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The Recession Index: Measuring the Effects of the Great Recession on Health Insurance Rates and Uninsured Populations

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Abstract

Background: The economic recession that began in 2008, or the "Great Recession," did not affect all counties in California equally. With differential effects of economic indicators such as job loss, it is possible that differential effects were also seen in health insurance rates by county and demographic group. **Objective:** To study whether the Great Recession had a differential impact on the uninsured rates among counties in California. **Research Design:** A four-level "recession index" measured the impact of various economic indicators, between the populations uninsured for all or part of the prior year in 2009 compared to 2007. **Methods:** Data sources include the 2007 and 2009 California Health Interview Surveys and California Employment Development Department unemployment data. **Results:** The medium recession impact group (that is, counties with high increases in unemployment and lower household incomes on average) had the highest growth in the uninsured rates, due to a large drop in job-based coverage only partially offset by public coverage. Changes in coverage by demographic groups were similar among recession index categories. **Conclusions:** We find that the uninsured in 2009 were older, more likely to be U.S.- born citizens, had lower household incomes, and were more likely to be unemployed and looking for work, regardless of the impact of the Great Recession at the county level. The growth in the uninsured rates in the medium-impact group highlights the importance of public health insurance programs as a safety net during economic downturns.

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Introduction

Beginning in 2008, California experienced an economic recession of greater proportions than the rest of the United States. Unemployment in the state was consistently at least two percentage points higher than the rest of the country. In mid-2007, California's unemployment rate stood at 5.5 percent. By mid-2009, the unemployment rate had soared to 12.3 percent (CA EDD 2010).

Corresponding with this increase in unemployment, the population uninsured for all or part of the past year swelled from 6.4 million in 2007 to 7.1 million in 2009 (Lavarreda and Snyder 2012). The effects of the recession were widespread, enduring, and, for the most part, detrimental to access to health care. An investigation of the health insurance consequences of the recession exposes potential shortfalls in the health care system.

The existing research literature documents the Great Recession's contribution to substantial losses or changes in health insurance coverage at the national level. Variations in insurance coverage at the regional level have not been examined, (Greenstein and Sherman 2008) and no research has been done that examines the relationships between regional economic indicators (i.e., unemployment and personal income), public health insurance programs, and health insurance status. The study of these relationships is essential to understanding the role that public coverage programs play throughout California's diverse regions.

The safety net was clearly crucial during the recession but was not sufficient to avoid coverage gaps. The decline in employment-based insurance among adults during the Great Recession was only partially offset by Medicaid expansions (Rowland 2009). The aggregate increase in Medicaid enrollment caused spending on this public program to increase 14.5 percent to $387 billion between 2007 and 2009 (Holahan et al. 2011; Young et al. 2013).

Adults accounted for nearly all of the increase in the number of uninsured. Fifty million nonelderly Americans had no health insurance in 2009, up 5.6 million from 2007 (Fronstin 2010; Holahan et al. 2011). Many children gained coverage through Medicaid, thereby harboring this age group from joining the uninsured ranks in large numbers.

While Medicaid enrollment grew during the recession, employment-based health insurance (EBHI) declined substantially. EBHI is the largest source of insurance for individuals below age 65 (Christianson et al. 2011; Gould 2005; Gould 2012; Holahan et al. 2011; Levit et al. 2013; Roehr 2010). From 2007 to 2009, unemployment in the US rose dramatically (5.1 percentage points) (US Bureau of Labor Statistics 2010). Consequently, much of the shift in health coverage was due to heightened unemployment during the recession.

The loss of health insurance that accompanied much of the rising unemployment compounded other stress factors brought about by the recession such as loss of income. Median household income declined 4.2 percent and the number of people living in poverty increased 16.9 percent between 2007 and 2009 (US Bureau of Labor Statistics 2010). Falling income is noteworthy because many health care costs are paid out of pocket.

Many employers that did not drop health coverage shifted the cost to employees (Christianson et al. 2011). This cost shifting strained disposable income during and after the Great Recession and further reduced access to health care (Gilmer and Kronick 2009). The associations between income, access to health care, and health outcomes are well established in the literature (Doty et al. 2009; Freeman et al. 1987; Shi et al. 1999). These relationships highlight the detrimental health toll related to the economic aspects of the Great Recession.

California was no exception to the rule, but the regional consequences of the Great Recession are less well documented in the literature than the national effects. At 12.3 percent, California had one of the highest jobless rates in the nation in 2009, up from 5.5 percent in 2007 (CA EDD 2012). During the recession, Californians living in middle-income families fell to less than 50 percent, and the gap between the highest and lowest income families expanded (Bohn and Schiff 2011). The toll on income was longer-term in California than in the US at large. In California, median household income increased slightly between 2007 and 2009 (0.7%) but fell 4.25 percent between 2007 and 2010 (US Bureau of Labor Statistics 2010).

Policymakers in California reacted unfavorably to the recession in light of rising unemployment and falling income, restricting enrollment in safety-net programs such as Medi-Cal due to mounting budget deficits (Redlener and Grant 2009). In 2008, the state increased the frequency with which parents and children were required to renew coverage, retracting the guarantee of full-year coverage essential for children with ongoing medical needs. In addition, California required children and parents on Medi-Cal to comply with new reporting procedures that may have caused sizeable gaps in coverage for many families (Ross and Marks 2009).

Some variation in outcomes was related to unemployment rates. Sacramento's unemployment rate was higher than San Francisco's by October 2009 (US Bureau of Labor Statistics 2010). Some variation among regions was the result of specific policy decisions. Los Angeles County's substantial budget reductions ($140 million for the 2008–09 fiscal year) led to cuts in Medi-Cal program administration and mental health services. San Diego County's reduced payments to Medi-Cal providers limited access to services (Redlener and Grant 2009).

This study examines the relationship between economic changes heightened by the Great Recession—namely unemployment and loss of household income—and the loss of health insurance. We seek to answer the following questions: (1) did the increased impact of the Great Recession at county-level lead to increased loss of health insurance for households in those counties, (2) which demographic groups were most impacted by the loss of health insurance, and (3) did the difference vary by the impact of the Great Recession where a person lived?

Methods

Our study examines whether economic variations in regions throughout California are associated with effects of the Great Recession on health insurance coverage. We use the 2007 and 2009 California Health Interview Surveys (CHIS) and link data from adult, child, and adolescent interviews. We use data from CHIS and the California Employment Development Department (EDD) to create a "recession index" by county that will shed light on health insurance coverage trends in the regions. The index captures variations in unemployment and decreases in household income at the county level, based on the expanded Andersen Model of social determinants of health care access that includes environmental-level (i.e., societal) variables (Andersen 1995).

We incorporated six county-level measures into the recession index, representing the nearest government level that affected the health system in the geographic area: (1) 2009 unemployment rate higher than state average; (2) the increase in the unemployment rate from 2007 to 2009 higher than the state average; (3) 2009 mean household income lower than state average; (4) whether there was a decrease in mean household income from 2007 to 2009; (5) 2009 median household income lower than state average; and (6) whether there was a decrease in median household income from 2007 to 2009.

Factors were chosen to measure the economic environment in which a person could access health services. Both the mean and median income measures were included as proxies to evaluate the income inequality in a county in the absence of a GINI index. We then divided the counties into four groups based on the number of factors that were either true for the average of their sampled population in the CHIS (household income indicators) or for the county as a whole according to the EDD data.

"Low impact" counties had either 0 or 1 of the recession index indicators. "Moderate impact" counties had 2 or 3 indicators. "Medium impact" counties had 4 indicators, and "High impact" counties had 5 or 6 indicators. In CHIS, counties have been aggregated for sampling purposes into strata, with the smaller counties grouped together. No stratum contained less than 400 unweighted cases in CHIS, and the strata cannot be disaggregated into the counties that make up a group. Therefore, counties that have been grouped into a single stratum were given the same number for their aggregated recession index score. There are 44 total county-level strata in the CHIS survey. In the final groupings of the recession index, 15 counties fell into the low-impact category, 10 were in each of the moderate impact and medium impact categories, and 9 were in the category of highest recession impact (Table 1).

The CHIS is the largest state-based health survey in the nation, with over 40,000 household interviews for each sample of the survey. The survey is administered in six languages (English, Spanish, Mandarin, Cantonese, Vietnamese, and Korean) to give a full picture of California's multiethnic/multilingual population. The survey sample is stratified into 44 counties and county groupings (for some rural counties with small populations) to ensure representative samples for most counties. County stratification enables policy analysis that takes into account the variations across counties, most notably county differences in unemployment rates and in county-based public health care insurance programs for children. Using CHIS 2007 and 2009 data enables us to examine the impact of the economic recession that began in the final quarter of 2008.

"Uninsured" is defined as any period of one month or greater of not having medical insurance coverage within the 12 months prior to the CHIS interview. At the household level, we include household income as a percentage of the Federal Poverty Level (FPL) in all models, which takes into account the income of both the adult CHIS respondent and the spouse (if applicable). At the individual level, we included work status of the adult CHIS respondent and citizen and immigration status of all respondents.

We used bivariate and logistic regression models, with chi-squared to determine significant differences among cells in the bivariate analyses. Odds ratios and p-values determined significant differences in the logistic regression model, with uninsured status as the dependent variable.

Table 1. Counties by County-Level Recession Index, Ages 0–64, California, 2009

County-Level Recession Index	Low Impact	Moderate Impact	Medium Impact	High Impact
County	Alameda	Alpine	Butte	San Bernardino
	Contra Costa	Amador	Del Norte	Alpine
	El Dorado	Calaveras	Humboldt	Calaveras
	Marin	Inyo	Lake	Imperial
	Napa	Los Angeles	Lassen	Plumas
	Orange	Mariposa	Madera	San Joaquin
	Placer	Mendocino	Modoc	Shasta
	San Diego	Mono	Monterey	Trinity
	San Francisco	Nevada	Plumas	Yuba
	San Luis Obispo	Riverside	Sierra	
	San Mateo	Sacramento	Siskiyou	
	Santa Barbara	Shasta	Solano	
	Santa Clara	Stanislaus	Trinity	
	Santa Cruz	Tuolumne	Tulare	
	Sonoma	Ventura	Yuba	
		Yolo		

Sources: 2007 and 2009 California Health Interview Surveys and California EDD unemployment data.

Results

Discrepancies in the growth of the uninsured populations among the four county groups were evident. While the three lower impact groups all had some increase in the rate of uninsured (and a statistically significant increase for the medium impact group), the highest impact group actually saw a slight drop in the percentage of uninsured (Table 2). All four groups experienced at least some decline in the rate of employment-based coverage. For counties in the lowest two categories of recession impact, these declines were smaller, and for the moderate impact group, they were not significantly different statistically from 2007. The medium impact group experienced the highest drop in job-based health insurance from 2007 to 2009.

The increase in public coverage (either Medi-Cal or Healthy Families) is the other major factor in the differences in uninsurance (Table 3). High recession impact counties expanded their public coverage programs, while the rest of the county groups had smaller increases or none at all. These expansions offset some of the losses in insurance coverage in these counties.

Although the size of the uninsured populations in each county group differed, the patterns of changing demographics among them were markedly similar. In all four of the county groups, the uninsured populations from 2007 to 2009 shifted slightly towards an older population, with growth in those ages 45–64 years in three county groups and growth in ages 26–44 years in the lowest recession impact group. This is consistent with the loss of employment among middle-class, middle-aged workers during this time period, although it remained true that younger workers were less likely to have coverage in the first place.

Table 2. Insurance Status by County-Level Recession Index Group, Ages 0–64, California, 2007 and 2009

Insurance Status		Uninsured		Employment-Based Health Insurance (EBHI)		Medi-Cal Health Insurance	
		Rate	95 percent CI	Rate	95 percent CI	Rate	95 percent CI
Recession Level Impact Scale							
Low Recession Impact	2007	19.1	(18.3-19.9)	56.9	(56.0-57.8)	13.9	(13.3-14.6)
	2009	20.8	(19.6-19.9)	53.6	(52.2-57.8)	14.2	(13.4-14.6)
Moderate Recession Impact	2007	17.1	(15.2-19.1)	58.1	(55.6-60.6)	15.9	(13.9-17.9)
	2009	18.3	(15.8-19.1)	57.4	(53.9-60.6)	15.0	(12.6-17.9)
Medium Recession Impact	2007	20.8	(19.0-22.6)	52.2	(50.1-54.3)	18.0	(16.5-19.6)
	2009	26.2	(22.8-22.6)	45.1	(41.5-54.3)	18.8	(16.3-19.6)
High Recession Impact	2007	22.5	(20.2-24.8)	47.9	(45.4-50.3)	22.4	(20.3-24.6)
	2009	21.5	(18.8-24.8)	43.8	(40.2-50.3)	25.8	(22.6-24.6)

Sources: 2007 and 2009 California Health Interview Surveys, CA EDD unemployment data.

In each county group, the uninsured population shifted from 2007 to 2009 to a lower overall household income, with a greater proportion of the uninsured in 2009 having income at or below the income level that would be included under the future ACA Medi-Cal expansion.5 The counties with the highest recession impact experienced a slight (but not statistically significant) increase in the percentage of uninsured having incomes over 400 percent FPL, from 10 percent in 2007 to 12.7 percent in 2009.

For all but the highest impact recession group, the proportion of US-born or naturalized citizens among the uninsured grew from 2007 to 2009. Ranging from an increase of 4 percentage points in the low impact group to 7.9 percentage points in the medium impact group, this trend clearly shows how the composition of the uninsured population changed with the loss of job-based coverage during the recession. High recession impact counties are mainly counties in which the noncitizen populations (with and without "green cards") comprise a substantial proportion of the residents.

The work status of the uninsured population underwent the most dramatic shift from 2007 to 2009 as the state absorbed an increase in the unemployment rate of 6.8 percentage points (more than doubling the 2007 rate). This dramatic shift occurred in every county group, with drops in the proportion of the uninsured who were working full-time ranging from 14.5 percentage points (low impact) to 17.1 percentage points (high impact). While some of these newly uninsured dropped entirely out of the work force, the largest increases were among the uninsured individuals who were unemployed and looking for work. Small increases were seen in the proportion of

Table 3. County-Level Recession Index Group by Demographics, Ages 0–64, California, 2007 and 2009

Recession Level Impact Scale	Low Recession Impact		Moderate Recession Impact		Medium Recession Impact		High Recession Impact	
	2007	**2009**	**2007**	**2009**	**2007**	**2009**	**2007**	**2009**
Age Group								
0 to 18 Years	15.4	13.8	17.2	14.4	20.0	19.2	16.2	13.6
19 to 25 Years	22.0	19.6	18.4	19.7	23.9	24.0	23.7	21.1
26 to 44 Years	39.2	43.2	42.0	41.6	35.4	33.3	42.4	41.9
45 to 64 Years	23.4	23.4	22.4	24.4	20.7	23.5	17.8	23.4
Total	100%	100%	100%	100%	100%	100%	100%	100%
Federal Poverty Level								
0-133 percent FPL	37.3	42.0	44.3	47.9	38.2	41.1	50.0	53.6
134-400 percent FPL	42.0	37.2	41.7	39.7	48.4	45.6	40.0	33.8
401%+ FPL	20.8	20.8	14.0	12.4	13.3	13.4	10.0	12.7
Total	100%	100%	100%	100%	100%	100%	100%	100%
Work Status								
Full-Time	63.3	48.8	61.9	46.0	64.4	47.9	64.7	47.6
Part-Time	11.2	10.6	8.1	13.1	9.0	11.9	7.7	9.3
Employed, Not at Work	---	---	---	---	---	---	---	---
Unemployed, Looking for Work	8.1	18.2	8.8	21.2	6.6	21.9	9.1	20.5
Unemployed, Not Looking for Work	16.4	21.6	20.4	18.7	19.3	18.0	18.2	20.3
Total	100%	100%	100%	100%	100%	100%	100%	100%
Citizenship and Immigration Status								
US Born or Naturalized Citizen	67.4	71.4	62.7	67.5	71.6	79.5	71.8	66.3
Noncitizen with Green Card	13.1	14.4	16.3	14.2	13.3	10.4	12.1	15.3
Noncitizen without Green Card	19.5	14.2	21.0	18.3	15.1	10.1	16.1	18.4
Total	100%	100%	100%	100%	100%	100%	100%	100%

Sources: 2007 and 2009 California Health Interview Surveys, CA EDD unemployment data.
Data are unstable due to coefficient of variation above 30%.

* Numbers are rates and will not add to 100%.

uninsured individuals who had part-time employment, particularly in the moderate and medium recession impact categories.

When controlling for all demographic factors in a multivariate model, only the medium impact recession group exhibited an increased likelihood of being uninsured from 2007 to 2009 (OR = 1.39, $p < 0.001$; Table 4). The other two groups, moderate and high impact, had no statistically significant difference compared to the reference group, which contained the low recession impact counties. Expected demographic indicators showed significant differences in all county groups. Notably, those who were unemployed and not looking for work did not show a significant difference in their odds of being uninsured compared to full-time employees.

Discussion

This article presents data on the disparate impact of the economic recession on county groups within California and the health insurance types and coverage status of their residents. We found that counties with the highest impact of the recession did *not* have the highest rate of growth in the uninsured population. This was mainly because of the smaller decline in an already low rate of job-based coverage and an increase in the rate of public coverage, likely due to the very low household incomes of the uninsured in the highest-recession impact group. Additionally, the medium-recession impact group, which did have the largest increase in uninsurance, includes many of the smaller, more rural counties in the state that have less outreach and enrollment infrastructure for public coverage assistance.

The decline in employer-based insurance was offset by increases in public coverage, demonstrating the importance of public programs during economic downturns. Public coverage eligibility during this time depended heavily on age, with children's eligibility for CHIP and Medicaid far exceeding that of their parents, and childless able-bodied adults having no eligibility at all. Our results show that children were much less likely to be uninsured than any other age group, supporting the positive impact that public coverage eligibility had for this population. We also found that the uninsured population overall, with some variation among county groups, changed in composition. In 2009, the uninsured population was older, had lower household incomes, and was more likely to have US citizenship and less likely to have full-time employment compared to the 2007 uninsured population.

This shift has policy implications for the implementation of both Medi-Cal expansion and Covered California (the California Health Benefit Exchange) under the Affordable Care Act of 2010 (ACA). Given a population with declining household incomes, the Medi-Cal expansion to include childless nonelderly uninsured adults may encompass a larger number of people than anticipated before the enactment of the ACA (Lavarreda et al. 2012). Data from CHIS 2011/2012 shows a considerable increase in the current Medi-Cal population, illustrating the result of this income shift as the uninsured begin to take advantage of the public coverage for which they are eligible (Lavarreda and Snyder 2012). Since even a worker with wages at or near minimum wage working full-time may be eligible for Medi-Cal under the expansion (depending on family size), enrollment in public health insurance programs is likely to grow even as jobs return and California climbs out of the recession. It remains to be seen if the composition of the uninsured population has changed permanently or if these shifts will revert to trends seen earlier in the decade (exemplified in the 2007 population). Still, it continues to be important for policymakers to note the differences among county groups and to target the outreach and resources to those areas hardest hit by difficult economic times.

Table 4. Odds of Being Uninsured among Nonelderly Persons, Ages 0–64, California, 2009

Variable	Odds Ratio	95 percent Confidence Limits	
Recession Scale		**Lower**	**Upper**
Low Recession Impact (ref)			
Moderate Recession Impact	0.868	0.705	1.068
Medium Recession Impact	1.390***	1.147	1.685
High Recession Impact	1.093	0.948	1.261
Age Group			
Ages 0-18 (ref)			
Ages 19-25	6.524***	5.177	8.222
Ages 26-44	4.080***	3.485	4.776
Ages 45-64	3.085***	2.605	3.652
Federal Poverty Level			
401 percent FPL and Above (ref)			
0%-133 percent FPL	5.825***	4.785	7.091
134%-400 percent FPL	3.434***	2.855	4.131
Work Status			
Full-Time Employment (ref)			
Employed, Not at Work	2.520***	1.770	3.586
Part-Time Employment	1.502**	1.210	1.865
Unemployed, Looking for Work	3.405***	2.779	4.172
Unemployed, Not Looking for Work	1.009	0.878	1.159
Citizenship and Immigration Status			
US Born or Naturalized Citizen (ref)			
Non-Citizen with Green Card	1.732***	1.378	2.175
Non-Citizen without Green Card	3.070***	2.539	3.714
Gender			
Male (ref)			
Female	0.695***	0.611	0.790

*p < .05; **p < .01; ***p < .001
Sources: 2007 and 2009 California Health Interview Surveys, CA EDD unemployment data

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