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DOI: 10.1111/j.1475-6773.2012.01409.x
RESEARCH ARTICLE

COBRA ARRA Subsidies: Was the Carrot Enticing Enough?

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Objective. To help preserve continuity of health insurance coverage during the recent recession, the American Recovery and Reinvestment Act provided a 65 percent Consolidated Omnibus Budget Reconciliation Act (COBRA) premium subsidy for workers laid off in 2008–2010. We examined COBRA enrollment levels with the subsidy and the health, access, and financial consequences of enrollment decisions.

Study Design/Data Collection. Telephone interviews linked with health system databases for 561 respondents who were laid off in 2009 and eligible for the COBRA subsidy (80 percent response rate).

Principal Findings. Overall, 38 percent reported enrolling in COBRA and 54 percent reported having some gaps in insurance coverage since being laid off. After adjustments, we found that those who had higher cost-sharing, who had higher incomes, were older, or were sicker were more likely to enroll in COBRA. COBRA enrollees less frequently reported access problems or that their health suffered because of poor access, but they reported greater financial stress due to health care spending.

Conclusion. Despite the substantial subsidy, a majority of eligible individuals did not enroll in COBRA, and many reported insurance coverage gaps. Nonenrollees reported more access problems and that their health worsened. Without a mandate, subsidies may need to be widely publicized and larger to encourage health insurance enrollment among individuals who suffer a negative income shock.

Key Words. Premium subsidy, COBRA, individual mandate, care access

Providing affordable and continuous access to necessary medical care is a fundamental challenge in the United States given our current system of health insurance. Health insurance coverage plays a central role in providing access, protecting against financial strain, and improving health, yet because many Americans receive their insurance through their employer, changes in employment frequently result in disruptions in coverage (Ayanian et al. 2000; Schoen and DesRoches 2000; Ross, Bradley, and Busch 2006; McWilliams et al. 2007; Finkelstein et al. 2011; Gulley, Rasch, and Chan 2011). Economic downturns such as with the recent

recession not only threaten to increase this churn but result in substantial coverage gaps as workers losing their jobs have difficulty finding either new employment or employment offering health insurance coverage (Collins et al. 2006; Lavarreda et al. 2010; Fronstin 2011; Holahan 2011).

To address the coverage gaps associated with employment changes, the Consolidated Omnibus Budget Reconciliation Act (COBRA) allows workers to extend their employer-sponsored coverage after loss of employment by paying the full (unsubsidized) premium amount themselves; thus, former workers can keep their existing coverage without interruption at the group rate obtained by their former employer, which often is less expensive than comparable insurance obtained in the individual insurance market.

Given the substantial premiums at a time when an individual's earnings have fallen, it is not surprising that COBRA uptake historically has been limited, with an estimated 10 percent of eligible individuals enrolling (Bovbjerg et al. 2009; Doty et al. 2009; Claxton et al. 2010b; Linehan 2010). Some of this low uptake could reflect having other less expensive coverage options, for example, coverage on a partner's insurance plan, but there has been little research in this area, and particularly in insurance coverage decisions once individuals become COBRA eligible.

The American Recovery and Reinvestment Act (ARRA) of 2009 offered a temporary 65 percent COBRA premium subsidy to workers involuntarily terminated between September 2008 and May 2010 (Bovbjerg et al. 2009; Linehan 2010). The subsidy sought to increase the affordability of health insurance and reduce coverage disruptions (Copeland 1998; Schoen et al. 1998, 2008; Rahimi et al. 2007; Smolderen et al. 2010).

The Patient Protection and Affordable Care Act (ACA) of 2010 similarly aims to increase coverage using subsidies and multiple other approaches including mandates, Medicaid expansion, and employer penalties starting in 2014. In 2014, the ACA will provide federal subsidies based on a sliding scale to low-income persons and families (up to 400 percent of the federal poverty

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level) to purchase health insurance. Recent court challenges have targeted the ACA's use of the individual mandate and Medicaid expansion (Jost 2010; Shapiro 2010). In 2012, the Supreme Court will review these challenges. Pending their ruling, it is possible that ACA will be limited to the use of subsidies alone as a means for expanding health care coverage. There is limited information on whether a subsidy alone is sufficient to encourage insurance uptake or prevent undesirable effects of access disruptions.

In this study, we conducted telephone interviews among individuals laid off in 2009 to assess how the subsidy and other factors affected decisions to enroll in COBRA. We also examined the degree to which COBRA enrollment was associated with subsequent insurance status, access to care, health consequences, and health care associated financial stress. We interviewed a stratified random sample of workers laid off during the COBRA subsidy eligibility period to determine their sources of insurance coverage, including COBRA enrollment and gaps in coverage, and the health and financial effects of these decisions. We hypothesized that the subsidy would result in higher COBRA enrollment, above presubsidy historical levels, and that enrollees would report fewer care access problems and better health outcomes than nonenrollees.

METHODS

COBRA and the Subsidy

Generally, COBRA allows individuals who lose their employer-sponsored health plan to continue with the same coverage for up to 18 months by paying the full group insurance premium plus a 2 percent administrative fee. When enrolling in COBRA, subscribers have the choice to continue covering any dependents previously enrolled or switching to an individual plan covering only the subscriber; thus, these decisions might affect the entire family.

ARRA provided a 15-month, 65 percent COBRA premium reduction in the form of a subsidy to workers involuntarily terminated between September 1, 2008 and May 31, 2010. Employers were required to notify terminated employees of their COBRA and subsidy eligibility, including the premium amount they would have to pay after the subsidy. The subsidy applied to coverage that began after February 2009, for up to 15 months or the start of other group health coverage (e.g., through a spouse or new employer).

Study Setting and Design

Kaiser Permanente-Northern California (KPNC) is a prepaid integrated delivery system (IDS), which provides comprehensive medical care to over 3 million members. The target population for our study included individuals with employer-sponsored insurance who were involuntarily terminated in 2009 and thus eligible for the COBRA subsidy. To identify this population, we selected a sample of IDS primary subscribers who were likely to have been laid off, based on insurance plan information on employers and the timing of insurance payer changes. In telephone calls, we screened for study eligibility by asking whether they had indeed been laid off from the employer that had provided their Kaiser health insurance. We then interviewed subjects who met our eligibility criteria.

Population

To obtain a sample that was likely subsidy eligible, we first identified companies that experienced large layoffs in 2009, defined as over 100 employee health plan members in 1 month. From these companies, we identified employees who had a subsequent disruption in their employer-sponsored coverage. Health plan account managers tracked large layoffs and provided the list of employers by month. Through the health system's databases, we were able to identify monthly changes in an individual's insurance-purchaser, for example, self-purchase of a COBRA plan, self-purchase of an individual plan, or purchase by a new employer.

Using a SAS random number generator, we obtained a stratified random sample of nonelderly adult (18–64 years of age) primary subscribers whose employers had large layoffs in 2009 and who themselves experienced a subsequent disruption in their employer-sponsored coverage: 50 percent from among the subset who enrolled in COBRA in 2009 and 50 percent from among those who did not enroll in COBRA. In each of these strata, both COBRA enrollees and those who did not enroll in COBRA, we oversampled members with a chronic disease so that 70 percent were in the health plan's chronic disease registries for asthma, hypertension, and/or diabetes prior to the insurance change and 30 percent were not. We oversampled members with a chronic disease because they may be more vulnerable to adverse health consequences associated with a disruption in health insurance coverage.

While the databases accurately identified employers with layoffs, not all employees experiencing transitions during the layoff months were necessarily

laid off, that is, there also could be some unrelated, nonlayoff employee turnover. The additional telephone screening questions helped differentiate employees who lost their health insurance coverage due to a layoff from those who had an unrelated transition in employment rendering them ineligible for the COBRA subsidy and for our study.

In January 2010, we mailed the study introduction letter and a postcard for refusal to our sample, including both current KPNC members and those who had left the system. Between February and August, trained interviewers called and screened for study eligibility all those who had not refused participation. Respondents were eligible for our study if they were COBRA subsidy eligible, meaning that they were laid off in 2009 and that this layoff was from the employer that had provided their Kaiser health insurance coverage. In addition, respondents must have been able to complete an English language telephone interview. If a respondent was eligible to participate in the study, the interviewer administered the phone questionnaire. All respondents who completed the interview received a five dollar coffee gift card as a token of appreciation. The Kaiser Foundation Research Institute Institutional Review Board approved the study protocol and materials.

We initially identified 1,392 potential subjects whose employer had experienced large layoffs in 2009 and had a subsequent change in their health plan purchaser. Telephone study eligibility criteria initially excluded those who were unreachable ($n = 260$), with language barriers ($n = 40$), that did not have valid contact information ($n = 139$), had cognitive impairment or severe illness ($n = 5$), or who had died ($n = 5$). Remaining respondents were asked screening questions to determine eligibility: respondents had to report being laid off in 2009 by an employer that provided their Kaiser health insurance. We attempted to screen all remaining respondents for eligibility: 137 subjects refused to participate in the screening. Among those who were screened ($N = 814$), 69 percent were eligible to participate and 99.8 percent of those eligible completed the survey. Making the conservative assumption that all of those who refused to be screened for the survey would have been eligible to participate, our overall response rate was 80 percent ($N = 561$).

Questionnaire

Knowledge. Although all study participants were eligible for the COBRA subsidy, to assess knowledge, we asked participants to report whether they were aware of the option to continue their insurance through COBRA and if they

were eligible for the subsidy. Among those aware of the subsidy, we asked about the percentage of COBRA premiums covered by the subsidy.

Insurance Status Since Involuntary Employment Termination. To determine participants' access to health care since losing their employer-sponsored insurance, we asked all participants whether they enrolled in COBRA or experienced any of the following since losing their job: gaps in health insurance, switches to a family member's health insurance, coverage through a government program (e.g., Medicaid or Medicare), purchase of insurance on the individual market, or coverage through a new employer. Among COBRA enrollees, we asked for how many months they were enrolled and why they enrolled (e.g., to keep the same doctors or because they had no other insurance options). Among COBRA nonenrollees, we asked why they did not enroll (e.g., could not afford the premium or had other options).

Access to Care, Health, and Financial Stress. We asked respondents whether they received less care than needed and if their health suffered due to changes in their health insurance coverage. To assess whether respondents experienced any financial stress, we asked if their health care costs resulted in any of the following: borrowing money; accumulating credit card or bank debt; reduction of some necessity (food, rent, etc.); bankruptcy filing; or collection agency contact over health care bills. We categorized respondents who reported any of these behaviors as having experienced financial stress.

Covariates. In the survey, we also collected respondents' race/ethnicity, education level, and annual household income for 2009.

Automated Data

In addition to self-reported survey data, we also used the health system's automated databases to collect the following insurance and clinical characteristics of each individual and any dependents before the insurance change and after COBRA enrollment: gender, age, comorbidity score (DxCg), whether the plan was for an individual or family, and cost-sharing levels. We modeled cost-sharing using the office copayment amount, as cost-sharing amounts for different services are highly collinear. Because we could not observe

premiums directly, we used cost-sharing as a proxy for plan premiums. All IDS plans had exactly the same delivery options and only varied in their level of cost-sharing. Higher cost-sharing plans generally had lower premiums.

Analysis

Among all respondents, we calculated the percent aware of COBRA and their subsidy eligibility, and reasons for enrolling or not. To examine insurance status since layoff, we calculated the percent of respondents who enrolled in COBRA, had insurance gaps, or obtained health insurance through other sources. We weighted all results using the stratified sampling proportions.

To examine the association between COBRA enrollment and individual characteristics, family characteristics, and awareness of the subsidy, we used multivariate logistic regression. The individual characteristics included in this model were gender, education (no college versus some college or more), race/ethnicity (non-white versus white), plan type (individual versus family), annual household income in 2009 (<\$40,000, \$40,000–59,000, \$60,000–99,000, \$100,000+), and age (18–39 versus 40–64 years). We also adjusted for awareness of COBRA subsidy eligibility. To adjust for coexisting conditions, we used the prospective diagnostic-cost-group (DxCg) score, which we grouped into four categories (<1, 1–1.9, 2–3.9, 4+). DxCg values are expanded versions of the method used by the Centers for Medicare and Medicaid Services for risk adjustment (Zhao et al. 2001; Pope et al. 2004). Higher DxCg scores indicate a greater severity of coexisting illnesses. We included the highest DxCg score and age per family account, rather than just those of the primary subscriber, because decisions to enroll in COBRA likely depend on characteristics of the family member with the greatest need for care.

To compare reports of access to health care, health changes, and financial stress due to changes in insurance between COBRA enrollees and nonenrollees, we used logistic regression adjusted for individual characteristics to calculate the adjusted percentages of each outcome by COBRA enrollment status. We examined the following four outcomes: (1) reports that the respondent received less care than needed (yes versus no); (2) that their health suffered due to changes in their insurance (yes versus no); (3) that they experienced insurance gaps (yes versus no); and (4) that they experienced any financial stress due to health care costs (yes to any versus none). Again, individual characteristics included in these models were gender, education, race/ethnicity, plan type, annual household income in 2009, and the respondent's age and DxCg score. These models were also adjusted for COBRA

enrollment status. We computed the adjusted percent of respondents who reported each outcome by fitting results from the logistic regression models as if all respondents had enrolled in COBRA, and then again as if all respondents had not enrolled in COBRA.

We adjusted standard errors for clustering by previous employer in all models. In sensitivity analyses that focused only on the subgroup without insurance availability from a spouse or new employer, the findings were comparable to those in the main analyses. Analyses adjusting for the number of months between job loss and the interview also yielded comparable findings.

RESULTS

Respondent Characteristics and COBRA Knowledge

Respondents were similar to nonrespondents with respect to characteristics captured in our automated databases, including sex, age, and race/ethnicity. Table 1 displays respondent characteristics. Interviews were conducted, on average, 11 months after the layoff date. Overall, 50 percent were aware of their COBRA subsidy eligibility (Table 2). Among those aware of the subsidy, 67 percent correctly reported that 51–75 percent of COBRA premiums would be covered by the subsidy and 31 percent mistakenly thought that the subsidy covered less than half of their premiums.

Insurance Status Since Involuntary Employment Termination

Overall, 38 percent enrolled in COBRA at some point since losing their job. Respondents also reported the following types of coverage at any time between losing their job and the interview (individuals could report having multiple experiences): 54 percent had a gap in insurance; 27 percent obtained new employer-sponsored insurance; and 22 percent switched to a family member's plan (Table 2). The mean insurance gap was 6.5 months among respondents reporting any gap.

Among reasons reported for enrolling in COBRA: 90 percent wanted to continue coverage with the same doctors and hospitals; 61 percent needed comprehensive coverage; 25 percent reported that they could not obtain individual insurance due to a preexisting condition; and 20 percent did not have other options for coverage (Figure 1). Over half (56 percent) of those who enrolled in COBRA reported that they would not have enrolled without the

Table 1: Characteristics of the Study Population

<i>Percent (SE)</i>	<i>Total (n = 561)</i>	<i>No COBRA Enrollment (n = 161)</i>	<i>Any COBRA Enrollment (n = 400)</i>	<i>p-Values</i>
Gender: female (versus male)	58.6 (6.5)	55.5 (10.4)	63.6 (5.1)	.48
Age (subscriber only): 40–64 years (versus 18–40)	47.4 (4.2)	41.2 (7.1)	57.5 (5.4)	.11
Age (highest per family): 40–64 years (versus 18–40)	48.1 (4.2)	41.5 (7.1)	58.9 (5.4)	.09
Race/ethnicity*: non-white (versus white)	50.9 (5.0)	56.4 (7.7)	42.0 (4.2)	.07
Education*: high school or less (versus some college +)	19.6 (4.7)	19.7 (6.7)	19.3 (5.4)	.68
2009 Household income*: <\$40,000	37.6 (3.2)	44.1 (5.0)	26.8 (3.7)	.04
\$40,000–\$59,000	25.1 (3.3)	24.4 (5.0)	26.3 (3.8)	
\$60,000–\$99,999	24.1 (2.9)	21.9 (5.1)	27.9 (4.5)	
\$100,000+	13.1 (2.1)	9.5 (2.6)	19.1 (3.0)	
Individual (versus family) plan	58.7 (5.3)	61.4 (7.8)	53.9 (3.9)	.11
Office visit copayment: \$0	10.1 (5.1)	14.4 (8.1)	3.0 (1.9)	<.01
\$5–\$20	81.6 (6.7)	83.4 (8.3)	78.6 (9.6)	
\$25–\$40	8.4 (4.1)	2.2 (1.0)	18.4 (9.4)	
Subscriber’s comorbidity score†: <1	55.1 (3.1)	59.4 (5.9)	48.0 (4.5)	.39
1–1.9	24.1 (4.0)	22.4 (6.9)	26.8 (2.4)	
2–3.9	16.7 (2.8)	15.4 (4.2)	19.0 (3.2)	
4+	4.1 (1.0)	2.8 (1.2)	6.2 (1.5)	
Highest comorbidity score per family account†: <1	52.2 (2.9)	58.7 (5.8)	41.5 (4.9)	.13
1–1.9	25.2 (4.0)	22.4 (6.9)	29.8 (2.6)	
2–3.9	17.2 (2.9)	15.7 (4.3)	19.5 (3.6)	
4+	5.4 (1.3)	3.2 (1.3)	9.2 (1.9)	

Notes. Weighted for sampling proportions. *p*-values compare respondents who enrolled in COBRA for any period since layoff with those who did not enroll in COBRA. In this manuscript, we report only the office copayment amount because the various types of cost-sharing tend to be collinear.

*Race/ethnicity, education, and household income based on self-reported survey data. All other characteristics included were attained using the IDS’s automated databases.

†Comorbidity scores based on DxCG values, which is similar to the method used by the Centers for Medicare and Medicaid Services for Medicare risk adjustment. Higher DxCG scores indicate a greater severity of coexisting illnesses.

subsidy. Respondents who enrolled in COBRA reported an average length of coverage of 7.3 months. From the automated databases, we calculated that COBRA enrollees were enrolled for an average of 8 months. Among reasons reported for not enrolling in COBRA; 89 percent could not afford COBRA premiums; 40 percent had other options for health insurance coverage; 16 percent felt that insurance was unnecessary; and 2 percent reported difficulty signing up for COBRA. Among the 89 percent that reported that they could

Table 2: COBRA Knowledge and Insurance Status

	Total (<i>n</i> = 561), %	No COBRA Enrollment (<i>n</i> = 161), %	Any COBRA Enrollment (<i>n</i> = 400), %	<i>p</i> -Values
Knowledge				
Aware of COBRA option	91.70	86.80	100.00	.04
Aware of COBRA subsidy	49.80	33.20	77.10	<.01
Insurance status since layoff				
COBRA	37.50			
No health insurance	53.50	72.20	21.65	<.01
Join family or partner's employer-sponsored insurance	21.90	28.31	10.88	<.01
New employer-sponsored health insurance	26.76	30.44	20.73	.06
Government program	4.87	5.83	3.28	.30
Individual plan	3.70	1.83	6.80	.05

Notes: Weighted for stratified sampling proportions. *p*-values compare respondents who enrolled in COBRA for any period since layoff with those who did not enroll in COBRA. Respondents could report having multiple experiences.

not afford the cost of COBRA, 36 percent reported having other options for coverage and only 39 percent were aware of the subsidy.

Table 3 shows odds ratios for COBRA enrollment. After adjustments, respondents aware of the subsidy (OR = 7.53, 95 percent CI = 2.98–19.00), with higher office visit copayments and inferentially lower premiums (OR = 11.99 for \$25–\$40 versus \$0, 95 percent CI = 2.68–53.69), with higher household incomes (OR = 2.75 for \$100,000+ versus <\$40,000, 95 percent CI = 1.30–5.80), who were older (based on oldest age in the family, OR = 2.28 for age 40–64 versus 18–39, 95 percent CI = 1.01–5.17), and with higher comorbidity scores (based on highest score in family, OR = 3.38 for DxCG 4+ versus <1, 95 percent CI = 1.22–9.37) were significantly more likely to enroll in COBRA.

Access to Care, Health, and Financial Stress

After adjustments, COBRA enrollees were significantly less likely to report receiving less care than needed because of insurance changes (19 percent versus 32 percent), that their health suffered because of insurance changes (22 percent versus 36 percent), and that they experienced any gaps in coverage (22 percent versus 60 percent) compared with nonenrollees (Figure 2). However, COBRA enrollees were significantly

Figure 1: Reasons for Enrolling or Not Enrolling in COBRA

Note. Weighted for stratified sampling proportions. Respondents could report having multiple reasons for enrolling or not enrolling in COBRA.

Table 3: Logistic Model Results for Reported Enrollment in COBRA

	OR (95% CI)
Aware of COBRA subsidy	7.53** (2.98–19.00)
Female (versus male)	1.15 (0.38–3.48)
No college (versus some college and above)	2.36 (0.47–11.79)
Non-white (versus white)	0.63 (0.29–1.33)
Family (versus individual) coverage	1.01 (0.51–2.03)
Office visit copayment: \$5–\$20 (versus \$0)	1.15 (0.17–7.75)
\$25–\$40 (versus \$0)	11.99** (2.68–53.69)
Income: \$40,000–\$59,000 (versus <\$40,000)	1.6 (0.67–3.84)
\$60,000–\$99,999K (versus <\$40,000)	1.79 (0.75–4.25)
\$100,000+ (versus <\$40,000)	2.75** (1.30–5.80)
Age (highest per family): 40–64 (versus <40)	2.28* (1.01–5.17)
DxCG score (highest per family): 1 to <2 (versus <1)	1.16 (0.45–2.99)
2 to <4 (versus <1)	1.29 (0.46–3.62)
4+ (versus <1)	3.38** (1.22–9.37)

Note. Weighted for stratified sampling proportions.

* $p < .05$.

** $p < .01$.

more likely than nonenrollees to report experiencing financial stress due to their total health care costs including insurance premiums (52 percent versus 25 percent, all $p < .05$).

Figure 2: Reported Health Care Access Outcomes by COBRA Enrollment

Note. Weighted for stratified sampling proportions. Adjusted percentages computed by fitting the logistic models as if all respondents had enrolled in COBRA, and then again as if all respondents had not enrolled in COBRA. *p*-values are based on results from the logistic regressions and compare respondents who enrolled in COBRA for any period since layoff with those who did not enroll in COBRA. **p* < .05, ***p* < .01

DISCUSSION

The passage of ARRA in 2009 created a natural experiment during which millions of Americans who involuntarily lost their jobs during the recession became eligible for health insurance subsidies that covered 65 percent of their COBRA premium. Prior to this ARRA subsidy, national estimates of COBRA enrollment ranged from 5 to 19 percent (Bovbjerg et al. 2009; Doty et al. 2009; Fronstin 2010). In our study, we found that 38 percent of laid-off workers eligible for the subsidy enrolled, which is considerably higher than historical unsubsidized levels, but well short of a majority. In addition, over half of all eligible individuals experienced gaps in coverage and the majority of those who did not enroll cited their inability to afford the COBRA premium.

Perhaps equally important is that over half of COBRA enrollees reported that they would not have enrolled without the subsidy. Like previous studies, we found that fewer COBRA enrollees reported problems with care access or that their health suffered because of insurance changes, compared with nonenrollees (Ayanian et al. 2000; Ross, Bradley, and Busch 2006; McWilliams et al. 2007). Nevertheless, half of COBRA enrollees reported experiencing financial stress due to health care spending. These findings sug-

gest that despite the subsidy, COBRA premiums were still difficult to afford for a population experiencing a significant income shock.

The ARRA COBRA subsidy was projected to assist 7 million people during the recession (Bovbjerg et al. 2009; Muldowney 2010). However, recent reports suggest that although enrollment increased substantially, it fell short of expectations (Bovbjerg et al. 2009). Limited knowledge of the subsidy among those eligible may have contributed to this outcome. Our study found that fewer than half of those eligible were aware of the subsidy, and among those aware of the subsidy, one in three mistakenly reported that the subsidy would cover less than half of premiums. Not surprisingly, those aware of the subsidy were more likely to enroll, but awareness could be acting as a marker for greater insurance literacy or better decision making; thus, increasing awareness alone might not be a certain solution. Our study, however, cannot nor was it designed to assess the magnitude of contributing factors with respect to the decision to enroll.

Because decisions to enroll in COBRA likely depend on the characteristics of the family member with the greatest need for care, our model for COBRA enrollment included highest age and comorbidity score per family account. In our adjusted model, we found that those with lower insurance premiums, as indicated by higher office visit cost-sharing, with higher incomes, who were older or had older dependents, and those who were sicker or had sicker dependents were more likely to enroll in COBRA. We found no evidence that individuals with family plans downsized to individual COBRA plans covering only the subscriber. Like findings on financial strain, these findings are consistent with adverse selection among those who chose to enroll in COBRA. Although younger, healthier people may have been less likely to enroll in COBRA because they were able to find a cheaper coverage in the individual market, fewer than 4 percent of respondents reported purchasing health insurance on the private market.

Our study sheds some light on what might happen if the mandate feature of the ACA as well as the guaranteed issue and guaranteed renewal provisions were to be repealed, but a subsidy to purchase health insurance remained (Bal-kin 2010; Connors and Gostin 2010; Jost 2010; Shapiro 2010). Under the ACA as passed, individuals with incomes up to 133 percent of the Federal Poverty Line (FPL) (138 percent including disregards) will be covered under Medicaid. Those earning between 133 and 400 percent FPL will be required to spend up to a set percentage of their income to obtain health insurance, with the remaining cost covered by government subsidies. Because the subsidy percentage depends on the cost of the Silver plan in the geographic area, the

subsidy levels in the ACA are hard to compare directly with the COBRA subsidy, but they are likely to be considerably higher than 65 percent in the relevant income ranges after the loss of a job. For example, for an individual with an income at 133 percent FPL, the ACA subsidy would be approximately 91 percent, assuming the mean premium amount for individual coverage in 2010 (\$6,438), well above the COBRA ARRA subsidy. If, however, the Silver plan in an area only cost \$5,000, the implied subsidy rate for the same individual would be 82 percent and if it were \$4,000, it would be 78 percent (Claxton et al. 2010a).

There are important differences between the ARRA COBRA subsidies and buying individual insurance in the private market that limit the applicability of our findings to a program of voluntary insurance, that is, one with no mandate. Most important, those in the COBRA program had recently suffered a negative income shock from loss of employment. For those with a job but with no employer-provided insurance, the ACA levels of subsidy may attract many more enrollees. For example, employer plans in which the subsidy is 70–80 percent of premiums typically achieve penetration rates of 75–85 percent, and enrollment in Medicare Part B, which has a 75 percent premium subsidy, is over 90 percent (Bovbjerg et al. 2009; Claxton et al. 2010a). Many uninsured, however, have low incomes and also face some level of income uncertainty (McDonough, Sacker, and Wiggins 2005; McWilliams et al. 2007).

Although other health coverage subsidy programs for the unemployed exist, most have had limited success. For example, the Health Coverage Tax Credit (HCTC) program, enacted in 2002 as part of the Trade Act and offering trade-displaced workers a 65 percent credit toward insurance premiums, has had low uptake (<15 percent among those eligible) in large part because of the cost and complexity associated with enrollment (Dorn 2008). Similarly, the Health Insurance Tax Credit (HITC) available briefly from 1991 to 1993, which provided low-income workers with children a refundable tax credit on their health insurance premium based on a percentage of their earned income, had limited uptake, estimated between 19 and 26 percent among those eligible (Cebi and Woodbury 2009). The U.S. Government Accountability Office attributed the HITC's limited enrollment to lack of awareness of the program and to the modest level of the credit, which averaged to only 23 percent of premium costs in 1991.

Our findings are particularly relevant for understanding insurance coverage outcomes for the recently unemployed under ACA law starting in 2014. Under proposed regulations, unemployed individuals with access to COBRA

insurance would not be eligible for insurance subsidies in the health insurance exchanges (Patient Protection and Affordable Care Act 2011). Thus, we would predict either high levels of uninsurance or substantial financial stress from paying unsubsidized premiums. An obvious but possibly expensive policy improvement would be to make individuals involuntarily terminated eligible for exchange subsidies even if offered COBRA, which could result in higher take-up and lower financial stress estimates, that is, closer to those found in the current study.

Our study population was limited to former employees in specific firms in Northern California that experienced large layoffs, all of whom had previously been enrolled in plans within a single IDS offering comprehensive health coverage. Therefore, our findings may not be broadly generalizable beyond our specific study population. Specifically, because a common reason for COBRA enrollment was to continue with the same hospitals and doctors, it is possible that in other settings, where member may be less attached to the delivery system, enrollment would be lower. We did not have access to individual premium amounts but used the cost-sharing level as a proxy for plan premium. Premiums in this setting are comparable to premiums for other group insurance plans in the area.

Our study relied on self-reported data for several outcomes, but in previous studies, we have found these self-reported measures to be comparable with measures using automated data (Hsu et al. 2008; Reed et al. 2008, 2009). The interview data also provided additional depth to our measures, for example, for access when one needed it, perceived health consequences, and financial stress, which claims or automated data lack. Although we worded questions on financial stress carefully to try to isolate only stress that resulted from medical care expenses, many factors typically contribute to financial stress. It can be difficult to isolate the specific effect of medical expenses as opposed to other expenses on overall financial stress, especially when a family experiences a significant income shock. Still, previous research has demonstrated that insurance status can have a large impact on an individual's financial security (Baicker and Finkelstein 2011; Finkelstein et al. 2011). Finally, the cross-sectional interview design provides limited information on temporal relationships between COBRA enrollment status and our outcomes.

Our study has a number of strengths. First, we captured measures of medical need and insurance details prior to job loss at both the individual and family level and included these measures when examining COBRA enrollment. We captured alternative sources of insurance after job loss, basic insur-

ance knowledge, and reasons for enrolling in COBRA or not. Finally, we examined both clinical and economic consequences of the enrollment decision, as patients might need to make difficult trade-offs.

Despite the substantial premium subsidy, a majority of eligible individuals did not enroll in COBRA, and many reported insurance coverage gaps. We found that the limited enrollment under the COBRA subsidy was associated with lack of awareness and understanding of the subsidy as well as the continued high cost of insurance premiums at a time when families were experiencing a significant income shock. Our findings suggest that without a mandate, subsidies need to be more widely publicized to promote awareness and need to be higher than 65 percent to entice a substantial portion of the uninsured who suffer a negative income shock to obtain health insurance. Such changes could address the amount of coverage uptake but not necessarily the closely related problem concerning potential adverse selection. Because of the need to finance any subsidies, the ultimate success of ACA in expanding health care coverage may depend not only on the use of subsidies and the mandate but also on ACA's effectiveness in containing overall health care costs.

ACKNOWLEDGMENTS

Joint Acknowledgment/Disclosure Statement: This research was supported by Kaiser Foundation Research Institute. Newhouse is a director of and holds equity in Aetna, which sells COBRA eligible health plans.

Disclosures: None.

Disclaimers: None.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

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