Inequality in Durations of Insurance Loss Following Employment Disruption

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Abstract

This paper uses duration analysis to determine how long uninsurance spells last, who is most at risk of suffering long uninsurance spells, and, among those who reacquire coverage, what sorts of insurance policies they tend to reacquire. In doing so, this papers focuses on a population particularly vulnerable to short-term insurance loss – individuals who experience employment disruption. Results, based on data from the Medical Expenditure Panel Survey, point to three conclusions. First, more than half of uninsurance spells last less than one year, and almost two-thirds last less than two years. Second, unmarried males, Hispanics, high school dropouts, rural residents, and those in their 50s tend to reacquire insurance at slower rates than their counterparts. Third, among individuals who do reacquire insurance, females, individuals with children, and subjects with health problems tend to move to public plans. In contrast, married subjects tend to enroll as dependents on spouses' policies.

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1. Introduction

Nearly 50 million Americans currently lack health insurance, but this point-in-time estimate hides the fact that some of those uninsured individuals will acquire coverage in the coming months, while others who currently have coverage will soon join the ranks for the uninsured. Although estimates differ depending on timing and data sources, evidence suggests that most uninsurance spells last less than a year (Swartz and McBride, 1990; Bennefield, 1998; Copeland, 1998; Short and Graefe, 2003; Zuckerman and Haley, 2004), while at least one-third of uninsurance spells last longer than one year (Henderson, 2009, p. 192). Any period of insurance loss, regardless of its brevity, has been shown to correlate with negative health consequences (Hadley, 2003), and health problems appear to increase with the duration of insurance loss (Ayanian et al., 2000; Baker et al., 2002).

Despite obvious importance to public policy, relatively little formal duration analysis exists on the topic of insurance loss, including what types of individuals tend to experience lengthy uninsurance spells. This likely stems, in part, from the fact that most household surveys of insurance status report annual information. But formal duration analysis of insurance status requires relatively high frequency data (i.e., monthly) in order to identify short-term insurance loss, and to calculate how long such spells last. A notable exception is Cutler and Gelber (2009), who use monthly data to investigate whether uninsurance spells have shortened or lengthened since the mid 1980s.

This paper uses duration analysis to determine how long uninsurance spells last, who is most at risk of suffering long uninsurance spells, and, among those who reacquire coverage, what sorts of insurance policies they tend to reacquire. In doing so, this papers focuses on a population particularly vulnerable to short-term insurance loss – individuals who experience employment disruption.

Results point to three main conclusions. First, among those who lose insurance do to employment distruption, more than half of uninsurance spells last less than one year, and almost two-thirds last less than two years. Second, unmarried males, Hispanics, high school dropouts, rural residents, and those in their 50s tend to reacquire insurance at slower rates than their counterparts. Individuals who possess several of these traits face especially onerous paths to reacquiring coverage. Third, among individuals who do reacquire insurance, females, individuals with children, and subjects with health problems tend to move to public plans. In contrast, married subjects tend to enroll as dependents on spouses' policies.

2. Employment Disruption and Insurance Loss

Individuals experiencing employment disruption have long attracted policy interest, most evident by the passing of the Consolidated Omnibus Reconciliation Act of 1985 (COBRA), which introduced a continuing coverage mechanism that allows certain individuals experiencing employment separation the option to continue purchasing employee insurance. The law states that individuals experiencing employment separation may continue purchasing group coverage from their former employer for 18 months. Because COBRA was designed, primarily, to assist individuals experiencing employment separation, adjustments to COBRA have become hotly debated topics during times of economic turmoil. Senators Max Baucus and Edward Kennedy argued, unsuccessfully, for a 50 percent subsidy to COBRA premiums as part of the Bush Administration's 2001 economic stimulus package. A similar proposal resurfaced, and was ultimately included in, the American Recovery and Reinvestment Plan signed into law in February of 2009. The ARRP package provides a 65 percent subsidy for COBRA premiums for a period of 9 months (later expanded to 15 months) for workers laid off between September 1, 2008 and December 31, 2009. Responding to political pressure, Congress extended coverage to those laid off before June 2, 2010.

The primary motivation behind COBRA's passing was that uninsurance spells are a relatively common occurance, even among the employed population. For example, approximately 16 percent of full time workers in 1999, a year of robust economic growth, experienced at least 1 month without insurance (Bhandari and Mills, 2003). When viewed over a four-year horizon, approximately one in three working-age adults experience a lapse in health insurance coverage (Short and Graefe, 2003). Individuals with less education and lower incomes appear to experience longer uninsurance spells compared to their better-educated and higher-income counterparts (Swartz, Marcotte, and McBride 1993).

Another strand of literature focuses on the complex link between employment and insurance loss. Evidence shows that employment disruptions, including impending disruptions, result in uninsurance spells of varying length

(Gruber and Madrian, 1997; Simon and Schroeder, 2006). On the other hand, becoming re-employed does not necessarily increase the likelihood of gaining coverage (Fairlie and London, 2008). Not surprisingly, among workers, insurance loss appears to be more common among those employed part-time or for shorter periods (Farber and Levy, 2000), and among the self-employed (Perry and Rosen, 2001). Evidence also suggests that being black or Hispanic exacerbates problems maintaining coverage (Haas and Swartz, 2007; Reschovsky, Hadley, and Nichols, 2007).

This paper contributes to the extant literature in three ways. First, it estimates formal duration models that account for the fact that some uninsurance spells are not completely observed. Second, it does so using the most recent waves of the Medical Expenditure Panel Survey, a large up-to-date household survey containing relatively high-frequency information and insurance status and labor market attachment. Finally, it estimates models, for individuals who reacquire insurance following insurance loss in order to predict what sorts of policies employment separators eventually reacquire.

3. Data

The derth of studies on uninsurance duration stems, in part, from a lack survey data with higher-than-annual frequency information on insurance status and employment activity. From its inception, the Medical Expenditure Panel Survey (MEPS) has collected monthly data on insurance status, but until recently, sample sizes were too small to study the highly unique subpopulation of individuals who lose insurance as a result of employment disruption. As additional waves of the survey have accumulated, sample sizes are now large enough to permit such an analysis. The estimation sample used in this paper draws upon the 1997–2008 waves of the survey. MEPS's survey design consists of a series of five interviews, at approximately 4-6 month intervals, during which respondents provide detailed information on health insurance, socioeconomic details, and labor market attachment. Using this information, 24 months of data were extracted for all respondents.

The estimation sample focuses on subjects between ages 20-59. Those younger than 20 might have coverage through parents' policies, while those older than 59 have employment and insurance decisions influenced by impending Medicare eligibility. The sample further focuses on subjects who enter the survey employed, and who *hold* private insurance policies. The sample does not consider non-policyholders, as those subjects are less likely to lose insurance as a result of their own employment disruption. For the same reason, the sample also excludes those who enter the survey enrolled in public plans.

The sample consider subjects who, after entering the survey employed, report either not working or report changing jobs in a subsequent round. The remainder of this paper refers to work stoppage or job change, collectively, as "employment disruption." Finally, among this sample of subjects experiencing employment disruption, the final estimation sample focuses on those who, after entering the survey holding private insurance, experience at least one month without insurance. The final sample includes 3,681 unique subjects who experience both employment disruption and insurance loss.

Recalling that MEPS includes only 24 months of information, and recalling that subjects may lose insurance at any point during those 24 months, more than half of the sample (53%) still lacks insurance upon exiting the survey. In survival analysis jargon, these observations are "right censored", in the sense that the termination of the uninsurance spell is not observed. The remaining 47% of the sample reacquires insurance before exiting the survey, and, thus, those uninsurance spells are completely observed.

Table 1 reports sample means for the estimation sample. The most important variable, shown at the bottom of the table, measures the number of months until the subject reaquires *any* insurance coverage, either private of public, and either policyholder or not. Among subjects who reacquire coverage before exiting the survey, insurance loss durations last, on average, 5.85 months. In constrast, the censored observations have an average of 9.77 months of uninsurance before leaving the survey. To shed further light on distributional shape, Figure 1 shows histograms of the uninsurance duration variable. Among subjects who reacquire insurance, most uninsurance spells appear to terminate before 6 months, and relatively few spill into a second year. On the other hand, among subjects who exit the survey without reacquiring coverage, long spells of uninsurance, including some longer than a year, appear more common.

The remainder of Table 1 report sample means for various socioeconomic measures. Younger subjects, especially those below 40 years of age, appear to have easier times reacquiring insurance, compared to their elder counterparts.

Females appear to have easier paths to reaquiring insurance, while Hispanics have a more difficult time. Finally, higher educated individuals also appear to have easier paths to reacquiring insurance.

This discussion offers hints at which socioeconomic groups are more likely to reacquire insurance after losing it. But among those who do reacquire coverage, from where do they obtain it? The following table shows that, among those who reacquire insurance, the majority end up once again holding their own private policies. Approximately 10% enroll in someone else's plan, most likely a spouse's, and, likewise, approximately 10% enrolls in public insurance.

Reacquired coverage source	Percentage
Reaquire as private policyholder	80%
Reaquire as dependent on private policy	10%
Reaquire with public insurance	10%

Part of the empirical strategy, outlined in the following section, involves identifying what types of individuals tend to reaquire coverage from these different sources. Such information should help inform policymakers in designing reforms that aim to shrink the duration of uninsurance spells, perhaps by ushering individuals towards coverage sources that they would have eventually gravitated toward anyway.

4. Methods

To calculate the length of uninsurance spells, the estimation approach uses survival analysis, a common method in epidemiological and actuarial studies. In economics, survival models have been used to model strike durations (Kennan, 1985), unemployment spells (McCall, 1996), and, in the most closely related study to this one, uninsurance duration (Culter and Gelber, 2009). Cutler's and Gelber's primary focus concerns the changing length of uninsurance spells over a 20 year period. This paper draws inspiration from their empirical methods to try to calculate how long uninsurance spells last, as well as identify individuals at risk of incurring long uninsurance spells.

Following insurance loss, subjects face several options to reacquire coverage. To determine what types of policies subjects reacquire, estimation uses multinomial logit analysis. Each of these estimation approaches, survival methods and multinomial logit, are discussed in the following two subsections.

4.1. Estimating uninsurance duration

For individuals $i = 1, \ldots, N$, let t_i denote the duration of uninsurance measured in months. Because everyone in the sample experiences insurance loss, the minimum value is $t_i = 1$. For uncensored observations, t_i indicates that the subject reacquires insurance in month $t_i + 1$. On the other hand, for right censored observations, t_i indicates that the subject remained uninsured for t_i months, and then exited the survey.

Estimation relies on a proportional hazard function given by

$$\lambda\left(t_i|\mathbf{X}_i'\boldsymbol{\beta}\right) = \lambda_0\left(t_i\right)\exp\left(\mathbf{X}_i'\boldsymbol{\beta}\right)$$

where λ_0 represents the baseline hazard, a function of uninsurance duration alone, and $\mathbf{X}_i$ represents a vector of control variables with estimable coefficients $\boldsymbol{\beta}$. Estimates rely on the semiparametric Cox proportional hazard setup, in that the baseline hazard remains unspecified, affording protection against potential misspecification of the overall hazard function. Estimates derive from partial likelihood methods (Cox, 1975), accounting for the presence of right censored observations, with standard errors calculated using the robust sandwich formula.

The coefficients $\boldsymbol{\beta}$ represent the main parameters of interest, as they inform upon the relationship between the explanatory variables and uninsurance duration. Positive values for the coefficients indicate that the associated explanatory variable correlates with shorter uninsurance spells, while negative values point to longer spells.

Explanatory variables included in $\mathbf{X}_i$ measure person-specific traits present and measurable upon entry into the survey. The primarily concern in choosing these explanatory variables is to select characteristics that are relatively easy for policy makers to observe, perhaps through census questionnaires, so that health care officials might identify subjects most at risk of enduring long uninsurance spells. These traits include four dummies indicating age upon entry, four education dummies, gender, marital status upon entry, gender times marital status upon entry, race, ethnicity, number of children upon entry, and an indicator for metropolitan residence upon entry. To this end, the vector $\mathbf{X}_i$ does not include, for example, attitudes toward risk, which, although certainly important in determining the speed with which one reaquires insurance, are not readily available to policy makers. The vector $\mathbf{X}_i$ does include a dummy variable indicating the presence of a health condition on AHRQ's "priority list." Although not as easy for policy makers to observe, health problems are often cited as an obstacle to obtaining health coverage. Indeed, such concerns fostered the Affordable Care Act's ban of refusals of coverage for pre-existing conditions.

4.2. Estimating the reacquired policy

Following insurance loss, an individual who reacquires coverage might (1) once again become a policyholder; (2) enroll as a dependent on someone else's policy; or (3) enroll in a public plan. To calculate the probability of these three states, multinomial logit models are estimated using observations on subjects who do reacquire coverage.

Let p_{ij} be the probability that subject i obtains coverage from source j, where $j = 1, 2, 3$ indexes the three options listed in the previous paragraph. This probability assumes the form

$$p_{ij} = \frac{\exp\left(\mathbf{X}_i'\boldsymbol{\gamma}_j\right)}{\exp\left(\mathbf{X}_i'\boldsymbol{\gamma}_1\right) + \exp\left(\mathbf{X}_i'\boldsymbol{\gamma}_2\right) + \exp\left(\mathbf{X}_i'\boldsymbol{\gamma}_3\right)}.$$

Normalizing $\boldsymbol{\gamma}_1 = 0$, this probability forms the basis of the multinomial logit model. The vector $\mathbf{X}_i$ includes the same explanatory variables discussed in the previous subsection. The main parameters of interest, $\boldsymbol{\gamma}_j$, indicate whether subjects show higher or lower probability of reacquiring coverage from each of the three possible sources.

5. Results

Coefficient estimates for the Cox proportional hazard model appear in Table 2. Positive coefficients indicate that the explanatory variable correlates with faster reacquirement of insurance, while negative coefficients imply the opposite. Age shows nonlinear effects on termination of uninsurance spells, with subjects in their 30s reacquiring insurance quicker than those in their 20s, but subjects in their 40s and 50s reacquiring slower than those in their 20s. Females reacquire faster than males; as shown below, this discrepancy in reacquire rates between genders appears to derive from lower eligibity thresholds for public insurance for females. Similarly, married subjects reacquire faster than their unmarried counterparts; as shown below, this appears due to married subjects having access to spousal coverage.

Hispanics appear to reaquire slower, while blacks do not appear to show different reacquirement rates compared to nonblacks/nonHispanics. The presence of children associates with slower reacquirement, while residence in a metropolitan area correlates with faster reacquirement. Reacquirement rates appear to monotonically increase with educational attainment, with college graduates reacquiring faster than any other eduation level. Finally, subjects with health conditions listed on AHRQ's "priority list" appear to reacquire slower than those without such conditions.

To help gain a sense of the magnitude of the coefficient estimates, Figures 1−3 plot survival functions based on the estimates obtained from the Cox model. To ascertain how quickly typical uninsurance spells terminate, Figure 1 presents the estimated survival funcation calculated at the mean values of the explanatory variables. The vertical axis can be interpreted as the approximate probability that a subject remains uninsured in each month following insurance loss. Following insurance loss, the probability that the mean individual remains uninsured trickles down to less than 0.50 within 12 months, and then below 0.40 within 24 months. The implication is that, among the population under consideration, more than half of uninsurance spells last less than a year, and almost two-thirds last less than two years.

Figure 2 presents several plots after adjusting the values of specific explanatory variables. For example, the top left picture shows survival plots for subjects in their 30s compared to those in their 50s. All other explanatory variables remain fixed at their mean values. Subjects in their 30s reacquire insurance quicker than those in their 50s. Within two years of insurance loss, approximately 60 percent of subjects in their 50s have reacquired insurance, while almost 70 percent of subjects in their 30s have. The top right picture highlights the relatively slow pace at which Hispanics reacquire, compared to their nonblack/nonHispanic counterparts. The middle plots show that subjects with priority list conditions and those residing in rural areas reacquire at slower rates.

The bottom left picture highlights the sizable impact of education attainment. Approximately 75 percent of college graduates reacquire insurance within two years, compared to only about 55 percent of high school dropouts. The bottom right picture show the impact of gender and marital status. Unmarried males appear to reacquire slowest, approximately on pace with high-school dropouts. On the other hand, married males reacquire fastest, approximately on pace with college graduates. Females fall in the middle, with little difference across marital status.

Figure 3 points to several socioeconomic traits that correlate with slower reacquirement of insurance. Yet, subjects are not likely to possess these traits in isolation. Rather, these traits are likely correlated, and therefore likely occur together, which would be expected to amplify difficulties reacquiring insurance. Figure 3 plots survival curves for subjects at high risk of remaining uninsured, compared to subjects at low risk. As described at the bottom of the plot, the high risk subject is an unmarried Hispanic male in his 50s with zero children, less than a high school education, rural residence, and a priority list condition. In contrast, the low risk subject is a married nonblack/nonHispanic college-educated male in his 30s with zero children, metropolitan residence, and no priority list condition. Following insurance loss, the low risk subject reacuires quickly; 60 percent have reacquire with 6 months, 80 percent have reacquired within 12 months, and almost 90 percent have reaquired within 24 months. In contrast, high-risk subjects reacquire far more slowly; only 10 percent have reaquired within 6 months, only 20 percent have reacquired within 12 months, and fewer than 30 percent have reacquired within 24 months.

6. Sources of reacquired insurance

Following insurance loss, an individual who reacquires coverage might (1) once again become a policyholder; (2) enroll as a dependent on someone else's policy; or (3) enroll in a public plan. To calculate the probability of these three states, multinomial logit models are estimated using observations on subjects who do reacquire coverage. Table 3 presents marginal effects estimated from a multinomial logit model using the same explanatory variables as in the duration models.

Females are approximately 10.5 percentage points less likely to become private policyholders, and approximately 9.5 percentage points more likely to obtain public insurance. A similar pattern emerges with respect to the number of children. These results likely reflect that Medicaid eligibility targets low-income women and children.

Married subjects are 10 percentage points less likely to reacquire as private policyholders, and 11 percentage points more likely to enroll as dependents on others' policies, mostly their through spouses. Some patterns also emerge with respect to race and ethnicity, with blacks showing lower likelihoods of becoming private policyholders, and Hispanics appearing less likely to enroll as dependents in others' policies. Subjects with college degrees appear 5 percentage points more likely to become private policyholders, and 5 percentage points less likely to enroll in public options.

Finally, subjects with priority list health conditions are approximately 13 percentage points less likely to become private policyholders, and about 10 percentage points more likely to find public coverage. This result might reflect the widespread practice, followed by private insurers but not the government, of refusing coverage to individuals with obvious pre-existing conditions. The recently-passed Affordable Care Act prohibit such refusals. Therefore, a topic for future research is to determine whether, among subjects with priority list problems, the 13 percentage point lower probability of becoming policyholders shrinks in the coming years.

7. Policy Implications

Health insurance reforms, including public insurance expansions, depend crucially on the duration of insurance loss. Such an investigation also helps inform upon who stands the most to gain with the impending full implementation in 2014 of the Affordable Care Act. Yet surprisingly little evidence exists on uninsurance spells. This paper zeros in on individuals who lose private coverage in the wake of disruptions to employment.

Results of Cox proportional hazard models reveal several important conclusions. First, among the population under consideration, more than half of uninsurance spells last less than one year, and almost two-thirds last less than two years. Second, certain socioeconomic groups show lower likelihoods of reacquiring insurance, including unmarried males, Hispanics, high school dropouts, rural residents, and those in their 50s. In addition, the presence of a health problem also impedes reaquirement of coverage. Third, when individuals possess several of those traits that correlate with slower reaquirement, insurance reaquirement rates are remarkable low: Only 20 percent have reacquired within 12 months, and fewer than 30 percent have reacquired within 24 months. In contrast, among individuals who do not possess those traits, 80 percent have reacquired within 12 months, and almost 90 percent have reaquired with 24 months.

In addition, multinomial logit estimates show that, among individuals who do reacquire insurance, females and individuals with children tend to move to public plans. Subjects with health problems also tend to move to public plans. In contrast, married subjects tend to enroll as dependents on spouses' policies.

The explanatory variables used in this paper are intentionally chosen such that they are easy for policymakers to observe, perhaps through census questions. Thus, policymakers might uses the findings in this paper to target reforms at groups that tend to reaquire insurance slower than others, especially unmarried males, Hispanics, and high school dropouts. The findings of this paper also suggest that those groups stand the most to gain from implementation of the Affordable Care Act, as problems associated with insurance loss should be reduced.

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Figure 1: Histograms of insurance loss duration

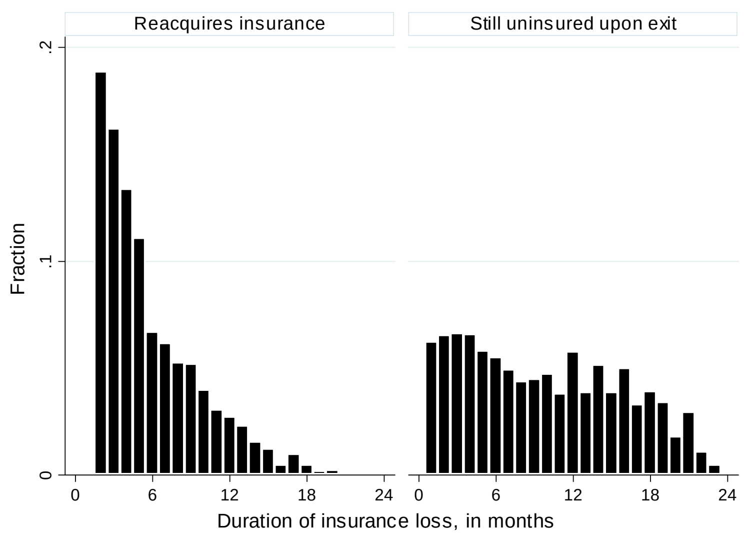


Figure 2: Probabilities of no insurance (estimated survival functions)

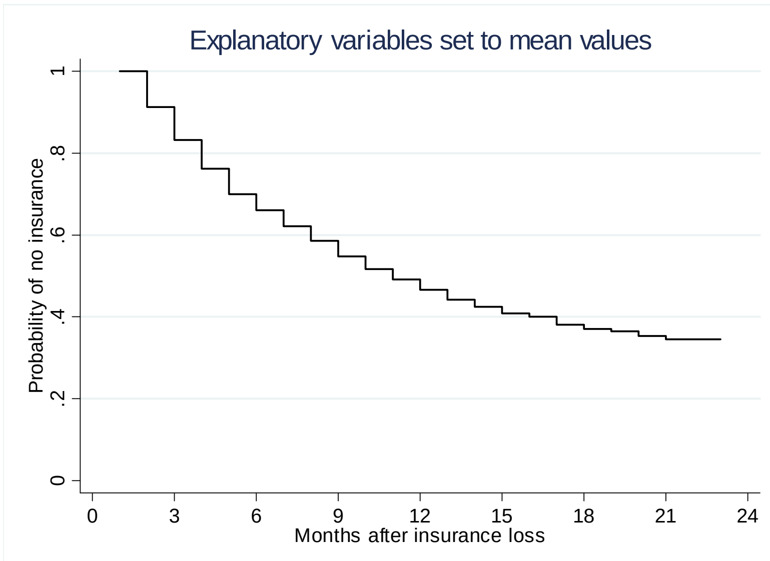


Figure 3: Probabilities of no insurance (estimated survival functions), by socioeconomic groups
(all other explanatory variables set to mean values)

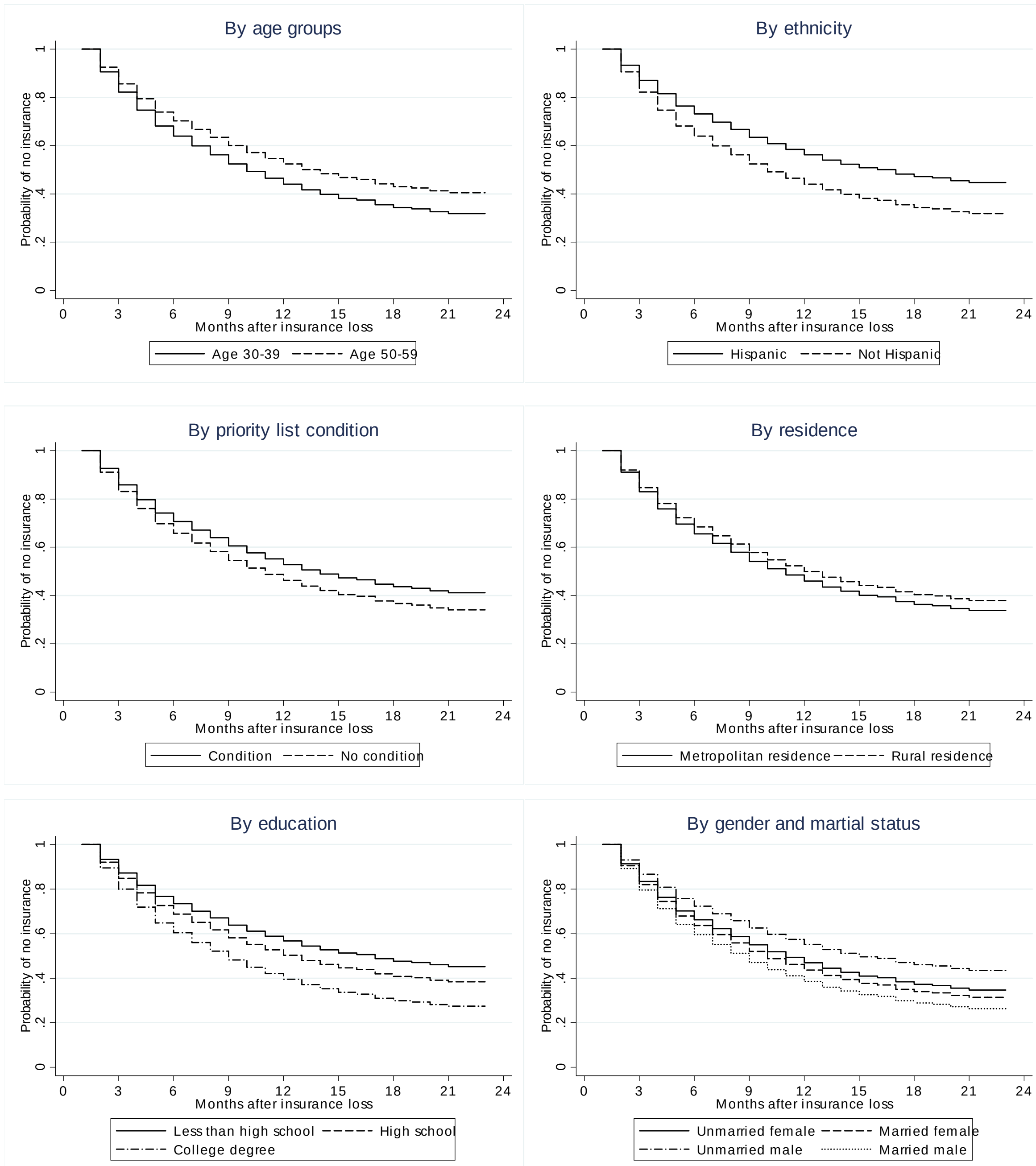
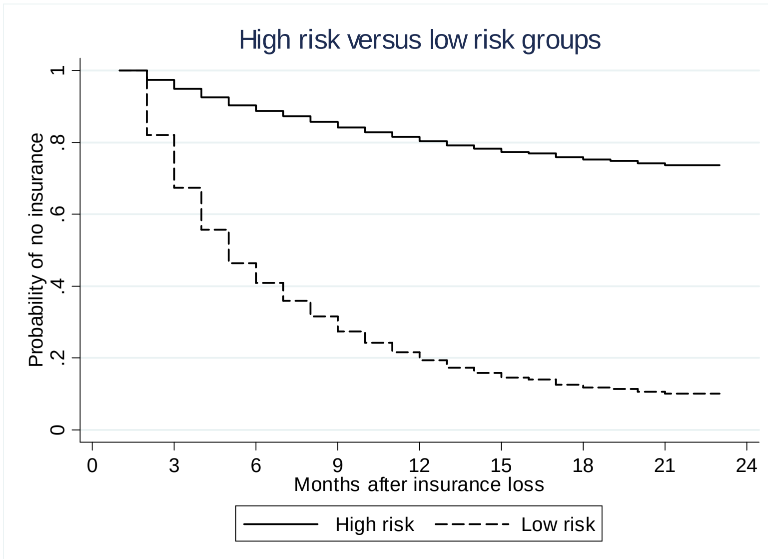


Figure 4: Probabilities of no insurance (estimated survival functions), high risk versus low risk groups



Note: Both groups consider males with zero children.
Then "high" and "low" risk are defined as:

	High risk	Low risk
Age	50-59	30-39
Married	No	Yes
Race/Ethnicity	Hispanic	Nonblack/NonHispanic
Education	Less than high school	College degree
Residence	Rural	MSA
Priority list condition	Yes	No

Table 1: Sample means.
All subjects enter the survey employed, and holders of private insurance policies, but not public policies.
All subjects then experience both employment disruption and at least one month of insurance loss.

	Reacquire insurance before leaving survey N = 1,735	Still uninsured upon exit of survey N = 1,946
Age 20-29	0.33	0.34
Age 30-39	0.32	0.27
Age 40-49	0.22	0.24
Age 50-59	0.13	0.15
Female	0.48	0.45
Married	0.43	0.41
Black	0.16	0.17
Hispanic	0.16	0.25
Number of kids	0.87	1.06
Less than high school education	0.13	0.19
High school degree	0.34	0.39
Some college	0.27	0.25
College degree	0.26	0.17
Resides in metropolitan area	0.84	0.81
Has “priority list” medical condition	0.05	0.06
Months without insurance	5.85	9.77 (before exit)

Table 2: Cox proportional hazard model for gaining insurance

	Coeff.	St. Err.
Age 20-29	omitted	
Age 30-39	$0.103^{\dagger}$	0.058
Age 40-49	$-0.113^{\dagger}$	0.065
Age 50-59	-0.190^{*}	0.079
Female	0.241^{*}	0.063
Married	0.471^{*}	0.071
Female × Married	-0.382^{*}	0.096
Black	-0.025	0.062
Hispanic	-0.353^{*}	0.068
Number of kids	-0.067^{*}	0.017
Less than high school education	-0.351^{*}	0.080
High school degree	-0.164^{*}	0.060
Some college	omitted	
College degree	0.248^{*}	0.064
Resides in metropolitan area	$0.110^{\dagger}$	0.066
Has "priority list" medical condition	$-0.190^{\dagger}$	0.108

$\dagger$: $p < 0.10$

$*$: $p < 0.05$

Table 3: Multinomial logit estimates of reacquiring insurance

	Private policyholder		Private dependent		Public insurance	
	Marg. Eff.	St. Err.	Marg. Eff.	St. Err.	Marg. Eff.	St. Err.
Age 20-29	omitted		omitted		omitted	
Age 30-39	-0.008	0.022	0.011	0.016	-0.004	0.017
Age 40-49	0.006	0.024	-0.023	0.015	0.017	0.020
Age 50-59	-0.007	0.031	-0.001	0.020	0.008	0.025
Female	-0.105^{*}	0.029	0.009	0.023	0.095^{*}	0.020
Married	-0.097^{*}	0.033	0.108^{*}	0.027	-0.011	0.022
Female × Married	-0.029	0.044	0.058	0.040	-0.029	0.022
Black	$-0.047^{\dagger}$	0.026	0.018	0.019	0.028	0.019
Hispanic	-0.003	0.025	$-0.028^{\dagger}$	0.015	0.031	0.021
Number of kids	-0.012^{*}	0.006	-0.002	0.005	0.014^{*}	0.004
Less than high school education	-0.004	0.029	-0.026	0.017	0.030	0.025
High school degree	0.010	0.021	-0.008	0.015	-0.001	0.020
Some college	omitted		omitted		omitted	
College degree	0.054^{*}	0.022	-0.004	0.016	-0.050^{*}	0.020
Resides in metropolitan area	0.012	0.024	0.012	0.015	-0.024	0.020
Has "priority list" medical condition	-0.126^{*}	0.055	0.027	0.033	0.100^{*}	0.047

$\dagger$: $p < 0.10$

$*$: $p < 0.05$