



# Adverse childhood experiences among children placed in and adopted from foster care: Evidence from a nationally representative survey<sup>☆</sup>



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## ABSTRACT

Despite good reason to believe that children in foster care are disproportionately exposed to adverse childhood experiences (ACEs), relatively little research considers exposure to ACEs among this group of vulnerable children. In this article, we use data from the 2011–2012 National Survey of Children's Health (NSCH), a nationally representative sample of non-institutionalized children ages 0–17 in the United States, to estimate the association between foster care placement and exposure to an array of ACEs. In adjusted logistic regression models, we find that children placed in foster care or adopted from foster care, compared to their counterparts, were more likely to experience parental divorce or separation, parental death, parental incarceration, parental abuse, violence exposure, household member mental illness, and household member substance abuse. These children were also more likely to experience ACEs than children across different thresholds of socioeconomic disadvantage (e.g., children in households with incomes below the poverty line) and across different family structures (e.g., children in single-mother families). These results advance our understanding of how children in foster care, an already vulnerable population, are disproportionately exposed to ACEs. This exposure, given the link between ACEs and health, may have implications for children's health and wellbeing throughout the life course.

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## 1. Introduction

Foster care placement is common in the United States, with estimates suggesting that 6% of U.S. children will experience this event at any point between their birth and their 18th birthday. Risks of foster care placement vary across the population, with vulnerable groups such as race/ethnic minority children and children living in poverty having the greatest risks of foster care placement. For example, in the United States, 12% of African American children and 15% of Native American children are placed in foster care at some point between birth and age 18, compared to 5% of White children (Wildeman & Emanuel, 2014). Cumulative risks of foster care placement are lower in the other developed democracies for which estimates have

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been generated. For example, Australia (O'Donnell et al., 2016), Canada (O'Donnell et al., 2016), Denmark (Fallesen, Emanuel, & Wildeman, 2014; Ubbesen, Gilbert, & Thoburn, 2015), and England (Ubbesen et al., 2015) all have cumulative risks of foster care placement that are non-negligible but roughly one-quarter to one-half as high as risks in the United States.

As many researchers and policymakers have noted, the foster care system merits attention because a substantial number of children will ever experience this event, because it is more commonly experienced among children from historically disadvantaged racial/ethnic groups, and because children in foster care disproportionately suffer from poor mental and physical health (for recent reviews on the topic, see Gilbert, Kemp, Thoburn, Sidebotham, & Radford, 2009; Gilbert, Widom, Browne, Fergusson, Webb, & Janso, 2009; Wildeman & Waldfogel, 2014). For example, recent research using nationally representative data on children in the United States finds that children placed in foster care, net of an array of demographic and socioeconomic characteristics, were three to five times more likely than children not placed in foster care to experience mental health conditions such as depression, anxiety, behavioral or conduct problems, and Attention Deficit Disorder/Attention Deficit Hyperactivity Disorder (Turney & Wildeman, 2016). These findings are broadly consistent with an earlier wave of research that documented children in the foster care system to be in extremely poor mental and physical health relative to other children (e.g., Chernoff, Combs-Orme, Risley-Curtiss, & Heisler, 1994; Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Halfon, Mendonca, & Berkowitz, 1995).

Although the degree to which foster care placement contributes to these poor mental and physical health outcomes is hotly debated (e.g., Berger, Bruch, Johnson, James, & Rubin, 2009; Doyle, 2007, 2008, 2013), there are certainly many other risk factors that could also be driving the poor outcomes of children in foster care (e.g., English, Thompson, & White, 2015). Indeed, it is well known that children ever placed in foster care are more likely than their counterparts to experience family instability (Taylor, Guterman, Lee, & Rathouz, 2009), to be exposed to socioeconomic disadvantage (e.g., Cancian, Yang, & Slack, 2013; Gilbert, Widom et al., 2009; Kruttschnitt, McLeod, & Dornfeld, 1994), and to live in poor neighborhoods (e.g., Andersen, 2010; Coulton, Korbin, & Su, 1999; Drake & Pandey, 1996; Freisthler, 2004; Garbarino & Sherman, 1980), all of which are risk factors for poor mental and physical health.

Unfortunately, existing research on the risk factors disproportionately faced by children in foster care is limited in two ways. First, this research has generally neglected to consider exposure to a broad range of adverse childhood experiences (ACEs) such as parental incarceration or violence exposure. Most individual empirical studies focus on a more narrow range of risk factors children have experienced (but see English et al., 2015; see also reviews of Gilbert, Widom et al., 2009; Wildeman & Waldfogel, 2014). Additionally, to date, data limitations have precluded a nationally representative examination of the differences in exposure to ACEs between U.S. children in foster care and their counterparts. These limitations are an oversight because indicators of childhood misfortune such as ACEs are strong predictors of poor health throughout the life course (Anda et al., 1999; Chapman, Wall, & Barth, 2004; Corso, Edwards, Fang, & Mercy, 2008; Felitti, 2009; Felitti et al., 1998; Gilbert et al., 2015; Klassen, Chirico, O'Leary, Cairney, & Wade, 2016; Wade et al., 2016).

In this article, we extend research on the correlates of foster care placement by using the 2011–2012 National Survey of Children's Health (NSCH), a nationally representative sample of children ages 0–17, to document the relationship between foster care placement and exposure to seven indicators of ACEs that are tightly linked to poor child health and wellbeing throughout the life course. Specifically, we provide two types of comparisons. First, we compare children placed in or adopted from foster care to children not placed in nor adopted from foster care, after adjusting for a range of covariates. Second, we compare children with foster care exposure (those placed in or adopted from foster care) to children across different thresholds of socioeconomic disadvantage (e.g., children in households with incomes below the poverty line) and to children in various family types (e.g., single-mother families). The latter two comparisons—across socioeconomic disadvantage and across family types—is important because it documents ACE exposure among other groups traditionally at risk of exposure to ACEs and, in so doing, provides unique insight into just how disadvantaged children in foster care are relative to other types of children who also experience risk factors for ACE exposure.

## 2. Method

### 2.1. Participants

We use data from the cross-sectional 2011–2012 National Survey of Children's Health (NSCH), a nationally representative survey of 95,677 children in the United States, to estimate the association between children's exposure to adverse childhood experiences (ACEs) and foster care placement. Survey researchers first identified households with list-assisted random-digit dialing, stratifying by state and telephone type (cell phone or landline), and conducted interviews between February 2011 and June 2012 (Centers for Disease Control and Prevention, 2013). In each household, interviewers selected a focal child and interviewed the household adult with the most information about the focal child (the child's biological/step/foster/adoptive mother, biological/step/foster/adoptive father, and other household member in 69%, 24%, and 7% of observations, respectively; hereafter referred to as the parent respondent). The survey completion rate was 54% for the landline sample and 41% for the cell phone sample. Sampling weights adjust for non-response. The 2011–2012 NSCH allows for a nationally representative examination of children placed in foster care, a difficult-to-reach population, both because of the large sample size and the information collected about children's living arrangements.

To comprise the analytic sample, we first dropped the 2443 (2.6% of the full sample) observations missing data on children's living arrangements and the additional 1973 (2.1%) observations missing data on any one of the seven ACE measures

(described below). Importantly, the vast majority of observations missing information about one ACE were missing information about all ACEs. We excluded observations from the analytic sample that were missing values on one (or more) of the ACEs, as this strategy ensures the same observations are included in all of the analyses. The analytic sample comprises 91,261 observations, representing well over 95% of the original sample. There are no substantive differences between the full sample and the analytic sample, as documented in [Appendix A Table A1](#).

## 2.2. Measures

**2.2.1. Outcome variables.** The outcome variables include seven individual indicators of children's ACEs and two composite indicators of children's ACEs, as reported by the parent respondent. The individual indicators are as follows: (1) parental divorce or separation, indicating the child ever lived with a parent or guardian who got divorced or separated after the child was born; (2) parental death, indicating the child ever lived with a parent or guardian who died; (3) parental incarceration, indicating the child ever lived with a parent or guardian who served time in jail or prison after the child was born; (4) parental abuse, indicating the child ever saw or heard any parents, guardians, or other adults in his/her home slap, hit, kick, punch, or beat each other up; (5) violence exposure, indicating the child was ever the victim of violence or witnessed any violence in his/her neighborhood; (6) household member mental illness, indicating the child ever lived with someone who was mentally ill or suicidal or severely depressed for more than a couple of weeks; and (7) household member substance abuse, indicating the child ever lived with someone who had a problem with alcohol or drugs. The first composite indicator is a binary variable indicating the child was exposed to at least one ACE, and the second composite indicator is a count variable indicating the number of ACEs faced by the child.

Importantly, if parent respondents report not knowing if their child was exposed to an ACE, children are considered to not have experienced that event. This underreporting is more common among children placed in foster care, as documented in [Appendix A Table A2](#), which is as expected given that foster parents may not be aware of ACE exposure prior to placement. Results were substantively similar if children with unknown ACE exposure were instead dropped from the analyses.

**2.2.2. Explanatory variable.** The primary explanatory variable, foster care placement, is a binary variable indicating the parent respondent answered affirmatively to one of the following two questions: (1) "Is [focal child] currently in foster care? That is, are you or another adult in the household acting as a foster parent to [focal child] under the supervision of a state or county child welfare agency?" (2) "Prior to being adopted, was [focal child] in the legal custody of a state or county child welfare agency in the United States? That is, was the [focal child] in the U.S. foster care system?" Therefore, the measure of foster care placement captures both children currently placed in foster care and children adopted from foster care (though some analyses distinguish between these two types of care). Importantly, this variable is only available in the restricted-use NSCH data, accessible through a National Center for Health Statistics (NCHS) Research Data Center (RDC).

## 2.3. Covariates

The multivariate analyses adjust for a number of child, family, and household characteristics that might be associated with both foster care placement and ACEs. This allows us to isolate the relationship between foster care placement and ACEs net of these variables. Importantly, for children placed in foster care, parent and household characteristics measure the child's current household, not their family of origin. Unfortunately, these cross-sectional data do not include information about these children's families of origin.

The first set of control variables include child characteristics that are either stable or occurred at the child's birth in an effort to ensure that these variables preceded both foster care placement and ACEs (and, therefore, could not be affected by either of these experiences). Child characteristics include age (a continuous measure ranging from 0 to 17), gender (1 = female), birth weight (1 = born <2,500 g), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and non-Hispanic other race), and nativity status (1 = first- or second-generation immigrant). These child characteristics are all exogenous to the measures of foster care placement and ACEs and have been linked with children's risks of foster care placement in previous research (for reviews, see [Gilbert, Widom et al., 2009](#); [Wildeman & Waldfogel, 2014](#)).

The second set of control variables includes a number of family and household characteristics that have been linked with elevated risks of foster care placement, ACEs, or both (again, for reviews, see [Gilbert, Widom et al., 2009](#); [Wildeman & Waldfogel, 2014](#)). Importantly, because all variables are measured contemporaneously, it is possible that these control variables are endogenous to foster care placement and ACEs; therefore, adjusting for these control variables provides a conservative test of this association. Household characteristics include the biological, step, foster, or adoptive mother's/caregiver's age, measured by the following categorical variables: 20–29 years, 30–39 years, 40–49 years, and 50 years or older. Household characteristics also include parent's/caregiver's education (less than high school, high school diploma, and post-secondary education), parent's/caregiver's overall health (1 = fair or poor), household employment status (1 = at least one person employed 50 of the past 52 weeks), welfare receipt (1 = household member receives welfare), Special Supplemental Nutrition Program for Women, Infants and Children (WIC) receipt (1 = household member receives WIC, a federal assistance program provided to low-income pregnant or breastfeeding women and children under the age of 5), and poverty (1 = household income below the poverty line, a threshold established by the U.S. government that takes into account household income and household composition).

All multivariate analyses also adjust for the parent/caregiver respondent's relationship to the child (mother, father, other adult), as these different types of caregivers may have different knowledge or perceptions of the child's ACEs.

**2.2.4. Analyses.** We first present frequencies of the dependent variables, separately for two groups: (1) children placed in or adopted from foster care and (2) children not placed in nor adopted from foster care. Chi-square tests examine whether these group differences in ACEs are statistically significant.

The multivariate analyses proceed in three stages. First, we use nested regression models to estimate ACEs as a function of foster care. We use logistic regression models to estimate the eight binary outcomes and ordinary least squares (OLS) regression models to estimate the count outcome (though supplemental analyses using the Poisson distribution produced results of a similar magnitude and statistical significance). We compare children placed in or adopted from foster care to children not placed in nor adopted from foster care. Model 1 presents the bivariate relationship. Model 2 adjusts for exogenous child characteristics described above, and we consider this model to present an upper-bound of the association between foster care placement and ACEs. Model 3 adjusts for both child and household characteristics. This final model captures household characteristics that are measured after both exposure to foster care and ACEs and, accordingly, we consider this model to present a lower-bound, or conservative, estimate of the association between foster care placement and ACEs. Although adjusting so extensively may lead to biased estimates of the association between foster care placement and ACEs, we also adjust for these covariates because subsequent analyses examine more explicit comparisons between children in foster care and other specific types of children, making these conservative models critical. Finally, as part of this first analytic stage, we also consider differences in ACEs between children placed in foster care at the time of the survey and children adopted from foster care, as other research using these data finds these distinctions to be important (Turney & Wildeman, 2016; Zill & Bramlett, 2014).

Second, as noted above, we use regression models to estimate ACEs, comparing children exposed to foster care to children who experience different thresholds of socioeconomic disadvantage: (1) children living in households with incomes below 400% of the poverty line, (2) children living in households with incomes below 200% of the poverty line, and (3) children living in households with incomes below 100% of the poverty line. The poverty line is often used as a threshold for determining eligibility for public benefits and considering children across these three different thresholds ensures that we examine a range of socioeconomic conditions. Comparing children placed in foster care to children who experience different thresholds of socioeconomic disadvantage is important because children experiencing socioeconomic disadvantage are more likely to be exposed to ACEs (e.g., Felitti et al., 1998:251). These models adjust for all child, family, and household characteristics described above.

Third, we use regression models to estimate ACEs, comparing children in foster care to children in the following eight types of household living arrangements: (1) single mother; (2) single father; (3) only grandparents; (4) grandparents and parents; (5) only relatives; (6) relatives and parents; (7) non-relatives; and (8) other complex family. These indicators of household living arrangements are constructed from the household roster, also only available in the restricted-use NSCH data. Comparing children placed in foster care to children in various types of households also provides a conservative estimate of the relationship between foster care placement and ACEs. Children living in complex families have a greater risk of ACE exposure than other children because many ACEs (through death, divorce, or incarceration) involve being removed from one or more of their parents. These models also adjust for all child, family, and household characteristics described above.

All analyses use sampling weights to adjust for the complex survey design and non-response. Control variables are missing between 0% (child age) and 8.1% (household income below the poverty line) of observations (see Appendix A Table A3 for the frequency and number of missing covariate values for the full sample and by exposure to foster care). We use multiple imputation, following the multivariate normal method, to preserve these observations, and we averaged results across five data sets. All analyses were conducted in Stata 14.1 (StataCorp., 2015). This study was deemed exempt from human subjects research by the Institutional Review Boards (IRBs) at the University of California, Irvine and Cornell University.

### 3. Results

#### 3.1. Sample description

Table 1 presents weighted descriptive statistics for the sample, before and after multiple imputation. The descriptive statistics were relatively similar before and after imputation and here we describe the descriptive statistics after imputation. Foster care was experienced by 1.4% of children in the sample (with 0.5% of children placed in foster care at the time of the survey and 0.9% of children legally adopted from foster care, descriptives not shown). The percentage of children in foster care is consistent with expectations from other data sources. The Children's Bureau distributed annual reports on all children in foster care that can be used to generate estimates of the share of children currently in foster care based on official administrative data (though there are no other national data sources that allow for an examination of the percentage of children adopted from foster care). Based on the 2011 and 2012 reports (U.S. Department of Health and Human Services, 2012, 2013), we estimate that about 397,500 U.S. children were in foster care on any given day in 2011–2012. As there were about 73.8 million children in the United States on any given day during these same years, this means these official administrative records show that 0.5% of U.S. children are currently in foster care, which aligns exactly to the estimates from the NCHS data.

**Table 1**  
Weighted Descriptive Statistics of All Variables Included in Analyses: 2011–2012 National Study of Children's Health.

Explanatory Variable	Before imputation		After imputation	
	Mean or %	N	Mean or %	N
<i>Explanatory Variable</i>				
Foster care placement	1.4%	1527	1.4%	1527
<i>Child Characteristics</i>				
Child age (range: 0–17)	8.57	–	8.57	–
Child female	48.7%	44,088	48.7%	44,188
Child born low birth weight	9.4%	7780	13.9%	11,603
<i>Child race/ethnicity</i>				
Non-Hispanic White	52.6%	59,740	49.3%	59,966
Non-Hispanic Black	13.6%	8557	14.7%	8765
Hispanic	23.8%	12,259	24.8%	12,653
Non-Hispanic other	10.0%	9657	11.2%	9877
Child first- or second-generation immigrant	26.7%	15,500	29.4%	19,379
<i>Parent/Caregiver Characteristics</i>				
<i>Parent/caregiver respondent</i>				
Mother/caregiver	70.2%	62,640	70.2%	62,624
Father/caregiver	23.9%	22,035	23.9%	22,051
Other adult	5.9%	6570	5.9%	6586
<i>Mother/caregiver age</i>				
20–29 years old	18.9%	13,121	16.5%	16,032
30–39 years old	42.1%	31,049	44.4%	32,329
40–49 years old	32.0%	31,137	33.0%	32,735
50–59 years old	7.0%	9302	6.0%	10,165
<i>Parent/caregiver educational attainment</i>				
Less than high school	20.8%	12,410	13.3%	8389
High school diploma	32.3%	29,698	36.5%	33,719
Post-secondary education	46.9%	45,132	50.2%	49,153
Parent/caregiver fair or poor health	15.0%	8579	15.1%	12,437
<i>Household Characteristics</i>				
Household member employed	84.3%	79,578	84.4%	80,266
Household member receives welfare	7.5%	4798	8.8%	5874
Household member receives WIC	14.3%	8365	15.4%	9260
Household income below the poverty line	21.9%	12,746	28.4%	20,120
N	Varies		91,261	

Notes: Means and frequencies are calculated with sampling weights (and corresponding stratum and primary sampling units). Means and frequencies after imputation are averaged across five imputed data sets. Ns are unweighted and presented for the first imputed data set.

Other descriptive statistics are also in line with expectations. On average, children were 8.6 years old. About half (48.7%) of children were female. Non-Hispanic White children comprised the largest share of the sample (49.3%), followed by Hispanic children (24.8%), non-Hispanic Black children (14.7%), and non-Hispanic other race children (11.2%). About 29.4% of children were foreign-born or had a foreign-born parent.

### 3.2. Adverse childhood experiences (ACEs), by foster care exposure

Table 2 presents weighted frequencies of ACEs, first for the full sample. ACEs were not uncommon among children. Of the seven individual ACEs considered, experiencing parental divorce or separation was most common (with 19.9% of children in the sample experiencing this), followed by household member substance abuse (10.5%), violence exposure (8.6%), household member mental illness (8.5%), parental abuse (7.2%), parental incarceration (6.9%), and parental death (3.0%). On average, about one-third of children (33.8%) were exposed to at least one ACE.

Table 2 also presents weighted frequencies of ACEs by foster care exposure, which support two conclusions. First, a large percentage of children in foster care were exposed to ACEs. For example, among children in foster care, more than half (53.8%) experienced household member substance abuse. Parental divorce or separation (45.4%), parental incarceration (40.1%), parental abuse (34.2%), household member mental illness (33.7%), and violence exposure (31.1%) were quite common. More than three-quarters (75.5%) of children exposed to foster care experienced at least one ACE. And, on average, these children experienced 2.5 ACEs.

Second, ACEs were more common among children exposed to foster care (via current placement or adoption) than among children not exposed to foster care. Children in foster care were more likely to experience parental divorce or separation (45.4% vs. 19.6%,  $p < 0.001$ ), parental death (11.5% vs. 2.8%,  $p < 0.001$ ), parental incarceration (40.1% compared to 6.4%,  $p < 0.001$ ), parental abuse (34.2% vs. 6.9%,  $p < 0.001$ ), violence exposure (31.1% vs. 8.2%,  $p < 0.001$ ), household member mental illness (33.7% vs. 8.2%,  $p < 0.001$ ), and household member substance abuse (53.8% vs. 9.9%,  $p < 0.001$ ). They were also

**Table 2**

Weighted Frequencies of Adverse Childhood Experiences (ACEs), for Full Sample and by Foster Care Status: 2011–2012 National Study of Children's Health.

	Full Sample		By Foster Care Status				
	%	N	Placed in or adopted from foster care		Not placed in or adopted from foster care		p
			%	N	%	N	
Parental divorce or separation	19.9%	16,333	45.4%	623	19.6%	15,710	<0.001
Parental death	3.0%	2747	11.5%	156	2.8%	2591	<0.001
Parental incarceration	6.9%	5393	40.1%	555	6.4%	4838	<0.001
Parental abuse	7.2%	5695	34.2%	510	6.9%	5185	<0.001
Violence exposure	8.6%	6958	31.1%	491	8.2%	6467	<0.001
Household member mental illness	8.5%	8229	33.7%	504	8.2%	7725	<0.001
Household member substance abuse	10.5%	9616	53.8%	801	9.9%	8815	<0.001
Any ACE	33.8%	28,723	75.5%	1042	33.2%	27,681	<0.001
Number of ACEs	0.64	–	2.47	–	0.62	–	<0.001
N	91,261		467		89,734		

Notes: Means and frequencies are calculated with sampling weights (and corresponding stratum and primary sampling units) and are averaged across five imputed data sets. Ns are unweighted and presented for the first imputed data set.

**Table 3**

Regression Models Estimating Adverse Childhood Experiences (ACEs) as a Function of Foster Care Status: 2011–2012 National Study of Children's Health.

	Model 1				Model 2				Model 3			
	b	SE b	OR	p	b	SE b	OR	p	b	SE b	OR	p
Parental divorce or separation	1.23	(0.38)	3.41	<0.001	0.80	(0.28)	2.23	<0.001	0.63	(0.24)	1.87	<0.001
Parental death	1.49	(0.73)	4.44	<0.001	0.66	(0.36)	1.94	<0.001	0.43	(0.30)	1.53	0.031
Parental incarceration	2.28	(1.16)	9.77	<0.001	1.85	(0.84)	6.33	<0.001	1.90	(1.00)	6.67	<0.001
Parental abuse	1.95	(0.85)	7.05	<0.001	1.59	(0.67)	4.89	<0.001	1.59	(0.77)	4.88	<0.001
Violence exposure	1.61	(0.58)	5.01	<0.001	1.20	(0.46)	3.33	<0.001	1.27	(0.56)	3.56	<0.001
Household member mental illness	1.74	(0.70)	5.70	<0.001	1.52	(0.62)	4.59	<0.001	1.44	(0.60)	4.22	<0.001
Household member substance abuse	2.36	(1.17)	10.62	<0.001	2.09	(1.05)	8.08	<0.001	1.98	(1.01)	7.23	<0.001
Any ACE	1.82	(0.76)	6.20	<0.001	1.37	(0.55)	3.94	<0.001	1.27	(0.55)	3.56	<0.001
Number of ACEs	1.85	(0.11)	–	<0.001	1.52	(0.11)	–	<0.001	1.43	(0.11)	–	<0.001
N	91,261				91,261				91,261			

Note: Dependent variables presented in rows. Independent variable is a binary measure indicating the focal child was placed in foster care or adopted from foster care at the time of the interview. Ordinary least squares (OLS) regression estimates number of ACEs, and all other outcomes are estimated with logistic regression. Model 1 estimated the unadjusted association. Model 2 adjusted for the following: child age, child gender, child born low birth weight, child race/ethnicity, child foreign born, and parent/caregiver respondent relationship to child. Model 3 adjusted for all variables in Model 2 plus the following: mother/caregiver age, parent/caregiver educational attainment, household member employment status, parent/caregiver fair or poor health, household member received welfare, household member receives WIC, and household income below the poverty line.

more likely to experience at least one ACE (75.5% vs. 33.2%,  $p < 0.001$ ) and experienced a higher number of ACEs (2.47 vs. 0.62,  $p < 0.001$ ).

### 3.3. Regression models estimating adverse childhood experiences (ACEs)

Table 3 presents results from regression models estimating each of the nine dependent variables as a function of foster care exposure. In Model 1 (the unadjusted association), children exposed to foster care, compared to their counterparts neither in foster care nor adopted from foster care, had a greater odds of experiencing all seven individual measures of ACEs. They also had a greater odds of experiencing any ACE and, on average, experienced a larger number of ACEs. In Model 2, which adjusted for child characteristics, all of these associations remained statistically significant. In Model 3, the most conservative model that adjusted for both child and household characteristics, the associations also remained statistically significant. In this final model, children exposed to foster care have a greater likelihood of parental divorce or separation [ $b = 0.63$ ,  $OR = 1.87$ ,  $p < 0.001$ ], parental death [ $b = 0.43$ ,  $OR = 1.53$ ,  $p = 0.031$ ], parental incarceration [ $b = 1.90$ ,  $OR = 6.67$ ,  $p < 0.001$ ], parental abuse [ $b = 1.59$ ,  $OR = 4.88$ ,  $p < 0.001$ ], violence exposure [ $b = 1.27$ ,  $OR = 3.56$ ,  $p < 0.001$ ], household number mental illness [ $b = 1.44$ ,  $OR = 4.22$ ,  $p < 0.001$ ], and household member substance abuse [ $b = 1.98$ ,  $OR = 7.23$ ,  $p < 0.001$ ]. Children exposed to foster care were more likely to experience at least one ACE [ $b = 1.27$ ,  $OR = 3.56$ ,  $p < 0.001$ ] and also experienced more ACEs [ $b = 1.43$ ,  $p < 0.001$ ].

### 3.4. Children placed in foster care compared to children adopted from foster care

Table 4 presents results from regression models estimating each of the nine dependent variables as a function of foster care exposure, this time separating children exposed to foster into two groups: (1) those placed in foster care at the time

**Table 4**  
Regression Models Estimating Adverse Childhood Experiences (ACEs) as a Function of Foster Care Status: 2011–2012 National Study of Children's Health.

		<i>b</i>	SE <i>b</i>	OR	<i>p</i>	Prob > F
Parental divorce or separation	Placed in foster care	0.76	(0.51)	2.14	0.001	0.450
	Adopted from foster care	0.55	(0.26)	1.74	<0.001	
Parental death	Placed in foster care	0.03	(0.32)	1.03	0.911	0.065
	Adopted from foster care	0.71	(0.48)	2.04	0.002	
Parental incarceration	Placed in foster care	1.69	(1.53)	5.43	<0.001	0.315
	Adopted from foster care	2.02	(1.24)	7.52	<0.001	
Parental abuse	Placed in foster care	1.81	(1.74)	6.13	<0.001	0.260
	Adopted from foster care	1.44	(0.76)	4.22	<0.001	
Violence exposure	Placed in foster care	1.29	(0.87)	3.62	<0.001	0.929
	Adopted from foster care	1.26	(0.71)	3.53	<0.001	
Household member mental illness	Placed in foster care	1.42	(1.13)	4.13	<0.001	0.909
	Adopted from foster care	1.45	(0.67)	4.28	<0.001	
Household member substance abuse	Placed in foster care	1.76	(1.57)	5.83	<0.001	0.297
	Adopted from foster care	2.09	(1.25)	8.05	<0.001	
Any ACE	Placed in foster care	1.30	(1.20)	3.68	<0.001	0.675
	Adopted from foster care	1.15	(0.50)	3.17	<0.001	
Number of ACEs	Placed in foster care	1.52	(0.21)	–	<0.001	0.567
	Adopted from foster care	1.38	(0.13)	–	<0.001	
N		91,261				

Note: Independent variables include binary measures indicating the focal child was (1) placed in foster care at the time of the interview or (2) adopted from foster care at the time of the interview. F tests examine statistically significant differences between these two groups. Ordinary least squares (OLS) regression estimates number of ACEs, and all other outcomes are estimated with logistic regression. All models adjust for covariates in Model 3 of Table 3.

**Table 5**  
Regression Models Estimating Adverse Childhood Experiences (ACEs) as a Function of Foster Care Status, with Comparisons Across Poverty Status: 2011–2012 National Study of Children's Health.

	Household income below 400% of poverty line				Household income below 200% of poverty line				Household income below 100% of poverty line			
	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>
Parental divorce or separation	1.74	(0.82)	5.71	<0.001	0.51	(0.21)	1.67	<0.001	0.48	(0.43)	1.61	0.071
Parental death	0.54	(0.22)	1.72	<0.001	0.42	(0.28)	1.52	0.026	0.08	(0.32)	1.08	0.805
Parental incarceration	0.41	(0.28)	1.50	0.031	1.65	(0.72)	5.20	<0.001	1.40	(1.05)	4.04	<0.001
Parental abuse	1.45	(0.65)	4.28	<0.001	1.42	(0.62)	4.12	<0.001	1.13	(0.84)	3.09	<0.001
Violence exposure	1.17	(0.49)	3.22	<0.001	1.14	(0.48)	3.14	<0.001	0.34	(0.42)	1.40	0.255
Household member mental illness	1.40	(0.56)	4.04	<0.001	1.36	(0.55)	3.88	<0.001	1.19	(0.97)	3.29	<0.001
Household member substance abuse	1.85	(0.87)	6.34	<0.001	1.79	(0.84)	6.00	<0.001	1.71	(1.44)	5.54	<0.001
Any ACE	1.08	(0.43)	2.93	<0.001	0.99	(0.39)	2.70	<0.001	0.74	(0.57)	2.09	0.007
Number of ACEs	1.37	(0.11)	–	<0.001	1.35	(0.11)	–	<0.001	1.10	(0.23)	–	<0.001
N	61,505				36,081				21,322			

Note: Subsamples include children in foster care and children across various thresholds of socioeconomic disadvantage. Dependent variables presented in rows. Independent variable is a binary measure indicating the focal child was placed in foster care or adopted from foster care at the time of the interview. Ordinary least squares (OLS) regression estimates number of ACEs, and all other outcomes are estimated with logistic regression. All models adjust for covariates in Model 3 of Table 3.

of the survey and (2) those adopted from foster care. This table shows there were no statistically significant differences in ACEs between these two groups of children after adjusting for child and household characteristics.

### 3.5. Comparisons to children experiencing socioeconomic disadvantage

Table 5 presents results from regression models estimating each of the nine dependent variables as a function of foster care exposure, restricting the sample to children in foster care and children across different thresholds of socioeconomic disadvantage (see Appendix A Table A4 for descriptives across the three thresholds of socioeconomic disadvantage). The first and second columns, restricted to children exposed to foster care and children in households with incomes below 400% of the poverty line and with incomes below 200% of the poverty line, respectively, show that children exposed to foster care, compared to their counterparts, had a greater likelihood of experiencing all seven individual measures of ACEs, had a greater likelihood of experiencing any ACE, and experienced a greater number of ACEs. The final column, which is the most conservative because it restricts the sample to children exposed to foster care and children in households with incomes below

100% of the poverty line, shows that children in foster care were more likely to experience parental incarceration [ $b = 1.40$ ,  $OR = 4.04$ ,  $p < 0.001$ ], parental abuse [ $b = 1.13$ ,  $OR = 3.09$ ,  $p < 0.001$ ], household member mental illness [ $b = 1.19$ ,  $OR = 3.29$ ,  $p < 0.001$ ], and household member substance abuse [ $b = 1.71$ ,  $OR = 5.54$ ,  $p < 0.001$ ]. These children were also more likely to experience any ACE [ $b = 0.74$ ,  $OR = 2.09$ ,  $p = 0.007$ ] and experienced a greater number of ACEs [ $b = 1.10$ ,  $p < 0.001$ ].

### 3.6. Comparisons to children experiencing different family structures

Table 6 presents results from regression models estimating ACEs, restricting the sample to children in foster care and children across a range of family types (see Appendix A Table A5 for descriptives). These analyses show that children in foster care generally experienced more ACEs than their counterparts, even when restricting the sample to children in families that generally have a high risk of ACEs. For example, when restricting the sample to children in foster care and children with single mothers, foster care exposure was associated with a greater likelihood of five of the seven ACEs (including parental incarceration, parental abuse, violence exposure, household member mental illness, and household member substance abuse). Foster care exposure was also positively associated with any ACE and a greater number of ACEs.

## 4. Discussion

In this article, we used a population-based survey, the 2011–2012 National Survey of Children's Health (NSCH), to provide the first nationally representative estimates of ACEs among children in foster care, including both those currently in foster care and those adopted from foster care, and compare exposure to ACEs among these children and other children.

These analyses yield three main findings. First, we find that exposure to ACEs is quite high among children in foster care relative to children in the general population. Descriptively, about half of children placed in foster care or adopted from foster care were exposed to household member substance abuse, more than two-fifths were exposed to parental divorce or parental incarceration, and nearly 1 in 8 children experienced parental death. Children in foster care were exposed to ACEs at a much greater frequency than children in the general population. For example, though nearly half (40.1%) of children in foster care experienced parental incarceration, this was true of 6.4% of children not in foster care. Therefore, our findings corroborate recent research showing that adverse experiences are linked to foster care entry (e.g., English et al., 2015).

Second, we find that though some of the associations between foster care and ACEs are explained by child-, family-, and household-level characteristics, about half of the association persists after adjusting for these characteristics (including some characteristics that may be endogenous to both foster care and ACEs, as they are measured contemporaneously). Therefore, children placed in foster care and adopted from foster care, compared to their counterparts, are more likely to experience adversities including parental divorce or separation, parental incarceration, parental abuse, violence exposure, household member mental illness, and household member substance abuse. Perhaps not surprising given the other disadvantages experienced by children in foster care (Andersen, 2010; Cancian et al., 2013), the magnitude of these associations are large. For example, even after adjusting for a host of covariates that could have plausibly explained the relationship between foster care placement and ACEs, children in foster care are about seven times more likely than other children to experience parental incarceration or household member substance abuse.

Third, and relatedly, we find children in foster care are more likely than children in poverty and children in nearly all types of complex family structures to be exposed to ACEs (excluding parental death, which was often similarly experienced by children in foster care and other children). This suggests that children in foster care are uniquely disadvantaged relative to a host of other types of children, including children who have an elevated risk of ACEs such as children in poverty or children living with single mothers (Dong, Dube, Felitti, Giles, & Anda, 2003; Wade, Shea, Rubin, & Wood, 2014). Because previous research has generally been unable to compare children in foster care to other severely marginalized groups of children such as homeless children or children living without their parents (but without state intervention), this finding is especially novel. And, indeed, by showing how children in foster care compare to these other types of living in complex families—some of which include living apart from their parents—the current study suggests a promising new avenue for future research to pursue.

Taken together, our findings use a nationally representative data source to examine ACE exposure (relying on seven individual indicators and two composite indicators) among children in foster care and children not in foster care, both descriptively and after adjusting for covariates. Therefore, we extend research in this area by providing insight into the factors that may mediate the relationship between foster care placement and child health (Gilbert, Kemp et al., 2009; Turney & Wildeman, 2016; Wildeman & Waldfoegel, 2014). Although much research has established that children who experience foster care placement were disadvantaged prior to their placement (e.g., Andersen, 2010; Berger et al., 2009; Cancian et al., 2013; Coulton et al., 1999; Drake & Pandey, 1996; English et al., 2015; Freisthler, 2004; Garbarino & Sherman, 1980; Gilbert, Widom et al., 2009; Kruttschnitt et al., 1994; Taylor et al., 2009), this article extends that research by providing precise estimates on ACEs. This article also extends that research by using a nationally representative sample and by adjusting for a wide range of covariates, showing that the relationship between foster care and ACEs exists net of these covariates. The findings suggest that foster care placement is a unique risk factor for exposure to a range of potentially traumatic events that inhibit child health.



**Table 6**

Regression Models Estimating Adverse Childhood Experiences (ACEs) as a Function of Foster Care Status, with Comparisons Across Family Type: 2011–2012 National Study of Children's Health.

	Single mothers				Single fathers				Only grandparents				Grandparents and parents			
	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>
Parental divorce or separation	−0.30	(0.13)	0.74	0.074	−0.21	(0.30)	0.81	0.558	0.39	(0.35)	1.48	0.095	0.63	(0.28)	1.87	<0.001
Parental death	−0.08	(0.24)	0.92	0.758	0.61	(0.80)	1.84	0.162	−0.13	(0.29)	0.88	0.695	0.53	(0.43)	1.70	0.036
Parental incarceration	1.42	(0.87)	4.15	<0.001	2.00	(3.57)	7.37	<0.001	0.94	(0.61)	2.57	<0.001	1.80	(1.05)	6.05	<0.001
Parental abuse	1.09	(0.56)	2.97	<0.001	1.88	(2.99)	6.56	<0.001	0.84	(0.56)	2.31	0.001	1.65	(0.97)	5.21	<0.001
Violence exposure	0.86	(0.48)	2.37	<0.001	0.85	(0.97)	2.33	0.043	0.81	(0.59)	2.24	0.002	1.38	(0.76)	3.98	<0.001
Household member mental illness	1.33	(0.68)	3.78	<0.001	1.12	(1.54)	3.08	0.025	0.60	(0.50)	1.82	0.027	1.39	(0.78)	4.00	<0.001
Household member substance abuse	1.38	(0.75)	3.98	<0.001	1.60	(1.96)	4.95	<0.001	1.17	(0.75)	3.22	<0.001	2.03	(1.25)	7.63	<0.001
Any ACE	−0.01	(0.19)	0.99	0.954	−0.01	(0.52)	0.99	0.978	0.73	(0.64)	2.07	0.018	1.00	(0.45)	2.72	<0.001
Number of ACEs	0.97	(0.14)	–	<0.001	1.27	(0.35)	–	<0.001	0.95	(0.22)	–	<0.001	1.44	(0.12)	–	<0.001
N	10,534				3278				3871				10,470			
	Relatives only				Relatives and parents				Nonrelatives				Other complex family			
	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>	<i>b</i>	SE <i>b</i>	OR	<i>p</i>
Parental divorce or separation	0.28	(0.41)	1.32	0.369	0.37	(0.29)	1.45	0.063	0.23	(0.29)	1.26	0.300	0.85	(0.66)	2.34	0.002
Parental death	−0.05	(0.35)	0.95	0.881	0.25	(0.38)	1.28	0.406	0.47	(0.54)	1.60	0.167	0.64	(0.70)	1.89	0.086
Parental incarceration	0.85	(0.70)	2.34	0.005	1.89	(1.55)	6.63	<0.001	1.65	(1.28)	5.19	<0.001	1.17	(0.95)	3.21	<0.001
Parental abuse	0.81	(0.69)	2.25	0.008	1.59	(1.12)	4.92	<0.001	1.18	(0.82)	3.26	<0.001	1.87	(1.87)	6.49	<0.001
Violence exposure	0.62	(0.59)	1.86	0.051	0.87	(0.54)	2.39	<0.001	1.05	(0.69)	2.87	<0.001	1.41	(1.36)	4.09	<0.001
Household member mental illness	0.19	(0.39)	1.21	0.549	1.39	(0.89)	4.00	<0.001	0.98	(0.61)	2.66	<0.001	1.12	(0.83)	3.08	<0.001
Household member substance abuse	1.07	(0.84)	2.91	<0.001	1.78	(1.29)	5.91	<0.001	1.18	(0.73)	3.26	<0.001	1.70	(1.38)	5.47	<0.001
Any ACE	1.12	(1.13)	3.05	0.003	0.84	(0.46)	2.32	<0.001	0.77	(0.48)	2.15	0.001	1.18	(0.92)	3.25	<0.001
Number of ACEs	0.77	(0.29)	–	0.007	1.33	(0.14)	–	<0.001	1.06	(0.18)	–	<0.001	1.41	(0.19)	–	<0.001
N	1903				3868				2743				2096			

Note: Subsamples include children in foster care and children across various thresholds of family type. Dependent variables presented in rows. Independent variable is a binary measure indicating the focal child was placed in foster care or adopted from foster care at the time of the interview. Ordinary least squares (OLS) regression estimates number of ACEs, and all other outcomes are estimated with logistic regression. All models adjust for covariates in Model 3 of [Table 3](#).

#### 4.1. Strengths and limitations

By using a broadly representative sample of American children that included a relatively large number of children placed in foster care, this article provides the first nationally representative estimates of how children ever in foster care compare to other children—including children whose families are poor and children living in highly complex families—in terms of exposure to seven different ACEs. Although these results add substantially to our understanding of adversity among children placed in foster care, there are three relevant limitations. First, our descriptive estimates of ACEs among children placed in foster care are conservative for three reasons: (1) foster parents are more likely than other parents to not know what ACEs children experienced in their homes of origin; (2) the sampling frame of the NSCH excludes children in congregate care (including both children in group homes and secure juvenile detention facilities, many of whom may be officially in foster care); and (3) some children in the study are quite young and will undoubtedly go on to experience ACEs (which will affect children in foster care more than their counterparts). Second, it is possible that children who were neither in foster care nor adopted from foster care were placed in foster care at some point in their lives. Again, this means that the differences in ACEs between children in foster care and their counterparts are conservative estimates. Third, there is no information about the timing of foster care placement or exposure to ACEs. Future research should use longitudinal data to estimate how the timing and frequency of ACEs is associated with foster care placement (and, further, consider the differences in ACEs before, during, and after foster care placement). Critically, such data collection efforts should include both a large sample of children with CPS contact and a representative comparison sample of children from the general population.

#### 5. Conclusions

Limitations notwithstanding, by showing the risk factors for poor health that children in foster care face in a nationally representative sample, this article highlights the vulnerability of children in foster care. Our analyses shed light on how exposure to ACEs among children placed in foster care compares to exposure among other traditionally disadvantaged groups of children. In so doing, this article further demonstrates the need for designing interventions that help this vulnerable group, two of which we conclude with. First, and most importantly, substantial resources should be allocated to help foster children deal with the stressors they have faced prior to foster care placement. Second, when possible, foster parents should be made aware of the adversity these children faced—beyond the abuse and neglect that may have contributed to their placement in foster care—so they are better able to deal with both the maltreatment and adversities.

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## Appendix A.

**Table A1**

Weighted Descriptive Statistics of All Variables Included in Analyses: 2011–2012 National Study of Children's Health.

	Full sample		Analytic sample	
	Mean or %	N	Mean or %	N
Child age (range: 0–17)	8.59		8.57	–
Child female	48.8%	46,349	48.7%	44,088
Child born low birth weight	9.6%	8277	9.4%	7780
Child race/ethnicity				
Non-Hispanic White		63,674	52.6%	59,740
Non-Hispanic Black	13.5%	8875	13.6%	8557
Hispanic	23.7%	12,682	23.8%	12,259
Non-Hispanic other	10.3%	10,446	10.0%	9657
Child first- or second-generation immigrant	26.4%	15,826	26.7%	15,500
Parent/caregiver respondent				
Mother/caregiver	70.0%	65,773	70.2%	62,640
Father/caregiver	24.0%	23,081	23.9%	22,035
Other adult	6.0%	6823	5.9%	6570
Mother/caregiver age				
20–29 years old	18.7%	21,051	18.9%	13,121
30–39 years old	41.9%	31,916	42.1%	31,049
40–49 years old	32.0%	32,328	32.0%	31,137
50–59 years old	7.4%	10,382	7.0%	9302
Parent/caregiver educational attainment				
Less than high school	20.7%	18,298	20.8%	12,410
High school diploma	32.2%	30,691	32.3%	29,698
Post-secondary education	47.1%	46,688	46.9%	45,132
Parent/caregiver fair or poor health	14.9	8990	15.0%	8579
Household member employed	84.2%	82,255	84.3%	79,578
Household member receives welfare	7.4%	4923	7.5%	4798
Household member receives WIC	14.2%	8507	14.3%	8365
Household income below the poverty line	21.8%	13,071	21.9%	12,746
N	95,677		91,261	

Notes: Means and frequencies are calculated with sampling weights (and corresponding stratum and primary sampling units). Means and frequencies are presented prior to imputation. Ns are unweighted.

**Table A2**

Raw Values of Adverse Childhood Experiences (ACEs), for Full Sample and by Foster Care Status.

		Full sample		Placed in or adopted from foster care		Not placed in or adopted from foster care	
		N	%	N	%	N	%
Parental divorce or separation	Yes	17,081	18.1%	647	41.7%	16,434	17.7%
	No	76,940	81.4%	779	50.2%	76,161	81.9%
	Don't know	289	0.3%	121	7.8%	168	0.2%
	Refused	197	0.2%	6	0.4%	191	0.2%
Parental death	Yes	2942	3.1%	159	10.2%	2783	3.0%
	No	91,364	96.7%	1359	87.5%	90,005	96.8%
	Don't know	118	0.1%	35	2.3%	83	0.1%
	Refused	68	0.1%	0	0.0%	68	0.1%
Parental incarceration	Yes	5642	6.0%	558	35.9%	5084	5.5%
	No	88,453	93.6%	900	58.0%	87,553	94.2%
	Don't know	230	0.2%	86	5.5%	144	0.2%
	Refused	157	0.2%	9	0.6%	148	0.2%
Parental abuse	Yes	5912	6.3%	515	33.2%	5397	5.8%
	No	87,698	92.8%	887	57.1%	86,811	93.4%
	Don't know	542	0.6%	140	9.0%	402	0.4%
	Refused	310	0.3%	11	0.7%	299	0.3%
Violence exposure	Yes	7255	7.7%	498	32.1%	6757	7.3%
	No	86,571	91.7%	972	62.6%	85,599	92.1%
	Don't know	483	0.5%	73	4.7%	410	0.4%
	Refused	136	0.1%	9	0.6%	127	0.1%
Household member mental illness	Yes	8550	9.1%	507	32.7%	8043	8.7%
	No	85,289	90.3%	919	59.2%	84,370	90.8%
	Don't know	367	0.4%	120	7.7%	247	0.3%
	Refused	227	0.2%	6	0.4%	221	0.2%
Household member substance abuse	Yes	10,061	10.7%	812	52.4%	9249	10.0%
	No	83,969	88.9%	678	43.7%	83,291	89.7%
	Don't know	196	0.2%	52	3.4%	144	0.2%
	Refused	194	0.2%	9	0.6%	185	0.2%

Note: Ns presented prior to sample restrictions or imputation.

**Table A3**

Frequency of Missing Values, for Full Sample and by Foster Care Status: 2011–2012 National Study of Children's Health.

	Full Sample		By Foster Care Status			
	Mean or %	N	Placed in or adopted from foster care		Not placed in nor adopted from foster care	
			Mean or %	N	Mean or %	N
Child age (range: 0–17)	0.0%	0	0.0%	0	0.0%	0
Child female	0.1%	100	0.1%	1	0.1%	99
Child born low birth weight	4.2%	3823	36.2%	553	3.6%	3270
Child race/ethnicity						
Non-Hispanic White	1.2%	1048	1.9%	29	1.1%	1019
Non-Hispanic Black	1.2%	1048	1.9%	29	1.1%	1019
Hispanic	1.2%	1048	1.9%	29	1.1%	1019
Non-Hispanic other	1.2%	1048	1.9%	29	1.1%	1019
Child first- or second-generation immigrant	4.3%	3879	23.1%	352	3.9%	3527
Parent/caregiver respondent						
Mother/caregiver	0.0%	16	0.1%	1	0.0%	15
Father/caregiver	0.0%	16	0.1%	1	0.0%	15
Other adult	0.0%	16	0.1%	1	0.0%	15
Mother/caregiver age						
20–29 years old	7.8%	7080	28.0%	428	7.4%	6652
30–39 years old	7.8%	7080	28.0%	428	7.4%	6652
40–49 years old	7.8%	7080	28.0%	428	7.4%	6652
50–59 years old	7.8%	7080	28.0%	428	7.4%	6652
Parent/caregiver educational attainment						
Less than high school	4.4%	4021	6.1%	93	4.4%	3928
High school diploma	4.4%	4021	6.1%	93	4.4%	3928
Post-secondary education	4.4%	4021	6.1%	93	4.4%	3928

Table A3 (Continued)

	Full Sample		By Foster Care Status			
	Mean or %	N	Placed in or adopted from foster care		Not placed in nor adopted from foster care	
			Mean or %	N	Mean or %	N
Parent/caregiver fair or poor health	4.2%	3858	23.6%	360	3.9%	3498
Household member employed	0.8%	688	0.5%	8	0.8%	680
Household member receives welfare	1.2%	1076	1.4%	22	1.2%	1054
Household member receives WIC	1.0%	895	0.6%	9	1.0%	886
Household income below the poverty line	8.1%	7374	7.4%	113	8.1%	7261
N	91,261		1527		89,734	

Note: Frequencies and Ns are unweighted.

**Table A4**

Frequencies of Adverse Childhood Experiences (ACEs), By Poverty Status: 2011–2012 National Study of Children's Health.

	Household income below 400% of poverty line		Household income below 200% of poverty line		Household income below 100% of poverty line	
	%	N	%	N	%	N
Parental divorce or separation	22.1%	12,857	22.7%	8203	21.3%	4382
Parental death	3.4%	2303	3.9%	1613	4.1%	918
Parental incarceration	8.5%	4783	10.0%	3560	10.7%	2131
Parental abuse	8.7%	4828	9.7%	3363	10.2%	1961
Violence exposure	10.1%	5726	11.4%	3918	12.5%	2278
Household member mental illness	9.4%	6404	9.6%	4104	9.0%	2222
Household member substance abuse	11.8%	7615	12.2%	4886	11.6%	2617
Any ACE	37.6%	22,493	39.5%	14,490	39.4%	8046
Number of ACEs	0.74	–	0.79	–	0.79	–
N	61,141		35,228		20,120	

Notes: Means and frequencies are calculated with sampling weights (and corresponding stratum and primary sampling units) and are averaged across five imputed data sets. Ns are unweighted and presented for the first imputed data set.

**Table A5**

Frequencies of Adverse Childhood Experiences (ACEs), by Family Type: 2011–2012 National Study of Children's Health.

	Single mother		Single father		Only grandparents		Grandparents and parents	
	%	N	%	N	%	N	%	N
Parental divorce or separation	47.3%	4691	70.0%	1216	46.9%	1173	24.2%	2367
Parental death	6.8%	762	8.8%	174	19.2%	355	3.9%	436
Parental incarceration	12.9%	1015	10.0%	177	28.2%	688	10.9%	949
Parental abuse	16.4%	1257	12.0%	186	23.6%	636	9.1%	832
Violence exposure	17.2%	1383	15.9%	263	20.6%	497	8.8%	751
Household member mental illness	14.0%	1439	13.9%	341	20.3%	512	10.5%	1058
Household member substance abuse	18.7%	1814	19.9%	372	35.6%	956	11.9%	1287
Any ACE	67.3%	6441	83.3%	1464	75.0%	1792	42.3%	3987
Number of ACEs	1.33	–	1.50	–	1.94	–	0.79	–
N	9007		1751		2344		8943	
	Only relatives		Relatives and parents		Non-relatives		Other complex family type	
	%	N	%	N	%	N	%	N
Parental divorce or separation	46.8%	177	25.0%	510	33.9%	410	22.5%	97
Parental death	20.1%	87	4.8%	129	3.9%	72	5.5%	44
Parental incarceration	29.5%	142	9.1%	181	11.3%	121	17.8%	66
Parental abuse	26.3%	121	9.6%	191	14.3%	145	8.4%	64
Violence exposure	26.9%	116	14.1%	265	12.6%	155	11.1%	70
Household member mental illness	26.2%	106	10.6%	253	15.6%	205	12.8%	77
Household member substance abuse	38.4%	180	14.0%	327	21.4%	229	16.8%	107
Any ACE	66.8%	290	42.2%	938	47.9%	628	46.4%	229
Number of ACEs	2.13	–	0.87	–	1.13	–	0.95	–
N	376		2341		1216		569	

Notes: Means and frequencies are calculated with sampling weights (and corresponding stratum and primary sampling units) and are averaged across five imputed data sets. Ns are unweighted and presented for the first imputed data set.