

Effect of Disability and Exposure to High Levels of Adverse Childhood Experiences on Health Outcomes

In 2019, over two-thirds of Michigan adults reported one or more Adverse Childhood Experiences (ACEs). ACEs are potentially traumatic events that occur in childhood (0-17 years). These can include experiencing violence, abuse, or neglect, and growing up in a family with mental health or substance use problems, among others. Traumatic events in childhood can be emotionally painful or distressing and can have effects that can last for years. A child's response to trauma can also be shaped by factors such as nature, the frequency and seriousness of the event, prior history of trauma, and available familial and community supports. Having experienced four or more ACEs is linked to significantly poorer health outcomes later in life¹.

While there is significant current and ongoing research on the intersectionality of ACEs with demographic subgroups of gender, race, ethnicity, income and sexual orientation, examination of disability in discussions of ACEs intersectionality is limited at this writing. Recognizing this gap and using data from the 2019 Michigan Behavioral Risk Factor Survey, this brief will examine the distribution of ACEs among disabled Michigan adults and compare the prevalence of health outcomes by disability status among Michigan adults with high ACE exposure. The purpose of this work is to raise awareness about the disparities identified, and about the need to include disability data and the disability community in research and discussion of ACEs and intersectionality.

Background

Individually, the populations examined in this brief – people who have experienced Adverse Childhood Experiences, and people with disabilities – face significant and well-documented health disparities.^{1,2} To date, there has been limited exploration of the intersectionality of these populations. Both groups are vulnerable to being 'blamed' for the health disparities they experience, with inequalities attributed to individual behavior or membership in the population itself, rather than systemic barriers³. Examination of intersectionality is critical because it reveals this attribution error as one-dimensional and contributes to a more nuanced picture of how multiple identities can amplify inequities.

What is the Michigan Behavioral Risk Factor Surveillance System (BRFSS)?

The Michigan BRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the Centers for Disease Control and Prevention (CDC). The Michigan BRFSS follow the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions, and preventive health care practices related to the leading causes of mortality, morbidity and disability. Landline and cell phone interviews are conducted across each calendar year.

Data are weighted to adjust for the probabilities of selection and a raking weighting factor is used to adjust for the distribution of the Michigan adult population based on eight demographic variables.

All analyses are performed using SAS-callable SUDAAN® to account for the complex sampling design.

Methods

BRFSS is a telephone-based health survey of adult Michigan residents that provides statewide data on the prevalence of chronic health conditions, health-related behaviors, medical conditions, and preventive health care practices. The Michigan BRFSS provides cross-sectional data, and a temporal relationship cannot be established. To improve the generalizability of the data, making it possible to draw conclusions about the health of Michiganders, the CDC weighted survey data using iterative proportional fitting, also known as raking, to account for demographic differences between the survey sample and Michigan's population.

The 2019 Michigan BRFSS survey included six nationally recognized disability status questions (Table 1). Respondents who answered “yes” to one or more questions about hearing, vision, cognition, mobility, self-care and/or independent living disability were classified as having a disability. Respondents who said “no” to all six questions were classified as not having disabilities.

Table 1: Disability Module Questions

1. Are you deaf or do you have serious difficulty hearing? (hearing)
2. Are you blind or do you have serious difficulty seeing, even when wearing glasses? (vision)
3. Because of a physical, mental or emotional condition, do you have serious difficulty concentrating, remembering or making decisions? (cognition)
4. Do you have serious difficulty walking or climbing stairs? (mobility)
5. Do you have difficulty dressing or bathing? (self-care)
6. Because of a physical, mental or emotional condition, do you have difficulty doing errands alone such as visiting a doctor’s office or shopping? (independent living)

In the 2019, Michigan BRFSS survey, the ACE module consisted of 11 questions that measure events experienced in childhood (0-17 years). Six questions captured household dysfunction, five questions captured childhood abuse and these 11 questions captured eight ACE categories, as indicated in Table 2. The ACE score was created based on these eight ACE categories to measure cumulative ACE exposure. Exposure to any single category counted as one point toward the score. The final ACE score was the sum of the total number of points accumulated; scores ranged from zero to eight. Respondents who reported zero ACEs were considered to have no ACE exposure; one to three ACEs were considered low ACE exposure; and four to eight ACEs were considered high ACE exposure.

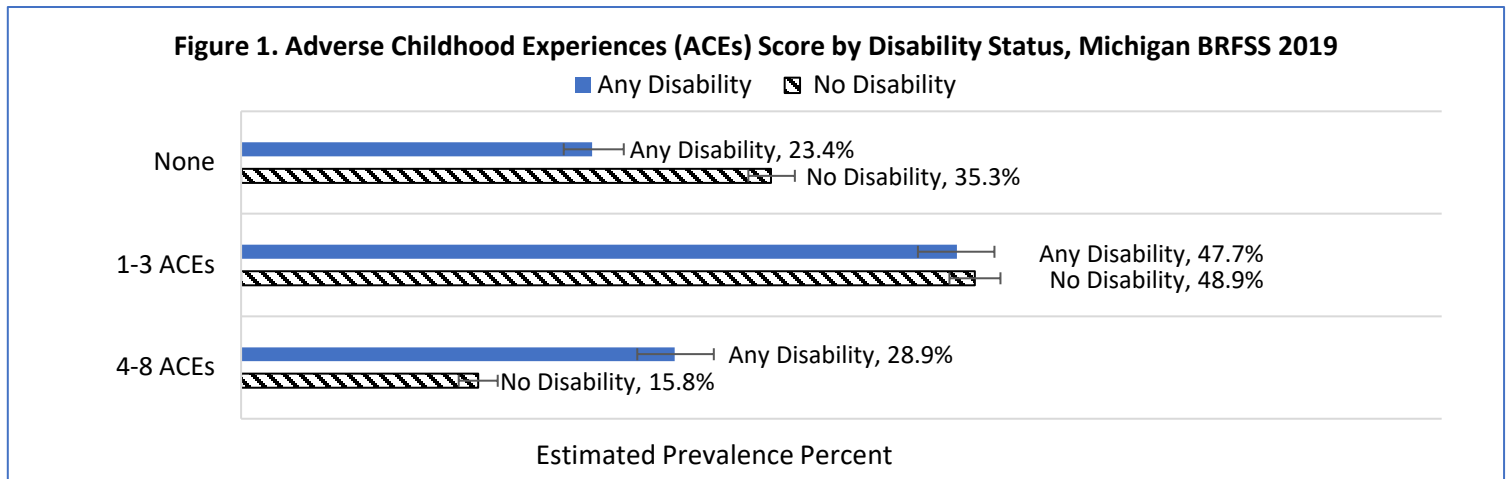
Table 2. Adverse Childhood Experiences Module

ACEs Category	Related Question/s <i>Answer options: 1-5, (Yes/No); 6-11, (Never/Once/More than once)</i>
Mental illness	1. Did you live with anyone who was depressed, mentally ill or suicidal?
Substance use	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?
Incarceration	4. Did you live with anyone who served time or was sentenced to serve time in a prison, jail or other correctional facility?
Divorce	5. Were your parents separated or divorced?
Violence	6. How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up?
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.
Emotional abuse	8. How often did a parent or adult in your home ever swear at you, insult you or put you down?
Sexual abuse	9. How often did anyone at least five years older than you or an adult touch you sexually? 10. How often did anyone at least five years older than you or an adult force you to have sex? 11. How often did anyone at least five years older than you or an adult try to make you touch them sexually?

Demographic characteristics of respondents included age, gender, race/ethnicity, education level, household income, health insurance and employment status. Health outcomes included self-reported indicators: fair or poor general health, depressive disorders, cardiovascular disease, current asthma/lifetime asthma, kidney disease, chronic obstructive pulmonary disease (COPD), cancer, diabetes, arthritis, obesity and high blood pressure. This brief will assess the distribution of ACEs by disability status and the selected characteristics of Michigan adults with high ACE exposure by disability status. This brief also compares the prevalence of health outcomes by disability status among Michigan adults with high ACE exposure.

Results

Distribution of ACEs by disability status. Based on 2019 Michigan BRFSS data, it is estimated that more than 2 in 3 (68.3%) adults reported having one or more ACEs that occurred before the age of 18: 23.9% for one ACE; 13.8% for two ACEs; 10.8% for three ACEs; and 19.8% for four or more ACEs. In 2019, almost 1 in 3 Michiganders (30.4%) had a disability. Figure 1 shows the distribution of ACEs by disability status among Michigan adults. Among those with disabilities, 28.9% reported high ACE exposure (four to eight ACEs) compared to 15.8% of those without disabilities.



Demographic Characteristics by disability status. Table 3 displays select demographic characteristics by disability status among adults with high ACE exposure. Chi-square tests were conducted to test associations between disability status and each demographic characteristic among adults with high ACE exposure. Significant differences were observed in age, education, household income and employment status. Gender, race/ethnicity, and health insurance did not differ significantly by disability status. Specifically, adults with less than a high school education, people with a household income of less than \$20,000 and individuals not working were more prevalent among people with disabilities.

Table 3. Selected Characteristics of Michigan Adults with High ACE Exposure (4–8 ACEs) by Disability Status, Michigan BRFSS, 2019

Demographic characteristic	Any Disability (%)	95% CI	No Disability (%)	95% CI
Age*				
18-24	17.4	(12.8-23.2)	16.7	(13.1-21.1)
25-34	18.6	(14.5-23.4)	26.8	(22.9-31.1)
35-44	16.8	(13.1-21.3)	20.3	(16.9-24.2)
45-54	18.0	(14.4-22.3)	14.6	(11.8-17.9)
55-64	18.1	(14.5-22.3)	13.8	(11.3-16.8)
65-74	7.9	(6.2-10.1)	6.1	(4.8-7.8)
75+	3.2	(2.2-4.5)	1.7	(1.1-2.8)
Gender				
Male	40.6	(35.1-46.2)	43.7	(39.3-48.2)
Female	59.4	(53.8-64.9)	56.3	(51.8-60.7)
Race/Ethnicity				
White non-Hispanic	75.8	(70.4-80.5)	71.1	(66.7-75.1)
Black non-Hispanic	12.1	(9.0-16.2)	15.7	(12.5-19.5)
Other non-Hispanic	4.3	(2.8-6.5)	5.5	(4.0-7.4)
Hispanic	7.7	(4.6-12.8)	7.8	(5.5-10.8)
Education*				
< High school	23.8	(18.4-30.3)	7.1	(4.3-11.4)
High school grad	30.6	(26.0-35.5)	29.1	(25.1-33.4)
Some college	33.8	(29.1-38.7)	42.3	(37.9-46.8)
College grad	11.8	(9.6-14.5)	21.5	(18.7-24.7)

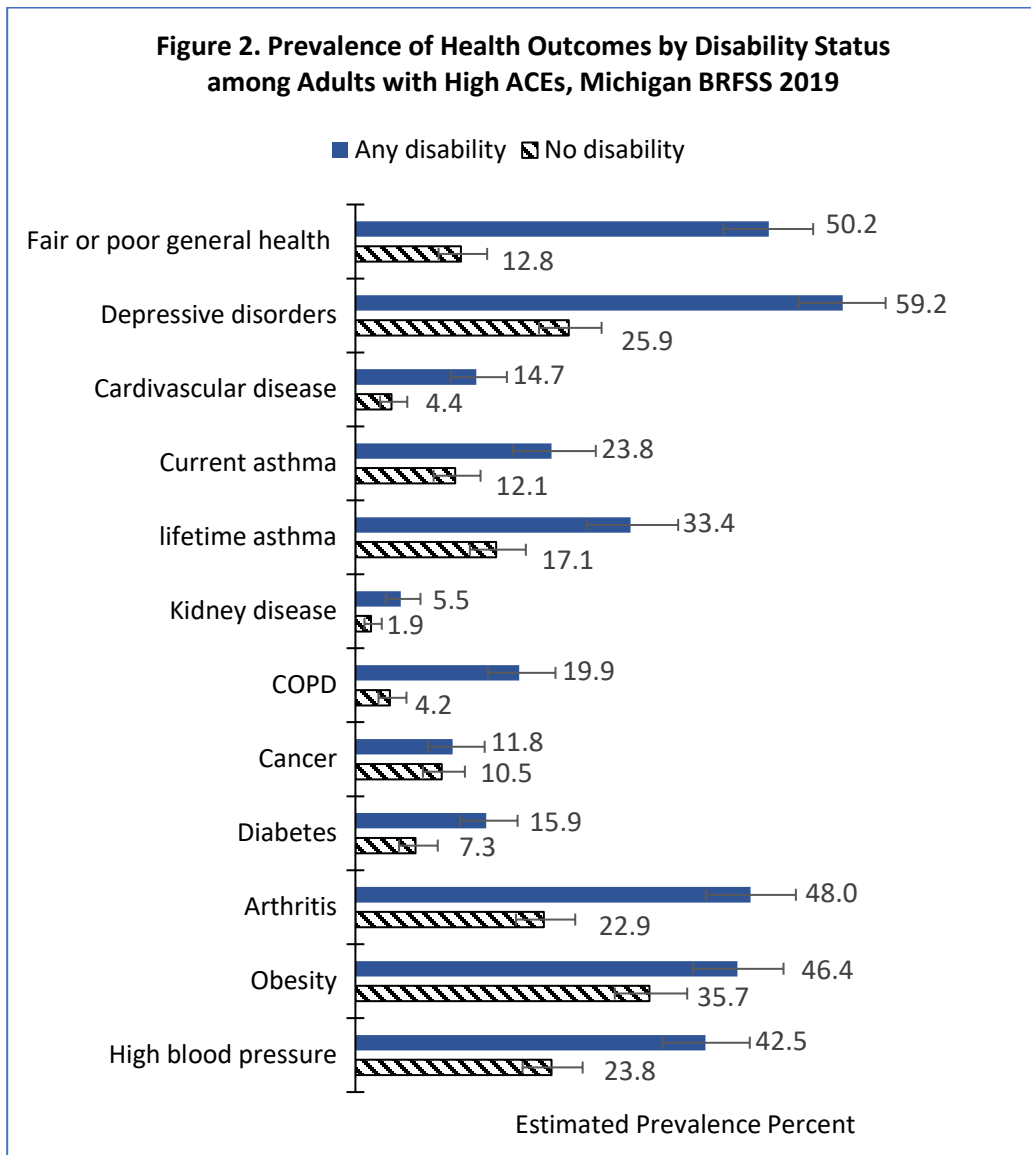
Demographic characteristic	Any Disability (%)	95% CI	No Disability (%)	95% CI
Household Income*				
< \$20,000	36.9	(31.3-42.8)	13.5	(10.5-17.2)
\$20,000 - \$34,999	27.9	(22.8-33.6)	22.5	(18.9-26.6)
\$35,000 - \$49,999	13.0	(9.6-17.3)	9.8	(7.6-12.7)
\$50,000 - \$74,999	10.0	(7.2-13.7)	16.5	(13.3-20.2)
\$75,000 +	12.3	(9.3-16.1)	37.6	(33.3-42.2)
Health Insurance				
Insured	88.0	(83.8-91.2)	89.8	(86.8-92.1)
Uninsured	12.0	(8.8-16.2)	10.2	(7.9-13.2)
Employment Status*				
Employed	48.5	(43.0-54.0)	69.2	(64.7-73.4)
Unemployed	7.1	(4.9-10.0)	6.5	(4.3-9.5)
Non-working	44.4	(39.2-49.8)	24.3	(20.5-28.6)

CI = confidence interval. ACE = Adverse Childhood Experience.

* Chi-Square test p-value < 0.05.

Prevalence of Health Outcomes by disability status

Figure 2 displays the prevalence of health outcomes by disability status among adults with high ACE exposure (4-8 ACEs). Overall, these results indicate significant differences between disability status and health outcomes, except cancer, among adults with high ACE exposure. Adults with disabilities had a significantly higher prevalence of fair or poor general health than people without disabilities (50.2% vs. 12.8%). The prevalence of depressive disorders was significantly higher among adults with disabilities (59.2%) than people without disabilities (25.9%). The prevalence of cancer was not significantly different by disability status. Adults with disabilities had a significantly higher prevalence of cardiovascular disease, current asthma, lifetime asthma, kidney disease, COPD, diabetes, arthritis, obesity and high blood pressure than people without disabilities.



Discussion

The disparities revealed by this analysis underscore the importance of the inclusion of disability as a demographic in data collection and reporting about ACEs, such as that found in the Mi-BRFS. Without it, disability is a hidden disparity population whose barriers to prevention and treatment of childhood trauma remain unaddressed.

Adults with disabilities were nearly twice as likely to have a high ACEs score; and among adults who have a high ACEs score, people with disabilities have significantly poorer health outcomes. Because the cross-sectional data of the Michigan BRFS cannot establish a temporal relationship, we cannot address causation. Nonetheless, it is worth examining the documented ways ACEs and disability intersect. High ACEs scores result in significantly increased prevalence of injuries and chronic conditions, which can cause disability¹. In addition, children with disabilities have been found to be at increased risk of ACEs⁴.

While this relationship is complex, it offers abundant opportunities for further examination and discussion. Exposure to ACEs does not always result in trauma or toxic stress; supportive relationships, protective systems and positive coping strategies can mitigate negative outcomes¹. Preventing the exclusion of children with disabilities from resilience-building factors and protective relationships by ensuring accessibility and inclusion in schools and communities, and increasing awareness among parents and caregivers of the increased risk of ACEs, represent possible avenues for intervention. More research on this topic at the national level is needed to increase understanding and inform the creation of effective, inclusive interventions.

References

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