

# Managed Care Quality and Disenrollment in New York SCHIP

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**Background:** During the past decade, experts have devoted substantial efforts to quality improvement for managed care. Although a handful of studies have examined the effect of quality on enrollment, few have systematically investigated the association between managed care quality and plan disenrollment, especially among low-income populations.

**Objective:** To examine whether higher-quality measures in managed care plans are associated with lower disenrollment from the State Children's Health Insurance Program (SCHIP) in New York State.

**Design, Setting, and Participants:** Observational study of managed care plan disenrollment for a New York statewide cohort of 2206 new SCHIP enrollees.

**Measurements:** Managed care quality was measured by 7 Consumer Assessment of Health Plans Survey (CAHPS) scores and 3 Healthcare Effectiveness Data and Information Set (HEDIS) scores, obtained from the 2002 New York State Managed Care Plan Performance Report. *Disenrollment* was defined as being disenrolled from an SCHIP plan for 2 or more consecutive months based on the New York SCHIP universal billing files.

**Results:** Nearly 40% of children were disenrolled during the study period. No overall effects of plan quality on disenrollment were detected, but plans with higher scores in "preventive care visits" had a significantly lower disenrollment rate. The disenrollment rate in the eligibility recertification period was 3.2 percentage points higher than that in other time periods.

**Conclusion:** Disenrollment was not associated with overall managed care plan quality as measured by CAHPS and HEDIS, suggesting that further study is warranted to determine optimal strategies for enhancing managed care quality in the SCHIP population.

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For author information and disclosures, see end of text.

Managed care has been the dominant type of health insurance in the United States during the past 2 decades. As of 2008, 90% of nonelderly people receiving employer-sponsored health benefits and 17% of Medicare beneficiaries were enrolled in managed care<sup>1,2</sup>; managed care enrollees accounted for 64% of all Medicaid beneficiaries in 2007<sup>3</sup>; and most State Children's Health Insurance Program (SCHIP) enrollees are in managed care.<sup>4</sup> During the past decade, enormous efforts have been expended to develop managed care quality measures and reports. Starting in 1997, all Medicare managed care plans have been required to report the Healthcare Effectiveness Data and Information Set (HEDIS).<sup>5</sup> The Centers for Medicare & Medicaid Services also issued rules for comprehensive Medicaid managed care quality management and external review of quality improvement programs in 2002 and 2003, respectively.<sup>6,7</sup> As of 2005, pay-for-performance strategies to improve managed care quality in Medicaid programs have been adopted in several states including California, Michigan, New York, and Rhode Island.<sup>8</sup> But limited evidence exists on the impact of managed care pay-for-performance programs or other mandatory requirements on quality improvement.<sup>9,10</sup>

A handful of studies have examined whether consumers' enrollment choice is associated with plan quality report cards. These studies have produced mixed results, with some studies showing a positive association between quality and enrollment and others suggesting no correlation.<sup>11-18</sup> Additionally, 2 studies directly examined the effect of quality on plan choice, regardless of the sources of information. It has been demonstrated that large employers were more likely to offer their employees plans with higher quality, which was approximated by Consumer Assessment of Health Plans Survey (CAHPS) and HEDIS measures.<sup>19</sup> A study on plan choice in an SCHIP population found that parents were more likely to choose a plan with higher CAHPS scores, but plan choice was not associated with HEDIS scores.<sup>20</sup> However, few studies have systematically investigated the association between consumers' disenrollment and managed care quality, especially among low-income populations. In several studies on commercial populations or social/health maintenance organization (HMO) enrollees, satisfaction was found to be negatively correlated with disenrollment or switching behavior.<sup>21-24</sup> Among Medicare HMO enrollees, overall plan rating and some composite ratings of special services strongly predicted

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a lower disenrollment rate.<sup>25</sup> Virtually nothing is known about the relationship between children's disenrollment from managed care and plan quality.

To inform the policy debate, we took advantage of a New York SCHIP evaluation to assess the level of disenrollment in relation to quality of care of managed care plans.<sup>26</sup> In this program, managed care plans are reimbursed based on prior cost experience, and no risk-adjustment mechanism or pay-for-performance program is incorporated into contracting. The premium is determined by family income, with no cost sharing for families below 160% of the federal poverty level (FPL). Families have to recertify every 12 months for continued enrollment of their children. Individuals in this program could disenroll from the current plan and enroll in a private plan (if available), switch to another SCHIP plan or Medicaid plan (if eligible), or become uninsured.

Experts have become increasingly concerned about children's disenrollment from SCHIP.<sup>27,28</sup> Prior studies have highlighted that administrative requirements during recertification can discourage continued participation of low-income children.<sup>29-31</sup> Other factors such as cost-sharing also might lead to disenrollment.<sup>32-35</sup> Prior studies also have noted that individual and family characteristics such as being an only child, having better-educated parents, and being healthy were associated with disenrollment, whereas other characteristics such as age, race, and income were not consistently related to disenrollment from SCHIP.<sup>35-38</sup> It also has been shown that compared with those in traditional fee-for-service Medicaid, managed care enrollees were about 70% less likely to disenroll.<sup>39</sup>

Quality of care may be a factor leading to disenrollment if low quality of care decreases the desirability of the program, especially for families paying premiums for SCHIP or families with parents receiving employer-sponsored insurance. Because parents' decisions hinge on their ability to understand quality information, which is affected by education level and experience with health plan services, we hypothesized that children in health plans with higher quality would be less likely to disenroll and that the effect of quality would be greater for parents with better education and higher family income, and for parents who have children with special healthcare needs or prior health insurance.

This study assessed whether managed care quality, approximated by CAHPS and HEDIS measures, is associated with disenrollment. Determining this relationship is important. If individuals are more likely to disenroll from low-quality plans, this would indicate that market-based policies are worth con-

### Take-Away Points

The association between managed care quality and plan disenrollment was examined using data from the New York State Children's Health Insurance Program (SCHIP).

- Plan disenrollment was not significantly associated with overall managed care plan quality, but plans with higher scores in "preventive care visits" had a significantly lower disenrollment rate.
- The disenrollment rate in the eligibility recertification period was 3.2 percentage points higher than that in other time periods.
- Further study is warranted to determine optimal strategies for enhancing managed care quality in the SCHIP population.

sidering for quality improvement. However, null findings (ie, enrollees do not respond to plan quality) would suggest that further study is warranted to determine optimal strategies for enhancing managed care quality in the SCHIP population.

## METHODS

### Data and Variables

The study cohort consisted of a stratified random sample of 2644 children who were newly enrolled in New York's SCHIP between November 2000 and February 2001. Hispanic children were oversampled to ensure the validity of subgroup analysis.<sup>26</sup> The program used a 2-month presumptive eligibility period, meaning that every child who applied was enrolled in the program until they were found to be ineligible or 60 days, whichever was shorter. An initial interview was conducted about 4 to 6 months after enrollment to avoid interviewing temporarily enrolled children, and a second interview followed about 12 months later. Individual and family characteristics also were obtained by interview. Enrollment status was derived from the 2000-2002 New York SCHIP universal billing files. Managed care plan quality measures as well as plan characteristics were obtained from the plan component of the survey and the 2002 New York State Managed Care Plan Performance Report.

Quality measures included 7 CAHPS measures from the performance report and 3 pediatric HEDIS measures, all in percentages. CAHPS measures included 5 composites and 2 overall ratings: provider communication, getting care quickly, problems with getting care needed, problems with services, called or wrote health plan with complaints, overall rating of personal doctor or nurse, and overall rating of health plan. Three HEDIS measures were used: preventive care visits, use of appropriate medications for children with asthma, and childhood immunization. In order to avoid collinearity between variables, the final CAHPS and HEDIS measures were the weighted averages based on the standards and guidelines for managed care organization accreditations from the National Committee on Quality Assurance.<sup>40</sup> When CAHPS or HEDIS measures were not available for SCHIP,

those of Medicaid or commercial lines of the same plan were used because quality measures were moderately correlated among different product lines within a health plan (correlation coefficient varying from 0.2 to 0.8) or between calendar years (correlation coefficient varying from 0.6 to 0.9).

Following Shenkman et al,<sup>35</sup> *disenrollment* was defined as being disenrolled from SCHIP for at least 2 consecutive months because New York State has a 30-day grace period after disenrollment and no waiting period for reenrollment.<sup>30</sup> Disenrollments due to moving out of a county, turning 19 years old, and becoming Medicaid eligible also were included. Because these disenrollments were due to eligibility changes, we only used the related enrollment records and censored them at the time of disenrollment.

### Statistical Model

An optimal evaluation of disenrollment would model an individual's full choice set, including the current health plan, private insurance, and being uninsured. Because information on private insurance after SCHIP disenrollment was not available, a choice set was constructed for each individual based on the Combined Statistical Areas (CSAs) from US Census 2000.<sup>41</sup> For the purpose of this study, the state was divided into 8 areas: New York City, Long Island, other suburbs of New York City, the northeast area, the north-central area, the south-central area, the central-west area, and the west or southwest area. It was assumed that the alternative private insurance plans in an area were the same for enrollees in that area. Introducing these reference areas as fixed effects enabled us to model disenrollment decisions as a function of the current health plan quality and other covariates.

Because enrollment status was recorded by month, we used a discrete-time survival model. The logit of the probability of disenrollment was modeled as a function of plan quality and other characteristics, individual/family characteristics, time, and geographic areas. We adopted an order 1 autoregressive correlation structure based on quasi-likelihood information criteria (QIC).<sup>42</sup> A variant of QIC was used for selecting the best subset of covariates.<sup>42,43</sup> Independent variables included quality measures, plan outreach activities, child's age, child's race, parent education, family income, presence of any special healthcare needs,<sup>44,45</sup> and prior health insurance status before enrollment. Health plan outreach activity was measured by the number of outreach staff in full-time equivalents per 1000 eligible SCHIP or Medicaid population in a county. As outreach information was not available for 8 of 29 plans, an expectation-maximization algorithm was used to impute the missing outreach activity using other plan characteristics.<sup>46</sup> A dummy variable to flag plans without outreach information was added to the model. Dummy variables of time were used

to capture the baseline hazard, and geographic areas also were included to allow for fixed effects.

To avoid incorrect inferences for interaction effects of nonlinear models, marginal effects were calculated as derivatives for continuous variables or differences for discrete variables.<sup>47,48</sup> Standard errors were based on bootstrapping with 200 replications. Sampling weights were used in the estimation so that the results could be generalized to the population. Power calculations showed that these data would have the ability to detect a 1.6 percentage point change in the probability of disenrollment for each percentage point change in average quality scores with 80% power.<sup>49</sup>

### Sensitivity Analysis

We performed several secondary analyses to check the robustness of the main results. (1) In addition to the weighted averages of CAHPS and HEDIS measures, we examined individual quality measures as some aspects of quality may have had strong effects compared with others. (2) Nearly 13% of individuals did not complete the second interview, and it is unclear whether the related disenrollment was due to eligibility or not. We did a sensitivity analysis and assumed the disenrollment was not due to eligibility changes. (3) Finally, prior literature has shown that many dropouts from SCHIP were unintentional, especially because of the recertification process.<sup>31</sup> Thus, we conducted a secondary analysis by excluding the data after the 11th month when the recertification occurred.

## RESULTS

### Descriptive Analysis

The parents of 2644 children participated in the first interview, and 2290 (87%) individuals completed the second interview. In addition, 84 individuals without enrollment status in the universal billing files were excluded from the analysis. The final sample consisted of 2206 individuals enrolled in 29 managed care plans.

Among 2206 individuals, nearly 40% were younger than age 6 years, and about 44% were Hispanic children (**Table 1**). The income of more than three quarters of the families was below 160% of the FPL, and only about 5% of the families were above 250% FPL. During the preceding 12 months before joining SCHIP, 40% of the enrollees had some type of health insurance, and about 1 of 6 children had at least 1 special healthcare need.

The average CAHPS score was 75.24 with a standard deviation of 4.56, and the average HEDIS score was 69.46 with a standard deviation of 6.92 (**Table 2**). The average number of full-time equivalents of outreach staff for SCHIP and Medicaid per 1000 eligible population was 0.24, but with tremen-

dous variation. Twenty-two plans were nonprofit, and 13 plans had a commercial insurance business line.

Over the study period, the median observed time was 14 months, with the longest period being 19 months. Nearly 40% of children were disenrolled during this period of time. The Kaplan-Meier survival curve of the first disenrollment and the empirical disenrollment hazard are illustrated in the **Figure**, in which 2 waves of disenrollment are evident. The first wave occurred during the first several months, when a dramatic increase in the number of disenrollees was seen in the fourth month. The second wave of disenrollment occurred around the annual recertification period, with its highest rate being 7.85%.

### Multiple Regression Analysis

**Association Between Disenrollment and Plan Quality.** **Table 3** presents the marginal effects (in percentage points) of various factors on disenrollment. Neither the CAHPS score nor the HEDIS score was significantly associated with disenrollment from SCHIP. We also evaluated quality scores at different cut-off values of CAHPS, and the findings were unchanged (data not shown). The interaction effects between CAHPS and other individual characteristics (except for special healthcare needs) showed negative signs, but none of these interaction effects were significant and thereby did not confirm our hypothesis that quality of care might be more closely related to disenrollment for parents who were better at assessing quality. The results for the HEDIS measures were similar to those for the CAHPS measures: with insufficient evidence to support the hypothesis that children in health plans with higher HEDIS measures were less likely to disenroll. No significant interaction effects were observed between HEDIS and having special healthcare needs, having insurance before SCHIP, income, or education.

**Table 1.** Individual/Family Characteristics<sup>a</sup>

Characteristic	Number	Percentage
<b>Age, y</b>		
0-2	456	20.67
3-5	408	18.52
6-11	684	31.01
12-18	657	29.80
<b>Male</b>	1101	49.91
<b>Race</b>		
White (non-Hispanic)	566	25.65
Black (non-Hispanic)	666	30.20
Hispanic	974	44.14
<b>Education</b>		
Less than high school	492	22.31
High school graduate or GED certificate	801	36.32
Technical/vocational	99	4.47
Some college	493	22.35
College graduate or higher	321	14.55
<b>Income</b>		
<160% FPL	1748	79.25
160%-250% FPL	353	16.01
>250% FPL	105	4.74
<b>Employment</b>		
Full-time	1448	65.63
Part-time	332	15.03
Unemployed	427	19.34
<b>Single parent family</b>	1058	47.97
<b>Household size</b>		
≤3	705	31.97
4-6	1313	59.52
>6	188	8.51
<b>Had special care needs<sup>b</sup></b>	365	16.56
<b>Health status</b>		
Excellent	993	45.01
Good	985	44.67
Fair	227	10.32
<b>Had insurance before SCHIP</b>	888	40.25
<b>Had usual source of care before SCHIP</b>	1852	83.93
<b>Satisfied with doctor (score ≥8 on a 0-10 scale)</b>	1738	78.79
<b>Area of New York</b>		
New York City	1453	65.88
Suburbs of New York City	174	7.87
Long Island	217	9.85
Northeast	68	3.07
North Central	121	5.50
South Central	38	1.73
Central West	82	3.73
West or Southwest	52	2.37
<b>Region of New York</b>		
New York City	1452	65.83
New York City environs	375	17.02
Upstate urban	268	12.15
Upstate rural	110	5.00

FPL indicates federal poverty level; GED, general educational development; SCHIP, State Children's Health Insurance Program.

<sup>a</sup>Including 2206 individuals.

<sup>b</sup>Based on the screener by the National Survey of Children with Special Health Care Needs.<sup>44,45</sup>

■ **Table 2. Plan Characteristics<sup>a</sup>**

Characteristic	Mean (SD)	Minimum	Maximum
Average CAHPS score	75.24 (4.56)	62.88	84.25
Average HEDIS score	69.46 (6.92)	51.33	81.00
Outreach FTEs per 1000 eligible population	0.24 (0.24)	0.01	0.99
SCHIP and Medicaid enrollees (10,000s)	3.98 (3.49)	0.48	12.50

CAHPS indicates Consumer Assessment of Health Plans Survey; FTE, full-time equivalent; HEDIS, Healthcare Effectiveness Data and Information Set; SCHIP, State Children's Health Insurance Program.  
<sup>a</sup>Including 29 plans.

**Factors Related to SCHIP Disenrollment.** We found a trend toward larger plans with more SCHIP and Medicaid enrollees having a slightly lower disenrollment rate ( $P = .078$ ). The interaction with the annual recertification period was negative and statistically significant ( $P = .010$ ), indicating that its effect mainly occurred during the annual recertification period. Overall, plans without outreach information had similar disenrollment rates of other plans, but their rates were higher in the first several months ( $P = .032$ ) with trends during the recertification period ( $P = .065$ ). Among the plans without outreach information, having a commercial insurance line was significantly associated with a lower disenrollment rate ( $P = .003$ ). Children with parents who received some college or higher education had a trend toward being less likely to disenroll from SCHIP (by 1 percentage point) compared with children whose parents received less than a high school education. Overall, the likelihood of disenrollment among children with a family income between 160% and 250% FPL was estimated to be 1.2 percentage points lower than that among children with a family income lower than 160% FPL, who received fully subsidized insurance coverage ( $P = .059$ ). Having special healthcare needs was associated with an estimated 1.5 percentage point increase in the disenrollment rate ( $P = .061$ ), whereas living in rural areas was associated with a reduction in the disenrollment rate by about 2 percentage points ( $P = .001$ ). Finally, compared with other time periods, in the annual recertification period there was an estimated increase of 3.2 percentage points in the disenrollment rate ( $P < .001$ ).

**Sensitivity Analysis**

We found that only “preventive care visits” showed a significant effect on disenrollment after controlling for other individual quality measures (data not shown). For every percentage point increase in the proportion of enrollees receiving at least 1 preventive care visit in the last 12 months, the probability of disenrollment was lower by 0.12 percentage point ( $P = .002$ ). No significant interaction effects with individual/family characteristics were detected. Plans with higher

overall plan ratings showed a trend of having a 0.13 percentage point lower disenrollment rate ( $P = .056$ ).

Including the individuals without the second interview did not change the main conclusions. When

the records after the 11th month were excluded, plans with higher HEDIS scores showed a trend toward having a 0.15 percentage point lower disenrollment rate for each unit increase in the average HEDIS score ( $P = .081$ ).

**DISCUSSION**

Overall, no significant association was detected between managed care quality measured by CAHPS or HEDIS and SCHIP disenrollment. However, we did find that plans with higher scores for preventive care visits had a significantly lower disenrollment rate. Our overall null findings should not be interpreted as the evidence that no effect on disenrollment exists, but rather that an actual effect is not likely to be larger than a 1.6 percentage point change in the probability of disenrollment for each unit change in quality measures.

The market-based approaches seem to be less effective in quality improvement through the disenrollment process than the enrollment process. A recently published study on plan choice in the same population showed that parents were more likely to choose plans with higher CAHPS scores for their children, but HEDIS scores were not shown to be associated with plan enrollment.<sup>20</sup> In contrast, no overall effects of plan quality on disenrollment were found in this study. However, a significant negative effect of preventive care visits on disenrollment was detected, which indicates that disenrollment may be more strongly associated with clinical quality. It could be that preventive care is a basic service for all age groups and that parents perceive quality better along this dimension. The negative effect of preventive care visits on disenrollment also is consistent with the importance of having a medical home and children’s use of preventive services, which was highlighted by experts.<sup>50,51</sup> Nevertheless, the sensitivity analysis did show a trend toward plans with higher overall plan ratings having lower disenrollment. Although not statistically significant, this finding is consistent with the finding from prior studies among Medicare beneficiaries or commercial enrollees that disenrollment was negatively correlated with satisfaction or plan rating.<sup>21-25</sup>

## Quality and Disenrollment

It is important to note that rather than assessing the effect of quality report cards, our study examined the relationship between SCHIP disenrollment and managed care quality, which is approximated by CAHPS and HEDIS measures. Prior literature mostly focuses on the effects of quality report cards, especially on plan choice. For example, 2 randomized clinical trials did not demonstrate any effect of CAHPS reports on Medicaid beneficiaries' managed care plan choice.<sup>12,18</sup> Although the population studied was similar to that in our study, these studies estimated the effect of additional quality information rather than the effect of quality itself.

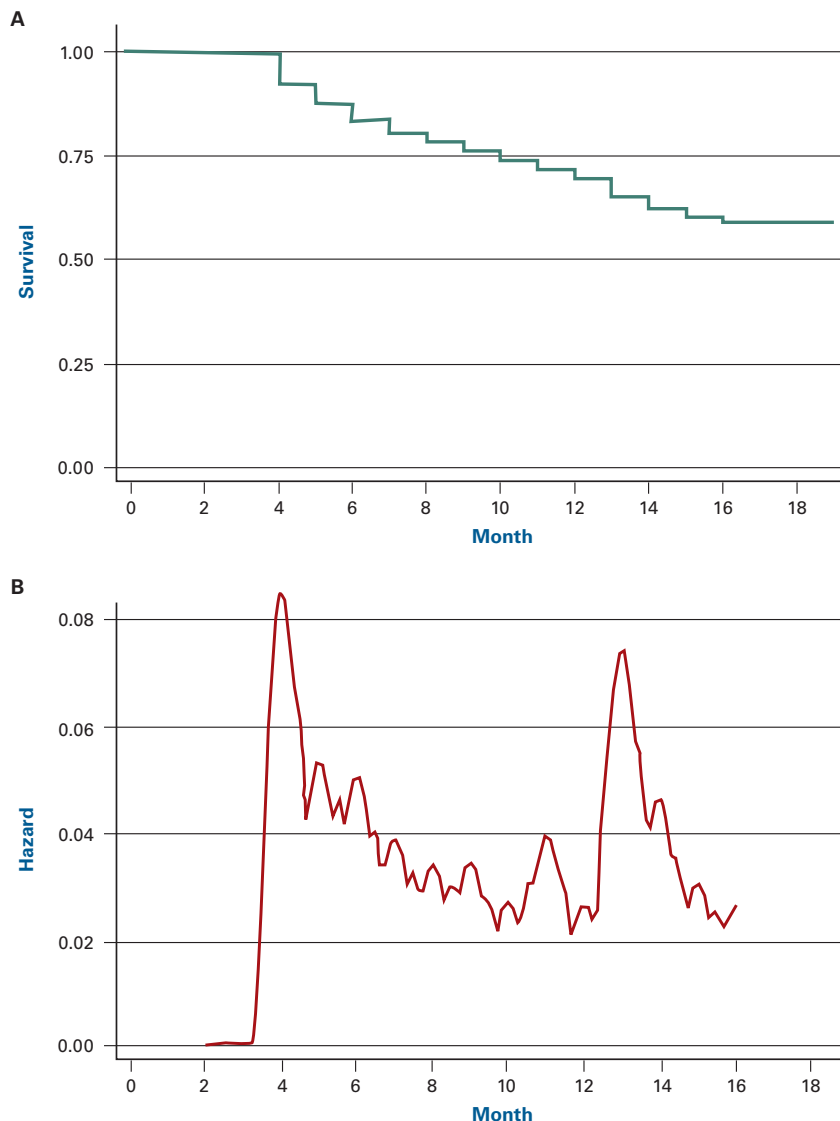
It has been shown that disenrollment in SCHIP could be unintentional primarily because of the recertification process, which involves collecting income documents and paperwork.<sup>31</sup> Because our analytical method was mainly based on a choice framework, these unintentional dropouts could potentially reduce efficiency if they are not fully captured by other covariates in the model. By excluding records after the 11th month, when the recertification occurred, we found that plans with higher HEDIS scores showed a trend of having lower disenrollment. This secondary analysis suggests that the effect of quality might be larger before the recertification period, but the findings of the main analysis are robust.

Consistent with the previous studies, the annual recertification process generated a large amount of disenrollment, increasing the disenrollment rate by an estimated 3.2 percentage points.<sup>29-31</sup> The primary reason is that this recertification process requires parents/plans to complete paperwork and collect documents. Plans with larger SCHIP and Medicaid enrollment showed a lower disenrollment rate during the recertification period, which might be attributed to their better management system. It is possible that the significant increase in disenrollment in the fourth month was the aftermath of the disenrollment due to the presumptive eligibility. Technically, these temporary enrollments should be resolved

within 60 days. Dick et al<sup>30</sup> showed that the effect of the presumptive eligibility on disenrollment appeared primarily in the second and third months. Further, additional analysis excluding the first 4 months of data did not change the main conclusions (data not shown).

The results should be interpreted in light of the following limitations. First, we did not have information about the quality measures or characteristics of the private plans in which some disenrolled children subsequently were enrolled. Because a CSA-based area consists of adjacent metropolitan or micro-politan areas that are linked by commuting ties,<sup>52</sup> it is reasonable to assume individuals within a CSA-based area would have the same health insurance alternatives because population and income are among the primary determinants of the demand for health insurance. However, this assumption might

■ **Figure.** Kaplan-Meier Survival Curve (A) and Hazard of Disenrollment (B)



■ **Table 3.** Marginal Effects of Individual or Plan Characteristics on the First Disenrollment<sup>a</sup>

Characteristic	Marginal Effect (in Percentage Points)	Bootstrap SE	P
Average CAHPS score <sup>b</sup>	0.121	0.106	.874
Average HEDIS score <sup>b</sup>	-0.039	0.059	.257
Outreach FTEs per 1000 eligible population	-0.398	1.203	.741
Having commercial business lines	-0.012	0.673	.985
SCHIP and Medicaid enrollees (10,000s)	-0.203	0.115	.078
Plan without outreach information	-0.084	0.687	.903
Education (less than high school) <sup>c</sup>			
High school or GED	-0.631	0.594	.288
Technical/vocational	1.046	0.954	.273
Some college	-0.944	0.589	.109
College or higher	-1.037	0.565	.066
Had insurance year before SCHIP	0.498	0.470	.289
Income (<160% FPL) <sup>c</sup>			
160%-250% FPL	-1.199	0.634	.059
>250% FPL	-0.635	0.812	.434
Had special care needs	1.454	0.776	.061
Age, y (0-2) <sup>c</sup>			
3-5	-0.562	0.408	.168
6-11	-1.040	0.667	.119
12-18	-1.946	0.371	.000
Race (white, non-Hispanic) <sup>c</sup>			
Black (non-Hispanic)	0.652	0.691	.345
Hispanic	0.203	0.635	.750
Living in upstate rural area	-1.641	0.512	.001
Months since enrollment (other months) <sup>c</sup>			
Months 3-6	2.679	0.718	.000
Months 11-15 (recertification period)	3.245	0.839	.000
Had special healthcare needs × HEDIS <sup>b</sup>	-0.011	0.026	.343
Had special healthcare needs × CAHPS <sup>b</sup>	0.086	0.082	.855
Had insurance before SCHIP × HEDIS <sup>b</sup>	0.008	0.022	.644
Had insurance before SCHIP × CAHPS <sup>b</sup>	-0.039	0.052	.223
Income >160% FPL × HEDIS <sup>b</sup>	-0.006	0.025	.409
Income >160% FPL × CAHPS <sup>b</sup>	-0.082	0.078	.145
Education (some college or higher) × HEDIS <sup>b</sup>	-0.004	0.025	.444
Education (some college or higher) × CAHPS <sup>b</sup>	-0.046	0.061	.225
Months 11-15 × Black (non-Hispanic)	-0.662	1.764	.707
Months 11-15 × Hispanic	-1.213	1.767	.493
Months 11-15 × income >160% FPL	2.649	2.035	.193
Months 11-15 × having commercial business lines	-0.109	1.833	.953
Months 11-15 × SCHIP and Medicaid enrollees (10,000s)	-1.510	0.587	.010
Months 3-6 × Black (non-Hispanic)	3.989	1.950	.041
Months 3-6 × Hispanic	1.664	1.811	.358
Month 3-6 × Income >160% FPL	-2.586	1.336	.053
Months 3-6 × having commercial business lines	-2.436	1.744	.162
Months 3-6 × SCHIP and Medicaid enrollees (10,000s)	-0.121	0.260	.642
Plan without outreach information × having commercial lines	-4.031	1.374	.003
Plan without outreach information × months 11-15	4.535	2.120	.032
Plan without outreach information × months 3-6	3.991	2.162	.065

CAHPS indicates Consumer Assessment of Health Plans Survey; FPL, federal poverty level; FTE, full-time equivalent; GED, general educational development; HEDIS, Healthcare Effectiveness Data and Information Set; SCHIP, State Children's Health Insurance Program.

<sup>a</sup>The dependent variable is 1 if disenrollment occurred, otherwise 0. Marginal effects are in percentage points. Standard errors were from 200 bootstrap replications. The variables related to CAHPS and HEDIS were evaluated at the 76th percentiles, and other continuous variables were evaluated at the medians.

<sup>b</sup>Based on a 1-sided test.

<sup>c</sup>Reference group.

not hold in rural areas because rural areas are not able to attract all the competitors due to a lower demand for health insurance. Second, because only those who enrolled for a full calendar year were included for the quality measurement reported in the plan performance reports, these measures could be overestimated due to the disenrollment of unsatisfied enrollees. Third, we relied on the second interview to identify individuals switching to Medicaid, which might not be accurate if some parents were not able to distinguish Medicaid from SCHIP.

## Implications

Our analysis indicates that disenrollment was not significantly associated with overall managed care plan quality, but a higher score in preventive care visits was correlated with lower disenrollment. The market-based approaches seem to be most effective for the enrollment process rather than the disenrollment process, as suggested by a prior study on plan quality and enrollment.<sup>20</sup> Nonetheless, our study suggests that the quality dimensions associated with disenrollment are different from those associated with enrollment. Thus, market-based approaches to quality improvement, if adopted, may need to emphasize different aspects of quality of care. Further study is warranted to determine optimal strategies to enhance quality of care for vulnerable populations enrolled in managed care.<sup>53</sup> Effective methods are required, at a population level, to improve public health insurance retention, quality of care, and consequently health outcomes of these vulnerable populations.

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