



Health consequences of the ‘Great Recession’ on the employed: Evidence from an industrial cohort in aluminum manufacturing



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ABSTRACT

While the negative effects of unemployment have been well studied, the consequences of layoffs and downsizing for those who remain employed are less well understood. This study uses human resources and health claims data from a large multi-site fully insured aluminum company to explore the health consequences of downsizing on the remaining workforce. We exploit the variation in the timing and intensity of layoff to categorize 30 plants as high or low layoff plants. Next, we select a stably employed cohort of workers with history of health insurance going back to 2006 to 1) describe the selection process into layoff and 2) explore the association between the severity of plant level layoffs and the incidence of four chronic conditions in the remaining workforce. We examine four health outcomes: incident hypertension, diabetes, asthma/COPD and depression for a cohort of approximately 13,000 employees. Results suggest that there was an increased risk of developing hypertension for all workers and an increased risk of developing diabetes for salaried workers that remain at the plants with the highest level of layoffs. The hypertension results were robust to a several specification tests. In addition, the study design selected only healthy workers, therefore our estimates are likely to be a lower bound and suggest that adverse health consequences of the 2007–2009 recession may have affected a broader proportion of the population than previously expected.

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Introduction

The 2007–2009 recession, dubbed “The Great Recession”, has been the most severe recession in the United States since the Great Depression of the 1930’s with the fastest increase in unemployment rates—108% increase in two years—the longest duration, and the slowest recovery (Goodman & Mance, 2011). While there has been much interest in the experiences of those who lost their jobs during this period, there has been limited interest in those who remain employed after downsizing events, hereafter referred to as survivors. Though survivors have fared relatively well, their experience is of interest because this group represents the majority of the population—79.3% of the labor force remained employed throughout the recession (Johnson & Butrica, 2012). Awareness of the rapidly changing unemployment rate may have increased all remaining workers’ perceived job insecurity, but the risk of unemployment may have been more salient at worksites that experienced layoff or downsizing

events. In turn, this may have affected workers’ health or health related behaviors.

Indeed, the negative impacts of organizational downsizing and increased job insecurity on employee health have been highlighted in a series of recent reviews. Studies suggest downsizing leads to increased sickness absence, lower self-reported health, higher self-reported job insecurity, and poorer psychological well-being (Davis, Savage & Stewart, 2003; Quinlan & Bohle, 2009). These reviews survey studies done in many different countries which examine employed and unemployed populations, utilize both cross-sectional and longitudinal designs, and consider a variety of macroeconomic periods. However, neither the longitudinal pattern of change in health status, nor the long-term consequences in relation to downsizing have been well characterized.

While most studies suggest that organizational downsizing is bad for employee health, there have several notable limitations, thus making it difficult to draw general conclusions. First, many studies rely on self-reported job insecurity, which may be inherently biased (Hellgren & Sverke, 2003). Second, most studies of downsizing include those workers who will eventually be laid off. Including these workers is problematic because workers who are laid off are generally at higher risk for adverse health or health related behavior to begin with (Bockerman & Ilmakunnas, 2009; Deb, Gallo, Ayyagari,

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Fletcher & Sindelar, 2009; Kivimäki, Vahtera, Elovainio, Pentti & Virtanen, 2003). Third, studies often do not account for the macro-economic condition. Yet during periods of heightened economic uncertainty the effects of organizational downsizing on health may be different than those occurring when a single sector, industry or firm downsizes. Finally, only a few studies have focused on the effects of downsizing and job insecurity on survivors (Dragano, Verde, & Siegrist, 2005; Kivimäki et al., 2003; Martikainen, Maki & Jantti, 2008; Vahtera et al., 2004).

Another salient issue for studies of survivors is selection in layoff events. An exceptional recent study of job insecurity on survivors used a population-level sampling strategy and examined the effects of an externally constructed measure of job insecurity (as opposed to self-reported) on excess mortality in an eight-year follow-up. This study was conducted during the deep recession in Finland of 1991–1993 (Martikainen et al., 2008), and it found no evidence of excess mortality among those remaining at downsized workplaces. However, the study did document that those who experienced the most severe downsizing at their worksite were actually protected in the eight-year mortality follow-up. The authors suggest that the counter intuitive result was due to selection—the survivors may well have been the healthiest workers. Thus, despite having an impressive sample, namely, a population registry, the authors could not account for the selection process into layoff. Our study intends to fill this remaining gap. There have been no studies in the United States of how survivors fared in the context of the 2007–2009 recession using an external measure of job insecurity while accounting for previous health. In this paper, we describe how survivors and those who were laid off differ, and then discuss the effects of organizational downsizing on survivors of layoffs in the context of the peak of the recent global recession.

We examine workers at Alcoa, a large multi-site, geographically diverse, aluminum manufacturing company with rich and uniform insurance benefits. Our study takes advantage of a large on-going cohort study dating back to 1996; therefore we have detailed data on the cohort before, during and after the recession at multiple worksites. Fortunately we have significant variation on how worksites were affected by the global downturn. As a consequence of plummeting demand for its products, Alcoa was forced to cut production broadly, with layoffs and accelerated retirements at every level of the organization in 2009 (Alcoa, 2010). However, not all worksites experienced similar levels of layoffs. Some worksites let go of as much as 40% of workers while others let go of only 5%—a turnover similar to that in normal times. Unlike previous studies of downsizing in US manufacturing worksites in the auto and aircraft industries (Hamilton, Hoffman, Broman & Rauma, 1993), the Alcoa worksites are distributed across 15 states with largely independent labor markets.

Accordingly for each plant, we categorize the severity of layoffs as an external measure of job insecurity and then evaluate subsequent health outcomes on the remaining workforce. Based on the intensity of downsizing, our measure captures the extent to which downsizing induced job insecurity for the remaining workforce, but it cannot account for workers' own appraisal of how secure their job was. These attributes make our measure an imperfect proxy for perceived job insecurity but also limit the potential for bias if the least healthy workers report the most job insecurity.

Methods

Data sources

This study relied on a series of administrative datasets including personnel data, health claims data and earnings data, which have been made available to researchers through an ongoing

collaboration between Alcoa and the study investigators. These data have been described in detail in previous publications where they have been used in a variety of studies ranging from validating the use of claims data to evaluate health to examining the association between job characteristics and health outcomes (Clougherty, Eisen, Slade, Kawachi & Cullen, 2009; DeSanto Iennaco et al., 2010; Pollack et al., 2007). The company's personnel dataset was used to construct the cohort of interest, extract basic demographic data, and define our exposure measure, the intensity of downsizing at each plant. In addition, health claims data were used to administratively identify new cases of four health conditions and to control for previous health. We linked these data sources with available information on changes in area-level unemployment rate in our final analyses. Each dataset, its treatment and linkages are detailed below.

Personnel data, demographic controls, cohort definition, and constructed downsizing measure

The central dataset for this study was constructed from personnel data files. For each employee basic demographic variables (sex, race, age), employee type/job category (hourly or salary), employee tenure, plant information (location and union status), employment status (active or retired), and termination date were derived from the personnel data. In addition, we used the personnel file to define a cohort (detailed below) and categorize the intensity of downsizing events as a measure of job insecurity (detailed below).

Cohort definition

We used the personnel data to select a cohort of approximately 22,000 stably employed workers who were employed on January 1, 2006. Approximately 16,000 of these workers remained working at Alcoa on January 1, 2010. Of these 16,000 survivors of the 2009 layoffs, approximately 14,000 employees worked at plants for which we had a history of health insurance going back to 2006 to verify new cases of disease. Four plants were excluded. This cohort was further selected to exclude individuals who already had significant health issues before the recession (criteria based on risk scores which are detailed below) or for whom we did not have a measure of prior health status in 2008. Our final cohort included 13,393 employees. The cohort selection strategy is outlined in Table 1.

External measure of downsizing

To create an external measure of downsizing, as a proxy for job insecurity, we used two criteria: 1) the change in size of the workforce at each plant from January 1 to December 31, 2009 and 2) plants experiencing a mass termination event. For 30 fully functional US plants with >100 employees in 2008, we calculated the proportion of the workforce that was laid off in 2009. For these same plants we noted dates in 2009 when more than 40 workers

Table 1
Sample selection.

Reason	Reasons for exclusion from analytical sample	
	Observations excluded	Observation left
Workers at 30 plant on 1/1/2006		22,164
No longer at Alcoa on 1/1/2010	6262	15,902
Worked at four plant with high HMO coverage	1753	14,149
Could not be matched in claims data	37	14,112
Risk score in 2008 missing or >4	719	13,393

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