

# **Falling Apart: How Adults are Faring in the Crisis of Job-Based Health Insurance in the United States**

## **Technical Appendix on Methodology**

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### **Data Sources and Definitions**

This section reports the primary data sources and the population analyzed in this study. Here we also define some important categories used throughout the report such as family, types of health coverage, and work status.

This study uses data from the March Supplement to the household-based Current Population Survey (CPS) for the purpose of identifying different types of health insurance coverage. The four primary categories of coverage identified here are employer-based, public (includes Medicaid and State Children's Health Initiative Programs), and private coverage as well as uninsured. The CPS asks respondents if they were covered by a particular form of health insurance at any time over the previous year (e.g., by an employer-based insurance, or Medicaid). Those not being covered by one of the various types of insurance are categorized here as uninsured.

The population studied here includes children (those under 19) and non-elderly adults (ages 19-65). Sometimes, results are reported by family characteristics, such as family income. Our definition of a family corresponds to the concept of a health insurance eligibility unit (HIEU). It is composed of adults, their spouses, all children under 18, and children between the ages of 19-23 if they are full-time students.

Family income was computed as total annual income of families as defined here. Relation to the Federal Poverty Level (FPL) was computed as follows. We computed the poverty level income based on the number and type of family members and the year. Then we computed the ratio of family level income to the FPL. Our family income in relation to FPL differs sometimes from the pre-produced variables in the March CPS due to different definitions of family. Our definition of family more closely resembles the relevant family definition for both job-based and public health insurance, and our definition of family income is closer to what is used to determine eligibility by public programs.

**Table A1: Federal Poverty Income Levels**

<b>Federal Poverty Income Levels</b>				
Year	Number of Adults	Number of Children	Income at 100% of FPL	Income at 300% of FPL
2000	1	0	\$8,959	\$26,877
2000	1	1	\$11,869	\$35,607
2000	1	2	\$13,874	\$41,622
2000	2	2	\$17,463	\$52,389
2000	2	3	\$20,550	\$61,650
2003	1	0	\$9,573	\$28,719
2003	1	1	\$12,682	\$38,046
2003	1	2	\$14,824	\$44,472
2003	2	2	\$18,660	\$55,980
2003	2	3	\$21,959	\$65,877

<b>Percent of Individuals at or Below 300% of FPL</b>		
	California	United States
2000	53.4%	50.3%
2001	52.9%	49.2%
2002	54.2%	49.9%
2003	52.6%	50.3%
2004	52.0%	50.6%

For the purpose of this report, a worker is someone who worked at the time of the interview, and also for at least 45 weeks in the past year; workers are considered to be full-time if they work at least 35 hours a week. As the health coverage questions refer to the year prior to the date of interview, it is important to have a corresponding annual concept of work. A working family is defined as having at least one member of the family (HIEU) working at the time of the interview, and who worked at least 45 weeks in the past year. Finally, a full-time working family is defined as having at least one member of the family working at the time of the interview, who works at least 35 hours a week and has worked at least 45 weeks in the past year.

Although the CPS has information on health coverage, it does not contain data on health insurance premiums. Therefore, the CPS data is augmented by information on premium costs

of job-based plans from the Kaiser Family Foundation / Health Research and Educational Trust Employer Health Benefits Survey. We estimate the average single and family premium by region (i.e., 8 census divisions, the most disaggregated geographic identifiers available in the data) for each year, and match this to the CPS survey. We form two region-specific premium indices – for single and family plans – by dividing the premium in year  $t$  over the premium in year 2000. Formally, the premium price indices are:

$$(0.1) \quad P_{jt}^F = \frac{\text{premium}_{jt}^{\text{Family}}}{\text{premium}_{j2000}^{\text{Family}}}, \quad P_{jt}^S = \frac{\text{premium}_{jt}^{\text{Single}}}{\text{premium}_{j2000}^{\text{Single}}}$$

Here  $j$  refers to one of 8 census divisions. The construction of the premium price indices and the fact that we include state dummies in our regressions imply that we only use *intertemporal* variation in prices over this period by region, as opposed to variation in the level of prices across regions, to estimate how the coverage rate changes in response to increased premium prices. There is substantial variation in premium price growth among the 8 regions. The family premium index  $P_{j2004}^F$  ranges between 1.45 and 1.64, meaning the aggregate growth in premium prices varies between 45% and 64% depending on the region. Similarly, the single premium index  $P_{j2004}^S$  ranges between 1.33 and 1.59. This regional variation in price growth means that we are not identifying coverage responses solely from a common national time trend.

Below we report average premium prices for US and California over this period.

**Table A2: Premium Price for Job-Based Health Insurance**

Year	Average Annual Family Premium	Average Worker Contribution	Average Annual Individual Premium	Average Worker Contribution
US				
2000	\$6,567	\$1,670	\$2,557	\$259
2001	\$6,603	\$2,022	\$2,710	\$288
2002	\$7,695	\$2,308	\$3,213	\$439
2003	\$8,760	\$2,621	\$3,418	\$364
2004	\$9,831	\$3,156	\$3,862	\$576
CA				
2000	\$5,890	\$1,477	\$2,267	\$271
2001	\$6,273	\$1,536	\$2,348	\$306
2002	\$7,361	\$1,923	\$2,796	\$376
2003	\$8,422	\$2,552	\$3,048	\$454

Source: Kaiser Family Foundation, Employer Health Benefit Survey

## Regression Specification

We estimate the coverage responses separately for four types of individuals: (1) working individuals without a working spouse; (2) working individuals with a working spouse; (3) non-working individual with a working spouse; and (4) child with at least one working parent. Such disaggregation allows the effect of premiums on coverage to vary based on work status and availability of spousal coverage. Moreover, it ensures that changes in working family compositions over this period (e.g., less workers because of the economic downturn) does not confound the impact of prices on coverage. The outcome variables in all cases are: (1) employment-based coverage - either own or dependent; (2) public coverage through Medicaid or SCHIP (for children); (3) private coverage; (4) uninsured.

To quantify the premium responses, we use a multinomial logit model, which jointly estimates the probabilities of having employer, public and private coverage as well as the probability of being uninsured. The primary independent variable is the premium price index - single plan premium for workers, and family plan for dependent adults and children. This premium price index,  $P$ , is interacted with five categories of family income: under 100% of FPL, 100-199% of FPL, 200-299% of FPL, 300-399% of FPL, and 400% of FPL and over, *each in turn interacted with an individual level public eligibility indicator*. This is a 0-1 variable indicating public program eligibility, which is coded for each person using state, income and age- specific eligibility rules for Medicaid and SCHIP over this period.<sup>2</sup> Overall, the set of interactions produce a total of ten premium cost variables, and ten sets of family income variables crossed with public eligibility. This set of twenty variables can be represented as follows:

$$(0.2) \left\{ \bigcup_{j=0}^4 \bigcup_{k=0}^1 FPL_j \cdot Elig_k \right\} \cup \left\{ \bigcup_{j=0}^4 \bigcup_{k=0}^1 FPL_j \cdot Elig_k \cdot P \right\}$$

$FPL$  is the five-category family income variable described above.  $Elig$  is a dummy variable indicating public program eligibility. And  $P$  is the premium cost index as defined in Equation (0.1).

Intuitively, this formulation allows the coverage response of a child in a family with 275% of FPL to vary if that child lives in a state where she is eligible for SCHIP versus a state where is not. Since we are only imperfectly able to tell whether an individual would be eligible based on family income information, we leave out “near eligible” individuals - within 25% of the cutoff in each state - from our regression estimation. However, this does not substantially change any of the results.

### Regression Specification for Working Adults

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<sup>2</sup> The data for public program eligibility was compiled using information from Kaiser Family Foundation, Families USA and specific state level programs, and is available from authors upon request.

The regression model controls for demographic factors such as age, gender, race (latino, black, asian, and other), education levels (high school and college graduation), the number of year round workers in the family, industry and job characteristics, as well as a state dummy. Job characteristics include: 1-digit level industry, 6 categories of firm size, whether the individual is self-employed, whether the individual is working full time, and whether the individual has been at the same job for the past year. This control helps net out changes in coverage that are due to changing observable job characteristics over this period, as opposed to premium increases. In the specification below, *Demog* is a vector of demographic variables, *Ind* is a vector of industry dummies and *FirmSize* is a vector of firm size dummies.

(0.3)

$$Y^H = \beta_0^H + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \gamma_{jk}^H \cdot FPL_j \cdot Elig_k \right\} + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \delta_{jk}^H \cdot FPL_j \cdot Elig_k \cdot P^S \right\} + \Omega^{H'} State \\ + \Lambda^{H'} Demog + \Phi^{H'} Ind + \Gamma^{H'} FirmSize + \eta_1^H SelfEmp + \eta_2^H FullTime + \eta_3^H SameJob + \varepsilon$$

The multinomial logit produces 3 sets of coefficients (represented by the superscript *H*), each corresponding to one of three types of outcome categories (public coverage, private coverage, or uninsurance) as compared to the base category (job-based coverage). The primary coefficients of interest are the price responses  $\delta_{jk}^H$ . As an example,  $\delta_{12}^{uninsurance}$  represents the increased odds of uninsurance (vis-à-vis employment based coverage) resulting from an increase in the single premium price index – for workers in families between 100% and 200% of FPL in states where such workers are ineligible for public coverage.

The regression is estimated separately for working adults with and without working spouses.

### Regression Specification for Adult Dependents

For adult dependents – i.e., non-working spouses of working individuals – a similar model is fitted. The regression specification is as follows.

$$(0.4) \quad Y^H = \beta_0^H + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \gamma_{jk}^H \cdot FPL_j \cdot Elig_k \right\} + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \delta_{jk}^H \cdot FPL_j \cdot Elig_k \cdot P^F \right\} + \Omega^{H'} State \\ + \Lambda^{H'} Demog + \Phi^{H'} \overline{Ind} + \Gamma^{H'} \overline{FirmSize} + \eta_1^H \overline{SelfEmp} + \eta_2^H \overline{FullTime} + \eta_3^H \overline{SameJob} + \varepsilon$$

There are two differences between (0.3) and (0.4). First, in the specification for dependents, we use the family instead of single premium index. Second, the job characteristics in (0.4) refer to those of the working spouse, and are denoted as  $\overline{Ind}$  as opposed to *Ind*.

## Regression Specification for Dependent Children

Within our definition of family, an adult could only have one person (a working spouse) who could claim him as a dependent. However, a child may have two working parents who can claim her as a dependent; in such a case, we need to consider the job characteristics of both individuals. We deal with this issue by taking the parent whose characteristics *maximizes* the odds of having employment-based coverage, and using this in the children's regression. These characteristics were estimated as follows: (1) a first level OLS regression is run for each working parent predicting job-based coverage as a function of the job characteristics (industry, firm size, self-employment, full-time work and having worked at the same job over the past year, highschool and college completion); and (2) taking the job characteristics of the working parent who has the *maximum* predicted odds of having employment-based coverage. The regression specification is as follows, with the terms with hats referring to the job characteristics of the relevant working parent.

For the children's regression, there is an additional concern. Over this period, most states began implementing State Children's Health Insurance Programs (SCHIP). The SCHIP was created to build on Medicaid program and provide health insurance to children who cannot access employer-based coverage and are ineligible for Medicaid. Since its creation in 1997, virtually every state has taken steps to extend health coverage to low-income children (and in some states to parents), and by 2003 more than 7.1 million individuals were enrolled in SCHIP. Eligibility for SCHIP also varies by state, and in California children up to 250% of FPL are eligible for either Medi-Cal or SCHIP.

Take-up of such programs usually occurs over the first few years of implementation as outreach and enrollment efforts are conducted. This fact introduces a possible bias as we use intertemporal variation in premium costs to identify how coverage responds to costs. The "one time" increase in public coverage and reduction in uninsurance (what we call "implementation effect") can confound our estimates. To address this issue, we use a "difference in difference" strategy by estimating the children's regression for working and non-working families, and including a time variable allowing trends in take-up of public coverage (vis-a-vis uninsurance and private coverage). This specification estimates the implementation effect of increased public coverage and reduced uninsurance by taking as a control group a population not affected by rising costs of job-based insurance: the children of non-working families. Consequently, the premium effects are estimated *net of* such implementation effects. For our future simulation, we do not forecast continuation of this implementation effect.

(0.5)

$$P^H = \left\{ \begin{array}{l}
\beta_0^H + \beta_1^H WorkingFam + \beta_2^H Time + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \gamma_{jk}^H \cdot FPL_j \cdot Elig_k \right\} + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \delta_{jk}^H \cdot FPL_j \cdot Elig_k \cdot P^F \right\} \\
+ \Omega^{H'} State + \Lambda^{H'} Demog + \Phi^{H'} Ind + \Gamma^{H'} FirmSize + \eta_1^H SelfEmp + \eta_2^H FullTime + \eta_3^H SameJob + \varepsilon \\
\text{if } H \in \{uninsured, private\} \\
\\
\beta_0^H + \beta_1^H WorkingFam + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \gamma_{jk}^H \cdot FPL_j \cdot Elig_k \right\} + \left\{ \sum_{j=0}^4 \sum_{k=0}^1 \delta_{jk}^H \cdot FPL_j \cdot Elig_k \cdot P^F \right\} \\
+ \Omega^{H'} State + \Lambda^{H'} Demog + \Phi^{H'} Ind + \Gamma^{H'} FirmSize + \eta_1^H SelfEmp + \eta_2^H FullTime + \eta_3^H SameJob + \varepsilon \\
\text{if } H \in \{employment based\}
\end{array} \right.$$

Formally, (0.5) uses “public coverage” as the base category. For all non-working family children,  $FPL_j \cdot Elig_k \cdot P^F$  is set at zero, since they cannot be affected by rising job-based premiums. A common time trend is fitted for working and non-working family children in determining the odds of uninsurance and private coverage – vis-à-vis public coverage. (Such a trend cannot be included for employment versus public coverage, as by definition, this group does not have a benchmark among the non-working family population.) For these children, separate “industry,” “firm size” and other job categories are created, as by definition there are no workers in the family. Common coefficients are estimated for working and non-working children for the following: demographic variables, state dummies, and the time trend.

## **Regression Estimates**

Below we report the coefficients and standard errors from the four key regressions estimated using multinomial logit models. The regression coefficients are presented in terms of relative risk ratios – which can be interpreted as how an incremental change in the independent variable affects the relative odds of an outcome  $O$  as compared to the “base outcome.” The base outcome is employment-based coverage for the three adult regressions. Since we need to control for time-specific trends for public coverage due to the implementation effect of SCHIP, the base category for children’s regression is public coverage. We do not report the coefficients associated with state, industry, family size and firm-size dummies below.

**Table A3: Coefficients from Multinomial Logit Regressions for Health Insurance Coverage**

<u>Adults with Working Spouse</u>	<i>Public</i>		<i>Private</i>		<i>Uninsurance</i>	
	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error
100-199% FPL	0.297	0.378	0.453	0.862	0.548	0.679
200-299% FPL	0.366	0.245	0.356	1.073	0.391	0.856
> 400% FPL	0.154	0.251	2.308	4.033	1.675	2.058
Not Public Elig	0.426	0.384	0.214	0.459	0.097	0.150
100-199% FPL * Not Public Elig	1.527	2.416	7.701	19.931	7.106	12.157
200-299% FPL * Not Public Elig	0.324	0.610	6.362	22.080	8.415	20.937
300-399% FPL * Not Public Elig	0.145	0.256	3.162	5.586	1.812	2.250
Premium	1.007	0.006	1.011	0.010	1.006	0.008
Premium * Not Public Elig	1.007	0.006	1.006	0.017	1.018	0.012
Premium * 100%-199% FPL	1.005	0.010	0.995	0.014	0.998	0.010
Premium * 100%-199% FPL * Not Public Elig	0.988	0.011	0.993	0.020	0.986	0.013
Premium * 200%-299% FPL	0.993	0.003	0.997	0.022	0.996	0.016
Premium * 200%-299% FPL * Not Public Elig	1.003	0.014	0.990	0.025	0.984	0.018
Premium* 300%-399% FPL	0.990	0.013	0.984	0.013	0.981	0.009
Premium* >400% FPL	0.985	0.012	0.985	0.013	0.979	0.009
Age	0.957	0.005	1.006	0.002	0.994	0.002
Female	1.292	0.128	1.112	0.048	1.178	0.037
Black	2.322	0.317	0.847	0.078	1.522	0.078
Latino	1.276	0.179	0.811	0.065	2.230	0.093
Asian	1.841	0.361	1.476	0.130	2.264	0.140
High School Graduate	0.599	0.070	0.836	0.062	0.576	0.023
Bachelors Degree	0.624	0.078	0.885	0.040	0.717	0.027
Not Self-Employed	0.897	0.133	0.306	0.016	0.698	0.030
Full Time	0.626	0.062	0.613	0.027	0.843	0.030
Same Job >1 year	1.196	0.182	0.859	0.057	0.849	0.040

<u>Working Adult without Working Spouse</u>	<i>Public</i>		<i>Private</i>		<i>Uninsurance</i>	
	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error
100-199% FPL	0.205	0.092	0.333	0.210	0.479	0.184
200-299% FPL	0.498	0.203	0.512	1.190	0.769	1.415
300-399% FPL	0.130	0.068	0.230	0.081	0.177	0.043
> 400% FPL	0.215	0.069	0.167	0.053	0.194	0.045
Not Public Elig	0.334	0.057	0.808	0.386	0.972	0.292
100-199% FPL * Not Public Elig	2.323	1.172	3.313	2.339	1.470	0.639
200-299% FPL * Not Public Elig	0.468	0.315	0.705	1.654	0.486	0.899
Premium	1.003	0.001	0.996	0.003	1.000	0.002
Premium * Not Public Elig	1.003	0.001	1.004	0.004	1.002	0.002
Premium * 100%-199% FPL	1.009	0.003	1.008	0.005	1.003	0.003
Premium * 100%-199% FPL * Not Public Elig	0.992	0.004	0.989	0.005	0.997	0.003
Premium * 200%-299% FPL	0.998	0.002	1.001	0.017	0.994	0.014
Premium * 200%-299% FPL * Not Public Elig	1.003	0.004	1.000	0.017	1.006	0.014
Premium* 300%-399% FPL	1.001	0.004	1.003	0.003	1.002	0.002
Premium* >400% FPL	0.994	0.002	1.005	0.002	0.998	0.002
Age	0.987	0.001	0.992	0.001	0.980	0.001

Female	1.514	0.057	1.137	0.029	0.939	0.016
Black	2.000	0.099	0.810	0.036	1.631	0.040
Latino	1.287	0.069	0.742	0.034	1.925	0.044
Asian	1.642	0.142	1.134	0.068	1.762	0.069
High School Graduate	0.444	0.020	1.017	0.046	0.520	0.012
Bachelors Degree	0.464	0.028	0.918	0.026	0.670	0.015
Not Self-Employed	0.683	0.050	0.304	0.011	0.584	0.017
Full Time	0.497	0.019	0.410	0.011	0.666	0.013
Same Job >1 year	0.760	0.036	0.686	0.022	0.810	0.018

<u>Non-Working (Dependent) Adults with Working Spouse</u>	<i>Public</i>		<i>Private</i>		<i>Uninsurance</i>	
	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error
100-199% FPL	0.121	0.065	0.078	0.071	0.321	0.160
200-299% FPL	0.387	0.143	0.086	0.189	2.176	4.428
300-399% FPL	0.291	0.183	0.255	0.187	0.371	0.177
> 400% FPL	0.183	0.096	0.221	0.156	0.267	0.122
Not Public Elig	0.304	0.085	0.269	0.236	0.204	0.102
100-199% FPL * Not Public Elig	4.637	2.794	9.396	10.842	3.047	1.970
200-299% FPL * Not Public Elig	0.640	0.491	7.461	17.184	0.201	0.418
Premium	1.004	0.002	0.992	0.004	1.000	0.003
Premium * Not Public Elig	1.004	0.002	1.008	0.007	1.010	0.004
Premium * 100%-199% FPL	1.010	0.004	1.015	0.007	1.002	0.004
Premium * 100%-199% FPL * Not Public Elig	0.989	0.004	0.984	0.009	0.992	0.005
Premium * 200%-299% FPL	0.996	0.002	1.014	0.016	0.981	0.015
Premium * 200%-299% FPL * Not Public Elig	1.003	0.005	0.985	0.017	1.014	0.016
Premium* 300%-399% FPL	0.995	0.005	1.004	0.006	0.993	0.004
Premium* >400% FPL	0.993	0.004	1.004	0.005	0.992	0.003
Age	0.986	0.002	1.010	0.001	1.001	0.001
Female	0.837	0.038	0.576	0.020	0.890	0.026
Black	1.928	0.131	1.147	0.074	1.541	0.075
Latino	1.244	0.071	0.710	0.041	2.256	0.077
Asian	1.474	0.140	1.065	0.085	1.844	0.106
High School Graduate	0.595	0.026	0.853	0.038	0.635	0.019
Bachelors Degree	0.385	0.028	0.761	0.030	0.646	0.023
Not Self-Employed	1.133	0.093	0.395	0.020	0.847	0.040
Full Time	0.617	0.034	0.618	0.027	0.780	0.030
Same Job >1 year	0.608	0.038	0.747	0.042	0.793	0.035

<u>Children</u>	<i>Employment</i>		<i>Private</i>		<i>Uninsurance</i>	
	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error	Coefficient (RRR)	Std. Error
Year	.	.	0.950	0.008	0.920	0.006
Working Family Member	2.757	0.410	1.231	0.220	1.702	0.220
<100% FPL	0.314	0.013	0.557	0.025	0.341	0.010
100-199% FPL	1.803	0.078	1.388	0.074	0.407	0.013
200-299% FPL	5.221	0.525	3.263	0.427	0.744	0.095
300-399% FPL	8.676	0.440	3.354	0.302	0.610	0.061
> 400% FPL	15.038	0.721	5.412	0.414	0.761	0.068
100-199% FPL * Not Public Elig	1.686	0.706	2.819	1.273	1.444	0.637

200-299% FPL * Not Public Elig	2.084	0.307	1.644	0.297	1.399	0.263
Premium * 100%-199% FPL	0.995	0.000	0.998	0.000	1.000	0.002
Premium * 100%-199% FPL * Not Public Elig	1.002	0.004	0.997	0.005	1.002	0.005
Premium * 200%-299% FPL	0.995	0.001	0.996	0.001	0.998	0.001
Premium * 200%-299% FPL * Not Public Elig	0.999	0.001	1.000	0.001	1.000	0.002
Premium* 300%-399% FPL	1.000	0.001	1.003	0.001	1.003	0.001
Premium* >400% FPL	1.001	0.001	1.002	0.001	1.003	0.001
Age	1.020	0.002	1.057	0.002	1.041	0.002
Female	1.008	0.016	1.034	0.023	0.999	0.017
Black	0.526	0.014	0.400	0.015	0.813	0.021
Latino	0.514	0.012	0.326	0.012	1.221	0.028
Asian	0.758	0.037	0.662	0.044	1.315	0.067
High School Graduate	1.831	0.366	1.396	0.233	1.434	0.422
Bachelors Degree	2.358	0.323	1.419	0.177	1.980	0.388
Not Self-Employed	0.956	0.045	0.442	0.023	0.783	0.037
Full Time	1.659	0.051	0.881	0.036	1.202	0.043
Same Job >1 year	1.636	0.058	1.131	0.057	1.267	0.054

### Coverage Responses to a 10% Increase in Premium

Since the coefficients (even the relative risk ratios terms) of a multinomial logit are not as easily interpretable as changes in probabilities, the table below reports the coverage responses to a 10% increase in premium by type of individual (workers, dependent adults and children) and income levels, estimated for the U.S. working family population. Coefficients that are statistically significant at 5% level are marked with an asterisk (\*).

**Table A4: Regression Estimates – National Coverage Response to a 10% Increase in Premium Costs: Alternative Categories of Working Family Members**

<u>Workers</u>				
	Job-based	Public	Private	Uninsured
Under 100% FPL	-0.89%*	0.37%*	-0.11%	0.63%*
100% - 200% FPL	-1.23%*	0.33%*	-0.20%	1.09%*
200% - 300% FPL	-1.01%*	0.23%*	0.07%	0.71%*
300% - 400% FPL	-0.95%*	0.04%	0.08%	0.83%*
Over 400% FPL	-0.34%*	0.00%	0.20%*	0.14%
<i>All</i>	<i>-0.70%*</i>	<i>0.11%*</i>	<i>0.09%</i>	<i>0.50%*</i>
<u>Adult Dependents</u>				
	Job-based	Public	Private	Uninsured
Under 100% FPL	-1.34%*	0.36%*	-0.67%*	1.65%*
100% - 200% FPL	-1.51%*	0.94%*	-0.32%	0.89%*
200% - 300% FPL	-1.10%*	0.38%*	-0.26%	0.98%*
300% - 400% FPL	-0.58%*	-0.04%	0.25%*	0.37%*
Over 400% FPL	-0.46%*	-0.01%	0.19%	0.28%*
<i>All</i>	<i>-0.80%*</i>	<i>0.22%*</i>	<i>0.00%</i>	<i>0.58%*</i>

<u>Children</u>	Job-based	Public	Private	Uninsured
Under 100% FPL	-0.15%	0.10%	0.00%	0.05%
100% - 200% FPL	-1.29%*	0.86%*	-0.03%	0.47%*
200% - 300% FPL	-1.07%*	0.70%*	0.07%	0.30%*
300% - 400% FPL	-0.45%*	-0.03%	0.27%*	0.21%*
Over 400% FPL	-0.28%*	-0.01%	0.15%	0.14%
<i>All</i>	<i>-0.60%*</i>	<i>0.29%*</i>	<i>0.09%</i>	<i>0.22%*</i>

(\*) signifies statistical significance at the 5% level

Overall, we find substantial response in coverage to premium prices among workers, adult dependents and children over the past five years. Job-based coverage response to premium is statistically significant at 5% level for nearly all groups (except children under 100% of FPL). Public coverage responds significantly in a statistical sense for all individuals under 300% of FPL (except children under 100% of FPL). Finally, uninsurance responses are also significant for nearly all groups.

Finally, here we report the premium price responses for all non-elderly and adults, respectively, for the entire U.S. sample. Note that this includes both working families—whose coverage may respond to increasing premium costs for job-based coverage—and non-working family individuals, whose coverage is assumed to be invariant to such increases.

**Table A5: Regression Estimates – Coverage Response to a 10% Increase in Premium Costs**

<u>All Non-Elderly</u>	<u>Family Income in relation to FPL</u>	<u>Coefficient</u>
Job-Based	Under 100%	-0.10%
Public	Under 100%	0.07%
Private	Under 100%	-0.05%
Uninsured	Under 100%	0.08%
Job-Based	100 - 200%	-0.91% *
Public	100 - 200%	0.56% *
Private	100 - 200%	-0.15%
Uninsured	100 - 200%	0.50% *
Job-Based	200 - 300%	-0.82% *
Public	200 - 300%	0.37% *
Private	200 - 300%	0.03%
Uninsured	200 - 300%	0.42% *
Job-Based	300 - 400%	-0.61% *
Public	300 - 400%	0.03%
Private	300 - 400%	0.16% *
Uninsured	300 - 400%	0.42% *

Job-Based	Over 400%	-0.30% *
Public	Over 400%	-0.01%
Private	Over 400%	0.18% *
Uninsured	Over 400%	0.12% *
Job-Based	Total	-0.49% *
Public	Total	0.17% *
Private	Total	0.05%
Uninsured	Total	0.27% *

<u>Adults</u>	<u>Family Income in relation to FPL</u>	<u>Coefficient</u>
Job-Based	Under 100%	-0.14% *
Public	Under 100%	0.10%
Private	Under 100%	-0.07%
Uninsured	Under 100%	0.11% *
Job-Based	100 - 200%	-0.71% *
Public	100 - 200%	0.40% *
Private	100 - 200%	-0.21%
Uninsured	100 - 200%	0.52% *
Job-Based	200 - 300%	-0.70% *
Public	200 - 300%	0.21% *
Private	200 - 300%	0.01%
Uninsured	200 - 300%	0.48% *
Job-Based	300 - 400%	-0.68% *
Public	300 - 400%	0.06%
Private	300 - 400%	0.11%
Uninsured	300 - 400%	0.51% *
Job-Based	Over 400%	-0.30% *
Public	Over 400%	0.00%
Private	Over 400%	0.19% *
Uninsured	Over 400%	0.12% *
Job-Based	Total	-0.45% *
Public	Total	0.12% *
Private	Total	0.04%
Uninsured	Total	0.29% *

(\*) signifies statistical significance at the 5% level

All else equal, for all non-elderly adults, a 10% increase in premium results in a 0.5 percent point decline in job-based coverage. Of this loss, more than half (0.27 percent point) is absorbed through increased uninsurance, and a lesser extent (0.17 percent point) through public coverage. The fall in job-based coverage is much greater (more than twice) for individuals in the 100% to 400% of FPL categories than for either individuals under the poverty line, or individuals with incomes greater than 400% of FPL.

## **Comparison to Other Estimates in the Literature**

Several other studies have also recently estimated the impact of premium costs on health coverage – be they job-based coverage or uninsurance. These studies employ diverse methodologies, but as discussed below, produce estimates which can be rationalized with our findings. We should note, however, that these studies are typically not able to disaggregate the coverage responses by income and state-level public program rules as we do here.

The employment-based coverage responses are reasonable in light of evidence on *take-up* response found in the literature analyzing previous periods. For adults overall, our estimates imply a *coverage* elasticity of premium prices between -0.07 and -0.08. For adults between 100% and 300% of FPL, the coverage elasticities range between -0.10 and -0.15. In the existing literature, *take-up* elasticity is found between -0.04 and -0.09 (Blumberg, Nichols, and Banthin (2002)<sup>3</sup>, Cutler(2002)<sup>4</sup>), and slightly higher (-0.1) for workers under 200% of FPL. (Blumberg, Nichols, and Banthin (2002). Modest eligibility/offer elasticities, coupled with the aforementioned take-up elasticities, can easily rationalize the coverage elasticities documented here.

We can also compare our uninsurance responses to those in the literature. Looking at the 1988-2000 period, Chernew, Cutler and Keenan (2004)<sup>5</sup> find that a \$1000 increase in individual coverage premium (which comes to be around a 60% increase over this period) produces an increase in uninsurance of 2.7 percent points among the non-elderly. Therefore, a 10% increase in premiums would produce a 0.4 percent point increase in uninsurance in this population. This is slightly greater but close to our estimate of a 0.3 point increase in uninsurance overall for the non-elderly population in response to a 10% increase in premiums (an increase of 0.5, 0.58 and 0.22 points for workers, adult dependents and children, respectively). Finally, using a somewhat different methodology and a longer period of analysis (1979 to 2002), Gilmer and Kronick (2005)<sup>6</sup> predict that the number of uninsured will grow by 11 million between 2003 and 2013, an increase of 1.1 million a year. Our average annual projected increase in uninsurance over 2004 to 2010 (reported below) are slightly higher, but close, at 1.3 million a year for the U.S. population as a whole.

## **Future Projections**

We simulate future coverage for the United States and for California by taking the 2004 sample of the relevant population (U.S. or California) and applying the relevant price increases to working family members in each scenario. All other variables (family characteristics, job characteristics and “implementation effect” for children’s public coverage)

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<sup>3</sup> Blumberg, Linda, Len Nichols and Jessica Banthin 2001. “Worker Decisions to Purchase Health Insurance.” *International Journal of Health Care Finance and Economics*. Sep-Dec: 1, 3-4.

<sup>4</sup> Cutler, David 2002. “Employee Costs and the Decline in Health Insurance Coverage.” *NBER Working Paper* No. 9036.

<sup>5</sup> Chernew, Michael, David Cutler and Patricia Keenan 2004. “Health Insurance Costs and the Decline in Health Insurance Coverage.” *ERIU Working Paper* No. 8.

<sup>6</sup> Gilmer, Todd and Richard Kronick 2005. “It’s The Premiums, Stupid: Projections Of The Uninsured Through 2013.” *Health Affairs* Web Exclusive, April 5.

are assumed constant in this simulation. Coverage for non-working families is assumed to remain constant. Therefore, the simulation should be understood as projecting changes in coverage solely due to premium cost increases.

Here we report past (2000 to 2004) and projected (2010) rates for various types of coverage – for all non-elderly and adults in the United States and California.

**Table A6 : Past and Projected Coverage Rates for U.S. and California – All non-elderly and Adults by Family Income**

<u>U.S. Non-Elderly</u>	FPL	2000	2001	2002	2003	2004	2010*
Job-Based	300% and below	47.18%	47.46%	44.93%	43.41%	41.84%	37.02%
Public	300% and below	18.11%	18.39%	20.05%	20.79%	22.28%	25.18%
Private	300% and below	10.16%	10.05%	10.04%	10.05%	9.72%	9.29%
Uninsured	300% and below	27.77%	27.01%	28.00%	29.00%	29.47%	31.82%
Job-Based	Over 300%	86.43%	86.42%	86.02%	85.20%	84.50%	81.24%
Public	Over 300%	1.43%	1.59%	1.76%	1.90%	1.96%	2.01%
Private	Over 300%	5.97%	5.60%	5.80%	6.04%	6.54%	8.03%
Uninsured	Over 300%	7.03%	7.35%	7.46%	7.88%	8.13%	9.84%
Job-Based	All	66.68%	67.25%	65.51%	64.20%	62.93%	58.87%
Public	All	9.82%	9.85%	10.89%	11.39%	12.23%	13.75%
Private	All	8.08%	7.79%	7.92%	8.05%	8.15%	8.65%
Uninsured	All	17.47%	17.02%	17.71%	18.50%	18.92%	20.96%

<u>U.S. Adults</u>	FPL	2000	2001	2002	2003	2004	2010*
Job-Based	300% and below	47.20%	47.62%	45.35%	43.84%	42.37%	38.26%
Public	300% and below	11.85%	11.84%	12.77%	13.07%	13.69%	15.90%
Private	300% and below	10.91%	10.69%	10.75%	10.92%	10.73%	10.10%
Uninsured	300% and below	31.76%	31.90%	33.21%	34.50%	35.57%	38.08%
Job-Based	Over 300%	86.29%	86.08%	85.71%	84.85%	84.12%	80.71%
Public	Over 300%	0.93%	1.11%	1.16%	1.21%	1.16%	1.29%
Private	Over 300%	5.75%	5.42%	5.56%	5.85%	6.32%	7.79%
Uninsured	Over 300%	7.57%	8.11%	8.30%	8.78%	9.13%	10.95%
Job-Based	All	67.70%	68.13%	66.58%	65.16%	64.04%	60.28%
Public	All	6.12%	6.12%	6.67%	6.90%	7.18%	8.34%
Private	All	8.20%	7.88%	8.02%	8.29%	8.44%	8.88%
Uninsured	All	19.08%	19.21%	20.11%	21.13%	21.84%	24.01%

<u>California Non-elderly</u>	FPL	2000	2001	2002	2003	2004	2010*
Job-Based	Over 300%	83.21%	83.16%	81.81%	83.14%	81.25%	77.09%
Public	Over 300%	2.10%	1.70%	2.01%	2.45%	2.13%	2.07%

Private	Over 300%	5.91%	6.20%	6.53%	5.73%	7.54%	9.42%
Uninsured	Over 300%	8.79%	8.94%	9.65%	8.68%	9.09%	11.42%
Job-Based	300% and below	38.24%	38.74%	36.98%	37.36%	34.45%	29.11%
Public	300% and below	21.84%	22.79%	22.68%	22.97%	25.95%	28.71%
Private	300% and below	5.18%	6.37%	7.16%	7.14%	6.28%	5.85%
Uninsured	300% and below	34.74%	32.11%	33.17%	32.52%	33.31%	36.33%
Job-Based	All	59.19%	59.66%	57.51%	59.06%	56.93%	52.14%
Public	All	12.64%	12.86%	13.22%	13.25%	14.51%	15.95%
Private	All	5.52%	6.29%	6.87%	6.47%	6.89%	7.54%
Uninsured	All	22.65%	21.20%	22.40%	21.22%	21.68%	24.37%

California Adults	FPL	2000	2001	2002	2003	2004	2010*
Job-based	Over 300%	83.56%	82.87%	81.71%	82.62%	80.86%	76.36%
Public	Over 300%	1.27%	1.33%	1.34%	1.69%	1.29%	1.28%
Private	Over 300%	6.11%	6.14%	6.22%	6.13%	7.57%	9.52%
Uninsured	Over 300%	9.06%	9.67%	10.74%	9.56%	10.28%	12.84%
Job-based	300% and below	38.34%	38.50%	36.99%	37.63%	34.92%	30.04%
Public	300% and below	14.69%	15.10%	14.61%	14.58%	16.05%	17.94%
Private	300% and below	7.49%	8.19%	8.36%	8.84%	8.19%	7.62%
Uninsured	300% and below	39.48%	38.21%	40.04%	38.95%	40.83%	44.39%
Job-based	All	60.82%	60.80%	58.87%	60.13%	58.13%	53.43%
Public	All	8.02%	8.18%	8.12%	8.14%	8.60%	9.55%
Private	All	6.80%	7.16%	7.31%	7.48%	7.88%	8.54%
Uninsured	All	24.36%	23.86%	25.71%	24.25%	25.40%	28.47%

For the non-elderly population, between 2004 and 2010, job-based coverage is predicted to fall by about 4 percentage points nationally, and 7 percentage points in California. Uninsurance is predicted to rise by 2 points nationally and 3 points in California. For adults, the corresponding fall in job-based coverage is predicted to be 4 and 5 points in US and California, respectively.

By 2010, a bare majority (52%) of Californians will have job-based insurance, somewhat lower than the national average of 59%. For Californians in the bottom half of the income distribution (under 300% FPL), only 29% will have job based coverage, as compared to 37% of all non-elderly individuals in the country.

By disaggregating the projection by five categories of income in table A 7, we can see that the sharpest drops in job-based coverage and rise in uninsurance will occur in families with incomes between one and four times the poverty level.

**Table A7 : Current and Projected Coverage Rates for U.S.– All non-elderly and Adults by Disaggregated Family Income**

		All Non-Elderly		Adults	
		2004	2010	2004	2010
Job-Based	Under 100%	19.93%	19.25%	23.47%	22.49%
Public	Under 100%	36.25%	36.82%	24.20%	25.02%
Private	Under 100%	9.67%	9.35%	11.21%	10.75%
Uninsured	Under 100%	36.62%	37.06%	43.69%	44.32%
Job-Based	100 - 200%	40.48%	33.37%	41.23%	35.39%
Public	100 - 200%	20.13%	24.83%	11.28%	15.09%
Private	100 - 200%	10.50%	9.44%	11.85%	10.42%
Uninsured	100 - 200%	30.07%	33.55%	36.70%	40.17%
Job-Based	200 - 300%	66.72%	59.72%	65.35%	59.40%
Public	200 - 300%	6.86%	10.43%	3.97%	6.12%
Private	200 - 300%	8.45%	8.60%	8.53%	8.59%
Uninsured	200 - 300%	18.56%	21.84%	22.59%	26.33%
Job-Based	300 - 400%	78.97%	73.67%	77.85%	71.96%
Public	300 - 400%	2.91%	3.25%	1.99%	2.58%
Private	300 - 400%	7.13%	8.45%	6.99%	7.88%
Uninsured	300 - 400%	11.28%	14.91%	13.45%	17.85%
Job-Based	Over 400%	86.74%	84.21%	86.60%	84.01%
Public	Over 400%	1.29%	1.24%	0.81%	0.78%
Private	Over 400%	5.86%	7.41%	5.71%	7.36%
Uninsured	Over 400%	6.27%	7.29%	6.99%	7.95%

We also predict aggregate coverage numbers that factor in future population growth. We use interim projections from the U.S. Census Bureau for the U.S. non-elderly population, and projections by the California Finance Department for the state-level population. Utilizing the population numbers and our predicted coverage rates, we derive the following projections for the number of individuals in various types of coverage during the 2004-2010 period: adjusted for population growth, if premiums continue to increase 10% each year between 2004 and 2010, job-based coverage will drop from by 3 million nationally, as the number of uninsured will rise by 8 million. 1.5 million fewer adults will have employer-based coverage, and 6.1 million more adults will be uninsured by 2010.