Mental and Physical Health of Children in Foster Care

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abstract

BACKGROUND AND OBJECTIVES: Each year, nearly 1% of US children spend time in foster care, with 6% of US children placed in foster care at least once between their birth and 18th birthday. Although a large literature considers the consequences of foster care placement for children's wellbeing, no study has used a nationally representative sample of US children to compare the mental and physical health of children placed in foster care to the health of children not placed in foster care.

METHODS: We used data from the 2011–2012 National Survey of Children's Health, a nationally representative sample of noninstitutionalized children in the United States, and logistic regression models to compare parent-reported mental and physical health outcomes of children placed in foster care to outcomes of children not placed in foster care, children adopted from foster care, children across specific family types (eg, single-mother households), and children in economically disadvantaged families.

RESULTS: We find that children in foster care are in poor mental and physical health relative to children in the general population, children across specific family types, and children in economically disadvantaged families. Some differences are explained by adjusting for children's demographic characteristics, and nearly all differences are explained by also adjusting for the current home environment. Additionally, children adopted from foster care, compared with children in foster care, have significantly higher odds of having some health problems.

CONCLUSIONS: Children in foster care are a vulnerable population in poor health, partially as a result of their early life circumstances.

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WHAT'S KNOWN ON THIS SUBJECT: Data limitations to date have made it impossible to compare the mental and physical health of children placed in foster care to the mental and physical health of the general population of US children.

WHAT THIS STUDY ADDS: This study uses data from the nationally representative 2011–2012 National Survey of Children's Health to provide a descriptive portrait of the mental and physical health outcomes of children placed in foster care relative to other children.

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ARTICLE

Each year, nearly 1% of US children spend time in foster care.[1] Yet only considering children placed in care annually dramatically understates the number of children ever experiencing this event. Recent estimates show that between 5% and 6% of US children will ever be placed in foster care, with roughly 10% of African-American children and 15% of Native American children ever experiencing this event.[2]

Children placed in foster care endure a number of disadvantages, both because of the maltreatment they have endured and other risk factors associated with their placement, including poverty, parental drug and alcohol abuse, neighborhood disadvantage, and epigenetics.[3–15] Therefore, it is perhaps unsurprising that children in foster care experience more depression/anxiety, attention-deficit/hyperactivity disorder (ADHD), and behavioral/conduct problems than children living with 2 biological parents and children living with never-married biological single mothers.[16] Children ever placed in foster care, compared with their counterparts, also disproportionately struggle in school, have trouble finding employment, and abuse drugs and alcohol in adolescence and early adulthood.[17–23]

Data limitations to date have made it impossible to compare the mental and physical health of children placed in foster care to the general population of US children. Data limitations have also made it impossible to compare the mental and physical health of children placed in foster care to children across most specific family types or to children in economically disadvantaged families.[16] Therefore, in this article, we use data from the 2011–2012 National Survey of Children's Health (NSCH), a nationally representative sample of noninstitutionalized children in the United States, to provide a descriptive portrait of the health outcomes of children placed in foster care relative to children not placed in foster care, children adopted from foster care, children across specific family types (eg, single-mother households), and children in economically disadvantaged families.

METHODS

Participants

We estimated the association between foster care placement and children's health with the cross-sectional 2011–2012 NSCH, a nationally representative survey of 95 677 noninstitutionalized children ages 0 to 17 years in the United States.[24] During the survey, interviewers first selected a focal child and then interviewed the household adult with the most information about the focal child (the child's mother or father in 93% of observations, hereafter referred to as the parent respondent). The survey completion rate was 41% and 54% for the cell phone and landline samples, respectively, and sampling weights adjust for nonresponse. The large sample size of the NSCH allows for an examination of children placed in foster care, a typically difficult-to-reach population. The analytic sample excludes the 2443 observations missing data on household living arrangements.

Measures

Outcome Variables

The outcome variables include 13 binary indicators of children's mental and physical health, all reported by the parent respondent. These include 2 general indicators of health: (1) fair or poor health (compared with excellent, very good, or good health), and (2) activity limitations (1 = child is limited or prevented in ability to do things because of medical, behavioral, or other health condition). These also include 11 specific indicators of health conditions, measured affirmatively if the parent respondent

reports the child has been diagnosed with the condition by a doctor or other health care provider and if the parent respondent reports the child has the condition at the time of the interview. These indicators include the following: (1) learning disability; (2) attention deficit disorder (ADD) or ADHD; (3) depression; (4) anxiety; (5) behavioral or conduct problems; (6) developmental delay; (7) asthma; (8) obesity (95th percentile or higher, only ascertained for children ages 10–17 years); (9) speech or other language problems (including stuttering or stammering); (10) hearing problems; and (11) vision problems that cannot be corrected with standard glasses or contact lenses.

Explanatory Variables

The primary explanatory variable, foster care placement, is a binary indicator that the parent respondent answered affirmatively to the following question: "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?" In addition to measuring current foster care placement, we also included a binary variable indicating that the child was placed in foster care before being legally adopted. A series of binary variables also indicate household living arrangements constructed from the household roster, the list of individuals living in the household and their relationship to the focal child. These mutually exclusive household living arrangements are as follows: (1) married biological parents; (2) cohabiting biological parents; (3) married step-parents; (4) cohabiting step-parents; (5) single mother; (6) single father; (7) only grandparents; (8) grandparents and parents; (9) only relatives; (10) relatives and parents; (11) nonrelatives; and (12) other complex family. Importantly, foster care placement (and adoption

from foster care) supersede the measures of household living arrangements. For example, a child placed in foster care with a single mother is coded as being placed in foster care.

Covariates

The multivariate analyses adjusted for variables commonly used when estimating children's health.[16,25–27] Child characteristics include the following: age (a continuous measure ranging from 0–17 years), sex (1 = girl), birth weight (1 = born <2500 g), race/ethnicity (non-Hispanic white, non-Hispanic black, Hispanic, non-Hispanic other race), and nativity status (1 = first- or second-generation immigrant). Household characteristics include the following: mother's age (age 20–29 years, age 30–39 years, age 40–49 years, ≥50 years), parent's educational attainment (less than high school, high school diploma, postsecondary education), parent's unemployment status (1 = unemployed), economic hardship (1 = family often has difficulty getting by on its income), welfare receipt (1 = household member receives welfare), Supplemental Nutrition Program for Women, Infants, and Children (WIC) receipt (1 = household member receives WIC), poverty (1 = household income below the poverty line), home ownership (1 = parent owns home), child's health insurance (private insurance, public insurance, no insurance), child's health care access (1 = saw doctor in past year), parent's health (1 = fair or poor health), child's exposure to smoking (1 = household member smokes inside home), and neighborhood safety (1 = not always safe for child). Importantly, for children placed in foster care, these household characteristics represent the characteristics of the foster family and not the family of origin.

Statistical Analyses

Table 1 presents descriptive statistics of all variables. Table 2 presents frequencies of outcome variables by foster care placement. In Table 3, logistic regression models estimate children's health as a function of foster care placement (temporarily excluding children adopted from foster care). Model 1 estimates the unadjusted association, Model 2 adjusts for child characteristics, and Model 3 adjusts for both child and household characteristics. Because children placed in foster care experienced difficulties in their families of origin,[3,22] which are not captured due to data limitations, Model 3 provides a conservative test of the association between foster care placement and children's health. In Table 4, logistic regression models estimate children's health as a function of foster care placement, comparing children placed in foster care to children adopted from foster care and children across a variety of household living arrangements (eg, single-mother households). Providing these family-level comparisons is essential for showing pediatricians how the health and wellbeing of children in foster care compares to children in other sorts of family arrangements. Finally, in Table 5, logistic regression models estimate children's health, comparing children placed in foster care to children in the following groups: (1) children in households with income below the poverty line; (2) children in households receiving welfare; (3) children with public health insurance; (4) children with no health insurance; (5) children of parents who have less than a high school diploma; (6) children with unemployed parents; (7) children living in not always safe neighborhoods; and (8) children with ≥3 of these indicators of socioeconomic status (SES) disadvantage. In Tables 4 and 5, we present models that adjust for both

child and household characteristics (the equivalent of Model 3 in Table 3).

All analyses were conducted in Stata version 14.1 (Stata Corp, College Station, TX).[28] The median control variable was missing 2% of observations, and we imputed missing values with multiple imputation. All analyses account for the complex sampling design (including sampling weights, stratum, and primary sampling units). This study was deemed exempt from human subjects research by the institutional review boards at the University of California, Irvine and Cornell University.

RESULTS

Table 1 presents weighted descriptive statistics of all dependent, independent, and control variables included in the analyses. In the full sample, 3.2% of parents reported their child was in fair or poor health, and 4.9% of parents reported their child had an activity limitation. In terms of specific health conditions, obesity was most commonly reported (15.8% of children), followed by asthma (8.8%), learning disability (7.9%), ADD/ADHD (7.7%), and speech problems (4.8%). A total of 0.5% of children were placed in foster care (and an additional 0.8% were legally adopted from foster care).

Table 2 shows vast descriptive differences between the health of children placed and not placed in foster care. Children placed in foster care, compared with their counterparts, were more likely to be in fair or poor health (4.2% vs 3.1%) and have activity limitations (9.8% vs 4.8%). Children placed in foster care were twice as likely to have learning disabilities (14.7% vs 7.6%), developmental delays (7.3% vs 3.4%), asthma (18.0% vs 8.7%), obesity (24.1% vs 15.7%), and speech problems (11.2% vs

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TABLE 1 Weighted Means or Frequencies of All Variables Included in Analyses, for All Children, Children Placed in Foster Care, and Children Not Placed in Foster Care: 2011–2012 NSCH

	% or Mean
Outcome variables	
Fair or poor health (ages 0–17 y)	3.2
Learning disability (ages 3–17 y)	7.9
ADD or ADHD (ages 2–17 y)	7.7
Depression (ages 2–17 y)	2.1
Anxiety (ages 2–17 y)	3.3
Behavioral problems (ages 2–17 y)	3.1
Developmental delay (ages 2–17 y)	3.5
Asthma (ages 0–17 y)	8.8
Obesity (ages 10–17 y)	15.8
Speech problems (ages 2–17 y)	4.8
Hearing problems (ages 0–17 y)	1.2
Vision problems (ages 0–17 y)	1.3
Activity limitation (ages 0–17 y)	4.9
Independent variables	
Foster care placement	0.5
Adopted from foster care	0.8
Married biological parents	52.7
Cohabiting biological parents	5.2
Married step-parents	5.6
Cohabiting step-parents	2.2
Single mother	13.0
Single father	2.5
Only grandparents	1.9
Grandparents and parents	8.9
Only relatives	0.5
Relatives and parents	3.6
Nonrelatives	1.4
Other complex family type	1.3
Control variables	
Child age (y; range: 0–17)	8.6
Child sex (girl)	48.8
Child born low birth weight	9.5
Child race/ethnicity	
Non–Hispanic white	45.6
Non–Hispanic black	16.0
Hispanic	25.9
Non–Hispanic other	12.5
Child first– or second–generation immigrant	26.2
Mother age, y	
20–29	18.9
30–39	41.8
40–49	32.0
50–59	7.3
Parent educational attainment	
Less than high school	11.3
High school diploma	37.6
Postsecondary education	51.1
Parent unemployed	15.9
Family often has difficulty getting by on its in com	9.1
Household member receives welfare	10.3
Household member receives WIC	16.8
Household income below poverty line	29.5
Child health insurance	
Private insurance	54.8

TABLE 1 Continued

	% or Mean
Public insurance	38.2
No insurance	7.0
Child saw doctor in past year	88.1
Parent owns home	61.7
Parent fair or poor health	16.1
Household member smokes inside home	6.0
Neighborhood not always safe for child	43.6
N	93 234

Ns vary across outcome variables because not all outcome variables were ascertained for children at all ages.

4.7%). They were 3 times as likely to have ADD/ADHD (21.8% vs 7.4%), hearing problems (3.9% vs 1.2%), and vision problems (3.4% vs 1.3%); 5 times as likely to have anxiety (14.2% vs 3.1%); 6 times as likely to have behavioral problems (17.5% vs 2.9%); and 7 times as likely to have depression (14.2% vs 2.0%).

Table 3 presents results from logistic regression models. Model 1, the unadjusted model, shows that children placed in foster care, compared with their counterparts not placed in foster care, have higher odds of experiencing 9 of the 13 outcome variables. These statistically significant associations remain in Model 2, which adjusts for child characteristics. Finally, in Model 3, which adjusts for household characteristics, children placed in foster care have a greater likelihood of ADD/ADHD (odds ratio [OR] = 3.00; 95% confidence interval [CI] = 1.91–4.71), depression (OR = 4.92; 95% CI = 2.63–9.18), anxiety (OR = 3.94; 95% CI = 2.36–6.60), behavioral or conduct problems (OR = 4.22; 95% CI = 2.59–6.88), and speech or other language problems (OR = 1.91; 95% CI = 1.01–3.61) than their counterparts. Therefore, in these conservative models, the differences between children placed and not placed in foster care are most apparent for mental health outcomes.

Table 4 presents results from the logistic regression models that compare children placed in foster care to other children across a variety of household living arrangements, adjusting for an array of child and household characteristics (see Supplemental Table 6 for frequencies). These analyses show that children placed in foster care, compared with children in nearly all other types of household living arrangements, have a greater likelihood of having mental health problems, including ADD/ADHD, depression, anxiety, and behavioral or conduct problems. For example, compared with children placed in foster care, children have a lower likelihood of ADHD when they are in households with married biological parents (OR = 0.21; 95% CI = 0.13–0.33), cohabiting biological parents (OR = 0.21; 95% CI = 0.12–0.38), married step-parents (OR = 0.39; 95% CI = 0.23–0.67), cohabiting step-parents (OR = 0.40; 95% CI = 0.23–0.71), single mothers (OR = 0.29; 95% CI = 0.18–0.48), single fathers (OR = 0.20; 95% CI = 0.11–0.35), grandparents and parents (OR = 0.29; 95% CI = 0.17–0.48), relatives and parents (OR = 0.26; 95% CI = 0.15–0.45), nonrelatives (OR = 0.28; 95% CI = 0.15–0.51), and other complex families (OR = 0.39; 95% CI = 0.21–0.72). There are few differences in fair or poor health, learning disability, developmental delay, asthma, obesity, speech problems, hearing problems, vision problems, and activity limitations between children placed in foster care and children in most other household living arrangements.

Table 5 presents results from the logistic regression models that compare children placed in foster care to children who experience 8 types of socioeconomic disadvantages, again adjusting for an array of child and household characteristics (see Supplemental Table 7 for frequencies). These analyses show that children placed in foster care, compared with children

	Placed in Foster Care (%)	Not Placed in Foster Care (%)
Fair or poor health	4.2	3.1
Learning disability	14.7	7.6
ADD or ADHD	21.8	7.4
Depression	14.2	2.0
Anxiety	14.2	3.1
Behavioral problems	17.5	2.9
Developmental delay	7.3	3.4
Asthma	18.0	8.7
Obesity	24.1	15.7
Speech problems	11.2	4.7
Hearing problems	3.9	1.2
Vision problems	3.4	1.3
Activity limitation	9.8	4.8
N	481	91 678

*N*s vary across outcome variables because not all outcome variables were ascertained for children at all ages. Children adopted from foster care (*N* = 1075) excluded from this table.

who experience socioeconomic disadvantages, have a greater likelihood of having mental health problems. For example, compared with children who experience ≥3 indicators of socioeconomic disadvantage, children placed in foster care have a greater likelihood of ADD/ADHD (OR = 3.13; 95% CI = 1.91–5.13), depression (OR = 4.78; 95% CI = 2.47–9.25), anxiety

(OR = 3.67; 95% CI = 2.11–6.39), and behavioral or conduct problems (OR = 4.14; 95% CI = 2.44–7.03).

DISCUSSION

Foster care placement is a common event for US children,[2] yet no previous research had considered how the mental and physical health of children in foster care compared with children in the general population not in foster care.[22] In a similar vein, research that had compared children in foster care to other children in the population had focused initially only on a small number of types of households and did not consider comparisons with children in economically disadvantaged families.[16] The goal of this article was to document the differences in mental and physical health outcomes of children placed in foster care to outcomes of children not placed in foster care, children adopted from foster care, children across specific family types, and children in economically disadvantaged families by using the 2011–2012 NSCH.

The results support 3 key conclusions. First, children placed in foster care had more mental and physical health conditions than children not placed in foster care. For instance, these children were about twice as likely to have a learning disability and 3 times as likely to have ADD or ADHD. They were also roughly twice as likely to have asthma and speech problems and 3 times as likely to have hearing problems and vision problems. Differences were even more substantial for other mental health conditions; they were 5 times as likely to have anxiety, 6 times as likely to have behavioral problems, and 7 times as likely to have depression.

Second, although some of the mental and physical health differences of children in foster care compared with other children were explained by characteristics of these children and their households, many of the differences in mental health persisted after adjusting for these child and household characteristics, suggesting possible effects of foster care placement on mental health. However, unlike much other research in this area, our primary goal was

TABLE 3 Logistic Regression Models Estimating Children's Health as a Function of Foster Care Placement: 2011–2012 NSCH

	Model 1 (Unadjusted)		Model 2 (+ Basic Controls)		Model 3 (+ Extended Controls)	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Fair or poor health	1.35	(0.65–2.80)	0.97	(0.45–2.11)	0.75	(0.34–1.68)
Learning disability	2.09	(1.29–3.38)	1.90	(1.13–3.21)	1.18	(0.71–1.95)
ADD or ADHD	3.51	(2.22–5.56)	4.29	(2.68–6.88)	3.00	(1.91–4.71)
Depression	8.15	(4.89–13.60)	8.88	(4.84–16.27)	4.92	(2.63–9.18)
Anxiety	5.10	(3.16–8.25)	6.20	(3.73–10.30)	3.94	(2.36–6.60)
Behavioral problems	7.17	(4.37–11.77)	7.53	(4.45–12.74)	4.22	(2.59–6.88)
Developmental delay	2.25	(1.36–3.72)	2.03	(1.21–3.41)	1.21	(0.71–2.05)
Asthma	2.32	(1.39–3.87)	2.10	(1.19–3.70)	1.55	(0.90–2.67)
Obesity	1.70	(0.95–3.06)	1.53	(0.85–2.78)	1.12	(0.61–2.08)
Speech problems	2.56	(1.40–4.68)	2.68	(1.41–5.08)	1.91	(1.01–3.61)
Hearing problems	3.27	(0.86–12.38)	2.87	(0.75–11.00)	2.00	(0.47–8.53)
Vision problems	2.74	(0.96–7.85)	2.10	(0.72–6.11)	1.33	(0.40–4.45)
Activity limitation	2.15	(1.34–3.44)	1.85	(1.12–3.06)	1.25	(0.76–2.08)

Each row represents a separate dependent variable. OR for foster care placement presented (1 = placed in foster care, 0 = not placed in foster care). Children adopted from foster care (*N* = 1075) excluded from table. Model 2 adjusts for the following: child age, child is a girl, child born low birth weight, child race/ethnicity, and child first- or second-generation immigrant. Model 3 adjusts for all variables in Model 2 and the following: mother age, parent highest educational attainment, parent married to child's biological father, parent unemployed, family often has difficulty getting by on its income, household member receives welfare, household member receives WIC, household income below the poverty line, parent owns home, child health insurance, child saw doctor in past year, parent in fair or poor health, household member smokes inside home, and neighborhood not always safe for child. All analyses account for the sampling design.

	Fair or Poor Health		Learning Disability		ADD or ADHD		Depression		Anxiety	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Adopted from foster care	2.63	(0.96–7.22)	2.83	(1.57–5.11)	1.77	(1.03–3.02)	0.72	(0.35–1.48)	1.02	(0.57–1.84)
Married biological parents	1.60	(0.67–3.82)	0.86	(0.50–1.46)[a]	0.21	(0.13–0.33)[a]	0.09	(0.04–0.17)[a]	0.20	(0.11–0.34)[a]
Cohabiting biological parents	1.56	(0.62–3.97)	0.86	(0.46–1.59)[a]	0.21	(0.12–0.38)[a]	0.25	(0.11–0.61)[a]	0.18	(0.09–0.36)[a]
Married step-parents	1.45	(0.52–4.03)	0.82	(0.46–1.47)[a]	0.39	(0.23–0.)[a]	0.32	(0.15–0.71)[a]	0.30	(0.16–0.55)[a]
Cohabiting step-parents	2.04	(0.78–5.35)	1.14	(0.59–2.22)[a]	0.40	(0.23–0.71)[a]	0.38	(0.17–0.86)	0.45	(0.22–0.92)[a]
Single mother	1.95	(0.80–4.77)	0.97	(0.57–1.66)[a]	0.29	(0.18–0.48)[a]	0.28	(0.14–0.56)[a]	0.32	(0.18–0.57)[a]
Single father	1.57	(0.59–4.22)	0.57	(0.29–1.11)[a]	0.20	(0.11–0.35)[a]	0.12	(0.04–0.42)[a]	0.08	(0.04–0.17)[a]
Only grandparents	0.78	(0.33–1.85)[a]	1.10	(0.62–1.97)[a]	0.77	(0.45–1.30)[a]	0.32	(0.15–0.68)[a]	0.38	(0.20–0.71)[a]
Grandparents and parents	1.89	(0.78–4.57)	0.77	(0.45–1.34)[a]	0.29	(0.17–0.48)[a]	0.21	(0.10–0.44)[a]	0.35	(0.19–0.63)[a]
Only relatives	1.10	(0.35–3.44)	0.97	(0.46–1.34)[a]	0.88	(0.43–1.80)[a]	0.68	(0.21–2.22)	0.44	(0.17–1.12)
Relatives and parents	1.70	(0.69–4.22)	0.70	(0.39–1.26)[a]	0.26	(0.15–0.45)[a]	0.14	(0.06–0.31)[a]	0.30	(0.14–0.62)[a]
Nonrelatives	2.64	(0.93–7.48)	0.69	(0.35–1.36)[a]	0.28	(0.15–0.51)[a]	0.17	(0.07–0.39)[a]	0.29	(0.14–0.62)[a]
Other complex family type	1.03	(0.39–2.74)[a]	0.83	(0.39–1.78)[a]	0.39	(0.21–0.72)[a]	0.08	(0.03–0.23)[a]	0.16	(0.07–0.37)[a]

	Behavioral Problems		Developmental Delay		Asthma		Obesity		Speech Problems	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Adopted from foster care	1.45	(0.81–2.60)	2.51	(1.33–4.73)	0.65	(0.35–1.21)	0.80	(0.40–1.63)	0.87	(0.41–1.84)
Married biological parents	0.13	(0.07–0.22)[a]	0.87	(0.47–1.60)[a]	0.49	(0.28–0.86)	0.84	(0.44–1.61)	0.64	(0.32–1.25)
Cohabiting biological parents	0.20	(0.09–0.42)[a]	0.83	(0.39–1.78)[a]	0.49	(0.27–0.91)	1.40	(0.66–2.96)[a]	0.70	(0.33–1.48)
Married step-parents	0.37	(0.19–0.71)[a]	0.78	(0.40–1.52)[a]	0.62	(0.34–1.12)	0.86	(0.43–1.71)	0.50	(0.23–1.10)
Cohabiting step-parents	0.42	(0.19–0.91)[a]	0.99	(0.47–2.11)[a]	0.67	(0.36–1.25)	0.95	(0.45–1.98)	0.61	(0.27–1.38)
Single mother	0.28	(0.16–0.49)[a]	0.91	(0.49–1.68)[a]	0.63	(0.36–1.11)	1.06	(0.55–2.05)	0.61	(0.31–1.21)
Single father	0.17	(0.08–0.40)[a]	0.73	(0.34–1.60)[a]	0.36	(0.18–0.71)[a]	0.76	(0.37–1.58)	0.43	(0.18–1.05)
Only grandparents	0.42	(0.23–0.76)[a]	0.99	(0.53–1.83)[a]	1.11	(0.60–2.05)[a]	0.92	(0.47–1.83)	0.50	(0.24–1.02)
Grandparents and parents	0.21	(0.12–0.36)[a]	0.71	(0.38–1.31)[a]	0.63	(0.36–1.13)	1.18	(0.60–2.32)	0.52	(0.26–1.03)[a]
Only relatives	0.58	(0.26–1.29)[a]	1.04	(0.44–2.46)[a]	0.78	(0.31–1.95)	0.72	(0.24–2.13)	0.64	(0.24–1.08)
Relatives and parents	0.18	(0.09–0.34)[a]	0.73	(0.35–1.49)[a]	0.58	(0.32–1.05)	1.33	(0.64–2.75)	0.51	(0.24–1.08)
Nonrelatives	0.16	(0.08–0.32)[a]	0.81	(0.37–1.77)[a]	0.58	(0.26–1.28)	1.11	(0.49–2.50)	0.42	(0.18–0.96)[a]
Other complex family type	0.10	(0.05–0.23)[a]	0.52	(0.23–1.15)[a]	0.84	(0.41–1.72)	0.55	(0.25–1.19)	0.33	(0.14–0.76)[a]

	Hearing Problems		Vision Problems		Activity Limitation	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Adopted from foster care	0.46	(0.10–2.18)	1.87	(0.51–6.92)	1.81	(0.98–3.32)
Married biological parents	0.39	(0.08–1.92)	0.75	(0.19–3.00)[a]	0.74	(0.43–1.29)[a]
Cohabiting biological parents	0.44	(0.08–2.38)	0.58	(0.13–2.55)[a]	0.73	(0.38–1.37)[a]
Married step-parents	0.53	(0.10–2.73)	0.74	(0.18–3.12)[a]	0.88	(0.45–1.70)[a]
Cohabiting step-parents	0.51	(0.10–2.72)	1.17	(0.23–6.04)	1.01	(0.47–2.14)
Single mother	0.43	(0.08–2.16)	1.18	(0.29–4.86)	1.00	(0.57–1.75)[a]
Single father	0.45	(0.11–1.93)	0.44	(0.12–1.63)[a]	0.49	(0.22–1.10)[a]
Only grandparents	0.99	(0.25–3.98)	0.87	(0.25–3.02)	0.85	(0.46–1.56)[a]
Grandparents and parents	0.42	(0.08–2.22)	0.72	(0.19–2.80)[a]	0.85	(0.48–1.51)[a]
Only relatives	0.58	(0.13–2.50)	0.91	(0.16–5.22)	0.88	(0.34–2.29)
Relatives and parents	0.49	(0.10–2.52)	0.94	(0.22–3.92)	0.81	(0.43–1.52)[a]
Nonrelatives	0.21	(0.04–1.12)	0.60	(0.14–2.66)[a]	1.08	(0.46–2.56)
Other complex family type	0.26	(0.05–1.46)	0.31	(0.08–1.22)[a]	1.04	(0.45–2.39)

Across each outcome variable, the reference category is children who were neither placed in foster care nor adopted from foster care. All models adjust for the following: child age, child is a girl, child born low birth weight, child race/ethnicity, child first- or second-generation immigrant, mother age, parent highest educational attainment, parent married to child's biological father, parent unemployed, family often has difficulty getting by on its income, household member receives welfare, household member receives WIC, household income below the poverty line, parent owns home, child health insurance, child saw doctor in past year, parent in fair or poor health, household member smokes inside home, and neighborhood not always safe for child. All analyses account for the sampling design.

[a] Coefficient is statistically different from "adopted from foster care" coefficient (P < .05).

TABLE 5 Logistic Regression Models Estimating Children's Health as a Function of Foster Care Placement, With Comparisons to Economically Disadvantaged Children: 2011–2012 NSCH

	Fair or Poor Health		Learning Disability		ADD or ADHD		Depression		Anxiety	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Children in foster care versus children in households below poverty line (N = 22 793)	0.69	(0.23–2.06)	1.11	(0.58–2.14)	3.53	(1.85–6.74)	4.79	(2.02–11.32)	2.08	(0.97–4.48)
Children in foster care versus children in households receiving welfare (N = 8533)	0.53	(0.12–2.39)	0.93	(0.40–2.14)	3.31	(1.61–6.81)	2.66	(0.85–8.30)	2.71	(1.07–6.88)
Children in foster care versus children with public health insurance (N = 28 433)	0.75	(0.33–1.72)	1.31	(0.77–2.24)	3.16	(1.97–5.06)	4.93	(2.64–9.22)	3.78	(2.24–6.38)
Children in foster care versus children with no health insurance (N = 6617)	0.14	(0.03–0.69)	0.52	(0.14–1.91)	0.60	(0.12–2.98)	2.94	(0.51–17.15)	0.28	(0.06–1.38)
Children in foster care versus children of parents with < high school diploma (N = 13 771)	0.34	(0.08–1.52)	1.71	(0.87–3.37)	3.20	(1.68–6.11)	3.54	(1.34–9.30)	3.30	(1.65–6.60)
Children in foster care versus children with unemployed parent (N = 12 372)	0.83	(0.29–2.37)	1.08	(0.51–2.29)	3.95	(2.00–7.81)	3.99	(1.62–9.82)	3.58	(1.63–7.83)
Children in foster care versus children in not always safe neighborhoods (N = 38 094)	0.55	(0.19–1.65)	0.96	(0.50–1.86)	2.83	(1.59–5.04)	4.41	(1.84–10.54)	3.65	(1.90–7.01)
Children in foster care versus children with 3+ indicators of SES disadvantage (N = 21 077)	0.69	(0.30–1.57)	1.42	(0.84–2.42)	3.13	(1.91–5.13)	4.78	(2.47–9.25)	3.67	(2.11–6.39)

TABLE 5 Continued

	Behavioral Problems		Developmental Delay		Asthma		Obesity		Speech Problems	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Children in foster care versus children in households below poverty line (N = 22 793)	3.41	(1.64–7.09)	0.96	(0.40–2.30)	2.04	(1.03–4.04)	1.50	(0.72–3.15)	0.96	(0.44–2.09)
Children in foster care versus children in households receiving welfare (N = 8533)	3.13	(1.47–6.65)	0.72	(0.25–2.10)	1.30	(0.53–3.18)	1.61	(0.65–4.01)	1.05	(0.46–2.41)
Children in foster care versus children with public health insurance (N = 28 433)	4.24	(2.57–7.02)	1.30	(0.75–2.24)	1.39	(0.79–2.44)	0.97	(0.53–1.77)	2.06	(1.07–3.99)
Children in foster care versus children with no health insurance (N = 6617)	1.76	(0.50–6.23)	1.05	(0.20–5.50)	1.59	(0.50–5.03)	1.84	(0.48–7.10)	0.99	(0.14–6.89)
Children in foster care versus children of parents with < high school diploma (N = 13 771)	3.74	(1.99–7.04)	0.78	(0.33–1.88)	0.72	(0.36–1.44)	0.81	(0.33–1.99)	0.96	(0.35–2.61)
Children in foster care versus children with unemployed parent (N = 12 372)	3.17	(1.44–7.01)	1.23	(0.49–3.08)	1.24	(0.52–2.95)	0.73	(0.31–1.68)	2.06	(0.86–4.95)
Children in foster care versus children in not always safe neighborhoods (N = 38 094)	3.48	(1.87–6.47)	1.22	(0.59–2.50)	1.31	(0.69–2.49)	0.94	(0.49–1.81)	2.04	(0.90–4.66)
Children in foster care versus children with 3+ indicators of SES disadvantage (N = 21 077)	4.14	(2.44–7.03)	1.28	(0.71–2.32)	1.63	(0.93–2.85)	0.96	(0.51–1.81)	1.88	(0.96–3.71)

TABLE 5 Continued

	Hearing Problems		Vision Problems		Activity Limitation	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Children in foster care versus children in households below poverty line (N = 22 793)	0.80	(0.26–2.51)	2.09	(0.43–10.22)	0.72	(0.32–1.62)
Children in foster care versus children in households receiving welfare (N = 8533)	0.88	(0.14–5.67)	4.23	(1.27–14.08)	0.87	(0.31–2.39)
Children in foster care versus children with public health insurance (N = 28 433)	1.66	(0.36–7.54)	0.99	(0.35–2.81)	1.25	(0.74–2.12)
Children in foster care versus children with no health insurance (N = 6617)	0.67	(0.07–6.68)	5.60	(0.39–80.60)	0.97	(0.23–4.06)
Children in foster care of parents with < high school diploma (N = 13 771)	1.37	(0.35–5.34)	1.06	(0.25–4.40)	0.71	(0.29–1.74)
Children in foster care versus children with unemployed parent (N = 12 372)	1.50	(0.12–19.34)	0.84	(0.21–3.30)	1.24	(0.56–2.76)
Children in foster care versus children in not always safe neighborhoods (N = 38 094)	4.43	(0.48–40.74)	1.39	(0.22–8.67)	0.90	(0.40–2.01)
Children in foster care versus children with 3+ indicators of SES disadvantage (N = 21 077)	1.43	(0.30–6.71)	1.40	(0.36–5.50)	1.33	(0.76–2.34)

Across each outcome variable, the reference category is children who were neither placed in foster care nor adopted from foster care. All models adjust for the following: child age, child is a girl, child born low birth weight, child race/ethnicity, child first- or second-generation immigrant, mother age, parent highest educational attainment, parent married to child's biological father, parent unemployed, family often has difficulty getting by on its income, household member receives welfare, household member receives WIC, household income below the poverty line, parent owns home, child health insurance, child saw doctor in past year, parent in fair or poor health, household member smokes inside home, and neighborhood not always safe for child. All analyses account for the sampling design.

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not to ascertain whether foster care placement has an effect on children.[29–33] Rather, our goal was to use these large and representative cross-sectional data to provide a descriptive portrait of the health of children in foster care relative to other children.

Third, children placed in foster care were in poor mental and physical health relative to children in virtually every other type of family situation and in children in economically disadvantaged families. The differences in mental health outcomes (ADD/ADHD, depression, anxiety, behavioral or conduct problems) were statistically significant. The differences in physical health outcomes, although sometimes substantial, were not statistically significant. Additionally, the results show that children adopted from foster care had worse health than their counterparts placed in foster care. These differences could be driven partially by the fact that children in foster care only become available for adoption after parental rights have been terminated (and therefore these children have likely experienced more maltreatment than children who remain in the system) or because adoption subsidies offered in some states encourage adoption of children with health conditions.

Although this article significantly expands our understanding of the mental and physical health conditions of children in foster care, it has some key limitations. First, the data are cross-sectional, meaning we are unable to assess whether the associations shown are causal. We consider this to be only a small limitation because the core goal of this article was to paint a descriptive portrait of the mental and physical health of children in foster care. Second, some children in foster care, including those in group homes or those institutionalized (eg, juvenile justice system, hospital), are not included in the sampling frame.

Because there are strong reasons to expect these children are in significantly worse mental and physical health than other foster children, the differences we show between children in foster care and other children are likely conservative. Third, measures of children's health are reported by children's caregivers. Although an ideal survey design would measure physician-reported health and/or anthropometric measures of health, parent-reported children's health is correlated with physician-reported children's health and is often used when physician-reported measures are not available.[34–38] Finally, and relatedly, reports of specific health conditions are based on caregiver reports of physician diagnoses, suggesting that children's health conditions are underreported. If children placed in foster care are less likely than other children to have physician visits, which is likely given their relatively low socioeconomic status, the differences in children's health by foster care placement are underestimated.

These limitations notwithstanding, this article makes an important contribution to knowledge in the field by showing, for the first time, that children who are in foster care are in significantly worse mental and physical health than children in the general population. As such, they are indeed a highly vulnerable population of children, something that both previous research and their histories of maltreatment implied, but that has never been demonstrated before. This is important information for the research community. Yet the implications for pediatricians are also important because they suggest that foster care placement is a risk factor for health problems in childhood.

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ABBREVIATIONS

ADD: attention deficit disorder
ADHD: attention-deficit/hyperactivity disorder
CI: confidence interval
NSCH: National Survey of Children's Health
OR: odds ratio
SES: socioeconomic status
WIC: Supplemental Nutrition Program for Women, Infants, and Children

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