hpio health policy institute of ohio

Health **Policy** Brief

Adverse Childhood Experiences (ACEs)

Economic Impact of ACEs in Ohio

Overview

Exposure to adversity in childhood is a pervasive problem in Ohio and across the country with severe, long-term health impacts that persist into adulthood. Nearly two-thirds of Ohioans have been exposed to an adverse childhood experience (ACE), with more than one-third of Ohioans exposed to two or more ACEs.[1] Nationally, Ohio is in the bottom quartile on ACEs exposure (ranking 39 out of 50 states and D.C.), indicating a higher percent of children exposed to two or more ACEs compared to many other states.[2]

According to HPIO's ***2019 Health Value Dashboard***, Ohio ranks 46 out of 50 states and D.C. on health value – a composite measure of Ohio's rank on health outcomes and healthcare spending. This means that Ohioans live less healthy lives and spend more on health care than people in most other states.

The research is clear that ACEs result in both significant health and economic impacts. Economic costs from ACEs are incurred across the public and private sectors, including substantial costs to the healthcare system.[3] The economic burden of ACEs also impacts the state child protection, behavioral health, criminal justice and education systems, as well as private sector businesses. By preventing and mitigating the impacts of ACEs, policymakers and others can put Ohio on a path towards improved health value.

This brief builds on HPIO's **Adverse Childhood Experiences (ACEs): Health Impact of ACEs in Ohio** by:

- Summarizing national research on the economic costs associated with ACEs exposure
- Providing new data and analysis on the economic impacts of ACEs in Ohio

More specifically, this brief expands on what we know from national research by providing Ohio data to answer the following questions:

- How does ACEs exposure impact healthcare costs?
- To what extent does ACEs exposure contribute to lost productivity?
- What is the impact of specific types of ACEs on economic costs?

3 key findings for policymakers

- **Preventing ACEs can reduce healthcare and other spending.** If ACEs exposure were eliminated, more than $10 billion in annual healthcare and related spending could be avoided in Ohio. Approximately $319 million in lost wages due to missed work days could also be prevented annually if ACEs exposure were eliminated.
- **Focusing action on specific ACEs, particularly those associated with behavioral health, can yield significant savings.** For example, over $4.5 billion in annual spending to treat depression is attributed to ACEs exposure. Significant healthcare costs for treating depression could be avoided by focusing on preventing and mitigating the impacts of emotional and sexual abuse and living in a household with someone who has a mental health problem.
- **Economic costs associated with ACEs extend beyond health impacts.** ACEs exposure results in economic burdens to individuals, families and society, including impacts on both the public and private sectors.

Inside

Figure 1. **What is considered an ACE?**

Abuse	Household challenges	Neglect
• Emotional abuse • Physical abuse • Sexual abuse	• Intimate partner violence • Substance use in the household • Mental illness in the household • Parental separation or divorce • Incarcerated member of the household	• Emotional neglect • Physical neglect

Source: Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention

What are ACEs?

ACEs are defined as "potentially traumatic events" that occur during childhood (ages 0-17).[4] There is variation among researchers in what is considered an ACE. However, ACEs can generally be grouped into three categories: abuse, household challenges and neglect. Figure 1 lists ACEs included in these categories as defined by the Behavioral Risk Factor Surveillance System (BRFSS).[5]

How do ACEs impact economic costs?

Beyond specific health impacts such as depression, heavy drinking and poor respiratory health, ACEs exposure results in direct and indirect costs to individuals, families and society at large. This includes costs to public- and private-sector institutions due to reduced quality of life and lost productivity.

This section provides an overview of the existing national and state literature on the economic costs of ACEs in the following categories:

- Child protection
- Criminal justice
- Health care
- Lost productivity

Child protection costs

Experiencing an ACE increases the likelihood of child protection system involvement.[6] Children typically become connected with the child protection system after a report of potential child abuse or neglect by a parent or caregiver.[7] Children involved in protective services are more likely to experience multiple ACEs. In fact, among U.S. children in the child protection system, more than half have experienced four or more ACEs.[8]

Summary of health impacts of ACEs in Ohio

Analysis conducted in HPIO's brief, **Adverse Childhood Experiences (ACEs): Health Impact of ACEs in Ohio**[9], found that:

1. **Exposure to ACEs is a pervasive problem:**
   - Nearly two-thirds (61%) of Ohio adults reported exposure to ACEs.
   - Ohioans of color, with low incomes, with disabilities and/or who are residents of urban and Appalachian counties were more likely to experience multiple ACEs.
   - Ohioans who reported experiencing multiple ACEs were also more likely to report the following negative health outcomes and behaviors:
     - Ever being diagnosed with depression, asthma and/or poor respiratory health
     - Current smoking and/or heavy drinking
     - Delaying health care because of cost in the past year
2. **Preventing ACEs can improve health.** A significant percentage of negative health outcomes could be prevented if exposure to multiple ACEs were eliminated. For example, if exposure to ACEs were eliminated in Ohio, an estimated 36% of depression diagnoses could be prevented.
3. **Focusing action on specific ACEs may yield more significant health impacts.** Data analysis suggests that preventing and mitigating the impacts of emotional and sexual abuse and living in a household with someone who has a substance use disorder, mental health problem or who is incarcerated are likely to have the largest impacts on the health of Ohioans.

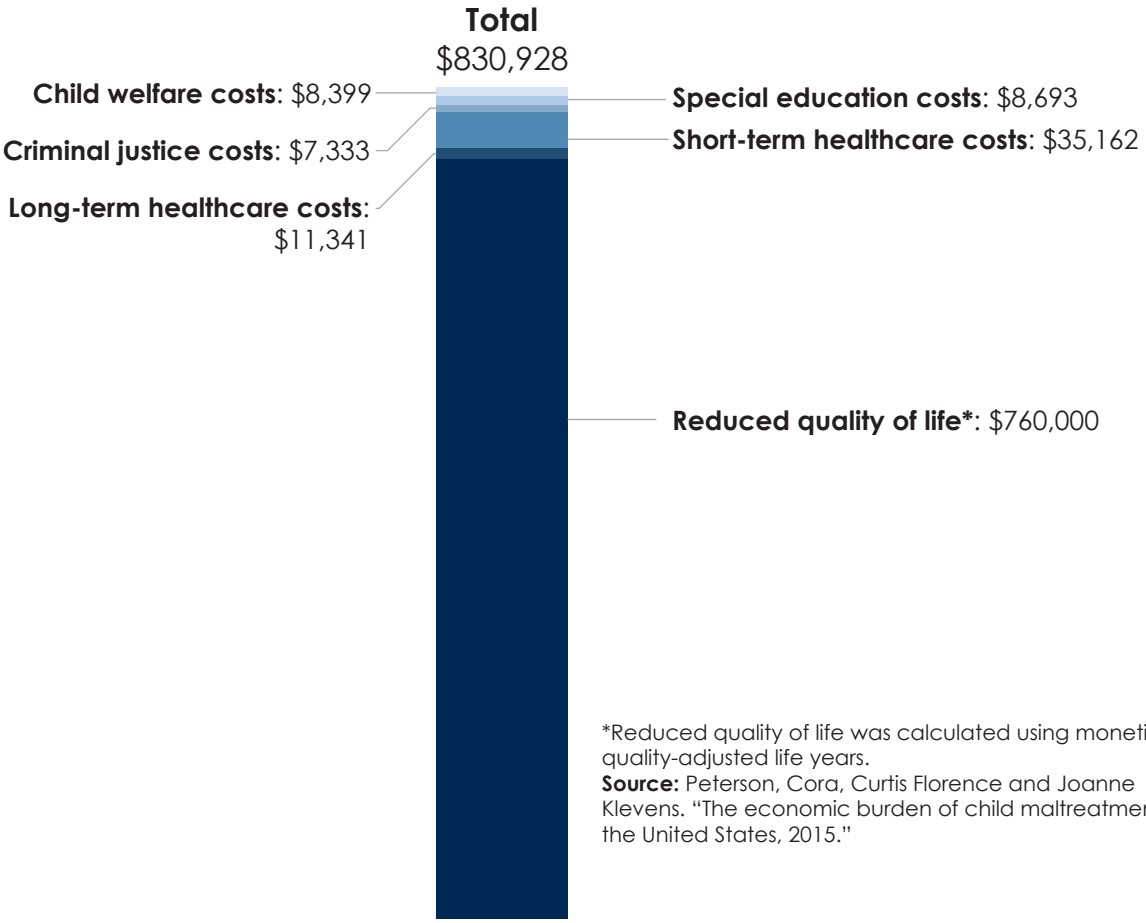
What we know and don't know about the economic costs of ACEs

National and Ohio-specific research on the connections between ACEs and economic costs is limited, especially in sectors other than health care. For this reason, proxies such as average costs to the child protection system are often used instead.

Figure 2 summarizes study findings of the average per-person lifetime cost of child maltreatment (abuse and neglect), using 2015 data. For each person affected by nonfatal child maltreatment in the U.S., lifetime costs translated to over $830,928 in child welfare, criminal justice and short- and long-term healthcare costs, as well as reduced quality of life.[10] These findings build on prior research from the Centers for Disease Control and Prevention (CDC).[11]

In 2017, 24,987 Ohio children were victims of abuse or neglect.[12] If each of those children accrued $830,928 in costs over their lifetime (see figure 2), this would amount to roughly $20.8 billion in potential costs in Ohio. Notably, this is likely an underestimate of the true burden of child abuse and neglect in Ohio because maltreatment is often underreported.[13]

Figure 2. **Estimated lifetime cost attributable to nonfatal child maltreatment per individual, 2015**



*Reduced quality of life was calculated using monetized quality-adjusted life years.
Source: Peterson, Cora, Curtis Florence and Joanne Klevens. "The economic burden of child maltreatment in the United States, 2015."

In Ohio, Public Children Services Agencies (PCSAs) are responsible for providing child protective services to children and families. In 2018, Ohio PCSAs screened 101,243 reports of child abuse and neglect, household substance use and families in need of other services. This equates to roughly $10,991 spent by PCSAs per child in 2018[4] and includes costs associated with investigating potential cases of abuse or neglect, finding permanent and temporary placements for children and providing support and assistance to families. Research suggests that these children are at risk of poorer physical and behavioral health outcomes, especially if placed in out-of-home care[15], which may translate to increased healthcare and other costs later in life.

Household substance use is another ACE that often contributes to involvement with the child protection system. In 2018, 33.1% of all children removed from the home in Ohio were removed due to parental substance use/abuse.[16] For more information about the connections between substance use, addiction and the Ohio child protection system, see HPIO's **Ohio addiction policy scorecard: Children, youth and families**.

Criminal justice costs

There is a significant amount of research connecting ACEs to increased involvement in the juvenile justice and adult criminal justice systems. Exposure to trauma and violence in childhood increases the likelihood of violent behavior later in life.[17] ACEs such as parental divorce[18], parental incarceration[19] and intimate partner violence[20] have all been tied to increased juvenile delinquency. ACEs exposure and childhood trauma have also been linked to youth gang involvement[21], violence perpetration[22] and increased involvement in the juvenile justice system.[23]

As the number of ACEs experienced by a juvenile offender increases, so does the risk of reoffending or relapsing into delinquent behavior.[24] The effects of ACEs continue into adulthood, where it is estimated that experiencing childhood abuse and neglect increases the likelihood of engaging in criminal behavior as an adult by 28%.[25]

In fiscal year 2019, the average annual cost for a child in juvenile custody in Ohio was $190,399.[26] The average annual cost per incarcerated adult in Ohio was $30,558 in fiscal year 2020.[27] Juvenile justice and adult criminal justice system costs include spending related to arrests, judicial processing, probation and housing.[28] As of October 2020, there were 364 juveniles[29] and 44,598 adults[30] detained in Ohio facilities.

Healthcare costs

Household out-of-pocket healthcare costs are estimated to be 18% higher for individuals exposed to one or two ACEs and 30% higher for those exposed to three or more ACEs, as compared to those who were not exposed to ACEs.[31]

Experiencing child abuse and neglect results in significant financial costs to the Medicaid system. One study found that children who experienced abuse and neglect had average Medicaid expenditures nearly 70% higher per year than children who did not experience abuse and neglect.[32] For context, in fiscal year 2018, approximately 976,000 children were enrolled in Medicaid in Ohio with average costs of $2,875 each.[33]

In addition, ACEs exposure can result in significant behavioral health costs. A 2019 study estimated ACE-related annual costs of drug use at $168 billion, alcohol use at $73 billion and smoking at $160 billion in North America.[34]

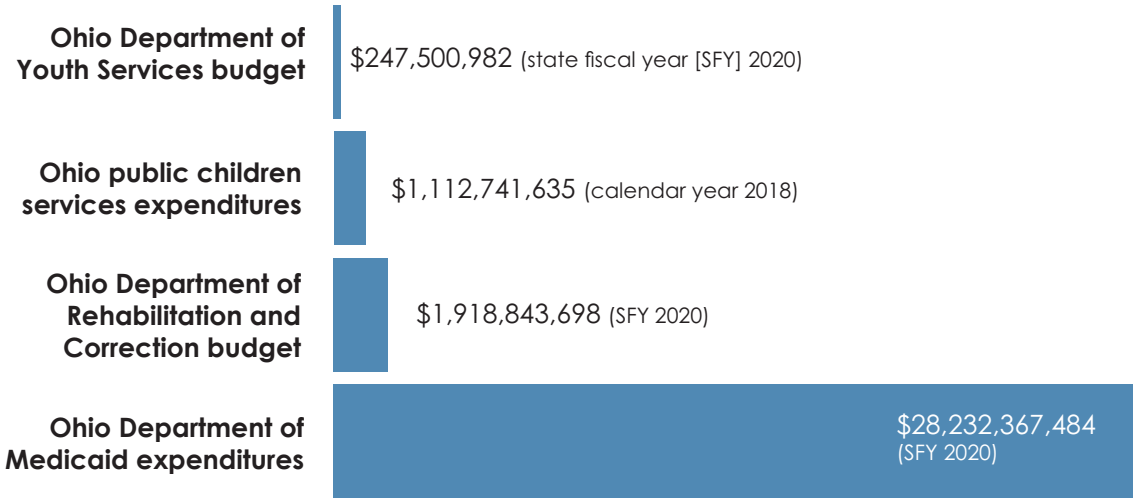
Lost productivity costs

ACEs exposure also increases the risk of lost productivity through reduced employment and lifetime earnings. Adults who experienced abuse and neglect as children may earn about $5,000 less each year[35] and are two times more likely to be unemployed than adults who did not experience childhood abuse or neglect.[36] Furthermore, early death and disability attributable to ACEs reduce lifetime productivity and income by cutting short or reducing the number of years that a person can work. This loss in productivity includes both lost income for individuals and their families, as well as larger losses to state economies.

Who bears the costs of ACEs?

In addition to direct costs, like healthcare expenses, borne by those who experience ACEs, indirect costs of ACEs are incurred more broadly by communities and society as a whole. As shown in figure 3, costs across the child protection, criminal justice and healthcare systems are significant in Ohio. These costs are not entirely attributed to ACEs; however, ACEs and the poor outcomes they cause are contributing factors.

Figure 3. **Annual cost of child protection, criminal justice and Medicaid systems in Ohio**



Sources
ODYS: Monthly Fact Sheet. Ohio Department of Youth Services, November 2020
PCSAs: PCSAO Factbook. Public Children Services Association of Ohio, 2019
ODRC: Monthly Fact Sheet. Ohio Department of Rehabilitation and Correction, October 2020
ODM: Ohio Medicaid Budget Variance Report. Ohio Department of Medicaid, June 2020

Some communities bear a higher proportion of these costs than others. As discussed in **Health Impact of ACEs in Ohio**, Ohioans of color, with low incomes, with disabilities and/or who are residents of urban and Appalachian counties are more likely to experience multiple ACEs.

The negative impacts of ACEs exposure on these communities can be compounded by other inequities they face. For example, Ohioans with disabilities have higher healthcare costs and are often paid lower wages than Ohioans without disabilities.[37] Black Ohioans are disproportionally incarcerated and experience higher levels of unemployment compared to Ohioans of other races.[38] These inequities contribute to poor health outcomes, have financial implications and can exacerbate the negative impacts of ACEs.[39]

What is the economic impact of ACEs in Ohio?

Building on national research findings on the economic costs of ACEs, this analysis provides Ohio-specific data to answer the following questions:

- How much does ACEs exposure cost Ohio?
- To what extent does ACEs exposure contribute to lost productivity in Ohio?
- How much do specific types of ACEs cost Ohio?

This analysis

This brief builds on HPIO's analysis of the BRFSS ACEs module data discussed in **Health Impact of ACEs in Ohio**. In that analysis, HPIO estimated population attributable risk (PAR) for ACEs exposure for three health outcomes (asthma, chronic obstructive pulmonary disorder [COPD] and depression), two health risk behaviors associated with addiction (smoking and heavy drinking) and inability to afford health care.[40] Inability to afford health care is excluded from this analysis due to a lack of reliable data to attribute costs to this outcome.

HPIO used findings from **Health Impact of ACEs in Ohio**, along with data from the sources listed below, to estimate:

- Annual costs (primarily healthcare costs) associated with asthma, COPD, depression, smoking and heavy drinking
- Annual costs associated with these conditions and health behaviors attributable to ACEs
- Missed work days and lost wages due to COPD and depression attributable to ACEs

Data sources

- **Medical Expenditure Panel Survey (MEPS), Agency for Healthcare Research and Quality (AHRQ)**
- **Smoking-Attributable Morbidity, Mortality, and Economic Costs (SAMMEC) - Smoking-Attributable Expenditures (SAE) dataset, Centers for Disease Control and Prevention (CDC)**
- A **CDC study of the economic costs attributable to excessive drinking published in the *American Journal of Preventive Medicine***
- **State Occupational Employment and Wage Estimates, U.S. Bureau of Labor Statistics (BLS)**

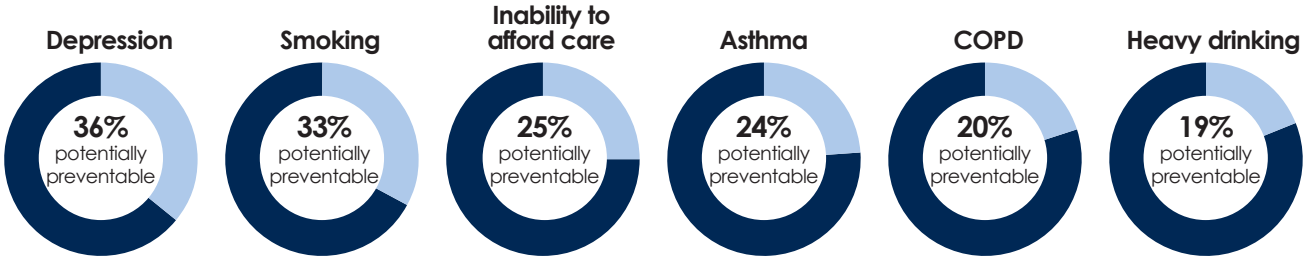
More detail about the data sources is available in the **Appendix**.

In this analysis, estimates from all sources were adjusted for inflation to 2020 dollars using the Consumer Price Index Urban All Items deflator.

Population attributable risk (PAR)

Population attributable risk (PAR) is a statistical tool that can be used to envision a future without ACEs and to quantify the return on investment for preventing ACEs. PAR estimates the percentage of an outcome observed in a population that can be attributed to a specific factor. In HPIO's **Health Impact of ACEs in Ohio** analysis, PAR was calculated to estimate the percent of a negative health outcome or condition attributed to ACEs exposure (see figure 4). In that analysis and throughout this brief, unless specifically noted, ACEs exposure is defined as exposure to two or more ACEs.

Figure 4. **Population attributable risk (PAR) for outcomes with a significant relationship to ACEs exposure**



Source: Data from the 2015 BRFSS was provided by the Ohio Department of Health's Division of Health Improvement and Wellness.

*HPIO contracted with researchers from the Ohio University Voinovich School for Leadership and Public Affairs and the University of Wyoming Center for Business and Economic Analysis to analyze data for this brief. For more information about data sources and a detailed methodology of the analysis, see the **Appendix**.*

How much does ACEs exposure impact healthcare costs in Ohio?

In total, depression, asthma, COPD, smoking and excessive drinking account for over $36 billion dollars in annual statewide spending, and more than $10 billion of that can be attributed to ACEs exposure (see figure 5). ACEs exposure is also responsible for $319 million in lost wages due to COPD and depression. This brief's analysis indicates that:

- More than $10 billion in annual costs — shared across state agencies, healthcare and behavioral health providers, employers, consumers and others — could be avoided in Ohio if exposure to ACEs was eliminated.
- Avoiding even 10% of the costs attributable to ACEs would amount to more than $1 billion in savings for Ohio.

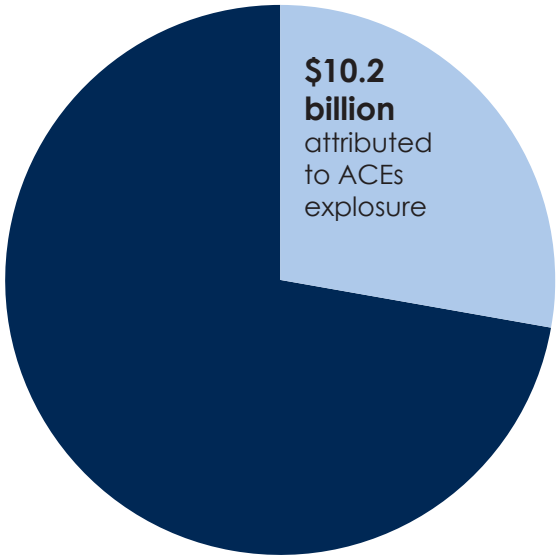
What are the annual healthcare costs attributable to ACEs exposure in Ohio?

Estimates of annual costs attributable to ACEs exposure for asthma, COPD, depression, smoking and excessive drinking range from $625 million to $4.5 billion, totaling more than $10 billion dollars (see figure 6). The cost attributable to ACEs exposure for treating depression alone is more than $4.5 billion per year.

To what extent does ACEs exposure contribute to lost productivity in Ohio?

In addition to reducing healthcare spending, efforts to prevent ACEs could have significant impacts on the productivity and financial well-being of Ohioans. As seen in figure 7, about $319 million in lost wages due to missed work days can be attributed to ACEs exposure. Total annual lost wages attributable to ACEs are $298 million for depression and $21 million for COPD (see figure 7).

Figure 5. **Annual spending on ACEs-associated conditions and behaviors in Ohio and the portion attributable to ACEs exposure (in 2020 dollars)**



Total: $36.3 billion in spending on depression, asthma, COPD, smoking and excessive drinking

Source: Analysis of MEPS and CDC data.

Figure 6. **PARs, total annual healthcare cost in Ohio* and costs attributable to ACEs exposure (in 2020 dollars)**

Condition or behavior	PAR	Total annual healthcare cost to Ohio**	Healthcare cost attributable to ACEs exposure
Depression	36%	$12,499,000,000	$4,500,000,000
Smoking	33%	$6,780,000,000	$2,237,000,000
Asthma	24%	$3,794,000,000	$911,000,000
COPD	20%	$3,123,000,000	$625,000,000
Drinking**	19%	$10,063,000,000	$1,912,000,000
Total		**$36,259,000,000**	**$10,185,000,000**

*Amounts for asthma, COPD and depression are based on cost estimates for the Midwest region, which includes Ohio and 11 other states.
**The dataset used to estimate annual costs related to excessive drinking includes costs other than healthcare costs, such as lost productivity at home and work, criminal justice costs and property damage.
Note: Totals are rounded to nearest million, see Appendix for additional detail.
Source: Analysis of 2018 MEPS, 2009 SAMMEC-SAE, 2010 CDC and 2015 BRFSS

Figure 7. **PARs, total annual lost wages in Ohio and costs attributable to ACEs exposure (in 2020 dollars)**

Condition	PAR	Total cost of missed work days in Ohio	Cost attributable to ACEs exposure
COPD	20%	$106,000,000	$21,000,000
Depression	36%	$827,000,000	$298,000,000
Total		**$934,000,000**	**$319,000,000**

Note: Totals are rounded to nearest million, see Appendix for additional detail. The number of missed work days for asthma is not statistically significant.
Source: Analysis of 2018 MEPS data and U.S. Bureau of Labor Statistics

How much do specific types of ACEs cost in Ohio?

To identify ACEs with the greatest impact on health, HPIO's previous **analysis** calculated a PAR for specific ACEs. This brief builds on that analysis to estimate the annual cost of asthma, COPD, depression, smoking and excessive drinking attributed to specific ACEs with significant health impacts (see figure 8).

The following examples are provided to aid with interpretation of the findings in figure 8:

- 16% of depression diagnoses in Ohio are attributable to emotional abuse during childhood. This means that $2 billion in annual spending to treat depression can be attributed to experiencing emotional abuse. Given the relationship between emotional abuse and depression, a condition that is costly to treat, this analysis suggests that investing in efforts to prevent emotional abuse could lead to significant cost savings.
- 14% of current smoking can be attributed to living in a household with a person with substance use problems during childhood. This means that nearly $1 billion in costs associated with smoking can be

Figure 8. **PARs, estimated total annual cost in Ohio and costs attributable to experiencing specific ACEs (in 2020 dollars)**

Emotional abuse			
Outcome	**PAR**	**Annual cost**	**Cost attributable to ACE**
Depression	16%	$12,499,000,000	$2,000,000,000
Current smoking	12%	$6,780,000,000	$814,000,000
Sexual abuse			
Outcome	**PAR**	**Annual cost**	**Cost attributable to ACE**
Depression	15%	$12,499,000,000	$1,875,000,000
Mental illness in the household			
Outcome	**PAR**	**Annual cost**	**Cost attributable to ACE**
Depression	20%	$12,499,000,000	$2,500,000,000
Asthma	13%	$3,794,000,000	$493,000,000
Substance use in the household			
Outcome	**PAR**	**Annual cost**	**Cost attributable to ACE**
Current smoking	14%	$6,780,000,000	$950,000,000
Incarcerated member of the household			
Outcome	**PAR**	**Annual cost**	**Cost attributable to ACE**
Current smoking	7%	$6,780,000,000	$475,000,000

Note: Totals are rounded to nearest million, see Appendix for additional detail.
Source: Analysis of 2018 MEPS and 2015 BRFSS data.

attributed to living in a household with a person with substance use problems. Given the relationship between this ACE and smoking, a health behavior associated with addiction that leads to serious health problems and high healthcare spending, this analysis suggests that investing in efforts to prevent and mitigate the impacts of substance use could lead to significant cost savings.

- 13% of asthma diagnoses in Ohio are attributable to living in a household with a person with a mental illness during childhood. This means that about $493 million in costs associated with treating asthma can be attributed to living in a household with a person with a mental illness. Given the relationship between this ACE and asthma, this analysis suggests that efforts to prevent and mitigate the impacts of mental illness could lead to significant cost savings.

There are many types of ACEs, and responsibility for funding and implementing prevention and treatment strategies falls across various entities at state and local levels. Concerted efforts that focus resources on preventing and mitigating the impacts of specific types of ACEs can lead to large economic savings.

These findings also highlight that poor behavioral health outcomes, like depression, are incredibly costly to treat. Policymakers and other stakeholders can mitigate significant healthcare costs related to the treatment of depression by focusing efforts on preventing and mitigating the impacts of emotional and sexual abuse and living in a household with someone who has a mental health problem.

An important caveat for interpreting this analysis is that not all of the costs shown in figure 8 can be fully attributed to experiencing the specific ACE alone. Some costs may be attributed to experiencing that ACE in combination with other ACEs.

Considerations for this analysis

- This analysis does not capture the complexity of everyday life, particularly for children and adults who are exposed to trauma and toxic stress. Numerous factors, such as close connections to caring adults and quality education, can protect against the harmful health and economic impacts of ACEs. Other factors, such as being the victim of a violent crime and experiencing racism, may worsen health outcomes and costs. These important nuances are not captured in this analysis.
- There are some differences in variables between BRFSS, used in HPIO's previous analysis, and the data sources used in the current analysis. For example, the definition of excessive drinking in this analysis is broader than the alcohol use variable from BRFSS used in **Health Impact of ACEs in Ohio**, which was limited to heavy drinking. In the CDC study, excessive drinking includes heavy drinking, binge drinking, underage drinking and drinking during pregnancy. According to BRFSS data, however, heavy drinking and other types of excessive drinking are often reported by the same individuals. For example, in 2018, 83.7% of adults ages 18 and older who reported binge drinking also reported heavy drinking. Other differences in variables are noted in the **Appendix**.
- The scope of this analysis was limited to health outcomes and behaviors with statistically significant PARs as identified in **Health Impact of ACEs in Ohio**. ACEs also contribute to other negative health outcomes, such as cancer, heart disease, stroke and diabetes.[41] Better data and further research are needed for a full account of the long-term health and economic consequences of ACEs exposure in Ohio.
- Exposure to ACEs — such as physical abuse, divorce and/or separation of parents or witnessing domestic violence — also contribute to economic costs. However, the PARs for these ACEs were not statistically significant in HPIO's **Health Impact of ACEs in Ohio analysis** and, therefore, are not reflected in this analysis.
- Due to limitations in the datasets used for costs associated with smoking and excessive drinking, HPIO could not estimate lost productivity and lost wages attributable to these behaviors.

Conclusion

This brief's findings provide evidence that preventing ACEs would result in substantial savings for Ohio. More than $10 billion in annual healthcare and related costs shared across state agencies, healthcare providers, employers, consumers and others could be avoided if exposure to multiple ACEs was eliminated. An additional $319 million in lost wages could also be prevented annually. These numbers are conservative estimates of the economic costs of ACEs, focused primarily on healthcare and lost productivity. The total costs of ACEs exposure are likely significantly higher.

Findings in this brief also indicate that Ohio would realize substantial financial savings by mitigating the impacts of, or preventing exposure to, the following ACEs that have significant health impacts on Ohioans:

- Emotional and sexual abuse
- Substance use in the household
- Mental illness in the household
- Incarcerated member of the household

For example, billions of dollars in healthcare costs related to the treatment of depression could be avoided by focusing efforts on preventing and mitigating the impacts of emotional and sexual abuse and living in a household with someone who has a mental health problem. Over $4.5 billion in annual spending to treat depression alone is attributed to ACEs exposure.

If Ohio were successful in avoiding even 10% of the costs attributable to ACEs, more than $1 billion in spending could be saved each year. State policymakers, community leaders and others can use these findings to develop a comprehensive plan that prevents and mitigates the impact of ACEs, improves the overall health and well-being of Ohioans and prevents billions of dollars in annual spending across Ohio's public and private sectors.

Acknowledgments

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Members of HPIO's **ACEs advisory group** contributed information and feedback to this brief. For more information and a detailed methodology of the analysis provided in this brief see the **Appendix**.

Find more resources and tools at HPIO's

Adverse Childhood Experiences (ACEs)
online resource page

www.hpio.net/resource-page-ohio-adverse-childhood-experiences-aces-impact-project

Notes

1. Health Policy Institute of Ohio. "Adverse Childhood Experiences (ACEs): Health Impact of ACEs in Ohio," August 2020.
2. Data from the 2018-2019 National Survey of Children's Health, as analyzed by Health Policy Institute of Ohio. Health Resources and Services Administration. https://www.childhealthdata.org/browse/survey
3. Fang, Xiangming et al., "The Economic Burden of Child Maltreatment in the United States and Implications for Prevention," Child Abuse & Neglect 36, no. 2 (2012): 156-165. doi: 10.1016/j.chiabu.2011.10.006
4. Chang, Xuening et al. "Associations between adverse childhood experiences and health outcomes in adults aged 18–59 years." PloS One 14, no. 2 (2019): e0211850. doi: 10.1371/ journal.pone.0211850; see also "Adverse Childhood Experiences (ACEs); What Are ACEs?" The Children's Bureau, U.S. Department of Health and Human Services. Accessed March 4, 2020. https://www.childwelfare.gov/topics/preventing/preventionmonth/resources/ace/
5. Behavioral Risk Factor Surveillance System (BRFSS) is a tool used to collect state data on health-related measures. BRFSS categories have been modified and adapted from the original ACEs study conducted by the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente in 1995-1997.
6. National Survey of Child and Adolescent Well-Being (NSCAW), No. 20: Adverse Child Experiences in NSCAW. Office of the Administration for Children and Families, U.S. Department of Health and Human Services, 2013.
7. How the Child Welfare System Works. Children's Bureau, U.S. Department of Health and Human Services, 2020.
8. National Survey of Child and Adolescent Well-Being (NSCAW), No. 20: Adverse Child Experiences in NSCAW. Office of the Administration for Children and Families, U.S. Department of Health and Human Services, 2013.
9. HPIO contracted with researchers from the Ohio University Voinovich School for Leadership and Public Affairs to analyze the most-recently available BRFSS ACEs module data for Ohio (from 2015).
10. Peterson, Cora, Curtis Florence and Joanne Klevens. "The economic burden of child maltreatment in the United States, 2015." Child Abuse & Neglect 86 (2018): 178-183. doi: 10.1016/j.chiabu.2018.09.018
11. "Cost of Child Abuse and Neglect Rival Other Major Public Health Problems." National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Accessed December 10, 2020. https://www.cdc.gov/violenceprevention/childabuseandneglect/EconomicCost.html
12. Ohio's Children 2019. Child Welfare League of America, 2019. https://www.cwla.org/wp-content/uploads/2019/04/Ohio-2019.pdf
13. Gilbert, Ruth et al. "Recognizing and Responding to Child Maltreatment." The Lancet 373, no. 9658 (2009): 167-180. https://doi.org/10.1016/S0140-6736(08)61707-9
14. Data from PCSAO Factbook. "State of Ohio Profile." Public Children Services Association of Ohio, 2019. Accessed December 10, 2020. https://www.pcsao.org/pdf/factbook/2019/StateOfOhioProfile.pdf
15. NSCAW II Wave 2 Report: Child Well-Being. Washington, DC: Administration for Children and Families, U.S. Department of Health and Human Services, 2012.; see also Villodas, Miguel T. et al. "Long-term Placement Trajectories of Children who were Maltreated and Entered the Child Welfare System at an Early Age: Consequences for Physical and Behavioral Well-Being." Journal of Pediatric Psychology 41, no. 1 (2016): 46-54. doi: 10.1093/jpepsy/jsv031
16. Health Policy Institute of Ohio. "Ohio Addiction Policy Scorecard: Children, Youth and Families," November 2020.
17. Kimonis, Eva R. et al. "Anger Mediates the Relation Between Violent Exposure and Violence Perpetration in Incarcerated Boys." Child and Youth Care Forum 40 (2011): 381-400. https://doi.org/10.1007/s10566-010-9121-7; see also Aebi, Marcel et al. "Posttraumatic Stress and Youth Violence Perpetration: A Population-Based Cross-Sectional Study." European Psychiatry 40 (2017): 88-95. https://doi.org/10.1016/j.eurpsy.2016.08.007
18. Burt, S.A. et al. "Parental divorce and adolescent delinquency: ruling out the impact of common genes." Developmental psychology 44, no. 6 (2008): 1668-77. doi:10.1037/a0013477; see also Amato, Paul R. "Children of divorce in the 1990s: an update of the Amato and Keith (1991) meta-analysis." Journal of Family Psychology 15, no. 3 (2001): 355-70. doi: 10.1037//0893-3200.15.3.355
19. Geller, Amanda et al. "Parental Incarceration and Child Wellbeing: Implications for Urban Families." Social Science Quarterly 90, no. 5 (2009): 1186-1202. doi:10.1111/j.1540-6237.2009.00653.x; see also Murray, Joseph, David P. Farrington and Ivana Sekol. "Children's Antisocial Behavior, Mental Health, Drug Use, and Educational Performance After Parental Incarceration: A Systematic Review and Meta-Analysis." Psychological Bulletin 138 no. 2 (2012): 175-210. doi:10.1037/a0026407
20. Herrera, Veronica M. and Laura Ann McCloskey. "Gender Differences in the Risk for Delinquency Among Youth Exposed to Family Violence." Child Abuse and Neglect 25, no. 8 (2001): 1037-1051. https://doi.org/10.1016/S0145-2134(01)00255-1; see also Evans, Sarah E, Corrie Davies and David DiLillo. "Exposure to Domestic Violence: A Meta-Analysis of Child and Adolescent Outcomes." Aggression and Violent Behavior 13, no. 2 (2008): 131-140. https://doi.org/10.1016/j.avb.2008.02.005
21. Wolff, Kevin T. et al. "Adverse Childhood Experiences (ACEs) and Gang Involvement Among Juvenile Offenders: Assessing the Mediation Effects of Substance Use and Temperament Deficits." Youth Violence and Juvenile Justice18, no. 1 (2020): 24–53. doi: 10.1177/1541204019854799
22. Duke, Naomi N. et al. "Adolescent violence perpetration: associations with multiple types of adverse childhood experiences." Pediatrics 125, no. 4 (2010): e778-786. doi: 10.1542/peds.2009-0597
23. Dierkhising, Carly B. et al. "Trauma Histories Among Justice-Involved Youth: Findings from the National Child Traumatic Stress Network." European Journal of Psychotraumatology 4, no. 1 (2013): https://doi.org/10.3402/ejpt.v4i0.20274; see also Abram, Karen M. et al. "Posttraumatic Stress Disorder and Trauma in Youth in Juvenile Detention." Archives of General Psychiatry 61, no. 4 (2004): 403-410. doi: 10.1001/archpsyc.61.4.403; see also Baglivio, Michael T. et al. "The Prevalence of Adverse Childhood Experiences (ACE) in the Lives of Juvenile Offenders." Journal of Juvenile Justice 3, no. 2 (2014). https://www.prisonpolicy.org/scans/Prevalence_of_ACE.pdf see also Baglivio, Michael T et al., "The Relationship Between Adverse Childhood Experiences (ACE) and Juvenile Offending Trajectories in a Juvenile Offender Sample." Journal of Criminal Justice 43, no. 3 (2015): 229-241. http://dx.doi.org/10.1016/j.jcrimjus.2015.04.012
24. Baglivio, Michael T. et al. "The Prevalence of Adverse Childhood Experiences (ACE) in the Lives of Juvenile Offenders." Journal of Juvenile Justice 3, no. 2 (2014). https://www.prisonpolicy.org/scans/Prevalence_of_ACE.pdf
25. Widom, Cathy S. and Michael G. Maxfield. An Update on the "Cycle of Violence." Washington, D.C.: National Institute of Justice, U.S. Department of Justice, 2001.
26. Data from "DYS Monthly Factsheet, November 2020." Ohio Department of Youth Services. Accessed December 10, 2020. https://www.dys.ohio.gov/static/About+DYS/Communications/Reports/Monthly+Fact+Sheets/DYS+Monthly+Fact+Sheet+November+2020.pdf
27. Data from "Monthly Fact Sheet, October 2020." Ohio Department of Rehabilitation and Correction. Accessed December 10, 2020. https://drc.ohio.gov/Portals/0/OCT%20fact%20sheet%20%282%29.pdf
28. Fang, Xiangming et al. "The Economic Burden of Child Maltreatment in the United States and Implications for Prevention." Child Abuse & Neglect 36, no. 2 (2012): 156-165. doi: 10.1016/j.chiabu.2011.10.006
29. Data from "DYS Monthly Factsheet, November 2020." Ohio Department of Youth Services. Accessed December 10, 2020. https://www.dys.ohio.gov/static/About+DYS/Communications/Reports/Monthly+Fact+Sheets/DYS+Monthly+Fact+Sheet+November+2020.pdf
30. Data from "Monthly Fact Sheet, October 2020." Ohio Department of Rehabilitation and Correction. Accessed December 10, 2020. https://drc.ohio.gov/Portals/0/OCT%20fact%20sheet%20%282%29.pdf
31. Schickedanz, Adam et al. "Adverse Childhood Experiences and Household Out-of-Pocket Healthcare Costs." American Journal of Preventative Medicine 56, no. 5 (2019): 698-707. doi: 10.1016/j.amepre.2018.11.019.
32. Florence, Curtis et al. "Healthcare Costs Associated with Child Maltreatment." Pediatrics 132, no 2. (2013): 312-318. doi: 10.1542/peds.2012-2212
33. Data from "MACStats: Medicaid and CHIP Data Book." Medicaid and CHIP Payment and Access Commission (MACPAC). Accessed December 10, 2020. https://www.macpac.gov/wp-content/uploads/2020/12/MACStats-Medicaid-and-CHIP-Data-Book-December-2020.pdf
34. Bellis, Mark A. et al. "Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis." The Lancet Public Health 4, no. 10 (2019): e517-e528. doi: 10.1016/S2468-2667(19)30145-8
35. Fang, Xiangming, et al. "The Economic Burden of Child Maltreatment in the United States and Implications for Prevention." Child Abuse & Neglect 36, no. 2 (2012): 156-165. doi: 10.1016/j.chiabu.2011.10.006
36. Macmillan, Ross and John Hagan. "Violence in the Transition to Adulthood: Adolescent Victimization, Education, and Socioeconomic Attainment in Later Life." Journal of Research on Adolescence 14, no. 2 (2004): 127-158. doi: 10.1111/j.1532-7795.2004.01402001.x
37. Peterson, Mark D. and Elham Mahmoudi. "Healthcare Utilization Associated With Obesity and Physical Disabilities. American Journal of Preventive Medicine 48, no. 4 (2015): 426-435. https://doi.org/10.1016/j.amepre.2014.11.007; see also Snyder, Lori Anderson, et al. "Perceptions of Discrimination and Justice Among Employees with Disabilities." Employee Responsibilities and Rights Journal 22 (2010): 5-19. https://doi.org/10.1007/s10672-009-9107-5
38. Health Policy Institute of Ohio. "Ohio addiction policy scorecard: Law enforcement and the criminal justice system," November 2019; see also Campbell, Emily. "Racial disparities extend to unemployment in Ohio." The Center for Community Solutions, January 4, 2021. https://www.communitysolutions.com/racial-disparities-extend-unemployment/
39. Health Policy Institute of Ohio. "Connections between racism and health: Taking action to eliminate racism and advance equity," August 2020.
40. HPIO's analysis of 2015 BRFSS data includes 14 variables associated with ACEs exposure through other research. These six variables (asthma, COPD, depression, smoking, heavy drinking and inability to afford care) had statistically significant PARs for experiencing multiple ACEs (2 or more). For a list of variables included in HPIO's analysis of 2015 BRFSS data, see the Health Impacts of ACEs in Ohio Appendix: Methodology and technical report.
41. Health Policy Institute of Ohio. "Adverse Childhood Experiences (ACEs): Health impact of ACEs in Ohio," August 2020.

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Ohio ACEs Impact project
Led by the Health Policy Institute of Ohio and informed by a **multi-sector advisory group**, this project includes a series of three policy briefs and a **resource page** to build on and amplify current efforts to address ACEs in Ohio.

In August 2020, HPIO released the first brief, **Adverse Childhood Experiences (ACEs): Health impact of ACEs in Ohio**. This brief, the second in the series, focuses on the economic impact of ACEs in Ohio. The third brief will build on the previous two by identifying evidence-informed and cost-effective strategies to prevent and mitigate the impacts of ACEs.

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