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Improved Access and Quality of Care After Enrollment in the New York State Children's Health Insurance Program (SCHIP)

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ABSTRACT. *Background.* Although many studies have noted that uninsured children have poorer access and quality of health care than do insured children, few studies have been able to demonstrate the direct benefits of providing health insurance to previously uninsured children. The State Children's Health Insurance Program (SCHIP), enacted as Title XXI of the Social Security Act, was intended to improve insurance coverage and access to health care for low-income, uninsured children. With limited state and federal resources for health care, continued funding of SCHIP requires demonstration of success of the program. As yet, little is known about the effectiveness of SCHIP on improving access and quality of care to enrollees.

Objectives. To measure the impact of the New York State (NYS) SCHIP on access, utilization, and quality of health services for enrolled children.

Design Setting. NYS, stratified into 4 regions. The NYS SCHIP is modeled on commercial insurance (32 managed care plans) and at the time of the study had 18% of SCHIP enrollees nationwide.

Study Design. For the study group, the design used pre/poststudy telephone interviews of parents of children enrolling in the NYS SCHIP, with baseline interviews soon after enrollment and follow-up interviews 1 year after enrollment. Baseline interviews reflected the child's experience during the 1-year period before enrollment in SCHIP. The follow-up interviews reflected the 1-year period after enrollment in SCHIP. For the comparison group, the design used baseline interviews of a comparison group enrolled 1 year after the study group to test for secular trends; these interviews reflected the 1-year period before enrollment in SCHIP.

Subjects. Children ($n = 2644$) 0 to 18 years of age who enrolled in the NYS SCHIP for the first time (November 2000 to March 2001), stratified by age (0-5, 6-11, and 12-18 years), race/ethnicity (white non-Hispanic, black non-Hispanic, and Hispanic; others excluded), and region of NYS. The comparison group consisted of 400 children. Telephone interviews were conducted in English or Spanish throughout the day and evening, 7 days per week, to obtain measures.

Main Outcome Measures. Demographic and health measures (child and family characteristics, health status, presence of a special health care need, and prior health

insurance), access (usual source of care [USC] and unmet needs for health care), utilization (visits for specific health services), and quality (continuity with USC and measures of primary care interactions). Analyses included bivariate tests, comparing the pre-SCHIP period to the 1-year period after enrollment in SCHIP. Multivariate models were computed to generate standardized populations comprised of key characteristics of the sample to test for differences in measures (after SCHIP versus before SCHIP), controlling for demographic characteristics.

Results. Of the 2644 study-group children who completed the initial interview, 2290 (87%) completed the follow-up interview. Key measures for the pre-SCHIP period and short-term "postenrollment" measures for the study group were not statistically different from measures for the comparison group, suggesting no major secular trends.

Participants were non-Hispanic white (25%), non-Hispanic black (31%), and Hispanic (45%). Fifty-one percent of the parents were single, and 61% had a high school education or less; 81% of families had income <160% of the federal poverty level. Sixty-two percent of the children were uninsured ≥ 12 months before the NYS SCHIP; of those insured, 43% previously had Medicaid.

The proportion of children who had a USC increased after enrollment in the NYS SCHIP (86% to 97%). Two measures of accessibility (difficulty getting a medical person by telephone and difficulty getting an appointment) improved after enrollment in SCHIP. The proportion of children with any unmet health care needs decreased (31% to 19%). Specific types of unmet need also were reduced after enrollment; for example, among SCHIP enrollees who had a need for specific type of care, unmet needs were significantly lower postenrollment versus pre-SCHIP for specialty care (-15.5% in unmet need), acute care (-10.1%), preventive care (-9.6%), dental care (-13.0%), and vision care (-13.2%).

Emergency and total ambulatory visits did not change, but the proportion of children with a preventive care visit increased (74% to 82%).

The proportion of children who used their USC for most or all visits increased (47% to 89%), demonstrating increased continuity of care. Several indicators of health care quality improved, including an overall rating of quality, the 4 indicators of physician-patient interaction used by the Consumer Assessment of Health Plans Survey, and a measure of parental worry about their child's health. Improvements were noted among major subgroups of children, with the greatest improvements for those with the lowest baseline levels. For example, at baseline, a lower percentage of children living at <160% of the federal poverty level had a presence of a USC or continuity with their USC than children living in families at >160% of the federal poverty level, and these

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poorer children experienced the greatest gains in having a USC or having continuity with their USC after enrollment in SCHIP.

Conclusions. Enrollment in the NYS SCHIP was associated with 1) improved access, continuity, and quality of care and 2) a change in the pattern of health care, with a greater proportion of care taking place within the usual source of primary care. *Pediatrics* 2004;113:e395-e404. URL: <http://www.pediatrics.org/cgi/content/full/113/5/e395>; SCHIP, health insurance, children, access, quality.

ABBREVIATIONS. SCHIP, State Children's Health Insurance Program; USC, usual source of care; NYS, New York State; CHIRI, Child Health Insurance Research Initiative; FPL, federal poverty level; CSHCN, children with special health care needs.

The State Children's Health Insurance Program (SCHIP) was enacted in 1997 by Congress as Title XXI of the Social Security Act¹ to provide health insurance coverage to children in low-income families who are not eligible for Medicaid or covered by private health insurance. SCHIP was a national response to the vexing problem that large numbers of children were uninsured or underinsured.²⁻⁹ Studies had found that uninsured children were more likely than insured children to lack a usual source of care (USC),^{5,7,8,10,11} to delay seeking health care or to have unmet needs for health care,^{11,12} to use fewer ambulatory health services,^{11,13-16} to have lower levels of preventive services such as immunizations,^{17,18} to be perceived by their parents as being in fair or poor health,¹⁰ to be hospitalized for potentially preventable conditions,¹⁹ to be discharged from the hospital early after birth,²⁰ and to have more adverse outcomes after birth.²¹ By providing comprehensive health insurance, SCHIP was intended to improve the health care for low-income, uninsured children.²²

Title XXI of the Social Security Act provided states with substantial flexibility in designing or modifying their SCHIP programs.^{23,24} Unlike Medicaid, SCHIP is not an open-ended entitlement but instead provides a total of \$40 billion over 10 years distributed as block grants to states.^{25,26} Continued funding of SCHIP requires demonstration of success of the program. A number of concerns have risen recently with respect to SCHIP. Although national enrollment surpassed 3.6 million by 2002,²⁷ early enrollment in some states was less than expected.²⁸ In 2002, federal funding was reduced by \$1 billion or 26%, and at least 20 states may not have sufficient federal funding to sustain their SCHIP over the next 5 years.²⁹ States are facing economic problems, coupled with rising Medicaid and SCHIP costs,^{28,29} and political leaders are scrutinizing health care programs with hopes of addressing increasing economic pressures. Thus, evidence about whether SCHIP is effective in meeting the needs of the enrolled population is relevant to future policy choices.

Despite evidence that uninsured children and adolescents fare poorly compared with insured children, relatively few studies have evaluated the benefit of providing health insurance to previously uninsured children.^{30,31} Before SCHIP, studies in Pennsylvania,³²⁻³⁴ New York,³⁵⁻³⁹ and Florida^{40,41}

found that children who enrolled in state prototype programs for low-income children had measurable improvements in access, utilization, and some quality measures. Since SCHIP, several rigorous qualitative studies⁴²⁻⁴⁴ and a few quantitative studies have been reported⁴⁵⁻⁴⁹ about access to and utilization of health services for SCHIP enrollees. Evaluating the impact of SCHIP requires measurement of change in health measures after enrollment versus baseline measures before enrollment. Recent reports about 2 small SCHIP programs^{50,51} noted improvements in access to care among enrollees.

In 2001, New York State (NYS) had 590 000 SCHIP enrollees (18% of SCHIP enrollees nationwide).⁵² The NYS SCHIP is a mature program,⁵³ having evolved from a state-funded prototype insurance program that began in 1991.²³ The objectives of the current study were to assess the impact of the NYS SCHIP on access to care, utilization of health services, and quality of care among its enrolled population. This study is part of the Child Health Insurance Research Initiative (CHIRI), a multistate research program funded by the Agency for Healthcare Research and Quality, the David and Lucile Packard Foundation, and the Health Resources and Services Administration. CHIRI's objective is to supply policy makers with information to help them improve access to and quality of health care for low-income children.⁵⁴⁻⁵⁶

METHODS

The University of Rochester Institutional Review Board approved this study.

Setting

The study was conducted throughout NYS to assess children who enrolled in SCHIP between 2001 and 2002. A stratified sampling frame was used to reflect the substantial demographic differences across the state,⁵⁷ with the state categorized into 4 regions: New York City; the urban environs of New York City (eg, Long Island); upstate urban areas (principally Albany, Syracuse, Rochester, and Buffalo); and upstate rural regions. As in prior studies,³⁵ counties were categorized as urban (if included in a standard metropolitan statistical area⁵⁸) versus rural.

The NYS SCHIP

The NYS SCHIP, Child Health Plus, was modeled on commercial insurance and was a prototype for freestanding SCHIP programs in other states.⁵⁹ At the time of the study, the NYS SCHIP was administered by 32 managed care plans. Children were eligible for coverage if they were 0 to 18 years old, at $\leq 230\%$ of the federal poverty level (FPL), residing in NYS, not covered by other insurance, and not eligible for Medicaid. Monthly premiums varied by income, from no premium ($<160\%$ of FPL) to \$9 to \$15 per child per month for other income levels. A few families $>230\%$ of FPL purchased the NYS SCHIP for the full monthly premium; approximately two thirds of all enrollees receive full state subsidy (J. Arnold, PhD, New York State Department of Health, verbal communication, 2003). The state-defined benefit package included ambulatory, emergency, inpatient, pharmacy, dental, and mental health services, similar to benefits of commercial plans but less comprehensive than Medicaid.

Study Design

The study used a T_1/T_2 cohort design with a T_2 -only comparison sample, similar to a prior study of a health insurance program for children.³²⁻³⁴ For the study group, we interviewed parents of NYS SCHIP enrollees ~ 4 to 6 months after enrollment (T_1) and again 13 months after enrollment (T_2). The T_1 interview reflected the child's experience during the 1-year period before enrollment in SCHIP; it was timed to avoid unnecessary interviews for chil-

dren who were enrolled for the 2-month presumptive eligibility period and then found to be ineligible.⁶⁰ The T₂ interview reflected experience during the first year after SCHIP enrollment. We also interviewed a separate comparison group who enrolled ~1 year after the study group enrolled in SCHIP. For the comparison group, the single interview reflected the child's experience before enrollment in SCHIP. This group was included to account for secular trends, because the relevant pre-SCHIP year for the comparison group was identical to the relevant SCHIP time period for the study group.

Study Subjects

The NYS SCHIP billing files were analyzed to identify first-time enrollees. A stratified random sample (1 child per family) was selected from the following strata: the 4 geographic regions, 3 age groups (0-5, 6-11, and 12-18 years), and 3 race/ethnicity groups (non-Hispanic white, non-Hispanic black, and Hispanic; other groups were excluded). Because race and ethnicity were not present on the billing files, a 2-stage process was performed to sample children. Children were sampled randomly from geographic and age strata, at which point a name-matching program was used, based on a US census study,⁶¹ to enrich the sample of Hispanic subjects in each stratum (self-reported race/ethnicity was used to categorize children of all races). Brief telephone interviews then were conducted to screen for race and ethnicity, and full interviews were conducted for those who were eligible. The final data were weighted to account for this complex sampling design.

The comparison group consisted of randomly selected children from throughout NYS who were first-time enrollees in SCHIP during the appropriate time period.

Telephone Interviews

The National Opinion Research Center,⁶² using Computer Aided Technology Inc,⁶³ conducted telephone interviews. A letter was mailed to families describing the study and requesting participation in the telephone interviews. Families were offered \$10 for participation in the full interview. T₁ interviews were conducted between March 15, 2001, and September 15, 2001, and T₂ interviews were conducted between December 1, 2001, and May 4, 2002. Telephone numbers were obtained from state billing files and verified as needed by using local telephone and web-based directories. Interviews were conducted in English and Spanish throughout the day and evening, 7 days per week. The T₁ and T₂ interviews included identical questions specific to the relevant time periods.

Measures

Key questions were obtained from standard instruments and also were developed collaboratively with other CHIRI research teams.⁵⁶ Demographic measures included patient age group, gender, single-parent household, family income, and parent education and employment status. Key measures of health characteristics included the presence of special needs, assessed by using the nationally validated Child and Adolescent Health Measurement Initiative Children With Special Health Care Needs (CSHCN) Screener, as used in the National Children With Special Needs Survey.⁶⁴⁻⁶⁶ Overall health status also was measured with a standard summary question.⁶⁷ Prior health insurance was assessed by the number of months that the child was insured (or uninsured) during the year before the NYS SCHIP and the type of insurance before SCHIP (private, public, or none). Access measures included the presence of a USC, the type of USC, and unmet health care needs overall and for specific types of services. Utilization measures involved "any use" of health services during the relevant year for key types of health care. Quality measures included use of the USC for preventive and other services (as a measure of continuity) and parents' ratings of specific aspects of health care and their primary provider.⁶⁸

Analyses

All children who completed both interviews were included in the analyses. We summarized baseline measures by tabulating demographics, health characteristics, and insurance measures at the time of enrollment (T₁ survey). We tabulated measures of health care access, utilization, and quality separately for the year

before enrollment in the NYS SCHIP (before SCHIP) and for the first year after enrollment in the NYS SCHIP (after SCHIP). We calculated the change in each measure, before versus after enrollment in SCHIP, by using Pearson χ^2 tests to test statistical significance.

We estimated multivariate models to generate adjusted rates for the change in each measure before versus after SCHIP. All models controlled for the effects of before-to-after differences in analyses of the entire sample and in analyses of subgroups. For each of the dichotomous dependent variables (eg, having a USC), we estimated multivariate population average logistic regression models.^{69,70} For continuous dependent variables, we estimated multivariate random-effects regression models.⁷¹ All models controlled for age, gender, race/ethnicity, single-parent household, household size, income, region, parents' education, parents' employment status, and prior health insurance. These models included child-level random effects, because each child contributed 2 observations to the sample (before and after enrollment in SCHIP).⁷¹

To generate adjusted Δ values (before versus after SCHIP enrollment), we adopted the approach used in the RAND Health Insurance Experiment.⁷² We generated a standardized population with characteristics that were representative of our sample for the year before enrollment (T₁). For each dependent variable, we used these patient demographic characteristics to calculate mean T₁ and T₂ predictions. The differences in these mean predictions are the adjusted Δ values presented in Tables 2-5. For comparisons across subpopulations in Table 6, each subpopulation prediction was calculated using the entire standardized population as above, changing only those variables that identify the subpopulation and the time period. Bootstrapped standard errors of the adjusted Δ values were used to perform statistical tests.

All analyses were weighted to be representative of the population of new SCHIP enrollees, and Stata 7.0 was used to adjust for the complex survey designs.⁷³

RESULTS

Response Rates

The T₁ interview was completed by 2644 children; 2290 (87%) completed the T₂ interview; and 401 completed the comparison-group interview. The response rates between T₁ and T₂ varied slightly by region (84-91%), race/ethnicity (85-92%), and age (86-87%); these variables were controlled for in subsequent analyses. The T₂ nonrespondents had similar baseline characteristics on their T₁ interview, when compared with the subjects who responded to both interviews.

Duration of Enrollment

According to parents, 76% of children were still enrolled in SCHIP 1 year after initial enrollment, 4% had private insurance, 3% had Medicaid, and 17% were uninsured.

Comparison Group Versus Study Group

Key measures for the pre-SCHIP period were compared for the study group versus the control group to assess potential secular trends. Of 75 measures tested, including demographic characteristics, access to care, unmet health care needs, utilization of outpatient services, and quality of care, minor but statistically significant differences were noted for only 3 measures (data are available on request) and none for the remainder of the measures, which suggests that there were no major secular trends during this 1-year time span. In addition, we asked a limited number of short-term postenrollment questions (eg, presence of a USC "right now") at both the T₁ and control interviews, because these interviews were

conducted several months after enrollment in SCHIP. There were no differences between the study and comparison groups for these measures of early experiences with SCHIP.

Demographic Characteristics (Table 1)

The age and racial/ethnic distribution of the sample are shown in Table 1. Half were from single-parent households, and only 19% had a family income $\geq 160\%$ of FPL. The majority of parents had at least a high school education and worked full- or part-time. Nearly 17% of children were identified as having a special health care need, and 11% had fair or poor health. More than 60% were uninsured for at least 12 months before enrolling in SCHIP, and nearly 80% had some uninsured months during the year before SCHIP. Of those who had prior health insurance, nearly half had employer-sponsored health insurance, and $\sim 40\%$ had Medicaid. Reasons for loss of prior insurance included job loss or change (26%), loss of Medicaid (21%), the high cost of the

prior insurance (12%), or failure to renew the prior insurance because of paperwork or administrative issues (7%).

Access, Utilization, and Quality of Health Care Before and During the NYS SCHIP (Tables 2-5)

The proportion of children with a USC increased from 86% to 97% ($P < .001$) after enrollment in SCHIP (Table 2). The distribution of the types of USC did not change substantially after enrollment; these types included doctor's offices (42% before vs 41% after), neighborhood health centers (20% vs 27%; $P < .05$), hospital clinics (21% versus 22%), and health department clinics (5% vs 3%). Although neither travel time to nor waiting time at the doctor's office changed after enrollment in SCHIP, 2 measures of accessibility improved (Table 2): Fewer families noted difficulty in reaching a medical person by telephone, and fewer noted difficulty in getting an appointment.

Twenty-six percent of children who had a USC

TABLE 1. Demographic and Health Characteristics of the Sample ($n = 2,644$)

Characteristic	Value	Percent (SE)
Demographic characteristics		
Child age group	0–2.9 y	19.8 (1.3)
	3–5.9 y	17.9 (1.2)
	6–11 y	34.0 (2.9)
	12–18 y	28.2 (1.6)
Gender	Male	48.6 (2.4)
Race/ethnicity	White (non-Hispanic)	24.6 (1.7)
	Black (non-Hispanic)	30.7 (2.3)
	Hispanic	44.7 (2.6)
Household composition	Single parent	51.1 (2.4)
Household size	Mean	4.3 (0.07)
Family income*	$\geq 160\%$ FPL	18.7 (2.2)
Region	New York City	69.0 (1.7)
	New York City environs	15.5 (1.1)
	Upstate urban	11.2 (1.0)
	Upstate rural	4.3 (0.3)
Highest grade completed†	<High school	23.9 (2.1)
	High school graduate or GED	36.6 (2.5)
	Technical/vocational	0.9 (0.2)
	Some college	23.8 (2.1)
	College graduate and higher	14.8 (1.3)
Employment status‡	Full-time	62.4 (2.3)
	Part-time	18.1 (2.0)
	Not working (includes home, school, and other)	19.5 (1.8)
Health characteristics		
Special-needs status	CSHCN§	16.6 (1.9)
Child's health status	Excellent or very good	44.6 (2.3)
	Good	44.3 (2.5)
	Fair or poor	11.1 (1.6)
Prior health insurance		
No. of months insured in the year before NYS SCHIP	All 12 mo	23.7 (2.4)
	9–11 mo	4.3 (0.7)
	6–8 mo	5.0 (0.7)
	3–5 mo	3.2 (0.8)
	1–2 mo	1.7 (0.3)
	None (uninsured all year)	61.7 (2.4)
Type of last insurance	Private employer sponsored	47.4 (4.1)
	Private other	1.7 (0.5)
	Medicaid	41.5 (4.5)
	Other	9.3 (2.6)

* Below 160% FPL, families receive full subsidy for the NYS SCHIP and make no contribution toward monthly premium costs.

† Maximum education (respondent or parent or head of household).

‡ Maximum employment in household (respondent or parent or head of household).

§ CSHCN were identified by using the CSHCN Screener (see text).

|| For the subset of children who had any prior insurance before the NYS SCHIP. The total exceeds 100% because some children had dual coverage that was truly simultaneous.

TABLE 2. Access to USC Before Enrollment And 1 Year After Enrollment in SCHIP

	Before Enrollment in NYS SCHIP, %	After Enrollment in NYS SCHIP, %	Unadjusted Δ , %	Adjusted Δ , % \S
Had USC	86.4	97.2	10.8*	11.6*
Accessibility measures				
Travel time to place (\geq half an hour)	32.9	32.2	-0.7	-6.6 \dagger
Wait >15 min past appointment time	58.9	60.2	1.3	0.6
Difficult to get medical person on the phone	18.6	11.3	-7.3*	-7.5*
Difficult getting an appointment	18.6	11.6	-7.0 \ddagger	-7.0 \ddagger

* $P \leq .001$; $\dagger P < .05$; $\ddagger P < .01$.

\S Adjusted for the variables shown in Table 1.

before and after enrollment in SCHIP changed their USC shortly after enrollment. Of the 3% of children who still lacked a USC 1 year after enrollment in SCHIP, major reasons were that the family didn't know where to go (25%) or the child was never ill (23%).

Table 3 shows the proportion of children who had a need for a health service, the proportion with a need who also had an unmet need, and the proportion of all children with an unmet health care need for the periods before SCHIP and 1 year after enrollment. A high proportion of children had a need for a specific type of service, both before and after enrollment. Before SCHIP, many children had an unmet health care need. One year after enrollment, the proportion of children with an unmet health care need was substantially lower for most types of care, both for the subset who had a health care need and among all children.

Although utilization of most health care services (emergency, mental health, specialty, and acute services) did not change statistically or clinically, visit rates for preventive services increased (74% to 82%; $P < .001$) after enrollment in SCHIP (Table 4).

Table 5 displays several measures of quality of care. The proportion of children who made all their outpatient visits to their USC increased from 40% to 77% ($P < .001$), and the proportion of children who made none of their visits to the USC declined from 48% to 4% ($P < .001$), which suggests that children were using their USC for a greater proportion of their total health care services. Mean rating of the overall health care improved after enrollment in SCHIP. Several specific indicators of quality of primary care improved after enrollment: providers listening to parents, explaining things in an understandable way, respecting what parents have to say, and spending enough time with parents. Finally, although parents' overall rating of their child's health status did not change after enrollment in SCHIP, fewer parents worried about their child's health after enrollment.

Several cross-sectional measures of satisfaction obtained at T₂ only showed improvements: 74% were more satisfied with benefits, 80% were more satisfied with the child's doctor, and 74% were more satisfied with medical care received after enrollment in SCHIP, compared with before.

Impact of the NYS SCHIP on Subgroups of Children (Table 6)

To assess whether the impact of SCHIP enrollment varied by patient characteristics, we conducted re-

gression analyses for subpopulations for 4 outcome measures: having a USC, any unmet health care need, any preventive visits during the time period, and most or all visits being to the child's USC. In general, major improvements were noted for all population subgroups regardless of geographic region, age group, race/ethnic group, prior insurance, income, or special-needs status. Greater improvements were noted for those subgroups that had lower baseline levels (eg, minority children, those uninsured for all 12 months before SCHIP, and those from poorer families).

DISCUSSION

Enrollment in the NYS SCHIP was associated with significant improvements in access and quality of care. One year after enrollment, more children had a USC, and a greater proportion of medical visits occurred at their USC. Unmet health care needs were reduced substantially. Specific indicators reflecting the quality of primary care improved, although they were relatively high before SCHIP, and cross-sectional measures of parent-reported quality ratings were uniformly high. Improvements also were noted among major population subgroups including children from different geographic regions, ages, racial and ethnic backgrounds, income, prior insurance, and special-needs status. Subgroups of children with the poorest baseline levels of health care at the time of enrollment in SCHIP experienced the greatest gains. These findings were found by using multivariate as well as bivariate analyses, indicating that improvements were not caused by demographic or prior health care factors.

Impact of the NYS SCHIP: A Changing Pattern of Health Care Delivery

The "starting point" among enrollees influences the potential impact of a health insurance program. Many of the NYS SCHIP enrollees had prior links or visits with the health care system. Nevertheless, many had risk factors: compared with the overall population of near-poor children in NYS,⁵³ SCHIP enrollees had lower family incomes and parental education, and more lived with single parents and were members of minority groups. Also, the prevalence of CSHCN (16.6%) was high^{74,75} and greater than the statewide prevalence (11.8%).⁷⁶ Baseline levels of unmet health care needs also were higher than national rates for uninsured children or for children without a USC.⁷⁷ Although the reason for this is

TABLE 3. Needs for Health Services and Unmet Health Care Needs Before Enrollment and 1 Year After Enrollment in SCHIP

	Before Enrollment in NYS SCHIP				After Enrollment in NYS SCHIP				Unadjusted Δ				Adjusted Δ			
	A Specific Need	Unmet Need if Had Need	Unmet Need All Kids	Unmet Need if Had Need	A Specific Need	Unmet Need if Had Need	Unmet Need All Kids	Unmet Need if Had Need	A Specific Need	Unmet Need if Had Need	Unmet Need All Kids	Unmet Need if Had Need	A Specific Need	Unmet Need if Had Need	Unmet Need All Kids	
Any health service, %	100	31.1	31.1	18.8	100	18.8	18.8	-12.4*	0	-12.4*	-12.4*	0	-13.8*	-12.4*	-13.8*	
Mental health, % [¶]	4.3	33.7	1.5	24.5	4.7	24.5	1.1	-9.2	0.4	-9.2	-0.3	<0.1	-9	-0.3	-0.3	
Specialty, %	16.5	34.2	5.6	11.3	19.3	11.3	2.2	-22.8 [‡]	2.7	-22.8 [‡]	-3.5 [‡]	2.5	-15.5 [‡]	-3.5 [‡]	-3.5 [‡]	
Acute care, %	29.8	18.5	5.5	8.1	28.4	8.1	2.3	-10.3 [‡]	-1.4	-10.3 [‡]	-3.2 [‡]	-2.5	-10.1 [‡]	-3.2 [‡]	-3.5 [‡]	
Preventive care, %	100	14.5	14.5	5.2	100	5.2	5.2	-9.2*	0	-9.2*	-9.2*	0	-9.6*	-9.2*	-9.6*	
Dental care, %	52.1	27.1	14.1	15.0	57.4	15.0	8.6	-12.1 [‡]	5.3	-12.1 [‡]	-5.5 [‡]	1.6	13.0*	-5.5 [‡]	-6.7*	
Prescription medications, %	50.6	16.8	8.5	7.1	59.6	7.1	4.2	-9.7*	9.1 [‡]	-9.7*	-4.2 [‡]	8.3 [‡]	-9.6*	-4.2 [‡]	-4.1 [‡]	
Vision care, %	23.7	19.9	4.7	10.7	19.8	10.7	2.1	-9.2 [‡]	-3.8	-9.2 [‡]	-2.6 [‡]	-5.3 [‡]	-13.2*	-2.6 [‡]	-3.6*	
Emergency department, %	25.0	14.6	3.6	2.7	24.3	2.7	0.7	-11.9*	-0.7	-11.9*	-3.0*	-0.6	-14.8*	-3.0*	-3.2*	

* $P \leq .001$; † $P < .05$; ‡ $P < .01$.

§ Adjusted for the variables shown in Table 1.

|| All children were assumed to have a need for preventive health care during each 1-year time period.

¶ Because few children had mental health needs, we were unable to estimate multivariate models for "Unmet Need if Had Need."

unclear, it is intriguing to consider the possibility that the prior existence of the pre-SCHIP insurance program in NYS (for other children) may have accounted for this higher level of having a USC among uninsured children, perhaps by improving overall reimbursement for safety-net providers.

All the factors discussed above would tend to limit the potential impact of SCHIP. Nevertheless, we observed substantial improvements in access and quality of care after enrollment in SCHIP. One possible mechanism to account for these improvements is that the pattern of care changed after enrollment, centering more on the primary care provider or the USC. After enrolling in SCHIP, children had a greater proportion of all health care visits at their USC, less fragmentation across multiple sources, and a corresponding higher rating of accessibility and quality of primary care. Furthermore, the reduction in unmet needs in the face of relatively stable utilization rates suggests the possibility of more efficient care delivery. Altogether, these findings point to a changing pattern of health care after enrollment in SCHIP, with improved coordination and receipt of primary care, resulting in greater parental ratings of quality.

In this study, the impact of SCHIP on access, unmet needs, and quality is greater than the impact found in studies of SCHIP precursors³²⁻⁴⁰ and of SCHIP programs in 2 small states.^{50,51} It is not clear why the NYS SCHIP seems to have such a large effect despite several factors that would tend to limit its potential impact. One possibility is that the existing health care system for near-poor children in NYS is able to function well if individuals are provided with health insurance. The relatively high proportion of families who switched primary care physicians may represent a shift to a USC better suited to their needs, with resultant improved overall care stemming from more effective primary care.⁷⁸ Interestingly, SCHIP did not seem to cause an outflow of families away from neighborhood health centers and toward private practices; in fact, the only practice type that experienced statistically significant gains after SCHIP was neighborhood health centers. This result suggests that SCHIP may benefit a wide group of health care providers as well as their patients.

Although it is encouraging that improvements were seen across population groups and in all regions, the level of unmet needs even after SCHIP remained high (18.8%), similar to levels in other programs.³⁴ Barriers to mental health⁷⁹ and dental^{80,81} care have been noted among low-income populations; additional study is needed to determine whether SCHIP could better address unmet needs in these areas.

Strengths and Limitations

Our study was based on parent self-report without verification by provider report or medical chart review. Parent-reported unmet needs may differ from those reported by providers. Second, differences by race or ethnicity may be confounded by factors not measured in this study. Third, we cannot control for the possibility of regression to the mean; eg, people who had particularly poor access at baseline or high

TABLE 4. Utilization of Health Care: Any Visits Before and During NYS SCHIP Enrollment

	Before Enrollment in NYS SCHIP, %	After Enrollment in NYS SCHIP, %	Unadjusted Δ , %	Adjusted Δ , % [§]
Emergency department	24.0	24.1	0.1	0.2
Any outpatient visit	82.0	88.8	6.7 [‡]	6.2 [‡]
Mental health	3.5	3.7	0.2	-0.1
Specialty	14.8	18.7	3.9	3.6
Acute	29.0	27.4	-1.6	-2.6
Preventive	73.6	81.7	8.1 [‡]	8.9 [*]
Dental	47.7	52.7	5.0	2.5

* $P \leq .001$; † $P < .05$; ‡ $P < .01$.

§ Adjusted for the variables shown in Table 1.

|| Any outpatient visit = sum of mental health, specialty, acute, and preventive visits.

TABLE 5. Quality of Health Care Before and After NYS SCHIP Enrollment

	Before Enrollment in NYS SCHIP	After Enrollment in NYS SCHIP	Unadjusted Δ	Adjusted Δ [§]
Measures of continuity				
Proportion of visits to USC				
All, %	39.5	76.7	37.2 [*]	37.7 [*]
Most, %	7.6	12.2	4.7 [†]	4.2 [†]
Some, %	10.2	7.0	-3.2 [†]	-3.2
None, %	42.7	4.3	-38.7 [*]	-38.4 [*]
Parent rating of quality				
Mean rating of health care (1–10, 10 being highest)	8.0	8.7	0.7 [*]	0.66 [*]
My provider usually or always:				
Listens carefully to me, %	77.1	85.7	8.6 [‡]	8.5 [*]
Explains things in understandable way, %	82.2	89.8	7.6 [‡]	7.2 [*]
Respects what I have to say, %	86.4	93.3	6.9 [*]	6.4 [*]
Spends enough time with me, %	76.1	84.6	8.5 [‡]	8.7 [‡]
Measures of health status				
Health status				
Health status is fair/poor, %	11.1	9.2	-1.9	-2.0
Much worry about child's health, %	52.8	45.6	-7.2 [†]	-7.4 [†]
Child is less healthy than others (physically), %	10.4	7.5	-2.8	-0.2

* $P \leq .001$; † $P < .05$; ‡ $P < .01$.

§ Adjusted for the variables shown in Table 1.

unmet needs may have been more likely to enroll into SCHIP, and their care may have improved even in the absence of SCHIP. If this was the case, we would expect that baseline measures for enrollees (before SCHIP) would have been worse than measures noted for similar populations. Instead, we found higher baseline levels of access than has been reported among uninsured children nationally.¹² Although these findings make regression to the mean less likely, it is still possible that some of the improvements were caused by this regression-to-the-mean phenomenon, and only a randomized, clinical trial would eliminate this potential concern. Fourth, although it is possible that unmeasured secular trends affected the findings, our analyses of the comparison group that enrolled 1 year later suggests little if any secular trend. Fifth, although the second interview captured 87% of those initially interviewed and nonrespondents seemed similar to respondents on T₁ measures, some bias may have occurred from loss to follow-up. Sixth, because the study goals were to assess changes in the populations 1 year after initial enrollment in SCHIP, we included all children who completed both interviews, although one sixth of the population reported being uninsured at the time of the second interview. This may result in a conservative estimate of the effect of SCHIP; the

effect for the population continuously enrolled for longer periods is likely to be higher.

A limit to external validity is that we studied only 1 state, although New York had 18% of the nation's SCHIP population. We excluded children other than black, white, and Hispanic children, and our findings cannot be generalized to other racial groups. Additionally, because we studied children who enrolled in SCHIP and not children who are eligible but not enrolled,^{82,83} our study findings may not be generalized to the entire population of near-poor children.

Implications for Clinicians and Policy Makers

New SCHIP enrollees will likely have many unmet health care needs at enrollment. The burden of meeting these needs will fall largely on primary care clinicians and will be facilitated by the shift of utilization into the USC rather than across multiple sources of care after enrollment in SCHIP. The burden for policy makers will be to ensure that SCHIP benefit packages and delivery systems are adequate to meet a variety of needs among enrollees.

Two overarching policy implications are evident from our study. First, enrollment in the NYS SCHIP seems to be associated with improved access, continuity of care, and quality of care. Continued funding of SCHIP and the benefit coverage under SCHIP is

TABLE 6. Key Outcomes for Major Subgroups: Before SCHIP and 1 Year After Enrollment in SCHIP* (Percent of Children Within Each Subgroup)

Independent Variables	Has USC			Any Unmet Need			Any Preventive Visit			Most/All Visits to USC		
	Before	After	P Value	Before	After	P Value	Before	After	P Value	Before	After	P Value
Region												
New York City	84.9	97.0	<.001	30.3	15.5	<.001	74.6	80.5	.10	44.5	90.0	<.001
NYC environs	88.5	96.4	<.001	38.1	17.8	<.001	72.5	78.4	.08	47.2	83.8	<.001
Upstate urban	90.0	98.3	.004	44.0	24.8	.006	70.1	90.4	<.001	59.0	88.7	<.001
Upstate rural	88.9	97.9	.03	47.8	28.6	.001	68.4	78.8	.15	53.1	90.2	<.001
Age												
0–2.9 y	90.7	98.6	<.001	21.2	13.3	.01	77.8	84.3	.13	59.9	86.2	<.001
2–5.9 y	86.2	97.3	<.001	26.4	23.1	.34	74.0	84.4	.009	51.5	89.4	<.001
6–11 y	87.7	98.8	<.001	38.9	15.3	<.001	76.5	86.8	.04	39.3	88.4	<.001
12–18 y	81.9	94.9	<.001	37.4	18.1	<.001	68.9	72.6	.32	47.4	90.2	<.001
Race												
White	92.6	97.3	.004	25.2	14.7	.01	67.1	77.7	.15	53.0	87.6	<.001
Black	85.9	94.9	<.001	40.1	17.0	<.001	76.0	86.5	.001	55.8	86.9	<.001
Hispanic	83.5	98.3	<.001	34.4	19.3	.002	75.0	79.0	.23	37.2	91.3	<.001
Prior insurance												
Insured until SCHIP	95.2	97.5	.26	31.1	18.9	.06	84.0	83.3	.90	49.1	91.4	<.001
Insured some months	95.4	98.1	.09	35.3	14.9	<.001	86.6	82.2	.13	52.2	85.7	<.001
Uninsured >12 mo	85.7	96.7	<.001	33.7	14.9	<.001	73.5	80.3	.02	47.2	89.6	<.001
Income												
≥160% FPL	94.8	99.0	.03	39.4	21.2	<.001	72.8	80.0	.001	49.1	89.7	<.001
<160% FPL	83.9	96.5	<.001	32.4	16.5	<.001	79.4	85.7	.006	46.6	88.6	<.001
Special-needs status												
Not CSHCN	85.3	97.3	<.001	32.0	15.9	<.001	74.1	81.8	.004	46.3	88.7	<.001
CSHCN	87.9	95.7	.04	42.3	24.0	.02	70.6	77.8	.18	51.8	89.8	<.001

* All analyses (P values) are adjusted for the other variables shown in Table 1.

predicated on evidence that it has positive effects on health care for children. Our findings suggest that SCHIP does have a positive impact on access to primary and specialty care, with reduction in unmet health care needs for a variety of services.

Second, the impact of the NYS SCHIP may have been modulated through improved primary care coordination and continuity of care. Overall utilization of outpatient services increased only slightly, although the pattern of care changed markedly, with more visits to the USC. With mounting evidence for the importance of coordination and continuity of primary care,^{84–88} it is reassuring that the provision of health insurance to low-income children may enhance this desirable pattern of service use. It is notable also that these improvements occurred even among children who had been insured through other systems, both private and public. Overall, this study suggests that SCHIP and care-delivery systems in New York have demonstrated success in meeting the needs of new SCHIP enrollees.

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Improved Access and Quality of Care After Enrollment in the New York State Children's Health Insurance Program (SCHIP)

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