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Abstract

The Balanced Budget Act of 1997 established the State Children's Health Insurance Program (SCHIP), which makes health insurance available to children under the age of eighteen who are members of low income families that do not qualify for Medicaid. The recent development in the government outreach strategies of the SCHIP program has contributed to reduce the disparity in healthcare service accessibility to children.

Purpose: The objective of this study is to examine children with special healthcare needs and the unmet healthcare needs under state health insurance programs for children. Two major purposes of the study are: 1. to assess children with healthcare needs between SCHIP single (SCHIP-S), SCHIP combination (SCHI-C) and SCHIP Medicaid expansion (SCHIP-M) programs, and Medicaid; and 2. to examine children with unmet healthcare needs under the SCHIP-S, SCHIP-C, and SCHIP-M programs.

Data: The data source comes from the Center for Disease Control and Prevention, the National Center for Health Statistics, the State and Local Area Integrated Telephone Survey, and the National Survey of Children with Special Healthcare Needs, 2001.

Results: The study shows that regardless of the types of the SCHIP, the children under three types of the SCHIP programs have more healthcare needs than Medicaid children. Another thing that has been uncovered is that parents who do not speak English and who are without regular healthcare sources are more likely to decline their access to services allowing them to address the healthcare needs of their children.

Based on this study, children under SCHIP single are more likely to be associated with a higher probability of unmet healthcare needs than children under SCHIP combination and SCHIP Medicaid expansion programs. The study illustrates that financial barriers (cost, health plan coverage, and financial hardships), indirect barriers (time constraints), and practice-level barriers (treatment issues of doctors, and the difficulty of getting an appointment) would raise children with unmet healthcare needs.

Conclusion: The variation in coverage of a state's SCHIP program depends on the particular state's baseline and criteria. This variation introduces an inequality of health accessibility, which in turn, leads to health inequality in children among and within states. In order for SCHIP programs to reduce the number of children with unmet healthcare needs and improve the health of children, financial and practice-level barriers for healthcare services must be diminished.

I. INTRODUCTION

An alarming issue in the United States is that there has been an increase in the number of children without adequate health insurance coverage. A recent trend toward managed care under public insurance (Medicaid) and private health insurance has contributed to a widening in the disparity of healthcare service accessibility to children. The Balanced Budget Act of 1997 established the State Children's Health Insurance Program (SCHIP), which has made health insurance available to children under the age of eighteen who are members of low-income working families which do not qualify for Medicaid. The two goals of the SCHIP program are to reduce the number of uninsured children among low-income families, as well as to facilitate access to needed healthcare services in order to improve the health status of children in low-income families (Blewett & Davern, 2007). In 1997, there were two states with the SCHIP combination, five states with the SCHIP Medicaid expansion programs established, and there were no states implementing the single SCHIP programs. Recently, however, many states have developed and improved their SCHIP programs. As of May 2007, eighteen states have implemented the SCHIP single, twenty-one states have implemented the SCHIP combination, and twelve states still provide the SCHIP Medicaid expansion programs.[1] The recent development and the government outreach strategies of the SCHIP program have contributed to reduce the disparity in healthcare service accessibility to children.

Since the inception of the SCHIP program, the federal and state governments have made significant commitments to expanding the program for children (Morreale & English, 2003; Lo Sasso & Buchmueller, 2004; Davis, 2005; Demske, 2006; Iglehart, 2007; Williams & Rosenbach, 2007). However, rising healthcare costs have threatened children with special healthcare needs among the heterogeneous population (Szilagyi et al., 2003; Dick et al., 2004; Mayer, Skinner & Slifkin, 2004). Eisert and Gabow (2002), Bermudez and Baker (2005), and Cunningham (2006) found that children of the Child Health Insurance Program are associated with a reduction in the need for ambulatory care services. SCHIP has another important role; mitigating the problems of the nation's low-income, uninsured children (Carroll, Corman, Noonan, & Reichman, 2007). Johnson and Rimsza (2004), as well as Gordon, Emond and Camargo (2005) addressed the issue, and discovered that uninsured children were nearly four times more likely to use the

emergency department than insured children. Uninsured children do not only represent U.S. children, but also immigrant children who have only arrived into the United States recently. The lack of health insurance among immigrants remains a major public problem (Carrasquillo, Ferry, Edwards, & Glied, 2003; Buchmueller, Lo Sasso, & Wong, 2007).

The effect of SCHIP in the state of New York, on access to healthcare and the quality of health care for children, is demonstrated by Szilagyi et al. (2004), who found that children under the SCHIP of New York changed their healthcare service utilization behavior because of increased accessibility to healthcare services and better general quality of health care. Eisert and Gabow (2002) particularly emphasized the accessibility of different healthcare services by using Denver Health utilization data, and found that children of the Denver Child Health Insurance Program have better accessibility to dental services, specialty visits, and immunizations than uninsured children. In addition, Hill, Stockdale, Evert, and Gifford (2006) and Kenny (2007) presented that children of the Child Health Insurance Program are associated with having improved access to primary healthcare services for children. However, Adekoya (2007) used Medicaid/SCHIP children together to evaluate emergency room use for children afflicted with infectious diseases, and found that the rate of medical visits for black children was higher than for white children. Furthermore, Hill, Stockdale, Evert, and Gifford (2006) highlighted the language barrier to show healthcare service accessibility among the SCHIP children, while Shi and Stevens (2005) underscored that racial and ethnic minorities, usual source of care, and poverty status are associated with different access to healthcare services.

The influence of the State Children's Insurance Program has been well documented in enrolling behavior, accessibility to healthcare services, utilization of healthcare services, and health status. Few studies have examined the issues of different characteristics of children with special healthcare needs[2] or children with unmet healthcare needs in the three different SCHIP programs that states offer: the SCHIP Single, the SCHIP Combination, and the SCHIP Medicaid expansion programs. Very little study has been done to examine the special healthcare needs of children under the different SCHIP programs, relative to children covered by Medicaid, and other socio-economic and demographic factors. It should be noted that many states have reported that SCHIP has had a significant impact on their Medicaid program. Children

enroll in separate child health programs because of the different eligibility requirements of the SCHIP and Medicaid programs. In addition, each state offers one of the three SCHIP programs with their own unique set of requirements. SCHIP generally requires more stringent information than the state Medicaid programs, although it provides less extensive benefit coverage than Medicaid. These differences may lead to a disparity in healthcare services among children in states as well as within a state's heterogeneous population, i.e. children. Consequently, the different health outcomes would direct a general decline in the quality of life. Thus, the evaluation of the different characteristics of different SCHIP programs is critical to understanding children with special healthcare needs, and unmet healthcare needs.

The objectives of this study are twofold: [1] to assess children with special healthcare needs enrolled in SCHIP Single, SCHIP Combination or SCHIP Medicaid expansion programs, as well as children covered by Medicaid; [2] to examine children with special healthcare needs under the SCHIP Single, SCHIP Combination, or SCHIP Medicaid expansion programs. The organization of the paper is as follows: Section II briefly describes the background of SCHIP. Section III describes an empirical framework and the data. The empirical results are presented in Section IV, and are followed by the policy implications and conclusion in Section V.

II. Brief Background of SCHIP

The State Children's Health Insurance Program (SCHIP) was designed as a Federal/State government partnership with the goal of expanding health insurance to those children whose families do not earn enough money to purchase private insurance. The program was created in 1997 as part of the Balanced Budget Act of 1997 because of the increasing amount of uninsured children. SCHIP is designed to provide health insurance to low-income children whose families have an income 50% higher than the state's Medicaid eligibility threshold as well as families with an income below 200% of the Federal Poverty Level.[4] The program aims to improve the quality of life for children under the age of eighteen.

SCHIP offers states three options to design their own program. The state governments can either use SCHIP funds to expand Medicaid eligibility to children,

design a separate children's health insurance program, or combine both the Medicaid and separate child health programs. A state's plan is the mechanism that begins Federal Financial Participation in a given state, similar to how Medicaid works. The amount of federal funds available for the program is limited for each fiscal year both nationally and on a state-specific basis. State allotments for a fiscal year are determined by two factors: the number of children enrolled, and the state geographic cost factor, which is based on annual wages in the healthcare industry for each state. State allotments consist of the fiscal year of the award and the two subsequent fiscal years, i.e. a three-year period. Any yearly allotment amounts for a fiscal year are subject to reallocations that remain available after the three-year period.

Of the targeted low-income children, certain groups of children cannot be covered under SCHIP: children who are covered under a group health plan, that are members of a family that is eligible for state employee insurance, or are residing in an institution for mental disease, are not eligible for Medicaid coverage. If a state establishes an extended Medicaid program using SCHIP, the eligibility rules of Medicaid apply. States are permitted to impose a cost-sharing provision although they may not include cost-sharing provisions for preventive services or immunizations. States are also prohibited from engaging in cost sharing that exceeds 5% of a family's gross or net income.

In the first quarter of 2002, sixteen states had a SCHIP Single program, nineteen states had a SCHIP Combination program, and sixteen states had a SCHIP Medicaid expansion program including District of Columbia. In 2007, eighteen states had a SCHIP single, twenty-one states had a SCHIP combination program, and twelve states had Medicaid expansion programs including District of Columbia.[5]

III. EMPIRICAL FRAMEWORK

The economics of health behavior has been driven by the demand-side approach to understanding decision-making behavior by controlling a health service sector. Health behavior is determined by the production and the demand for healthcare services, and by an institutional framework, i.e. policy, its regulation and related organizations (Grossman, 1972a, 1972b, & 2003; Yamada, Chen, & Yamada, 2005). The line of research on health behavior and its policy implications originated through the use of the

PRECEDE-PROCEED model (PP model) (Green & Kreuter, 1992; Green & Kreuter, 2004). The PP model offers some concepts and analytical tools that help analyze policy influences on behavioral decisions. This empirical study is an application and an extension of the PP model, and examines children with special healthcare needs together with SCHIP programs, and employs variables that are available from the data source: National Survey of Children with Special Healthcare Needs, 2001 by the Center for Disease Control and Prevention, the National Center for Health Statistics, and the State and Local Area Integrated Telephone Survey. In Figure one, Phases 1-5 show the assessment of the extended PP model. Phase four shows four categories of influential factors. The focus of this study is to evaluate the process evaluation and impact evaluation (see the bottom part of Figure 1) by using influential factors in Phase Four within the framework of the extended PP model.

This study assumes that health is measurable and interpretable as a flow per unit of time for simplicity reasons, because children with special healthcare needs have heterogeneous needs, such as preventive/routine physician care, specialty physician services, acute care, dental care, mental care, and health educational services. Individual healthcare needs are attributed to the physical and environmental domains that are related to unmet/met healthcare needs. This will lead to improved health outcomes as well as improved quality of life (U.S. Department of Health and Human Services, 2000). For physical and environmental domains, this study uses Grossman's concept about the separable impact of the education and income of a child's parents in health capital factors, in addition to the health status of children (Grossman, 1972b & 2003; Jacobson, 2000). Jacobson further extends the Grossman model, where the family is seen as the producer of health and each family member is also seen as a producer of health, not only his/her own health, but also the health of the other family members. Thus, the extended PP model incorporates health capital factors to examine children with special healthcare needs and unmet healthcare needs in Figure one.

The health promotional public healthcare program, SCHIP, and the Medicaid program will be merged into reinforcing factors in Phase Four. Reinforcing factors are comprised of the different types of feedback and rewards that those in the target population (children with special healthcare needs) receive after behavioral change by the

SCHIP programs. The feedback and rewards will allow a child and his/her parents to obtain tangible benefits such as: access to healthcare services as well as a diminished reliance on healthcare. We are now brought to enabling factors which include access to health care facilities, availability of resources, referrals to appropriate providers, barriers, and financial sources. The enabling factors are used to control the supply side, i.e. the healthcare sector, in this study. Predisposing factors include attitude, beliefs, perception, value, ethnicity, and culture.

This study focuses on both children with special healthcare needs and children with unmet healthcare needs in Phase Three that are related to reinforcing, predisposing, enabling and health capital factors of the extended PP model in Figure One. The study assumes that health outcome (HO) in Phase Two is attributed to a child's healthcare utilization behavior based on his/her special healthcare needs (CSHCN) and unmet healthcare needs (UNMET) in Phase Three, which is influenced by health capital, as well as predisposing, reinforcing, and enabling factors in Phase Four (See Figure One). Children with special healthcare needs and their unmet healthcare needs are both evaluated.

$HO_i = \Phi(CSHCN_i)$……..…….….(1-1), and

$HO_i = \Psi(UNMET_i)$……..…….….(1-2).

Equations (1-1 and 1-2) represent the relationship between the health outcome of child "i," and a child with special healthcare needs and unmet healthcare needs at Phases Two and Three in Figure One. Both, CSHCN and UNMET, consist of health capital (HC), reinforcing (RE), enabling (EN), and predisposing (PR) factors that will influence a child's special healthcare needs. Various components, as well as the amount of time invested in health within the family/individual, influence a child's health status (Grossman, 1972a & 1972b). The education level of parents, family income, language, and work status of a family are associated with the healthcare needs for children. Higher educational attainment levels affect health capital development and increase health status. Years of education represent the health capital that is related to the health knowledge of parents allowing them to raise healthier children, is related to educational attainment (Fairbrother et al., 2004; Kenney & Chang, 2004). Income is an important determinant of the health of children. Higher income implies a higher optimal level of health stock for

the individual and the family (Grossman, 2003).

A function behavioral model of the children with special healthcare needs in Phases Three and Four in Figure One could be expressed as follows:

$CSHCN_i = f\ (HC_i, RE_i, EN_i, PR_i) + e_{CSHCN,i}$…….……..(2-1).

Health capital (HC), reinforcing (RE), enabling (EN), and predisposing (PR) factors will influence a child's special healthcare needs, and e_{CSHCN} is an unobserved error, generally assumed to satisfy $E(e_{CSHCN}|HC, RE, EN, PR)=0$. A function of their unmet healthcare needs is:

$UNMET_i = \xi\ (HC_i, RE_i, EN_i, PR_i) + e_{UNMET,i}$ …….……..(2-2).

e_{UNMET} is an unobserved error, generally assumed to satisfy $E(e_{UNMET}|HC, RE, EN, PR)=0$. Health capital (HC), reinforcing (RE), enabling (EN), and predisposing (PR) factors will also influence a child's unmet healthcare needs.

Equations 2-1 and 2-2 represent the relationship between a child with special healthcare needs, and its influential factors (i.e. health capital, predisposing, reinforcing, and enabling factors) in Phases Three and Four in Figure One. Similarly, a child's unmet healthcare need is also incorporated in the extended PP Model to observe decision-making health behavior and influential determinants.

The basic estimation equations for the health behavior of a child are in general:

$CSHCN_i = \alpha_0 + \alpha_1 HC_i + \alpha_2 RE_i + \alpha_3 EN_i + \alpha_4 PR_i + \varepsilon_{CSHCN,i}$ i=1,…..,k…..(3-1),

and

$UNMET_i = \beta_0 + \beta_1 HC_i + \beta_2 RE_i + \beta_3 EN_i + \beta_4 PR_i + \varepsilon_{UNMET,i}$

i=1,…..,k…..(3-2).

$\varepsilon_{CSHCN,i}$ and $\varepsilon_{UNMET,i}$ are error terms for special healthcare needs and unmet healthcare needs, respectively. The equations (3-1 and 3-2) postulate that a child's health behavior (CSHCN or UNMET) depends on health capital factors (HC), reinforcing factors (RE), enabling factors (EN), and predisposing factors (PR). For this estimation, there are four issues in terms of internal validity: a specification of an omitted variable bias, multicollinearity, heteroskedasticity, and exogeneity/endogeneity in probit estimation.

A child's health status is included in a base specification and a parent's educational level, i.e. health knowledge. This is seen as a factor that improves the efficiency with

which that parent can produce a healthy child. The parents' income level affects the living standard which ends up contributing to a health and quality oriented child. Thus, estimation is an alternative specification without a child health status variable. An underlying factor in the discussion above is an economic theory that implies that the estimated coefficient on a parent's education level would be an upward biased estimate of the true impact of these variables, assuming the child health status variables are omitted. For the specification test, the likelihood ratio tests: the SCHIP program for children with special healthcare needs (λ=230.034 >χ^2 =20.0902) and children with unmet healthcare needs (λ =43.8108 > χ^2 =43.8108) are significant at the 1% level. The conclusion would then be to reject the restricted regression in this study.

Furthermore, the multicollinearity educational attainment and income are generally positive. A parent with a higher education is more likely to raise a healthy child because of his/her health knowledge. Both variables are theoretically important to evaluate children with special healthcare needs. The correlation coefficient between educational attainment by a mother and family poverty level ($r_{e,\ p}$) were evaluated. The SCHIP program for children with special healthcare needs ($r_{e,\ p}$ = 0.0210-0.2969) and children with unmet healthcare needs ($r_{e,\ p}$ = 0.0285-0.3127) are positively but loosely correlated. The variance-inflation factors (vif) for the SCHIP program for children with special healthcare needs (vif=4.44-1.32<10) and children with unmet healthcare needs (vif=4.10-1.22<10) are both less than 10. As a rule of thumb, when analyzing standardized data, a VIF<10 indicates a non-harmful collinearity.[6]

All of the results reported in Tables Two through Five use heteroskedasticity-robust standard errors, so heteroskedasticity does not threaten the internal validity of the multiple regression analysis. In the exogeneity/endogeneity tests, weak health status led to an increase in healthcare service utilization that was also related to a rise in healthcare expenditures. Consequently, this leads to higher healthcare costs, financial problems and unmet needs. Children with unmet healthcare needs may cause health status to weaken. The study of health behavior, by applying the extended PP Model, requires exogeneity/endogeneity tests for cost and health variables.

Concerning the issue of exogeneity/endogeneity, the study used the Hausman Specification Test to examine the endogeneity of the equations, and the examined cost,

finance, and health variables. Under the null hypothesis that there is no simultaneity, the correlation between $\hat{s}_{i,cost}$ and ω_i, $\hat{s}_{i,health}$ and ω_i , and $\hat{s}_{i,finance}$ and ω_i should be zero, asymptotically. The study found that this is the case since the coefficients of $s_{i,cost}$, $s_{i,health}$, and $s_{i,finance}$ are statistically zero. The residuals of cost, health, and reduced finance forms are included in the structural form. The study used six instrument variables: [1] health plan problem for medication, [2] health plan problem for dental care, [3] the last twelve months of out-of-pocket medical expenses in the amount of $5,000 or more, [4] no health insurance from work place, [5] health plan coverage for specialist services, and [6] the competency of the physician. The order condition and rank condition of identifiabilities are satisfied for four equations. Three of the residuals in the structural equation were found to not be statistically significant at the 10% level, they include, the residual of cost (t=0.692), the residual of health (t=0.788), and the residual of finance (t=0.156) implying that the cost, health, and finance variables are exogenous.

Source of Data

The National Survey of Children with Special Healthcare Needs (NSCSHN) was conducted as a module of the State and Local Area Integrated Telephone Survey (SLAITS). SLAITS is a program sponsored by the Center for Disease Control and Prevention's (CDC) National Center for Health Statistics, and is an ongoing surveillance system available at the state and local levels for tracking and monitoring the health and well-being of children and adults. The survey methods that the NSCSHN used were a random-digit-dial sample of households with children under 18 years of age, and were selected from each of the 50 states, and the District of Columbia. A total of 196,888 household screening interviews were completed from October 2000 to April 2002. There were also 38,866 special-needs interviews for the NSCSHN and 176,296 health insurance interviews for the children without special healthcare needs that were conducted.

The National Survey of NSCSHN was designed to look at children under the age of eighteen, with and without special healthcare needs. The National Survey also looked at the prevalence of special healthcare needs, quality of primary, specialty and ancillary care that children receive, the receipt of needed healthcare services, health insurance coverage for children, parents' health knowledge, as well as the use of SCHIP and Medicaid

programs, health and functional status, access to care, utilization and unmet needs, and financial impact of healthcare services and health insurance on the family.

There are four files in the National Survey of NSCSHN, the screeners file, the household file, the NSCSHN interview file, and the insurance analysis. The screener file (n=372,174) includes healthcare needs screening questions as well as a child's age, sex, race and state of residence. In the household file (n=196,888) all information about households, including the state of residence, household size, total number of children of special healthcare needs living in the household, the federal poverty level, and whether the household is located in a metropolitan area is included. The NSCSHN interview file (n=38,866) contains all information from the detailed interview, including the relationship of the respondent to the sample child, health and functional status, access to care, experience with care, the adequacy of care, health insurance, and the impact of the special healthcare need on the family. Lastly, insurance analysis (n=215,162) contains health status information, age, sex, race, state of residence, the federal poverty level, detailed special healthcare needs, health insurance coverage, healthcare utilization, access to care, experience with care, the adequacy of care, the impact of the special healthcare need on the family, the relationship of the respondent to the sample child, the respondent's educational level, uninsured children, and the parent's knowledge and experience with Medicaid and SCHIP.

IV. EMPIRICAL RESULTS

Special Healthcare Needs

In the use of the National Survey of Children with Special Healthcare Needs (NSCSHN), this study applies health economic theory to an extended PRECEDE-PROCEED model as a conceptual framework to analyze the behaviors of children with special healthcare needs and children with unmet healthcare needs under SCHIP single, SCHIP combination, and SCHIP Medicaid expansion programs. Table One presents the definition of the variables. The results are organized as follows. Table Two, Table Three, and Table Four focus on children with special healthcare needs, and Table Five presents children with unmet health care.

In Table Two, in the reinforcing factors, the Medicaid coefficient reveals that

children with special healthcare needs under the Medicaid program show a positive and statistically significant result. Children covered by Medicaid with special healthcare needs are 14.3 percentage points higher than SCIHP single children. Children with special healthcare needs may tend to enroll more in Medicaid while relatively healthy children enroll in the SCHIP with a given income level. One possible could be that children covered by Medicaid with social and economic vulnerability are more likely to face special healthcare needs than children under SCHIP programs. The similar impacts are seen when comparing children covered by Medicaid children under a SCHIP combination program (12 percentage points in Table 3) and against children under a SCHIP Medicaid expansion program (14.2 percentage points in Table 4). Compared with other variables in the reinforcing factors, the high probabilities that were calculated imply that Medicaid is their most recent prior insurance. Furthermore, children covered by Medicaid have a significantly higher probability of getting into the SCHIP programs and they are also more likely to have special healthcare needs (Lo Sasso & Buchmueller, 2004). Children with private insurance coverage are less likely to have special healthcare needs than children under the SCHIP programs, however the coefficient is not statistically significant. Given predisposing, enabling, and health capital factors, those groups with the highest special healthcare needs are children with Medicaid coverage, then children covered by SCHIP, followed by children covered by private insurance. The Medicaid children are the most vulnerable population among children.

A parent that goes uninsured for less than one year is more likely to qualify for special healthcare needs. Oddly enough, however, children with a parent who goes uninsured for more than one year are less likely to qualify for special healthcare needs. The negative effect of a long duration of being uninsured by a parent tends to have a discouraging effect on children with special healthcare needs. The results of the positive coefficients with a statistically significant duration of being uninsured (12 months or more) in children enrolled in the SCHIP single (Table Two), SCHIP combination (Table Three), and SCHIP Medicaid expansion (Table Four) programs show that children, who experience both an insured and an uninsured periods of more than one year, face unstable health plan/coverage concerns, and also seem to have an unstable health condition (Cawley & Simon, 2005; Hill, Stockdale, Evert, & Gifford, 2006).

The major finding in the enabling factors is that children without regular healthcare service resources are more likely to decline accessibility of special healthcare needs. As expected, all coefficients of no regular resources in Tables 2, 3, and 3 are negative and statistically significant. The marginal effects range from -0.088 (SHCIP Medicaid expansion program in Table 4) to -0.117 (SCHIP combination program in Table 3), and those magnitudes of influence on special healthcare needs are similar in all of the SCHIP programs. To capture the supply side influence, this study also examines enabling factors which include the type of place where children go to receive healthcare services: the doctor's office, the hospital emergency room, the health center, and the hospital outpatient department (an omitted variable). The negative coefficients indicate that children with special healthcare needs are more likely to use hospital outpatient departments than doctors' offices, hospital emergency rooms, and health centers. There is a high percentage of substitution between the hospital outpatient department, the doctor's office and health center (ranging from -0.113 to -0.129 under the SCHIP single program in Table Two and from -0.123 to -0.124 under the SCHIP combination program in Table Three). The substitution by children with special healthcare needs, however, is relatively small, ranging from -0.055 (office) to -0.076 (health center) for children under the SCHIP Medicaid expansion program. Shifting the services for children with special healthcare needs from the hospital outpatient departments to doctors' offices and health centers would create more efficient resource utilization, which could mean that the programs save money (Nolan et al., 2003).

In health capital factors, higher educational attainment by a mother is one of the most important health inputs needed to improve the health status of a child. Acquiring education increases a parent's health knowledge, attitude, and the motivation to obtain health related information and healthcare services. The marginal column of Table Two shows that the marginal probabilities associated with a mother with less than a college degree (i.e., "less than college") or college degree and higher (i.e., "college") are higher by 3 percentage points, and by 2.7 percentages points, respectively, relative to a child with a mother who did not graduate from high school (an omitted variable). In contrast, controlling for socio-economic and demographic factors, parents who do not speak English (coefficient of English not being spoken) are more likely to reduce a child's

special healthcare needs. The negative marginal effects show the similar and consistent magnitudes for all children covered by SCHIP. Children with parents who do not speak English appear to confront frequent difficulty in accessing special healthcare services.

In contrast to a mother's educational level, the family poverty level, which influences a child's health behavior, is used more commonly to understand healthcare needs for a child. A child of a family with a federal poverty level (FPL) less than 100% and a child with a family of a FPL range between 100% and 200% have a higher probability of having special healthcare needs, 0.9 percentage points in Table 2 and 1.4 percentage points in Table 3, than a child whose family poverty level is 200% greater than the federal poverty level (FPL) (omitted variable). These results in regards to the signs and magnitudes are generally consistent in children with special healthcare needs under SCHIP single (Table Two), SCHIP combination (Table Three) or SCHIP Medicaid expansion programs (Table Four). Our results are congruent with the results of Shi and Stevens (2005).

Unmet Healthcare Needs

One prominent theme in the government healthcare policy of SCHIP programs is the growing issue seen with an increase in unmet healthcare needs. Interesting results in the reinforcing factor in Table Five demonstrate that children in SCHIP single states are significantly more likely to have an unmet need for healthcare services than children in SCHIP combination or SCHIP Medicaid expansion states. As for a marginal measure, the children in SCHIP combination states have the least probability of unmet healthcare needs, while the SCHIP single states have the highest probability of unmet health needs. The complexity of the insurance system and different baselines in individual states possibly introduces inequality in terms of unmet healthcare needs.

As we discussed in the previous section of "special healthcare needs," uninsured children are less likely to receive special healthcare needs than insured children. The result of uninsured children in Table Five noticeably underscored that uninsured children are more likely to have unmet healthcare needs than insured children since they do not have a usual source of care. The lack of consistent primary care causes a high probability of healthcare services needed among children. The growing number of children without

health insurance is also caused by the complexity of the insurance system (Morreale & English, 2003). There are issues about the coordination between SCHIP programs and Medicaid in states, as well as that the churning of public health insurance (i.e. SCHIPs and Medicaid), occurs through macroeconomic conditions as a result of unstable employment or income or change in eligibility status, especially with children and women (Cawley & Simon, 2005). The result of a social security variable that is associated with unmet healthcare needs in Table Five is statistically significant and positive at 17.4% of the P values. The lack of health insurance among immigrants remains a major public health policy concern (Buchmueller, Lo Sasso, & Wong, 2007). Newly arrived immigrants who do not have a social security number tend to lead to their children having unmet special healthcare needs.

For the predisposing factor, white children under the SCHIP programs seem to have the least unmet healthcare needs when comparing races and ethnicities (Shi & Stevens, 2005; Adekoya, 2007). The results also display ethnic and racial differences of health behavior. Racial and ethnic disparities in the amount of unmet healthcare needs seem to become important in reducing the disparities among the children in the SCHIP programs. It would be helpful for policy makers and/or state program planners to recognize the ethnic and racial differences so that they can target children who truly need healthcare services.

For no regular sources in the enabling factor in Table Five, lack of accessibility causes inequality in healthcare service utilization (unmet healthcare needs), adversely affecting the health of children. The marginal effect shows that children without regular healthcare resources are 7.7 percentage points more likely to have poorer healthcare utilization than children with regular healthcare resources. The positive coefficient indicates that children who need healthcare services and who are without regular healthcare resources, are more likely to have unmet healthcare needs than children with regular access to healthcare resources, assuming that other factors remain constant. The results that we found are congruent with the results of Shi and Stevens (2005), as well as Shone, Dick, Klein, Zwanziger, and Szilagyi (2005). Children without a usual source of healthcare under the SCHIP single program have a significantly greater level of unmet healthcare needs than the SCHIP combination and the SCHIP Medicaid expansion.

Another enabling factor (i.e., doctor's office, emergency rooms, and health centers) in the healthcare supply side show that children who use a hospital outpatient department (omitted variable) as their usual healthcare sources, have a lower probability of unmet healthcare needs than children who attain healthcare services through some other venue. Children who obtain healthcare services from an emergency room are 11.6 percentage points more likely to have unmet healthcare needs than children who obtain healthcare services from the outpatient hospital department in the marginal effect. According to marginal effects, the SCHIP children who visit a hospital emergency room for unmet healthcare needs indicate that they are less likely to receive necessary healthcare services than children who visit a doctor's office or health center. The result is congruent with the study by Bermudez and Baker (2005).

Barriers to healthcare services in Table Five are a significant issue for children under SCHIP and are especially essential concerns for children with unmet healthcare needs. The findings are consistent with past research that barriers to receiving healthcare services include, getting an appointment, a lack of health insurance coverage, traveling time, availability of transportation, and healthcare provider-patient interaction (Yamada, Chen, Yamada, Chiu & Smith, forthcoming 2007). Financial barriers are major factors in the receipt of special healthcare services. For the children covered under the SCHIP program with high costs of care, children with insufficient health plan coverage, and families with healthcare financial problems have a higher probability of unmet healthcare needs than children without these barriers. The result of insurance coverage is congruent with the study of Buchmueller, Lo Sasso, and Wong (2007). For practice-level barriers, the results indicate that three sub-factors (i.e., an issue with physician's treatment, getting an appointment, and dissatisfaction with healthcare providers) represent higher probabilities of increasing unmet healthcare needs. This suggests the importance of facilitating health education and health communication to improve a patient's trust in physicians. Indirect barriers such as a lack of availability of transportation to healthcare services and lack of convenient time arrangement with healthcare service providers also demonstrate the strong association with unmet healthcare needs for children. It is possible that a working mother and/or father would find great difficulty in arranging for a healthcare service provider for their child.

As for health capital factors, a mother's educational attainment significantly is related to whether or not a child will have unmet healthcare needs as seen in Table Five. A child with a mother who has at least graduated from college is significantly less likely to have unmet healthcare needs than a child with a mother who has not completed high school. Educational attainment related to health capital, health knowledge, risk information, information of health services, and prevention attitude and motivation have an important role in reducing the number of children with unmet healthcare needs. The results suggest that an increase in formal and informal health education would significantly decrease the number of children with unmet healthcare needs, and would overall improve the health of children.

V. POLICY IMPLICATION AND CONCLUSION

This study sheds light on the fact that health insurance plays a critical role in children with special healthcare needs and unmet healthcare needs under the different SCHIP programs: SCHIP single, SCHIP combination, and SCHIP Medicaid expansion programs. The study incorporates a tool of an extended PRECEDE-PROCEED model with economics of health behavioral theory to evaluate the characteristics of children with special healthcare needs and unmet healthcare services under the SCHIP programs.

One of the important key policy variables is the Medicaid program. The Medicaid program generally has a significant impact on the probability of an increase in the amount of children with special healthcare needs. The probability impact is 14.3 percentage points in the SCHIP single, 12.0 percentage points in the SCHIP combination, and 14.2 percentage points in the SCHIP Medicaid expansion programs.

The state budget is generally constrained to limit the amount of benefits for children (Cunningham, 2003 & 2006; Demske, 2006; Blewett & Davern, 2007; Iglehart, 2007; Williams, Margo, & Rosenbach, 2007). Medicaid programs, therefore, provide better coverage of healthcare services for children with special healthcare needs than the SCHIP programs can provide. The SCHIP programs tend to offer more restricted benefit packages than the Medicaid program. However, children covered under Medicaid have a significantly higher probability of getting into the SCHIP programs and having special healthcare needs.

In order to capture the supply side influence, the negative coefficients point out that hospital outpatient departments are more likely to be used by children with special healthcare needs than doctors' offices, hospital emergency rooms, or health centers. There is a high percentage of substitution between the hospital outpatient department, the doctor's office, and health centers in the SCHIP single and SCHIP combination programs, while the substitution is relatively small in the SCHIP Medicaid expansion program. Currently, there is a scarce utilization of resources and ever rising healthcare expenditures. The shifting of services for children with special healthcare needs from the hospital outpatient department to doctors' offices and health centers would then create more efficient resource utilization. This undoubtedly would lead to a reduction in the amount of healthcare expenditures by children with special healthcare needs under the state SCHIP programs. The SCHIP program is largely influenced by the amount of federal funds as well as the size and allocation of the state budget. If state allotments for the fiscal year are determined by the number of children enrolled and the state cost factor (i.e. annual wages in the healthcare industry for each state), then stabilizing these factors may facilitate a steady development of the SCHIP programs. Children in low income families are associated with a variety of special healthcare needs and unmet healthcare needs.

For factors associated with unmet healthcare needs, children in SCHIP single states are significantly more likely to have an unmet need for healthcare services than children in SCHIP combination and SCHIP Medicaid expansion states. The complexity of the insurance system and the different baselines among states may introduce an inequality in the amount of unmet healthcare needs. The variation in coverage of state SCHIP programs depends on the state's baseline and criteria and introduces an inequality of healthcare accessibility, leading to health inequality in children among and within states.

Despite a large differential in the educational attainment of mothers, a child with a mother who has only completed high school is generally associated with a higher prevalence of special healthcare needs. However, a child with a mother who has graduated from college is less likely to have unmet healthcare needs. Higher educational attainment as it pertains to health capital, shows an increase in health knowledge, risk information, prevention attitude, and motivation contributes to the reduction of unmet healthcare needs. Health intervention promotion to SCHIP families, and formal and

informal health education for SCHIP mothers would significantly decrease the number of children with unmet healthcare needs.

Barriers to healthcare services must be diminished to enable the SCHIP programs to reduce the number of children with unmet healthcare needs and improve the health of children. Financial barriers for children with unmet healthcare service in the SCHIP programs include cost, health plan coverage, as well as financial problems caused by a child's healthcare. The cost of healthcare services is a major factor for children in SCHIP families that have unmet healthcare needs. State governments may need to coordinate the healthcare supply side so that there is standardization of cost guidelines for the SCHIP programs. The results from practice-level barriers indicate that a physician's treatment, trouble getting an appointment, and dissatisfaction with healthcare providers are all associated with higher probabilities of unmet healthcare needs. Health education and health communication to improve the patient-physician relationship for families in the SCHIP programs play an important role in the reduction of children with unmet healthcare needs. Occasional monitoring of healthcare providers and on children with unmet healthcare needs may be a viable plan to reduce unnecessary healthcare services.

There are two limitations to this study. First, this study is based on the data respondents from the mother (79%), father (17%), and other (4%). The respondent answers are based on the perceived needs of children with special healthcare needs and children with unmet healthcare needs. The second limitation of this study is that it did not link children with special healthcare needs to children with unmet healthcare needs to understand their past history and experiences.

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ENDNOTES

1 The SCHIP program offers states three options when designing a health insurance program for children. The options include: (1) the state can use SCHIP funds to expand Medicaid eligibility to children who previously did not qualify for the program (SCHIP Medicaid expansion program); (2) the can design a separate children's health insurance program entirely separate from Medicaid (SCHIP single program; and (3) the state combine both the Medicaid and single program (SCHIP combination program).

2 Special healthcare needs refers to "children with special healthcare needs are those who have or are at increased risk for a chronic physical, developmental, behavioral or emotional condition and who also require health and related services of a type or amount beyond that required by children generally." (Design and Operation of the National Survey of Children with Special Health Care Needs, Vital and Health Statistics, U.S. Department of Health and Human Services, Center for Disease Control and Prevention, Series 1, Number 41, pp.2-8, June 2003).

3 According to the Center for Disease Control and Prevention, State and Local Area Integrated Telephone Survey, National Survey of Children with Special Health Care Needs, 2001, Vital and Health Statistics, Series 1, Number 41, p.7, June 2003, unmet healthcare needs are defined by "respondents who were asked about the types of medical services their children required in the last year, whether they had experienced any problems accessing medical care for the sampled child, and whether they had delayed medical treatment for the child."

4 The Center for Medicare & Medicaid Services, State children's Health Insurance Program (SCHIP), http://www/cms.hhs.gov/schip, June 2005. U.S. Department of Health and Human Services, Vital and Health Statistics: Design and Operation of the National Survey of Children with Special Health Care Needs, Series 1, Number 41, June 2003.

5 The Center for Medicare & Medicaid Services, Division of State Children's Health Insurance, State Children's Health Insurance Program (SCHIP), March 2007.

6 Data problems are intensively discussed in pp.56-61 in pp.327-346 in Gujarati (2004), in pp.56-61 in Green (2003), and in pp.182-193 in Kennedy (2003).

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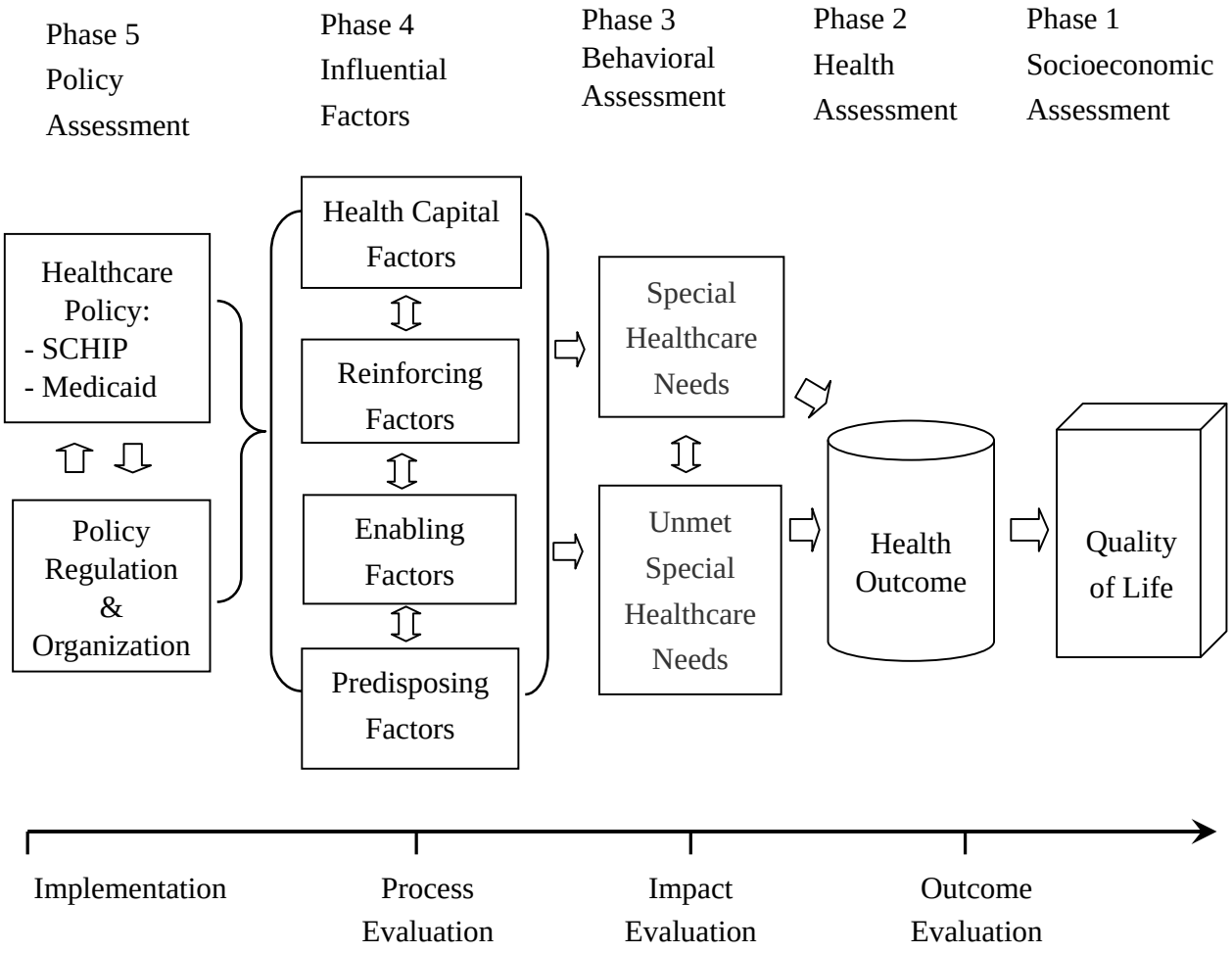
Figure 1 Extended PRECEDE-PROCEED Model for Children with Healthcare Needs and Unmet Healthcare Needs



Source: Green, L.W., & Kreuter, M.W. (2004). *Health Program Planning: An Educational and Ecological Approach* (4th ed.). New York: McGraw-Hill.

Table 1 Definition of variables

Variables	Definition
Dependent Variable:	
special healthcare needs	Dummy variable equal to 1 if a child needs special health care such as preventative/routine physician care, specialty physician services, acute care, dental care, mental care, health educational services, and 0 otherwise. (in Table 2: SCHIP single: mean=0.179; std. dev.=0.383) (in Table 3: SCHIP combination: mean=0.177; std. dev.=0.381) (in Table 4: Medicaid expansion: mean=0.187; std. dev.=0.390)
unmet healthcare needs	Dummy variable equal to 1 if a child has a delayed needed health care or does not receive needed health care, and 0 otherwise (in Table 5: mean=0.012; std. dev.=0.108)
Independent Variables:	
Reinforcing Factors	
SCHIP Single program	Dummy variable equal to 1 for a state of SCHIP single program and 0 otherwise. (omitted variable for the regression of unmet healthcare needs) (mean=0.310; std. dev.=0.463 in Table 5)
SCHIP Combination program	Dummy variable equal to 1 for a state of SCHIP combination program and 0 otherwise (mean=0.374; std. dev.=0.484 in Table 5).
SCHIP Medicaid expansion program	Dummy variable equal to 1 for a state of SCHIP Medicaid expansion program and 0 otherwise (mean=0.316; std. dev.=0.465 in Table 5).
Medicaid	Dummy variable equal to 1 if a child is covered by Medicaid and 0 otherwise.
private insurance	Dummy variable equal to 1 if a child is covered by private health insurance and 0 otherwise.
other health insurance	Dummy variable equal to 1 if a child is covered by other types of insurance and 0 otherwise.
uninsured duration -12	Dummy variable equal to 1 if a child is uninsured 1-11 months and 0 otherwise.
uninsured duration 12+	Dummy variable equal to 1 if a child is uninsured 12 months and more and 0 otherwise.
uninsured	Dummy variable equal to 1 if a child is uninsured and 0 otherwise.
social security number	Dummy variable equal to 1 if a child has no social security number and 0 otherwise.
Predisposing Factors	
age05	Dummy variable equal to 1 for child age 0-5 and 0 otherwise. (omitted variable)
age611	Dummy variable equal to 1 for child age 6-11 and 0 otherwise.
age1217	Dummy variable equal to 1 for child age 12-17 and 0 otherwise.
gender (male)	Dummy variable equal to 1 for males and 0 otherwise.

Table 1 continued,

Variables	Definition
Hispanic ethnicity	Dummy variable equal to 1 for Hispanic ethnicity and 0 otherwise.
White	Dummy variable equal to 1 for Whites and 0 otherwise.
African American	Dummy variable equal to 1 for African Americans and 0 otherwise.
other race	Dummy variable equal to 1 for other races and 0 otherwise. (omitted variable)
Enabling Factors: Supply factors	
MSA	Dummy variable equal to 1 if a child resides in MSA area and 0 otherwise.
no regular sources	Dummy variable equal to 1 if a child has no regular healthcare place or/and sources and 0 otherwise.
office	Dummy variable equal to 1 if there is a kind of Dr.'s office where a child receives service and 0 otherwise.
emergency room	Dummy variable equal to 1 if there is a kind of hospital emergency room where a child receives service and 0 otherwise.
hospital outpatient	Dummy variable equal to 1 if there is a kind of hospital outpatient department where a child receives service and 0 otherwise. (omitted variable)
health center	Dummy variable equal to 1 if there is a kind of health center where a child receives service and 0 otherwise.
home doctor	Dummy variable equal to 1 if a child has own home doctor and 0 otherwise.
Enabling Factors: Barrier factors	
cost (finance barrier)	Dummy variable equal to 1 if healthcare services cost too much and 0 otherwise.
health plan coverage (finance barrier)	Dummy variable equal to 1 if there is health plan coverage problems and 0 otherwise.
finance (finance barrier)	Dummy variable equal to 1 if a child's health care causes financial problems and 0 otherwise.
transportation (indirect barrier)	Dummy variable equal to 1 if transportation is not available and 0 otherwise.
time (indirect barrier)	Dummy variable equal to 1 if time is not convenient and 0 otherwise.
treatment (practice-level barrier)	Dummy variable equal to 1 if a doctor doesn't know how to treat and 0 otherwise.
appointment (practice-level barrier)	Dummy variable equal to 1 for difficulty in getting an appointment and 0 otherwise.
dissatisfaction (practice-level barrier)	Dummy variable equal to 1 if dissatisfaction with a healthcare provider and 0 otherwise.

Table 1 continued,

Variables	Definition
Health Capital Factors	
Mother's educational level	
less than high school	Dummy variable equal to 1 if a mother's education is less than high school and 0 otherwise. (omitted variable)
high school	Dummy variable equal to 1 if a mother's education is high school and 0 otherwise.
less then college	Dummy variable equal to 1 if a mother's education is less than college and 0 otherwise.
college	Dummy variable equal to 1 if a mother's education is college and higher and 0 otherwise.
non English spoken	Dummy variable equal to 1 if a respondent doesn't speak English and 0 otherwise.
Poverty status	
poverty I	Dummy variable equal to 1 if a family poverty level is 100% less than Federal Poverty Level (FPL) and 0 otherwise.
poverty II	Dummy variable equal to 1 if a family poverty level is 100% greater than FPL and 200% less than FPL and 0 otherwise.
poverty III	Dummy variable equal to 1 if a family poverty level is 200% greater than FPL and 0 otherwise. (omitted variable)
no work	Dummy variable equal to 1 if no family members are working and 0 otherwise.
Child health status	
healthy	Dummy variable equal to 1 if a child's health status is healthy and 0 otherwise. (omitted variable)
least sever	Dummy variable equal to 1 if a child's health status is least sever and 0 otherwise.
mildly sever	Dummy variable equal to 1 if a child's health status is mildly sever and 0 otherwise.
modestly sever	Dummy variable equal to 1 if a child's health status is modestly sever and 0 otherwise.
most sever	Dummy variable equal to 1 if a child's health status is most sever and 0 otherwise.
dental problem	Dummy variable equal to 1 if a child has dental problems during the last 12 months and 0 otherwise.
physical problem	Dummy variable equal to 1 if a child has physical health problems during the last 12 months and 0 otherwise.
mental health problem	Dummy variable equal to 1 if a child has mental health problems during the last 12 months and 0 otherwise.

Table 2 Regression results for the factors that associated with children with **healthcare needs** in **SCHIP single program**: Probit estimation (n=37,384)

Variables	Estimate	Marginal	Std. Err.	P value	Mean
Reinforcing factors					
Medicaid	0.480	0.143	0.010	0.000	0.156
private insurance	-0.005	-0.001	0.008	0.869	0.760
other health insurance	0.289	0.084	0.013	0.000	0.029
uninsured duration -12	0.031	0.008	0.008	0.326	0.076
uninsured duration 12+	-0.139	-0.034	0.014	0.028	0.047
social security number	0.384	0.116	0.090	0.144	0.002
Predisposing factors					
age611	0.520	0.145	0.006	0.000	0.323
age1217	0.553	0.153	0.006	0.000	0.359
gender (male)	0.215	0.055	0.004	0.000	0.517
Hispanic ethnicity	-0.045	-0.011	0.008	0.147	0.120
White	0.123	0.031	0.007	0.000	0.808
African American	-0.040	-0.010	0.010	0.297	0.078
Enabling factors					
MSA	0.091	0.023	0.004	0.000	0.738
no regular sources	-0.586	-0.112	0.017	0.000	0.014
office	-0.594	-0.113	0.018	0.000	0.020
emergency room	-0.466	-0.095	0.038	0.063	0.002
health center	-0.736	-0.129	0.015	0.000	0.013
home doctor	0.110	0.030	0.030	0.295	0.029
Health Capital factors					
high school	-0.051	-0.013	0.008	0.126	0.286
less than college	0.113	0.030	0.009	0.001	0.270
collage	0.103	0.027	0.009	0.003	0.352
non English spoken	-0.440	-0.093	0.009	0.000	0.055
poverty I	0.033	0.009	0.008	0.288	0.123
poverty II	0.066	0.017	0.006	0.003	0.192
no work	-0.477	-0.096	0.032	0.028	0.002
child health status					
least sever	0.103	0.028	0.033	0.383	0.025
mildly sever	0.556	0.177	0.052	0.000	0.008
modestly sever	0.441	0.136	0.081	0.056	0.002
most sever	0.909	0.090	4.010	0.001	0.002
dental problem	0.182	0.051	0.027	0.046	0.023
physical problem	0.931	0.324	0.062	0.000	0.003
mental health problem	1.338	0.482	0.055	0.000	0.003
constant	-1.678	--	0.055	0.000	--
Log likelihood = -17164.391					
Wald Statistic = 1752.52					
Likelihood Ratio (chi-square distribution) = 2109.21					
Probability > chi-square = 0.0000					
Pseudo R^2 = 0.0579					

Note: Marginal is a change in the probability for a change in $x_i = \partial\Phi/\partial x_i$.

An intercept term is a regular probit estimation.

Table 3 Regression results for the factors that associated with children with **healthcare needs** in **SCHIP combination program**: Probit estimation (n=42,331)

Variables	Estimate	Marginal	Std. Err.	P value	Mean
Reinforcing factors					
Medicaid	0.422	0.120	0.009	0.000	0.170
private insurance	-0.032	-0.008	0.007	0.254	0.765
other health insurance	0.298	0.085	0.012	0.000	0.031
uninsured duration -12	0.034	0.009	0.008	0.262	0.068
uninsured duration 12+	-0.163	-0.038	0.013	0.005	0.039
social security number	0.329	0.095	0.074	0.146	0.002
Predisposing factors					
age611	0.485	0.131	0.005	0.000	0.330
age1217	0.509	0.137	0.005	0.000	0.356
gender (male)	0.267	0.067	0.004	0.000	0.517
Hispanic ethnicity	-0.044	-0.011	0.006	0.094	0.128
White	0.131	0.032	0.006	0.000	0.770
African American	-0.034	-0.008	0.008	0.300	0.115
Enabling factors					
MSA	0.091	0.022	0.004	0.000	0.769
no regular sources	-0.659	-0.117	0.014	0.000	0.010
office	-0.726	-0.124	0.013	0.000	0.017
emergency room	-0.188	-0.043	0.036	0.286	0.002
health center	-0.723	-0.123	0.013	0.000	0.013
home doctor	0.248	0.069	0.029	0.010	0.027
Health Capital factors					
high school	-0.086	-0.021	0.007	0.003	0.279
less than college	0.048	0.012	0.008	0.108	0.254
collage	0.032	0.008	0.008	0.286	0.374
non English spoken	-0.471	-0.096	0.007	0.000	0.064
poverty I	0.040	0.010	0.008	0.169	0.131
poverty II	0.055	0.014	0.006	0.013	0.176
no work	0.081	0.021	0.041	0.593	0.003
health status					
least sever	0.093	0.024	0.029	0.379	0.023
mildly sever	0.468	0.142	0.046	0.000	0.006
modestly sever	0.782	0.260	0.073	0.000	0.002
most sever	1.095	0.385	0.073	0.000	0.002
dental problem	0.070	0.018	0.022	0.404	0.021
physical problem	0.804	0.269	0.064	0.000	0.002
mental health problem	1.303	0.465	0.054	0.000	0.002
constant	-1.620	--	0.051	0.000	--
Log likelihood = -19011.701					
Wald Statistic = 1965.14					
Likelihood Ratio (chi-square distribution) =2254.59					
Probability > chi-square = 0.0000					
Pseudo R^2 = 0.0560					

Note: Marginal is a change in the probability for a change in $x_i = \partial\Phi/\partial\, x_i$.

An intercept term is a regular probit estimation.

Table 4 Regression results for the factors that associated with children with **healthcare needs** in **SCHIP Medicaid expansion program**: Probit estimation (n=40,397)

Variables	Estimate	Marginal	Std. Err.	P value	Mean
Reinforcing factors					
Medicaid	0.468	0.142	0.009	0.000	0.201
private insurance	-0.012	-0.003	0.008	0.651	0.747
other health insurance	0.367	0.114	0.015	0.000	0.028
uninsured duration -12	-0.005	-0.001	0.008	0.881	0.065
uninsured duration +12	-0.229	-0.057	0.014	0.000	0.038
social security number	0.074	0.021	0.105	0.837	0.001
Predisposing factors					
age611	0.538	0.158	0.006	0.000	0.328
age1217	0.571	0.166	0.006	0.000	0.358
gender (male)	0.252	0.069	0.004	0.000	0.516
Hispanic ethnicity	-0.156	-0.040	0.007	0.000	0.104
White	0.074	0.020	0.007	0.008	0.707
African American	-0.122	-0.032	0.008	0.000	0.128
Enabling factors					
MSA	0.111	0.030	0.004	0.000	0.689
no regular sources	-0.388	-0.088	0.026	0.007	0.009
office	-0.225	-0.055	0.031	0.111	0.015
emergency room	-0.355	-0.082	0.038	0.076	0.002
health center	-0.326	-0.076	0.028	0.022	0.012
home doctor	-0.001	-0.019E-2	0.030	0.995	0.023
Health Capital factors					
high school	-0.019	-0.005	0.008	0.534	0.301
less than college	0.129	0.036	0.009	0.000	0.260
college	0.139	0.039	0.009	0.000	0.350
non English spoken	-0.556	-0.117	0.010	0.000	0.039
poverty I	0.037	0.010	0.008	0.190	0.144
poverty II	0.028	0.008	0.006	0.200	0.203
no work	0.010	0.003	0.056	0.959	0.002
health status					
least sever	-0.115	-0.030	0.029	0.325	0.021
mildly sever	0.377	0.119	0.050	0.008	0.006
modestly sever	0.873	0.309	0.075	0.000	0.002
most sever	0.970	0.347	0.093	0.000	0.001
dental problem	0.041	0.012	0.026	0.656	0.019
physical problem	0.922	0.328	0.064	0.000	0.002
mental health problem	1.308	0.477	0.056	0.000	0.002
constant	-1.635	--	0.052	0.000	--
Log likelihood = -19411.338					
Wald Statistic = 2048.23					
Likelihood Ratio (chi-square distribution) =2477.31					
Probability > chi-square = 0.0000					
Pseudo R^2 = 0.0600					

Note: Marginal is a change in the probability for a change in $x_i = \partial\Phi/\partial x_i$.

An intercept term is a regular probit estimation.

Table 5 Regression results for the factors associated with **unmet healthcare needs** by children in **SCHIP single, SCHIP combination, and SCHIP Medicaid expansion programs**: Probit estimation (n=120,112)

Variables	Estimate	Marginal	Std. Err.	P value	Mean
Reinforcing factors					
SCHIP combination program	-0.164	-0.193E-3	0.058E-3	0.000	0.374
SCHIP Medicaid expansion program	-0.106	-0.126E-3	0.057E-3	0.024	0.316
uninsured	0.262	0.508E-3	0.146E-3	0.000	0.041
social security number	0.155	0.255E-3	0.244E-3	0.174	0.002
Predisposing factors					
age611	0.008	0.010E-3	0.063E-3	0.878	0.327
age1217	0.067	0.088E-3	0.068E-3	0.170	0.357
gender (male)	-0.025	-0.032E-3	0.048E-3	0.502	0.517
Hispanic ethnicity	0.003	0.004E-3	0.082E-3	0.960	0.118
White	-0.100	-0.139E-3	0.081E-3	0.052	0.762
African American	0.021	0.027E-3	0.092E-3	0.766	0.108
Enabling factors					
Supply factors					
MSA	0.098	0.116E-3	0.051E-3	0.023	0.733
no regular sources	1.989	0.077	0.011	0.000	0.011
office	1.806	0.053	0.009	0.000	0.017
emergency room	2.205	0.116	0.021	0.000	0.002
health center	1.811	0.054	0.009	0.000	0.013
home doctor	0.066	0.093E-3	0.074E-3	0.158	0.026
Barrier factors					
Financial barriers					
cost	1.238	0.015	0.003	0.000	0.006
health plan coverage	0.951	0.007	0.002	0.000	0.002
finance	0.355	0.836E-3	0.239E-3	0.000	0.008
Indirect barriers					
transportation	0.248	0.485E-3	0.529E-3	0.178	0.047E-2
time	0.973	0.007	0.004	0.000	0.044E-2
Practice-level barriers					
treatment	0.787	0.004	0.003	0.002	0.023E-2
appointment	0.622	0.002	0.003	0.038	0.015E-2
dissatisfaction	0.702	0.003	0.005	0.118	0.008E-2
Health capital factors					
high school	-0.057	-0.069E-3	0.059E-3	0.255	0.288
less than college	-0.052	-0.063E-3	0.069E-3	0.378	0.261
college	-0.114	-0.137E-3	0.078E-3	0.089	0.360

Table 5 continued,

Variables	Estimate	Marginal	Std. Err.	P value	Mean
non English spoken	-0.421	-0.300E-3	0.058E-3	0.000	0.053
poverty I	0.522	0.001	0.315E-3	0.000	0.133
poverty II	0.498	0.001	0.252E-3	0.000	0.190
no work	-0.034	-0.041E-3	0.099E-3	0.696	0.002
health status					
least sever	0.214	0.387E-3	0.138E-3	0.000	0.023
mildly sever	0.272	0.553E-3	0.227E-3	0.000	0.006
modestly sever	0.244	0.474E-3	0.318E-3	0.028	0.002
most sever	0.072	0.103E-3	0.196E-3	0.556	0.001
dental problem	0.134	0.211E-3	0.093E-3	0.003	0.021
physical problem	0.081	0.118E-3	0.159E-3	0.391	0.002
mental health problem	0.214	0.392E-3	0.240E-3	0.019	0.002
constant	-3.499	--	0.100	0.000	--
Log likelihood = -2819.6483					
Wald Statistic = 8682.07					
Likelihood Ratio (chi-square distribution) =10700.16					
Probability > chi-square = 0.0000					
Pseudo R^2 = 0.6549					

Note: Marginal is a change in the probability for a change in $x_i = \partial\Phi/\partial\, x_i$.

An intercept term is a regular probit estimation.