The Economic Recession on the Health of Adult Nevadans

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Abstract

Recessions are often considered to cause negative consequences, yet recent studies have provided evidence that some health outcomes improve as the economy deteriorates. Las Vegas, Nevada was previously considered "recession-proof", unaffected by previous economic downturns, but led the country in the highest rates of unemployment and foreclosure during the Great Recession of 2007-2009. The purpose of this study was to examine the association between socio-demographic, employment, and health insurance status with self-reported health before, during, and after the Great Recession. Demographic and health data were obtained from the Behavioral Risk Factor Surveillance System and local unemployment data from the Bureau of Labor Statistics. Multiple logistic regression was used to examine the association between employment, health insurance status, and self-reported health. Interestingly, employment status was associated with self-reported health before and after, but not during the recession period. Further, lower educational attainment was the biggest risk factor of poor self-reported health. These findings could be key for future studies focusing on reducing the economic barriers among populations experiencing poor health, particularly during economic recessions.

Keywords*:* Recession, Employment, Health Insurance, Sociodemographic status

Introduction

The Great Recession of 2007-2009 was associated with numerous macroeconomic problems including home foreclosures, unequal income distribution, and high unemployment rates. Throughout the United States, high rates of unemployment resulted in decreased spending and increased financial burden. The pre-recession unemployment rate of 4.4% in the United States more than doubled to 10% in October 2009 (Bureau of Labor Statistics, 2012). Employment losses and decreased wages led to reliance on government programs to supplement income from those who may not have needed support before. The amount paid in Unemployment Insurance (UI) increased 23.6%, or $97 billion from 2007 to 2009 (Oh and Reis, 2012). Upwards of 2.5 million people signed up to receive benefits from the Supplemental Nutrition Assistance Program (SNAP), increasing the amount of benefits paid from $37 billion in 2008 to $54 billion in 2009 (Jenkins et al., 2012). Economic stress and instability has also been found to impact family structure and function. Worsening economic conditions during the Great Recession increased partner violence among married couples, with the highest increases among whites and those with a college education (Schneider, Harknett, & McLanahan 2014). Fertility rates declined, ranging from 9- 11% during this period; the highest declines were in states with higher unemployment rates (Cherlin et al., 2013).

Since economic downturns affect various aspects of life, it is important to study if health has been impacted and to what extent. Aggregate-level research on how recession impacts health frequently shows that physical health declines when economic conditions begin to deteriorate. Employment is positively correlated with better health, slower declines in physical functioning, and increased perceived health for those with full-time employment (Ross, 1995), while unemployment leads to an increase in symptoms of physical illness (Gore, 1978) and health complaints (Schwarzer, Jerusalem, & Hahn, 1994). Further, a 1995 study indicated that unemployment is associated with higher rates of overall mortality and death, typically due to heart disease or suicide (Jin, Shab, & Svoboda, 1995). Nevertheless, other research has found connections between economic stress and health outcomes that suggest a counterintuitive relationship. In one study, evidence shows that death rates fall and health outcomes improve as economies deteriorate (Ruhm & Black, 2002). Lower death rates are in part due to reductions in risky behaviors, including smoking, poor diet, physical inactivity, and alcohol consumption. Many mechanisms explain why economic growth causes negative health effects, including increasing work demands, along with higher motor vehicle and workplace accidents, and higher alcohol and tobacco consumption (Ruhm & Black, 2002). A business-cyclical relationship has been suggested as contributing to these findings due to: (1) more time to commit to healthier behaviors, (2) decreased workplace stress and injuries, and (3) reduced injuries and deaths from external sources, such as car accidents and air pollution.

The ability for population-level physical health to change during economic downturns may be through changes in individual behavior. There are

two common reasons why fluctuations in local labor markets affect health (Charles & DeCicca, 2008). First, a behavioral explanation implies that as unemployment rates increase, individuals have increased time for non-market activities, including spending more time partaking in activities to improve health. Second, a structural explanation where a weak economy with high unemployment leads to behavioral changes in individuals, such as increased stress due to reduced income.

The relationship between economic deterioration and health is not straightforward, therefore, it is important to analyze how health was impacted in one of the locations most affected by the recession. Las Vegas, Nevada was hit especially hard by the recession due to the local economic profile and several unique characteristics. The city grew rapidly due to the expanding gambling industry and had previously been at the top of the list for population, job, and construction growth for several decades. During the recession, however, Las Vegas led the country in highest rates of unemployment, uninsured individuals, and foreclosures, which resulted in a stagnation of population growth and building development. This study aimed to understand how economic recession is associated with changes in self-reported health among adults residing in Las Vegas, Nevada between 2006-2011. The goal of this study was to examine if socio-demographic, employment, and health insurance status were associated with self-reported health before, during, and after the Great Recession.

Materials and Methods

Data Sources

This was a cross-sectional study utilizing data from 2006 to 2011; it drew from from two data sources: the Bureau of Labor Statistics (BLS) and the Behavioral Risk Factor Surveillance Survey (BRFSS). Data for the local unemployment rate came from the BLS. As an entity of the U.S. Department of Labor, the BLS measures labor market activity, working conditions, and economic price fluctuations while producing reports to support public and private decision-making (Bureau of Labor Statistics 2012). Data on self-reported health status, employment status, health insurance coverage and sociodemographic information was obtained from the BRFSS. The BRFSS is a cross-sectional health-related survey aimed to collect self-reported data annually on adults both statewide and Nationally. Data are collected in Nevada and designated into geographic boundaries of the Reno-Sparks or Las Vegas-Paradise metropolitan area. The 2006-2011 timeframe isolates the pre-recessionary period of strong economic performance and the recessionary and post-recessionary periods of weak economic performance and recovery. This is secondary, de-identified data; therefore, IRB approval was unnecessary.

Study Sample

The study sample includes adults aged 18-64 living in the Las Vegas Metropolitan Area in Nevada that completed a BRFSS telephone survey between 2006 and 2011. Those aged 65 and older were not included since 65 is the full retirement age in the U.S. As it was documented for each survey respondent the day, month, and year completed, this information was utilized to categorize responses into one of the three recessionary periods.

Study Measures

The outcome variable in this study was a binary measure of self-reported health status and was measured as either “good or better” health (indicating ‘good’, ‘very good’ or ‘excellent’ health), versus ‘fair to poor' health. The model attempted to capture the effect of the local unemployment rate on self-reported health. Economic status was measured as the average unemployment rate pre-, during, and post-recessionary period. Each recessionary period was comprised of 24 continuous months, totaling 72 months total for the analyses. Survey respondents were assigned to one of the three study time periods by the month and year that the survey was completed.

Employment status was categorical and coded based on length and type of employment. Health insurance was a binary variable, indicating presence or absence of coverage. Regression models were adjusted for sociodemographic characteristics including age, race, education gender, and family. For the purpose of this study, self-reported health status was classified as ‘favorable’ for good or better health and ‘unfavorable’ for fair to poor health.

Statistical Analysis

The exclusion criteria were individuals aged $\geq$65, or retired, in an attempt to capture employment data. A total 4,284 survey respondents were included in this study. For each recessionary period, employment (employed/unemployed), insurance status (insurance/no insurance), age (18-24, 25-34, 35-44, 45-54, 55-64), education (did not graduate H.S., graduated H.S., attended college, graduated from college), race (white, black, Hispanic, other, multiracial), marital status (married, divorced, widowed, separated, never married), income (less than 15k, 15-<25k, 25k-<35k, 35k-<50k, >50k), and gender (male/female) were considered categorical variables.

All data were weighted to account for probability of selection and the Rao-Scott adjustment was performed to account for weighted proportions. Multiple logistic regression analysis for each recessionary period was used to determine factors associated with self-reported health. Each recessionary period was examined to determine any time-specific differences. A final adjusted logistic regression model was performed to examine factors associated with self-reported health among subjects throughout the entire study period (2006-2011). The significance level was set at $p<0.05$, and odds ratios

Table 1: Descriptive Characteristics of independent and dependent variables in Las Vegas MMSA, BRFSS 2006-2011 (N=4,284).

Variable		Unweighted (n)	Weighted %
Employment	Employed	3800	86.8%
	Unemployed	484	13.2%
Insurance	Has insurance	3473	76.3%
	No insurance	811	23.7%
Recession	Pre	1306	30.6%
	During	1373	35.8%
	Post	1605	33.6%
Health	Favorable	3738	87.0%
	Unfavorable	546	13.0%
Employed	Has insurance	3234	70.7%
	No insurance	566	16.1%
Unemployed	Has insurance	239	5.6%
	No insurance	245	7.6%
Gender			
	Male	2058	58.8%
	Female	2226	41.2%
Age			
	18-24	225	9.6%
	25-34	770	27.0%
	35-44	1129	27.9%
	45-54	1183	22.4%
	55-64	947	13.1%
Race			
	White	2676	55.3%
	Black	315	6.8%
	Hispanic	783	25.3%
	Other	293	8.4%
	Multiracial	217	4.2%
Marital			
	Married	2258	56.7%
	Divorced	783	11.8%
	Widowed	124	1.6%
	Separated	122	2.4%
	Never Married	997	27.6%
Education			
	Did not graduate high school	331	10.5%
	Graduated high school	1053	27.1%
	Attended College	1333	30.6%
	Graduated from College	1567	31.8%
Income			
	Less than 15K	232	6.2%
	15k to less than 25k	527	14.2%
	25k to less than 35k	450	11.0%
	35k to less than 50k	657	14.5%
	50k or more	2418	54.2%

with 95% confidence intervals were obtained from multiple logistic regression models.
SPSS v.20 with Complex Samples was utilized for data analyses.

Results

Approximately one-third of responses came from each recessionary period (pre- 30.6%, during 35.8%, and post- 33.6%). The average unemployment rate in Las Vegas was 4.3% pre-recession, 9.1% during the recession, and 13.6% post-recession. Demographic characteristics are presented in Table 1. Means were derived from the entire study period (2006-2011), both unweighted (n) and weighted (%) are reported for the population (n=4,284). For employment and health insurance status, n=3,800 (86.8%) participants were employed and n=484 were unemployed (13.2%); those with health insurance totaled n=3,473 (76.3%) and those without insurance totaled n=811 (23.7%) (Table 1). Those reporting having favorable accounted for 87% (n=3738) of the population and unfavorable health represented the remaining 13% (n=546) (Table 1).

Self-reported health outcomes across all recessionary periods are shown in Table 2. In the employed group, favorable health outcomes increase from 87.8% (n=1,080) pre-recession, to 89.1% (n=1,062) during the recession, and finally to 90.1% (n=1,238) post-recession, but the opposite is true for the unfavorable health status which reduces throughout pre-, during, and post-recessionary periods (12.2% (n=146), 10.9% (n=140), and 9.9% (n=134), respectively) (Table 2). Surprisingly, the uninsured and unemployed had the largest increase in self-reported favorable health status during the recession period, however, these groups had the largest subsequent decreases in self-reported favorable health in the post-recession period (Table 2).

Weighted multiple logistic regression was used to assess significant factors associated with self-reported health status for each recessionary period. A total of five variables (employment, insurance, age, education, and income) reached statistical significance at $p<0.05$, and each recessionary period yielded distinct significant factors associated with self-reported health status (Table 3). Gender and race were not significant during any of the recessionary periods. Marital status was only significant during the recessionary period. Employment status was significantly associated with unfavorable self-reported health pre-and post-recession. Age and income were also only significant in the pre-and post-recession periods. Health insurance status was only significantly associated with self-reported health status in the pre-recession period. Finally, education level was the only variable significantly associated with self-reported health during all three recessionary periods.

In the pre-recession period, employment status (p=0.036), health insurance status (p=0.001), age (p=0.016), education (p=0.001), and income (p=0.009) were all found to be significantly associated with self-reported health (Table 4). Reporting an unfavorable health status was higher among the unemployed and uninsured when compared to the employed and insured. With respect to age, each subgroup had lower odds of self-reporting unfavorable health when compared to the 55-64 age subgroup. The age group 25-34 had 64% lower odds of reporting unfavorable health than those aged 55-64 (p=0.004; 95% CI 0.185-0.720) (Table 4). Other significant factors in the pre-recession period were education (p=<0.001) and income (p=<0.009)

Table 2: Health Status by Recessionary Period Among Employment and Health Insurance Status (N=4,284).

Recession	Unfavorable		Favorable	
Pre	N	%	N	%
Employed	146	12.2%	1080	87.8%
Unemployed	27	30.0%	53	70.0%
Has insurance	114	9.2%	971	90.8%
No insurance	59	28.1%	162	71.9%
During				
Employed	140	10.9%	1062	89.1%
Unemployed	42	22.7%	129	77.3%
Has insurance	128	10.8%	1002	89.2%
No insurance	54	19.4%	189	80.6%
Post				
Employed	134	9.9%	1238	90.1%
Unemployed	57	27.3%	176	72.7%
Has insurance	118	9.5%	1140	90.5%
No insurance	73	22.4%	274	77.6%

(Table 4). Those who did not graduate high school had 6.3 higher odds of self-reporting unfavorable health when compared to college graduates (p=<0.001; 95% CI 3.328-11.954) (Table 4). Those who graduated from high school had 2.5 higher odds of self-reporting unfavorable health when compared to college graduates (p=0.002; 95% CI 1.401-4.587) (Table 4). Those making between $35k-$50k/year were at higher odds (OR=2.75; 95% CI 2.749-4.931) of having unfavorable health when compared to those making more than $50k a year (Table 4).

Other significant demographic variables in the post-recession period included education (p=0.002) and income (p=0.001). Those who did not graduate high school had 3.7 higher odds of reporting unfavorable health compared with subjects completing high school (p=0.001; 95% CI 1.764-8.052) (Table 4). Those who attended college (p=0.030; 95% CI 1.062-3.352) had 1.8 higher odds in reporting unfavorable health when compared to college graduates (Table 4). Individuals that graduated from high school showed 1.8 increased odds and approached significance (p=0.05; 95% CI 1.000-3.525) (Table 4). Those making $15k-$25k/year had 3.3 higher odds in reporting unfavorable health (p=0.001; 95% CI 1.815-6.017), those making $25k-$35k/year (p=0.005; 95% CI 1.329-4.974) had 2.5 higher odds, and individuals making 35k-<$50k (p=0.001; 95% CI 0.858, 2.971) had 1.6 times higher odds when compared to those making more than $50k a year (Table 4).

Table 3: Multiple Logistic Regression Summary of Significance Levels for Independent and Demographic Variables and Health for Each Recessionary Period (N=4,284) (*p<0.05, **p<0.005, ***p<0.001).

Variable	Pre Sig.	During Sig.	Post Sig.
Employment	0.036*	0.117	0.006*
Insurance	0.001**	N/A	N/A
Gender	N/A	N/A	N/A
Age	0.015*	0.062	0.014*
Race	N/A	0.326	0.219
Marital	N/A	0.057	N/A
Education	0.001***	0.002**	0.002**
Income	0.003**	0.128	0.001***

During the recession period, education was found to be significantly associated with unfavorable health (p<0.05), indicating that a low education level was a risk factor (Table 4). Those who did not graduate high school had 3.7 higher odds of unfavorable health compared to college graduates (p=0.001; 95% CI 1.781-7.924), those who graduated from high school had 1.8 higher the odds of unfavorable health (p=0.049; 95% CI 1.004-3.357), and those who attended college had 2.02 higher odds of unfavorable health (p=0.02; 95% CI 1.115-3.656) (Table 4). Marital status itself was not significant, however, divorced individuals had 1.92 higher odds of unfavorable health (p=0.014; 95% CI 1.140-3.232). In this model, employment (p=0.117), age (p=0.062), and income (p=0.128) were not significant during the recessionary period.

Employment (p=0.006), age (p=0.014), education (p=0.002), and income (p=0.001) were all found to be significantly associated with unfavorable health in the post-recession period (Table 4). Those unemployed were at two times higher odds of reporting unfavorable health when compared to those that were employed (p=0.006; 95% CI 1.254-3.751) (Table 4). With respect to age, each subgroup had lower odds of unfavorable health when compared to the 55-64 age subgroup; and the age group 18-24 had 82% lower odds of reporting unfavorable health than those aged 55-64 (p=0.014; 95% CI 0.055-0.564) (Table 4).

Discussion

The purpose of this study was to examine how economic recession impacts self-reported health status through pre-, during, and post-recessionary periods. Results show that the percentage of unfavorable health responses declined during the Great Recession and subsequently, favorable health responses increased. The largest decreases in reporting unfavorable health during the recession were among the unemployed and uninsured groups. At peak unemployment rates post-recession, favorable health continued to increase 1.0% for the employed and insured while decreasing 5.0% for the unemployed and uninsured.

The analyses shed light on significant associations between rising unemployment rates and self-reported health status that was unique to each recessionary period (pre-, during, and post-). The most important finding may be that employment and health insurance status were not associated with health during the recession but were associated at the pre-and post-recessions when the unemployment rate

Table 4: Multiple Logistic Regression with Final Significance Factors and Unfavorable Health in Pre-Recession (n=1,306), during the recession (n=1,373), and Post-Recession (n=1,605) periods (*p<0.05, **p<0.005, ***p<0.001). ¥Employed, had insurance ages 55-64, Graduated from college, married, 50k or higher were the references used. [1]Health insurance was only significantly associated with self-reported health status in the pre-recession period. [2]Martial Status was only significantly associated with self-reported health status during the recession.)

	Pre-Recession (n=1,306)			During (n=1,373)			Post-Recession (n=1,605)		
Variable	OR	CI	p-value	OR	CI	p-value	OR	CI	p-value
Employment¥			0.036*			0.117			0.006*
Unemployed	2.072	(1.049, 4.092)		1.621	(0.886, 2.967)		2.169	(1.254, 3.751)	
Insurance¥,1			0.001***						
No insurance	2.308	(1.393, 3.824)							
Age¥			0.016*			0.062			0.014*
18-24	0.571	(0.232, 1.405)		0.435	(0.177, 1.068)		0.176	(0.055, 0.564)	0.003**
25-34	0.365	(0.185, 0.720)	0.004**	0.445	(0.231, 0.857)	0.016*	0.624	(0.329, 1.183)	
35-44	0.957	(0.544, 1.684)		0.533	(0.301, 0.943)	0.031*	0.587	(0.318. 1.084)	
45-54	0.891	(0.491, 1.615)		0.625	(0.365, 1.067)		0.548	0.294, 1.024)	
Education¥			0.001***			0.002**			0.002**
Did not graduate HS	6.307	(3.328, 11.954)	0.001***	3.757	(1.781, 7.924)	0.001***	3.769	(1.764, 8.052)	0.001***
Graduated HS	2.535	(1.401, 4.587)	0.002**	1.836	(1.004, 3.357)	0.049*	1.878	(1.000, 3.525)	0.05
Attended College	1.001	(0.577, 1.798)		2.019	(1.115, 3.656)	0.020*	1.887	(1.062, 3.352)	0.030*
Marital Status¥,2						0.064			
Divorced				1.919	(1.140, 3.232)	0.014*			
Widowed				0.745	(0.218, 2.552)				
Separated				2.193	(0.885, 5.430)				
Never Married				1.118	(0.594, 2.104)				
Income¥			0.009*			0.128			0.001***
Less than 15K	1.145	(0.461, 2.845)		2.091	(0.891, 4.908)		1.835	(0.786, 4.284)	
15k to less than 25k	1.472	(0.707, 3.066)		2.034	(0.930, 4.453)		3.305	(1.815, 6.017)	0.001***
25k to less than 35k	1.849	(0.929, 3.683)		2.007	(1.061, 3.796)	0.032*	2.571	(1.329, 4.974)	0.005**
35k to less than 50k	2.749	(2.749, 4.931)	0.001***	1.343	(0.705, 2.557)		1.597	(0.858, 2.971)	0.001***

was at its lowest and highest points. This finding may offer support to the *reallocation of time hypothesis* described by Ruhm suggesting that unemployed persons often reallocate time into physical activity and that costly habits, such as smoking and drinking, decline due to restricted monetary resources (Ruhm, 2005). Another critical finding was that education was the only sociodemographic factor found to be significantly associated with health status during all recessionary periods, and that those who did not graduate from high school were at greatest risk of reporting unfavorable health. Low educational attainment has been tied to poor health and is a complex issue, usually tied to income, which was significant during pre-and post-recession periods only. This finding may indicate that greater importance should be placed on education, rather than income, to yield improved health outcomes as higher education often leads to more job stability and opportunities for growth.

A limitation of this study is the validity of self-reported information collected through the BRFSS. The sensitive and personal nature of many questions may increase the likelihood of response bias. Participants may be more inclined to respond with answers that they believe invoke the least amount of judgment or may not be as comfortable with divulging personal information to telephone interviewers. When asking about objective measures, such as health status, participants often report on individual perceptions of their health rather than data

obtained from a clinical assessment. Non-definitive measures such as income may not account for recent pay raises and responses may vary based on whether the participant is reporting gross or net income. Finally, this analysis did not include household size which is an important characteristic that may provide better estimates of resource allocation and accumulated wealth. Strengths of the study, however, include a large sample size with robust modeling and analyses. Utilizing the data provided by BLS and the BRFSS allows for generalizability in the population. The city of Las Vegas, NV is transient and contains a diverse racial ethnic population. Although race/ethnicity was not associated with self-reported health in this study, follow up studies in different locations experiencing a financial crisis would be of interest.

Conclusion

These results indicate that during the Great Recession, employment or health insurance status were associated with self-reporting unfavorable health. However, findings from this study shed light on other important conclusions about economic recessions in general. First, being unemployed in the pre-and post-recession periods was associated with unfavorable health. Second, when compared to the oldest participants of the study, being in a younger age group was protective against unfavorable health in each recession period. Finally, educational attainment was the most significant socio-demographic factor across all recessionary periods; those without a high school diploma were consistently reporting unfavorable health status compared with all other subgroups.

While the cyclical patterns of economic conditions and health have been well-studied and documented, the effects of the Great Recession on the previously 'recession-proof' Las Vegas, Nevada have not been explored relative to potential negative impacts on the city. This study examined the impact of the economic recession on self-reported health by addressing here longitudinal recessionary periods as well as the local unemployment rate associated with each. This analysis provides support for intervention-based health considerations throughout times of economic up and downswings, and further illustrates the importance for more work addressing the association between individual and economic health within metropolitan areas as well as larger populations.

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