ABSTRACT. Background. The legislation and funding of the State Children's Health Insurance Program (SCHIP) in 1997 resulted in the largest public investment in child health care in 30 years. The program was designed to provide health insurance for the estimated 11 million uninsured children in the United States. In 1991 New York State implemented a state-funded program—Child Health Plus (CHPlus)—intended to provide health insurance for uninsured children who were ineligible for Medicaid. The program became one of the prototypes for SCHIP. This study was designed to measure the association between CHPlus and access to care, utilization of care, quality of care, and health care costs to understand the potential impact of one type of prototype SCHIP program.

Methods. The study took place in the 6-county region of upstate New York around and including the city of Rochester. A before-and-during design was used to compare children's health care for the year before they enrolled in CHPlus versus the first year during enrollment in CHPlus. The study included 1828 children (ages 0–6.99 years at enrollment) who enrolled between November 1, 1991 and August 1, 1993. A substudy involved 187 children 2 to 12.99 years old who had asthma. Data collection involved: 1) interviews of parents to obtain information about demographics, sources of health care, experience and satisfaction with CHPlus, and perceived impact of CHPlus; 2) medical chart reviews at all primary care offices, emergency departments, and health department clinics in the 6-county region to measure utilization of health services; 3) claims analysis to assess costs of care during CHPlus and to impute costs before CHPlus; and 4) analyses of existing datasets including the Current Population Survey, National Health Interview Survey, and statewide hospitalization datasets to anchor the study in relation to the statewide CHPlus population and to assess secular trends in child health care. Logistic regression and Poisson regression were used to compare the means of dependent measures with and without CHPlus coverage, while controlling for age, prior insurance type, and gap in insurance coverage before CHPlus.

Results. Enrollment: Only one third of CHPlus-eligible children throughout New York State had enrolled in the program by 1993. Lower enrollment rates occurred among Hispanic and black children than among white children, and among children from lowest income levels. Profile of CHPlus Enrollees: Most enrollees were either previously uninsured, had Medicaid but were no longer eligible, or had parents who either lost a job and related private insurance coverage or could no longer afford commercial or private insurance. Most families heard about CHPlus from a friend, physician, or insurer. Television, radio, and newspaper advertisements were not major sources of information. Nearly all families had at least 1 employed parent. Two thirds of the children resided in 2-parent households. Parents reported that most children were in excellent or good health and only a few were in poor health. The enrolled population was thus a relatively low-risk, generally healthy group of children in low-income, working families.

Access and Utilization of Health Care: Utilization of primary care increased dramatically after enrollment in CHPlus, compared with before CHPlus. Visits to primary care medical homes for preventive, acute, and chronic care increased markedly. Visits to medical homes also increased for children with asthma. There was, however, no significant association between enrollment in CHPlus and changes in utilization of emergency departments, specialty services, or inpatient care.

Quality of Care: CHPlus was associated with improvements in many measures involving quality of primary care, including preventive visits, immunization rates, use of the medical home for health care, compliance with preventive guidelines, and parent-reported health status of the child. For children with asthma, CHPlus was associated with improvements in several indicators of quality of care such as asthma tune-up visits, parental perception of asthma severity, and parent-reported quality of asthma care.

Health Care Costs: Enrollment in CHPlus was associated with modest additional health care expenditures in the short term—$71.85 per child per year—primarily for preventive and acute care services delivered in primary care settings.

Conclusions. Overall, children benefited substantially from enrollment in CHPlus. For a modest short-term cost, children experienced improved access to primary care, which translated into improved utilization of primary care and use of medical homes. Children also received higher quality of health care, and parents perceived these improvements to be very important. Nevertheless, CHPlus was not associated with ideal quality of care, as evidenced by suboptimal immunization rates and...
receipt of preventive or asthma care even during CHPlus coverage. Thus, interventions beyond health insurance are needed to achieve optimal quality of health care.

This study implemented methods to evaluate the association between enrollment in a health insurance program and children’s health care. These methods may be useful for additional evaluations of SCHIP.

**Implications:** Based on this study of the CHPlus experience, it appears that millions of uninsured children in the United States will benefit substantially from SCHIP programs. *Pediatrics* 2000;105:687–691; SCHIP, CHPlus, children, uninsured, underinsured, health insurance, asthma, utilization, quality of care.

**ABBREVIATIONS.** SCHIP, State Children’s Health Insurance Program; CHPlus, Child Health Plus.

The decade of the 1990s was a watershed for children’s health insurance. The traditional fee-for-service system of private insurance is being replaced rapidly by commercial managed care. Traditional Medicaid is transforming into Medicaid-managed care. One of the greatest changes in children’s health insurance involves state-based programs to provide health insurance coverage for poor children who are uninsured or underinsured. These state-based programs now come under the umbrella of the State Children’s Health Insurance Program (SCHIP), enacted in 1997 with the passage of Title XXI of the Social Security Act. SCHIP is the largest expansion in expenditures for child health care since the Medicaid program, and it has the potential to affect millions of children within several years.

Since the 1980s, state and national leaders have been faced with several disturbing issues regarding uninsured children. First, the number of uninsured children has continued to increase to >11 million children or 14% of the child population; this increase has been fueled in part by a steady erosion of private employer-based health insurance. Second, it has become increasingly evident that children from poor working families are caught in the uninsured umbrella of the State Children’s Health Insurance Program (SCHIP), enacted in 1997 with the passage of Title XXI of the Social Security Act. SCHIP is the largest expansion in expenditures for child health care since the Medicaid program, and it has the potential to affect millions of children within several years.

Evaluation of the impact of these earlier programs offers important lessons as the nation moves rapidly toward implementing SCHIP. Understanding the impact of the private program model should help states choose their own approach. In addition, SCHIP (unlike Medicaid in previous years) is not an entitlement program, and it will require reauthorization in 5 years. Reauthorization will depend in large part on evidence that SCHIP works. Furthermore, although there are many studies about the problems of uninsured children, there is surprisingly little scientific data about the impact of health insurance programs like SCHIP on children’s health. SCHIP and its prototypes such as New York’s CHPlus represent an important natural experiment, allowing us to examine the potential benefits and limits of health insurance in children’s lives.

This supplement issue of *Pediatrics* provides an in-depth evaluation of New York State’s CHPlus program in a 6-county region in upstate New York. This work is the result of a 5-year study of CHPlus in the region. Each article examines a particular aspect of the evaluation, including a historical assessment of how CHPlus was implemented; a detailed description of the evaluation methodology; a profile of the population enrolled in CHPlus; evaluations of changes in access, utilization, and quality of care; an evaluation of the care of children who have asthma; and an assessment of costs associated with provision of CHPlus insurance. Each article emphasizes lessons from CHPlus that are applicable to current SCHIP programs and to state health insurance planning. This supplement issue will be published electronically in part to speed publication because states currently are working on developing and evaluating their SCHIP programs, and in part to facilitate retrieval of information from the articles.

**LESSONS FROM NEW YORK STATE’S CHPLUS PROGRAM**

CHPlus began enrolling children in 1991, and its goals were to provide coverage to poor children, improve access and appropriate use of health services, and target charity care expenditures in the state more efficiently. Initially CHPlus provided cov-
verage for ambulatory services, emergency department services, and prescription medications (but not hospitalizations) for children <13 years old not enrolled in Medicaid and lacking equivalent health coverage. Children were eligible for full state subsidy if their families had gross incomes below 160% of the federal poverty level and partial subsidy if their income was between 160% and 222% of the federal poverty level. Recently CHPlus was expanded to cover children <19 years old and to include hospitalizations. Enrollment rose within several years of initial implementation to >100 000 children at the time of this study and now is well >300 000. Pediatricians, the American Academy of Pediatrics, and child advocacy groups in New York State had a major influence on the program’s design and passage, enrollment of children, and evaluation, and on the strengthening of its subsequent amendments. Extrapolating from New York’s experience, we believe that child health leaders can have a major impact on implementation and evaluation of SCHIP programs in other states. The American Academy of Pediatrics’ policy statement—Implementation Principles and Strategies for Title XXI18—and guidelines and advice by expert groups19,20 will facilitate these efforts to implement and evaluate a state’s SCHIP program.

The current evaluation of CHPlus occurred in the 6-county region in upstate New York around and including the city of Rochester. The objectives of the evaluation were to describe characteristics of children enrolled in CHPlus and to measure the association between CHPlus insurance and access, utilization, quality of care, health outcomes, and costs of care. The evaluation was designed as a before-and-after study. Data were obtained on 1828 children for the 12 months immediately before and 12 months immediately after their enrollment in CHPlus. The study focused on younger children (0–6.99 years old) who enrolled in CHPlus between November 1, 1991 and August 1, 1993. In addition, a separate study of 187 children who had asthma (2–12.99 years old) was performed. Data collection involved: 1) interviews of parents to obtain information about demographics, sources of health care, experience with CHPlus, and perceived impact of CHPlus; 2) medical chart reviews at all primary care offices, emergency departments, and health department clinics in the 6-county region to measure utilization of health services; 3) claims analysis to assess costs of care during CHPlus and to impute costs before CHPlus; and 4) analyses of existing datasets such as the Current Population Survey, National Health Interview Survey, and statewide hospitalization datasets to anchor the study in relation to the statewide CHPlus population and to assess secular trends in child health care. Because the objectives of the evaluation were to measure the association between enrollment in CHPlus and changes in health care among children who enrolled, it was critical to obtain accurate information about the period before enrollment in CHPlus and to measure the change that occurred after enrollment in CHPlus. This design allowed each child to serve as his or her own control and for the analyses to be adjusted for the aging of each child during the study period.

Analysis of the Current Population Survey for the years 1989–1993 found that in 1993, only one third of children throughout New York State who were eligible for CHPlus had enrolled in the program.21 Hispanic and black children and children in the lowest eligible income levels were slightly underrepresented in CHPlus. During subsequent years the enrollment rates among eligible children increased substantially. Methods to improve enrollment of eligible children in any SCHIP program might include special targeting of subgroups (adolescents, minority groups, immigrants), employee-based information programs, health care provider-based outreach and information, and simplification of enrollment with respect to Medicaid. One suggested improvement involves joint application forms for SCHIP and Medicaid and automatic notification about SCHIP for families who disenrolled or for those who do not qualify for Medicaid.

Most children who enrolled in CHPlus were either uninsured previously, had Medicaid but were no longer eligible, or had parents who either lost a job and its private insurance coverage or could no longer afford commercial or private insurance. Most families heard about CHPlus from a friend, physician, or insurer. Traditional mechanisms of advertisement were not major sources of information. Almost all families had at least 1 employed parent, and two thirds of families had 2-parent households. Parents reported that most children were in excellent (66%) or good health (30%) and only a few (4.1%) in poor health. This suggests that the potential SCHIP population is basically healthy, and is not a high-cost population with many chronic diseases.

There was dramatically higher utilization of primary care services during CHPlus coverage compared with the period before enrollment. This marked increase in primary care utilization involved preventive, acute, and chronic care visits to children’s medical homes. Similarly, CHPlus was associated with higher quality of care for many measures that involved primary care, including immunization rates, reliance on the medical home for health care, and compliance with some preventive guidelines. There was no significant association of CHPlus coverage with changes in emergency department utilization, utilization of specialty services, or hospitalizations. For children who had asthma, CHPlus was associated with improved utilization of the primary care office, greater reliance on primary care practitioners for asthma care, and improvements in several indicators of quality such as asthma tune-up visits and parental perception of both asthma severity and the quality of asthma care. CHPlus also was associated with higher health care expenditures in the short term; however, the additional costs were relatively low—$71.85 per child per year—mostly in the form of additional up-front costs for preventive and acute care in primary care settings.

This was an observational study. Although our study was able to demonstrate significant differences in many health care measures between time periods
before and after CHPlus enrollment, it is not possible to show definitively that these differences were attributable solely to CHPlus. The limitations of the study are discussed in detail in the accompanying article that summarizes the study methods. Similarly, there will be no perfect method to measure the impact of SCHIP health insurance on children. There is unlikely to be a randomized clinical trial of SCHIP, and even if such a clinical trial could take place it would have limited generalizability because SCHIP in the real world will have voluntary enrollment of only a portion of eligible children. Such voluntary enrollment results in selection effects that are not part of randomized clinical trials. Furthermore, closely controlled randomized clinical trials may yield different results than actual health care programs. Only cumulative evidence from multiple studies will provide conclusive evidence about the impact of children’s health insurance programs such as SCHIP on children’s health. Of note, an evaluation of a program in Pennsylvania similar to CHPlus found results similar to those in our study.

While acknowledging the methodologic limitations, it appears from our study that children in New York State gained quite a lot after enrolling in CHPlus. For relatively low short-term costs, children experienced improved access to primary care services, which translated into improved utilization of primary care and medical homes. Children also received higher quality of health care, and parents perceived these improvements to be very important. Nevertheless, CHPlus was not associated with ideal quality of care, as evidenced by suboptimal immunization rates, lack of receipt of recommended preventive care, and suboptimal asthma care even during CHPlus coverage. This is similar to findings from many studies noting that many well-insured children still lack optimal quality of care. More specific interventions to improve practices by clinicians and by health care systems are needed to improve care further. This is not surprising—after all, why should health insurance by itself guarantee optimal quality of care? It is important not only to recognize the benefits of CHPlus coverage, but to note the limitations of any health insurance program to improving children’s health. We cannot rest easy with CHPlus or with SCHIP. Much more work remains to be done.

What are children in other states likely to gain from their SCHIP programs? Can findings from CHPlus be generalized to other states? There is some evidence from a statewide evaluation of CHPlus that the association between CHPlus and improvements in health care may actually be greater in other regions and states than in the current study because baseline levels of access to care are often worse elsewhere than were baseline levels in this study region. A national study by Newacheck noted baseline levels of access to primary care that were substantially poorer than baseline levels measured in the current study. Our statewide evaluation of CHPlus found that the strongest association between CHPlus and improvements in health care occurred in regions that had the poorest baseline levels of access and integration into primary care. Thus, findings in this study may actually underestimate the potential impact of SCHIP programs, especially for programs that are implemented in areas that have poor access to primary care.

CHPlus follows the private model of a statewide health insurance program and clearly is not a Medicaid expansion in structure, in implementation, or in the view of families who enrolled. It is not at all clear that SCHIP programs that involve Medicaid expansions will observe improvements in care as large as those observed in this study; in fact, several preliminary studies of Medicaid expansion programs had mixed results in terms of benefits to children. It is important for state leaders to compare the structure and implementation of CHPlus to that of their own SCHIP programs in attempting to estimate the impact of the their version of SCHIP.

We hope that this evaluation of CHPlus provides a blueprint for evaluating other SCHIP programs. Although not all evaluations can be as detailed as the current one, there are several issues that will be applicable to all SCHIP evaluations. To estimate the association between enrollment in SCHIP programs and changes in health care outcomes for enrollees, it is critical to assess baseline characteristics and level of care; otherwise, changes in outcomes are difficult to measure. Determining the baseline is challenging because existing data sets (such as insurance claims or current national interview datasets) usually lack the necessary details. Accurate utilization and quality of care data are essential to determining the impact of a program, but they are expensive and time-consuming to obtain because multiple sources of data often are needed for comprehensive and accurate measurement. Furthermore, while this study was not able to include a control group, and assessed only short-term changes after enrollment in CHPlus to minimize secular trends, future studies of SCHIP (particularly long-term studies) should attempt to include control groups because of the potential influence of secular trends on children’s health care.

Because SCHIP is one of the most important new child health initiatives in several decades, thorough and scientific evaluations of SCHIP programs are essential if we are to understand their impact on children’s health and improve the performance of the SCHIP programs. Based on the CHPlus experience, it appears that the millions of uninsured children in the United States will benefit substantially from SCHIP programs. Additional evaluations of SCHIP will determine if the lessons from CHPlus can be translated into the realities of SCHIP in the coming years.

REFERENCES

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