
Disenrollment and Re-enrollment Patterns in a SCHIP

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This article examines the impact of four policy changes made to a State children's health insurance program (SCHIP) as it transitioned to Title XXI on program disenrollment and re-enrollment. The changes were: (1) expanded eligibility criteria, (2) reduction in the family share of the premium, (3) expansion of the mental health benefit, and (4) implementation of a 60-day wait period to re-enroll in the program for children who involuntarily disenrolled due to non-payment of premium. Disenrollment was reduced by 20 percent after the changes were implemented. Disenrollment and re-enrollment rates varied significantly based on the child's health and family income.

INTRODUCTION

Title XXI of the Social Security Act established the SCHIP to provide coverage for low-income uninsured children. States had the option to provide this coverage by (1) expanding their Medicaid Programs, (2) expanding other existing subsidized insurance programs for children in their States, and/or (3) developing new programs. In addition to considering the overall program structure, State health care program administrators and policymakers had other critical decisions to make about the design of their Title XXI initiatives, including program eligibility criteria, the benefits package, the amount of the family share of the premium, and many others (Rosenbaum et al., 1998).

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States expanding existing subsidized insurance programs (other than Medicaid) for children often had to incorporate changes into those programs to meet Federal requirements. The purpose of this article is to examine the impact of four major policy changes on program disenrollment, and re-enrollment as a subsidized SCHIP transitioned to a Title XXI program. The changes were: (1) expanded eligibility criteria, (2) a reduction in the family share of the monthly health insurance premium, (3) expansion of the mental health benefit offered through the program, and (4) implementation of a 60-day wait period to re-enroll in the program for those families whose children were involuntarily disenrolled due to non-payment of premium. The State program and the importance of gaining a greater understanding of the impact of the preceding program changes on enrollment, disenrollment, and re-enrollment are described in subsequent sections.

STATE PROGRAM

In 1990, the Florida Legislature established a non-profit HKC to administer a comprehensive health insurance program for uninsured children (Freedman et al., 1988). A pilot project was implemented in one Florida county in 1992 and expanded to 17 other sites by 1998, with more than 40,000 enrollees. Prior to the Title XXI implementation, families with incomes below 185 percent of the Federal poverty level (FPL) were eligible for subsidized premiums. Following the beginning of the Title XXI implementation in April 1998,

Table 1
Comparison of Mental Health Benefits in the Florida Healthy Kids Program Pre- and Post-Title XXI Initiative

Category	Health Benefits	
	Pre-Title XXI ¹	Post-Title XXI
Behavioral Health		
Inpatient	15 days per year	30 days per year, of which 20 days can be used for residential services
Outpatient	20 behavioral health visits per year	40 behavioral health visits per year
Substance Abuse Treatment	Only pregnant adolescent enrollees were entitled to alcohol and drug abuse detoxification	Any enrollee is allowed up to 40 outpatient substance abuse treatment visits per year; and up to 30 inpatient substance abuse treatment visits per year
Lifetime Maximums	\$20,000 for behavioral health services and \$1 million for medical services	\$1,000,000 for all benefits

¹ October 1998.

SOURCE: Florida Healthy Kids Corporation, 2000.

subsidized premiums were extended to families with incomes below 200 percent of the FPL. Second, the family share of the premium changed. Prior to April 1998, families paid a range of \$5-\$27 per child per month depending on the county where the family lived and family income. Families above 186 percent of the FPL could pay the full premium amount of \$55-\$65 per child per month. After April 1998, the family share of the premium was changed to \$15 per family per month for those under 200 percent of the FPL, regardless of the number of children enrolled. Families above 200 percent of the FPL could pay the full premium of approximately \$75 per child per month.

Two other changes were made to the Healthy Kids Program (HKP) as part of the Title XXI initiative in October 1998. First, the behavioral health component of the benefits package was enhanced (Table 1). The allowable number of inpatient days and outpatient visits were doubled. Eligibility for substance abuse treatment was expanded and the lifetime maximum for benefits was increased. Second, as part of the program eligibility changes, a 60-day

waiting period was implemented for those families whose children disenrolled from the program due to non-payment of their premium and later wished to re-enroll.

The basic functions performed by the HKC did not change after the implementation of Title XXI. The HKC continues to negotiate contracts with health plans to assume financial risk and to provide health care services. Thirteen different health plans participate in the statewide program. In three counties, families may choose between two health plans. In the remaining counties, there is one plan available per county with some plans participating in more than one county. At the time of this study, all of the participating plans were health maintenance organizations (HMOs).

Both before and after the implementation of Title XXI, the HKP used a passive renewal process to renew coverage for its enrollees. Annually, the HKC sends letters and a copy of the application to enrollees' families asking them to complete the application to renew coverage for the upcoming year. Completed and returned applications are used to update the enrollees' files. However, if an application is not returned,

the child remains enrolled. A child is only disenrolled if the parent requests that the child discontinue program participation or if the parent stops paying the monthly premium. Families are not required to engage in a face-to-face renewal process and the children are not disenrolled for failure to return paperwork.

The Healthy Kids benefit package includes well-child visits, immunizations, inpatient care, and maternity benefits with no copayment required. Other benefits with minimal copayments include outpatient care, mental health services, prescriptions, eyeglasses, physical therapy, and emergency services and transportation. A \$3 copayment is required for acute care outpatient services, a \$5 copayment for mental health visits, a \$10 copayment for eyeglasses, and a \$25 copayment for emergency room services. As of July 2001, the HKP is the largest component of the Title XXI initiative in Florida, with over 160,000 enrollees.

SIGNIFICANCE OF PROGRAM CHANGES

Program Eligibility Changes

Two of the HKP changes were categorized as eligibility changes. These were (1) eligibility expansion to 200 percent of the FPL and (2) implementation of a 60-day wait period to re-enroll after involuntary disenrollment following premium non-payment. Florida already covered families up to 185 percent of the FPL through the HKP and decided to expand coverage to 200 percent of the FPL as allowed in the Federal legislation. This expansion in eligibility translated into a premium reduction for families between 185-200 percent of the FPL. Prior to the policy changes, families at or above 185 percent of the FPL could participate in the HKP by paying the full

premium amount of approximately \$65 per child per month for their children. After the policy change, families between 185-200 percent of the FPL experienced a marked reduction in the amount to \$15 per month regardless of the number of children covered. We anticipated that this eligibility expansion would result in reduced disenrollment from the program.

Prior to the implementation of SCHIP, there was no waiting period to re-enroll children if the policy was cancelled involuntarily due to non-payment of premium. The 60-day waiting period was implemented to discourage families from paying their monthly premiums only during those months when their children used health care services. The health plans participating in the program were concerned about adverse selection and the negative financial impact if families were allowed to enroll, disenroll, and re-enroll their children with no penalty. Thus, the 60-day waiting period was implemented in the hope that selective enrollment and disenrollment from the plans, at least due to non-payment of premium, would be controlled. We anticipated that this policy change would result in reduced disenrollment from the program.

Changes in the Family Monthly Insurance Premium

Insurance premium affordability for low-income families is a major issue. To comply with the Federal requirement that no family pay more than 5 percent of their income for premiums and copayments annually, the Healthy Kids insurance premium was set at \$15 per family per month regardless of the number of children enrolled. This program change resulted in a premium reduction for the majority of families. In addition, families between 185-200 percent of the FPL whose children

were enrolled in the program prior to the Title XXI related changes experienced a premium decrease due to the expanded eligibility allowing subsidized premiums for families below 200 percent of the FPL. We anticipated these changes would result in decreased disenrollment. However, the effect of this change on families' decisions to keep their children enrolled is not known.

Expansion of the Mental Health Benefit Package

Among children, mental health conditions are the most common cause of disability (Newacheck and Taylor, 1992). Yet, traditionally, mental health benefits for children and adolescents have been limited. In addition to limited benefits, children with mental health conditions may face restricted access to care due to stringent utilization management approaches and limited provider networks. The Florida Legislature approved a richer mental health benefit for HKP enrollees as part of the transition to Title XXI in an attempt to better meet the special health care needs of these children. We anticipated that the enriched benefit package would result in decreased disenrollment for children with mental health conditions.

STUDY QUESTIONS AND HYPOTHESES

The following study questions were addressed:

- What is the relationship between child health variables (as measured by the presence of a special health care need, and the presence of a mental health condition), child demographic variables (as measured by child age, sex, household size, and FPL status), and the program changes (reduced family premium,

enhanced mental health benefits, and 60-day waiting period) on disenrollment from the HKP?

- What is the relationship between child health variables, child demographic variables, and the program changes on re-enrollment in the HKP?

We hypothesized that:

- Families who experienced a reduction in their premium would be less likely to disenroll after the eligibility and premium changes of April 1998, than before those changes were implemented. The eligibility expansion for subsidized premiums from 185 to 200 percent of the FPL resulted in a premium reduction because these families changed from a minimum of \$75 per child per month to \$15 per month regardless of the number of children enrolled.
- Children who had a physical special health care need would be less likely to disenroll from the program after the October 1998 policy changes.
- Children who had a diagnosis indicating a mental health condition would be less likely to disenroll from the program after the October 1998 policy changes.
- Families would be less likely to disenroll their children after the implementation of a 60-day waiting period for re-enrollment following non-payment of premium.

METHODS

Sample Selection

A census of all children enrolled in the HKP for at least 1 month from October 1, 1997-September 30, 1999 was identified and included in the analysis ($N=36,648$). These date ranges were selected to capture sufficient periods of time both before and after the program changes in April and October 1998. Thus, 6 months of coverage information

(i.e., enrollment and disenrollment) was available prior to the first program changes that expanded eligibility and reduced the family share of the premium (April 1, 1998). A full year of coverage information was available preceding the second program changes involving the expansion of the mental health benefit and the implementation of the 60-day waiting period to re-enroll children following involuntary disenrollment due to non-payment of premium (October 1, 1998). One full year of coverage information was available following the October 1, 1998 program changes. Children who enrolled after October 1997 were not included in the analysis because we wanted to ensure that we had a full year of coverage and health care use information on the enrollees for at least 1 year before and after the last program change in October 1998. Moreover, we did not want to include children in the analyses who had not experienced both policy changes.

Data Sources

The Florida HKC provided the data that were used in this study. The data came from two original sources. First, enrollment files from the third party administrator contracting with the program were used to identify the number of months each child was covered, whether the child disenrolled, and whether the child subsequently re-enrolled. The enrollment files also contained information about family income, household size, and the age and sex of the child.

Second, each participating health plan provided person-level claims and encounter files for the same 2-year time period described. The claims and encounter records contain the following information: Physician's Current Procedural Terminology (CPT) codes (American Medical Association, 1999) and *International Classification of Diseases*,

Ninth Revision, Clinical Modification (ICD-9-CM) codes (Public Health Service and the Health Care Financing Administration, 1980). These claims and encounter data included all outsourced mental health claims.

Measures

Child Health Variables

The claims and encounter data were used to characterize the children's health. First, we determined if the child had any diagnoses assigned during a health care encounter that might be indicative of a physical special health care need. A list of ICD-9-CM codes that might be indicative of a physical special health care need was used to search the claims and encounter data (Shenkman, Nackashi, and Bucciarelli, 1996). Three pediatricians from the University of Florida developed this list that included low-prevalence but high-severity conditions such as various congenital anomalies and high-prevalence, low-severity conditions such as asthma. The pediatricians included two generalists specializing in the care of children with special health care needs and a pediatric cardiologist/neonatologist. A consultant at the National Association of Children's Hospitals and Related Institutions reviewed this list and made recommendations for further refinement. Based on these recommendations, the list was revised and used in this study. Using this diagnostic list, children were categorized as having a physical special health care need or not if they had at least two occurrences of the condition during the study period. Two occurrences were required to reduce the likelihood that we would include rule out diagnoses in our analyses.

Second, we identified children who had an ICD-9-CM code indicating a mental health condition. The claims and encounter

data were searched for any ICD-9-CM code in the range of 290 to 319. In addition, certain V-codes and E-codes were incorporated into the search that reflected the presence of a mental health condition. Children with two occurrences of these codes were categorized as having a mental health condition. The occurrence of one E-code indicating attempted suicide also resulted in the classification of the child as having a mental health condition.

Demographic Variables

The families' income expressed as a percent of the FPL was calculated from the enrollment files. Household size, age and sex of the child, and the number of months the child was enrolled in the program also were included. In addition, for each child, the family share of the premium pre and post the implementation of Title XXI was available. The amount of the monthly premium was calculated for each family and used in the analyses. For example, families at 150 percent of the FPL were paying as much as \$27 per child per month before Title XXI. After Title XXI, the premium amount for these same families was reduced to \$15 per month regardless of the number of children enrolled. These actual premium amounts were used in the analyses.

Program Change Variables

A time-varying covariate named "premium" was constructed to capture the premium in dollars that each family paid both before and after the April 1998 policy change altering the family share of the premium. In addition, this variable also captured the premium amount paid by families between 185-200 percent of the FPL who became eligible for subsidized premiums as a result of the program eligibility changes.

A time-varying dummy covariate was constructed and named "policy" to reflect the expansion of the mental health benefit and the implementation of the 60-day waiting period that occurred in October 1998. Because two program changes occurred simultaneously in October, it was not possible to construct separate variables representing the two changes.

Enrollment, Disenrollment, and Re-enrollment

All children enrolled in the program for at least 1 month were included in the analyses. A child was considered a disenrollee if he or she was not enrolled in the program for at least 2 consecutive months. Two consecutive months was selected as the timeframe to ensure that the child is truly a disenrollee. Families pay their premium in one month to ensure coverage for the following month. Although the payment is due on the first of the month, the family has the full 30 days to submit payment. The Third Party Administrator's enrollment files are dynamic and are adjusted daily. However, there is a cutoff date each month when the enrollment files are sent to us for analytic purposes. Thus, it is possible that a child whose family who had not yet made a monthly payment by the time our file was prepared would appear as a disenrollee for the following month. However, as soon as the payment was received, the child would appear in the file as an enrollee, with no loss in coverage. To avoid problems with late payments that did not result in a loss of coverage, we elected to use a 2-month time period to identify disenrollees. A child was considered a re-enrollee if he or she had been enrolled at some time in the 2 years under study, disenrolled for at least 2 consecutive months, and then appeared again as an enrollee.

Data Analysis

We chose to analyze the impact of program changes using a Cox proportional hazards model with time-varying covariates (Cox, 1972). The Cox proportional hazards model is widely used in the multivariate analysis of duration data, and represents a reasonable compromise between the rigid structure of full parametric models and strictly empirical approaches such as the Kaplan-Meier estimator (Kaplan and Meier, 1958).

Following the sample description, we concentrate on the hazard rate for statistically significant variables. This ratio measures the hazard rate when $X=1$ divided by the hazard rate when $X=0$, and provides a useful summary of the impact of dummy covariates.

RESULTS

Sample Description

Table 2 contains a description of the sample. The majority of children had at least one health care encounter during the time period studied, with a significant increase in the percentage of health care users post the Title XXI related changes ($\chi^2=440.01$). On October 1, 1997, a small percentage of the enrollee pool (11 percent) had a diagnosis that was indicative of a physical special health care need and an additional 8 percent had a diagnosis indicative of a mental health condition. The percentage of children with a physical special health care need increased to 14 percent after the policy changes ($\chi^2=37.42$) while no change was observed in the percentage of children with mental health conditions.

The majority of enrollees resided in families with incomes below 133 percent of the FPL. This percentage decreased from 66 to 63 percent after the policy changes.

There also was an increase in the percentage of families with incomes between 133-185 percent of the FPL ($\chi^2=153.93$). As a result of the Title XXI-related program changes, only one-half of the families had a decrease in their premium. Approximately 65 percent of children were between ages 5-14. Only 1 percent were under age 5 and these were siblings of school age enrollees. The age group 15-19 comprised about 25 percent of the enrollee pool.

Prior to the Title XXI-related changes, 32 percent disenrolled from the program and an additional 16 percent disenrolled but later re-enrolled. After the Title XXI-related changes, 13 percent disenrolled and another 18 percent disenrolled but later re-enrolled. The changes in disenrollment pre and post the policy changes were significantly different ($\chi^2=324.39$).

Survival Model Results for Disenrollment

The results for our survival model for disenrollment are presented in Table 3. The first model using continuous covariates for child age, household size, and income and the second using dummies variables for these constructs. Because the second model uses dummies, its hazard rates are easier to interpret. Both models, however, give similar results.

Our major interest is in measuring the impacts of the policy changes that occurred in April and October 1998. To capture the effect of the premium change in April 1998, we included in our models a time-varying covariate measuring the actual amount each family paid for the Healthy Kids premium. By including such a variable in our models, we are able to measure the impact of variations in premiums on the hazard rate for disenrollment. Consequently, we are able to estimate the impact of the April 1998 changes in the Healthy Kids premium

Table 2

Percent of Children Enrolled in the Florida Healthy Kids Program Pre- and Post-Title XXI Program Changes, by Study Variables: 1997-1999

Variable	Program Changes	
	Prior to October 1998 N=36,648	Post October 1998 N=27,917
Health Related		Percent
Used Health Care System at Least Once ¹	81	87
Presence of a Diagnosis Indicating a Special Health Care Need ¹	11	14
Presence of a Mental Health Diagnosis	8	8
Demographic		
Family Income as a Percent of FPL¹		
Less than 133	66	63
133-185	23	26
185-200	3	4
More than 200	7	8
Had an Increase in Premium	NA	50
Had a Decrease in Premium	NA	50
Sex		
Male	52	52
Female	48	48
Age		
1-4 Years	1	1
5-9 Years	29	29
10-14 Years	44	45
15-19 Years	26	25
Household Size		
2 or 3	39	39
4	31	31
5	19	19
6 or More	11	11
Enrollment Characteristics¹		
Enrolled With No Episodes of Disenrollment	52	69
Disenrolled and Did Not Return	32	13
Disenrolled But Later Re-enrolled	16	18

¹ Differences between pre- and post-Title XXI group significant $p < 0.0001$

NOTES: FPL is Federal poverty level. NA is not applicable.

SOURCE: Shenkman, E., Vogel, B., Boyett, J.M., University of Florida and Naff, R., Florida Healthy Kids Corporation, 2001.

structure. To do this, we first calculated the change in total monthly premium for each family resulting from the April 1998 policy change. Next, we calculated the key percentiles of the distribution of these changes in premiums. Then, we used the coefficients from the premium variable in disenrollment survival models to calculate the ratio of the hazard rate after the premium change to the hazard rate before the premium change. The impact of the premi-

um change on the hazard rate will vary across families because the premium change will vary with the household's number of children and income. The coefficient for the premium variable is 0.000 in the continuous model and 0.004 in the dummy model. (Given the proportional hazards model $h(t|X) = h_0(t)e^{\beta X}$, we calculated the hazard rate for each key percentile of the premium change distribution as where β_{prem} is the regression coefficient for the

Table 3
Florida Healthy Kids Program Survival Model for Disenrollment, by Study Variables: 1997-1999

Variable	Continuous Variable Model			Dummy Variable Model		
	Parameter Estimate	Hazard Rate	P-Value	Parameter Estimate	Hazard Rate	P-Value
Intercept	-0.513	0.599	<0.0001	-0.502	0.605	<0.0001
Has a Diagnosis of a Physical Special Health Care Need	-0.455	0.634	<0.0001	-0.465	0.0628	<0.0001
Has a Mental Health Diagnosis	-0.623	0.536	<0.0001	-0.617	0.539	<0.0001
Age	-0.007	0.993	0.0009	NA	NA	NA
5-9 Years	NA	NA	NA	-0.125	0.882	0.1142
10-14 Years	NA	NA	NA	-0.239	0.750	<0.0003
15-19 Years	NA	NA	NA	-0.018	0.834	0.0223
Sex	0.007	1.000	0.666	0.005	1.005	0.7435
Household Size	0.074	1.077	<0.0001	NA	NA	NA
Less than 3	NA	NA	NA	-0.019	1.980	0.4556
4	NA	NA	NA	-0.056	0.945	0.0328
5	NA	NA	NA	-0.0025	0.975	0.3804
Family Income as a Percent of FPL	0.000	1.000	<0.0001	NA	NA	NA
Less than 133	NA	NA	NA	0.559	1.748	<0.0001
133-185	NA	NA	NA	0.037	1.038	<0.3630
185-200	NA	NA	NA	-0.149	0.863	0.0161
Premium	0.000	1.005	<0.0001	0.004	1.004	<0.0001
Policy	0.076	1.079	<0.0001	0.668	1.069	<0.0065
Mental Health Diagnosis x Policy	0.702	2.018	<0.0001	0.687	2.009	<0.0001

NOTES: NA is not applicable. FPL is Federal poverty level.

SOURCE: Shenkman, E., Vogel, B., Boyett, J.M., University of Florida and Naff, R., Florida Healthy Kids Corporation, 2001.

premium variable and Δ premium is the specified percentile of the distribution of premium changes [new premium minus old premium] in our sample.)

Table 4 summarizes these calculations. The mean and median changes in monthly premiums were reductions of approximately \$5. The disenrollment hazard rates for such a reduction in premiums are approximately 0.974 to 0.980. This indicates that families experiencing either the mean or median change in monthly premiums had slightly lower hazard rates for disenrollment following the changes in premium structure. Families that experienced greater absolute changes in premiums had greater absolute changes in hazard rates for disenrollment. For example, families at the 5th percentile of the premium change distribution experienced reductions of \$45 per month, and had post-change hazard rates that were only 0.800 to 0.831 percent of their pre-change hazard rates. By contrast, families at the 95th percentile of the

premium change distribution experienced monthly premium increases of \$20 and had a 8.6 to 10.4 percent increase in their hazard rates for disenrollment.

The October 1998 policy changes (the expansion of mental health benefits and establishment of a 60-day wait period for re-enrollment) were modeled in two different ways. First, we defined a time-varying dummy covariate that equaled one for the period after October 1, 1998 and zero beforehand. The results for this variable in both models in Table 3 indicate that these policy changes significantly increased hazard rates for disenrollment for children without a mental health diagnosis by approximately 7-8 percent (hazard rates = 1.069 and 1.079). This is somewhat puzzling since we had expected the October 1998 policy changes to decrease the hazard rates for disenrollment.

Our attempt to refine our estimates of the effects of October 1998 policy changes produced another puzzling result. We hypothesized that the expansion of mental health

Table 4
Disenrollment Hazard Rates Resulting from Changes in the Healthy Kids Premium Structure, Florida: 1997-1999

Percentile of Premium Change Distribution	Dollar Amount of Change in Premium	Hazard Rates	
		Continuous Variables Model	Dummy Variables Model
99th	\$54	1.307	1.248
95th	20	1.104	1.086
90th	8	1.038	1.031
75th	8	1.038	1.031
50th	-5	0.976	0.980
Mean	-5	0.974	0.979
25th	-12	0.944	0.953
10th	-35	0.841	0.866
5th	-45	0.800	0.831
1	-101	0.606	0.660

SOURCE: Shenkman, E., Vogel, B., Boyett, J.M., University of Florida and Naff, R., Florida Healthy Kids Corporation, 2001.

benefits would have a greater absolute impact on families with children who had a mental health diagnosis. In particular, we expected that the policy change would reduce the hazard rate for disenrollment for children with mental health diagnoses to a greater degree than for children without a mental health diagnosis. To capture this effect, we interacted the mental health diagnosis dummy with the October 1998 policy dummy. We expected to see a reduction in hazard rates for disenrollment in the post-October 1998 period for children with mental health diagnoses. Instead, we observed a large increase in hazard rates for disenrollment in the post-October 1998 period for children with mental health diagnoses. For kids with mental health diagnoses, the hazard rate for disenrollment in the post-October 1998 period was 2.15 times the hazard rate for disenrollment in the pre-October 1998 period.¹ This result is larger than the analogous hazard rate of 1.07-1.08 for kids without a mental health diagnosis.

Other results in Table 3 demonstrate the following:

- Children who have at least one physical special health care need are less likely to disenroll than children who have no phys-

ical special health care needs. The hazard rate for children with physical special health care needs is only approximately 63 percent (hazard rates=0.628-0.634) of the hazard rate for children without physical special health care needs.

- Children with mental health diagnoses are markedly less likely to disenroll than children without mental health diagnoses in the pre-October 1998 period (hazard rates = 0.536-0.539). In the post-October 1998 period, children with mental health diagnoses are slightly more likely to disenroll than those children without mental health diagnoses (hazard rate=1.08).
- Children in the age group 10-14 and over age 15 group may be less likely to disenroll than younger children. The variables for the age group 10-14 and over age 15 group in the dummy variable model are significant with hazard rates of 0.750-0.834, suggesting that children in this age group are less likely to disenroll than children in the reference group, whose ages are less than 5 years.
- The impact of household size is uncertain. The model with continuous covariates suggests that children from larger households have higher hazard rates for disenrollment, but the model with

¹This hazard rate was calculated as the product of the hazard rate for the mental health diagnosis-October 1998 interaction term and the hazard rate for the October 1998 policy dummy.

Table 5
Florida Healthy Kids Program Survival Model for Re-enrollment, by Study Variables: 1997-1999

Variable	Continuous Variable Model			Dummy Variable Model		
	Parameter Estimate	Hazard Rate	P-Value	Parameter Estimate	Hazard Rate	P-Value
Intercept	-0.491	0.612	<0.0001	-0.489	0.613	<0.0001
Has a Diagnosis of a Physical Special Health Care Need	0.387	1.473	<0.0001	0.379	1.460	<0.0001
Has a Mental Health Diagnosis	0.443	1.559	<0.0001	0.423	1.527	<0.0001
Age	-0.035	0.965	<0.0001	NA	NA	NA
5-9 Years	NA	NA	NA	0.073	1.075	0.0578
10-14 Years	NA	NA	NA	0.0517	1.053	0.6904
15-19 Years	NA	NA	NA	-0.262	0.769	0.0459
Sex	0.033	1.034	0.0204	0.033	1.034	0.0209
Household Size	-0.013	0.988	0.2254	NA	NA	NA
Fewer than 3	NA	NA	NA	-0.131	0.877	<0.0001
4	NA	NA	NA	-0.117	0.889	0.0087
5	NA	NA	NA	-0.128	0.880	0.0082
Family Income as a Percent of FPL	0.000	1.000	<0.0001	NA	NA	NA
Less than 133	NA	NA	NA	-0.579	0.561	<0.0001
133-185	NA	NA	NA	-0.155	0.856	0.1793
185-200	NA	NA	NA	-0.078	0.925	0.5534
Premium	-0.010	0.990	<0.0001	-0.012	0.988	<0.0001
Policy	-0.363	0.693	<0.0001	-0.365	0.695	<0.0001
Mental Health Diagnosis x Policy	-0.122	0.842	<0.0027	-0.171	0.843	<0.1046

NOTES: NA is not applicable. FPL is Federal poverty level.

SOURCE: Shenkman, E., Vogel, B., Boyett, J.M., University of Florida and Naff, R., Florida Healthy Kids Corporation, 2001.

dummy covariates suggest that children in households of four members are somewhat less likely to disenroll (hazard rate=0.945 than children in the largest households (more than five members).

- Children in families with very low incomes are more likely to disenroll, as evidenced by hazard rates of 1.748 for those below 133 percent of the FPL. By contrast, children in families with incomes between 185 and 200 percent of the FPL are somewhat less likely to disenroll, as evidenced by a hazard rate of 0.863. Both ratios are measured relative to those families above 200 percent of the FPL.

Survival Model Results for Re-enrollment

Table 5 presents the results for our re-enrollment survival models. As in the results for the disenrollment model in Table 3, two models are presented: one

using continuous covariates and the other using dummy variables to measure the major constructs. As in Table 3, the two models give generally similar results.

We used the coefficient of the premium variable along with the percentiles of the premium change distribution to measure the impact of the April 1998 change in premium structure. However, we are now focusing on the hazard rate for re-enrollment as opposed to the hazard rate for disenrollment. Table 6 summarizes our calculations for the re-enrollment model. The hazard rates for the median and mean premium changes are approximately 1.05-1.06. This indicates that families experiencing either the median or mean change in monthly premiums had slightly higher hazard rates for re-enrollment following the changes in premium structure. In examining the percentiles of the premium change distribution, we find that families at the 25th percentile of the premium change distribution (-\$12 per month) had post-change haz-

Table 6
Re-enrollment Hazard Rates Resulting from Changes in the Healthy Kids Premium Structure, Florida: 1997-1999

Percentile of Premium Change Distribution	Dollar Amount of Change in Premium	Hazard Rates	
		Continuous Variables Model	Dummy Variables Model
99th	\$54	0.570	0.522
95th	20	0.812	0.786
90th	8	0.925	0.914
75th	8	0.925	0.914
50th	-5	1.053	1.062
Mean	-5	1.056	1.065
25th	-12	1.129	1.151
10th	-35	1.439	1.524
5th	-45	1.597	1.718
1	-101	2.859	3.370

SOURCE: Shenkman, E., Vogel, B., Boyett, J.M., University of Florida and Naff, R., Florida Healthy Kids Corporation, 2001.

ard rates for re-enrollment that were approximately 1.13-1.15 times their pre-change rates. By contrast, families at the 90th percentile of the premium change distribution (+\$8 per month) had hazard rates that were only 91-92 percent of their pre-change rates.

Examining the dummy variable for the October 1998 policy changes (expansion of mental health benefits and establishment of a 60-day wait period for re-enrollment), we find that these changes decreased hazard rates for re-enrollment (hazard rates = 0.693-0.695) among those children without a mental health diagnosis (Table 5). In contrast to the disenrollment results, these October 1998 policy changes appear to have had a substantial impact on hazard rates for re-enrollment. While the October 1998 policy changes modestly increased the chances of disenrollment, they substantially decreased the chances of re-enrollment.

Once again, however, our attempt to refine our estimates of the effects of the October 1998 policy changes produced counterintuitive results. We hypothesized that the expansion of mental health benefits would have a greater absolute impact on families with children who had a mental health diagnosis. In particular, we expected that the policy change would increase the

hazard rate for re-enrollment for children with mental health diagnoses since mental health benefits had been increased. For this reason, we expected to see a sizable increase in hazard rates for re-enrollment in the post-October 1998 period for children with mental health diagnoses. Instead, we observed a reduction in hazard rates for disenrollment in the post-October 1998 period for children with mental health diagnoses. For kids with mental health diagnoses, the hazard rate for re-enrollment in the post-October 1998 period was only 0.585 times the hazard rate for re-enrollment in the pre-October 1998.² These results are quite similar to the results for children without mental health diagnoses, where the hazard rate for re-enrollment in the post-October 1998 period was 0.69 times the rate in the pre-October 1998 period.

Other results in Table 5 demonstrate the following:

- Children who have at least one physical special health care need are more likely to re-enroll than children who have no physical special health care needs. The hazard rate for children with physical

² This hazard rate was calculated as the product of the hazard rate for the mental health diagnosis-October 1998 interaction term and the hazard rate for the October 1998 policy dummy.

special health care needs is approximately 46-47 percent higher than the hazard rate for children without physical special health care needs.

- Children with mental health diagnoses are more likely to re-enroll than children without mental health diagnoses in the pre-October 1998 period (hazard rate = 1.527-1.559).
- There is some evidence that smaller households are less likely to re-enroll their children than larger households. While the continuous household size variable is statistically insignificant, the three dummies measuring smaller household size suggest that such smaller households have hazard rates that are only 88 percent of the hazard rates of the reference group (households with more than five members).
- The results suggest that older children are less likely to re-enroll. The model with continuous covariates suggests that older children have lower hazard rates for re-enrollment. The model with dummy covariates suggests that children over age 15 are only roughly 77 percent as likely to re-enroll as children under age 5.
- Children in families with the lowest incomes are less likely to re-enroll, as evidenced by a hazard rate of 0.561 for those below 133 percent of the FPL. The rate is measured relative to those families above 200 percent of the FPL.

DISCUSSION

The Title XXI Program was intended to improve children's access to health care by providing affordable insurance coverage to low-income families. However, access to care and the quality of the children's health care may be hampered if they are covered for short periods of time. Unfortunately, very little information is available about the

factors influencing disenrollment and re-enrollment patterns in subsidized children's health insurance programs. The HKP changes implemented as part of the Title XXI initiative offer a unique opportunity to assess the impact of changes in the premium amount, the implementation of a 60-day wait period for re-enrollment following cancellation due to non-payment of premium, and expansion of mental health benefits on children's disenrollment and re-enrollment.

The premium-related program changes had a significant impact on program disenrollment and re-enrollment, however, not always in the expected direction. Fifty-percent of families whose children were enrolled prior to April 1998 had a decrease in their premiums, on the average of \$5 per month. For those families experiencing the mean premium changes, the impact on children's disenrollment was modest, although significant. Children in these families had odds of disenrolling after the premium change that were only 0.97 when compared with their odds of disenrolling prior to the premium change (Table 4). A substantial decrease in the odds of disenrolling from the program after the premium change was not seen until reductions of \$45 per month were achieved. Those families were 0.80 times less likely to disenroll their children from the program after the premium reduction, as before the premium change (Table 4).

Similarly, families experiencing the mean premium change had a slightly higher hazard rate for re-enrolling their children following a disenrollment episode. For example, families experiencing the mean premium change had a hazard rate for their children's re-enrollment that was 5-6 percent higher post-April 1998 when compared with the pre-April 1998 time period.

The combined program changes that occurred in October 1998—expanding the mental health benefit package and imple-

menting a 60-day wait period for re-enrollment following cancellation due to non-payment of premium—had a significant impact on children’s disenrollment. In an attempt to isolate the effect of the mental health benefit expansion, we included a variable for the presence of mental health conditions in our models. For children with mental health conditions, their hazard rate for disenrollment post-October 1998 was about 7-8 percent higher when compared with the pre-October 1998 period. We also observed a substantially decreased hazard rate of 0.585 for re-enrollment among these children when comparing the pre- and post-October 1998 time periods.

Very limited information is available about the enrollment and disenrollment patterns of children with mental health conditions in managed care plans. One study revealed that children with at least one inpatient psychiatric admission had higher rates of disenrollment from a Medicaid managed care plan than children with other types of inpatient admissions (Scholle et al., 1997). The authors noted that the high rates of disenrollment among these children could be due to a range of factors including dissatisfaction with provider choice, access to care, or plan administration. Our finding warrants further exploration. The State’s expansion of the mental health benefit may not have the intended effect on children’s access to care for these services due to their increased risk for disenrollment. More detailed information is needed about these children’s access to care, families’ satisfaction with their care, and their health care use patterns. Such information may help explicate our finding.

Disenrollment for children without mental health conditions increased by about 7 percent after the October 1998 policy changes. Thus, the implementation of a

60-day waiting period following non-payment of premium seems to have had little effect on slowing the rate of disenrollment. While this finding is not as expected, perhaps other factors play a greater role in families’ decisions to disenroll their children from health insurance programs.

For example, some variables, independent of the policy changes, were significantly related to the odds of disenrollment and re-enrollment, particularly the presence of a physical special health care need and family income. Children with physical special health care needs had hazard rates for disenrollment that were 63 percent that of children without such health care conditions. Children with physical conditions also had a higher incidence of re-enrollment in the program following a disenrollment spell (hazard rate of 1.47) than children with no conditions. Not surprisingly, families may make decisions to keep their children enrolled or to re-enroll them in the program based on the children’s physical health care needs. These decisions may be independent of any policy changes intended to control disenrollment and re-enrollment behaviors among SCHIP enrollees.

Available studies assessing enrollees’ health status and their program enrollment and disenrollment patterns have focused on the elderly (Newcomer, Preston, and Harrington, 1996; Morgan, et al., 1997). These studies have also largely focused on plan switching or movement out of HMOs. Elderly enrollees with functional impairments or those with increased health care use are more likely to disenroll from HMOs when compared with their fee-for-service counterparts or to healthier enrollees. However, presumably, those disenrolling switch to a non-HMO option.

In our study, children with greater health care needs as evidenced by the presence of a physical special health care

need tend to remain enrolled or re-enroll after a disenrollment spell. If, in fact, children with physical special health care needs continue to have greater odds of remaining enrolled in the program than healthy children, there could be implications for the financing and organization of the program. Over time, the premium may increase due to the adverse retention of children with increased health care needs and the loss of healthier children. In addition, the size and composition of the provider network may need to change to accommodate sicker children, perhaps in need of more specialty care.

Further studies should focus on factors influencing families' decisions to enroll, disenroll, and re-enroll their children. Information about the children's health status as well as other insurance and health care options available to families will be essential to such analyses. At the present time we are gathering information about children's insurance status and access to care for those who disenroll and for those who disenroll and later re-enroll. These findings will be incorporated into future analyses.

In terms of family income, those below 133 percent of the FPL were the most likely to disenroll and the least likely to re-enroll their children in the HKP when compared with those above 200 percent of the FPL. Families in the lowest income categories may be least able to afford any premium or they may experience income fluctuations that more easily result in their children becoming Medicaid-eligible than children in higher income families. Further studies are needed that examine children's enrollment transitions between SCHIP and Medicaid, particularly for those children residing in lower income families. Families between 185-200 percent of the FPL in our study who transitioned from a full pay premium to a subsidized premium

were about 0.86 times as likely as families above 200 percent of the FPL to disenroll their children. Thus, the expanded program eligibility discouraged disenrollment among those affected by the policy change.

Several limitations should be noted about this study. First, we analyzed the experiences of children enrolled in the HKP before and after Title XXI-related program changes. This kind of analysis is not as strong as if we had the opportunity to observe the behavior of cohorts of children enrolled under differing program rules. Perhaps cross-State comparisons will provide such opportunities as more studies are conducted analyzing the enrollment and disenrollment behaviors of the Title XXI population.

Second, we did not assess other factors known to influence program disenrollment such as family satisfaction. Future studies should incorporate this variable in their analyses. Third, we were dependent on diagnoses as recorded in claims and encounter data to identify children with physical and mental health conditions. Diagnoses indicative of physical and mental special health care needs are not always recorded. For example, a child with cerebral palsy may be seen for an acute condition such as upper respiratory infection. The health care provider may only record the upper respiratory infection in the diagnoses fields and not cerebral palsy since the latter condition was not the reason for the visit. Such a child would not be identified as having a special health care need using our approach. Moreover, it is possible that providers do not always record mental health diagnoses. Thus, it is possible that children with physical and mental health conditions were under identified in our study. Fourth, we could not isolate individual policy changes due to the timeframes in which they were implemented.

Despite our attempts to focus on the mental health policy change and the 60-day wait period change, it is possible that we did not do so adequately.

Fifth, 49 percent of families had more than one child enrolled in the program; whereas 51 percent of families only enrolled one child. The outcomes of children in the same family in terms of disenrollment and re-enrollment may be related. We elected not to use the family as the unit of analysis and rather focused on the child because we wanted to include critical variables about the child's health status, namely the presence of physical or mental special health care needs. To address the issue of correlated outcomes among children in the same family we used the COVSANDWICH option in PROC PHREG in SAS®, to correct the standard errors for intrafamily correlations. Unfortunately, the COVSANDWICH option is not available with time-varying covariates, so we were forced to drop the premium and policy variables from our test runs. However, in this admittedly misspecified model, while the corrected standard errors did change in size, the *p*-values of the regression coefficients were not meaningfully changed. Significant variables remained significant and insignificant variables remained insignificant. Consequently, while we do not have a definitive test, we feel that accounting for intrafamily correlations would likely have little substantive effect on statistical significance in our full model.

Finally, Florida uses an annual passive renewal process to determine children's eligibility to remain in the program. Although asked to do so, families are not required to return updated application information or to have a face-to-face interview to renew their children's enrollment each year. Children remain enrolled

unless they reach age 19 or the families stop paying the premium. There is evidence to suggest that Florida's passive renewal process has a substantially different effect on disenrollment behavior than is seen in States requiring active renewal through resubmitted applications or face-to-face interviews (Dick et al., 2002). Thus, the findings in this study may not be generalizable to States requiring active renewal among their SCHIP enrollees.

SUMMARY

Only the expanded eligibility and premium reductions reduced the hazard rate for program disenrollment and improved program re-enrollment among Healthy Kids enrollees. Such a finding is positive in that more children will have increased access to care through their sustained program enrollment. Additional work is needed to examine the disenrollment and re-enrollment behavior of children with mental health conditions. Further, efforts need to be made to encourage families whose children are healthy (i.e., those not using the health care system and/or those without physical or mental conditions) to remain in the program. The availability of insurance has been shown to increase access to preventive care and to encourage the prompt treatment of acute conditions. Families may need increased education about these benefits for their children.

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