at risk for depression (Fig. 13), and 3 times more likely be living with a disability.

|   | Adjusted Odds Ratio                 | 95% Confidence Interval |
|---|-------------------------------------|-------------------------|
| Depression                                | 6.23 <sup>†</sup> times more likely | (4.48-8.65)             |
| Had more than 14 bad mental health days   | 4.67 <sup>†</sup> times more likely | (3.24-6.71)             |
| Vision impaired                           | 3.59 <sup>†</sup> times more likely | (2.10-6.12)             |
| Non-asthma lung diseases                  | 3.50 <sup>†</sup> times more likely | (2.12-5.76)             |
| Disabled                                  | 2.90 <sup>†</sup> times more likely | (2.17-3.90)             |
| Physical impairment                       | 2.89 <sup>†</sup> times more likely | (2.09-3.98)             |
| Arthritis                                 | 2.88 <sup>†</sup> times more likely | (2.19-3.78)             |
| Kidney disease                            | 2.67 <sup>†</sup> times more likely | (1.47-4.86)             |
| Had more than 14 bad physical health days | 2.59 <sup>†</sup> times more likely | (1.85-3.63)             |
| Fall in past 12 months (people 45+)       | 2.49 <sup>†</sup> times more likely | (1.85-3.34)             |
| Ever had asthma                           | 1.81 <sup>†</sup> times more likely | (1.31-2.50)             |
| Obesity                                   | 1.73 <sup>†</sup> times more likely | (1.33-2.24)             |

**Controlled for:**  
Income  
Education  
Age  
Race  
Ethnicity  
Gender

Figure 13: Adjusted Odds Ratio for Selected Health Outcomes by ACE scores of 3 and over

A person with an ACE score of 3 or greater is almost four times more likely to engage in HIV risk behaviors, which includes intravenous drug use, a sexually transmitted disease, transactional sex for drugs or money, unprotected anal sex or having four or more sexual partners in the last year as compared to a person with no ACE (Figure 14).

|                            | Adjusted Odds Ratio                 | 95% Confidence Interval |
|----------------------------|-------------------------------------|-------------------------|
| HIV risk behaviors*        | 3.67 <sup>‡</sup> times more likely | (2.23-6.04)             |
| E-cigarette ever used      | 2.70 <sup>‡</sup> times more likely | (1.95-3.75)             |
| Current smokers            | 2.84 <sup>‡</sup> times more likely | (2.00-4.03)             |
| Ever smokers               | 2.68 <sup>‡</sup> times more likely | (2.09-3.44)             |
| Binge drinking**           | 1.50 <sup>†</sup> times more likely | (1.08-2.06)             |
| Poor sleep                 | 1.67 <sup>‡</sup> times more likely | (1.30-2.13)             |
| Not eating fruit every day | 1.4 <sup>†</sup> times more likely  | (1.11-1.82)             |

**Controlled for:**  
Income  
Education  
Age  
Race  
Ethnicity  
Gender

\*HIV risk behaviors include history of any (within the past year): IV drug use, a venereal disease or sexually transmitted disease, transactional sex for drugs or money, unprotected anal sex, or having four or more sexual partners.

<sup>†</sup> = significant at  $p < .05$ ; <sup>‡</sup> = significant at  $p < .01$

**Figure 14: Adjusted Odds Ratio for Selected Health Risk Behaviors by ACE scores of 3 and over**

Some of the health conditions and risk behaviors did not appear to be affected by an ACE score of 3+. This may be due to small sample size. For example, “heavy drinking” only 5% of the sample reported being heavy drinkers, hence did not show up in the analysis (Fig. 15).

| Health Conditions                                  | Risk Behaviors   |
|--|--|
| Diabetes   | Current other tobacco use (snuff, snus, chewing tobacco) |
| Cancer (skin and other)                            | Current E-cigarette use                                  |
| Current asthma                                     | Always wearing a seatbelt while in the car               |
| Stroke   | Drinking and driving                                     |
| Cardiovascular Disease                             | Heavy drinking*  |
| Heart attack                                       | Eating Vegetables every day                              |
| High blood pressure                                |  |
| Exercise   |  |
| Perceived poor health                              |  |
| Hearing impairment                                 |  |
| Having an injury from a fall in the past 12 months |  |

\*Heavy drinking is considered 14+ drinks per week for men or 7+ drinks per week for women, while binge drinking is having 5+ drinks on one occasion for men or 4+ drinks on one occasion for women

**Figure 15: Health Outcomes not significantly affected by ACEs**

### 4.3 Correlation Among Different ACEs

A correlation matrix was created to show a summary of the co-occurrence, or relationship, between different ACEs. The number shown is the Pearson correlation coefficient, this is a decimal between 0 and 1 which reflects the relationship between two ACEs happening together all the time (1) and never happening together (0). For easier interpretation, the coefficients have been shaded to show the strongest correlations (shaded darker), down to the weakest correlations (no shading or lighter shading). Among ACEs, physical abuse is strongly correlated with emotional abuse. Domestic violence is strongly correlated with physical and emotional abuse, and substance use. Substance use is also correlated strongly with incarceration and mental illness. See Figure 16.

|                       |                    | Household Dysfunction |               |               |                    |                   | Abuse    |           |        |
|-----------------------|--------------------|-----------------------|---------------|---------------|--------------------|-------------------|----------|-----------|--------|
|                       |                    | Mental Illness        | Substance Use | Incarceration | Separation/Divorce | Domestic Violence | Physical | Emotional | Sexual |
| Household Dysfunction | Mental Illness     | -                     | 0.30          | 0.20          | 0.14               | 0.24              | 0.21     | 0.28      | 0.19   |
|                       | Substance Use      |                       | -             | 0.27          | 0.19               | 0.35              | 0.26     | 0.29      | 0.20   |
|                       | Incarceration      |                       |               | -             | 0.17               | 0.19              | 0.13     | 0.16      | 0.09   |
|                       | Separation/Divorce |                       |               |               | -                  | 0.20              | 0.13     | 0.13      | 0.08   |
|                       | Domestic Violence  |                       |               |               |                    | -                 | 0.41     | 0.37      | 0.20   |
| Abuse                 | Physical           |                       |               |               |                    |                   | -        | 0.45      | 0.26   |
|                       | Emotional          |                       |               |               |                    |                   |          | -         | 0.20   |
|                       | Sexual             |                       |               |               |                    |                   |          |           | -      |

Figure 16: Correlation among ACEs

Figure 17 illustrates another way to view the correction. Among those who identified as living with a household member who had been incarcerated (2<sup>nd</sup> row), 71% identified as also using substances. Of the respondents who responded as identifying living with a household member with domestic violence (2<sup>nd</sup> row), 63% identified as experiencing emotional abuse.



| Rank | Household Members (HM) |                       |                       |                         | Parents               | Abuse (A.)            |                       |                      |
|------|------------------------|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|-----------------------|----------------------|
|      | Mental Illness         | Substance Use         | Incarcerated          | Violence Between Adults | Separated or Divorced | Physical Abuse        | Emotional Abuse       | Sexual Abuse         |
| 1    | Emotional A.<br>59%    | Emotional A.<br>50%   | Substance Use<br>71%  | Emotional A.<br>63%     | Substance Use<br>39%  | Emotional A.<br>66%   | Physical A.<br>52%    | Emotional A.<br>53%  |
| 2    | Substance Use<br>56%   | Parent Sep/Div<br>40% | Emotional A.<br>57%   | Substance Use<br>58%    | Emotional A.<br>38%   | Substance Use<br>47%  | Substance Use<br>45%  | Physical A.<br>51%   |
| 3    | Physical A.<br>42%     | HM Violence<br>40%    | Parent Sep/Div<br>56% | Physical A.<br>57%      | HM Violence<br>30%    | HM Violence<br>46%    | HM Violence<br>40%    | Substance Use<br>47% |
| 4    | Parent Sep/Div<br>40%  | Physical A.<br>40%    | HM Violence<br>45%    | Parent Sep/Div<br>45%   | Physical A.<br>30%    | Parent Sep/Div<br>37% | Parent Sep/Div<br>35% | HM Violence<br>38%   |

Figure 17: Co-reporting among ACEs

#### 4.4 Comparing NYS ACEs with other states and related surveys

##### 4.4.1 Comparing ACEs in NYS with other states

Rates of no ACEs and 3+ ACEs in NYS are comparable to other states with about 3 out of 5 (59%) respondents in NYS experiencing one ACE, and 13 percent experiencing 4 or more ACEs as seen in Figure 18. Many of the states have larger samples, and several states combined data from multiple years to get a larger sample size.<sup>10</sup> Small sample sizes made it difficult to conduct analysis of ACEs with some of the health outcomes and health risks.


| State (Years)  | Sample Size  | % of adults with at least 1 ACE | % of adults with 4 or more ACEs |
|--|--------------|---------------------------------|---------------------------------|
| California, (2008, 2009, 2011, 2013),  | 24,745       | 62%                             | 17%                             |
| Iowa (2012-2014)   | 19,000       | 56%                             | 14.5%                           |
| Kansas (2014-2015)   | 29,686       | 55%                             | 13.5%                           |
| Minnesota (2011)   | 13,520       | 55%                             | 13%                             |
|  <b>New York (2016)</b> | <b>9,028</b> | <b>59%</b>                      | <b>13%</b>                      |
| Washington (2009)  | 7,471        | 62%                             | 17%                             |
| Wisconsin (2011, 2012)   | 9,039        | 56%                             | 14%                             |

Figure 18: ACEs in NYS and Selected States

##### 4.4.2 Other ACEs data on NYS

A telephone ACEs survey of 807 adults in the state was conducted by the New York Council of Children and Families in 2009.<sup>11</sup> This survey added a question on exposure to neighborhood violence drawn from the questionnaire My Child’s Exposure to Violence, version 3—a data collection instrument used

for the Project on Human Development in Chicago Neighborhoods.<sup>12</sup> The survey also found 59% of adults had at least one ACE, and the most common ACE experienced was exposure to neighborhood violence.

More recently, the 2016 National Survey of Children's Health<sup>13</sup> telephone survey of households with at least one 17 years old or younger living in the household, found that 45.3% 0-17 years had experienced with at least one ACE. The sampling methodology is different from the BRFSS survey, and cannot be compared. Though the NYS BRFSS did find that ACEs among adults with three or more children living in households were higher than in household with no children (Figure 10).

In some counties, Monroe<sup>14</sup>, Warren and Washington<sup>15</sup> counties surveyed students on ACEs, and the findings have been used to advocate for trauma-informed approaches in schools.

## **5. Discussion**

The NYS BRFSS survey findings are consistent with the findings from national and other states' ACEs studies and shows ACEs are common. ACE scores are significantly lower in the 65 years and older age group. ACE scores of 3 and older are higher among those who identified as Lesbian-Gay-Bisexual-Transgender (LGBT), people with incomes less than \$15,000, and lower for those who graduated from college or technical school. Adults in households with children are more likely to have reported ACEs than households that had no children. ACEs are higher among women, Hispanics and multiracial groups, though not significantly significant.

ACEs tend to co-occur or cluster. There are stronger correlations among emotional, physical abuse, domestic violence, substance use and mental illness. Significantly lower rates of ACEs were observed in the 65 years and older age groups. It has been suggested that older people may report fewer ACEs because they have more limited recall or are less willing to acknowledge potentially stigmatizing experiences.<sup>1</sup>

### **5.1 Neglect questions were not included in 2016 BRFSS survey**

The validated BRFSS ACE survey module was used, and this did not include emotional and physical neglect questions. Hence the maximum ACE score based on the module used was 8. The ACE rates may have been higher if neglect questions were included. It should be noted that many states did not include neglect questions because they were not part of a module. A few states added one or two neglect questions. In addition, ACEs data only measure categories of ACEs, not frequency or severity of each ACE. There are also many additional types of ACEs, such as the occurrence of neighborhood violence, and natural disasters, which are not accounted for in this questionnaire, though they have been associated with similar health outcomes and risk behaviors. Hence, it is likely ACE scores are under reported, and more complex than summarized in this report.

### **5.2 ACEs data are to be interpreted and addressed as a group**

The ACE study was one of the first epidemiologic studies to demonstrate that exposures to each of the ten categories of childhood abuse, neglect, and family dysfunction are common, and highly interrelated. It also indicated that the effects of the ACEs were cumulative, the higher the ACE score, the greater the likelihood of a negative health outcome or risk behavior. Traditionally, policies and

programs have focused on a one risk behavior or health outcome. The ACEs data support the rationale for using an integrative approach. For example, a program or policy focusing on reducing obesity could also integrate social emotional needs in interventions and data collection.

### **5.3 Biology of ACEs**

The ACE study demonstrated that abuse, neglect, and serious forms of household dysfunction are associated with multiple social, physical, behavioral, and mental health problems that emerge in adolescence and persist into adulthood. There are at least seven ways ACEs affects brain architecture.<sup>4, 5, 16</sup>

**Cause Epigenetic Shifts:** ACEs induce epigenetic shift, changes in markers that influence our genes. Through a process known as gene methylation, a small chemical marker, or methyl groups, adheres to the genes involved in regulating the stress response, interfering with their function. This causes the stress response to re-set on “high” for life, promoting inflammation and disease. This causes over reaction to everyday stresses.

**Changes size and shape of brain:** A developing brain, when chronically stressed releases a hormone that shrinks the size of the hippocampus, an area of the brain responsible of processing emotion and memory and managing stress. Magnetic resonance imaging (MRI) studies suggest that individuals with high ACE scores have less gray matter in other key areas of the brain. This causes over-reaction to even minor stressors.

**Unregulated neural pruning:** Children are born with many neurons and synaptic connections which are pruned as they grow. Neurons and synaptic connections that are not used are “lost”. Non-neuronal cells, called the microglia also help with the pruning by engulfing and digesting entire cells and cellular debris. When a child experience continuous unpredictable stress, these microglia cells release neurochemicals that lead to neuroinflammation which could lead to development of mood disorders or contribute to poor executive functioning and decision-making skills.

**Shortened telomeres:** Telomeres are protective caps found on the ends of DNA strands. They keep the genome healthy and intact. Childhood adversity has been found to erode telomeres erode, making it more likely for individuals to develop disease, and cause cells to age faster.

**Disengage default neural network:** Our brains are connected by a network of neurocircuitry, called the “default mode network”. It connects parts of the brain associated with memory, thought integration, and help our brains react to situations. In children whose brains are always in a state of fight-or-flight, there is less connectivity. As a result, they have less capacity to respond to changing situations.

**Pathway between brain and body:** When a child experiences adversity, the inflammatory chemicals that are produced in the body travel throughout the body though the lymphatic system. The brain is part of and connected to the immune system. Hence, stress affects the mind and the body.

**Weaker neural connections:** Children who experience chronic childhood adversity show weaker neural connections between the prefrontal cortex, the hippocampus and the amygdala. The prefrontal-cortex-amygdala relationship determines regulations of emotions. This increases the propensity for mood disorders such as anxiety and depression.

### **5.4 Biology of Resilience**

Resilience is the capacity to cope with stress, overcome adversity, and thrive despite challenges in life. If ACEs affects brain architecture, how does resilience work? For many years, people thought that an adult brain was unchangeable and static. In recent years, a major development in the field of neuro

science has been the discovery of neuroplasticity – the fact that the brain is a dynamic organ that changes at any age. Repeated exposure to social messages not only influences our belief systems, but also the biology of our brain. Resilience can now be measured in terms of how our brains, immune systems, and genes all respond to stressful experiences.<sup>17</sup>

A landmark study by Dr. Michael Meaney<sup>18</sup> and his colleagues at McGill University on the behavior of rat mother and pups illustrates the effect of early nurturing. Meaney and his team observed nurturing behaviors of two groups of rat mothers and pups. They noticed that after the pups were handled by researchers, their mother would soothe their stressed-out pups by licking and grooming them. Some displayed high levels of licking and grooming behavior, and some low levels. Pups from “high-licker” moms showed low levels of stress hormones, including corticosterone, when they were handled by researchers or placed in stressful situations. In contrast, pups from low-licker mom not only showed higher spikes of corticosterone in response to a stressor, such as being placed in a restraint for 20 minutes, they also had a harder time shutting off their stress response than did the pups of high-licker mom. Researchers found that the licking and grooming during the pups first 10 days not only predicted changes in their stress response for a lifetime, but also continued into the next generation. To understand this process further, Meaney’s research team switched some of the rat pups at birth. They placed pups of high-licker moms with moms who were low lickers and vice versa. They found biological pups of high-licker mums who were fostered by low-licker moms grew up to be stressed adults, and became low-lickers as moms. Licking and grooming in the first 10 days of a pup’s life made a difference throughout the lifespan, and through the next generation.

Biologically, there are at least three ways that early nurturing affects the neurological function, and later nurturing helps repair some of the damage.<sup>5,17,18,19</sup>

**Epigenetic regulation:** There are chemical markers which are situated on top of the DNA determine which genes get read and transcribed into proteins and which don’t. These epigenetic markers are subject to experience, and can be rewritten by the environment. This process of epigenome working with the genome in response to the environment is called epigenetic regulation. Different epigenetic patterns determined stress levels, and these patterns were determined by the nurturing in the early years.

**Maintaining healthy telomeres:** Telomeres are non-coding sequences at the ends of DNA strands, like protective bumpers. Early childhood adversity predicts shorter telomeres in adults, an indication of cellular aging and disease process. When telomeres are hurt and get too short, the cells age and retire. Hence in young people, collagen in the skin is supple and prevent wrinkle, and with age retire, and the skin starts to wrinkle. Telomeres can be protected by boosting levels of telomerase, an enzyme that lengthen telomeres. Telomerase can be boosted by meditation and exercise, and this would slow the decline.

**Neuroplasticity:** Critical and sensitive periods are times of maximal neuroplasticity, the brain’s ability to rewire or reorganize in response to a stimulus. Even outside the sensitive period, the wind does not totally close, it just gets smaller. There are two types of neuroplasticity. Cellular plasticity is a change in the number of brain cells that are talking to each other, and occurs most rapidly in the first years of life. About 90 percent occurs by the time a child turns six, but the rest stretches out until about age 25. Synaptic plasticity is a change in the strength of the connection between the junctions from one brain cell to the next, the synapse, and occurs over the lifespan. The most effective way to rewire the brain

is to intervene in early childhood, preventing the stress response from being dysregulated, and supporting practices that buffer the stress response, as in child-parent psychotherapy. Hormonal changes in adolescence, pregnancy and new parenthood are sensitive periods of neuroplasticity, and provide special opportunities for healing. Activities that boost synaptic plasticity are sleep, exercise, nutrition and meditation.

Resilience is born from the interplay between internal disposition and external experience. It derives from supportive relationships, adaptive capacities, and positive experiences. Learning to cope with manageable threats to our physical and social well-being is critical for the development of resilience.

## **5.5 Critique of ACEs**

There are several critiques of the ACEs study and surveillance related to the retrospective nature of the study, not understanding how ACEs is damaging, and concerns over the capacity to respond to ACEs.

### ***5.5.1 Retrospective nature of ACEs study***

The main critique of the ACEs study is that it is retrospective, relying on the memory and the credibility of the original respondents. Some respondents may not remember, or some may recharacterize trauma, or some may be blame external factors. Drs. Anda and Felitti have responded to this criticism in subsequent papers, saying that underreporting of trauma is more likely than overreporting; people are often uncomfortable acknowledging childhood sexual abuse or an alcoholic parent.<sup>19</sup>

One important source of corroboration for the ACEs study is a prospective study done by researchers in Dunedin, New Zealand.<sup>20</sup> For more than thirty years, they have been following a group of one thousand people born there between April 1972, and March 1973. They found the incidence of early trauma among the Dunedin cohort is similar to that of the Kaiser respondents. The adverse experiences data in the Dunedin study, were reported by children or parents, or observed by researchers, as they happened, rather than recalled by adult patients. The Dunedin researchers didn't include some of the most common adverse experiences counted by Anda and Felitti, like the alcoholism of a family member, but they still found that 40 percent of the children encountered one or more adverse experiences. They found similar relationships between early trauma and later health problems. Children who were victims of maltreatment, including maternal neglect and physical and sexual abuse, were almost three times as likely to experience major depression by their early thirties, and they were almost twice as likely to have an elevated risk of heart disease.

### ***5.5.2 Lack of understanding of biology of ACEs and Resilience***

Another reason for skepticism is not understanding of how ACEs is linked emotional, behavioral and physical problems later in life.<sup>19</sup> Since the ACEs study, researchers are beginning to unravel the answers through research with rats and primates, though it is still work in progress. The key pathway is the intricately interconnected system that our brain deploys in reaction to stressful events.

### ***5.5.3 ACEs makes people feel vulnerable***

A pediatrician who helps families heal at her clinic in Oakland, California says one reason for the push-back against ACEs is that it makes people feel vulnerable. When people understand the science behind ACEs, how it affects us at the biological and cellular level, and are given a ACE score based on adversity,

people realize that it is about each one of us. *“We are all equally susceptible and equally in need of help when adversity strikes. And that is what a lot of folks don’t want to hear. Some want to stand back and pretend that this is just a poor-person problem. Others take fierce ownership of the problem and say, “This is killing my community,” but what they mean is - It’s killing my people more than yours.”*<sup>21</sup>

After synthesizing findings from eight qualitative studies of professionals<sup>22</sup>, one recent study concluded that “professionals felt that they lacked the means necessary to explore child adversity, that they were apprehensive of worsening the child’s situation, and that their work with child adversity induced emotional discomfort.” The concerns revolved around three themes: “feeling inadequate”, “fear of making it worse”, and “facing evil.”<sup>20</sup> The authors recommended developing professionals’ ability to build relationships, skills in emotion regulation, and proficiency in reflective practice.

## 6. Action Steps

While 2016 was the first year that ACEs data were collected through BRFSS, local partnerships have been working with ACEs. As we move forward, it will be important to work with them in five areas:

- 1 Facilitate cross-sectoral engagement in developing, implementing and evaluating the action plan**  
Share the ACEs data and report with a variety of sectors including survivors of ACEs, healthcare, local health departments, schools and after school programs, law enforcement, community-based organizations, social services, mental health and substance treatment agencies, to develop a robust plan of action that will be included in the Prevention Agenda 2019-2024, the state health improvement plan.<sup>23</sup>
- 2 Offer technical support on best practice to prevent, reduce and respond to ACEs**  
Disseminate information on trauma-specific evidence-based and best practice programs and policy, and offer guidance on how to track changes in policy, attitudes and behaviors. Some examples include Trauma, Addiction, Mental Health and Recovery,<sup>24</sup> Collaborative Learning for Educational Achievement and Resilience,<sup>25</sup> Pediatric medical home screening tools for parents, children and adolescents who have been exposed to violence,<sup>26</sup> and Hague Protocol for identifying children at risk by interviewing parents in the Emergency Room.<sup>27,28</sup>
- 3 Support alignment of actions to address ACEs**  
ACEs science is about the prevalence and consequences of ACEs, and what to do to prevent them. Facilitate working with partners to integrate the science of ACEs in their programs and policies
- 4 Strengthen capacity for training and communications**  
Work with partners on culturally-sensitive ACEs training and to develop a communication strategy, and use existing web platforms to share experiences and lessons learned.
- 5 Collect data and information on ACEs and resilience periodically**  
Continue to collect ACEs data with other health risk behaviors and outcomes such as substance use, obesity, mental illness, tobacco use, injuries, disabilities to inform policy and program to support healthier communities. In addition, collect information on change brought about policies and program that address ACEs and build resilience.

# Appendices

## *Appendix 1: ACEs Workgroup members*

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## Appendix 2: Survey questions

### BRFSS Adverse Childhood Experience (ACE) Module

Prologue: I'd like to ask you some questions about events that happened during your childhood. This information will allow us to better understand problems that may occur early in life, and may help others in the future. This is a sensitive topic and some people may feel uncomfortable with these questions. At the end of this section, I will give you a phone number for an organization that can provide information and referral for these issues. Please keep in mind that you can ask me to skip any question you do not want to answer. All questions refer to the time period before you were 18 years of age. Now, looking back before you were 18 years of age---

- 1) Did you live with anyone who was depressed, mentally ill, or suicidal?
- 2) Did you live with anyone who was a problem drinker or alcoholic?
- 3) Did you live with anyone who used illegal street drugs or who abused prescription medications?
- 4) Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?
- 5) Were your parents separated or divorced?
- 6) How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?
- 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. Would you say—
- 8) How often did a parent or adult in your home ever swear at you, insult you, or put you down?
- 9) How often did anyone at least 5 years older than you or an adult, ever touch you sexually?
- 10) How often did anyone at least 5 years older than you or an adult, try to make you touch sexually?
- 11) How often did anyone at least 5 years older than you or an adult, force you to have sex?

#### Response Options

##### Questions 1-4

1=Yes  
2=No  
7=DK/NS  
9=Refused

##### Question 5

1=Yes  
2=No  
8=Parents not married  
7=DK/NS  
9=Refused

##### Questions 6-11

1=Never  
2=Once  
3=More than once  
7=DK/NS  
9=Refused



## 8. References

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- <sup>1</sup> Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., & Koss, M. P. (1998) Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood.
- <sup>2</sup> Shonkoff JP, Garner AS; American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232– e246. <http://pediatrics.aappublications.org/content/129/1/e232.full>. Accessed March 8, 2018
- <sup>3</sup> Center on the Developing Child at Harvard University. Key concepts: toxic stress. [http://developingchild.harvard.edu/topics/science\\_of\\_early\\_childhood/toxic\\_stress\\_response](http://developingchild.harvard.edu/topics/science_of_early_childhood/toxic_stress_response).
- <sup>4</sup> Fang X, Brown DS, Florence CS, Mercy JA. The economic burden of child maltreatment in the United States and implications for prevention. *Child Abuse & Neglect*. 33(2), 2012. Pp.156-165.
- <sup>5</sup> Harris, Nadine Burke. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. Houghton Mifflin Harcourt Publishing Company. 2018
- <sup>6</sup> National Research Council and Institute of Medicine. *Preventing Mental, Emotional and Behavioral Disorders Among Young People: Progress and Possibilities*, 2009. Washington, DC: The National Academies Press. Available online: [http://www.nap.edu/catalog.php?record\\_id=12480](http://www.nap.edu/catalog.php?record_id=12480). Accessed March 22, 2018.
- <sup>7</sup> Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. <https://www.cdc.gov/brfss/>
- <sup>8</sup> New York State Department of Health. Expanded Behavior Risk Factor Surveillance System (Expanded BRFSS) <https://www.health.ny.gov/statistics/brfss/expanded/>
- <sup>9</sup> BRFSS Combined Landline and Cell Phone Weighted Response Rates by State, 2016 [https://www.cdc.gov/brfss/annual\\_data/2016/pdf/2016\\_ResponseRates\\_Table.pdf](https://www.cdc.gov/brfss/annual_data/2016/pdf/2016_ResponseRates_Table.pdf)
- <sup>10</sup> Prewitt, E. State ACE Survey Results. ACEs Connection. <http://www.acesconnection.com/g/state-aces-action-group/blog/state-ace-survey-reports> Accessed March 27, 2018.
- <sup>11</sup> Council on Children and Families. *Adverse Childhood Experiences Among New York’s Adults*, 2010. [http://ccf.ny.gov/files/4713/8262/2276/ACE\\_BriefTwo.pdf](http://ccf.ny.gov/files/4713/8262/2276/ACE_BriefTwo.pdf)
- <sup>12</sup> Inter-University Consortium for Political and Social Research. Project on Human Development in Chicago Neighborhoods. <https://www.icpsr.umich.edu/icpsrweb/PHDCN/instruments.jsp> Accessed March 23, 2018.
- <sup>13</sup> Bethell, CD, Davis, MB, Gombojav, N, Stumbo, S, Powers, K. Issue Brief: A national and across state profile on adverse childhood experiences among children and possibilities to heal and thrive. Johns Hopkins Bloomberg School of Public Health, October 2017. <http://www.cahmi.org/projects/adverse-childhood-experiences-aces/>
- <sup>14</sup> 2017 Monroe County Youth Risk Behavior Survey Report. <https://www2.monroecounty.gov/files/health/DataReports/MC%20YRBS%202017.pdf>
- <sup>15</sup> Conversation with Council for Prevention. <http://councilforprevention.org/>
- <sup>16</sup> Nakazawa, DJ. Seven Ways Childhood Adversity Can Change the Brain. *Psychology Today*. 2015. <https://www.psychologytoday.com/us/blog/the-last-best-cure/201508/7-ways-childhood-adversity-can-change-your-brain>. Accessed March 22, 2018
- <sup>17</sup> Center on the Developing Child at Harvard University (2015). Supportive Relationships and Active Skill-Building Strengthen the Foundations of Resilience: Working Paper No. 13. Retrieved from [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu).
- <sup>18</sup> Meaney MJ. Maternal care, gene expression and the transmission of individual differences in stress reactivity across generations. *Annual Review of Neuroscience* 2001. 24:1161–192
- <sup>19</sup> Tough, Paul. The Poverty Clinic – Can a stressful childhood make you a sick adult? *The New Yorker*. March 21, 2011. <https://www.newyorker.com/magazine/2011/03/21/the-poverty-clinic>. Accessed March 22, 2018.
- <sup>20</sup> Danese A, Moffitt TE, Harrington H, Milne BJ, Polanczyk G, Pariante CM, Poulton R, Caspi A. Adverse Childhood Experiences and Adult Risk Factors for Age-Related Disease: Depression, Inflammation, and Clustering of Metabolic Risk Markers. *Arch Pediatr Adolesc Med*. 2009 December;163(12): 1135–1143. doi:10.1001/archpediatrics.2009.214.
- <sup>21</sup> Harris, Nadine Burke. *The Deepest Well: Healing the Long-Term Effects of Childhood Adversity*. Houghton Mifflin Harcourt Publishing Company. 2018. p.194

- 
- <sup>22</sup> Albaek AU, Kinn LG, Milde AM. Walking Children Through a Minefield. *Qualitative Health Research*, 2018, Vol 28(2) 231-244. <http://journals.sagepub.com/doi/10.1177/1049732317734828>
- <sup>23</sup> New York State Department of Health. Updating the Prevention Agenda for 2019-2014. [https://www.health.ny.gov/prevention/prevention\\_agenda/2019-2024/background.htm](https://www.health.ny.gov/prevention/prevention_agenda/2019-2024/background.htm)
- <sup>24</sup> SAMHSA. Trauma-Informed Approach and Trauma-Sensitive Interventions. <https://www.samhsa.gov/nctic/trauma-interventions>
- <sup>25</sup> Ko, S. & Sprague, C. (2007). Service System Brief: Creating Trauma-Informed Child-Serving Systems. [http://www.nctsnet.org/sites/default/files/assets/pdfs/Service\\_Systems\\_Brief\\_v1\\_v1.pdf](http://www.nctsnet.org/sites/default/files/assets/pdfs/Service_Systems_Brief_v1_v1.pdf)
- <sup>26</sup> American Academy of Pediatrics. The Resilience Project. <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/resilience/Pages/Clinical-Assessment-Tools.aspx>
- <sup>27</sup> Augeo Foundation. The Hague Protocol: a scientific approach to detect child maltreatment based on parental characteristics at the hospital Emergency Department. <https://www.augeo.nl/-/media/Files/Bibliotheek/Engels/Project-Description-Parental-Child--Check-2016-Norway.ashx?la=en>
- <sup>28</sup> Waters, R. The Hague Protocol: Identifying Kids at risk by interviewing parents in the ER. ACES TOO HIGH News. <https://acestoohigh.com/2017/09/12/the-hague-protocol-identifying-kids-at-risk-by-interviewing-parents-in-the-er/>