Research Repository UCD

Title	Is the individual market more than a bridge market? An analysis of disenrollment decisions
Authors(s)	Kapur, Kanika, Marquis, M. Susan, Buntin, Melinda J. Beeuwkes, Escarce, José J., Louis, Thomas A.
Publication date	2005
Publication information	Kapur, Kanika, M. Susan Marquis, Melinda J. Beeuwkes Buntin, José J. Escarce, and Thomas A. Louis. “Is the Individual Market More than a Bridge Market? An Analysis of Disenrollment Decisions” 42, no. 4 (2005).
Publisher	Excellus Health Plan
Item record/more information	http://hdl.handle.net/10197/269

Downloaded 2024-04-18 14:45:41

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)

© Some rights reserved. For more information

M. Susan Marquis
Melinda Beeuwkes Buntin
José J. Escarce
Kanika Kapur
Thomas A. Louis

Is the Individual Market More than a Bridge Market? An Analysis of Disenrollment Decisions

The individual insurance market is perceived by many to provide primarily transition coverage, but there is limited research about how long people stay in this market and what affects their disenrollment decisions. We examine these issues using administrative records and survey data for those enrolled in the individual market in California. We conclude that there is less turnover in this market than is commonly believed. We find that economic factors and coverage characteristics are important in the decision to disenroll, but that perceptions about insurance and the health care system also affect this decision.

The individual health insurance market is a potentially important source of coverage for those who do not have access to employer-based insurance. With the decline in employer-sponsored insurance and the growth in the number of the uninsured, some policymakers have proposed incentives to try to attract more people to the individual market. Some also promote an expansion of the individual market to provide consumers with a greater choice of plans and to increase the portability of coverage.

This market currently serves people with very different needs. It provides transitional coverage for people who are between jobs that provide insurance; some believe that the individual market is used primarily for such bridge coverage (Ziller et al. 2004). But it is also potentially a source of long-term insurance for the self-employed, for early retirees, and for others who do not have access to group coverage over long periods (U.S. GAO 1996; Pollitz and Chollet 2001).

Little is known about how long people stay in the individual market and what affects decisions to continue coverage. Yet this information is important in understanding the market and in designing policies to expand its role in providing insurance. Knowing how consumers' decisions to stay or leave are affected by variables, such as price, that can be changed by public policy can help in promoting the policy goal of continuity of coverage. The extent and nature of turnover in the market can affect the risk pooling in this market because underwriting to separate risks generally occurs only when people join a plan. Underwriting in the individual market reduces pooling and separates low- and high-risk individuals into groups charged different prices. However, guaranteed renewal, required by the Health Insurance Portability and Accountability Act (HIPAA), means that those who become sick cannot be excluded from the pool and, in practice, they are not placed in a new underwriting

M. Susan Marquis, Ph.D., *and* ***Melinda Beeuwkes Buntin, Ph.D.,*** *are senior economists, and* ***Kanika Kapur, Ph.D.,*** *is an economist, all at RAND.* ***José J. Escarce, M.D., Ph.D.,*** *is a professor of medicine at the David Geffen School of Medicine, University of California, Los Angeles, and a senior natural scientist at RAND.* ***Thomas A. Louis, Ph.D.****, is a professor in the Department of Biostatistics, Bloomberg School of Public Health, Johns Hopkins University.* *This research was supported by the California HealthCare Foundation (grant no. 01-1520).* *Address correspondence to Dr. Marquis at RAND, 1200 South Hayes St., Arlington, VA 22202. Email: susanm@rand.org*

Inquiry 42: 381–396 (Winter 2005/2006). © 2005 Excellus Health Plan, Inc.
0046-9580/06/4204–0381
www.inquiryjournal.org

class.[1] This practice provides some degree of protection against the costs of developing an illness, and for those who remain in the individual market over a period of time there may be greater pooling of long-term risk than of risk at entry (Pauly 1992; Patel and Pauly 2002). On the other hand, if insurers do not risk-rate people who become sick, then the cost for the pool may increase and drive out those who remain healthy. Knowing how changes in premiums and changes in health risk affect consumers' decisions to stay in or leave the individual insurance market can help us assess the likelihood of these outcomes and design policies that will help people obtain protection against unexpected medical costs in the near term and against unexpected future increases in risk.

Extending tax subsidies to individuals who do not have access to employer-provided health insurance is a popular policy tool. The Trade Act of 2002 created health care tax credits that cover 65% of premiums for certain workers displaced by international trade. President George W. Bush has proposed making it easier for lower-income families to buy individual health coverage by extending tax credits of $1,000 to individuals and $3,000 to such families to help defray the cost of coverage. While the primary goal of this plan is to draw the previously uninsured into the individual health insurance market, it also may promote continuity of coverage once individuals purchase health insurance. The success of this plan depends on the responsiveness of disenrollment decisions to the price breaks embodied by the proposed tax credits.

A number of studies have looked at the dynamics of uninsurance and provided methodological advances in studying insurance dynamics (Swartz, Marcotte, and McBride 1993a, b; Swartz and McBride 1990; Monheit and Schur 1988). However, the investigation of dynamics in the individual insurance market is more limited. One previous study based on a panel survey and self-reports of insurance and changes in insurance—which could be biased by errors in reporting—concluded that 50% of spells of coverage in the individual market last less than six months and almost two-thirds last less than one year—though duration is longer for spells among the self-employed and people near retirement age (Ziller et al. 2004).[2] The purpose of our study is to provide new information about disenrollment decisions of those who enroll in individual plans, based on observed behavior from insurer enrollment files.

Data and Methods

Overview

We hypothesize that decisions about whether to remain enrolled in the individual insurance market are influenced by factors that affect the initial demand for coverage, including expected benefits and costs of continuing coverage. Expected benefits of coverage will depend on the generosity of the plan provisions and a family's expected health expenditures. They also will depend on the availability of alternative coverage—such as access to employer-sponsored coverage or the availability of safety-net resources as a substitute for insurance. Expected costs of continuing coverage will depend on the premium of the plan and changes in premium. Demand for coverage also depends on preferences for health insurance that include perceived value of health coverage and taste for risk.

We analyze the duration of new episodes (or spells) of individual coverage; that is, we study the length of continuous coverage from the time a subscriber purchases coverage until that subscriber drops coverage. Our estimate will differ from estimates of the length of time subscribers to the individual market hold coverage over a fixed time period for two reasons. First, a subscriber may have more than one episode of coverage over a time period. As we note subsequently, this occurred very infrequently in our data. Moreover, promoting continuous coverage is an important policy objective, and maintaining continuous coverage may have implications for risk pooling. Therefore, we believe it is important to understand factors that promote continuous coverage. Second, measuring time in the individual market for all subscribers over a fixed time period would include episodes in progress at the start of the period and one would observe only the time remaining in the continuous episode and not the full duration; similarly, some people would end the period with a spell in progress and their full duration would not be reflected in the estimate. Our estimation accounts for the right censoring of spells in progress at the end of our observation period.

We estimate the number of quarters a new individual insurance episode lasts; thus, time is observed in discrete, integer values and we use discrete-time methods for analyzing the episode length. We let P_{it} be the conditional probability that individual i disenrolls from coverage in quarter t, given that the individual held coverage at the start of quarter t. This probability is sometimes called the discrete-time hazard (Allison 1995). In the Cox model for discrete-time data, this probability is related to time and covariates by a logistic regression equation:

$$P_{it} = 1/[1 + \exp(-\alpha_t - \beta' X_{it}].$$

A practical advantage of this approach is that maximum likelihood estimates of the parameters can be obtained by applying logistic regression programs for dichotomous data. For each quarter t of an episode, we define a dichotomous dependent variable denoting whether coverage ended in the period; we fit logit models of the hazard rate, or disenrollment rate, in the period—that is, the probability of terminating coverage given that the episode continued until the beginning of t. Moreover, it has been shown that this model is a discrete approximation to the continuous-time proportional hazards model (Allison 1982; Yamaguchi 1991).

There are two other advantages to using this discrete approach. First, it is straightforward to incorporate time-varying covariates into the model. Second, we are able to use the same method to analyze our two data sources: administrative records of insurers and a survey of subscribers in the individual insurance market in California. In the administrative data we observe and follow new episodes over time. The coverage history for each episode is cast in three-month periods with a dichotomous dependent variable denoting whether coverage ended in the period. The model is fit using multiple observations for each episode – one observation for each quarter the episode continues to be observed.[3] The administrative data allow us to investigate the role of price, plan characteristics, and subscriber health on duration decisions, but provide limited information about other characteristics of the subscribers.

We use the survey to provide additional information about how subscriber characteristics and subscriber perceptions of the benefits of insurance relate to duration and disenrollment decisions. However, the survey is a sample from the full administrative database of people enrolled in the individual market at a point in time, rather than new episodes. For each survey person, we measure the number of quarters in which that person has been enrolled at the sampling date and whether the individual continues enrollment through the subsequent three quarters. That is, each survey observation provides information about the conditional probability of disenrolling for three time periods that varies depending on the length of the episode at the time the sample was selected. People who recently have enrolled provide information about the conditional disenrollment rates early in the episode, whereas people who have been enrolled for some period of time provide information about disenrollment rates conditional on a longer tenure.[4]

Data

Administrative data. The data for our study come from the administrative files of the three largest carriers offering individual health insurance products in California; these carriers account for over 80% of individual policies sold in the state. We limited our analysis to one state because we required cooperation from insurers to obtain detailed information about the benefits and premiums of plans offered and about enrollment histories of subscribers. While our results describe experiences in only one state, we believe that this experience is likely to generalize to most states. As in most states, California has few regulations on its individual insurance market beyond the guarantees on renewal and portability required by the federal Health Insurance Portability and Accountability Act (Kelch 2005). Premiums and premium trends in California are similar to the nation as a whole (California HealthCare Foundation/HRET 2004). California has a higher rate of uninsured residents and lower rate of employer-sponsored coverage than the nation as a whole; however, trends in these rates in California mirror the U.S. experience (California HealthCare Foundation 2004). The California individual market, however, does differ from that in most other states in the large role that health maintenance organizations (HMOs) play in the market.

We obtained from the three carriers data about all episodes of coverage that began during the

period January 1997 through fall 2001. The administrative files include information about enrollment and disenrollment dates, product choices, contract type (e.g., single, family), the age and gender of the subscriber, and the residence zip code. There were about 1.2 million new episodes over our study period. For our analysis, we selected a sample of just under 5% of these cases; our analysis sample includes 54,512 new episodes.[5]

An episode of coverage was determined to have ended when an individual no longer was covered by the carrier. Thus, switching among products offered by a carrier was not counted as disenrollment from the market. However, switching to a product offered by another carrier would appear as disenrollment from the market because we could not track subscribers across carriers.[6] A subscriber may have had multiple new episodes of coverage; however, in practice this occurred very infrequently. Only 6% of subscribers in the full administrative database who started a new episode during our study period represent those with a second or subsequent episode; among subscribers with the greatest exposure—those with a new episode that began in 1997—only 7% had a second new episode.[7] In our analysis sample, less than 1% of subscribers starting a new episode had more than one. Again, however, we undercount multiple episodes for those who later enrolled with a different carrier.

Insurers' price files for this period provide premiums for each product by age of subscriber, contract type, and geographic pricing area. Premiums were linked to respondents in the administrative data and our survey (described later) based on the age of the person, time period, contract type, and county of residence. We also abstracted benefit data for all the plans offered during this study period. The Actuarial Research Corporation (ARC) used the abstracted data to develop measures of the actuarial value of each plan by simulating what each insurance product would pay for the health care services incurred by each person in a standardized population.[8] The actuarial values then were linked to each subscriber and time period. We used the linked premium and actuarial values to measure the percentage increase in price that the subscriber would face if remaining in the market into the next time period, as well as the actuarially adjusted level of the premium for the subscriber's plan.[9]

The insurers provided us with the claims history for all new subscribers during the period 1997–2001, which we used to develop indicators of health status. We chose our health measures to be predictive of future use of health care; we hypothesize that expectations of future health care use are a factor in decisions to stay in the market. Based on analysis of the claims data, we created an indicator of chronic conditions reflecting whether any family member has one of the following: arthritis, asthma (for children), hay fever, chronic ear infections (for children), cancer, depression, diabetes, heart disease, hypertension, lung disease, chronic skin problem (for children), spine or neck injury, or ulcers. The measures are based on diagnoses on claims forms. As a result, we are more likely to identify people who have remained in the market for a long period as having diagnoses than people who were enrolled with the insurer for a short period of time. Our analysis of the claims data revealed that a chronic condition indicator based on at least four quarters of enrollment matched fairly closely prevalence rates for these conditions reported by a similar population to the National Health Interview Survey. Therefore, we measure the presence of chronic conditions for the four time intervals immediately following entry into the market based on the first year of claims data. For later intervals, the indicator is based on claims observed to that point in time.[10] We also construct a measure of recent poor health if the family was first diagnosed as having a member with a chronic condition in the past six months—this measure is only available for those enrolled for at least 18 months (the first year for the initial indicator and the subsequent six months).

Auxiliary measures. The administrative data provide limited information about subscribers' demographic characteristics; thus, we included proxy measures for several important characteristics based on the characteristics of other people residing in the subscriber's zip code area of residence. These include the average per capita family income, the racial/ethnic composition of the population, and the distribution of educational attainment.[11] These characteristics were measured from the 2000 Census. We also measure the unemployment rate in the subscriber's county from the Area Resource File; the unemployment rate is

measured for the calendar year of the specific time interval. A higher unemployment rate indicates less access to group insurance.

Finally, we also include a measure of the relative availability of a safety net in the county of residence to see whether the availability of a strong safety net crowds out insurance and leads to an increase in disenrollment. We measure availability with a safety-net index based on four characteristics of the safety net in the county: the dollar amount of local government spending for health and hospital care; admissions to safety-net hospitals in the county; visits to the outpatient departments and emergency rooms of safety-net hospitals in the county; and visits to community health centers in the county. Each characteristic then is divided by the county's population with income below 200% of poverty in order to create a measure of the county's capacity to serve the low-income population. Our index of safety-net resources assigns each county a score of 1 to 4 on each characteristic in each time period based on cut-off values defined by the quartiles of the characteristic in the 1998 period. We summed the scores over all four measures in each period for each county to obtain our safety-net index, which ranges in value from 4 to 16.[12]

Survey data. Our second set of data comes from interviews of 3,964 subscribers enrolled in fall 2003 in the individual and family health plans offered by the three insurers. A sample of subscribers, stratified by age, gender, type of policy, and duration of enrollment, was selected from the enrollment files of each insurer.[13] Surveys were administered from October 2003 through February 2004 by phone, with a self-administered version of the questionnaire mailed to those whom we were unable to contact by phone. We completed 2,195 interviews by phone and 1,769 by mail. This represented 35% of the sample selected for the survey. The vast majority of incompletes were enrollees for whom we did not have sufficient information to locate a phone number or address (20% of incompletes) and enrollees who failed to return any of the three forms we mailed when we were unable to contact them by phone or locate a phone number (74% of incompletes). Surveyed respondents are weighted to account for different probabilities of selection and nonresponse; after weighting they represent all subscribers of these insurers at the time of the sample selection on measurable characteristics.

We obtained insurer administrative records about one year following the survey sample selection to determine whether the respondents were still enrolled in one of the insurer's individual plans or had left the market. Thus, our duration measure for the survey respondents also is derived from administrative records and not self-reports. As noted earlier, for each respondent to the survey, we measure up to three discrete time intervals that describe choices in the three quarters, including the post-enrollment quarter to which the respondent had survived at the time of the sample and the two following quarters. For example, new episodes at the sample selection contribute to estimating the hazard or disenrollment rates for the first three quarters of the episode. Enrollees who had been enrolled with the insurer for one year at the time of the sample contribute to estimating the hazard rate conditional on remaining in the market to quarter 5, 6, or 7. In contrast, in the administrative data we follow new episodes over time, and each new episode contributes to estimating the hazard for each quarter it continues, or until our observation period ends.

The survey collected economic and demographic data about subscribers and their families. It also asked about the presence of the chronic conditions listed earlier and when a condition was diagnosed. Respondents were asked to report their attitude about risk ("I'm more likely to take risks than the average person"), the availability of a safety net ("Good care at low cost can be found in public clinics," "Health care is easy to get even without money") and the cost of a doctor visit and a hospital visit.[14] We use these responses to evaluate how differences in consumers' risk aversion and perceptions of the need for insurance affect their decisions about dropping their individual insurance policy.

Characteristics of the new episodes in our administrative sample and the characteristics of our survey sample are shown in Table 1. The survey sample is somewhat older, and more likely to be enrolled in two-party or family contracts than the administrative sample. This is largely because the survey sample includes people who have been enrolled for several years as well as new enrollees, whereas the administrative data include only people who were new enrollees between 1997 and 2001. The samples are comparable when we restrict the survey data sample to subscribers who enrolled within the last year; they

Table 1. Characteristics of samples used in analysis of administrative data and survey data

	Administrative data (%)[a]	Survey data (%)[b]	
		All subscribers	New subscribers
Age of subscriber			
Under age 25	20.1	7.6	14.9
25–34	30.9	22.9	32.9
35–44	23.3	23.6	24.1
45–54	15.8	24.2	16.6
55–64	9.9	21.7	11.5
Male subscriber	45.7	40.5	38.9
Enrollment type			
Single plan	74.2	68.2	75.6
Subscriber and spouse	8.4	11.3	8.3
Subscriber and child	8.1	6.1	6.7
Family	9.3	14.4	9.4
Any family member with chronic conditon	20.5[c]	49.2[d]	38.9[d]
Any family member with new chronic condition	9.9[e]	5.1[f]	4.4[f]
Income			
Less than $40,000/yr	NA	32.1	35.5
$40,000–$80,000		29.1	31.5
$80,000–$135,000		23.6	21.5
$135,000 and up		15.2	11.5
Race/ethnicity			
White, non-Hispanic	NA	72.8	69.8
White, Hispanic		7.2	6.1
Asian		12.5	15.3
Black		1.8	2.3
Other		5.7	6.5
Any family reported in fair/poor health	NA	6.8	3.5
N of subscribers	54,512	3,964	1,602

Note: NA = not available.
[a] 4.5% sample of people first enrolling in individual plans with participating carriers between January 1997 and July 2001; characteristics are at time of enrollment.
[b] People enrolled with participating carrier in late summer of 2002 (two carriers) or December 2002 (one carrier); demographic characteristics are at time of interview; new subscribers if enrolled within one year of sample selection.
[c] Received treatment in first year of enrollment for one of the following conditions: for adults, arthritis, back pain, hay fever, hypertension, ulcers, cancer, heart disease, diabetes, lung disease, depression; for children, asthma, eczema, ear infections, emotional problem.
[d] Diagnosed by doctor as having one of the conditions in previous note.
[e] Measured only for people who remain in plan for 18 months or more; measured as first-time treatment for one of conditions in c; occurred in claims in past six months for people at the time of 18 months of enrollment.
[f] First time person told he or she had one of conditions listed in c in past six months.

account for 40% of the sample (Table 1). The survey elicits more reports of a chronic condition, but fewer reports of a recently diagnosed condition than measured when using the administrative data. The higher prevalence of chronic conditions is only partly due to the inclusion of both new and long-term enrollees in the survey sample. The survey asked whether a doctor had "ever" diagnosed a condition, and so is likely to identify people with conditions that are currently in remission and do not require ongoing treatment, whereas the claims-based measure would detect only conditions for which respondents were receiving treatment.

Methods

We used logit models to estimate the likelihood of leaving the market in a quarter conditional upon remaining in the market up to that time. As noted earlier, this method produces maximum likelihood estimates of the discrete-time hazard

rate model. Indicator variables for time in the market are included to allow disenrollment probabilities to vary depending upon how long a subscriber has held individual coverage.

Our model is based on standard economic theory of demand for insurance; we assume subscribers will assess the cost and benefits of retaining the plan and act accordingly. Benefits will depend on the provisions of the coverage, the family's expected need for health care, and family's perceptions about the value of insurance. Costs will depend on the premium and changes in premiums that the family faces.[15]

Our outcome measure indicates whether a subscriber continued to be insured with the carrier. In theory, changes in the costs and benefits of a plan held by the subscriber can lead to a decision to switch to another plan offered by the carrier, to switch to a plan offered by another carrier, or to leave the market completely. In practice, subscribers do not frequently switch from one product to another—this occurred during only 9% of episodes in our full administrative database, and only 14% of the longest episodes. In the administrative data, as we noted earlier, we are unable to identify subscribers who switch to a product offered by a competitor, and as a consequence, our outcome measure slightly understates the duration of coverage in the market as a whole.

The administrative data provide us with observations on a large sample of subscribers and the decisions they make over a 5-year period. Over this time, we observe variation in the nature of products offered and their prices and we observe the decisions that subscribers make when they are faced with changes in policy benefits and premium increases. Thus, the administrative data provide a good source for estimating how subscribers' decisions to leave the market are related to plan characteristics and changes in these characteristics. The explanatory variables include: the increase in premium over the quarter, the actuarially adjusted value of premiums, the actuarial value of benefits, the plan deductible, whether the plan provides prescription drug coverage, whether the plan provides mental health coverage, whether the plan benefits changed in the quarter, whether the plan is an HMO or preferred provider organizations (PPO), and whether the plan is closed to new enrollees. A plan that is not open to new enrollees is likely to experience a worsening risk and so may experience future large premium increases. These measures all vary over time. In addition, the models include the age and gender of the subscriber, the contract type, and health measures. The models estimated with the administrative data also include the measures of safety-net and zip-code characteristics. We allow the effect of health status on disenrollment decisions to vary over time. As noted earlier, we understate the presence of a health condition for those who are in the market for less than a year because our measure of health is endogenous to the length of time in the market. As a result, we expect our estimate of the effect of health on early disenrollment decisions to be biased. Therefore, we allow for a different health effect after the first year in the plan; we believe this affords us sufficient observation to obtain a health measure that is not determined by the length of our observation.

We use the survey data to get better estimates of the relation between duration and subscriber characteristics and attitudes. Because the survey data measure disenrollment decisions of subscribers over less than a one-year calendar period, we do not observe responses to premium changes or benefit changes. In addition, there are a limited number of different plans available in the market over this time, and there is a high degree of correlation among the plan provisions that we listed previously. Our survey model, therefore, includes a reduced set of plan benefit characteristics, and additional subscriber characteristics.

We use the estimated coefficient from our models to predict how many new subscribers will have left and how many will remain in the market at various time periods following initial enrollment. Our predictions for the administrative data are for the sample of all new enrollees, and we assume there are no price changes or benefit changes over the time period we examine in making these predictions. To have a comparable prediction population from the survey, we use those in our sample who were enrolled within the last year and we re-weight the survey sample so the distribution of age and contract types in the two prediction samples are the same.

We also report the marginal effects of characteristics—including price and benefit changes in the administrative model—on the hazard rate or disenrollment rate as $p(1-p)\beta$, where β is the coefficient on the characteristic in question and p is the disenrollment rate. The marginal effects will

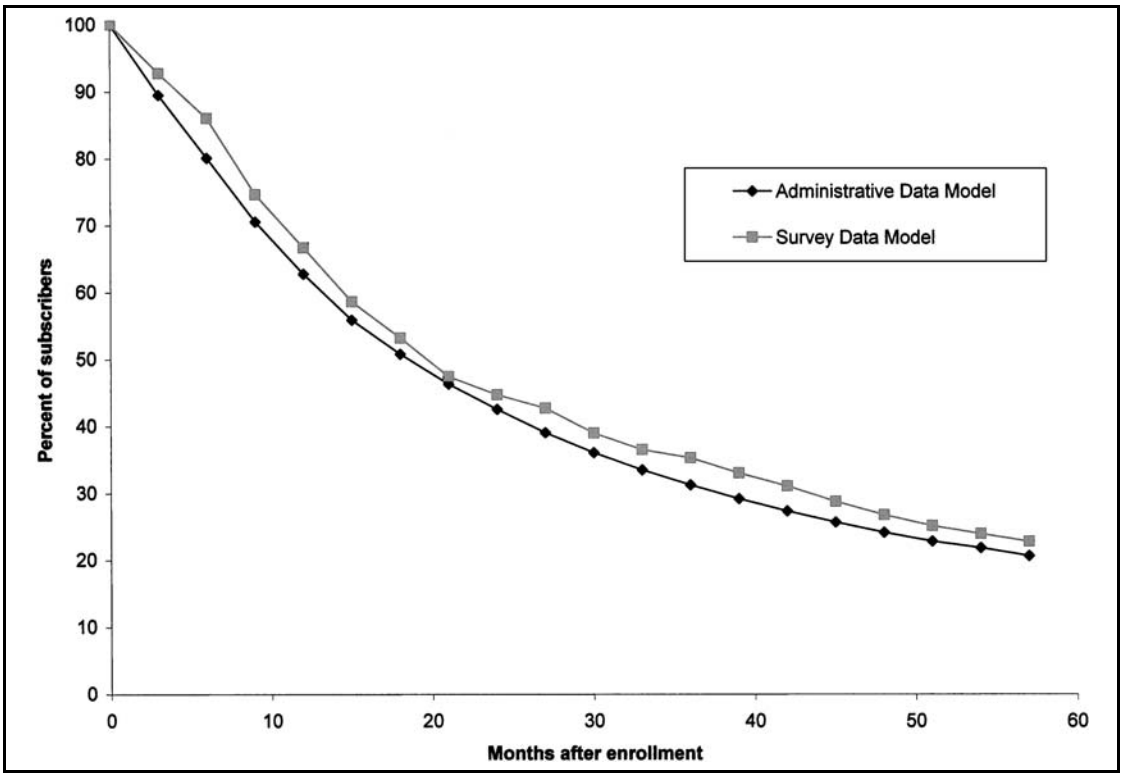

Figure 1. Percentage of subscribers still in the individual market by months after enrollment

vary over time because the disenrollment rate, p, will vary over time. Also, in the administrative data model, there are interactions of time and health status to account for the endogeneity of measured health status in the early period. Therefore, for the administrative model, we report the marginal effects in the first quarter following enrollment and in the first quarter following one year of participation (the 7th quarter). The disenrollment rate, p, used in the calculations is from the prediction samples described earlier.

Finally, we use the results from our estimated models to simulate how the risk profile of a cohort changes over time because of disenrollment decisions. We predict the probability of disenrollment in the first quarter of all subscribers in our entry cohort. To translate the predicted probability into a dichotomous decision to continue the episode or to terminate it, we use Monte Carlo simulation methods (Hammersley and Handscomb 1964; Mihram 1972). The predicted probability of ending the episode is compared to a random probability from a uniform distribution on the unit interval, and the episode terminates if the predicted probability is greater than the random number and continues otherwise. This procedure recognizes the stochastic nature of the model, produces the proportion of continuing episodes that matches the predicted sample average probability, and accounts for factors that increase the probability of continuing. We carry out this process for subsequent quarters for all episodes in the cohort that are simulated to continue. We then examine the characteristics of the remaining members at two years after enrollment and at four years after enrollment and summarize the resulting, time-dependent risk profile of the enrolled cohort.

Results

Contrary to earlier analyses of survey self-reports of duration and conventional wisdom, our analysis of insurer administrative data shows that a substantial share of new episodes of coverage in the individual market continue for a relatively long period (Figure 1). About 60% of new episodes continue more than one year, and over 30% continue for more than three years. Our results for

Table 2. Logit model for probability of exit plan in quarter if still enrolled at start of quarter (administrative sample)

Variable	Parameter	Std. error
Intercept	−2.875	.225
Quarter of enrollment		
2	.099	.020
3	.010	.022
4	−.001	.023
5	−.212	.026
6	−.236	.028
7	−.330	.031
8	−.322	.033
9	−.394	.036
10	−.468	.040
11	−.528	.044
12	−.554	.048
13	−.601	.054
14	−.631	.061
15	−.671	.070
16	−.754	.084
17	−1.000	.117
18	−.770	.142
19	−1.520	.414
Family characteristics		
Type enrollment (single omitted)		
Couple	−.192	.027
Subscriber and child	.062	.025
Family	−.231	.030
Male subscriber	−.039	.012
Age of subscriber (55–64 omitted)		
Under 25	.717	.032
25–34	.831	.029
35–44	.551	.027
45–54	.262	.028
Race/ethnicity of zip code: % of population (white, non-Hispanic omitted)		
White, Hispanic	−.085	.070
Black	.331	.090
Asian	.167	.050
Average income of zip-code population (000s)	−.004	.001
Education of zip code: % of population (less than high school omitted)		
High school	.962	.515
Some college	.229	.240
College degree	.155	.228
Post college	.035	.236
Unemployment rate in zip code	−.781	.251
Index of safety-net resources	.000	.003
Plan characteristics[a]		
Includes drug coverage	−.064	.035
Includes mental health coverage	−.069	.022
Includes a deductible	.323	.140
Includes a deductible if sick family[b]	.010	.044
Ln (Deductible −250)	−.073	.020
Plan benefits change if continue coverage	.061	.025
PPO (vs. HMO)	−.219	.032
Plan closed to new enrollees	.061	.058
Ln (Actuarial value of plan benefits)	.012	.098
Ln (Actuarial value of plan benefits) if sick family[b]	−.296	.102
Ln (Premium at start of period)	.105	.021
Relative change in premium to continue coverage	.856	.057
Health indicators for family		
Any chronic condition if in 1st year of enrollment	−.766	.030
Any chronic condition after 1st year of enrollment	−.183	.028
New chronic condition within six months[c]	−.349	.037
Likelihood ratio Chi^2 (d.f. = 56)[d]	5,745*	

[a] Specification included indicators for carrier, which are not shown for reasons of confidentiality.
[b] Sick if any family member treated for chronic condition.
[c] Measured only if in plan at least 18 months (i.e., for quarters 7 and later).
[d] d.f. = degrees of freedom.
*Prob > chi^2 <.0001.

duration are very similar predicted from both the administrative data and from our survey sample. Tables 2 and 3 show the full models for each data set. The results suggest that the model is stable over the period of our observation because the initial hazard rates depend only on recent enrollees in the survey sample data, but on all new episodes observed over the study period in the administrative data. As another test of the stability of the model over time, we estimated the model fit to the administrative data using only the cohorts enrolled in 1997 and 1998, and obtained similar results to those using all new episodes over the 1997–2001 observation period.[16]

The effects of a marginal change in key characteristics on disenrollment rates, holding all other characteristics constant, are shown in Table 4 since these are easier to interpret than the logistic regression coefficients. The table compares the disenrollment rate when a characteristic changes with a base rate, which is the overall

Table 3. Logit model for probability of exit plan in quarter if still enrolled at start of quarter (survey sample)

Variable	Parameter	Std. error
Intercept	−3.267	.683
Quarter of enrollment		
2	.603	.494
3	.531	.483
4	.614	.480
5	.416	.484
6	.276	.487
7	.238	.489
8	−.766	.544
9	.065	.506
10	.118	.503
11	−.510	.539
12	−.287	.536
13	.200	.517
14	−.241	.538
15	.159	.512
16	.034	.517
17	−.536	.553
18	−.737	.583
19	.140	.529
20	.021	.543
Family characteristics		
Male subscriber	.012	.102
Age of subscriber (under 25 omitted)		
25–34	−.191	.157
35–44	−.078	.177
45–54	−.238	.191
55–64	−.116	.201
Type enrollment (single omitted)		
Couple	−.073	.188
Subscriber and child	.298	.195
Family	.059	.178
Family income ($135,000 and up omitted)		
Less than $40,000	.351	.195
$40,000–$80,000	.307	.190
$80,000–$135,000	.405	.196
Race ethnicity (white non-Hispanic omitted)		
White, Hispanic	.271	.172
Black	.598	.306
Other	.252	.194
Asian	−.276	.160
Education (college degree omitted)		
High school or less	−.138	.120
Some college	−.122	.181
Self-employed	−.639	.123
Family perceptions		
Risk taker[a]	.269	.098
Recent or expected income change		
Increase[b]	.372	.101
Decrease[c]	−.059	.107
Recent or expected family change[d]	.265	.109
Perceived costs of medical care		
Low[e]	.290	.130
High[f]	−.130	.176
Perceive alternatives to insurance[g]	.233	.105
Expect to become eligible for group[h]	.198	.102
Plan characteristics[i]		
PPO (vs. HMO)	−.410	.193
Plan benefits		
Ln (Deductible −250)	1.036	.766
Plan benefits change if continue coverage	−.115	.084
Health indicators for family		
Any family member has chronic condition	.009	.104
Family member has new chronic condition	−.301	.259
Any family member in fair/poor health	−.052	.214
Likelihood ratio Chi^2 (d.f. = 53)[j]	205*	

[a] Strongly agree or agree to statement: "I'm more likely to take risks than the average person."
[b] Reports income increased in past 12 months or expected to increase next 12 months.
[c] Reports income decreased in past 12 months or expected to decrease next 12 months.
[d] Reports new member in family in past 12 months or expected in next 12 months, or family member left in past 12 months or expected to leave.
[e] Perceived cost of doctor visits or hospital visits in bottom 10th percentile and both below median.
[f] Perceived cost of doctor visits or hospital visits in top 10th percentile and both above median.
[g] Strongly agree or agree with at least one of the statements: "Good care at low cost can be found in public clinic," or "Health care is easy to get even without money."
[h] Expect to have access to group health insurance within year.
[i] Specification included indicators for carrier, which are not shown for reasons of confidentiality.
* Prob > chi^2 <.0001.
[j] d.f. = degrees of freedom.

hazard rate in examining changes in plan characteristics and the hazard rate for one value of the categorical family characteristics.[17] About 10% of new episodes end in the quarter in which the policy is purchased. Disenrollment rates decline slightly the longer the episode, and only about 9% of episodes that last for one year will terminate in the quarter following the first anniversary.

Table 4. Marginal effects of characteristics on disenrollment rate in quarter if present at start of quarter: estimates based on administrative data

	1st quarter of enrollment		7th quarter of enrollment	
	Disenrollment rate	% change vs. base rate	Disenrollment rate	% change vs. base rate
Plan characteristics				
Base rate[a]	.105	Inap	.091	Inap
20% increase in premium	.121	15.3*	.105	15.6*
20% higher actuarial adjusted premium	.107	1.9*	.093	1.9*
Has $500 deductible (vs. no deductible)	.119	13.2*	.103	13.4*
Has $500 deductible if in poorer health[b]	.117	11.6*	.102	11.8*
20% higher actuarial value	.105	.4	.091	.4
20% higher actuarial value if in poorer health[b]	.099	−6.2*	.085	−6.3*
Covers mental health	.099	−6.2*	.085	−6.3*
PPO (vs. HMO)	.090	−14.0*	.078	−14.2*
Benefits reduced	.111	5.5*	.096	5.6*
Family characteristics				
Family health				
No family member with chronic condition (base rate)	.117	Inap	.101	Inap
Family member has previous chronic condition	.038	−67.6*	.084	−16.5*
Family member has new chronic condition	Inap		.069	−31.4*
Age of subscriber				
Under 25 (base rate)	.102	Inap	.085	Inap
25 to 34	.109	6.6*	.091	6.7*
35 to 44	.093	−9.1*	.078	−8.9*
45 to 54	.076	−25.4*	.064	−25.6*
55 and older	.061	−40.1*	.051	−40.3*
Family income[c]				
$20,000 per person per year (base rate)	.108	Inap	.094	Inap
$40,000 per person per year	.099	−8.0*	.086	−8.1*
Community characteristics				
3% unemployment rate (base rate)	.108	Inap	.090	Inap
8% unemployment rate	.104	−3.5*	.087	−3.6*

Note: Inap = inapplicable.
[a] Overall hazard rate.
[b] Poorer health is any family member with chronic condition.
[c] Based on average income in zip code of residence.
* Significant at $p = .05$.

However, the costs and benefits of the coverage will affect the decision to stay enrolled or to disenroll. Episodes are more likely to end if the premium increases. A 20% hike in premiums raises the disenrollment rate in the quarter by about 1.5 percentage points, an increase of about 15% in the likelihood of disenrolling (from 10.5% to 12.1%). Disenrollment also is slightly more likely when a plan has a high premium relative to expected benefits.

Episodes are less likely to terminate when a plan offers generous benefits. Those in plans with a $500 per year deductible are about 13% more likely to leave than those in plans that do not have a deductible. We expected that a deductible might affect the decisions of the healthy and the sick differently, since those in poor health would expect to exceed a deductible and receive plan benefits whether or not a deductible was an element of the benefit package. Although we did not find a differential response to the deductible, we found that a high expected plan benefit is a deterrent to leaving among the sick, but does not significantly affect decisions of the healthy. Episodes are more likely to continue if a plan provides mental health coverage, is a PPO plan

rather than an HMO plan, and if the generosity of the benefit provisions are not reduced.

Those in poorer health are less likely to disenroll, indicating that a plan's risk pool will deteriorate over time due to plan attrition without new enrollees. We return to estimate this deterioration later. As noted earlier, our measure of health for people who leave in the first year of the episode may be endogenous because we have limited observation to determine their health. Consequently, we expect that our estimate of the effect of health on disenrollment during the first year might be overstated, so we allowed for the estimated effect to change over time. In fact, we estimate a very substantial difference in disenrollment rates between the healthy and sick during the first year of an episode. The effect is statistically significant, but much smaller in later time periods. Thus, we believe our estimates of health effects after the first year are a better representation of the true effect. The effect of having a newly diagnosed condition does not differ significantly from the effect of having a long-term condition (as measured subsequent to the first year).

Analysis of the administrative data indicates age is a significant factor in the decision to end an episode of coverage; young subscribers are more likely to terminate coverage. Economic factors also are a consideration in these decisions. The probability of leaving the market is lower among high-income subscribers, and it is lower when there is less access to group insurance, as measured by the unemployment rate.[18] However, the availability of safety-net resources as an alternative to having insurance coverage is not a significant factor in decisions (see Table 2 and 3).

The analysis of the survey data confirms the importance of economic factors (Table 5). Higher-income subscribers and those who do not expect to become eligible for group insurance within the next year all are more likely to continue coverage. The self-employed, who do not have group alternatives and who receive a tax break on their premium payments, are more than 50% less likely to drop coverage in a quarter than are other subscribers.

Changes in economic and family circumstances are a factor in decisions to stay enrolled in coverage. We noted that those who expect to have the opportunity to participate in a group plan within the next 12 months are more likely to leave than those who do not expect to have other insurance options. In addition, expected improvements in the family's income position and expected changes in the family composition are associated with an increased probability of dropping coverage.

In contrast to the lack of a relation in the administrative data between duration and the availability of safety-net resources, we find that subscribers who perceive that there are good alternatives to having insurance – those agreeing or strongly agreeing that they can get good care from safety-net providers or otherwise have easy access to no-cost care – are about 20% more likely to leave the market in a quarter. Those who believe care is fairly low cost are also more likely to drop coverage. Subscribers who strongly agree or agree that they are at least as likely to take risks as most people are 25% more likely to disenroll than people who are risk averse.

The survey results suggest that subscribers in more generous plans and those with new chronic conditions may be substantially less likely to disenroll, while younger subscribers may be more likely to disenroll—results that are consistent with those in the analysis of the administrative data. However, because of much smaller sample sizes, our survey estimates of these effects are not significant.

The nature of the risk pool in the individual market can change over time because subscribers with different characteristics have different disenrollment probabilities. Table 6 illustrates this. The first column shows the age and health characteristics of an entering cohort of purchasers based on the characteristics of subscribers at the start of a new episode in our study sample. The next two columns compare the characteristics of members of this cohort who remain in the market continuously for two years and those who remain for four years. The cohort becomes older and sicker, because these are the subscribers who are most likely to remain continuously enrolled.[19] Thus, unless new subscribers can be attracted to the market, deterioration in the risk pool is likely to occur.

Discussion

Some observers argue that the individual market will be viable only if it becomes larger and more stable (Fuchs 2004). But our analysis indicates that there is less turnover in the market than is

Table 5. Marginal effects of characteristics on probability of disenrollment from the individual market in quarter if present at start of quarter: estimates based on survey data

	7th quarter of enrollment	
	Disenrollment rate	% change vs. base rate
Plan characteristics		
Base rate[a]	.091	Inap
Has $500 deductible (vs. no deductible)	.154	69.15
PPO (vs. HMO)	.057	−37.28*
Family expectations		
Base rate[a]	.091	Inap
Expect to become eligible for group[b]	.107	18.00*
Recent or expected change in family composition[c]	.113	24.12*
Recent or expected income increase[d]	.122	33.81*
Perceive alternatives to insurance[e]	.110	21.21*
Perceive low costs of health care[f]	.115	26.32*
Perceive high costs of health care[g]	.080	−11.84
Risk taker[h]	.113	24.45*
Family characteristics		
Family health		
No family member fair/poor health (base rate)	.104	
Any family member has fair/poor health	.099	−4.65
No family member with chronic condition (base rate)	.104	
Family member has previous chronic condition	.105	.84
Family member has new chronic condition	.076	−26.99
Age subscriber		
Under 25 (base rate)	.092	
25 to 34	.076	−17.35
35 to 44	.085	−7.08
45 to 54	.072	−21.62
55 and older	.083	−9.58
Family income		
Less than $40,000 (base rate)	.092	
$40,000–$80,000	.089	−3.07
$80,000–$135,000	.095	3.80
$135,000 and up	.069	−24.62*
Self-employment status		
Not self-employed (base rate)	.105	
Self-employed	.044	−57.22*

Note: Inap = inapplicable.
[a] Overall hazard rate.
[b] Expect to have access to group health insurance within year.
[c] Reports new member in family in past 12 months or expected in next 12 months or family member left in past 12 months or expected to leave in next 12 months.
[d] Reports income increased in past 12 months or expected to increase next 12 months.
[e] Strongly agree or agree with at least one of the statements: "Good care at low cost can be found in public clinics" or "Health care is easy to get even without money."
[f] Perceived cost of doctor visits or hospital visits in bottom 10th percentile and both below median.
[g] Perceived cost of doctor visits or hospital visits in top 10th percentile and both above median.
[h] Strongly agree or agree with statement: "I'm more likely to take risks than the average person."
* Significant at $p = .05$.

commonly believed, and that there is stable demand for coverage in this market from a fairly sizable share of those who purchase coverage. This is especially true for the self-employed and for older subscribers who may be using the market as a source of insurance in retirement prior to being eligible for Medicare. For these populations, the guaranteed renewal practice in place

Table 6. Simulation of effects of exit decisions on characteristics of the risk pool over time with no new entrants

Characteristic	Percentage enrolled		
	At enrollment	2 years later	4 years later
Age at enrollment			
Under 25	20.1	16.9	14.7
25–34	30.9	24.4	21.4
35–44	23.3	24.3	24.8
45–54	15.8	20.1	22.2
55–64	9.9	14.3	16.9
Health			
Any family member has chronic condition	20.5	31.4	38.3

does provide protection against the consequences of becoming sick in the future. However, even with guaranteed renewal, choices are limited because subscribers who wish to switch products may face re-underwriting.

Nonetheless, the market does appear to serve two populations—people who have short-term needs for coverage, such as those between jobs, and people with longer-term needs, such as the self-employed. The turnover that stems from the transitory market may have negative effects on both purchasers and insurers. Those who stay enrolled are in poorer health than those who leave. This means that insurers constantly must attract new members to avoid risk selection due to attrition. In recent interviews, insurers in this market indicated that garnering a sufficient share of new entrants in the market is essential to effectively manage risk and maintain competitive prices (Buntin, Marquis, and Yegian 2004). As we demonstrated, failing to do so may lead to an increase in the risk of the group and drive up prices. Ultimately, rising prices could make these plans unaffordable. Since guaranteed renewal applies only to the purchased product, this could jeopardize the long-term protection afforded by guaranteed renewal as well as access for older, sicker workers who are likely to face substantial mark-ups if they switch to new plans.

Policies that have been proposed to expand the individual market, such as tax credits or reinsurance schemes, also may help to stabilize it and to alleviate the financial consequences of a deteriorating risk pool for long-term enrollees (Swartz 2002, 2003; McClellan and Baicker 2002; Buntin, Marquis, and Yegian 2004). Tax credits may expand the market by making it more attractive, and they also can enhance stability by tempering price changes. Reinsurance schemes can help address insurers' concerns about adverse selection and deterioration of a risk pool, and so may help improve long-term access for sicker and older people. If the costs of reinsurance are spread more broadly than just to individual market enrollees, for instance through tax revenues, reinsurance also can be a mechanism for helping the individual market attract and retain the young and healthy by lowering their total costs (Swartz 2002).

Insurers also are taking steps to spur the growth of the market and to retain customers. They are redesigning products to attract new segments of the market and to moderate price increases in order to reduce disenrollment. Our results indicate that consumer perceptions about insurance and the health care system are a key factor in their decisions, which points to the role of continued marketing to customers by insurers and to a role for public information in promoting insurance and continuity of coverage.

Notes

The authors are grateful to Al Crego and Roald Euller for preparing the data files that were used in this study. They also appreciate the cooperation of the three participating insurers in California in providing the administrative data and the assistance of the RAND survey group in administering the survey. Research results and conclusions expressed are those of the authors and do not necessarily indicate concurrence by RAND or the California HealthCare Foundation.

1 Although HIPAA does not prohibit underwriting at renewal, it generally does not occur (Patel and Pauly 2002).

2 As we discuss more completely subsequently, an insured spell is a period of continuous enrollment in the market; a subscriber may have more than one spell over a period of time.

3 The creation of multiple observations for an episode follows from factoring the likelihood function

for the data and does not create a dependence that inflates test statistics (Allison 1995).

4 Using the survey data, we estimate conditional hazard rates at the start of the episode for those who have been in the market for several years because we do not survey those who enrolled concurrently but left before the sampling date.

5 We stratified by year in the selection, and selected proportional to the number of new episodes in the year. Our sample includes approximately equal numbers of episodes in the first four years, with somewhat fewer in the final year because our observation period does not include the full year.

6 We do not think that this introduces much error into our estimate of the duration of continuous coverage in the market. In our survey, we asked the destination state for those who recently had left the carrier from which they were sampled, and less than 10% indicated that they enrolled with another carrier.

7 In contrast, Ziller et al. (2004) found that about 40% of people enrolled in the individual insurance market started a second episode within four years, based on self-reports of coverage in a panel survey.

8 The standardized population was based on privately insured people under age 65 in the 1997 National Medical Expenditure Panel Survey (MEPS); see Buntin, Marquis and Yegian (2004) for more details.

9 Premiums in the individual market also may vary by the health of the subscriber; however, most policies are sold at the standard price and are not "rated up." Our premium measures do not incorporate health differences; rather we include measures of health in our models.

10 We are likely to understate the presence of chronic conditions for families who are in the individual market for less than a year, and this would lead us to overestimate the relationship between poor health and disenrollment decisions. We account for this as subsequently described in the methods section.

11 The racial/ethnic measure was coded as: the percent white, Hispanic; the percent black; and the percent Asian. The percent white, non-Hispanic was the excluded category. Educational attainment was coded as: the percent high school graduate, percent with some college, percent with a college degree, and the percent with some post-college education. The percent with less than a high school degree was the excluded category.

12 For more detail about this index, see Marquis, Rogowski, and Escarce (2004).

13 We allocated 25% of our sample to those who had enrolled within the last six months, about twice the rate of a proportionate sample design, and sampled those enrolled for five or more years at half the rate of a proportionate design, given other analysis objectives of the study. We allocated approximately equal sample sizes to each of the three carriers. We also allocated the sample to obtain balanced numbers of subscribers by age and contract type.

14 There were four answer categories for the question about risk and the questions about the safety net, which ranged from agree strongly to disagree strongly. The cost questions pertained to the room and board cost for an overnight hospital stay and a doctor visit for the flu. For each type of use, respondents were given four answer categories that were chosen to represent the lowest 10% of charges for the type of service, charges between the 10th percentile and the median, charges above the median and up to the 90th percentile, and charges above the 90th percentile. The answer categories were based on an analysis of the claims data.

15 We measure premium costs in nominal dollars rather than in after-tax dollars because we are unable to identify the self-employed, who receive a tax break for premiums paid for individual products, and we do not have income for any families.

16 Some of our covariates vary with time—such as premium changes, whether benefits change, and whether the family has a new health condition. These changes may be more likely to occur for episodes that we observe for a long period than for shorter episodes. However, our estimates of these responses were also similar using the entire administrative sample and the two early cohorts.

17 The predicted hazard rate for each family category group assumes that the distribution of all other characteristics within the group is the distribution for the population as a whole.

18 Our estimate of the effect of income is based on the average per capita income in the zip-code area. We chose this measure because it reflects the resources per person in the family. We also fit the model using the median family income. The magnitude of the income effect was the same under the alternative specification; however, the parameter estimate was not statistically significant when we used the median family income.

19 Our simulation does not age the population; the cohort age in all cases is measured in terms of a person's entry age.

References

Allison, P. 1982. Discrete Time Methods for the Analysis of Event Histories. In *Sociological Methodology*, S. Leinhardt, ed. San Francisco, Calif.: Jossey-Bass.

———. 1995. *Survival Analysis Using the SAS System*. Cary, N.C.: SAS Institute Inc.

Buntin, M.B., M.S. Marquis, and J.M. Yegian. 2004. The Role of the Individual Health Insurance

Market and Prospects for Change. *Health Affairs* 23(6): 79–90.

California HealthCare Foundation/HRET. 2004. *California Employer Health Benefits Survey*. Available at: http://www.chcf.org/documents/insurance/HRETEmployerBenefits2004.pdf. Accessed June 24, 2005.

California HealthCare Foundation. 2004. *Snapshot: California's Uninsured*. Available at: http://www.chcf.org/topics/healthinsurance/index.cfm?itemID=106448&subTopic=CL119&subsection=reports. Accessed June 24, 2005.

Fuchs, B.C. 2004. *Expanding the Individual Health Insurance Market: Lessons From the State Reforms of the 1990s*. Research Synthesis Report No 4. Available at: http://www.rwjf.org/publications/synthesis/reports_and_briefs/issue4.html. Accessed Oct. 27, 2004.

Hammersley, J.M., and D.C. Handscomb. 1964. *Monte Carlo Methods*. London, U.K.: Chapman and Hall.

Kelch, D. 2005. *Rules Governing California's Individual Insurance Market*. Available at: http://www.chcf.org/topics/healthinsurance/index.cfm?itemID=20739&subTopic=CL500&subsection=reports. Accessed June 24, 2005.

Marquis, M.S., J.R. Rogowski, and J.J. Escarce. 2004. Recent Trends and Geographic Variation in the Safety Net. *Medical Care* 42(5): 161–166.

McClellan, M., and K. Baicker. 2002. Reducing Uninsurance Through the Nongroup Market: Health Insurance Credits and Purchasing Groups. *Health Affairs* Web Exclusive, Oct. 23: W363–366.

Mihram, G.A. 1972. *Simulation: Statistical Foundations and Methodology*. New York: Academic Press.

Monheit, A.C., and C.L. Schur. 1988. The Dynamics of Health Insurance Loss: A Tale of Two Cohorts. *Inquiry* 25(3): 315–327.

Patel, V., and M.V. Pauly. 2002. Guaranteed Renewability and the Problem of Risk Variation in Individual Insurance Markets. *Health Affairs* Web Exclusive, Aug. 28: W280–289.

Pauly, M.V. 1992. Risk Variation and Fallback Insurers in Universal Coverage Insurance Plans. *Inquiry* 29(2): 137–147.

Pollitz, K., and D. Chollet. 2001. Thinking About the Individual Health Insurance Market in a Post-HIPAA Era. Contract no: HHS-100-00-009. Washington, D.C.: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services.

Swartz, K. 2003. Reinsuring Risk to Increase Access to Health Insurance. *American Economic Review* 93(2): 283–287.

———. 2002. Government as Reinsurer for Very-High Cost Persons in Nongroup Health Insurance Markets. *Health Affairs* Web Exclusive, Oct. 23: W380–382.

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

———. 1993b. Personal Characteristics and Spells Without Health Insurance. *Inquiry* 30(1): 64–76.

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

U.S. General Accounting Office (U.S. GAO). 1996. *Private Health Insurance: Millions Relying on Individual Market Face Cost and Coverage Trade-Offs*. Report to the Chairman, Committee on Labor and Human Resources, U.S. Senate, Nov. 25. Available at: http://www.gao.gov/archive/1997/he97008.pdf. Accessed Oct. 25, 2004.

Yamaguchi, K. 1991. *Event History Analysis*. New York: Sage Publications.

Ziller, E., A. Coburn, T. McBride, and C. Andrews. 2004. Patterns of Individual Health Insurance Coverage, 1996–2000. *Health Affairs* 23(6): 210–221.