Trends in Access to Health Care Services for US Children: 2000–2014

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abstract

BACKGROUND AND OBJECTIVE: Recent years have witnessed substantial gains in health insurance coverage for children, but few studies have examined trends across a diverse set of access indicators. We examine US children's access to health services and whether trends vary by race/ethnicity and income.

METHODS: Analysis of 178 038 children ages 0 to 17 from the 2000 to 2014 National Health Interview Survey. Trends are examined for health insurance and 5 access indicators: no well-child visit in the year, no doctor office visit, no dental visit, no usual source of care, and unmet health needs. Logistic regression models add controls for sociodemographics and child health status. Statistical interactions test whether trends vary by race/ethnicity and income.

RESULTS: Among all children, uninsured rates declined from 12.1% in 2000 to 5.3% in 2014, with improvement across all 5 access indicators. Along with steep declines in the uninsured rate, Hispanic children had sizeable improvement for no doctor office (19.8% to 11.9%), no dental visit (43.2% to 21.8%), and no usual source of care (13.9% to 6.3%). Black children and those in poor and near-poor families also had large gains. Results from adjusted statistical interaction models showed more improvement for black and Hispanic children versus whites for 3 of 5 access indicators and for children in poor and near-poor families for 4 of 5 access indicators.

CONCLUSIONS: Children's access to health services has improved since 2000 with greater gains in vulnerable population groups. Findings support a need for continued support of health insurance for all children.

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WHAT'S KNOWN ON THIS SUBJECT: Previous research has shown steep declines in the uninsured rate for children. Few studies have examined trends across a broad range of health service access indicators and whether trends vary by race/ethnicity and income.

WHAT THIS STUDY ADDS: From 2000 to 2014, US children's access improved for well-child visits, doctor visits, dental visits, usual source of care, and unmet health needs. Improvements were larger for black and Hispanic children and those in poor and near-poor families.

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Major policy initiatives over the past couple of decades have had a dramatic impact on improving health care coverage for children. The percentage of US children younger than 18 years without health insurance has declined by two-thirds from 14.9% in 1997 to 4.8% in 2015.[1] Among those age 5 and younger, the decrease has been even steeper, declining >75% from 13% to 3.2%.[2] Multiple studies demonstrate large gains in US children's public health insurance through Medicaid and the Children's Health Insurance Program (CHIP), along with the declines in the uninsured rate.[3–6]

Although expansion in health insurance coverage is expected to improve access to health services, relatively few studies have assessed trends in children's access to health services. Available evidence suggests improvements for certain indicators, such as having a usual source of care or well-child visit.[3,7–10] Further, expansions in public insurance might especially benefit access for vulnerable populations, but limited studies have examined access trends by race/ethnicity and income and whether the magnitude of disparities has diminished as insurance coverage has expanded. Existing evidence points to possibly greater improvements for black and Hispanic children compared with white children for certain indicators, such as seeing a doctor or dentist, but results are mixed and vary by outcome and study population.[3,11–13]

Despite tremendous gains in public coverage, estimates suggest that millions of children could become ineligible for public or subsidized coverage by 2019 if funding for the separate state CHIP programs expires or states are allowed to roll back Medicaid and CHIP eligibility thresholds to statutory minimums.[14,15] To inform future health care policy decisions, therefore, it is vital to assess not only rates of insurance for children, but corresponding changes in health care access and disparities in access.

This study uses data from the National Health Interview Survey (NHIS) to examine trends since 2000 in children's access to health services and whether trends vary by race/ethnicity and income. The study also examines shifts in children's health insurance coverage and the degree to which these shifts might explain changes in health care access. To our knowledge, this is the first study to examine long-term trends in US children's access across a diverse set of indicators while also investigating shifts in the magnitude of disparities over time and the role of insurance coverage in contributing to access changes.

METHODS

Sample

Data are from the 2000 to 2014 NHIS, a nationally representative, cross-sectional survey of US households that has been conducted annually by the National Center for Health Statistics since 1957. The year 2000 was chosen to investigate trends because it marked the turn of the century and because consistent wording for health care access indicators has been available since then. Within each household, a sample child aged 0 to 17 was selected and information was obtained from an in-person interview with a parent or adult knowledgeable about the child's health and health care. The response rate for the sample child file ranged from 79.4% in 2000 to 66.6% in 2014.

From 2000 to 2014, there were 179 542 children in the NHIS sample child files. The sample was further restricted to include only individuals without missing data on the study covariates (n = 178 038). Missing data were singly imputed for race/ethnicity and multiply imputed for family income by statisticians at the National Center for Health Statistics and applied to our analyses. There is some variability in sample size across different health care outcomes due to missing data and because the dental visit question was asked only for children ages 1 to 17.

To produce population-based estimates, data records were assigned a sampling weight. Weights were designed to minimize bias by incorporating adjustments for various forms of survey nonresponse. Further details on the NHIS design are reported elsewhere.[16] This study was exempt from the American Academy of Pediatrics Institutional Review Board.

Measures

Health Insurance Coverage

Parents reported the type of health insurance coverage children had at the time of interview. Responses were coded to private, public, and uninsured. Private coverage included those with employer-sponsored coverage, family-purchased private plans, and military coverage. Public coverage included children with Medicare, Medicaid, CHIP, or other state-sponsored insurance. Children identified as having both private and public insurance were classified into private. Following standard coding used in other studies, uninsured children included those with no coverage or only limited coverage through Indian Health Service or single-service plans such as accidents or dental care.[4,8]

Health Care Access

The study includes 5 measures of children's access to health care. Parents reported whether the child had "a well-child visit, that is a general check-up, when he/she was not sick or injured" at any time during the past year. Parents also reported whether the child had seen a doctor or health care professional at a doctor's office, clinic, or some other place in the

past year (excludes hospitalizations, emergency department visits, home visits, telephone calls, and dental visits). No dental visit was measured by parent report of whether the child had seen any type of dental professional (including dentists, oral surgeons, orthodontists, and dental hygienists) in the past year. No usual source of care was indicated if the parent answered "no" to the question, "Is there a place that (the child) usually goes when he/she is sick or you need advice about his/her health?" Consistent with the Healthy People definition, children reported to receive care in a hospital emergency department also were coded as having no usual source. To identify unmet health care needs, parents were asked, "During the past 12 months, was there any time when (the child) needed any of the following, but didn't get it because you couldn't afford it: medical care, prescription medication, dental care, mental health care, or counseling?"

Race/Ethnicity and Income

Children were categorized into 4 racial/ethnic groups: non-Hispanic white, non-Hispanic black, Hispanic, and other (also includes multiple race). Federal poverty level (FPL) guidelines were used to classify children into 3 income categories: poor (<100% FPL), near-poor (100%–199% FPL), and not poor (≥200% FPL).

Analysis

Trends in health insurance coverage and health care access were determined for US children overall and by race/ethnicity and income. Among all children, bivariate access trends were assessed via logistic regression models. Study year was entered as a predictor with a quadratic term allowed if nested F tests revealed improvement in model fit. Tests for trend were conducted via *t* tests of the average marginal effect for year. Adjusted logistic regression models added controls for child age (in years), child sex, child race/ethnicity, family income, number of parents, household education level, and global child health status (excellent, very good, good, fair, poor). A second set of models also added health insurance coverage. For ease of interpretation, results are presented as average marginal effects for year multiplied by 100, so coefficients represent the average percentage point change per year. For example, a value of −1.0 would indicate an average decline of 1 percentage point per year in the prevalence of an access indicator. To assess for possible variations in trends by race/ethnicity and income, separate adjusted logistic regression models assessed statistical interactions between these variables and study year. Average marginal effects for year were determined by race/ethnicity and/or income for those access indicators in which the global test of the interaction was significant ($P < .05$).

TABLE 1 Trends in Health Insurance Coverage for US Children (n = 178 038), NHIS, 2000–2014

Year	Insurance Coverage at the Time of Interview		
	Uninsured, %	Public, %	Private, %
2000	12.1	18.9	69.0
2001	10.3	20.8	68.9
2002	10.0	23.9	66.1
2003	9.8	25.8	64.5
2004	9.0	26.3	64.7
2005	9.2	27.0	63.9
2006	9.9	29.7	60.4
2007	8.7	29.6	61.6
2008	9.0	30.9	60.1
2009	8.3	34.0	57.7
2010	7.9	35.9	56.2
2011	6.9	37.4	55.8
2012	6.5	37.9	55.6
2013	6.5	38.3	55.2
2014	5.3	38.9	55.8
Test for trend[a]	$P < .05$	$P < .05$	$P < .05$

[a] Unadjusted logistic regression models were used to conduct a test for trend. Year was entered as a continuous predictor. A quadratic term for year was added if nested models showed improvement in model fit via F tests. An average marginal effect for year was calculated and *t* tests assessed statistical significance.

RESULTS

Health Insurance Trends

Table 1 shows trends in health insurance coverage for US children. The uninsured rate declined by more than 50% from 12.1% of children in 2000 to 5.3% in 2014 ($P < .05$). Adjusted to the size of the child population in 2000, this amounts to an additional 4.9 million children who gained insurance over the study period. This was accompanied by an increase in public coverage (18.9% to 38.9%) and decrease in private coverage (69.0% to 55.8%). Health insurance trends by race/ethnicity and income are shown in Fig 1. Panels A and B show a steep narrowing of the disparities in the uninsured rate by race/ethnicity and income. The uninsured rate for Hispanic children declined by 64% from 26.1% in 2000 to 9.3% in 2014. This decline narrowed the gap versus white children (8.2% to 4.0%). Rates for black children declined by 72%, going from 11.7% to 3.3%, which eliminated the gap versus white children in 2014. Trends by income show steeper declines for children in poor (22.2% to 5.9%) and near-poor (21.2% to 8.8%) families than for others (6.0% to 3.5%). Increases in public coverage and decreases in private coverage were found across all racial/ethnic and income groups.

Health Care Access Trends

Table 2 shows trends in parent-reported health care access for US children. Health care access improved across all 5 indicators. Rates for no well-child visit declined from 29.0% to 16.2%, no doctor office visit from 12.9% to 8.6%, no dental visit from 29.6% to 20.7%, no usual source of care from 7.0% to 3.6%, and unmet health care need from 7.9% to 5.8% (all $P < .05$). Adjusted to the size of the US child population in 2000, this amounts to an additional 9.3 million children with a well-child visit in 2014 compared with 2000, 3.1 million children with a doctor office visit, 6.1 million children with a dental visit, 2.5 million children with a usual source of care, and 1.5 million more children with no reported unmet health care needs. Although the rate of improvement for some indicators, such as doctor visits, appeared constant over time, others showed faster improvement in more recent years.

Health care access trends by race/ethnicity and income are shown in Fig 2. No well-child visit rates had steep declines over time for all racial/ethnic and income groups. No visits to a doctor's office also declined across all subgroups with slightly larger improvements for Hispanic (19.8% to 11.9%) and black children (14.4% to 8.8%) compared with white children (10.7% to 6.8%) and for those in poor (17.0% to 10.6%) and near-poor families (18.0% to 10.8%). For dental visits, there was a steep narrowing of disparities over time. No dental visit rates were cut by 50.0% for Hispanic children (43.2% to 21.8%) and by 37.0% for black children (32.8% to 20.7%), which nearly eliminated the disparities versus white children (25.1% to 19.5%). Steeper declines were also seen for children in poor (41.6% to 25.1%) and near-poor families

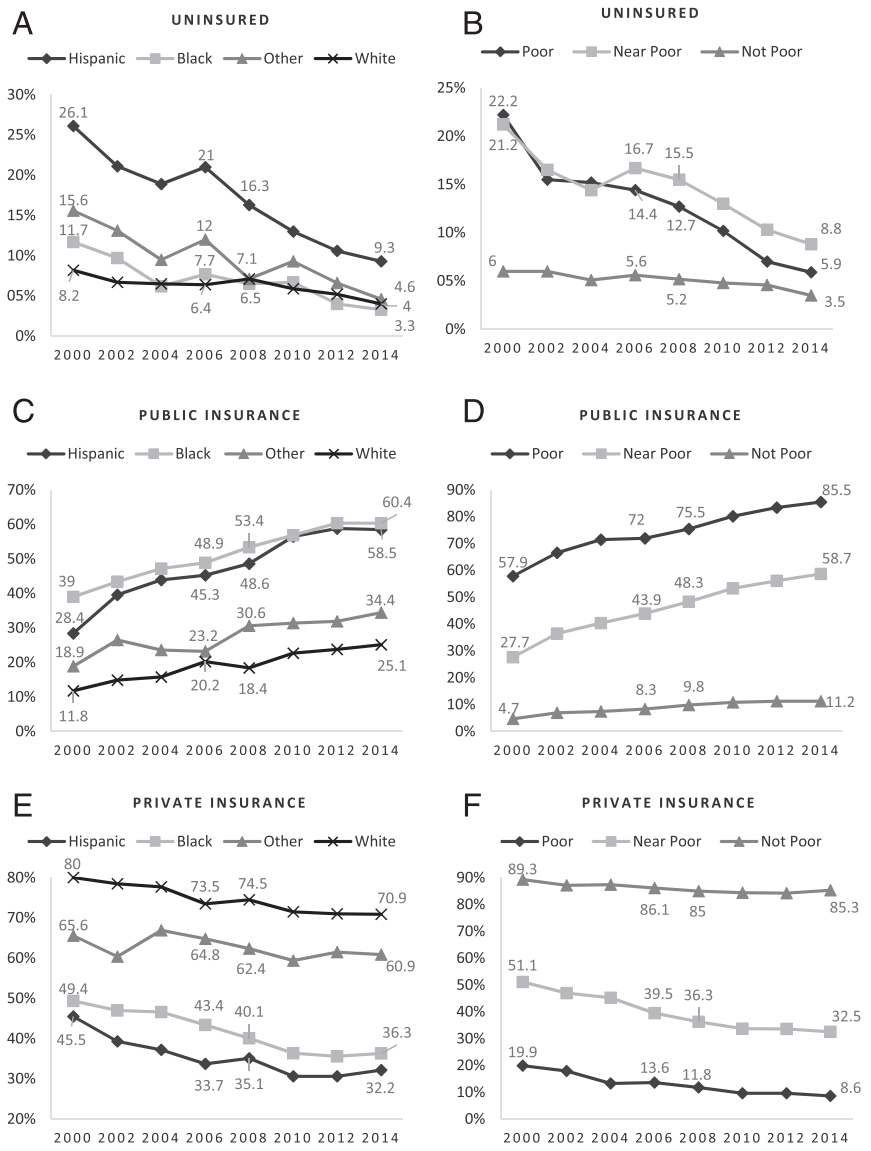

FIGURE 1
Trends in health insurance coverage for US children by race/ethnicity and income, 2000–2014.

(37.3% to 25.3%) compared with others (23.5% to 17.0%). For no usual source of care, there was a slight narrowing of disparities over time. Improvements were slightly larger for Hispanic (13.9% to 6.3%) and black children (8.4% to 3.6%) compared with white children (4.7% to 2.2%) and for those in near-poor families (10.9% to 4.8%). For unmet health care needs, there was an apparent narrowing of disparities for children in poor (12.8% to 8.5%) and near-poor families (13.0% to 7.2%) compared with others (4.8% to 4.2%).

Multivariable Results

In logistic regression models that control for possible sociodemographic and child health status shifts over time, improvements in health care access were still found across all 5 indicators (see Table 3). Adjusted average annual percentage point changes were −0.89 for no well-child visit, −0.34 for no doctor office visit, −0.73 for no dental visit, −0.20 for no usual source of care, and −0.11 for unmet health needs. Results from adjusted statistical interaction models showed that the

rate of improvement varied by race/ethnicity for 3 access indicators. For example, no doctor office visits showed larger improvement for Hispanic (marginal effect: −0.59, SE: 0.05) and black children (marginal effect: −0.37, SE: 0.06) compared with white children (marginal effect: −0.22, SE: 0.03). Patterns were similar for no dental visit and no usual source of care. By income, variations in trends were found for 4 access indicators. For example, no dental visit rates improved more for children in poor (marginal effect: −1.15, SE: 0.07) and near-poor (marginal effect: −0.97, SE: 0.07) families than for others (marginal effect: −0.47, SE: 0.04). Patterns were similar for no doctor visit, no usual source of care, and unmet health care needs. Among all children, results of the baseline model compared with a model also controlling for health insurance status reveals an attenuation in the marginal effect for year across all access indicators. For statistical interaction models, differential impacts by race/ethnicity and income were also attenuated when controlling for health insurance status. For doctor visits, shifts in health insurance coverage appeared to fully explain the steeper gains in access for black and Hispanic children versus white children and for those in poor and near-poor families versus others. For no usual source of care, steeper improvements for children in low-income families were fully explained by differential gains in coverage.

TABLE 2 Trends in Health Care Access for US Children, NHIS, 2000–2014

Year	No Well-Child Visit, *n* = 176 524, %	No Doctor Office Visit, *n* = 176 014, %	No Dental Visit, *n* = 166 155, %	No Usual Source of Care, *n* = 177 794, %	Unmet Health Care Need, *n* = 177 578, %
2000	29.0	12.9	29.6	7.0	7.9
2001	29.0	12.6	30.5	5.7	8.6
2002	27.9	11.3	29.4	6.0	7.7
2003	28.2	12.1	28.7	5.3	7.7
2004	27.0	11.7	27.5	5.5	8.7
2005	27.2	11.3	27.4	5.2	8.7
2006	27.5	11.8	27.9	5.5	9.0
2007	26.1	11.1	26.9	6.0	8.4
2008	24.1	10.8	26.3	5.7	9.0
2009	22.1	10.1	25.6	5.4	9.5
2010	20.1	9.1	25.2	5.4	8.7
2011	19.7	9.0	22.4	4.0	8.0
2012	19.8	8.8	21.3	4.1	7.5
2013	17.0	8.7	20.5	4.0	6.8
2014	16.2	8.6	20.7	3.6	5.8
Test for trend[a]	$P < .05$	$P < .05$	$P < .05$	$P < .05$	$P < .05$

[a] Unadjusted logistic regression models were used to conduct a test for trend. Year was entered as a continuous predictor. A quadratic term for year was added if nested models showed improvement in model fit via F tests. An average marginal effect for year was calculated and *t* tests assessed statistical significance.

DISCUSSION

This study found steep improvements in US children's access to health services across a diverse set of indicators since the start of the century. These improvements were independent of possible sociodemographic or child health status shifts. For population impact, the study showed large gains in the number of children gaining access to health services; for example, an estimated 9.3 million more children had a well-child visit in 2014 compared with 2000. Furthermore, statistical interaction models showed that disparities by race/ethnicity were reduced over time for 3 of 5 access indicators and disparities by income were reduced for 4 of 5 access indicators.

Among all children, shifts in health insurance coverage appeared to explain some, but not all of the gains in access to care over time. Not surprisingly, insurance gains appeared to have the most impact for children in more disadvantaged racial/ethnic and income groups as evidenced by attenuation in differential rates of improvement when controlling for health insurance status. Multiple studies using different data sources have shown that, at least for basic access indicators, such as having a preventive doctor visit or usual source of care, children with public health insurance coverage tend to fare as well as those with private coverage and better than children who are uninsured.[17–22]

Beyond increasing health insurance coverage rates, improving health care quality for children has been a major focus of recent policy initiatives such as the Children's Health Insurance Program Reauthorization Act of 2009. Many states have implemented quality monitoring programs to track indicators like well-child visits along with offering performance improvement programs targeting specific goals, such as increasing well-child and dental visit rates.[23,24] This expanded focus on quality might help explain why some access indicators showed rapid improvements during the later years of the study. There is substantial program variation across states and many additional factors, such as shifts in parent beliefs about the importance of regular health care for their children, could also contribute to improvement in children's access to and utilization of health services.

Improvements in access and reduction in disparities were particularly large for certain access indicators like seeing a dentist. States are now required to provide dental services to all children enrolled in Medicaid and CHIP. Numerous

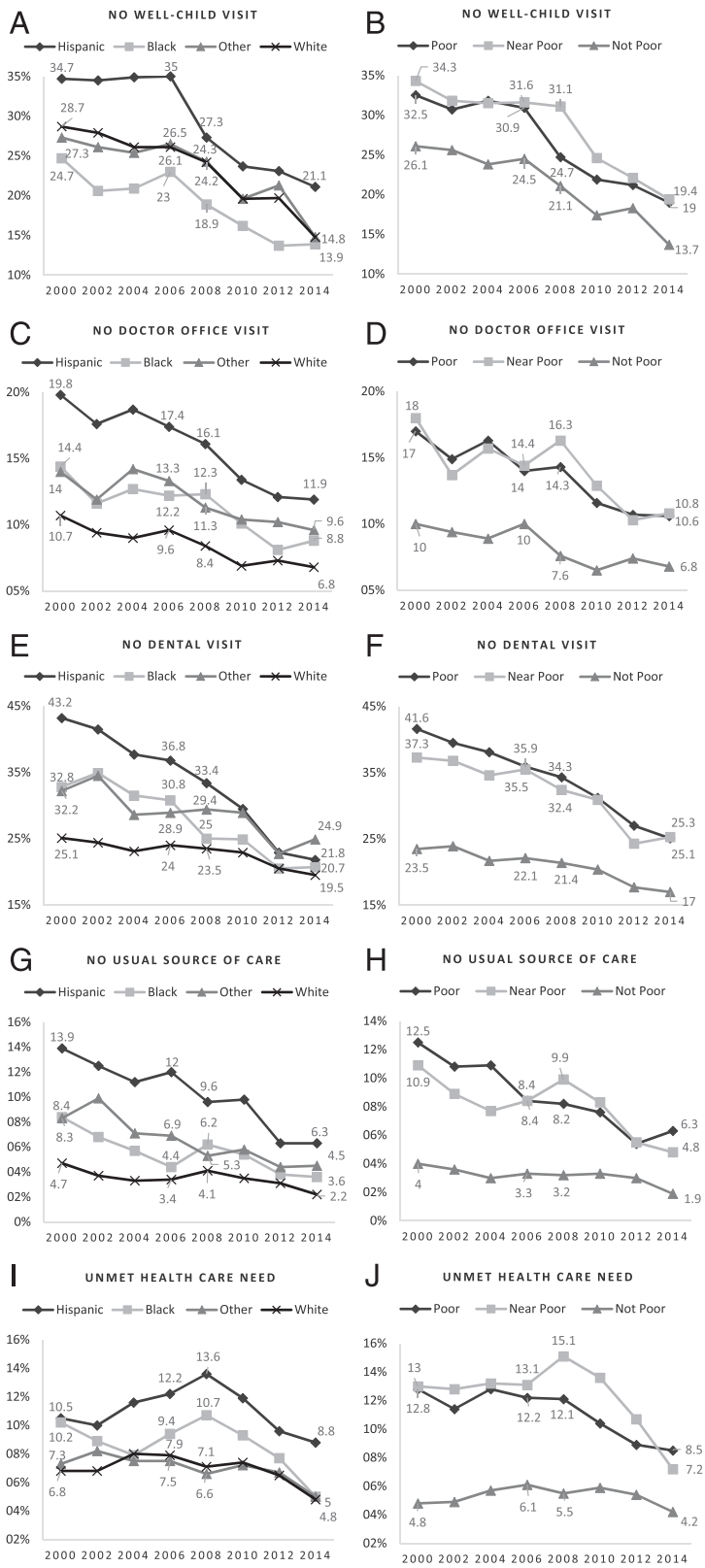

FIGURE 2
Trends in health care access for US children by race/ethnicity and income, 2000–2014.

studies conducted among children enrolled in public health insurance programs have shown large improvements in recent years in the number and percentage of enrollees with a dental visit.[25–27] States implementing changes to promote provider availability through increased dental service reimbursement rates and streamlined administrative processes have shown large gains.[28–30]

Hispanic children had particularly impressive gains with the uninsured rate, no dental visit rate, and no usual source of care rate all reduced by 50% or more over the study period. Previous studies have shown substantial improvements in the uninsured rate for Hispanic children.[3,31,32] This study found that a larger portion of Hispanic gains in access were explained by health insurance compared with white children. These findings suggest that policy initiatives aimed at improving health insurance coverage and access have had an impact, especially for children in vulnerable population groups.

Improving insurance coverage and access to health services are worthy policy goals for many reasons. Data from the Oregon Medicaid expansions indicate that having publicly provided health insurance provides an enhanced degree of financial security for poor and near-poor families and increases self-reported health status among adults.[33] Studies also have shown improved future health outcomes for children who gained Medicaid coverage during early childhood or had their mother gain coverage during the prenatal period.[34,35] A possible role for public coverage in improving children's health also is suggested by research showing a decrease in childhood mortality differentials between children in poor and rich counties of the United States during the same time period of

TABLE 3 Results of Adjusted Logistic Regression Models Predicting Trends in Health Care Access for US Children, NHIS, 2000–2014

	No Well-Child Visit, *n* = 176 524		No Doctor Office Visit, *n* = 176 014		No Dental Visit, *n* = 166 155		No Usual Source of Care, *n* = 177 794		Unmet Health Care Need, *n* = 177 578	
	Average Marginal Effect for Year (SE)[a]		Average Marginal Effect for Year (SE)[a]		Average Marginal Effect for Year (SE)[a]		Average Marginal Effect for Year (SE)[a]		Average Marginal Effect for Year (SE)[a]	
	Model 1[b]	Model 2[b]	Model 1[b]	Model 2[b]	Model 1[b]	Model 2[b]	Model 1[b]	Model 2[b]	Model 1[b]	Model 2[b]
Overall	−0.89[c] (0.03)	−0.77[c] (0.03)	−0.34[c] (0.02)	−0.24[c] (0.02)	−0.73[c] (0.03)	−0.60[c] (0.03)	−0.20[c] (0.02)	−0.10[c] (0.02)	−0.11[c] (0.02)	−0.03 (0.02)
White	—	—	−0.22[c] (0.03)	—	−0.40[c] (0.04)	−0.34[c] (0.04)	−0.07[c] (0.02)	−0.04 (0.02)	—	—
Black	—	—	−0.37[c,d] (0.06)	—	−1.06[c,d] (0.08)	−0.94[c,d] (0.08)	−0.19[c,d] (0.03)	−0.11[c] (0.04)	—	—
Hispanic	—	—	−0.59[c,d] (0.05)	—	−1.43[c,d] (0.06)	−1.14[c,d] (0.06)	−0.44[c,d] (0.03)	−0.18[c,d] (0.03)	—	—
Other	—	—	−0.44[c] (0.09)	—	−0.52[c] (0.11)	−0.35[c] (0.11)	−0.28[c,d] (0.06)	−0.12[c] (0.06)	—	—
Poor	—	—	−0.47[c,e] (0.05)	—	−1.15[c,e] (0.07)	−0.89[c,e] (0.06)	−0.34[c,e] (0.04)	—	−0.24[c,e] (0.04)	−0.07[e] (0.04)
Near poor	—	—	−0.44[c,e] (0.05)	—	−0.97[c,e] (0.07)	−0.76[c,e] (0.07)	−0.28[c,e] (0.03)	—	−0.21[c,e] (0.04)	−0.09[c,e] (0.04)
Not poor	—	—	−0.25[c] (0.03)	—	−0.47[c] (0.04)	−0.43[c] (0.04)	−0.09[c] (0.02)	—	0.00 (0.02)	0.02 (0.02)

—, no significant interaction.

[a] Coefficients represent the average percentage point change per year adjusted for covariates. A quadratic term for year was included if nested models showed improvement in model fit via F tests. Year*race/ethnicity and year*income interactions were tested in separate models. Results by race/ethnicity and income are shown only if a global test of the interaction was significant ($P < .05$).

[b] Model 1 includes controls for child age, child sex, child race/ethnicity, family income, number of parents, household education, and global child health status. Model 2 includes these covariates plus child health insurance status.

[c] $P < .05$.

[d] Additional analyses from the statistical interaction model (not shown) revealed that this rate change was statistically different ($P < .05$) from the rate change for white children.

[e] Additional analyses from the statistical interaction model (not shown) revealed that this rate change was statistically different ($P < .05$) from the rate change for children in families classified as not poor.

major expansions in public coverage programs.[36]

These findings and others support the need for efforts to provide insurance coverage and promote fairness and access to health care for all children.[37,38] Extending Medicaid and CHIP funding into the future will help ensure continued coverage for children.[37,39,40] Efforts are also needed to address issues such as quality of care, discontinuity of insurance coverage, and adequate payment levels for providers caring for children with public health insurance.[37,38] Furthermore, although the Affordable Care Act has potential for moving children into exchange-based coverage, many issues regarding affordability, accessibility, and quality of care incident on such a shift remain to be resolved.[6,41] As primary providers of health services for children, pediatricians are in an excellent position to advocate for the health insurance and health care needs of children and ensure families are aware of available programs and services.

Study strengths include the use of nationally representative NHIS data with consistent measurement used across multiple study years and the ability to link health insurance and health care access. Study limitations include, first, a reliance on parent report of children's health services that were not validated against the medical record. Second, there was potential nonresponse bias within the NHIS, and third, the study was limited to factors that were continuously available in NHIS since 2000. Notably, activities happening on the state, community, and health system levels are likely key factors influencing and explaining the trends, but are not collected within the NHIS.

CONCLUSIONS

This study found consistent improvement in children's access to health services since 2000. Improvements were generally steeper for black and Hispanic children and those in poor and near-poor families, and appeared to be at least partially explained by gains in public health insurance coverage. Findings support a need for ongoing efforts to provide insurance coverage and improved access to care for all children.

ABBREVIATIONS

CHIP: Children's Health Insurance Program
FPL: federal poverty level
NHIS: National Health Interview Survey

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