DEMAND FOR MEDICAL SERVICES AMONG PREVIOUSLY UNINSURED CHILDREN:

THE ROLES OF RACE AND RURALITY

South Carolina
Rural Health Research Center

UNIVERSITY OF SOUTH CAROLINA

Arnold School of Public Health
Department of Health Administration
Columbia, SC 29208

DEMAND FOR MEDICAL SERVICES AMONG PREVIOUSLY UNINSURED CHILDREN:

THE ROLES OF RACE AND RURALITY

October, 2002

Prepared by

Karen Goldsteen, Ph.D.
Charleston Area Medical Center
Institute for Health Education and Outcomes Research

Raymond L. Goldsteen, Dr.P.H.
Director of Research
West Virginia University Institute for Health Policy Research

Acknowledgments

We wish to acknowledge the assistance that we received from the following people and organizations. First, we thank the University of South Carolina Rural Health Research Center, funded by the Office of Rural Health Policy, for sponsoring the study and the South Carolina Department of Health and Human Services and the West Virginia Children's Health Insurance Program (CHIP) for agreeing to provide their data for this project. In West Virginia, Sharon Carte, Director of CHIP, and Sally K. Richardson, Executive Director of the West Virginia University Institute for Health Policy Research, were instrumental in this regard. We also thank Pete Bailey and Beth Corley at the South Carolina State Budget and Control Board, Office of Statistics, for preparing the data used for the South Carolina portion of the study, as well as Mike Madalena for his role in preparing data for the West Virginia section. We are very grateful for their help with this project.

Funding acknowledgment

This report was prepared under Grant No. 6 U1C RH 00045-01 with the Federal Office of Rural Health Policy, Health Resources and Services Administration.

Joan Van Nostrand, DPA, Project Officer

Executive Summary

Project Summary

This project examined the use of medical services over nearly two years among newly insured and continuously insured children, ages six through twelve, in the CHIP and Medicaid programs in South Carolina and West Virginia. We asked whether newly insured children had a different pattern of utilization than children who had been continuously insured. This information is needed to project the cost of extending coverage to uninsured children. However, the results of previous studies are conflicting, with some finding pent-up demand for care among newly insured children and others finding a gradual increase in demand. We hypothesized that the findings of previous studies were contradictory because of differences in the race and rurality of the children studied. Some studies were conducted in urban areas, others in rural. Some examined mainly white children, others mainly African-Americans. Our study improved on these studies because we were able to examine both white and African-American children in urban and rural areas in the same state - South Carolina - and rural and urban children in West Virginia. We also studied a longer time period than most other studies and were able to determine whether demand for medical services among newly insured children differed over the long-term from that of continuously insured children.

The study examined utilization of ambulatory care, prescription drug, emergency room, and inpatient hospital services, using number of services received and expenditures for services as the two measures of demand. The models controlled for age and sex of child as well as presence of chronic conditions including asthma, psychosocial problems, diabetes, congenital anomalies, and nervous system disorders. Continuously insured children had been insured for at least the year prior to the study period.

Major Findings

- There was no evidence of pent-up demand for medical care among newly insured children, when they were compared to children who had been continuously insured. In South Carolina, there was evidence of *delayed* demand, in which newly insured children had a lower demand for medical services at the outset and became increasingly similar in their demand to their continuously insured counterparts, over the long-term. In West Virginia, there was no difference between newly insured and continuously insured children's demand for medical services, either at the outset or over the long-term.
- In neither state did newly insured children's pattern of demand vary by whether a child lived in an urban or rural area or by the race of a child. Therefore, our original hypothesis that race and rurality would explain the discrepancies in initial demand for services between previous studies was not supported. In South Carolina, for instance, newly insured rural white children displayed delayed demand, just as did newly insured urban white children and rural and urban African-American children.

- Rurality and race affected all children's medical care utilization, regardless of their prior health insurance status. The influence of rurality and race was persistent, but not consistent, within or across states. In West Virginia, rurality had the effect of increasing utilization among all children including number of ambulatory services received, number of prescriptions received in Year 2, and the probability of using the emergency room. In South Carolina, rurality and race interacted, such that urban African-American children received the fewest services and had the lowest expenditures for ambulatory care and prescription drugs of all race/rurality groups. For ambulatory care, urban African-American children received the most ambulatory services and had the highest expenditures. For prescription drugs, urban white children had more prescriptions and higher prescription drug expenditures than any other children, although the difference between white and African-American children in prescription drug expenditures was greater in urban than in rural areas of South Carolina.

Policy Recommendations

- The results have funding implications for programs intended to extend health coverage to uninsured children. They suggest that funding projections for previously uninsured children, six to twelve years old:

  (1) need not include a large initial expenditure for pent-up demand;

  (2) should not be expected to be higher over the long-term than expenditures for continuously insured children; and

  (3) may be expected to be lower than expenditures for continuously insured Medicaid recipients because previously uninsured children appear to be less likely to have chronic health conditions than children covered by Medicaid for a substantial length of time (this study; Byck 2000).

- Cost projection models should include race and rurality since these factors consistently influenced utilization. At present, the effects must be state- and service-specific, since their impact was not consistent across states and services.

- Because of the persistence of rural and racial effects on medical care demand and because these findings are not explained by possible differential reimbursement policies based on rurality, further investigation is warranted regarding the cause of the disparity in utilization by children in rural and urban areas and children of different races.

Table of Contents

I. Introduction

Under the Balanced Budget Act of 1997, Congress created the State Children's Health Insurance Program (CHIP) in order to provide health insurance for low-income children who would otherwise lack coverage. Thus, CHIP affords the opportunity to examine an important question for health policymakers: Do previously uninsured children have the same demand for medical care as children who have been continuously insured? This project addressed the issue of medical care utilization among newly insured children by contrasting the utilization of children insured by public insurance programs in South Carolina and West Virginia.

Demand for Medical Care Among Previously Uninsured Children

Newly insured children are found to use more medical care than when they lacked health insurance (Lave, Keane, Lin, et al. 1998), with the size of the increase dependent upon their state's safety net resources. Newly insured children in states with few safety net providers have a larger increase in medical care utilization than those in states with an abundant safety net (Long and Marquis 1999). However, studies such as these do not inform us about utilization patterns among previously uninsured children, as compared to their continuously insured counterparts.

There are several hypotheses concerning newly insured children's course of medical care utilization. One possibility is that newly insured children have a pent-up demand for medical care, with utilization becoming similar to that of insured children as the pent-up demand is satisfied (*pent-up demand hypothesis*). Another possibility is that previously uninsured children demand fewer medical services at the outset, perhaps because their parents lack familiarity with health insurance and health care delivery. After parents gain experience with the health care system, utilization patterns of uninsured children rise to the levels of continuously insured children (*delayed demand hypothesis*). A third possibility is that medical care utilization among previously uninsured children is not similar to that of continuously insured children, at the outset or long-term. Under this scenario, initial use of services among uninsured children may start high or gradually increase, but long-term use is higher than that of continuously insured children (*persistently higher demand hypothesis*). This may be particularly true for children with a chronic health problem, such as asthma or diabetes, perhaps because poor access to medical care during the uninsured period exacerbated their need for medical care. A fourth possibility is that the pattern of medical care utilization is the same, at the outset and over time, among previously uninsured children when compared to their insured counterparts (*no difference hypothesis*), controlling for demographic characteristics and health status (Marquis and Long 1992; Rivlin, Cutler, and Nichols, 1994).

Comparing Previously Uninsured to Continuously Insured Children

The first issue addressed in the hypotheses has to do with the comparison of demand among previously uninsured children to that of the continuously insured. Does utilization among previously uninsured children become similar, over time, to that of the continuously insured. There are several existing studies about medical care utilization among newly insured children, but their findings about how newly insured demand patterns compare to those of continuously insured children are inconclusive - either because there was no continuously insured control group or the control group was not optimal. Lin and Lave (1998) examined utilization patterns of newly insured, low-income (up to 235% FPL) children in Western Pennsylvania. However,

they did not compare the demand of the study children to that of continuously insured children, and therefore, cannot report whether their utilization was similar to that of the insured.

Tilford, Robbins, Shema, and Farmer (1999) compared utilization among newly insured, low-income children to national utilization rates for insured, low-income children obtained from the National Medical Expenditure Survey (NMES). However, their results with respect to whether utilization patterns of newly insured children were higher, lower, or similar to that of continuously insured children are mixed. Inpatient hospital, emergency department, and prescription drug utilization were lower for the newly insured children in all four years. Ambulatory care use was lower in the first three years and higher in the last year. Hospital outpatient utilization was lower in two years and higher in two years, compared to the national sample.

Bograd, Ritzwoller, Calonge, Shields, and Hanrahan (1997) compared two groups newly insurance by a health maintenance organization (HMO): (1) previously uninsured low-income (up to 200% FPL) persons, whose length of time without insurance was unknown; and (2) new commercial enrollees, whose previous insurance status was unknown. The sample contained adults and children, but the authors presented some pediatric results separately. They found that the previously uninsured, low-income children in poor health used more services over the long-term than the controls in poor health. If the controls were insured prior to their enrollment in the HMO, this finding would support the *persistently higher demand* hypothesis. Unfortunately, the previous insurance status of the controls is unclear.

The Long-term Pattern of Utilization among Previously Uninsured Children

The second issue embedded in the hypotheses concerns the long-term pattern of utilization among newly insured children. Does utilization increase and decrease over time, reflecting delayed demand or pent-up demand for medical services. On this issue, the findings of these studies conflict. Two of them found evidence of pent-up demand that subsided after the first year of enrollment (Lin and Lave, 1998; Bograd, Ritzwoller, Calonge, Shields, and Hanrahan, 1997). On the other hand, Tilford, Robbins, Shema, and Farmer (1999) found no evidence of pent-up demand, but rather observed that utilization generally increased over the four-year period.

The Roles of Race and Rurality

The conflicting results about medical care demand patterns among previously uninsured children may be explained by the racial and rural differences among the child populations studied. Tilford, Robbins, Shema, and Farmer (1999) examined medical care utilization among low income, mostly African-American children in rural Mississippi, newly insured under a publically-funded, school-based health insurance program. The studies that found evidence of pent-up demand were conducted in urbanized areas. Lin and Lave (1998) analyzed utilization among low income (up to 235% FPL) children in Western Pennsylvania who were mainly urban (72 percent) and white (97 percent). Bograd, Ritzwoller, Calonge, Shields, and Hanrahan (1997) studied low-income and middle-income children in metropolitan Denver (no racial characteristics were reported).

Thus, differences in the three studies may be due to variation in the medical services available in rural and urban areas. Research indicates that availability of medical providers affect patterns of medical care use among children (Long and Marquis 1999; Halfon, Newachek,

Wood, and St. Peter 1996). In addition, race may play a role in explaining the discrepancies between the three studies. Social and demographic attributes of the parents or guardians, including race, have also been found to affect utilization patterns among children (Halfon, Newachek, Wood, and St. Peter 1996). Race and rurality may also affect whether previously uninsured children are similar or dissimilar to continuously insured children in their utilization of medical services.

Significance of Study for Rural Health Policy

There are at least three reasons to examine whether demand for medical care is different among previously uninsured and continuously insured children and whether race and rurality affect demand. First, the results have funding implications for programs intended to extend health coverage to uninsured children. They will suggest whether funding projections should be based on the history of existing programs such as Medicaid or whether new program costs must be estimated differently, based instead on the child population's previous insurance status, race, and rurality. Second, the results have implications for assessing the health effects of being uninsured. A persistently higher demand for medical care among previously uninsured children may indicate that being uninsured has long-term adverse health consequences for children, providing yet another reason to develop a policy to cover all children, right from the start. Third, clarification of the dual roles of race and rurality in determining utilization of medical services will contribute to our understanding of racial and geographic disparities in the need and demand for medical care.

Study Questions

By contrasting children newly insured by a public program to children continuously insured by the same programs in South Carolina and West Virginia, this study addresses three main questions:

[1] Do previously uninsured children differ from continuously insured children in their demand for medical care?

If demand patterns differ, do they suggest pent-up demand, delayed demand, or persistently higher demand among previously uninsured children? The null hypothesis is that there is no difference in demand patterns between newly insured and continuously insured children.

[2] Do urban and rural children have different demand profiles, suggesting a partial explanation for the discrepancy between the Mississippi and Pennsylvania studies?

We assess the effect of rurality on demand for medical services among previously uninsured children by contrasting the medical care utilization patterns of rural and urban children. The null hypothesis is that any differences in utilization patterns between newly insured children versus those continuously enrolled in the public program will be the same for rural and urban children.

[3] Do African-American and white children have different demand profiles, suggesting a partial explanation for the discrepancy between the Mississippi and Pennsylvania studies?

The study contrasts the utilization patterns of urban and rural African-American and white children enrolled in South Carolina's CHIP and Medicaid programs. The null hypothesis is that any differences in utilization patterns between newly insured children versus those

continuously enrolled in Medicaid or other public program will be the same for African-American and white children, in rural and urban South Carolina. West Virginia has a small African-American population and does not collect data on race. Therefore, this hypothesis cannot be addressed for West Virginia.

Advantages of the Study over Others

In South Carolina, the large number of children enrolled in one of the State's health insurance programs provides a sizable study population, even given our need for children with a lengthy period of continuous eligibility. Also, South Carolina has large rural and African-American populations. Approximately 36 percent of South Carolina's children are African-American according to the 2000 Census, and 30.6 percent of all children live in counties designated as rural. As a result, there are sufficient numbers of white and African-American children living in rural and urban areas to address the issues race and rurality that possibly led to conflicting results in other studies. Finally, we were able to obtain comparable records for newly insured and continually insured children since the State's Department of Health and Human Services administers all public insurance programs for low-income children. Therefore, we were able to obtain data for all programs and create groups of previously insured children whose utilization could be compared to that of the newly insured. Also, neither of the programs had co-pays or deductibles that might have altered the utilization patterns among the groups.

In West Virginia, only CHIP records were available for analysis, and therefore, the number of children in the West Virginia study is much smaller than for South Carolina. However, there are still a sufficient number to create a comparable data set with the same advantages as stated above for South Carolina, with the exception that the effect of race cannot be assessed.

II. South Carolina

Overview of Study Method

Design of Study

The study examines utilization in the South Carolina CHIP and Medicaid programs during the period FY1998 (Year 1) and FY1999 (Year 2). Children are placed in four categories based on their insurance history (Details in Appendix A). The first two groups consist of children who had not been enrolled in one of the public programs in South Carolina in the year prior to the study, The second two groups consist of children who were continuously insured by Medicaid in FY1997. The four groups are:

[1] Uninsured-CHIP: previously uninsured children, insured for at least 11 months in FY1998 by CHIP (n=2,276).

[2] Uninsured-Medicaid: previously uninsured children, insured for at least 11 months in FY1998 by Medicaid (n=3,509).

[3] Continuous Medicaid: children insured for 12 months in FY1997 by Medicaid and were insured for all of FY 1998 in the Medicaid program (n=18,519).

[4] Medicaid-CHIP: children insured for 12 months in FY1997 by Medicaid and insured for at least 11 months in FY1998 by CHIP (n=956).

We used two previously uninsured groups and two continuously insured groups in order control for differences between Medicaid and CHIP-eligible children. By having four groups in our study, we are able to examine whether there was greater similarity between groups based on insurance type (Medicaid versus CHIP) or groups based on previous health insurance status (Newly insured versus continuously insured).

Dependent Measures

The first dependent measure for the study is child's monthly expenditure totals for ambulatory care, inpatient hospital stays, emergency room visits, and prescription drugs during the 23 month period, or for the period in which the child was insured (at least Year 1). The second dependent measure is number of health care services received per month. For prescription drugs, the second dependent measure is number of prescriptions per month. For inpatient hospital and emergency room services, the second dependent variable is number of visits. For ambulatory health care, the second dependent variable is number of services received including those performed in a physician office, clinic, or home, ambulatory surgery procedures, laboratory tests, and ambulance and equipment services. We used monthly utilization, rather than annual or quarterly utilization, so that seasonable fluctuations in medical care use would not obscure differences in utilization patterns. If a child received no services, that month was coded "0", unless the child had disenrolled from the program. In this case, the measure was coded "missing".

Most children had a 23-month history in the program. Approximately 180 children per month lost coverage in Year 2, so that by June 1999, 23,039 children of the original 25,260 remained in the study (91.2%). The drop-out rate was higher among the previously uninsured children (Groups 1 & 2). However, the groups were still sufficiently large for the analysis (See

Table A-1). Whites, urban children, and children without a chronic condition were slightly more likely to disenroll. Sex was unrelated to disenrollment. There was little switching of programs in Year 2. Less than 5 percent of children enrolled in CHIP in Year 1 were enrolled in another program in Year 2. About 5 percent of children in Medicaid in Year 1 were enrolled in CHIP in Year 2.

Independent Measures

Group membership, rural residence, and child's race are the primary independent variables. The models also include child's age, sex, and chronic health condition status (See Appendix A for details).

Analysis

The analysis has two parts. First, we graphed the mean number of services per child and the mean expenditure per child by month for each insurance group, adjusted for chronic condition, race, and rurality. This analysis visualizes the pattern of utilization over the 23 month study period, including seasonal fluctuations. Second, we regressed annual number of services per child and annual expenditure per child for Year 1 and Year 2 on insurance group, adjusting for presence of a chronic condition, diagnosis of cancer, rural or urban residence, and race of child. Details of the analytic approach are provided in Appendix A.

Results

Demographic Characteristics and Health Status of Children

Among 6 to 12 year old children, the groups had similar age distributions, with the mean age about 8.8 in Groups 1-3 and 7.9 in Group 4 (See Table A-2). The children in each group were about 50 percent male. About 40 percent of children in each group lived in rural areas, except children in Group 4, Medicaid-CHIP (32 percent rural). Over half of the children in each group were African-American, with Group 1, Uninsured-CHIP recipients, having the smallest proportion of African-Americans and Group 3, Continuous Medicaid, having the largest.

Previously uninsured children were less likely to have a chronic condition, controlling for age, sex, and race (See Table A-3). This is consistent with previous findings about CHIP-eligible children (Byck 2000). Within insurance groups, African-American children were less likely to have a chronic health condition than white children, and girls were less likely than boys to have a chronic condition.

Within each insurance group, the most frequent chronic health problems were psychosocial health conditions, followed by asthma, congenital anomalies, nervous system disorders, and diabetes (See Table A-4). Generally speaking, the groups with newly insured children were less likely to have any of these conditions.

Patterns of Medical Care Utilization

[1] Do previously uninsured children differ from continuously insured children in their demand for medical care?

In South Carolina, newly insured children are slow to use services at the outset, but over time become similar to continuously insured children.

We examined both the form and the magnitude differences between previously uninsured and continuously insured children for expenditures and number of services over the 23-month period for ambulatory care, prescription drug, emergency room, and inpatient

hospital utilization. The preponderance of the results supports the *delayed demand hypothesis*, whereby newly insured children are slow to use services at the outset, but over time their demand for medical care becomes similar to that of continuously insured children.

The utilization pattern or form for number of services and for expenditures is seasonal. There was a small rise in number of services and expenditures in September and October, and then another larger rise occurring around February and March. During the 23-month period that we examined, this pattern was repeated twice, once for Year 1 and then again for Year 2. All insurance groups followed this utilization pattern for number of services and for expenditures. However, among both groups of newly insured children (Groups 1 & 2, CHIP and Medicaid, respectively) - whether the children had a chronic health condition, were white or African-American children, were rural or urban - the increase in use of services at the outset (about 4-5 months) was slower, compared to the insured groups (Groups 3 & 4). After that, the form of service utilization among the newly insured children became similar to that of continuously insured children, following the seasonal pattern.

We also examined the magnitude differences in number of services and expenditures between previously uninsured and continuously insured children. The general pattern was as follows: previously insured children (Groups 3 & 4) had more services and higher expenditures, particularly the children on Medicaid (Group 3) in Year 1. However, we also note that the discrepancy in number of services and expenditures between the newly insured and the continuously insured seemed to decrease over time. The newly insured children not only followed the same pattern (or form) of demand, but their magnitude of demand was increasingly similar to children who had been continuously insured.

Figures B1-B4 illustrate these findings for number of ambulatory services received by children with a chronic health condition. Figure B-1 illustrates the findings for non-Hispanic white children living in a rural county, Figure B-2 is for rural African-American children, Figure B-3 is for urban, non-Hispanic whites, and Figure B-4 is for urban African-American children. The figures look much the same for expenditures and for children without a chronic health condition, although the number of services and size of expenditures were greater for children with chronic health problems, as would be expected. They follow the same general pattern for prescription drug use, as well.

Tables A-5 (Ambulatory Care), A-6 (Prescription Drugs), and A-7 (Emergency Room and Inpatient Hospital) contain the regression results for this analysis. They confirm the descriptive findings illustrated in Figures 1-4 that, in Year 1, previously uninsured children (Groups 1 & 2) received fewer services and had lower expenditures, on average, than continuously insured children. The magnitude of difference between the newly insured and the continuously insured children narrowed in Year 2. There was only one case out of twelve where Year 1 demand was higher among newly insured children, than children who had been continuously insured. Therefore, there is virtually no support for the *pent-up demand hypothesis*. The exception is:

> Newly insured children on Medicaid (Group 2) had a higher probability of using inpatient hospital services in Year 1 than children continuously insured through Medicaid. (See Table A-7).

There were only two cases out of the twelve in which Year 2 demand among newly insured children was not the same or closer to the demand level of children who were previously insured. In all other cases, there was no statistical difference between the newly insured children in Groups 1 and 2 and the comparison group (Group 3) or the regression coefficients for Groups 1 and 2 were smaller in Year 2 than in Year 1, indicating a smaller difference between the groups in the second year of enrollment. The two exceptions are:

Newly insured children with CHIP had lower ambulatory care expenditures in Year 2 compared to children continuously insured through Medicaid (See Table A-5).

Newly insured children with CHIP received slightly more prescription drugs in Year 2, compared to children continuously insured through Medicaid (See Table A-6).

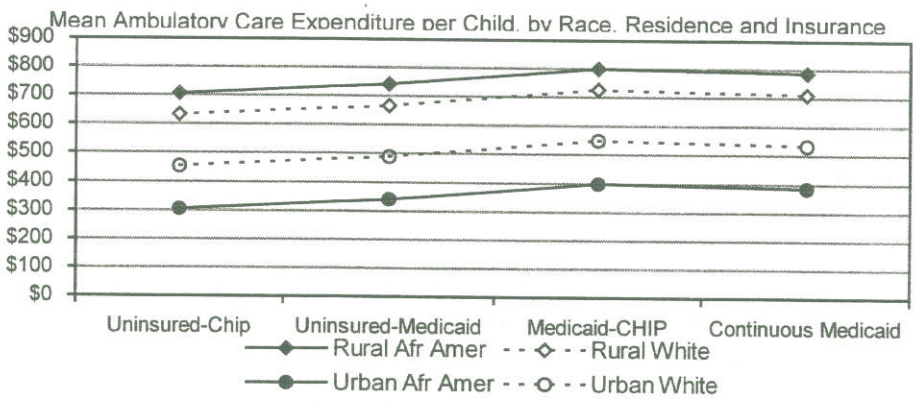
In summary, the *delayed demand hypothesis* is supported by the analysis. Previously uninsured children, adjusting for race, rurality, and presence of a chronic health condition, indicated less demand for ambulatory care, prescription drug, inpatient hospital, and emergency room services in the beginning of enrollment, compared to previously insured children. After about five months, the form and magnitude of their utilization increasingly matched that of continuously insured children.

[2] & [3] Do urban and rural children and white and African American children have different demand profiles?

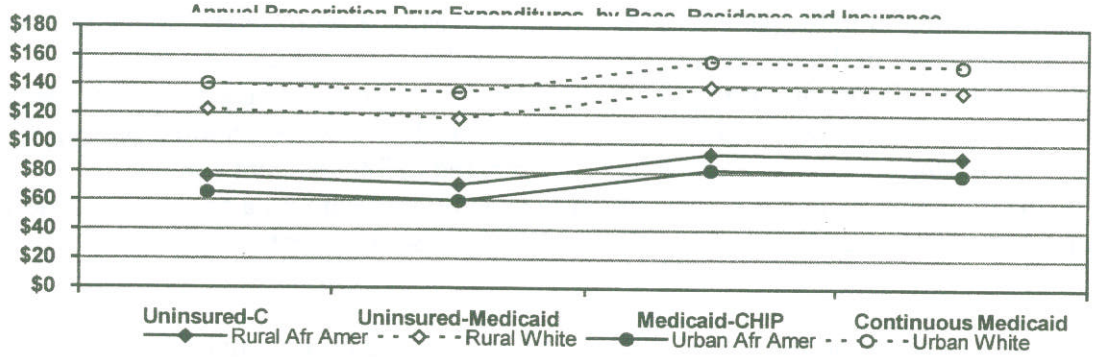
This research found no difference in the demand profiles between rural and urban children or white and African-American profiles that would explain the discrepancy between previous studies of newly insured children. The results from all groups and all services supported the *delayed demand hypothesis*.

However, the study did find differences between rural and urban children and white and African-American children in the magnitude of their demand for ambulatory care and prescription drugs, regardless of prior insurance status.

The regression results in Tables 5 and 6 suggest an interaction between race and rurality that affects number of services received and size of expenditures for ambulatory care and prescription drugs. As an illustration of the form of the interaction for ambulatory care, Table A-8 contains the adjusted mean scores for each insurance group by race and rurality calculated from the ambulatory care regression equations for Year 1 (Table A-5). Measured as either number of services received or size of expenditures, rural African-American children used more services than any other group and urban African-Americans used the fewest (See graph, below). Therefore, rural and urban white children were intermediate users of health care services, compared to African-American children. There was also a main effect of rurality on expenditures, with both African-American and white children in rural areas having higher expenditures than their urban counterparts.



Prescription drug use differed from that of ambulatory care. Race had a main effect in that white children had more prescriptions and higher expenditures, on average, than African-American children (See graph, next page, and Table A-9). However, for both number of prescriptions and size of expenditures, urban white children were more unlike urban African-American children than rural white children were unlike rural African-Americans. The only similarity between ambulatory care and prescription drug use was that urban African-American children had the lowest demand for services, both in number of services received and expenditures.



There was no interaction between race and rurality for probability of using emergency room or inpatient hospital services. For these services, rural children were no different than urban children, but African-American children had a lower demand than white children in both Year 1 and Year 2 (See Table A-7).

In summary, race and rurality play a role in demand for health care services, although the effect is not consistent across services. The only consistency across services and measures of demand was that urban African-American children received fewer services and had lower expenditures for services than any other group.

III. West Virginia

Overview of Study Methods

Design of Study

The study examines utilization in the West Virginia CHIP program among children ages 6 through 12 (1,462 children) during the 22 month period, October 2000 through July 2002. Children were sorted into two groups:

[1] Uninsured-CHIP: previously uninsured children, insured for at least the first 12 months (Year 1) between October 2000 and July 2002 (n=510).

[2] Continuous CHIP: previously insured children, insured for at least the first 12 months (Year 1) between October 2000 and July 2002. These were children who were enrolled in CHIP in October 1999 and remained covered through at least September 2001 (n=952).

Dependent Measures

The first dependent measure, paralleling the South Carolina analysis, is child's monthly expenditure totals for ambulatory care, inpatient hospital stays, emergency room visits, and prescription drugs during the 22 month period, or for the period in which the child was insured (See detailed method discussion in Appendix A).

The groups differed in the pattern of disenrollment. Most disenrollment among newly insured children occurred in the first month of Year 2, October 2001, while most of the continuously enrolled children disenrolled in the latter part of Year 2 (between months 18 and 22). The overall drop-out rate was higher among the previously uninsured children (Group 1) with 55.8 percent disenrolled by the end of Year 2, compared to 38.9 percent among the continuously insured (See Table 10). Urban children and children without a chronic condition were slightly more likely to disenroll. Sex was unrelated to disenrollment.

Independent Measures

Group membership and rurality of child's residence are the primary independent variables. The models also control for child's age, sex, and chronic health condition status (See Appendix A for details).

Analysis

The analysis has two parts. First, we graphed the mean number of services per child and the mean expenditure per child by month for each insurance group, adjusted for chronic condition, race, and rurality. This analysis visualizes the pattern of utilization over the 22 month study period, including seasonal fluctuations. Second, we regressed annual number of services per child and annual expenditure per child for Year 1 and Year 2 on insurance group, adjusting for presence of a chronic condition, diagnosis of cancer, and rural or urban residence. For Year 2, we also included number of months in the CHIP program to account for disenrollment during the second year. A variable indicating whether the child had a co-payment (about ... percent of children) was included in the models. Group 2, comprised of the continuously insured children,

was the comparison group. This two-part analysis was repeated for ambulatory care and prescription drug use. The analysis for annual inpatient hospital and emergency room utilization used logistic regression to predict the probability of using the emergency room or inpatient hospital services in Year 1 and Year 2 by each insurance group (1=at least one visit, 0=no visit). These models adjusted for all factors in the ambulatory care and prescription drug models.

Results

Demographic Characteristics and Health Status of Children

Among 6 to 12 year old children, the groups had similar age distributions, with the mean age of 8.8 in Group 1, Uninsured-CHIP and 9.2 in Group 2, Continuous CHIP. The children in each group were about 48 percent male. The majority of children in each group lived in rural areas. Although about 67 percent of children in Group 1 resided in rural areas compared to 74 percent in Group 2 (See Table A-11), the groups were not statistically different.

Overall, previously uninsured children were less likely to have a chronic condition (See Table A-12). This is consistent with previous findings about CHIP-eligible children (Byck 2000). However, when examined by sex, boys had a similar rate while previously insured girls had a much higher chronic condition rate than newly insured girls.

Within each insurance group, the most frequent chronic health problems were psychosocial health conditions, followed by asthma, congenital anomalies, nervous system disorders, and diabetes (See Table A-13). The newly insured children were less likely to have asthma and diabetes. Otherwise, they were not statistically different with regard to their rate of specific chronic conditions.

Newly insured West Virginia CHIP recipients had more chronic conditions than newly insured CHIP recipients in South Carolina and fewer than continuously insured CHIP children. Both groups of children in West Virginia were more likely to reside in a rural county than children in South Carolina. The West Virginia groups also had a lower proportion of males than the South Carolina CHIP groups. West Virginia CHIP recipients were like those in South Carolina in that the groups had about the same mean age and the order of chronic diseases was the same, with psychosocial conditions being by far the most prevalent and diabetes the least prevalent.

Patterns of Medical Care Utilization

[1] Do previously uninsured children differ from continuously insured children in their demand for medical care?

We examined both the form and the magnitude differences between previously uninsured and continuously insured children for expenditures and number of visits over the 22 month period, including ambulatory care, prescription drug use, inpatient hospital stays, and emergency room visits. The results of the analysis support the *no difference hypothesis*, whereby newly insured children have the same pattern of demand as children who were continuously insured during the previous year.

In West Virginia, newly insured children have the same level of demand as continuously enrolled children.

The utilization pattern or form for number of services and for expenditures is less distinct than in the South Carolina study, perhaps because of the smaller number of children in the West

Virginia study. The seasonal variation is not apparent. Also, there is no consistent pattern among the newly insured, compared to the continuously insured children. While in some months, newly insured children have higher expenditures or number of services, in others it is the continuously insured children who are higher, and there is no consistency to the pattern. Although visually, there are greater differences between newly insured and continuously insured children among those with chronic health conditions. These findings are illustrated in Figures 5-8, for number of ambulatory health care services received over the 22 month period.

Tables A-14 (Ambulatory Care), A-15 (Prescription Drugs), and A-16 (Emergency Room and Inpatient Hospital) contain the regression results for this analysis. They confirm the descriptive findings illustrated in Figures B5-B8 that, overall, newly insured children did not receive more health care services nor have higher expenditures than continuously insured children in the CHIP program. There was only one case out of twelve in which the groups differed significantly. In Year 2, ambulatory expenditures for the newly insured were higher than for the continuously insured (See Table A-14). In all other cases, there was no difference between the groups (See Tables A-15 and A-16).

In summary, the *no difference hypothesis* is supported by the analysis for West Virginia. Previously uninsured children, adjusting for rurality and presence of a chronic health condition, indicated the same demand for ambulatory care, prescription drug, inpatient hospital, and emergency room services as continuously insured children throughout the 22 month period, beginning with their enrollment in CHIP in October 2000.

[2] & [3] Do urban and rural children have different demand profiles, suggesting a partial explanation for the discrepancy between the Mississippi and Pennsylvania studies (Tilford et al., 1999; Lin and Lave, 1998)?

This research found no difference in the demand profiles between rural and urban children that would explain the discrepancy between previous studies of newly insured children. The results from all groups supported the *no difference hypothesis*.

However, the study did provide some support for differences between rural and urban children in demand for health care services. In Year 1, number of prescriptions received and probability of having an emergency room or inpatient hospital visit were higher among rural children. In Year 2, these differences were absent. Also, in Years 1 and 2, number of ambulatory services received by rural children was higher than for urban children, although expenditures were no different. It should also be noted that in all but one case, the regression coefficients are positive. These findings of higher utilization and expenditures by rural children, though not consistent over all services and years, provide some support for a difference between urban and rural children in their demand for medical care.

In West Virginia, rural children tended to receive more services.

IV. Conclusions and Recommendations

Cost Projections for Newly Insured Children

The study provides guidance for the projection of medical care costs and utilization among previously uninsured, low income children. With regard to the demand for medical services by newly insured children, compared to their continuously insured counterparts, we found no evidence in either South Carolina or West Virginia that newly insured children have a greater demand for services, immediately or over the long-term. At the beginning of their enrollment period, newly insured children in the CHIP and Medicaid programs had a demand for medical care that was less than (South Carolina) or the same as (West Virginia) that of continuously insured children, controlling for age, sex, presence of chronic conditions, rurality, and, in South Carolina, race. Over the course of the nearly two year enrollment period, demand was the same (West Virginia) or increasingly similar (South Carolina).

Thus, the contradictory findings of other studies regarding pent-up demand for services by previously uninsured children do not appear to be explained by rurality or race. Since the one previous study that found no pent-up demand was in the rural South, among mostly African-American children, we had originally hypothesized that rurality might constrain supply of medical services and, therefore, children living in rural areas would not be able to display pent-up demand for medical services. Further, African-American children might have lower utilization rates. However, in neither state did newly insured rural children or, in South Carolina, African-American children demonstrate a different initial demand for services than their urban and white counterparts – adjusting for presence of chronic conditions, age, and sex. There may, however, be a regional impact on this form of initial demand, since the studies that found pent-up demand were in the North and West (Lin and Lave 1998; Bograd et al. 1997), while the studies that found no pent-up demand were in the South or near South (this study; Tilford et al. 1999).

Nevertheless, the study does suggest that the race and rurality of children should be considered in projecting the cost of child medical care, since both factors affected number of services received and expenditures among newly insured and continuously insured children.

Race, Rurality, and Demand for Medical Care by Low-Income Children

Regardless of prior insurance status, the demand for medical care was affected by children's race and rurality. However, the effect of these factors was inconsistent across medical services and across states. In West Virginia, rurality did not influence demand for services consistently, but when it did, the effect was to increase service utilization. In South Carolina, where we were able to examine the effects of both race and rurality, their impact was variable.

For ambulatory care, rural African-American children used more services and had higher expenditures than any other group, and urban African-Americans used the fewest services and had the lowest expenditures, on average. For prescription drug usage, white children used more services than African-American children, on average, but the difference between white and African-American children was greater in urban than in rural South Carolina. The most constant finding about race and rurality in South Carolina was that urban African-American children used fewer services and had lower expenditures than any other group. Because of the persistence of rural and racial effects on medical care demand and because these findings are not explained by possible differential reimbursement policies based on rurality, they warrant further investigation

regarding the cause of the disparity in utilization.

Policy Recommendations

- The results have funding implications for programs intended to extend health coverage to uninsured children. They suggest that funding projections for previously uninsured children, six to twelve years old:

  (1) need not include a large initial expenditure for pent-up demand;

  (2) should not be expected to be higher over the long-term than expenditures for continuously insured children; and

  (3) may be expected to be lower than expenditures for continuously insured Medicaid recipients because previously uninsured children appear to be less likely to have chronic health conditions than children covered by Medicaid for a substantial length of time (this study; Byck 2000).

- Cost projection models should include race and rurality since these factors consistently influenced utilization. At present, the effects must be state- and service-specific, since their impact was not consistent across states and services.

- Because of the persistence of rural and racial effects on medical care demand and because these findings are not explained by possible differential reimbursement policies based on rurality, further investigation is warranted regarding the cause of the disparity in utilization by children in rural and urban areas and children of different races.

References

Bograd, Harvey, Debra P. Ritzwoller, Ned Calonge, Karen Shields, and Maureen Hanrahan. Extending health maintenance organization insurance to the uninsured. *JAMA*, 277:13 (April 2, 1997), 1067-1072.

Byck, Gayle R. A comparison of the socioeconomic and health status characteristics of uninsured, State Children's Health Insurance Program-eligible children in the United States with those of other groups of insured children: Implications for policy. *Pediatrics*.1 (July 2000, 106), 14-21.

Clinical Classifications Software (CCS) Summary and download Summary and Downloading Information. December 4, 2000. Agency for Health Care Policy and Research, Rockville, MD. Http://www.ahrq.gov/data/ccs.htm.

Halfon, Neal, Paul W. Newacheck, David L. Wood, and Robert F. St. Peter. Routine emergency department use for sick care by children in the United States. *Pediatrics*. 98:1 (July 1996), 28-34.

Lave, Judith R., Christopher R. Keane, Chyongchiou J. Lin, Edmund M. Ricci, Gabriele Amersbach, and Charles P. LaVallee. Impact of a children's health insurance program on newly enrolled children. *JAMA*. 279:22 (June 10, 1998), 1820-1825.

Lin, Chyongchiou J. and Judith R. Lave. Duration in pattern of utilization under children's health insurance programs. *Health Care Financing Review*. 19:4 (Summer 1998), 101-116.

Long, Stephen H. and Marquis, M. Susan. Geographic variation in physician visits for uninsured children: The role of the safety net. *JAMA*. 281:21 (June 2, 1999), 2035-2040.

Tilford, John M., James M. Robbins, Sarah J. Shema, and Frank L. Farmer. Response to health insurance by previously uninsured rural children. *Health Services Research*. 34:3 (August 1999), 761-775.

Appendix A

Detailed Method and Tables

South Carolina

Methods

Source of Data

We conducted a retrospective study based on claims data. These data were provided by the South Carolina Department of Health and Human Services (DHHS), the state agency that administers CHIP, Medicaid, and all other public health insurance programs for children. All claims data for all children, 0-18 years old, enrolled in one of these programs were obtained for fiscal years (FY) 1997 through 1999. The services covered included ambulatory care, emergency room, short-stay inpatient hospital, and prescription drugs. Excluded from this project were children receiving TANF-related coverage, SSI, and coverage only for pregnancy and childbirth. We studied only children 6 through 12 years old because this was the only age group with a sufficient number of children in each insurance group.

Design of Study

The study examines utilization in the South Carolina CHIP and Medicaid programs during the period FY1998 (Year 1) and FY1999 (Year 2). Four groups were constructed. The first two groups consists of children who had not been enrolled in one of the public programs in South Carolina in the year prior to the study, and these children were assumed to be previously uninsured. Although this assumption is not perfect, it is reasonable, particularly for children enrolling in CHIP, given the legislation's effort to prevent crowd-out. One of the previously uninsured groups include children who entered CHIP; the other is made up of children who enrolled in Medicaid.

The second two groups consist of children who were continuously insured by Medicaid in FY1997. The data from FY1997 were used to identify children who had been continuously insured prior to the study period. The first of these two groups is made up of children who remained in the Medicaid program. The second group contains children who were enrolled in CHIP during the study period. The four groups are:

[1] Uninsured-CHIP: Previously uninsured children, insured for at least 11 months in FY1998 by CHIP. These are all children who entered the CHIP program during the first month of enrollment in South Carolina - August 1997 - and remained in CHIP for at least the remainder of the 1998 fiscal year (n=2,276).

[2] Uninsured-Medicaid: Previously uninsured children, insured for at least 11 months in FY1998 by Medicaid. These are all children who enrolled in Medicaid in August 1997 and remained covered for the remainder of the 1998 fiscal year in the Medicaid program (n=3,509).

[3] Continuous Medicaid: Children insured for 12 months in FY1997 by Medicaid and were insured for all of FY 1998 in the Medicaid program (n=18,519).

[4] Medicaid-CHIP: Children insured for 12 months in FY1997 by Medicaid and insured for at least 11 months in FY1998 by CHIP (n=956).

We used two previously uninsured groups and two continuously insured groups in order control for differences between Medicaid and CHIP-eligible children. Byck (2000) found that CHIP-eligible children were proportionately older, less minority, and more suburban and rural than children receiving Medicaid. CHIP-eligible children were also more likely to live in two-parent families and have a college-educated adult in the household. They also tended to be in better health and have fewer chronic health conditions and activity limitations compared to Medicaid children. By having four groups in our study, we are able to examine whether there was greater similarity between groups based on insurance type (Medicaid versus CHIP - Groups 1 & 4; Groups 2 & 3) or groups based on previous health insurance status (Newly insured versus continuously insured - Groups 1 & 2; Groups 3 & 4).

Dependent Measures

The first dependent measure for the study is child's monthly expenditure totals for ambulatory care, inpatient hospital stays, emergency room visits, and prescription drugs during the 23 month period, or for the period in which the child was insured (at least Year 1). The second dependent measure is number of health care services received per month. For prescription drugs, the second dependent measure is number of prescriptions per month. For inpatient hospital and emergency room services, the second dependent variable is number of visits. For ambulatory health care, the second dependent variable is number of services received including those performed in a physician office, clinic, or home, ambulatory surgery procedures, laboratory tests, and ambulance and equipment services. We used monthly utilization, rather than annual or quarterly utilization, so that seasonable fluctuations in medical care use would not obscure differences in utilization patterns. If a child received no services, that month was coded "0", unless the child had disenrolled from the program. In this case, the measure was coded "missing".

Most children had a 23 month history in the program. Approximately 180 children per month lost coverage in Year 2, so that by June 1999, 23,039 children of the original 25,260 remained in the study (91.2%). The drop-out rate was higher among the previously uninsured children (Groups 1 & 2). However, the groups were still sufficiently large for the analysis (See Table 1). Whites, urban children, and children without a chronic condition were slightly more likely to disenroll. Sex was unrelated to disenrollment. There was little switching of programs in Year 2. Less than 5 percent of children enrolled in CHIP in Year 1 were enrolled in another program in Year 2. About 5 percent of children in Medicaid in Year 1 were enrolled in CHIP in Year 2.

Independent Measures

Group membership, rurality of child's residence, and child's race are the primary independent variables. However, the models also include child's age, sex, and chronic health condition status. Age was calculated at the first day of the study period, July 1,

1997. Rurality was coded using the U.S. Census Bureau's classification whereby urban counties are those with a town of 50,000 people or more and rural counties have no town greater than 49,999 persons. We used the 1990 classification of South Carolina counties which designated 16 counties as urban and 30 as rural. Race was coded 1=non-Hispanic white and 0=African-American children. African-American children comprise 98.1 percent of the non-white child population in the DHHS programs.

We classified children with a chronic health problem using the 1999 Clinical Classifications Software (CCS) that is based on ICD-9-CM codes and was updated for the study period - August 1996 through June 1999. Children with the following chronic health problems were identified: (1) asthma; (2) diabetes; (3) congenital anomalies; (4) psychosocial health conditions including mental retardation, substance abuse problems, organic disorders, affective disorders, schizophrenia, anxiety, and preadult disorders; (5) nervous system conditions including Parkinson's disease, multiple sclerosis, epilepsy, and paralysis; and (6) other chronic conditions including cystic fibrosis, sickle cell anemia, and HIV. In order to classify children by chronic disease status, we reviewed the primary and secondary diagnoses for all ambulatory, short-term hospital, and emergency room services for Year 1. A child with at least one primary diagnosis in Year 1 for any of the conditions in any of these settings is considered to have a chronic health condition (coded 1=has chronic health condition, 0=does not).

Analysis

The analysis has two parts. First, we graphed the mean number of services per child and the mean expenditure per child by month for each insurance group, adjusted for chronic condition, race, and rurality. This analysis visualizes the pattern of utilization over the 23 month study period, including seasonal fluctuations. Second, we regressed annual number of services per child and annual expenditure per child for Year 1 and Year 2 on insurance group, adjusting for presence of a chronic condition, diagnosis of cancer, rural or urban residence, and race of child. We included an interaction term for race and rurality in the models. For Year 2, we also included number of months in the CHIP or Medicaid programs to account for disenrollment during the second year. Group 3, comprised of the continuously insured children with Medicaid in FY 1997-1999, was the comparison group. This two-part analysis was repeated for ambulatory care and prescription drug use. The analysis for annual inpatient hospital and emergency room utilization used logistic regression to predict the probability of using the emergency room or inpatient hospital services in Year 1 and Year 2 by each insurance group (1=at least one visit, 0=no visit). These models adjusted for all factors in the ambulatory care and prescription drug models.

Table A-1.
Year 2 CHIP Drop-out Rate Among 6-12 Year Old CHIP and Medicaid Recipients by Month and Group
South Carolina, FY 1999

Month	Group 1 Disenrollment		Group 2 Disenrollment		Group 3 Disenrollment		Group 4 Disenrollment	
	%	#	%	#	%	#	%	#
July 1998	.2	5	.9	32	.7	123	.3	3
December 1998*	12.6	287	11.4	399	3.0	565	4.3	41
June 1999**	5.6	127	2.9	101	2.7	493	4.7	45
Total disenrolled in June 1999	18.4	419	15.2	532	6.4	1,181	9.3	89
Total remaining in June 1999	81.6	1,857	84.8	2,977	93.6	17,338	90.7	867

Source: South Carolina Medicaid and CHIP eligibility data
Note:
Group 1 = Uninsured in FY97, insured by CHIP in FY98-99
Group 2 = Uninsured in FY97, insured by Medicaid in FY98-99
Group 3 = Insured Continuously by Medicaid, FY97-99
Group 4 = Insured by Medicaid in FY97, insured by CHIP in FY98-99
* Percent of original number in group that had disenrolled since July 1998.
** Percent of original number in group that had disenrolled since December 1998.

Table A-2.
Demographic Characteristics Among 6-12 Year Old CHIP and Medicaid Recipients by Insurance Group
South Carolina, FY 1998

Demographic Characteristic	Group 1	Group 2	Group 3	Group 4
	%	%	%	%
Age (mean)	8.9	8.8	8.7	7.9
Male+	50.0	50.5	49.8	50.9
African-American+	52.6	60.6	66.1	54.2
Rural+	39.8	39.2	42.4	32.6

Source: South Carolina Medicaid and CHIP eligibility data
Note:
Group 1 = Uninsured in FY97, insured by CHIP in FY98-99
Group 2 = Uninsured in FY97, insured by Medicaid in FY98-99
Group 3 = Insured Continuously by Medicaid, FY97-99
Group 4 = Insured by Medicaid in FY97, insured by CHIP in FY98-99
+ Groups statistically different at $p < .001$ using the Chi Square

Table A-3.
Presence of Chronic Health Condition Among 6-12 Year Old CHIP and Medicaid Recipients by Insurance Group, Sex, and Race
South Carolina, FY 1998

Has Chronic Health Condition	Group 1	Group 2	Group 3	Group 4
	%	%	%	%
Overall+	**18.4**	**19.8**	**39.1**	**36.7**
White Male+	30.0	28.9	55.0	51.3
African-American Male+	18.0	22.4	43.3	41.2
White Female+	15.2	19.0	38.6	31.1
African-American Female+	10.9	11.8	27.3	24.0

Source: South Carolina Medicaid and CHIP claims data
Note:
Group 1 = Uninsured in FY97, insured by CHIP in FY98-99
Group 2 = Uninsured in FY97, insured by Medicaid in FY98-99
Group 3 = Insured Continuously by Medicaid, FY97-99
Group 4 = Insured by Medicaid in FY97, insured by CHIP in FY98-99
+ Groups statistically different at $p < .001$ using the Chi Square

Table 4.
Presence of Specific Chronic Health Conditions Among 6-12 Year Old CHIP and Medicaid Recipients by Insurance Group
South Carolina, FY 1998

Chronic Health Condition	Group 1*	Group 2*	Group 3*	Group 4*
	%	%	%	%
Psychosocial+	13.2	14.8	30.5	27.6
Asthma+	4.5	4.2	9.0	9.3
Congenital Anomalies+	1.3	1.2	2.8	3.7
Nervous System Disorders+	.5	.9	1.8	1.3
Diabetes+	.2	.3	.5	.3
Other	.2	.3	.4	.5

Source: South Carolina Medicaid and CHIP claims data
Note:
Group 1 = Uninsured in FY97, insured by CHIP in FY98-99
Group 2 = Uninsured in FY97, insured by Medicaid in FY98-99
Group 3 = Insured Continuously by Medicaid, FY97-99
Group 4 = Insured by Medicaid in FY97, insured by CHIP in FY98-99
+ Groups statistically different at $p < .001$ using the Chi Square
* Columns do not add to the total percent of children with chronic conditions in each insurance group because a few children have more than one condition.

Table 5.
Least Squares Regression Results for Annual Ambulatory Care Expenditure per Child and Annual Number of Ambulatory Care Services per Child, South Carolina, Fiscal Years 1998 and 1999

Variable	FY 1998 Expenditures*,[1,2]	FY 1999 Expenditures*,[1,2]	FY 1998 Number of Services*,[1,2]	FY 1999 Number of Services*,[1,2]
Control Factors				
Age (in years)	50.4 (5.5)	77.6 (7.1)	0.4 (.05)	0.7 (.06)
Female	-18.8 (22.1)	-20.7 (28.3)	0.6 (.21)	0.9 (.25)
Asthma	103.0 (40.4)	80.2 (51.7)	5.7 (.39)	4.9 (.46)
Diabetes	456.6 (159.2)	855.2 (202.7)	14.6 (1.53)	13.5 (1.82)
Nervous System Disorders	1179.5 (90.1)	1116.8 (115.0)	10.9 (.86)	11.2 (1.03)
Psychosocial Conditions	850.6 (25.6)	859.6 (32.7)	15.5 (.25)	13.0 (.29)
Congenital Anomalies	289.9 (70.7)	239.5 (90.3)	5.0 (.68)	3.4 (.81)
Cancer	136.5 (96.5)	31.6 (123.4)	2.8 (.93)	0.9 (1.11)
Other Chronic Conditions	695.6 (171.7)	813.1 (219.8)	10.1 (1.65)	11.8 (1.97)
Months Disenrolled in Year 2	0	-44.8 (6.6)	0	-1.1 (.06)
Race and Rurality				
Rural	-178.7 (38.0)	-184.3 (48.6)	-0.6 (.37)	-0.5 (.44)
African-American	-148.5 (29.2)	-196.5 (37.3)	-2.1 (.28)	-2.0 (.33)
Interaction (Race X Rurality)	222.3 (46.9)	273.8 (59.9)	3.1 (.45)	4.0 (.54)
Insurance Group**				
Previously Uninsured, CHIP (G1)	-94.0 (38.9)	-127.7 (49.9)	-2.7 (.37)	-2.1 (.45)
Previously Uninsured, Medicaid G(2)	-59.3 (32.3)	-66.7 (41.6)	-2.5 (.31)	-2.3 (.37)
Continuously Insured, CHIP (G4)	-15.3 (57.6)	13.1 (73.5)	-0.4 (.55)	-0.2 (.66)
Intercept	-144.9 (55.6)	-244.7 (71.2)	3.0 (.53)	3.1 (.64)
Adjusted R Square	0.06	0.05	0.18	0.12
df (F)	15 (115.0)	16 (78.9)	15 (378.9)	16 (217.9)
Number of Cases	25260	25097	25260	25097

Source: South Carolina Medicaid and CHIP claims data

Notes:

* Unstandardized coefficient and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in Medicaid in FY 1997-99 (Group 3)

[1] Bold coefficients are significant, .05 level, 2-tailed test.

[2] Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Table 6.
Least Squares Regression Results for Annual Prescription Drug Expenditure per Child and Annual Number of Prescriptions per Child, South Carolina, Fiscal Years 1998 and 1999

Variable	FY 1998 Expenditure*,1,2	FY 1999 Expenditure*,1,2	FY 1998 Number of Scripts*,1,2	FY 1999 Number of Scripts*,1,2
Control Factors				
Age (in years)	2.2 (1.1)	1.7 (1.5)	-00 (.01)	0.0 (.02)
Female	-5.1 (4.4)	-9.0 (6.0)	-.2 (.05)	-0.1 (.08)
Asthma	196.6 (8.1)	237.2 (11.0)	5.1 (.10)	5.8 (.14)
Diabetes	337.0 (31.7)	385.2 (43.1)	6.4 (.39)	9.0 (.55)
Nervous System Disorders	218.4 (17.9)	287.8 (24.4)	4.3 (.22)	4.9 (.31)
Psychosocial Conditions	97.6 (5.1)	119.2 (7.0)	2.8 (.06)	3.2 (.09)
Congenital Anomalies	35.4 (14.1)	23.0 (19.2)	1.3 (.17)	0.7 (.24)
Cancer	112.1 (19.2)	198.5 (26.2)	1.0 (.23)	0.6 (.33)
Other Chronic Conditions	915.4 (34.2)	923.1 (46.7)	4.4 (.42)	6.7 (.59)
Months Disenrolled in Year 2	0	-13.1 (1.4)	0	0
Race and Rurality				
Rural	-17.7 (7.6)	-26.8 (10.3)	0.2 (.09)	-0.0 (.13)
African-American	-74.7 (5.8)	-111.9 (7.9)	-2.1 (.07)	-3.0 (.10)
Interaction (Race X Rurality)	28.9 (9.3)	50.9 (12.7)	0.2 (.11)	0.6 (.16)
Insurance Group**				
Previously Uninsured, CHIP (G1)	-16.1 (7.6)	9.2 (10.6)	-0.4 (.09)	0.4 (.14)
Previously Uninsured, Medicaid G(2)	-22.3 (6.4)	-7.1 (8.8)	-0.6 (.08)	-0.1 (.11)
Continuously Insured, CHIP (G4)	-2.9 (11.5)	11.6 (15.6)	0.0 (.14)	0.2 (.20)
Intercept	87.9 (11.1)	141.0 (15.1)	3.8 (.14)	4.5 (.20)
Adjusted R Square	0.09	0.07	0.25	0.2
df (F)	15 (168.45)	16 (126.3)	15 (561.9)	16 (393.2)
Number of Cases	25260	250967	25260	25097

Source: South Carolina Medicaid and CHIP claims data

Notes:

* Unstandardized coefficient and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in Medicaid in FY 1997-99 (Group 3)

[1] Bold coefficients are significant, .05 level, 2-tailed test.
[2] Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Table 7.
Logistic Regression Results for Probability of Child Having an Emergency Room or Inpatient Hospital Visit,
South Carolina, Fiscal Years 1998 and 1999

Variable	FY 1998 Emergency Room Visits*,1,2	FY 1999 Emergency Room Visits*,1,2	FY 1998 Inpatient Hospital Visits*,1,2	FY 1999 Inpatient Hospital Visits*,1,2
Control Factors				
Age (in years)	0.97 (.01)	0.99 (.01)	1.01 (.02)	1.10 (.02)
Female	0.95 (.04)	0.97 (.04)	0.84 (.10)	1.08 (.10)
Asthma	2.18 (.06)	1.77 (.06)	4.63 (.11)	2.47 (.13)
Diabetes	1.51 (.23)	0.82 (.29)	7.37 (.28)	4.84 (.31)
Nervous System Disorders	1.54 (.13)	1.36 (.13)	4.74 (.18)	1.72 (.25)
Psychosocial Conditions	1.35 (.04)	1.33 (.04)	2.30 (.10)	2.28 (.10)
Congenital Anomalies	1.54 (.10)	1.01 (.12)	3.16 (.17)	2.21 (.20)
Cancer	1.23 (.15)	1.35 (.15)	2.57 (.25)	1.58 (.29)
Other Chronic Conditions	1.84 (.24)	1.44 (.26)	11.71 (.29)	8.81 (.30)
Months Disenrolled in Year 2	0	.81 (.02)	0	.82 (.05)
Race and Rurality+				
Rural	0.97 (.04)	0.64 (.04)	0.98 (.10)	1.10 (.10)
African-American	0.73 (.04)	0.90 (.04)	0.73 (.10)	0.61 (.10)
Insurance Group**				
Previously Uninsured, CHIP (G1)	0.72 (.07)	0.93 (.07)	1.38 (.17)	1.24 (.18)
Previously Uninsured, Medicaid G(2)	.83 (.06)	.89 (.06)	1.44 (.14)	1.23 (.15)
Continuously Insured, CHIP (G4)	0.83 (.10)	0.84 (.10)	0.57 (.32)	1.34 (.22)
Intercept	0.22 (.09)	0.21 (.09)	0.01 (.24)	0.01 (.25)
df (Hosmer-Lemeshow Chi Square)	8 (4.97)	8 (12.6)	8 (22.0)	8 (8.75)
df (Model Chi Square)	14 (458.3)	15 (325.7)	14 (505.2)	15 (272.6)
Number of Cases	25260	25097	25260	25097

Source: South Carolina Medicaid and CHIP claims data

Notes: * Exp(B) and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in Medicaid in FY 1997-99 (Group 3)

1 Bold coefficients are significant, .05 level, 2-tailed test.

2 Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Table 8.
Mean Annual Number of Ambulatory Care Services per Child and Mean Ambulatory Care Expenditure per Child by Insurance Group, Race, and Rurality, Adjusted for Covariates
South Carolina, Fiscal Years 1998-1999

	Group 1	Group 2	Group 3	Group 4
Mean Annual Number of Services*				
Rural African-Americans[1]	9.8	10.0	12.5	12.1
Rural Whites[3]	8.8	9.0	11.5	11.1
Urban African-Americans[4]	7.3	7.5	10.0	9.6
Urban Whites[2]	9.4	9.6	12.0	11.7
Mean Annual Expenditure*				
Rural African-Americans[1]	$707	$742	$801	$786
Rural Whites[2]	$634	$668	$728	$712
Urban African-Americans[4]	$306	$341	$400	$385
Urban Whites[3]	$455	$490	$549	$534

Source: South Carolina Medicaid and CHIP claims data
Notes:
* Equations solved at the mean level of all other variables in the model (See Table 5)
[1] Highest; [2] Second highest; [3] Third highest; [4] Lowest

Table 9.
Mean Annual Number of Prescriptions per Child and Mean Prescription Drug Expenditure per Child by Insurance Group, Race, and Rurality, Adjusted for Covariates
South Carolina, Fiscal Years 1998-1999

	Group 1	Group 2	Group 3	Group 4
Mean Annual Number of Prescriptions*				
Rural African-Americans[3]	2.6	2.4	3.0	3.0
Rural Whites[1]	4.5	4.3	4.9	4.9
Urban African-Americans[4]	2.2	2.0	2.6	2.6
Urban Whites[2]	4.3	4.1	4.7	4.7
Mean Annual Expenditure*				
Rural African-Americans[3]	$77	$71	$93	$91
Rural Whites[2]	$123	$117	$139	$136
Urban African-Americans[4]	$66	$60	$82	$79
Urban Whites[1]	$141	$135	$157	$154

Source: South Carolina Medicaid and CHIP claims data
Notes:
* Equations solved at the mean level of all other variables in the model (See Table 6)
[1] Highest; [2] Second highest; [3] Third highest; [4] Lowest

West Virginia

Methods

Source of Data

The West Virginia analysis, like that done for South Carolina, was a retrospective study based on claims data. These data were provided by the West Virginia Children's Health Insurance Program (CHIP). All claims data for all children, 0-18 years old, enrolled in one of these programs were obtained for the period October 1999 through July 2002. The services covered included ambulatory care, emergency room visits, short-stay inpatient hospital stays, and prescription drugs. We studied only children 6 through 12 years old in order to match the South Carolina study. However, as in South Carolina, this age group was also the largest. Of the 3,021 children, 0-18 years old, who met the study criteria, 1,462 were 6-12 (48 percent) and 866 were 13-18 (28.7 percent).

Design of Study

The study examines utilization in the West Virginia CHIP program during the 22 month period, October 2000 through July 2002. Two groups were constructed. The first consists of children who had not been enrolled in CHIP in the year prior to the study, and these children were assumed to be previously uninsured. Although this assumption is not perfect, it is reasonable, particularly for children enrolling in CHIP, given the legislation's effort to prevent crowd-out. The second group consists of children who were continuously insured in CHIP from October 1999 through September 2000. Both groups were enrolled for at least the first 12 months of the study period (Year 1). During Year 2, children began to drop-out. Thus, the two groups are:

[1] Previously uninsured children, insured for at least the first 12 months (Year 1) between October 2000 and July 2002 (n=510).

[2] Previously insured children, insured for at least the first 12 months (Year 1) between October 2000 and July 2002. These were children who were enrolled in CHIP in October 1999 and remained covered through at least September 2001 (n=952).

Dependent Measures

The first dependent measure for the study is child's monthly expenditure totals for ambulatory care, inpatient hospital stays, emergency room visits, and prescription drugs during the 22 month period, or for the period in which the child was insured (at least Year 1). The second dependent measure is number of health care services received per month. For prescription drugs, the second dependent measure is number of prescriptions per month. For inpatient hospital and emergency room services, the second dependent variable is number of visits. For ambulatory health care, the second dependent variable is number of services received including those performed in a physician office, clinic, or home, ambulatory surgery procedures, laboratory tests, and ambulance and equipment services. We used monthly utilization, rather than annual or quarterly utilization, so that seasonable fluctuations in medical care use would not obscure differences in utilization

patterns. If a child received no services, that month was coded "0", unless the child had disenrolled from the program. In this case, the measure was coded "missing".

The groups differed in the pattern of disenrollment. Most disenrollment among newly insured children occurred in the first month of Year 2, October 2001, while most of the continuously enrolled children disenrolled in the latter part of Year 2 (between months 18 and 22). The overall drop-out rate was higher among the previously uninsured children (Group 1) with 55.8 percent disenrolled by the end of Year 2, compared to 38.9 percent among the continuously insured (See Table 10). Urban children and children without a chronic condition were slightly more likely to disenroll. Sex was unrelated to disenrollment.

Independent Measures

Group membership and rurality of child's residence are the primary independent variables. However, the models also include child's age, sex, and chronic health condition status. Child's age was calculated at the first day of the study period, October 1, 2000. Rurality was coded using the U.S. Census Bureau's classification whereby urban counties are those with a town of 50,000 people or more and rural counties have no town greater than 49,999 persons. We used the 1990 classification of West Virginia counties which designated 12 counties as urban and 43 as rural.

We classified children with a chronic health problem using the 1999 Clinical Classifications Software (CCS) that is based on ICD-9-CM codes and was updated for the study period - August 1996 through June 1999. Children with the following chronic health problems were identified: (1) asthma; (2) diabetes; (3) congenital anomalies; (4) psychosocial health conditions including mental retardation, substance abuse problems, organic disorders, affective disorders, schizophrenia, anxiety, and preadult disorders; (5) nervous system conditions including Parkinson's disease, multiple sclerosis, epilepsy, and paralysis; and (6) other chronic conditions including cystic fibrosis, sickle cell anemia, and HIV. In order to classify children by chronic disease status, we reviewed the primary and secondary diagnoses for all ambulatory, short-term hospital, and emergency room visits for Year 1, October 2000-September 2001. A child with at least one primary diagnosis during this one year period for any of the conditions in any of these settings is considered to have a chronic health condition (coded 1=has chronic health condition, 0=does not). There were no children with "other chronic conditions" in the sample.

Analysis

The analysis has two parts. First, we graphed the mean number of services per child and the mean expenditure per child by month for each insurance group, adjusted for chronic condition, race, and rurality. This analysis visualizes the pattern of utilization over the 22 month study period, including seasonal fluctuations. Second, we regressed annual number of services per child and annual expenditure per child for Year 1 and Year 2 on insurance group, adjusting for presence of a chronic condition, diagnosis of cancer, and rural or urban residence. For Year 2, we also included number of months in the CHIP program to account for disenrollment during the second year. A variable indicating whether the child had a co-payment (about ... percent of children) was included in the models. Group 2, comprised of the continuously insured children, was the comparison group. This two-part analysis was repeated for ambulatory care and

prescription drug use. The analysis for annual inpatient hospital and emergency room utilization used logistic regression to predict the probability of using the emergency room or inpatient hospital services in Year 1 and Year 2 by each insurance group (1=at least one visit, 0=no visit). These models adjusted for all factors in the ambulatory care and prescription drug models.

Table A-10. Year 2 Drop-out Rates Among 6-12 Year Old CHIP Recipients by Month and Group West Virginia, October 2001-July 2002				
Month	**Group 1 Disenrollment**		**Group 2 Disenrollment**	
	%	**#**	**%**	**#**
October 2001	39.8	203	5.4	51
March 2002*	7.8	40	6.8	65
July 2002**	8.2	42	25.9	247
Total disenrolled in July 2002	55.8	285	38.1	363
Total remaining in July 2002	44.2	225	61.9	589

Source: West Virginia CHIP eligibility data
Note:
Group 1 = Newly Insured
Group 2 = Continuously Insured
* Percent of original number in group that had disenrolled since October 2001.
** Percent of original number in group that had disenrolled since March 2002.

Table A-11. Demographic Characteristics Among 6-12 Year Old CHIP Recipients by Insurance Group West Virginia, October 2000		
Demographic Characteristic	**Group 1**	**Group 2**
	%	**%**
Age (mean)	8.8	9.2
Male	48.0	47.5
Rural	76.1	74.1

Source: West Virginia CHIP eligibility data
Note:
Group 1 = Newly Insured
Group 2 = Continuously Insured
No statistical differences between groups, using the Chi Square.

Table A-12.
Presence of Chronic Health Condition Among 6-12 Year Old CHIP Recipients by Insurance Group and Sex
West Virginia, October 2000-September 2001

Has Chronic Health Condition	Group 1	Group 2
	%	%
Overall	**26.1**	**28.3**
Male	22.0	20.6
Female+	29.8	35.2

Source: West Virginia CHIP claims data
Note:
Group 1 = Newly Insured
Group 2 = Continuously Insured
+ Groups statistically different at p <.05 using the Chi Square

Table A-13.
Presence of Specific Chronic Health Conditions Among 6-12 Year Old CHIP Recipients by Insurance GroupWest Virginia, October 2000-September 2001, in percents

Chronic Health Condition	Group 1*	Group 2*
Psychosocial	17.1	17.1
Asthma+	7.8	11.3
Congenital Anomalies	3.1	2.5
Nervous System Disorders	1.2	1.2
Diabetes+	.4	1.5
Other	0	0

Source: West Virginia CHIP claims data
Note:
Group 1 = Newly Insured
Group 2 = Continuously Insured
+ Groups statistically different at p <.05 using the Chi Square
* Columns do not add to the total percent of children with chronic conditions in each insurance group because a few children have more than one condition.

Table 14.
Least Squares Regression Results for Annual Ambulatory Care Expenditure per Child and Annual Number of Ambulatory Care Services per Child, West Virginia, October 2000-July 2002

Variable	Year 1 Expenditures*,[1,2]	Year 2 Expenditures*,[1,2]	Year 1 Number of Services*,[1,2]	Year 2 Number of Services*,[1,2]
Control Factors				
Age (in years)	-41.9 (111.2)	-3.2 (65.5)	0.1 (.18)	0.1 (.15)
Female	190.7 (418.4)	54.6 (243.2)	-1.3 (.66)	-1.1 (.56)
Asthma	207.9 (685.9)	205.8 (382.6)	11.0 (1.10)	7.8 (.89)
Diabetes	816.0 (1983.5)	752.2 (1159.0)	16.8 (3.14)	6.7 (2.68)
Nervous System Disorders	274.3 (19230.0)	343.6 (1022.7)	10.2 (3.05)	9.9 (2.37)
Psychosocial Conditions	1953.5 (560.6)	1177.9 (318.9)	10.8 (.89)	7.9 (.74)
Congenital Anomalies	-246.8 (1267.1)	-130.5 (737.4)	4.3 (2.00)	4.0 (1.71)
Cancer	8762.9 (1311.8)	5199.2 (744.7)	12.8 (2.07)	10.6 (1.72)
Copayment required	-952.0 (1172.7)	-595.4 (703.5)	0.6 (1.86)	0.9 (1.63)
Months Disenrolled in Year 2	0	-52.8 (41.1)	0	-0.5 (.10)
Rurality				
Rural	361.6 (458.2)	165.3 (271.8)	3.2 (.73)	1.8 (.63)
Insurance Group**				
Previously Uninsured, CHIP (G1)	821.2 (449.2)	638.3 (288.0)	1.0 (.71)	0.8 (.67)
Intercept	-79.2 (1120.4)	-73.9 (660.2)	5.7 (1.77)	2.8 (1.53)
Adjusted R Square	0.03	0.05	0.21	0.21
df (F)	11 (5.6)	12 (6.0)	11 (35.7)	12 (28.2)
Number of Cases	1462	1208	1462	1208

Source: West Virginia CHIP claims data

Notes:

* Unstandardized coefficient and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in CHIP October 1999-July 2001(Group 2)

[1] Bold coefficients are significant, .05 level, 2-tailed test.
[2] Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Table 15.
Least Squares Regression Results for Annual Prescription Drug Expenditure per Child and Annual Number of Prescriptions per Child, West Virginia, October 2000-July 2002

Variable	Year 1 Expenditures*,1,2	Year 2 Expenditures*,1,2	Year 1 Number of Services*,1,2	Year 2 Number of Services*,1,2
Control Factors				
Age (in years)	-1.6 (6.2)	2.2 (5.3)	0.1 (.11)	0.1 (.10)
Female	-6.2 (23.4)	-14.7 (19.7)	-0.2 (.42)	-0.4 (.35)
Asthma	556.5 (38.4)	450.6 (31.0)	11.7 (.68)	8.3 (.56)
Diabetes	886.5 (110.9)	577.5 (93.8)	19.6 (1.97)	11.9 (1.68)
Nervous System Disorders	433.7 (108.0)	200.1 (82.8)	8.5 (1.92)	4.5 (1.49)
Psychosocial Conditions	356.7 (31.3)	313.5 (25.8)	7.1 (.56)	5.6 (.46)
Congenital Anomalies	6.6 (70.8)	9.1 (59.7)	1.3 (1.26)	1.56 (1.07)
Cancer	421.6 (73.3)	439.6 (60.3)	6.8 (1.31)	6.5 (1.08)
Copayment Required	-85.4 (65.6)	51.9 (56.9)	.-1.1 (1.17)	.1.9 (1.02)
Months Disenrolled in Year 2	0	-12.0 (3.3)	0	-0.3 (.06)
Rurality				
Rural	23.8 (25.6)	-2.1 (22.0)	0.9 (.46)	0.5 (.39)
Insurance Group**	0	0	0	0
Previously Uninsured, CHIP (G1)	2.8 (25.1)	-25.1 (23.3)	-0.3 (.45)	-0.6 (.42)
Intercept	107.3 (62.6)	92.4 (53.4)	5.7 (1.77)	2.7 (.96)
Adjusted R Square	0.25	0.3	0.31	0.31
df (F)	11 (45.3)	12 (43.2)	11 (60.7)	12 (46.5)
Number of Cases	1462	1208	1462	1208

Source: West Virginia CHIP claims data

Notes:

* Unstandardized coefficient and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in CHIP October 1999-July 2001(Group 2)

[1] Bold coefficients are significant, .05 level, 2-tailed test.

[2] Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Table 16.
Logistic Regression Results for Probability of Child Having an Emergency Room or Inpatient Hospital Visit,
West Virginia, October 2000-July 2002

Variable	Year 1 Emergency Room Visits*,1,2	Year 2 Emergency Room Visits*,1,2	Year 1 Inpatient Hospital Visits*,1,2	Year 2 Inpatient Hospital Visits*,1,2
Control Factors				
Age (in years)	1.02 (.03)	0.99 (.04)	1.02 (.03)	1.00 (.04)
Female	1.05 (.12)	1.02 (.15)	1.04 (.12)	1.01 (.15)
Asthma	1.88 (.18)	2.15 (.21)	1.89 (.18)	2.17 (.20)
Diabetes	3.61 (.52)	2.04 (.62)	3.53 (.52)	1.96 (.62)
Nervous System Disorders	1.87 (.50)	1.90 (.54)	1.84 (.50)	1.85 (.54)
Psychosocial Conditions	1.72 (.15)	1.61 (.18)	1.71 (.15)	1.60 (.18)
Congenital Anomalies	2.46 (.33)	4.62 (.37)	2.49 (.33)	4.72 (.37)
Cancer	1.72 (.35)	2.59 (.38)	--	--
Copayment Required	1.13 (.33)	0.92 (.43)	1.13 (.33)	0.92 (.43)
Months Disenrolled in Year 2	0	0.95 (.03)	0	0.95 (.03)
Rurality				
Rural	1.53 (.14)	1.22 (.17)	1.55 (.14)	1.26 (.17)
Insurance Group**				
Previously Uninsured, CHIP (G1)	0.94 (.13)	0.90 (.18)	0.94 (.13)	0.90 (.18)
Intercept	0.19 (.33)	0.19 (.42)	.18 (.33)	0.19 (.41)
df (Hosmer-Lemeshow Chi Square)	8 (7.11)	8 (7.46)	8 (6.67)	8 (16.2)
df (Model Chi Square)	11 (58.4)	12 (55.9)	10 (56.1)	11 (50.2)
Number of Cases	1462	1208	1462	1208

Source: West Virginia CHIP claims data

Notes:

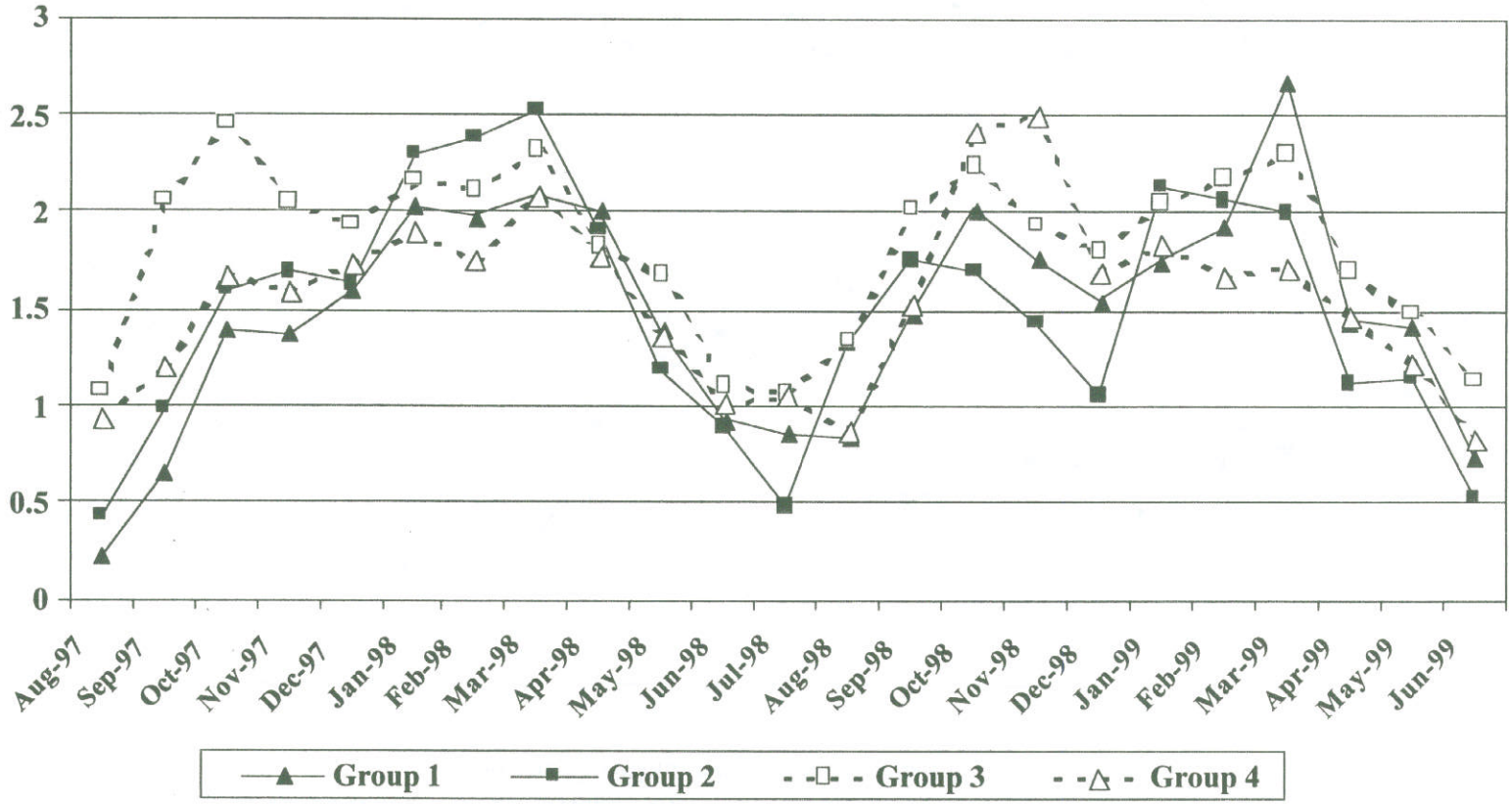
* Exp(B) and standard error (in parentheses)

** Comparison group is continuously insured children enrolled in CHIP October 1999-July 2001(Group 2)

[1] Bold coefficients are significant, .05 level, 2-tailed test.

[2] Bold, underlined coefficients are significant, .01 level, 2-tailed test.

Figure B-1.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Rural Whites with a Chronic Health Condition, South Carolina, Fiscal Year 1998-1999



Key:

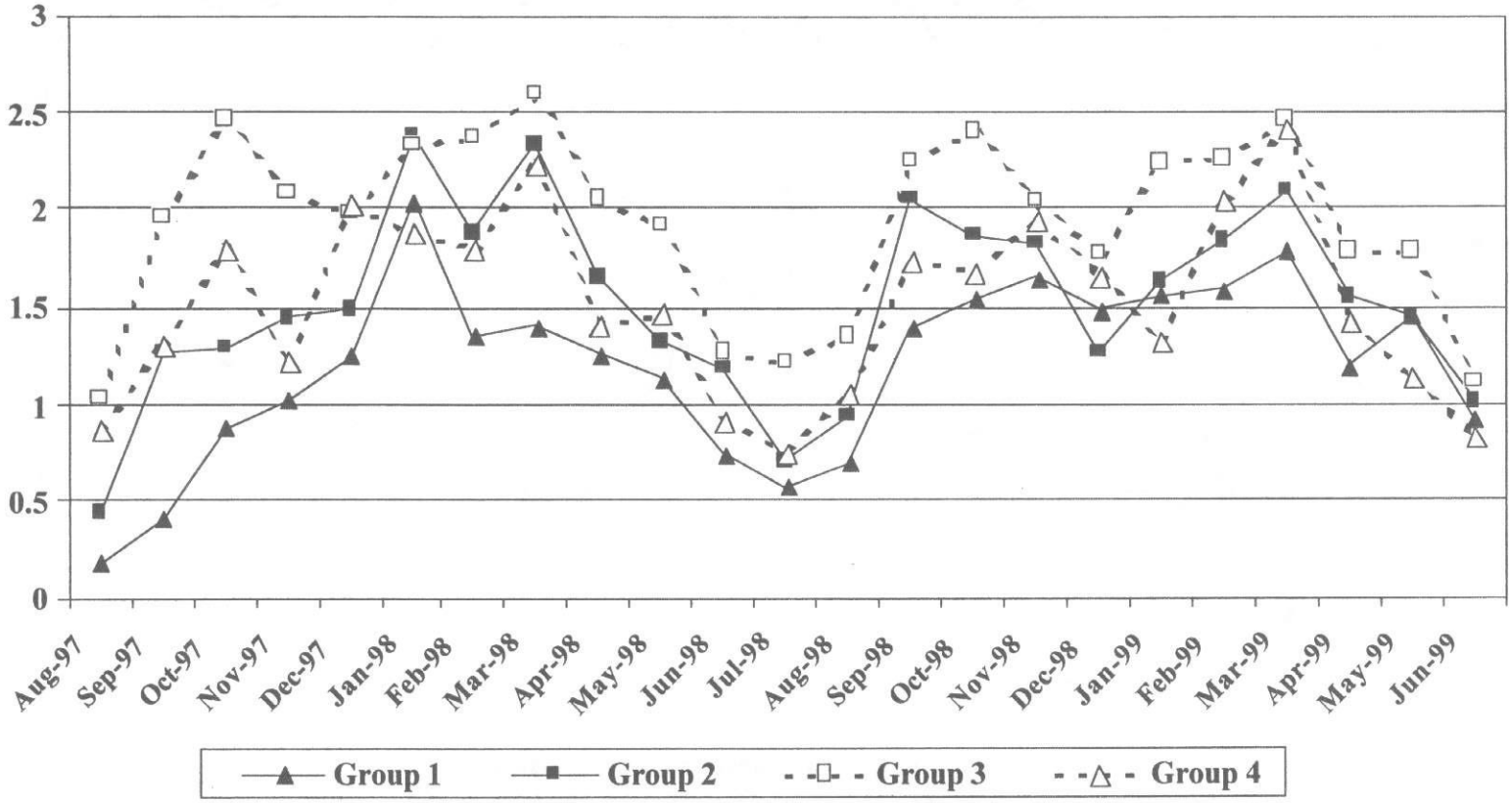
Group 1 = Uninsured in 1997, insured by CHIP in 1998-99

Group 2 = Uninsured in 1997, insured by Medicaid in 1998-99

Group 3 = Insured in 1997, 1998, and 1999 by Medicaid

Group 4 = Insured in 1997 by Medicaid, insured by CHIP in 1998-99

Figure B-2.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Rural African-American with a Chronic Health Condition, South Carolina, Fiscal Year 1998-1999



Key:

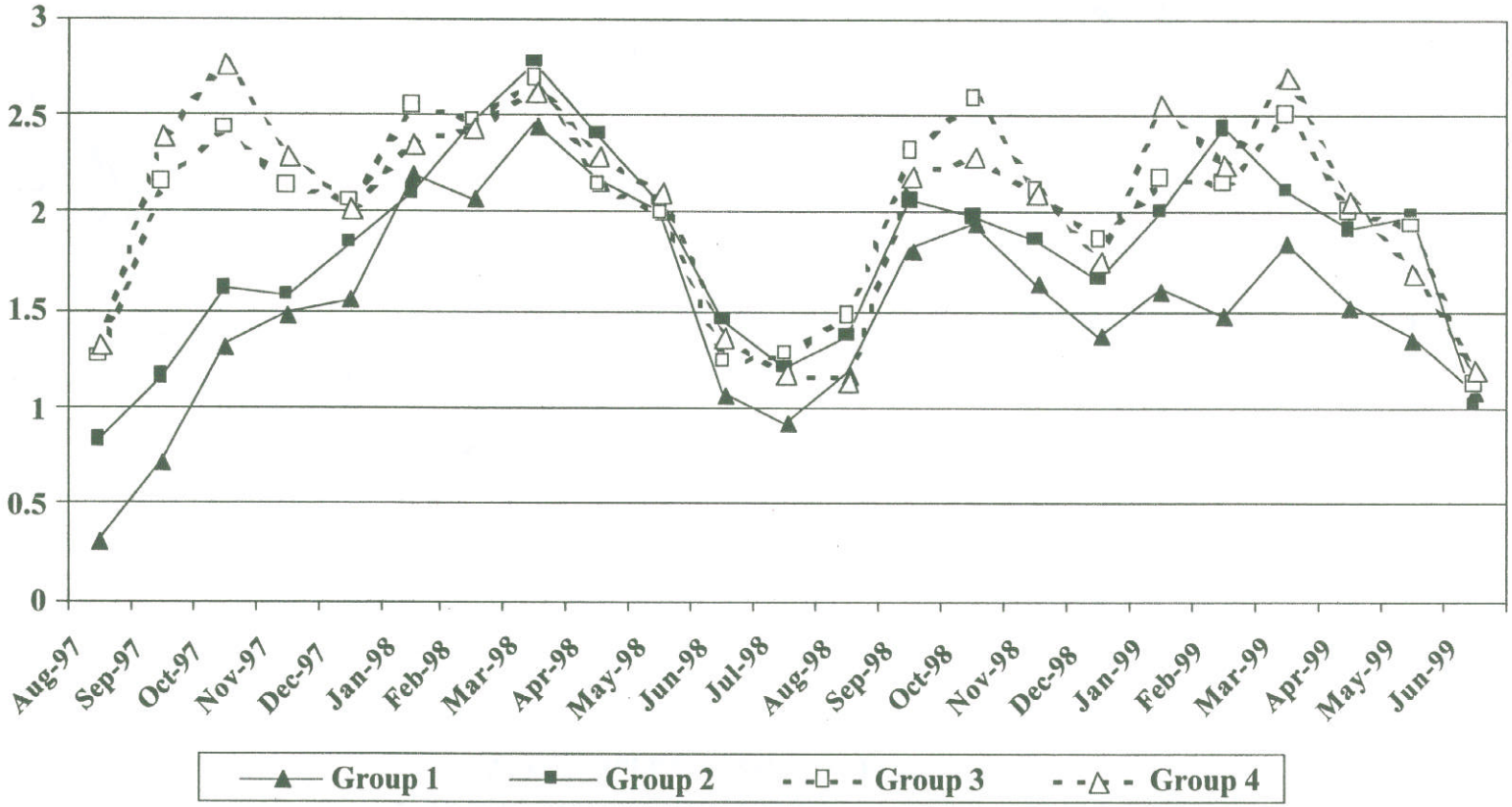
Group 1 = Uninsured in 1997, insured by CHIP in 1998-99

Group 2 = Uninsured in 1997, insured by Medicaid in 1998-99

Group 3 = Insured in 1997, 1998, and 1999 by Medicaid

Group 4 = Insured in 1997 by Medicaid, insured by CHIP in 1998-99

Figure B-3.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Urban Whites with a Chronic Health Condition, South Carolina, Fiscal Year 1998-1999



Key:

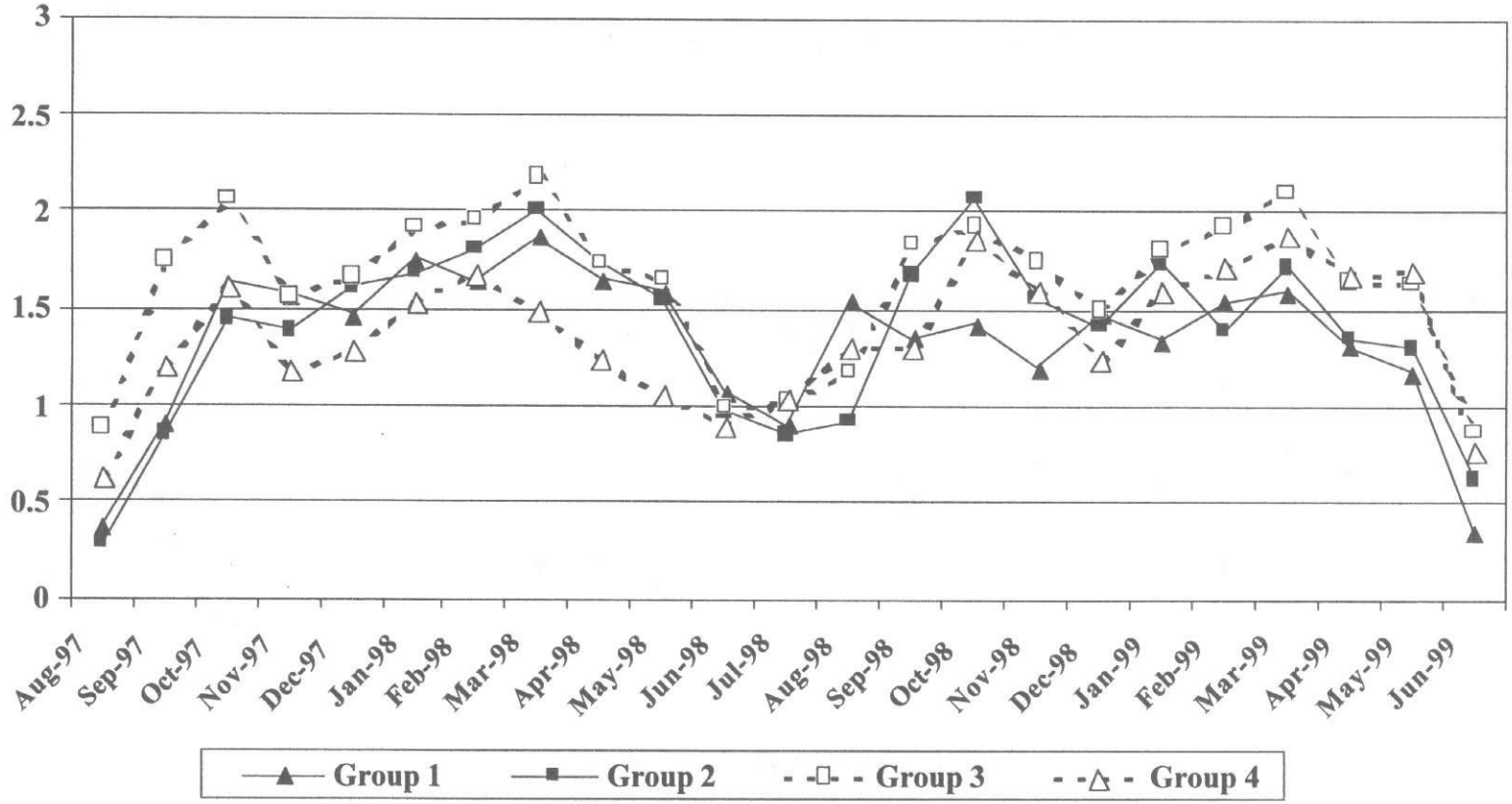
Group 1 = Uninsured in 1997, insured by CHIP in 1998-99

Group 2 = Uninsured in 1997, insured by Medicaid in 1998-99

Group 3 = Insured in 1997, 1998, and 1999 by Medicaid

Group 4 = Insured in 1997 by Medicaid, insured by CHIP in 1998-99

Figure B-4.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Urban African-Americans with a Chronic Health Condition, South Carolina, Fiscal Year 1998-1999



Key:

Group 1 = Uninsured in 1997, insured by CHIP in 1998-99

Group 2 = Uninsured in 1997, insured by Medicaid in 1998-99

Group 3 = Insured in 1997, 1998, and 1999 by Medicaid

Group 4 = Insured in 1997 by Medicaid, insured by CHIP in 1998-99

Figure B-5.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Rural Children without a Chronic Health Condition, West Virginia, October 2000 – July 2002

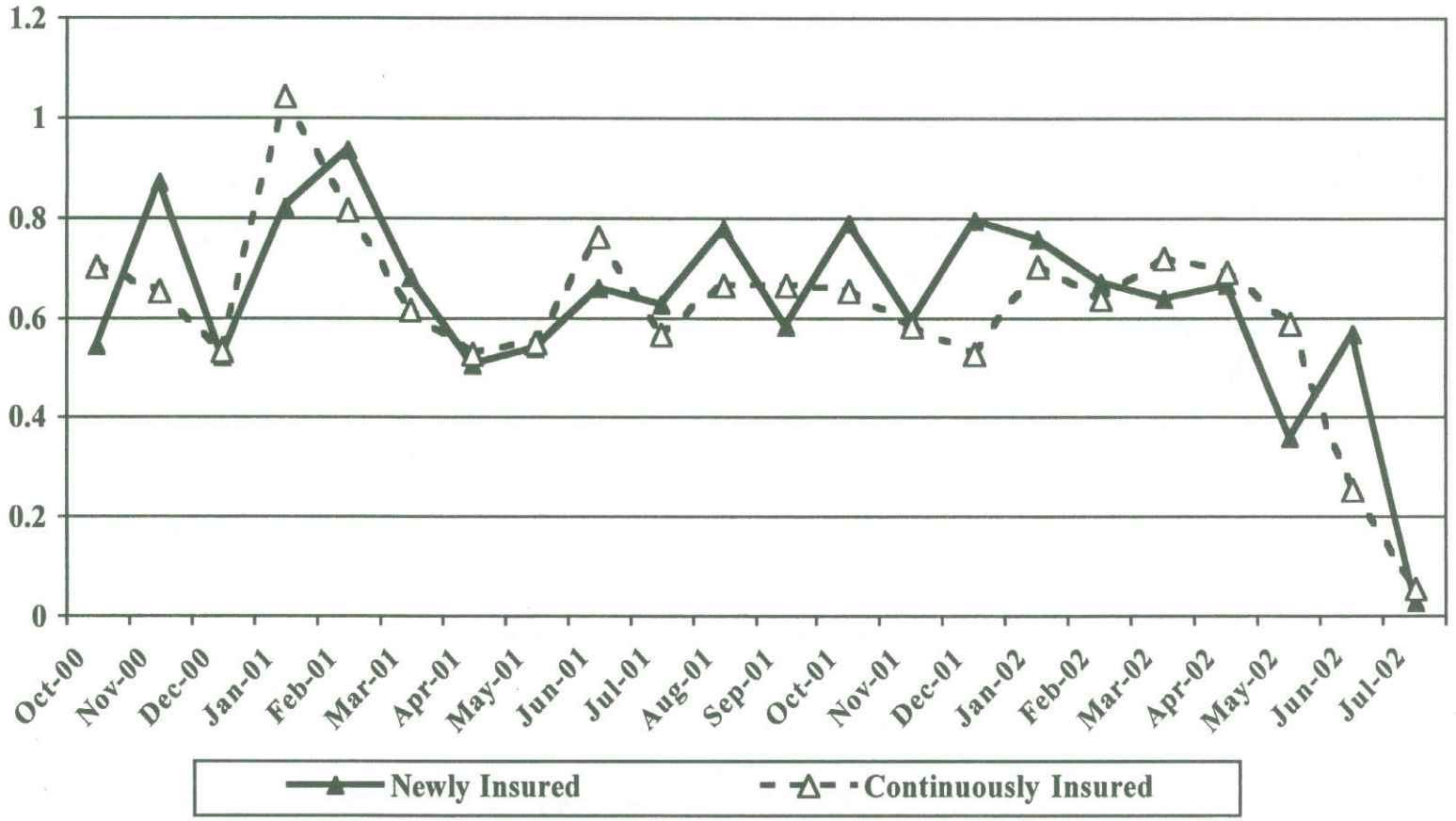


Figure B-6.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Urban Children without a Chronic Health Condition, West Virginia, October 2000 – July 2002

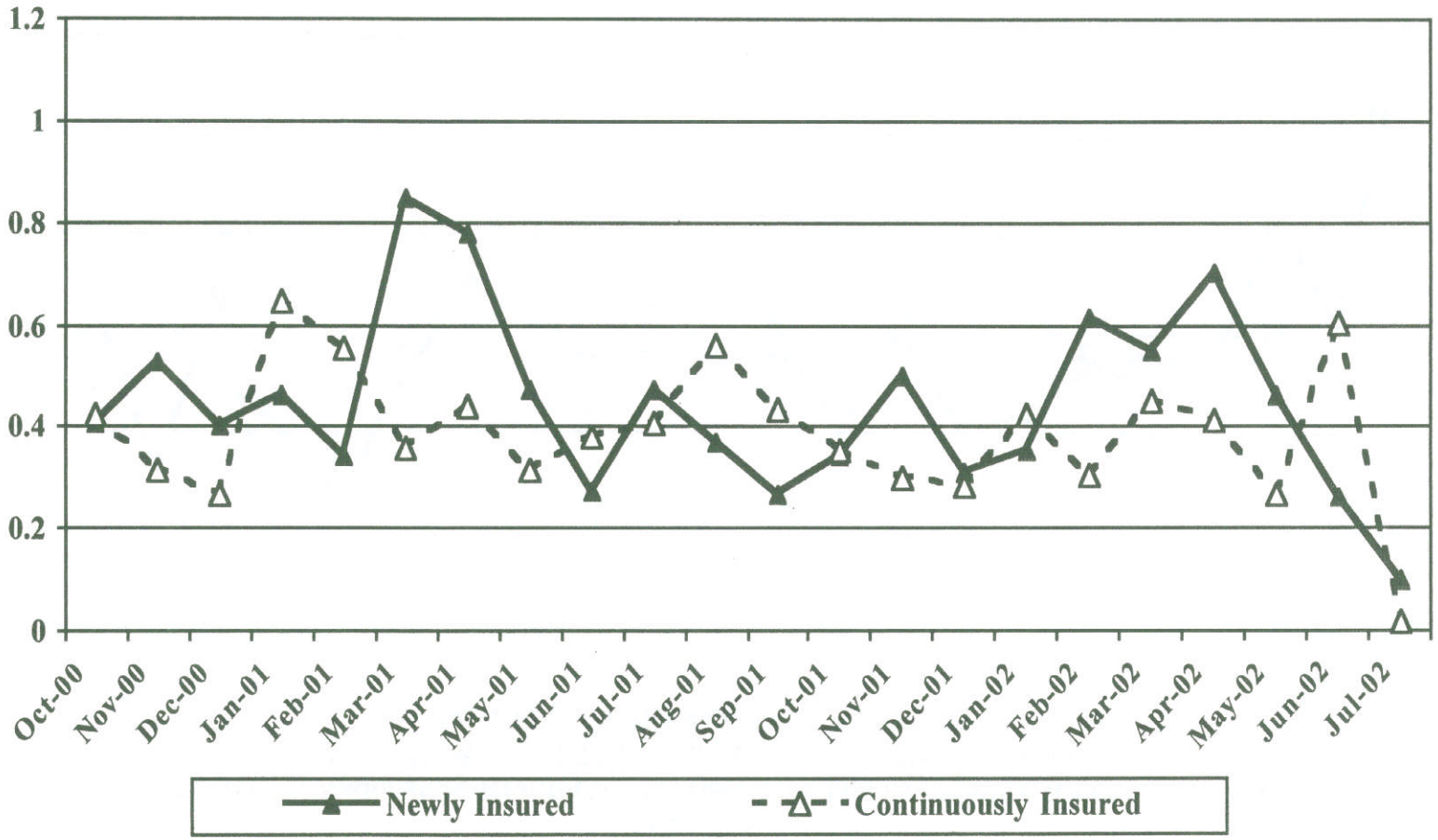


Figure B-7.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Rural Children with a Chronic Health Condition, West Virginia, October 2000 – July 2002

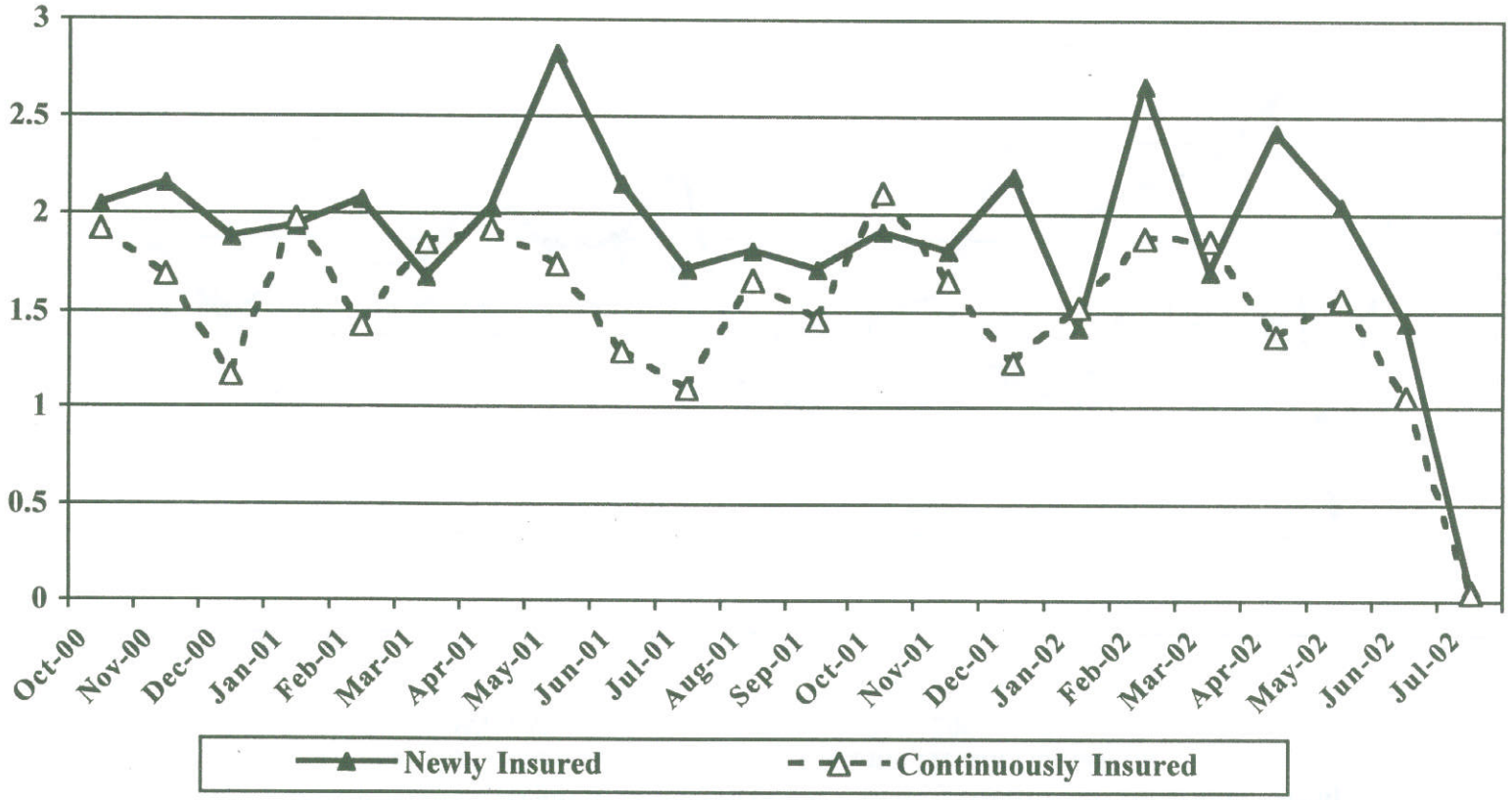


Figure B-8.
Mean Number of Ambulatory Health Care Services per Child by Month and Insurance Group, 6-12 Year Old Urban Children with a Chronic Health Condition, West Virginia, October 2000 – July 2002