



PATTERNS OF HEALTH INSURANCE
COVERAGE AMONG RURAL
AND URBAN CHILDREN



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SCHOOL

**PATTERNS OF HEALTH INSURANCE COVERAGE
AMONG RURAL AND URBAN CHILDREN**

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Table of Contents

Executive Summary	i
Introduction	1
Background	2
Prior Studies	3
Methods	5
Data Source	5
Analytic Methods	7
Findings	9
Socio-demographic Characteristics	9
Insurance Coverage	12
Duration of Uninsured Spells	13
Uninsurance Entries and Exits	16
Discussion and Policy Implications	17
Notes	
References	

EXECUTIVE SUMMARY

BACKGROUND: A steady decline in private insurance coverage for children over the past decade left more than 11 million children without insurance in 1998, despite expansions in state Medicaid programs over the same time period. One-fifth (22 percent) of these uninsured children lived in a non-metropolitan county. In response to this increase in uninsured children, Congress created Title XXI of the Social Security Act, known as the State Children's Health Insurance Program (S-CHIP). As of July 2000, nearly two million children had enrolled in an S-CHIP plan (Health Care Financing Administration 2000).

Despite the potential for dramatically improving the health care coverage of rural children, the implementation of (S-CHIP) in rural areas may be hampered by a lack of understanding about the patterns of insurance coverage these children experience. Although we know that rural children are more likely to be uninsured at a point in time, we do not know if this is the result of chronic uninsurance or intermittent losses in coverage. Differences in the length of uninsured spells could affect whether, how and the degree to which rural children take advantage of S-CHIP plans. On the one hand, a history of chronic uninsurance among rural children may create a pent-up demand for health insurance that would make rural families highly responsive to the start-up enrollment efforts of S-CHIP plans. On the other hand, if rural children are more likely to sporadically gain and lose insurance coverage, states will need to be more creative to ensure that S-CHIP plan designs effectively bridge the gaps in coverage for this population.

This study sought to assess differences in the patterns of insurance coverage and uninsured spells among rural and urban children and to examine the implications those differences for the design and implementation of public insurance programs such as the S-CHIP. Using data from the 1993 panel of the longitudinal Survey of Income and Program Participation (SIPP), we evaluate: (1) differences in insurance coverage between rural and urban children at a point in time, (2) differences in the duration of spells of uninsurance, and (3) patterns of entry and exit from spells of uninsurance for rural and urban children. Our analyses are intended to assist policy makers in identifying how different program eligibility, enrollment, and other design and implementation strategies may help or hinder the participation of rural children in S-CHIP plans.

METHODS: This project uses data from the 1993 Panel of the Survey of Income and Program Participation (SIPP). The SIPP is a nationally representative, multi-panel, longitudinal survey conducted by the Bureau of the Census. Through in-person and telephone interviews, the SIPP

collects detailed socio-demographic information as well as information on month by month fluctuations in household and individual income, health insurance status, labor force status, and participation in government sponsored programs such as Medicare and Medicaid. The focus of this paper is on the characteristics of uninsured children living in rural areas. The SIPP has data on uninsured children, but the variable that indicates whether a child lives in a metropolitan area or a nonmetropolitan area is only publicly available for 20 states in the sample. Although the limitation of an accurate indicator of residence limits this study, the range of twenty states included in our sample is large enough to make the study useful as it includes all of the largest states as well as states from every region of the country. The twenty states represented in the sample include: Arizona, California, District of Columbia, Florida, Georgia, Hawaii, Illinois, Kentucky, Maryland, Massachusetts, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, and Utah. The subsample used in this study includes 2,260 children (20 percent) identified as living in a non-metropolitan county and 8,874 children who live in a metropolitan county. In the subsample, 3,585 (32%) of the children had at least one spell without health insurance during the 36 month survey period. This includes 821 rural children with at least one uninsurance spell.

FINDINGS:

Rates Of Uninsurance: Comparing point in time estimates of uninsurance rates in December 1993 and December 1994, we found that rural children were somewhat more likely than urban children to lack health insurance (15.5 versus 13.8 percent in 1993 and 14.3 versus 12.7 percent in 1994). Although not statistically significant ($p = .07$), these findings support previous findings that have relied on other data sources to examine rural-urban differences in children's coverage. For example, Clark, Savitz and Randolph (1999) analyzed the Census Bureau's 1996 Current Population Survey and found that 15.0 percent of rural children were uninsured compared to 13.6 percent of those in urban areas.

Uninsured Spells: We also identified and counted spells of uninsurance for rural and urban children. More than 3,500 children in the 1993 SIPP panel were without health insurance at some time during the 36-month study period. Rural children were about 15 percent more likely to have had at least one spell of uninsurance compared to urban children (36.3 versus 31.1 percent; $p \leq .001$). For roughly three-fourths of all children who experienced an uninsured spell, only one spell of uninsurance occurred over the 36-month time period. This proportion of "single spells" was slightly higher for rural children. At the same time, however, having three or more uninsured spells was more common for rural than urban uninsured children (6.9 versus

5.5 percent; $p \leq .01$). The number of spells for rural children, therefore, tended slightly more toward each extreme than was true among urban children.

Duration of Uninsured Spells: We studied the duration of uninsurance spells faced by rural children using several different methods. Comparing the duration of new uninsured spells, we found that rural children who lost their insurance coverage during the survey were more likely than urban children to experience both short and long spells. Rural children who became uninsured during the survey were slightly more likely than urban children to have spells that lasted four months or less (50 versus 47.7 percent). Rural children were also more likely than urban children to have spells that lasted 17 months or more (9.2 versus 8.3 percent). The median spell duration for rural children was more than a month less than for urban children. This reflects the higher proportion of rural children who had short spells of uninsurance.

DISCUSSION AND POLICY IMPLICATIONS: The pattern of uninsurance for rural children is complex and not easy to characterize. While the average duration of new spells was shorter for rural children, and regaining coverage quickly seems to be likely for many that become uninsured, rural children were also more likely than urban children to experience protracted spells of uninsurance. This was demonstrated by our analysis of spell duration for those children without insurance at a specific point in time. Over three-quarters of these uninsured rural children (77.9 percent) were estimated to remain uninsured for more than a year, as compared to 71.6 percent of uninsured urban children. Moreover, 55 percent of rural children were estimated to remain uninsured for more than two years, as compared to only 51.9 percent of urban children. So, although rural children tended to have shorter spells when only new spells of uninsurance were considered, among children uninsured at a specific point in time, rural children were more likely than urban children to be uninsured for a long duration. These findings suggest again that chronic uninsurance is a significant problem for a many rural uninsured children.

One of our goals in this study was to assess the implications of differences in the patterns of insurance coverage and uninsured spells among rural and urban children for the design and implementation of public insurance programs such as the S-CHIP. The complexity of our findings raise a number of potentially important implications for policies and programs such as the S-CHIP programs that aim to expand insurance coverage and access to care for uninsured children and families.

Our findings suggest that states may face unique challenges to enrolling rural children and their families. For example, the fact that among children who have new spells of uninsurance rural children have shorter spells than urban children, suggests that rural families

may be less likely to take advantage of new public programs that have become available to them. The anticipation of obtaining coverage in the near future may discourage families from enrolling in a S-CHIP program, especially when the application and verification processes are complex and burdensome. These disincentives will be even greater in states that mandate waiting periods to reduce the risk of crowd-out from the private sector. For both rural and urban children, the majority of new spells began when the child lost private coverage. Because the median spell duration for rural children is less than 6 months, they could be more adversely affected by waiting periods.

Rural children also appear to have more volatile insurance coverage when we consider that they are more likely to end an uninsured spell with a different source of health insurance than they had lost at the spell's inception. On the positive side, this means that more than one-fourth of the rural children who lost Medicaid coverage were able to obtain private health insurance at some point in the future. Rural children who lost private coverage were also more likely than urban children to regain insurance through the Medicaid program. This suggests that rural families who lose private coverage are willing and able to take advantage of public insurance programs for their children, which could in part account for the fact that new spells of uninsurance were on the average shorter for rural than urban children. These findings suggest that strategies to wrap public coverage around private insurance plans could be particularly beneficial to rural children. In states that have created "stand alone" S-CHIP programs it will be particularly important to rural children that there are mechanisms in place to ensure smooth transitions between Medicaid and S-CHIP programs, thereby improving the ability of these public plans to provide "seamless" coverage.

While the average duration of new spells is shorter for rural children, and regaining coverage quickly seems to be likely for most uninsured children, some experience considerable difficulty obtaining coverage as quickly. Our findings indicate that rural children are more likely to be chronically uninsured than those in urban areas. This is demonstrated by their longer spell durations at a point in time, by the higher average months without health insurance in annual periods, and by the higher proportion of rural children whose spells were "left censored" in our sample (i.e. those children who entered the sample uninsured), and who remained uninsured throughout the sample. To put this into context, we estimate that there are almost 1.9 million chronically uninsured rural children in the United States, with chronic uninsurance defined as remaining uninsured for one year or more. Perhaps 1.3 million uninsured rural children will remain uninsured for two years or more. Policies that would be effective in addressing the needs of chronically uninsured children may differ significantly from those that would be

effective at reaching the short-term rural uninsured children. Policymakers need to consider whether, and to what extent this population of chronically uninsured rural children has gained coverage through the S-CHIP programs.

The implementation of the S-CHIP program has highlighted the complexity of devising effective programs and strategies for covering the diverse population of uninsured children and families (United States General Accounting Office, 1999). States have encountered numerous challenges from designing eligibility criteria to devising outreach strategies. The complex patterns of insurance coverage demonstrated in this study represent yet another set of challenges that should be considered as policymakers seek ways to devise effective public programs for covering uninsured children and their families.

INTRODUCTION

A steady decline in private insurance coverage for children over the past decade left more than 11 million children without insurance in 1998, despite expansions in state Medicaid programs over the same time period (U.S. Census Bureau 1999; Congressional Budget Office 1998; Weinick, Weigers & Cohen 1998; Employee Benefits Research Institute 1997). Roughly 22 percent of these uninsured children lived in a non-metropolitan county (Clark, Savitz & Randolph, 1999). In response to this increase in uninsured children, Congress created Title XXI of the Social Security Act, known as the State Children's Health Insurance Program (S-CHIP), which has been called "the most significant new federal health program since the enactment of Medicaid and Medicare (Moore 1999)." As of July 2000, more than two million children had enrolled in an S-CHIP plan (Health Care Financing Administration 2000).

S-CHIP may represent an even more important policy initiative for rural children, compared to those in urban and suburban areas, for two reasons. First, rural children are more likely to be uninsured. Recent research has found that children living in non-metropolitan counties are 10 to 50 percent more likely to be uninsured than those living in urban ones (Clark, Savitz & Randolph 1999; Weinick, Weigers & Cohen 1998). Second, a higher proportion of children in rural areas lives within the income ranges targeted by most S-CHIP programs. Thirty percent of rural children have family incomes between 100 and 200 percent of the Federal Poverty Level (FPL) compared to only 21% of urban children (Dagata 1999). As a result, if S-CHIP programs were truly responsive to the needs of rural children one would expect a higher representation of rural children within S-CHIP caseloads, compared to the proportion of children living in rural areas overall.

Despite the potential for dramatically improving the health care coverage of rural children, the implementation of (S-CHIP) in rural areas may be hampered by a lack of understanding about the patterns of insurance coverage these children experience. Although we know that rural children are more likely to be uninsured at a point in time, we do not know if this is the result of chronic uninsurance or intermittent losses in coverage. Differences in the length of uninsured spells could affect whether, how and the degree to which rural children take advantage of S-CHIP plans. On one hand, a history of chronic uninsurance among rural children may create a situation of pent-up demand for health insurance that would make rural families highly responsive to the start-up enrollment efforts of S-CHIP plans. On the other hand, if rural children are more likely to sporadically gain and lose insurance coverage, states will need to be more creative to ensure that S-CHIP plan designs effectively bridge the gaps in coverage for this population.

The aim of this study was to determine whether there are differences in the patterns of insurance coverage and uninsured spells among rural and urban children and to assess the implications those differences might have for the design and implementation of public insurance programs such as the S-CHIP. Using data from the 1993 panel of the longitudinal Survey of Income and Program Participation (SIPP), we assessed differences in insurance coverage between rural and urban children at a point in time, and differences in the duration of spells of uninsurance. Our analyses are intended to assist policy makers in identifying how different program eligibility, enrollment, and other design and implementation strategies may help or hinder the participation of rural children in S-CHIP plans.

BACKGROUND

States have been given considerable latitude in designing S-CHIP systems, with flexibility for determining general program structure as well as specific implementation strategies. At the broadest level, states are allowed to choose from three basic organizational systems that include expanding current Medicaid programs, creating a separate “stand alone” state insurance program (which could include subsidizing private insurance premiums at the employer level) or some combination of the two. As of October 1999, approximately half of the states (27) had structured their S-CHIP plans as Medicaid expansions, 16 had created entirely separate programs, and 13 had combined these approaches.

Within certain guidelines, states can also set eligibility levels, decide what benefits to offer, set premium and copay amounts, and select what measures to use for program evaluation. States are also allowed to decide how best to reduce private sector “crowd-out,” the fear, expressed by many policymakers, that individuals or their employers may drop dependent coverage to enroll in lower cost public plans, like S-CHIP. For about half the states, crowd-out prevention strategies have included requirements that children be uninsured for a minimum period of time before they become eligible for S-CHIP benefits. One analysis of the first 47 S-CHIP plans approved by HCFA found that 24 of the states required children to be uninsured for time periods ranging from two to twelve months (Riley & Pernice 1998). Understandably, many child health advocates have argued that these restrictions are barriers to continuity of coverage for children.

Providing continuity of insurance coverage for children is an important policy aim because research has demonstrated that even short gaps in coverage can significantly disrupt the relationships between a child and their primary care providers (Kogan, Alexander, Teitelbaum et al. 1995). However, policy makers have observed that ensuring continuity of

coverage through S-CHIP will be challenging because of income and insurance fluctuations in the target population. Families that are targeted by most S-CHIP programs tend to have more volatile incomes than do those below poverty or at higher income levels (CBO 1998). Consequently, assuring continued eligibility for a public program will be challenging, particularly for states that have chosen to develop S-CHIP plans separate from their Medicaid programs. At the same time, unlike poor children, most who are near-poor have some private health insurance coverage during a given year (CBO 1998). As a result, they are more likely to move between public and private insurance plans, further complicating the ability of states to assure continuous coverage for these children.

Prior Studies

There is ample evidence that rural families face substantial disadvantages securing health insurance, compared to those in more urban areas. Individuals in rural areas are significantly more likely to be uninsured, due in large part to lower enrollment in private, employer-based plans for rural residents (Pol 2000; Coburn, Kilbreth, Long & Marquis 1998; Edelman & Menz 1996; Hartley, Quam & Lurie 1994; Frenzen 1993). This disadvantage extends to rural children so that only 56 percent of children living in a non-metropolitan county had any form of private insurance in 1996, compared to 66 percent of children from metropolitan counties (Weinick, Weigers & Cohen 1998). This differential in private coverage left rural children more likely to be uninsured than children in urban areas during 1996, with estimates of this difference ranging from 10 percent (Clark, Kavitz & Randolph 1999) to approximately 50 percent (Weinick, Weigers & Cohen 1998).

Prior research has demonstrated that the receipt of employer-based insurance in rural areas is almost entirely attributable to differences in workplace characteristics such as wage, employer size, and industry (Coburn, Kilbreth, Long & Marquis 1998; Coward, Clarke & Seccombe 1993). While these studies did not specifically address children's coverage, the prevalence of uninsurance among rural children is undoubtedly linked to the employment characteristics of their parents. Previous studies have found that children are most likely to be uninsured if they live in low-income working families, especially if their parents are self-employed or work for a small employer (Families U.S.A Foundation, 1997; U. S. General Accounting Office, 1997). These workplace characteristics are particularly endemic to rural areas. Rural residents are more likely than urban residents to be self-employed, particularly as farmers (Schur & Franco 1999; Hartley, Quam & Lurie 1994). Similarly, even when rural individuals work for someone else, the size of their employer tends to be much smaller than in

urban areas (Coburn, Kilbreth, Long & Marquis 1998; Frenzen 1993; Coward, Clarke & Seccombe 1993).

In addition to workplace characteristics, certain sociodemographic characteristics that increase the risk of uninsurance among children are also more prevalent in rural areas. For example, more than two-thirds of all uninsured children have family incomes at or below 200% of the federal poverty level (Congressional Budget Office 1998; Shuptrine & Grant 1996; General Accounting Office 1996;). Much of the disparity in insurance coverage between rural and urban children may be linked to income as rural children are more likely to live in families with with income below 200 percent of the federal poverty level (Dagata 1999). Similarly, prior research has demonstrated that parental education plays an important role in whether or not children will have health insurance, where parents with higher education are more likely to have insured children (Weinick, Weigers & Cohen 1998; Kogan, Teitelbaum, Kotelchuck, & Pappas 1995; Newacheck & McManus 1989). Since rural adults are 35% more likely to lack a high school education than urban adults (Census Bureau, 1998: table 10), some of the insurance coverage barriers faced by rural children may be a factor of their parents' education.

Although we know that rural children are at greater risk of being uninsured, and which factors may influence this risk, little is known about how patterns of health insurance coverage differ between children based on rural or urban residence. On the one hand, the low wages and small firm sizes endemic to rural businesses may leave many parents without the resources to insure their children over long periods of time. On the other hand, the temporary and seasonal nature of many rural businesses may lead to episodic insurance coverage among rural children. For example, a parent with seasonal employment may be eligible for employer-sponsored family coverage for a period of time but lose it when the industries' season ends. Or, children may be eligible for Medicaid part of the year, only to lose their benefits when seasonal or temporary employment raises their family income.

Swartz and McBride (1990), in one of the first studies to look at the duration of uninsured spells, found that one-half of all uninsured spells end within four months, and only 15 percent last longer than last longer than 24 months. Swartz, Marcotte and McBride (1993a) confirmed these results and additionally examined the characteristics that predict the length of an uninsured spell (1993b). A number of the characteristics they found to be predictors of longer spells—lower family income, less than a high school education, and working part time—have also been associated with rural areas and may suggest that rural residents, including children will have longer spells of uninsurance. On the other hand, being married had a large impact on

reducing the length of an uninsured spell and rural children are more likely than urban children are to live in two-parent families (Clark, Savitz & Randolph, 1999).

METHODS

Data Source

This project uses data from the 1993 Panel of the Survey of Income and Program Participation (SIPP) which is, as of this writing, the latest available full panel file.¹ The SIPP is a nationally representative, multi-panel, longitudinal survey conducted by the Bureau of the Census. Through in-person and telephone interviews, the SIPP collects detailed socio-demographic information as well as information on month by month fluctuations in household and individual income, health insurance status, labor force status, and participation in government sponsored programs such as Medicare and Medicaid. The 1993 panel was initially interviewed in February 1993 and then was interviewed every four months through January 1996 for a total of nine interviews spanning 36 months. At each interview (called waves) information is collected for the individual and the individual's household, including children, for the four months preceding each interview.² The initial sample for the 1993 Panel includes approximately 27,300 households (or about 63,000 persons), but additional households and persons are added to the sample as individuals enter or exit from the original SIPP household.

This study is based on a large file that was created by merging data from two sources:

- *Extract from 1993 Full Panel Research File.* The Census Bureau produces a Full-Panel Research File (FPRF) by merging data from all nine interviews for every respondent. The Full Panel Research File (FPRF) includes data on basic demographic and economic variables, as well as longitudinal information on health insurance status. An extract from the FPRF was drawn for this project. Since the 1993 FPRF contains only a subset of the data collected through the “core” questionnaire on each wave, some relevant information on health insurance coverage, health status, and health utilization, was not attached to the FPRF. Thus an additional extract was created and attached to the FPRF.
- *Extracts from 1993 Topical Module Files.* Waves 1, 3, 6 and 9 of the 1993 Panel included “Topical Modules” that included questions of interest for this study, including data on health status, functional status, health insurance status, welfare enrollment, and health utilization. These data were extracted from the 1993 wave files and merged with the FPRF extract.

The result of this process of merging data from multiple sources is a large panel file that includes extensive detail on the health insurance coverage, health status, socio-demographics, and health utilization of a representative sample of persons in the U.S.

Data were extracted for every person in the SIPP sample, including adults and children, even though the focus of this study is the insurance status of children. Data on the adults were used to provide additional detail on the health insurance status and other family characteristics of the children. For the purposes of this analysis, the analysis sample is restricted to sample persons who were children (under age 18) at any point during the survey period. However, before making this extract of children for the analysis file, an extensive effort was made to link the key characteristics of the child's parents to the file. For this purpose we linked the characteristics of the child's mother and father if they were present.

The focus of this paper is on the characteristics of uninsured children living in rural areas. This is a rather unique focus, since few studies have focused on rural uninsured children. One reason for this is the lack of available data. The SIPP has data on uninsured children, but the variable that indicates whether a child lives in a metropolitan area or a non-metropolitan area is only publicly available for 20 states in the sample. In the other states, persons living in metropolitan areas are accurately recorded as living there, but some persons living in non-metropolitan areas are also recorded as living in metropolitan areas. This is done for confidentiality reasons, because of a fear that the samples in smaller states will be so small as to permit identification of sample respondents. Although the limitation of an accurate indicator of residence limits this study, the range of twenty states included in our sample is large enough to make the study useful as it includes all of the largest states as well as states from every region of the country. The twenty states represented in the sample include: Arizona, California, District of Columbia, Florida, Georgia, Hawaii, Illinois, Kentucky, Maryland, Massachusetts, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, and Utah.

The subsample used in this study includes 11,134 children living in the 20 states identified, drawn from the full SIPP sample that included 19,060 children. Thus the subsampling reduced the sample by about 7,900 children. In our subsample, 2,260 children (20 percent) are identified as living in a non-metropolitan county, while the remaining 8,874 live in a metropolitan county. In the subsample, 3,585 (32%) of the children had at least one spell without health insurance during the 36 month survey period. This includes 821 rural children with at least one uninsurance spell.

Analytic Methods

This study has two main objectives: (1) to measure and compare the duration of spells without health insurance for rural and urban children, and (2) to examine their paths of entry into, and exit from, uninsured spells. Estimates of uninsured spell durations for the rural

uninsured are of primary interest to test the hypothesis that these spells may be of a different duration compared to spells for uninsured urban children. This section briefly describes the conceptual framework for analyzing these phenomena and describes the statistical methods that we used to address our research objectives.

The primary variable of interest in this research is "spells." Here, the length of an uninsured spell is defined as: $T_u = T_{ue} - T_{ub}$, where T_{ub} is the month when a person makes a transition from insured to uninsured and T_{ue} is the month when they make the transition back to insured status. Insurance coverage is defined here to include any type of public insurance (e.g., Medicaid, Medicare, CHAMPUS, or public employer insurance), or private insurance (employer-provided or other private coverage). Thus, a person is defined as "uninsured" only if they have no source of health insurance.

Conventional nonparametric methods are used to estimate the duration of new uninsured spells. In particular, life table estimates produced by the SAS program, LIFETEST are used to produce estimates of spell duration and control for the problem of right censoring of spell lengths (Allison 1995, pp. 41-49). This is a conventional method used in the literature on this topic (Swartz and McBride 1991; McBride 1994; McBride 1997; Census Bureau 1996). This method accounts for the problem of "right-censoring," that is, where the end of an uninsurance spell is not observed because the survey ends or the sample respondent leaves the sample before completing their uninsurance spell.

The SIPP data are also affected by a "left censoring" problem, that is, where uninsurance spells are in progress at the start of the survey, or when the sample respondent enters the sample. Left censored spells are not considered in the analysis of spell lengths for new spells because the Swartz, Marcotte, and McBride (1993a) findings suggest that estimates of the duration of new spells are not materially affected by excluding left censored spells from the analysis. Nevertheless, it is worth exploring the incidence of left censored spells in the data, to see how children in urban and rural areas are affected by chronic spells. Two methods are used to study the left censored spells in the sample. The first examines the distribution of persons by the number of months within a period of time that they are uninsured. For example, the sample persons are arrayed by the number of months within a year that they are uninsured. This is a method used commonly in the literature, especially by the Census Bureau in its analysis of SIPP health insurance data (Census Bureau 1998). This method accounts for left censored spells because those with left censored spells will be counted, especially if they remain uninsured through the survey period. Those with left-censored spells are recorded as having 12 months without insurance during a particular year.

However, we employ a second method to analyze total duration of uninsured spells at a point in time. In other words, if a person is identified as uninsured at a point in time, how long will their uninsured spell last? To compute an estimate of the distribution of spell durations for the population of uninsured at a point-in-time, the procedures developed by McBride (1994) were used. First, a cross-sectional, point-in-time sample of the uninsured was drawn from the data file. The sample was chosen as of the last calendar month of the last year for which the SIPP panel respondents were interviewed (in the 1993 panel, December of 1994). This provides a statistical sample representative of the population of uninsured persons in the specified month. The second step requires the computation of the uninsured spell duration for each person up to the time when the sample was drawn. A good estimate of these durations can be computed from the SIPP data because each of these persons would have been followed for at least 24 months up to that month. This variable provides a distribution of spell durations up to that month, but does not provide an estimate of total spell durations because, by definition, all of the uninsured spells in the sample will be in progress. Thus, it is necessary to find a method for predicting the total spell length, given the information provided by the spell length to that point.

An estimate of total spell duration for this sample was computed by multiplying the SIPP sample weight by an estimate from a within-sample survival regression model.³ To compute these estimates, the following methods were used. First, the probability that the spell would last a given number of months, given the certain information of its spell length to December, was calculated. A simple survival model, with no covariates, was used to compute this probability.⁴ The model is then used to calculate the survival probability, i.e., the probability that a spell that has lasted t months will last $t+k$ months, $S(t+k|t)$. This probability can then be multiplied by the SIPP full panel sample weight (PW) to calculate an estimate of the number of persons with similar characteristics as the sample person whose uninsured spells would last the specified number of months, i.e., $W_{t+k}=PW*S(t+k|t)$. For example, the revised weight in the 13th month for a person whose spell had been in progress for 13 months by December would be equal to PW. But the weight used in the 14th month would be equal to the panel weight times the probability that the spell would last from the 13th to the 14th month (for example .916). Thus, if the person's sample weight equaled 5,000, then we would conclude that 4,580 ($5,000*.916$) persons with similar characteristics would have spells that lasted 14 or more months, and so on. These new weights were used to calculate the distributions in the paper.

Fortunately, this process of estimating the total duration of uninsured spells at a point in time yields a more precise estimate of very long spells (e.g., spells that have already lasted at

least 24 months) in this paper because the SIPP sample includes spells that have lasted at least that long.

FINDINGS

Socio-demographic Characteristics

To understand how the characteristics of rural uninsured children compared to those in urban areas, we completed bivariate analyses of the socio-demographic traits of the full sample of children and the subsample that experienced at least one spell of uninsurance during the study period. As indicated by Table 1, the characteristics of rural children in the SIPP panel differed significantly from those of urban children. A number of these characteristics are likely to contribute to differences in insurance coverage. For example, the higher proportion of rural children in poverty or just above the poverty line and the lower proportion of rural children with parents that have a college degree would be expected to place rural children at higher risk of being uninsured. On the other hand, rural children possess a number of characteristics associated with higher rates of insurance coverage. These include the higher proportion of rural children with two parents working full-time and living in two-parent families, as well as the lower proportion of rural children that are racial or ethnic minorities.

Approximately one-third of all children in the 1993 SIPP panel were uninsured at some point during the study period. However, rural children were slightly more likely to experience an uninsured spell during the study period, than were urban children (compare 36 percent to 31 percent). The characteristics of children who had a spell of uninsurance differed from those of the full panel in ways that one would expect based on prior research. Table 1 shows that uninsured children tended to be older, across both rural and urban locations, although rural children continued to be slightly older than urban children. Compared with the full sample of children, both rural and urban uninsured children were more likely to be a member of a racial or ethnic minority group.

As would be expected, uninsured children tended to have lower family incomes when compared to the full panel of children. One half of all uninsured children were poor (family income below 100 percent FPL) or near-poor (100-150 percent FPL) compared to about one-third of all children in the sample. A higher proportion of rural than urban uninsured children lives in poverty. In the full sample, rural children were somewhat more likely than urban children to live in poverty (20.5 versus 19.0 percent). When only uninsured children were considered, the proportion who lived in poverty was 15 percent higher for rural than urban children (28.1 vs. 24.4 percent). Related to this lower family income among all uninsured children, those children

who had an uninsured spell were less likely to have 2 parents working full time than was the full sample of children (16 versus 23 percent). Although rural children in the full sample were significantly more likely to have 2 parents working full time in the full sample, among uninsured children there was no rural-urban difference in the distribution of parental employment status.

The educational attainment of the parents of uninsured children was predictably lower than across the full sample of children. Uninsured children were half as likely as the full sample of children to have college educated parents and were almost 50 percent more likely to have a parent without a high school degree. Interestingly, rural children in the full sample were less likely than urban children to have parents without high school degrees. This continued to be true when we examined only uninsured children. Similarly, the rural-urban difference in family structure that we found for the entire panel of children persisted in our analysis of uninsured children. For both rural and urban children, being uninsured was associated with an increased likelihood of living in a single parent family compared to children in general (37.4 versus 29.8 percent). However, rural uninsured children continued to be more likely than their urban counterparts to live in a two-parent family (66.2 versus 61.6 percent).

Table 1: Selected Sociodemographic Characteristics of Children in Panel and the Subset of Uninsured Children

Characteristic	Full Panel (N = 11,134)		Uninsured Children (N = 3,582)	
	Rural Children (N = 2,260)	Urban Children (N = 8,874)	Uninsured Rural Children (N = 821)	Uninsured Urban Children (N = 2,761)
	Percent Distribution		Percent Distribution	
Child Age ¹				
0 to 5	41.6**	45.2	34.8**	41.1
6 to 12	34.4**	33.3	36.1**	33.4
13 to 17	24.1**	21.4	29.1**	25.5
Race/Ethnicity				
White, not Hispanic	80.1**	61.9	73.6***	51.2
Non-White, not Hispanic	13.5**	19.5	17.3***	21.0
Hispanic	6.4**	18.6	9.1***	27.7
Poverty Ratio ²				
Less than 1.0	20.5**	19.0	28.1***	24.4
1.0 to 1.5	17.5**	12.3	26.3***	23.3
1.5 to 2.0	12.6**	12.1	15.8***	17.2
2.0 to 3.0	25.0**	20.8	21.4***	19.9
3.0 or more	24.4**	35.8	8.4***	15.2
Parental Education				
Less than High School	13.3**	16.0	18.4***	24.1
High School	68.2**	54.4	73.1***	62.1
College Degree or More	18.5**	29.6	8.5***	13.7
Parental Employment				
2 parents working full-time	25.0*	23.0	16.0	15.9
1 parent working full-time	48.9*	51.8	49.6	51.6
No parents working full time	26.0*	25.2	34.4	32.5
Family Structure				
Single parent	27.1**	30.5	33.8*	38.4
Two parents	72.9**	69.5	66.2*	61.6

¹Child's age at entry into panel; the overrepresentation of children aged 0-5 reflects new babies born during the 36-month study period

²Ratio of annual family income to annual federal poverty line, averaged across the 36-month study period

* Differences between rural and urban children significant at $p \leq .05$

**Differences between rural and urban children significant at $p \leq .01$

*** Differences between rural and urban children significant at $p \leq .001$

Insurance Coverage

Before conducting our analysis of the duration of uninsured spells, we compared the insurance status of rural children to that of urban children at two distinct points in time. Table 2 shows the insurance status of all children in the sample in December 1993 and 1994. At both points in time, rural children were somewhat more likely than urban children were to lack health insurance (15.5 versus 13.8 percent in 1993 and 14.3 versus 12.7 percent in 1994). Although not statistically significant ($p = .07$), these differences are nearly identical to those of other studies that have relied on other data sources to examine rural-urban differences in children's coverage. For example, Clark, Savitz and Randolph (1999) analyzed the Census Bureau's 1996 Current Population Survey and found that 15.0 percent of rural children were uninsured compared to 13.6 percent of those in urban areas.

Table 2: Distribution of Insurance Coverage: December, 1993 and 1994

Insurance Status	All Children	Rural Children	Urban Children
Percent Distribution			
December, 1993			
Private/Other	64.9	63.5	65.3
Medicaid	20.9	21.1	20.9
Uninsured*	14.1	15.5	13.8
December, 1994			
Private/Other	67.1	65.8	67.4
Medicaid	19.9	19.9	19.9
Uninsured*	13.1	14.3	12.7

*Differences in rural and urban uninsurance rates not significant ($p = .07$)

The point in time estimates of insurance provided a static picture of how rural children compared to urban children vis-à-vis different coverage states. To deepen our understanding of how rural children differed over the full study period, we next identified and counted spells of uninsurance for rural and urban children. In contrast to the point in time data, we found that approximately one-third of all children in the 1993 SIPP panel were without health insurance at some time during the 36-month study period. As Table 3 indicates, rural children were about 15 percent more likely to have had at least one spell of uninsurance compared to urban children (36.3 versus 31.1 percent). For roughly three-fourths of all children who experienced an uninsured spell, only one spell of uninsurance occurred over the 36-month time period. This proportion of "single spells" was slightly higher for rural children. At the same time, however, having three or more uninsured spells was more common for rural than urban uninsured children (6.9 versus 5.5 percent). The number of spells for rural children, therefore, tended

slightly more toward each extreme than was true among urban children. In addition to being more likely to have an uninsured spell, rural children were significantly more likely to have entered the 1993 SIPP panel uninsured (17.4 versus 13.9 percent). These children are reported as “left-censored” to indicate that the start of their uninsured spell was not observed within the study period.

Table 3: Distribution of Uninsured Spells Among Children

Number of Uninsured Spells	All Children	Rural Children	Urban Children
Child Has Any Spell**	32.2	36.3	31.1
	Percent Distribution Among Children with any Spell		
Number of Spells*	(N = 3,582)	(N = 821)	(N = 2,761)
One spell	73.7	74.5	73.4
Two spells	20.5	18.5	21.1
Three or more spells	5.7	6.9	5.5
Child Has Left-censored Spell**	14.6	17.4	13.9
	Percent Distribution Among Left-censored Children		
Left-censored spell:*	(N = 1,627)	(N = 394)	(N = 1,233)
Ends; no other spells*	30.4	36.6	28.4
Ends; other spells*	32.5	26.7	34.4
Is right censored*	37.1	37.2	36.8

*Differences in distribution of spells between rural and urban significant at $p \leq .01$.

**Differences in distribution of spells between rural and urban significant at $p \leq .001$.

Duration of Uninsured Spells

In this paper, we use several different methods to study the duration of uninsurance spells faced by rural children, to test the hypothesis that rural children have different patterns of insurance coverage and spells of uninsurance. Table 4 compares the duration of new uninsured spells, that is, uninsured spells that began during the 36-month survey period for rural and urban children. The result of this analysis was that rural children who became uninsured during the survey were slightly more likely than urban children to have spells that lasted four months or less (50 versus 47.7 percent). Paradoxically, rural children were also about 10 percent more likely than urban children to have spells that lasted 17 months or more (9.2 versus 8.3 percent). Thus, rural children who lost their insurance coverage were more likely than urban children to experience both short and long spells.

Table 4: Distribution of New Uninsured Spell Lengths

Spell Length	Duration of New Uninsured Spells		
	All Children	Rural Children	Urban Children
	Percent Distribution		
Total	100.0	100.0	100.0
Less than 5 months*	48.2	50.0	47.7
5 - 8 months*	15.0	15.1	14.9
9 – 12 Months*	8.6	4.7	9.8
13 – 16 Months*	6.8	4.9	5.2
17 – 20 Months*	3.5	3.9	3.3
21 – 24 Months*	2.9	3.1	2.8
More than 24 Months*	2.2	2.2	2.2
Median Spell Length (Months)	6.2	5.1	6.3
Total Number of Spells	2484	532	1952
Spells with Observed Ending	1559	349	1210
Number of Right-Censored Spells	925	183	742
Percent of Spells Right- Censored	37.2	34.4	38.0

*Differences in rural and urban unadjusted survival distribution NS.

The median spell duration for rural children was more than a month less than for urban children, with rural spells lasting a median of 5.1 months and urban spells a median of 6.3 months. This reflects the higher proportion of rural children who had short spells of uninsurance.

Although the unadjusted survival distribution was not significantly different for rural compared to urban children, this was likely due in part to the significantly higher rates of uninsured teenagers in the rural sample. Prior research has found that children aged 13 to 17 have higher rates of uninsurance than younger children, a difference that researchers have attributed to more stringent Medicaid income rules for this age group (Weinick, Weigers & Cohen 1998; Shuptrine & Grant 1996). An analysis of new spell lengths by age based on our full sample found that children over age twelve had a median spell length of 8.2 months, compared to 5.0 months among children twelve and under (data not shown; $p \leq .01$). When we controlled for the child's age in our hazard model, the rural survival distribution differed significantly from the urban distribution.

As described earlier, the analysis in Table 4 accounts only for new spells that occurred within the survey time period and omits spells that began prior to the survey's inception. This is important because rural children were more likely to experience left censored uninsured spells.

To incorporate these left-censored spells into our analysis, we employ two analytic methods: (1) an estimate of the total duration of uninsured spells observed at a point in time, and (2) an estimate of the total number of months without insurance during the survey period.

An estimate of the duration of spells in progress at a point in time (specifically December 1994) is shown in Table 5, computed using the methods outlined in McBride (1994). When we looked at the total duration of uninsured spells at a point in time, we found that rural children actually had longer spells of uninsurance compared to urban children. Over three-quarters of uninsured rural children (77.9 percent) were estimated to remain uninsured for more than a year, as compared to 71.6 percent of urban children. Moreover, 55 percent of rural children remain uninsured for more than two years, as compared to only 51.9 percent of urban children. So, although rural children tended to have shorter spells when only new spells of uninsurance were considered, among children uninsured at a specific point in time, rural children were more likely than urban children to be uninsured for a long duration. These findings suggest again that chronic uninsurance is a significant problem for a large proportion of rural uninsured children.

Table 5: Distribution of uninsured children, by total estimated spell lengths, December 1994

Length of spell	All	Rural*	Urban
Less than 5 months	3.3	3.1	3.3
5-8 months	14.2	10.0	15.4
9-12 months	9.6	9.0	9.7
More than 1 year	73.0	77.9	71.6
13-16 months	7.4	10.5	6.6
17-20 months	7.3	7.5	7.2
21-24 months	5.7	4.9	5.9
More than two years	52.5	55.0	51.9

Another method for exploring spell durations focuses on the total months without insurance over a period of time (here, one year), a method commonly used by the Census Bureau to explore uninsured spell durations (Census Bureau 1998). This method captures persons with multiple uninsurance spells as well as persons with left-censored uninsurance spells. The results show that in addition to being more likely to lack health insurance at specific points in time, and at any time during the survey period, rural children spent more months uninsured than urban children did. Table 6 depicts the distribution of the total number of months children in the sample spent without health insurance during 1993 and 1994. In both 1993 and 1994, rural children spent an average of 15 percent more time uninsured (1.5 versus 1.3 months in 1993 and 1.4 versus 1.2 months in 1994). In both 1993 and 1994, the proportion of children

who spent no time uninsured was lower for rural than urban children, which means that a higher proportion of rural children experienced one or more months without health insurance in the 1993-94 period.

Table 6: Distribution of months spent without health insurance, 1993 and 1994

Months without insurance	All Children	Rural Children	Urban Children
1993 Months without insurance			
0	79.1	75.8	79.9
1	2.0	2.6	1.8
2-4	7.7	8.6	7.5
5-8	4.9	6.0	4.6
9-11	1.8	2.0	1.7
12	4.6	5.0	4.5
Mean number of months uninsured in 1993*	1.3	1.5	1.3
1994 Months without insurance			
0	80.0	79.4	80.7
1	2.2	1.7	2.3
2-4	6.7	6.7	6.7
5-8	4.4	4.8	4.3
9-11	1.9	2.8	1.7
12	4.4	4.7	4.3
Mean number of months uninsured in 1994*	1.3	1.4	1.2

*Differences between mean number of months uninsured for rural and urban children significant at $p < .05$

Uninsurance Entries and Exits

Identifying prior and subsequent sources of insurance coverage as children begin and end their spells of uninsurance is critical to understanding whether rural children face any unique barriers to achieving seamless insurance coverage under S-CHIP. Consequently, we compared the insurance coverage of rural and urban children as they entered and exited a spell of uninsurance. As shown in Table 7, nearly two-thirds of all new uninsured spells for children occurred when the child lost private insurance coverage. The proportion was slightly lower for rural children (61 versus 65 percent) which would be expected given the lower private coverage rate in rural areas. Uninsured spells tended to end with private insurance in roughly the same proportions, although rural children were slightly more likely to gain private insurance than they were to lose it (62.8 versus 61.0 percent). These findings suggest that there is significant "cycling" out of coverage, and then back on to the same type of coverage. For example, a significant proportion of rural families lose Medicaid, and then eventually will regain Medicaid

coverage again, perhaps because their economic situation made them temporarily ineligible for Medicaid. Despite this finding, note that a significant proportion of both rural and urban children are likely to make the transition from Medicaid to private coverage, or from private coverage to Medicaid coverage, with an intervening period of uninsurance.

The results displayed in Table 7 demonstrate another potentially important difference between rural and uninsured children. Compared to urban children, rural children were more likely to have a different source of insurance at the beginning and end of spells. For example, rural children who lost Medicaid were almost 20 percent more likely than urban children who lost Medicaid to have their spell end by gaining private insurance (30.1 versus 25.5 percent). Similarly, among those who lost private coverage, rural children were more likely to gain Medicaid coverage than urban children (16.4 versus 14.0 percent).

Table 7: Reasons Why Uninsured Spells Began And Ended

Reason Spell Began	Reason Spell Ended		
	Total	Gained Medicaid Coverage	Gained Private or Other Coverage
RURAL CHILDREN			
Percent of Uninsured			
Total	100.0	37.3	62.8
Lost Medicaid	39.0	27.2	11.8
Lost Private/other coverage	61.0	10.0	51.0
Percent by Reason for Spell Beginning			
Lost Medicaid	100.0	69.9	30.1
Lost Private/other coverage	100.0	16.4	83.6
URBAN CHILDREN			
Percent of Uninsured			
Total	100.0	35.1	64.9
Lost Medicaid	35.0	26.0	8.9
Lost Private/other coverage	65.0	9.1	56.0
Percent by Reason for Spell Beginning			
Lost Medicaid	100.0	74.5	25.5
Lost Private/other coverage	100.0	14.0	86.0

*Rural-urban differences in reason for spell beginning significant at $p \leq .05$. Rural-urban differences in reason for spell ending significant at $p \leq .01$.

DISCUSSION AND POLICY IMPLICATIONS

Our goal of this study was to examine the patterns of insurance coverage and uninsured spells among rural and urban children and to assess the implications that differences in those patterns might have for the design and implementation of public insurance programs such as

the S-CHIP. Our comparisons of uninsured spells between rural and urban children show that the pattern of uninsurance spells for rural children is complex. Rural children are slightly more likely than urban children to be uninsured at a point in time. Rural children are also significantly more likely to have had at least one spell of uninsurance during the 36-month study period. Rural children who lose their insurance coverage, however, are likely to have shorter uninsured spells than urban children. Paradoxically, when we measure spell durations for children who are uninsured at a specific point in time, rural children are more likely than urban children to be chronically uninsured. Thus, rural uninsured children are more likely than those in urban areas to experience both short and long spells.

There are a number of potentially important implications of these findings for policies and programs such as the S-CHIP programs that aim to expand insurance coverage and access to care for children and families. As noted earlier, differences in the number and length of uninsured spells could affect whether, how and the degree to which rural children take advantage of S-CHIP plans. A history of chronic uninsurance among rural children, for example, may create a situation of pent-up demand for health insurance that would make rural families highly responsive to the start-up enrollment efforts of S-CHIP plans. On the other hand, if rural children are more likely to sporadically gain and lose insurance coverage, rural families may be less inclined to enroll in coverage programs if they expect their gap in coverage to be relatively short. In this instance, states will need to be creative to ensure that S-CHIP plan designs effectively bridge the gaps in coverage for this population. And finally, where rural children come from and go to when they enter and leave a spell of uninsurance has important implications for the linkages between public and private coverage options

The results of this study indicate that states could face unique challenges to enrolling children and their families from rural areas. Specifically, they suggest that there are a number of important differences in the patterns of insurance coverage among rural children. When we look at new spells of uninsurance, we see that rural children typically have shorter spells than urban children. Consequently, rural families may be less likely to take advantage of new public programs that have become available to them, especially when the application and verification process is complex. As noted earlier, the anticipation of obtaining coverage in the near future may also discourage families from enrolling in an S-CHIP program. These disincentives will be even greater in states that mandate waiting periods to address the risk of crowd-out from the private sector. For both rural and urban children, the majority of new spells began when the child lost private coverage. Because the median duration for rural is less than 6 months,

compared to slightly longer urban median spell duration, children in rural areas could be more adversely affected by waiting periods.

Rural children also appear to have more volatile insurance coverage when we consider that they are more likely to end an uninsured spell with a different source of health insurance than they had lost at the spell's inception. On the positive side, this means that more than one-fourth of the rural children who lost Medicaid coverage were able to obtain private health insurance at some point in the future. On the other hand, rural children who lost private coverage were also more likely than urban children to regain insurance through the Medicaid program. This suggests that rural families who lose private coverage are willing and able to take advantage of public insurance programs for their children, which could in part account for the fact that new spells of uninsurance were on the average shorter for rural than urban children. It appears from these findings that strategies to wrap public coverage around private insurance plans could be particularly beneficial to rural children. In states that have created "stand alone" S-CHIP programs it will be particularly important to rural children that there are mechanisms in place to ensure smooth transitions between Medicaid and S-CHIP programs, thereby improving the ability of these public plans to provide "seamless" coverage.

While the average duration of new spells is shorter for rural children, and regaining coverage quickly seems to be likely for much of the population that becomes uninsured, some of the population will experience some difficulty obtaining coverage as quickly. The findings of this study indicate that rural children are more likely to be chronically uninsured than those in urban areas are. This is demonstrated by their longer spell durations at a point in time, by the higher average months without health insurance in annual periods, and by the higher proportion of rural children whose spells were "left censored" in our sample, and who remained uninsured throughout the sample. This is an important finding that should not be ignored by policymakers as they consider whether, and to what extent, this population of chronically uninsured rural children has gained coverage through the S-CHIP programs.

To put this into context, recall that approximately 11 million children were uninsured in 1998, according to recently released Census data. Of this group, it is likely that about 2.4 million are rural children (22 percent of uninsured children), based on the proportions found in previous studies (Clark, Savitz & Randolph 1999). Our findings here indicate that roughly 78 percent of rural uninsured children at a point in time will remain uninsured for more than one year and 55 percent will remain uninsured for more than two years. By applying these results to the estimate of uninsured in 1998, we could conclude that there are almost 1.9 million chronically uninsured rural children in the United States, with chronic uninsurance defined as

remaining uninsured for one year or more. Perhaps 1.3 million uninsured rural children will remain uninsured for two years or more.⁵ Policies that would be effective in addressing the needs of chronically uninsured children may differ significantly from those that would be effective at reaching the short-term rural uninsured children.

The implementation of the S-CHIP program has highlighted the complexity of devising effective programs and strategies for covering the diverse population of uninsured children and families (U.S. General Accounting Office, 1999). States have encountered numerous challenges from designing eligibility criteria to devising outreach strategies. The complex patterns of insurance coverage demonstrated in this study represent yet another set of challenges that should be considered as policymakers seek ways to devise effective public programs for covering uninsured children and their families.

NOTES:

¹The "Full Panel Research File" for each panel is created by the Census Bureau. It links the data from all waves of each panel. Because longitudinal analysis is the focus here, it is crucial to use a full panel file in this research. Although data from later SIPP panels are already available, the 1993 SIPP Panel file is the latest full panel file available.

²In the SIPP, interviews are conducted for every person in the household over age 15, but data records are obtained for all children under age 16, with the data obtained from the parents. In this analysis we include data on all children under age 18, from whatever source derived. In analysis of the data, we found that we had to correct some of the ages recorded by the Census, because newborns were recorded as age 00, while others with missing ages were also recorded with age=00. We corrected these ages by cross checking the age variable against the person's recorded date of birth.

³The SIPP data include annual sample weights, intended to allow analysts to compute 1993 and 1994 annual population estimates from the sample population. These are the weights used here.

⁴The regression was completed in the SAS module LIFEREG, using a log-logistic specification. This functional form was chosen because it fit the data more closely. In particular, the log-logistic function allows the hazard rate to increase, and then to decrease, as the length of the spell increases. This is a pattern which fits the observed phenomenon.

⁵ These numbers are computed as follows. Starting from the estimate of 11 million uninsured children in the U.S. from the most recent Census data, approximately 2.4 million (11 million times .22) are rural children. Of this point in time population, perhaps 1.9 million were chronically uninsured for more than a year (2.4 million times .78, the proportion of point-in-time uninsured that we find with spells of one year or more), and roughly 1.3 million will be uninsured for more than two years (2.4 million times 0.55, the proportion that we find will remain uninsured for two years or more).

REFERENCES

Census Bureau. (1998). Education attainment in the United States, March 1997: Detailed tables for Current Population Report. *Current Population Report: 20-505*. Washington, DC: U.S. Department of Commerce.

Clark, S. J. Savitz, L. A. & Randolph, R. K. (1999). Rural children's health. In T. C. Ricketts (Ed.), *Rural Health in the United States* (pp.150 -158). New York, NY: Oxford University Press.

Coburn, A.F. Kilbreth, E.H. Long, S.H. & Marquis, M.S. (1998). Urban-rural differences in employer-based health insurance coverage of workers. *Medical Care Research and Review*, 55 (4): 484-496.

Congressional Budget Office. (1998). *Expanding Health Insurance Coverage for Children Under Title XXI of the Social Security Amendment*. Washington, DC: CBO.

Coward, R.T. Clarke, L.L. & Seccombe, K. (1993). Predicting the receipt of employer-sponsored health insurance: The role of residence and other personal and workplace characteristics. *Journal of Rural Health*, 9 (4), 281-292.

Dagata, E.M. (1999). The socioeconomic well-being of rural children lags that of urban children. *Rural Conditions and Trends*, 9, (2): 85 – 90.

Edelman, M. & Menz, B. (1996). Selected comparisons and implications of a national rural and urban survey on health care access, demographics, and policy issues. *Journal of Rural Health*, 12 (3), 197 – 205.

Employee Benefits Research Institute. (1997). *Trends in Health Insurance Coverage*, Issue Brief (No. 185). Washington, DC: Employee Benefits Research Institute.

Families USA Foundation. (1997). *One Out of Three: Kids Without Health Insurance, 1995-96*. Washington, DC: Families USA Foundation.

Frenzen, P. (1993). Health insurance coverage in U.S. urban and rural areas. *Journal of Rural Health*, 9 (3), 204 – 214.

Hartley, D. Quam, L. & Lurie, N. (1994). Urban and rural differences in health insurance and access to care, *Journal of Rural Health*, 10 (2), 98-108.

Health Care Financing Administration (2000). *The State Children's Health Insurance Program: Preliminary Highlights of Implementation and Expansion*. Washington, D.C.: Health Care Financing Administration.

Kilbreth, E.H, Coburn, A.F., McGuire, C., Martin, D.P., Diehr, P., Madden, C.W., & Skillman, S.M. (1998). State-sponsored programs for the uninsured: Is there adverse selection? *Inquiry*, 35 (3), 250-265.

Kogan, M. Alexander, G. Teitelbaum, M. Kotelchuck, M. & Pappas, G. (1995). The effect of gaps in health insurance on continuity of regular source of care among preschool-aged children in the United States. *JAMA*, 274 (18): 1429-1435.

McBride, Timothy D. (1997). "Uninsured Spells for the Poor: Prevalence and Duration" *Health Care Financing Review* 19(1,Fall): 145-160.

McBride, Timothy D. (1994). "Estimating the Real Number of Chronically Uninsured," *Journal of American Health Policy* 4(4): 16-23.

Moore, J. (1999). CHIP and Medicaid outreach and enrollment. *National Health Policy Forum*, Issue Brief No. 748. Washington, DC: National Health Policy Forum.

Newacheck, P.W. & McManus, M. A. (1989). Health insurance status of adolescents in the United States. *Pediatrics*, 85 (4): 699 – 708.

Riley, T. & Pernice, C. (1998). *How Are States Implementing Children's Health Insurance Plans?* Second edition. Portland, ME: National Academy for State Health Policy.

Schur, C. & Franco, S. (1999). Access to health care. In T. C. Ricketts (Ed.), *Rural Health in the United States* (pp.158-158). New York, NY: Oxford University Press.

Shuptrine, S. & Grant, V. (1996). *Uninsured Children in the South, Second Report*. Columbia, S.C.: Southern Institute on Children and Families.

Smith, V. K. (1999). Preliminary estimates: Enrollment increases in State CHIP programs: December 1998 to June 1999. A report prepared for the Kaiser Commission on Medicaid and the Uninsured, June 30, 1999.

Swartz, K., and T.D. McBride. (1990). "Spells Without Health Insurance: Distribution of Durations and Their Link to Point-in-Time Estimates of the Uninsured" *Inquiry* 27(3): 281-288.

Swartz, K., J. Marcotte, and T. McBride. (1993a). "Spells Without Health Insurance: The Distribution of Durations when Left-Censored Spells are Included," *Inquiry* 30(1): 77-83.

Swartz, K., J. Marcotte, and T. McBride. (1993b). "Personal Characteristics and Spells Without Health Insurance," *Inquiry* 30(1): 64-76.

Weinick, R. M., Weigers, M. E., & Cohen, J.W. (1998). Children's health insurance, access to care, and health status: New findings. *Health Affairs*, 17(2), 127-36.

United States General Accounting Office. (1996). *Health Insurance for Children: Private Insurance Continues to Deteriorate*. Washington, DC: United States General Accounting Office.

United States General Accounting Office. (1997). *Health Insurance: Coverage Leads to Increased Health Care Access for Children*. Washington, DC: United States General Accounting Office.

United States General Accounting Office. (1999). *Children's Health Insurance Program: State Implementation Approaches Are Evolving*. Washington, DC: United States General Accounting Office.



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