Published in final edited form as:

Int Migr Rev. 2015 ; 49(2): 406–442. doi:10.1111/imre.12090.

The Occupational Cost of Being Illegal in the United States: Legal Status, Job Hazards, and Compensating Differentials¹

Matthew Hall,

Department of Policy Analysis and Management and Cornell Population Center Cornell University

Emily Greenman

Department of Sociology and Population Research Institute Penn State University

Abstract

Considerable research and pervasive cultural narratives suggest that undocumented immigrant workers are concentrated in the most dangerous, hazardous, and otherwise unappealing jobs in U.S. labor markets. Yet, owing largely to data limitations, little empirical work has addressed this topic. Using data from the 2004 and 2008 panels of the Survey of Income and Program Participation, we impute legal status for Mexican and Central American immigrants and link their occupations to BLS data on occupational fatalities and occupational hazard data from the Department of Labor to explore racial and legal status differentials on several specific measures of occupational risk. Results indicate that undocumented workers face heightened exposure to numerous dimensions of occupational hazard – including higher levels of physical strain, exposure to heights, and repetitive motions – but are less exposed than native workers to some of the potentially most dangerous environments. We also show that undocumented workers are rewarded less for employment in hazardous settings, receiving low or no compensating differential for working in jobs with high fatality, toxic materials, or exposure to heights. Overall, this study suggests that legal status plays an important role in determining exposure to job hazard and in structuring the wage returns to risky work.

Keywords

Undocumented Immigrants; Mexicans; Occupations; Labor Market Segmentation

In the context of rising inequality, understanding the well-being of workers in the low-skill labor market is taking on increased urgency. The employment outcomes of Latino immigrant workers in the United States are of particular interest due to their substantial presence in the low-wage labor market (Bean et al. 2012). Over 50 percent of U.S. workers lacking a high school diploma are Latino (Bureau of Labor Statistics 2011a), with the majority of these being foreign-born. A strong cultural narrative portrays immigrant workers, especially the undocumented, as being concentrated in dangerous, dirty, or otherwise undesirable jobs – that is, jobs Americans refuse to do. However, little scholarly research has focused on the work conditions of the low-skilled immigrant workforce. Previous literature on Latino

¹Direct correspondence to Matthew Hall, Department of Policy Analysis and Management, Cornell University, MVR Hall, Ithaca NY 14853; mhall@cornell.edu.

immigrant workers has investigated a relatively narrow range of employment outcomes, especially earnings or related constructs (Donato and Massey 1993; Hall, Greenman and Farkas 2010; Kaushal 2006; Kossoudji and Cobb-Clark 2002; Rivera-Batiz 1999). Few studies have focused on other key employment characteristics, such as the availability of benefits and employment stability (Bean et al. 2013; Flippen 2012) or work-related injuries and fatalities (Orrenius and Zavodny 2009a). Crucially, due to data limitations, prior research has been unable to consider how lacking authorization to work impacts the conditions of employment.

Understanding the impact of legal status on employment outcomes is particularly urgent not only because of undocumented migrants' sizeable presence in low-wage markets, but also given the current policy context. Increases in immigration enforcement efforts following the 2001 terrorist attacks (e.g., REAL ID; E-Verify), combined with enforcement of regulations requiring employers to verify legal status, make legal status a crucial part of any discussion of immigrant labor market outcomes.² Indeed, there is evidence that undocumented workers are being pushed further to the periphery of the labor market in the wake of such changes (Orrenius and Zavodny 2009b). On the other hand, recent evidence indicates that increased border enforcement, as well as practices used by businesses to ease compliance with new regulations, such as subcontracting, affect both documented and undocumented immigrant workers (Gentsch and Massey 2011; Flippen 2012; Massey et al. 2002). It is also possible that undocumented workers in the U.S. are exposed to particular types of occupational hazard and that processes of occupational closure shield them from other forms of occupational risk. Thus, an empirical investigation of the relationship between legal status and employment characteristics along multiple dimensions is critical to clarify these issues.

This study investigates how documentation status influences the concentration of Mexican and Central American (MCA) immigrants – who compose roughly two-thirds of the undocumented population (Hoefer, Rytina and Baker 2012; Passel, Cohn, and Gonzalez-Barrera 2012; Warren and Warren 2013) – in occupations featuring potentially unhealthy or unsafe work conditions. Specifically, we impute the legal status of persons in the Survey of Income and Program Participation (SIPP) in order to compare five groups of low-skill workers: undocumented MCA immigrants, documented MCA immigrants, native Latinos, native non-Hispanic blacks, and native non-Hispanic whites. Combining these data with information on the characteristics of workers' occupations, we compare these groups with respect to occupational fatalities and hazardous occupational conditions (such as exposure to heights and toxic substances). We further investigate the contributions of human capital and other observable characteristics in generating group disparities, as well as variation across groups in wage returns to adverse working conditions.

Background

It is an empirical reality that recently-arrived immigrant workers are structurally disadvantaged, relative to native workers with similar educational backgrounds, in U.S. labor markets. The median earnings of Mexican and Central American immigrants who worked

²See Griffith 2011, 2012; and Lee 2009, 2011 for a rich discussion on the interplay of immigration and workplace law

fulltime in 2003 were only \$20,840, compared to \$36,784 among native-born workers (U.S. Census Bureau 2004), and working Mexican immigrants also have particularly high rates of employed poverty (Hauan et al. 2000). In addition to low earnings, previous research has shown that Latino immigrant workers are also disadvantaged in terms of access to benefits, including overtime pay and sick time, and have enhanced odds of being employed informally or paid “off the books” (Flippen 2012). Lack of mastery of the English language, inexperience in the U.S. labor market, and employers’ lower valuation of human capital attained abroad are all factors likely to contribute to the poor labor market position of Latino immigrant workers.

Part of the explanation for Mexican immigrants’ comparative economic disadvantage is that they are clustered in a limited set of jobs with distinct characteristics. Previous research has found relatively high levels of occupational segregation among Latinos in general (Richardson, Ruser and Suarez 2003), and Latino immigrants in particular (Catanzarite 2000). Many of these jobs – including farm workers, janitors and cleaners, groundskeepers and gardeners, and construction and non-construction laborers – tend to require strenuous physical activity and relatively low levels of schooling (Richardson et al. 2003). Several studies have demonstrated that foreign-born Hispanic workers are located in occupations featuring higher levels of occupational fatalities or non-fatal injuries (Loh and Richardson 2004; Orrenius and Zavodny 2009a; Richardson et al. 2003). For instance, Hispanic immigrant workers are especially likely to work as construction laborers, one of the riskier jobs identified by the Census of Fatal Occupational Injuries. Furthermore, there is reason to believe that immigrant workers may experience higher fatalities than native workers even within occupations: Dong and Platner (2004) show that within the construction workforce, Hispanic workers are disproportionately likely to be the victims of fatal accidents, which they speculate to be due Hispanics’ limited English proficiency and pronounced tendency to lack legal authorization to work.

Regulatory changes in the low-skill labor market for immigrant workers are likely to contribute to such differences in occupational hazard. Efforts to increase penalties for hiring unauthorized workers, such as the Immigration Reform and Control Act (IRCA) of 1986 and the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA) of 1996, as well as changes in immigration enforcement following the attacks in 2001, have encouraged employers to rely on subcontracting rather than hiring immigrant workers directly (Massey, Durand, and Malone 2002; Valenzuela 2003). Since the Occupational Safety and Health Act (OSHA) does not require employers to provide protection from workplace hazards to independent contractors (1099 workers), employers seeking unauthorized workers have an incentive to outsource not only because it safeguards against sanctions for hiring undocumented migrants, but also because it shields them from penalties associated with unsafe or hazardous work environments (Occupational Safety and Health Act, 1970). Although immigration enforcement efforts are aimed specifically at unauthorized immigrants and are likely to have the largest effect on them, Flippen (2012) reports that the work conditions of low-skill immigrants, both documented and undocumented, have been affected by these broader changes in the labor market (also see Massey et al. 2002). On the other hand, Orrenius and Zavodny (2009b) find evidence that recently-arrived Latin American immigrants have seen their labor market outcomes deteriorate more rapidly than

earlier Latin American immigrants. Because the recent arrivals are more likely to be undocumented, this is construed as evidence that enforcement efforts have primarily affected the intended targets, unauthorized workers. However, the inability of Orrenius and Zavodny's analysis to directly identify undocumented workers makes this interpretation uncertain. Further research is necessary to clarify the role of legal status in the disproportionate risks facing immigrant workers.

Due to data limitations and challenges, there is little empirical evidence about the relationship between unauthorized status and occupational risk; however, there is ample reason to believe that undocumented workers are at a disadvantage in the low-wage labor market. Both popular and scholarly accounts highlight the vulnerability of undocumented workers to exploitation by employers (Massey 1987; Rivera-Batiz 1999). Because undocumented status lowers workers' bargaining position relative to employers, undocumented workers are likely to accept both lower wage offers and poor working conditions. Indeed, several studies have found that undocumented workers earn less than their documented counterparts, even controlling for human capital (Donato and Massey 1993; Donato, Wagner and Patterson 2008; Flippen 2012; Hall, Greenman and Farkas 2010; Kossoudji and Cobb-Clark 2002; Powers and Seltzer 1998; Powers, Seltzer and Shi 1998; Rivera-Batiz 1999). Furthermore, fear of detection by authorities serves as a strong disincentive to report or try to remedy unsafe working conditions once hired. Employers, by the same token, may find it easier to skirt regulations governing safety, overtime pay, and the like when most employees are undocumented. Yoshikawa's (2011) study, which features qualitative interviews with undocumented parents, supports this portrayal, finding that undocumented workers' fear of deportation can leave them stuck in jobs with onerous working conditions that often pay less than the minimum wage. Similarly, Flippen (2012) finds that undocumented workers are more likely to lack overtime pay than their documented counterparts. It is likely that undocumented status is also related to other disadvantageous labor market outcomes, including exposure to dangerous or unhealthy working conditions.

Studies that have examined this issue more explicitly have mostly used geographically or occupationally-specific data sources, since no nationally representative survey inquires directly about immigrants' legal status. Enchanutegi (2008) reports that, among immigrants living in New York and Los Angeles, undocumented migrants are more likely than documented ones to report working in dangerous jobs or being exposed to unhealthy conditions. Similarly, Valenzuela (2003) finds that day labor work – often synonymous with (but not exclusive to) unauthorized work – is characterized by exposure to hazardous work settings. Walter et al. (2003), in a qualitative study of undocumented laborers in San Francisco, identify several specific factors that put them at high risk of injury: employment in the construction industry, low likelihood of receiving safety training (both due to language barriers and reduced employer incentives to train temporary workers), employers flouting safety regulations with little fear of being reported by their undocumented employees, and severe economic pressures that make job mobility difficult for workers. On the other hand, in a study of agricultural workers that included measurement of documentation status, Kandel and Donato (2009) found that undocumented workers were less likely than either documented or citizen workers to be exposed to pesticides. They suggest that proper

handling of pesticides is a skill valued by employers, who therefore invest in hiring and training higher-status, more stable employees, who also receive an earnings premium. Thus, in some occupations, handling of hazardous substances may be associated with desirable job amenities, such as higher earnings, which may limit undocumented workers' access to such positions.

Theories of labor market segmentation posit that the economy contains two distinct sets of jobs: those in the primary sector, which offer stability, good working conditions, higher pay, and prospects for advancement; and those in the secondary sector, which tend to be low-paying, "dead-end" jobs with few prospects for advancement or earnings growth (see Doeringer and Piore 1971; Hudson 2007; Kallenger 2011; Kalleberg et al. 2000; Lang and Dickens 1988). Theoretical arguments and empirical works suggest that citizenship and legal status have become increasingly important in sorting workers into sectors of the labor market (Gleeson and Gonzales 2012; Hudson 2007; Kandel and Donato 2009; Portes and Rumbaut 2006). Although many jobs combine features from both primary and peripheral sectors, noncitizen workers are disproportionately likely to be found in jobs with a preponderance of features commonly associated with the secondary sector, including contingent, on-call, or temporary employment, work at irregular hours or days, a lack of benefits, and low pay (Hudson 2007; Kalleberg et al. 2000). While such secondary-sector jobs have many disadvantageous qualities, it does not necessarily follow that they entail a higher degree of risk or exposure to occupational hazards. Indeed, Kandel and Donato's (2009) "skilled job hypothesis" claims that responsibility for hazardous substances, at least in select occupations, is related to job amenities and is characteristic of jobs in the primary sector. Thus, labor market processes that exclude undocumented workers from primary sector jobs may, in some cases, inadvertently shield them from exposure to the most dangerous types of occupational environments.

Thus, previous research has suggested that a) undocumented workers are vulnerable in the workplace and are likely exposed to less desirable work conditions overall; and b) undocumented workers may be less exposed to specific types of hazards (i.e., pesticides) that are associated with higher-skilled jobs. Our analysis employs nationally representative data including information on multiple distinct occupational hazards to test these questions. We expect to find that undocumented immigrant workers are exposed to greater occupational hazards than documented immigrant workers, with the possible exception of exposure to hazardous materials. On the other hand, immigration scholars have argued that both documented and undocumented immigrant workers occupy an increasingly marginal place in the low wage labor market. We thus expect that both documented and undocumented MCA immigrants are exposed to greater occupational hazards than native-born workers of any ethnicity.

Variations by Gender

It is important to consider the influence of gender in studying differences by legal status in exposure to occupational hazards. Latin American-U.S. migration is known to be a gendered process in which women often follow male relatives later in the migration stream (Donato et al. 2008). Women's relatively later arrival in the migration process, their greater likelihood

of joining family members rather than migrating alone, and their greater responsibility for children are all factors that are likely to influence their labor market outcomes differently than those of men. Indeed, previous research has shown that legal status has a greater influence on the earnings of male than female Mexican immigrants (Hall et al. 2010). Workers with primary responsibility for children may be especially motivated to avoid dangerous occupations. Because immigrant women are more likely to be secondary earners within a family, they may also be more willing to turn down jobs involving dangerous employment conditions than their male counterparts.

Furthermore, there are large gender differences in exposure to occupational hazards in the labor force in general. While women make up nearly half of the labor force, there were only 319 fatal work injuries among women in 2009, compared to 4,021 among men (Bureau of Labor Statistics 2011b). The occupations accounting for the highest share of fatal work injuries among Hispanic immigrants (such as precision production, craft, and repair occupations and operators, fabricators and laborers) tend to also be male-dominated (Loh and Richardson 2004). Because fewer female-dominated occupations feature high levels of hazards, there may be relatively little variation in exposure to occupational hazards between immigrant and native women or between documented and undocumented immigrant women. Including both sexes together (as in Orrenius and Zavodny [2009a]) may therefore underestimate the association between immigration status and occupational hazard for men, while overestimating it for women. We therefore perform separate analyses for each gender, and expect, based on prior research, that documentation status will be more consequential for men than for women.

Compensating Differentials

Aside from variation in exposure to hazardous work conditions, legal status may moderate the wage returns associated with work in dangerous or risky environments. It is widely acknowledged that employers compensate for job disamenities (adverse working conditions), including irregular work shifts, job stress, physical exertion, occupational risk, and certification processes (Olson 1981; Smith 1979). Compensating differentials can, thus, help to explain variation in pay across jobs. Labor economists have previously shown that workers receive such wage premiums for laboring in jobs with high rates of occupational fatality or non-fatal injury (Cousineau, LaCroix, and Girard 1992; Hersch 1998; Kniesner and Leeth 1991; Viscusi 2004). These effects are evident for both male and female workers and tend to be stronger for those in lower-skilled sectors (Hersch 1998; Viscusi 2004).

In addition to being more likely to be exposed to hazardous work conditions, undocumented workers may receive weaker returns to occupational risk if their precarious labor market position limits bargaining power. Prior research has shown that while immigrants generally receive similar wage premiums compared to native workers for working in jobs with high fatality rates (Berger and Gabriel 1991; Hersch and Viscusi 2010; also see Leeth and Ruser 2003 for a focus on Latinos), Mexican immigrant workers realize small or no compensating differential for occupational risk (Hersch and Viscusi 2010). One study considered the role of prior illegal status on returns to occupational hazard for currently legal immigrants, and found no differential effect of documentation status (Hersch and Viscusi 2010). However,

the inability to connect migrants to their occupations while they were in an unauthorized status likely attenuates any actual effect of legal status. We thus expect to find that undocumented workers receive lower wage returns to occupational hazards than other workers with similar human capital profiles, including their documented counterparts.

Data and Methods

The main source of data for this research is the 2004 and 2008 panels of the Survey of Income and Program Participation (SIPP), a panel study focused on U.S. households' employment and public program experiences. The SIPP design draws a large, nationally-representative sample of U.S. households and collects information on each household member every four months for approximately four years. At each interview, respondents are asked a set of core questions and wave-specific topical questions that cover the reference month and three preceding months. In cases where respondents are non-English speakers, SIPP provides translators.³ We restrict the sample to respondents participating in the second wave of each SIPP panel because a topical module administered during that wave inquires about place of birth, citizenship, and visa status. Given our interest in the low-wage labor force, the sample is further limited to prime-age (18 to 64) workers not enrolled in school during any of the prior five months who have no more than a high school education.⁴ We also restrict our analysis to foreign-born Mexican and Central American (MCA) immigrants, and U.S.-born Latinos, non-Latino whites, and non-Latino blacks.⁵ The final analytic sample includes 3,103 MCA immigrants, 1,939 native Latinos, 16,120 native whites, and 3,140 native blacks.

Our analysis explores occupational hazard along several different dimensions. We use data from the Bureau of Labor Statistics' Census of Fatal Occupational Injuries, which enumerates all workplace fatalities, to calculate occupation-specific fatality rates (see Northwood et al. 2012).⁶ These fatality rates are expressed as the number of fatalities in each occupation per 100,000 workers.⁷ To ensure broad coverage of all occupations and to account for annual fluctuations and outliers in the distribution of fatalities, fatality rates are smoothed for each occupation over the 2003 to 2008 period. The resulting measure is thus: the average fatality rate for each occupation during the mid-2000s. Occupations in which no fatalities are reported are treated as having a fatality rate of "0." Because of both the positive skew, resulting from a few occupations with very-high fatality (e.g., fishers and tree fallers) and the peakedness of the distribution due to a clustering of occupations with no reported fatalities, a square-root transformation is employed.⁸

³In the 2004 panel, about 3% of interviews were conducted in Spanish (author's correspondence with the U.S. Census Bureau).

⁴We exclude respondents enrolled in school at the first wave because the second wave of the 2004 panel was administered between May and August of 2004, a period during which many students will be between academic years.

⁵The 2008 panel of SIPP does not differentiate between Mexican and Central American immigrants; thus we use the more inclusive definition of the study group than previous related work (Hall et al. 2011).

⁶The BLS additionally collects information on non-fatal occupational injuries through the Survey of Occupational Injuries and Illnesses. It is widely recognized, however, that these data suffer from a substantial undercount (Boden and Ozonoff 2008; Kica and Rosenbaum 2012; Rosenbaum et al. 2006; Ruser 2010) due to underreporting and misreporting by employers. This coverage error is especially problematic for jobs with high concentrations of undocumented immigrants (see Brown et al. 2002; Orrenius and Zavodny 2009a; Quandt et al. 2006).

⁷The number of workers in each occupation is calculated by estimating the size of the non-civilian workforce from the Current Population Survey and adding in the number of resident military workers in each occupation with data from the Department of Defense (see Bureau of Labor Statistics 2006).

To measure occupational hazard, data from the Department of Labor's Occupational Information Network (O*NET) are used, which provides detailed information on the characteristics, transferable skills and job requirements of occupations, and replaces the outdated Dictionary of Occupational Titles (see US Department of Labor 2012). The data are based on a detailed survey of workers in every occupation, including elements on worker skills, knowledge, and abilities, job tasks, generalized work activities, and work context. To develop measures of occupational hazard, we extract data from the Physical Work Conditions subcategory of the Work Context module in the 2011 update to O*Net (version 16.0), which includes detailed information on exposure to various hazardous conditions and materials, physical work environments, and the repetition of work tasks, among others. To develop the measures used in our analysis, we identify the occupations present in our sample of SIPP workers, and reduce the O*NET data on these occupations using factor analytic techniques. Specifically, 22 items are reduced to 6 factors using principal factor analysis with an orthogonal varimax rotation (Bryman and Cramer 2004), which we refer to as: physical strain, exposure to toxic materials, environmental exposure, exposure to heights, repetitive motions, and exposure to radiation and disease.⁹ Regression-based factor scores for each occupation are linked to SIPP respondents using their own "first" or primary occupation.

The key explanatory variable in our analysis is documentation status. To identify legal status, we apply the approach developed by Hall et al. (2010), which uses information on respondents' citizenship, legal permanent resident (LPR) status, and participation in federal public assistance programs to impute documentation status for less-skilled Mexican and Central American immigrants. Specifically, respondents who indicate that they are citizens or legal permanent residents (either currently or at entry) are classified as legal.¹⁰ Throughout the entire SIPP observation period, we also track respondents' participation in all federal assistance programs for which undocumented immigrants are ineligible (e.g., Food Stamps, Medicaid, SSI, TANF); if an immigrant reports receiving benefits from one of these federal programs in their own name (as opposed to dependently through someone else in the household [e.g., a U.S.-born child]) at any observable point, they are also classified as legal. Our more general allocation strategy considers full-time college students and their spouses to be legal; however, because the sample is restricted to those with no more than a high school diploma and excludes those currently enrolled in school, immigrants on student or exchange visas are indirectly excluded from our analysis. All other immigrants are either undocumented or fall into one of the following categories: refugees and asylees¹¹, tourist/business travelers, diplomats and other political representatives, and temporary workers

⁸Results based on a log transformation produce statistically and substantively similar results, but the shape of the distribution better approximates normality under the square-root transformation.

⁹The 22 items we analyze and their rotated loadings with each of the six factors are summarized in Appendix Table A1. In supplemental models, we considered a single scale of occupational hazard based on the 22 O*NET items ($\alpha = .935$). Results from this alternative specification suggest that undocumented MCA workers have higher levels of exposure to occupational risk than their documented counterparts, although the difference is only significant for men.

¹⁰To correct for over-reporting of citizenship among new immigrants (Passel et al. 1997), we classify all immigrants who have been in the country for fewer than four years but say they are naturalized, as noncitizens. The results are not sensitive to this correction.

¹¹While very few Mexican immigrants have been granted asylum in the U.S., immigrants from several Central American countries – particularly Nicaragua, El Salvador, and Guatemala – have been admitted as refugees (or have been eligible to have their immigration status adjusted to "asylee") following the conflicts in the region in the 1980s. Other Central Americans, including Hondurans, have been granted Temporary Protected Status following natural disasters during the late 1990s and early 2000s. Our imputation strategy

(U.S. Department of Homeland Security 2012). Since SIPP does not sample tourists and other short-term visitors, they are excluded from the analysis. Those admitted as diplomats are accounted for by deeming MCA foreigners who are themselves or are married to a high-ranking public official to be in the country legally. SIPP does not provide any information that would allow us to identify temporary workers, so our classification system is unable to distinguish them from the undocumented. Authorized temporary workers, however, form a comparatively small portion of MCA immigrants (Department of Homeland Security 2012). Nevertheless, when interpreting the results it is prudent to keep in mind that the group we refer to as “undocumented” may contain a small proportion of legal, temporary workers.¹²

Human capital characteristics included in our analyses are educational attainment (in years of schooling [between 0 and 12]) and linear and quadratic terms for potential labor market experience (age – educational attainment + 5). For immigrants, two important measures of acculturation are considered. Recency of arrival is a dummy indicator of whether the migrant arrived in the U.S. in the last five years. Given the importance of English proficiency for job accessibility and for comprehending safety training and recognizing potential occupational risks (Hersch and Viscusi 2010), we include a binary indicator of whether an immigrant worker reports speaking English only or “very well.”¹³ Our models also account for any potential differences between SIPP panels by including a dummy variable for whether the respondent is drawn from the latest 2008 panel. In addition, dummies for each of the four census-defined regions are included with the Western region – where a majority of MCA immigrants live – serving as the referent.¹⁴ Summary statistics for all variables used in the analysis are shown in Appendix Table A2.

To examine occupational risk, we use OLS models that regress each of the seven measures of job hazard on the explanatory variables. Given the shared hazard levels of workers within the same jobs, standard errors of parameter estimates are clustered on occupation. Descriptive results are weighted using the wave-2 person weights provided by SIPP. We have considered several alternative analytic approaches, including truncated regression to account for the truncated scale of the outcomes of interest, and seemingly-unrelated regression (SUR) to evaluate the possibility that dependent variables are related to one another. These alternative approaches produce results that are substantively and statistical similar to those shown here.

may classify some such immigrants as undocumented when their legal status would be better described as “liminal.” As Menjívar (2006) has shown, such temporary and provisional legal status is in many ways more similar to being undocumented than to being a legal immigrant. Overall, the number of refugees in our sample misclassified as undocumented is likely small given the numerical dominance of Mexicans among immigrants from the region.

¹²In additional analyses, we used a three-group measure of legal status by disaggregating documented migrants into naturalized and non-naturalized ones. Results from these models suggest that naturalized immigrants tend to have marginally better work environments than non-naturalized migrants, but differences between the two groups of legal immigrants are small and mostly nonsignificant, and disparities between undocumented migrants and the two groups of documented workers remain. Complete results are available on request.

¹³In alternative analyses, we considered a more complete categorization of English ability and find results that are substantively and statistically equivalent to those presented here.

¹⁴We also considered controls for marital status (married and living with spouse=1; otherwise=0) and the presence of children. For the most part, these additional covariates have small and statistically non-significant effects on occupational risk (especially among male workers), and most importantly, do not attenuate differences between groups.

Results

Occupational Clustering

Our analysis begins by exploring basic group differences in the top occupations held by low-skill workers. Table 1 shows the five most-commonly held jobs for each group of low-skill workers, separately for men (top panel) and women (bottom panel). For example, 10.41% of undocumented men are employed as construction laborers. As a crude measure of occupational segregation, these shares are summed to estimate the total percentage of workers that are employed in the five most-common occupations. There are several similarities in the jobs held by these workers – with construction laborers and carpenters being among the top-5 jobs for all male workers except native blacks; and maids and housecleaners being major occupations for all female groups except native whites – but the differences are notable. Among men, pesticide handlers and farmworkers – two potentially hazardous jobs – are top occupations for MCA immigrants (regardless of legal status) but not for native workers, while light truck drivers are main occupations for all native groups but not immigrant ones. The jobs held by undocumented and documented MCA immigrant men are very similar, but the overall concentration in the top-5 jobs is higher among undocumented men (38.48%) than documented ones (32.62%), suggesting that occupational segregation is moderately higher among undocumented men.¹⁵ Native male workers are even less segregated in their top jobs. The top occupations for female low-skill workers also vary across legal/racial groups. For MCA immigrant women (regardless of legal status), maids/housecleaners and janitors/cleaners predominate: more than one-fifth of low-skilled MCA immigrant women are employed in one of these two jobs alone. Native women are especially likely to be employed in office or sales/service occupations, with booth cashiers and receptionists being among their top occupations. Overall the level of occupational clustering among women is higher than for men, but the same legal/racial hierarchy is observed with undocumented women being most segregated (42.36%), followed by documented MCA immigrants (36.14%), native blacks (28.01%), native Latinos (26.80%), and native whites (23.55%).

Group Differences in Occupational Hazard

Table 1 suggests a process of segmentation by which immigrant workers – particularly men – are concentrated in occupations with plausibly elevated levels of environmental exposure and toxic product handling, but the results are thus far limited by a focus on a narrow range of occupations and by not directly assessing occupational risk. Tables 2 and 3, by contrast, use the full distribution of occupations in the sample of low-skill workers and examine group differences in occupational fatality rates and occupational risk factors.

Among male workers (Table 2), undocumented MCA immigrants have the highest levels of occupational hazard on five of the seven measured dimensions. This includes a higher rate of occupational fatality, greater exposure to physical strain, greater exposure to environmental conditions and to heights, and higher levels of repetitive motions (i.e., recurring hand

¹⁵This difference between undocumented and documented migrants in the proportion of workers concentrated in “top five” occupations is statistically significant ($p=.0098$).

movements). They differ significantly (at $p < .05$) from native workers of all race/ethnicities on all of these outcomes, and differ from their documented counterparts on three (physical strain, exposure to heights, and repetitive motions). On the other two outcomes, undocumented immigrant men exhibit lower levels of occupational hazard. Low-skilled native white men, on average, occupy jobs with the highest levels of exposure to toxic materials, followed by documented MCA immigrants and native Latinos.¹⁶ Exposure to radiation and disease is highest among native black workers, with undocumented workers being, on average, the least exposed to this potentially dangerous form of occupational hazard.¹⁷ That undocumented immigrants are least exposed to arguably the most potent types of occupational danger – radiation, disease, and toxic material – is consistent with some past work (Kandel and Donato 2009) and theoretical arguments that labor market segmentation and occupational closure exclude undocumented workers from risky but heavily regulated and potentially high-paying and/or stable jobs.

Levels of occupational hazard to which low-skill female workers are exposed tend to be lower than those for men, but Table 3 shows that group differences in occupational risk are evident. Like their male counterparts, female undocumented MCAs experience the highest levels of physical strain and environmental exposure, but for the most part, differences between undocumented and documented immigrant women are minimal (with the exception of physical strain, of which undocumented workers have significantly higher levels than any group). Native white women and native black women, like men, have the highest levels of exposure to toxic materials and radiation/disease, respectively.

Legal Status and Occupational Hazard

Group differences in occupational risk provide some indication that the jobs held by undocumented immigrants are riskier in some ways than the jobs held by others, but also indicate that their jobs are, in other ways, less hazardous. The multivariate models shown in Tables 4 and 5 attempt to better isolate the impact of legal status on occupational hazard by limiting the analysis to those at risk of being unauthorized – Mexican and Central American immigrants – and testing alternative arguments related to potential compositional differences between undocumented and documented MCA workers.

Results for men, summarized in Table 4, indicate that when human capital and acculturation traits are held constant, undocumented immigrants suffer from significantly higher levels of physical strain, repetitive motioning, and exposure to heights in their occupations than documented immigrants do. The magnitude of these estimates ranges from just one to just over two standard deviations; which, to put in perspective, are similar to (although somewhat smaller than) the corresponding effects of English proficiency. On three other outcomes (fatality, exposure to toxic material, and environmental exposure), documented and undocumented immigrants do not significantly differ. Moreover, documented immigrants actually exhibit higher levels of exposure to radiation and disease than undocumented

¹⁶Occupations with the highest levels of exposure to toxic materials include mine shuttle car operators, tool and die makers, mining machine operators, and metal pourer and casters.

¹⁷As expected, jobs with the highest exposure to disease and radiation are strongly represented in the health care industry (e.g., dental hygienists, radiologic technologists, nurses) but also among transportation security screeners and cleaners, janitors, and dry-cleaning workers.

immigrants, potentially because strict regulations and certifications in the health and related sectors limit undocumented workers' access to those jobs.

Other variables in the model work in directions mostly in line with microeconomic theory: physical strain and exposure to radiation and disease decline with labor market experience, but the other dimensions of occupational hazard tend to increase over MCA immigrant workers' careers; schooling exerts a mostly consistent negative effect on occupational hazard (albeit not significantly for all outcomes); and the jobs of recently-arrived immigrants tend to have higher levels of occupational hazard but only significantly so with respect to occupational fatality, for which they experience substantially higher rates than more-established immigrants. The ability to speak English proficiently has perhaps the most consistent effect on occupational hazard for immigrants, reducing it on five of the outcomes (albeit significantly on only three). Additional analyses, not shown here, indicate that language ability tends to be the most important factor in mediating observed differences between documented and undocumented immigrants.¹⁸ Despite the expectation that unions are able to protect against occupational hazard, there is no evidence in our models that union membership significantly reduces occupational risk for MCA immigrant workers. There is also moderate regional variation, with MCA immigrants living in the northeast tending to be employed in jobs with lower fatality rates and less exposure to toxic materials and environmental conditions, and workers in the south having heightened risks of fatality, physical strain, and exposure to heights, compared to MCA workers in the west.

Table 5 presents corresponding parameter estimates for female MCA immigrant workers. The results indicate that after sociodemographic and assimilation characteristics are equalized, undocumented immigrants face significantly greater occupational hazard on only a single outcome – physical strain – and remaining differences between documented and undocumented immigrants are small in magnitude and statistically non-significant. The impact of other variables in the models operate in ways similar to men: physical strain, repetitive motions, and exposure to radiation/disease increase with labor market experience, and exposure to most types of occupational hazard decreases with education. Recently-arrived MCA women tend to be employed in riskier jobs, albeit only significantly so on three outcomes. And, English ability – as is true for men – tends to reduce occupational risk, although the coefficient is only significantly associated with fatality rates, physical strain, and toxic materials.¹⁹

Compensating Differentials for Hazardous work

The preceding analysis show mixed evidence of the impact of legal status on occupational hazard – with the jobs that unauthorized MCA immigrants hold being riskier on some

¹⁸For example, excluding language proficiency, the effect of legal status on physical strain is 20.3% higher ($b = -.089$) and its effect on repetitive motions is 23.5% higher ($b = -.126$) than effects based on models including language ability. Complete results for mediation analysis are available on request.

¹⁹Because our objective in this part of the analysis is to isolate the impact of legal status on occupational hazard, we focus only on immigrant workers. In supplemental work, we examined conditional differences on each of the measures of job hazard for both immigrant and native workers (available on request). The results from these models indicate that on most dimensions for which undocumented and documented immigrants do not significantly differ, as a group, immigrant workers differ significantly from native workers in expected directions. This is true for both male and female workers and suggests that immigrant status may trump legal status in determining some characteristics of work.

dimensions but no worse on other dimensions than the jobs held by their legal counterparts. Another potential source of inequality can be derived from differential returns that workers receive to employment in dangerous jobs. The parameter estimates shown in Tables 6 and 7 address this issue by examining how compensating differentials for hazardous work vary across groups. Specifically, we regress log hourly wages on standard human capital variables – experience, experience-squared, unionization and education – as well as census region and SIPP panel; models for immigrant workers also include arrival recency and English proficiency.²⁰ Point estimates from this basic model are shown in the upper half of each table (above the first dashed line). We then separately add each of the seven dimensions of occupational hazard to this basic model. Thus, the compensating differentials for each type of occupational hazard are adjusted for their relationships with human capital (and acculturation) but not to other dimensions of hazard.

Among male workers (shown in Table 6), low-skill MCA immigrants have substantially weaker returns to labor market experience and educational investments than do native workers of every race. Specifically, while each year of schooling increases white men's wages by about 4.3%, the rate of return for MCA immigrants is between 0.6% and 1.0%. Undocumented MCA immigrants fare particularly poorly, with small and/or nonsignificant returns to experience, education, and union membership – a finding consistent with prior research (Hall et al. 2010). In comparison to their documented counterparts, undocumented men also receive smaller gains to speaking English well and are penalized more for being a recent arrival. The native low-skill groups receive similar average returns to human capital, although white men appear to fare somewhat better than Latino or black men.

Most importantly, the results indicate that undocumented migrants receive weaker compensating differentials for employment in hazardous occupations. Occupational fatality is associated with a modest wage premium for documented MCA and all native workers, but undocumented MCA immigrants receive no such compensating differential for working in jobs with high fatality rates. Similar differences are observed for exposure to toxic materials and exposure to heights, with compensating differentials associated with those types of occupational risk being weaker among undocumented MCA men than among documented ones and native men. Three of the seven measures of job hazard are associated with negative differentials: physical strain, repetitive motioning, and exposure to radiation/disease. These wage deficits may reflect relatively weak labor demand or be due to job amenities, such as reduced effort (physical or mental), flexible or convenient work hours, or fringe benefits.²¹ Alternatively, these jobs may be socially stigmatized and devalued due to characterizations as “dirty” labor, having high concentrations of immigrants (Waldinger and Lichter 2003) or being associated with female work (Cohen and Huffman 2003; England et al. 2007; Levanon et al. 2009).²² That undocumented migrants tend to have small negative differentials on these dimensions may be a promising sign; however, it also highlights the overall

²⁰Excluding acculturation characteristics does not alter the interpretation of the results: for both immigrant men and women, models without these terms yield estimates of experience and education that are nearly identical to those shown in Tables 6 and 7.

²¹In our data, physical strain, repetitive motions, and radiation/disease are negatively tied to work hours (Pearson's r between -.05 and -.18), for both men and women.

²²Additional analysis, linking occupation data from the 2010 ACS PUMS to our sample, reveals moderate and positive correlations between these factors and occupation-specific percent immigrant (Pearson's r between .14 and .46). Occupations with high levels of physical strain include maids, packers, and dishwashers. Those with repetitive motioning include sewing machine operators, shoe

compression of their wages. In the sample of SIPP data, undocumented men not only have lower average wages than any other group, but they have significantly less wage variation.²³

Parallel results for women are shown in Table 7. Among low-skill female workers, evidence that compensating differentials vary by legal status is weaker; this is consistent with results from Table 5, implying that legal status is less influential in determining women's economic well-being than men's. Yet, female undocumented workers have weaker wage premiums associated with exposure to toxic material and to heights than do other workers (both documented and native-born). Several of the dimensions of occupational risk have null effects and others register negative signs, suggesting that workers in occupations with high levels of physical strain and radiation/disease are paid less than workers in other jobs.

Conclusion

Although the Great Recession of 2008 has slowed the steady arrival of unauthorized immigrants to the United States, their overall population and share of the low-skill labor force remains substantial (Passel et al. 2012; Warren and Warren 2013). Moreover, their presence in American workplaces and labor markets remains a source of volatile political and cultural debate, with questions concerning the extent to which they compete with native workers over a limited set of jobs gaining increased salience during tough economic times. Central to these arguments is the question of whether the jobs that immigrants and natives hold are equivalent or if the two groups are concentrated in different sectors of the economy. Potential labor segmentation is especially relevant for unauthorized migrants whose vulnerable and precarious situation makes them both more susceptible to employer exploitation and abuse, and more willing to tolerate such occupational settings to avoid being exposed.

The purpose of this paper is to assess this claim by examining the costs of "being illegal" for workers' occupational environments. Although previous work has consistently found that immigrants – particularly Mexicans – have enhanced odds of being employed in dangerous, risky, or hazardous settings, extant research has been unable to assess the role of legal status in generating these differentials and has typically only examined single dimensions of job hazard. We overcome the inability to identify unauthorized workers by using a strategy to impute the documentation status of Mexican and Central American immigrants in the Survey of Income and Program Participation. These data are then linked to occupation-specific information on fatalities and various risk factors from the Bureau of Labor Statistics and Department of Labor.

Overall, we find mixed evidence for the role of legal status on occupational danger. In particular, the results show that in comparison to native workers and legal Mexican immigrants, low-skill undocumented Mexicans – particularly men – have the highest level of occupational hazard on three of the seven dimensions of risk that we assess, including work

shiners, refuse collectors, and construction equipment operators. Jobs with enhanced exposure to disease and radiation include dental hygienists, radiology technicians, and nurses, but also maids, home health aides, and dry-cleaning attendants.

²³As shown in Appendix Table A2, wages for undocumented workers are about 10% lower than documented workers' wages ($p < .000$), but they also have significantly less variability ($p < .000$). The same pattern holds among male and female workers.

characterized by physical strain, exposure to heights, and repetitive motion. On another two dimensions – occupational fatality and environmental exposure – undocumented immigrants have very high levels of job risk but do not differ from documented immigrants. However, with respect to two of the potentially most dangerous forms of work-related risk – exposure to toxic materials and exposure to radiation/disease – the jobs in which undocumented immigrants are concentrated have among the lowest levels of risk.

Our analysis of Mexican and Central American immigrant men reveals that disparities between undocumented and documented workers on several dimensions of occupational hazard are not explained by differences between the two groups in human capital characteristics or markers of acculturation. Results do indicate, however, that the ability to speak English proficiently tends not only to reduce immigrants' exposure to risky work environments, but to partially attenuate differences between documented and undocumented workers. The importance of language skills in mitigating inequalities between workers with and without legal authorization highlights the many ways that English proficiency promotes improved work outcomes for immigrants (e.g., in increasing job opportunities, bargaining for positions, understanding safety and worker training, or following rules and regulations) (also see Hersch and Viscusi 2010). But even with language ability held at its mean, the occupations of undocumented men had heightened levels of physical strenuousness, exposure to heights, and works routines characterized by repetitive motions.

Despite the impact that being undocumented has on these dimensions of occupational risk, on several other factors undocumented workers fare no worse than documented workers, and in some cases, no worse than native workers. The jobs held by MCA immigrants – among both men and women – have substantially higher fatality rates and exposure to environmental conditions than native-born whites, blacks, and Latinos, but differences by legal status are, on some measures, minimal. By contrast, MCA immigrants have the lowest levels of exposure to toxic materials and to radiation/disease. Thus, the general implication is that Mexican and Central American immigrant workers are not universally relegated to the riskiest and most dangerous jobs, but to jobs that are harmful on some measurable dimensions and safer on others. These findings are partially consistent with Kandel and Donato (2009), who found that among agricultural workers, legal immigrants were more likely to handle pesticides. They suggest that this difference stems from documentation status serving as a marker not only of legal authorization to work, but also of other desirable attributes, such as U.S. labor experience and English language ability, that are valued by employers. Employers thus channel documented workers into more responsible and sensitive positions requiring higher levels of skill and training – that is, primary-sector jobs. The findings presented here are consistent with this explanation. It may be that labor market processes in certain industries, such as in natural resource extraction, restrict access to certain hazardous, but afford better-rewarded occupations to documented workers. Undocumented workers, by contrast, remain segregated in secondary sector jobs that, while not involving the same degree of exposure to hazards, also involve less responsibility, skill, and compensation.

Results for female workers in some ways parallel their male counterparts, with undocumented migrants being especially prone to be employed in occupations featuring

high levels of physical strain; however, the overall impact of legal status on occupational hazard for women tends to be weaker than for men. Part of the explanation here is a mechanical one; the jobs held by women have, on average, substantially lower levels of occupational risk (with the exception of exposure to radiation/disease) and are less variable in their levels of hazard than are those held by men. Yet, this finding is also consistent with prior work suggesting that legal status is more consequential for male than for female migrants (Hall et al. 2011), potentially due to the narrow range of jobs available to Latina migrants (Myers and Cranford 1998), regardless of legal status. Furthermore, the fact that women tend to migrate later than men and are more likely to join a spouse or other relatives upon entering the United States (Donato et al. 2008) may give them greater flexibility to turn down or leave jobs with dangerous employment conditions. Ultimately, it is plausible that once gender has been combined with race and immigration status, there is little room for legal status to operate.

Our wage analysis provides potentially even stronger evidence of the role of legal status in structuring labor market opportunities. Low-skill men are compensated for employment in jobs with high fatality and exposure to toxic materials, heights, and poor environmental conditions. Undocumented MCA workers are, however, the exception. Their wage returns to occupational hazards are substantially smaller or nonexistent when compared to either documented MCA or native-born workers. Corresponding results for female workers are similar, although somewhat weaker. The consequence is that not only do undocumented workers concentrate in some jobs with heightened levels of occupational hazard – at least on some dimensions – but that they receive smaller wage premiums (if at all) for laboring in such risky positions.

There are several limitations of this analysis that are important to note. An important limitation rests with the aggregation of data on occupational fatalities and hazard for all workers – regardless of race, nativity, or legal status – employed in specific jobs. It is possible that within detailed occupations, undocumented immigrants are sorted into different job tasks, arrangements, or environments in ways that make them more or less prone to risk or exposure to dangerous settings. Indeed, there is some evidence that this occurs for immigrants, more generally (see Dong and Platner 2004; Loh and Richardson 2004; Simon and Deley 1984), and it is conceivable that undocumented immigrants suffer most from this sorting process because of their vulnerable status. Thus, any bias in our estimates of legal status should be toward zero, and our results likely represent conservative estimates of the impact of lacking authorization status on occupational hazard. A second limitation of the SIPP data for purposes of our analysis is that there may exist non-random bias in the coverage of undocumented respondents in large surveys. Although our sample of undocumented immigrants shares similar characteristics to smaller, place-based surveys (e.g., Flippen 2012), it is somewhat likely that those participating in surveys such as SIPP are more shrewd or at least less threatened by involvement and may, thus, represent a slightly more advantaged pool of undocumented workers than exists in the broader labor force. However, a recent evaluation of the SIPP-based legal status imputation method employed here suggests that the demographic profile of undocumented persons in SIPP compares similarly to samples of undocumented populations derived from administrative and non-self-reported data (Bachmeier, Van Hook, and Bean 2012). Nevertheless, if undocumented

persons in SIPP are positively selected, our models will underestimate the true impact of legal status and we may be finding null effects where true detrimental effects exist.

Overall, this study provides somewhat mixed support for arguments that undocumented workers are isolated in the riskiest or most hazardous jobs within the U.S. labor market. Unauthorized immigrants have among the highest levels of occupational fatality and hazard on several important features of work, but not significantly higher than legal immigrants on a number of dimensions. Furthermore, undocumented immigrants appear to be somewhat sheltered from work involving especially harmful materials or environments. Unauthorized status is also associated with smaller compensating differentials for employment in hazardous positions. Future research would profit from investigating how undocumented and documented migrants sort differentially into tasks within occupations as well as evaluating labor policies that may give rise to inequalities in occupational risk. An additional dynamic that deserves attention is whether documented and undocumented workers are equally selective in entering the labor market. If documented workers have access to additional formal or informal safety nets, they may be better able to withhold their labor in order to avoid working in excessively risky occupations.²⁴ Researchers should explore how the impact of legal status varies across labor markets or has changed over time, particularly in response to the Great Recession starting in 2008.

Our research also has potential implications for the broader nature of low-wage work in the U.S. if the substantial concentration of undocumented migrants in particular labor sectors has negative spillovers for other workers who are employed alongside them. Thus, researchers should consider how the density of unauthorized migrants in workplaces, industries, and labor markets may indirectly undermine work conditions for other laborers. Lastly, immigration scholarship would benefit from a greater understanding of how the consequences of unauthorized migration vary cross-nationally, and how its broader impacts may be conditioned on specific characteristics of migrants, economic and social conditions in origin and destination countries, and regulatory environments controlling the employment of unauthorized migrants.

Acknowledgments

We are grateful to the Editor and three anonymous reviewers for their useful comments; and to Stephanie Howe for outstanding assistance with data compilation. This research was supported by infrastructure grants to Cornell University's Cornell Population Center (R24 HD058488) and to Penn State's Population Research Institute (R24 HD041025) by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

References

- Bean, Frank D; Brown, Susan K; Bachmeier, James D; Gubernskaya, Zoya; Smith, Christopher D. Luxury, Necessity, and Anachronistic Workers: Does the United States Need Unskilled Immigrant Labor? *American Behavioral Scientist*. 2012; 56:1008–1028.
- Bean, Frank D, Brown, Susan K, Leach, Mark A, Bachmeier, James D, Hook, Jennifer Van. Unauthorized Mexican Migration and the Socioeconomic Integration of Mexican Americans. In: Logan, John, editor. *Changing Times: American in a New Century*. New York: Russell Sage; 2013.

²⁴Supplemental models employing a Heckman correction for selection into work provide tentative evidence that differential selection into employment by legal status does not threaten the validity of the results presented here.

- Berger, Mark C; Gabriel, Paul E. Risk Aversion and the Earnings of U.S. Immigrants and Natives. *Applied Economics*. 1991; 23:311–318.
- Boden, Leslie I; Ozonoff, Al. Capture-Recapture Estimates of Nonfatal Workplace Injuries and Illnesses. *Annals of Epidemiology*. 2008; 18:500–506. [PubMed: 18083542]
- Bureau of Labor Statistics. Employment status of the civilian noninstitutional population 25 years and over by educational attainment, sex, race, and Hispanic or Latino ethnicity. 2011a. Retrieved September 21, 2012 [<http://www.bls.gov/cps/cpsaat07.htm>]
- Bureau of Labor Statistics. Women at Work. BLS Spotlight on Statistics. 2011b. [www.bls.gov/spotlight/2011/women/pdf/women_bls_spotlight.pdf]
- Bureau of Labor Statistics. Fatality Rates Technical Notes. Census of Fatal Occupational Injuries. 2006. [http://www.bls.gov/iif/oshwc/foi/rate_exp.pdf]
- Brown, Marianne P, Domenzain, Alejandra; Villoria-Siegert, Nelliana. Voices from the Margins: Immigrants Workers' Perceptions of Health and Safety in the Workplace. UCLA Labor Occupational Safety and Health Program; 2002. [<http://www.losh.ucla.edu/losh/resources-publications/pdf/voicesreport.pdf>]
- Bryman, Alan; Cramer, Duncan. Constructing Variables. In: Hardy, Melissa; Bryman, Alan, editors. *Handbook of Data Analysis*. Thousand Oaks: Sage; 2004. 17–34.
- Catanzarite, Lisa. Brown Collar Jobs: Occupational Segregation and Earnings of Recent-Immigrant Latinos. *Sociological Perspectives*. 2000; 43:45–75.
- Cohen, Philip N; Huffman, Matt L. Individuals, Jobs, and Labor Markets: The Devaluation of Women's Work. *American Sociological Review*. 2003; 62:714–734.
- Cousineau, Jean-Michel; Lacroix, Robert; Girard, Anne-Marie. Occupational Hazard and Wage Compensating Differentials. *The Review of Economics and Statistics*. 1992; 74:166–169.
- Doeringer, Peter B, Piore, Michael. *Internal Labor Markets and Manpower Analysis*. Lexington, MA: D.C. Heath; 1971.
- Donato, Katharine M; Massey, Douglas S. Effect of the Immigration Reform and Control Act on the Wages of Mexican Migrants. *Social Science Quarterly*. 1993; 74:523–541.
- Donato, Katherine M; Wagner, Brandon; Patterson, Evelyn. The Cat and Mouse Game at the Mexico-U.S. Border: Gendered Patterns and Recent Shifts. *International Migration Review*. 2008; 42:330–359.
- Dong, Xiuwen; Platner, James W. Occupational Fatalities of Hispanic Construction Workers From 1992 to 2000. *American Journal of Industrial Medicine*. 2004; 45:45–54. [PubMed: 14691968]
- Enchautegui, María E. The Job Quality of U.S. Immigrants. *Industrial Relations*. 2008; 47:108–113.
- England, Paula; Allison, Paul; Wu, Yuxiao. Does Bad Pay Cause Occupations to Feminize, Does Feminization Reduce Pay, and How Can We Tell With Longitudinal Data? *Social Science Research*. 2007; 36:1237–1256.
- Flippen, Chenoa. Laboring Underground: The Employment Patterns of Hispanic Immigrant Men in Durham, NC. *Social Problems*. 2012; 59:21–42. [PubMed: 22844159]
- Gentsch, Kerstin; Massey, Douglas S. Labor Market Outcomes for Legal Mexican Immigrant Under the New Regime of Immigration Enforcement. *Social Science Quarterly*. 2011; 92:875–893. [PubMed: 21857750]
- Gleeson, Shannon; Gonzales, Roberto G. When Do Papers Matter? An Institutional Analysis of Undocumented Life in the United States. *International Migration*. 2012; 50:1–19. [PubMed: 24899733]
- Griffith, Kati L. Discovering 'Immployment' Law: The Constitutionality of Subfederal Immigration Regulation at Work. *Yale Law and Policy Review*. 2011; 29:389–451.
- Griffith, Kati L. Undocumented Workers: Crossing the Borders of Immigration and Workplace Law. *Cornell Journal of Law and Public Policy*. 2012; 21:611–697.
- Hall, Matthew; Greenman, Emily; Farkas, George. Legal Status and Wage Disparities for Mexican Immigrants. *Social Forces*. 2010; 89:491–514.
- Huan, Susan M; Landale, Nancy S; Leicht, Kevin T. Poverty and Work Effort Among Urban Latino Men. *Work and Occupations*. 2000; 27:188–222.

- Hersch, Joni. Compensating Differentials for Gender-Specific Job Injury Rates. *American Economic Review*. 1998; 88:598–607.
- Hersch, Joni; Viscusi, Wkip. Immigrant Status and the Value of Statistical Life. *Journal of Human Resources*. 2010; 45:749–771.
- Hoefer, Michael; Rytina, Nancy; Baker, Bryan. Population Estimates, Office of Immigration Statistics, Department of Homeland Security. 2012. Estimates of the Unauthorized Immigrant Population Residing in the United States: January 2011.
- Hudson, Kenneth. The New Labor Market Segmentation: Labor Market Dualism in the New Economy. *Social Science Research*. 2007; 36:286–312.
- Kalleberg, Arne L. Good Jobs, Bad Jobs: The Rise of Polarized and Precarious Employment Systems in the United States, 1970s–2000s. New York: Russell Sage Foundation; 2011.
- Kalleberg, Arne L; Reskin, Barbara F; Hudson, Ken. Bad Jobs in America: Standard and Nonstandard Employment Relations and Job Quality in the United States. *American Sociological Review*. 2000; 65:256–278.
- Kandel, William A; Donato, Katharine M. Does Unauthorized Status Reduce Exposure to Pesticides? Evidence from the National Agricultural Workers Survey. *Work and Occupations*. 2009; 36:367–399.
- Kaushal, Neeraj. Amnesty Programs and the Labor Market Outcomes of Undocumented Workers. *Journal of Human Resources*. 2006; 41:631–647.
- Kica, Jonna; Rosenman, Kenneth D. Multisource Surveillance System for Work-Related Burns. *Journal of Occupational and Environmental Medicine*. 2012; 54:642–647. [PubMed: 22513658]
- Kossoudji, Sherrie A; Cobb-Clark, Deborah A. Coming out of the Shadows: Learning about Legal Status and Wages from the Legalized Population. *Journal of Labor Economics*. 2002; 20:598–628.
- Kniesner, Thomas J; Leeth, John D. Compensating Wage Differentials for Fatal Injury Risk in Australia, Japan, and the United States. *Journal of Risk and Uncertainty*. 1991; 4:75–90.
- Lang, Kevin; Dickens, William T. Neoclassical and Sociological Perspectives on Segmented Labor Markets. In: Farkas, George; England, Paula, editors. *Industries, Firms, and Jobs: Sociological and Economic Approaches*. New York: Plenum; 1988. 65–92.
- Lee, Stephen. Private Immigration Screening in the Workplace. *Stanford Law Review*. 2009; 61:1103–1146.
- Lee, Stephen. Monitoring Immigration Enforcement. *Arizona Law Review*. 2011; 53:1089–1036.
- Leeth, John D; Ruser, John. Compensating Wage Differentials for Fatal and Nonfatal Injury Risk by Gender and Race. *Journal of Risk and Uncertainty*. 2003; 27:257–277.
- Levanon, Asaf; England, Paula; Allison, Paul. Occupational Feminization and Pay: Assessing Causal Dynamics Using 1950–2000 U.S. Census Data. *Social Forces*. 2009; 88:865–892.
- Loh, Katherine; Richardson, Scot. Foreign-born workers: trends in fatal occupational injuries, 1996–2001. *Monthly Labor Review*. 2004; 127:42–53.
- Massey, Douglas. Do Undocumented Migrants Earn Lower Wages than Legal Immigrants? *International Migration Review*. 1987; 21:236–274. [PubMed: 12268790]
- Massey, Douglas; Durand, Jorge; Malone, Nolan J. *Beyond Smoke and Mirrors: Mexican Immigration in an Era of Economic Integration*. New York: Russell Sage; 2002.
- Menjívar, Cecilia. Liminal Legality: Salvadoran and Guatemalan Immigrants' Lives in the United States. *American Journal of Sociology*. 2006; 111:999–1037.
- Myers, Dowell; Cranford, Cynthia J. Temporal Differentiation in the Occupation Mobility of Immigrant and Native-Born Latina Workers. *American Sociological Review*. 1998; 63:68–93.
- Northwood, Joyce M; Sygnatur, Eric F; Windau, Janice A. Updated BLS Occupational Injury and Illness Classification System. *Monthly Labor Review*. 2012; 135:19–27.
- Occupational Safety and Health Act. 1970:651–678.
- Olson, Craig A. An Analysis of Wage Differentials Received by Workers on Dangerous Jobs. *Journal of Human Resources*. 1981; 16:167–185.
- Orrenius, Pia M; Zavodny, Madeline. Do Immigrants Work in Riskier Jobs? *Demography*. 2009a; 46:535–551. [PubMed: 19771943]

- Orrenius, Pia M; Zavodny, Madeline. The Effects of Tougher Enforcement on the Job Prospects of Recent Latin American Immigrants. *Journal of Policy Analysis and Management*. 2009b; 28:239–257.
- Passel, Jeffrey; Cohn, D’Vera; Gonzalez-Barrera, Ana. Pew Hispanic Center, Pew Research Center. 2012. Net Migration from Mexico Falls to Zero – and Perhaps Less.
- Passel, Jeffrey; Clark, Rebecca; Fix, Michael. Naturalization and Other Current Issues in U.S. Immigration: Intersections of Data and Policy; Proceedings of the Social Statistics Section of the American Statistical Association; 1997.
- Portes, Alejandro; Rumbaut, Rubén G. *Immigrant America: A Portrait*. Berkeley, CA: University of California Press; 2006.
- Powers, Mary G; Seltzer, William. Occupational Status and Mobility Among Undocumented Immigrants by Gender. *International Migration Review*. 1998; 32:21–55. [PubMed: 12321470]
- Powers, Mary G; Seltzer, William; Shi, Jing. Gender Differences in the Occupational Status of Undocumented Immigrants in the United States: Experience before and after Legalization. *International Migration Review*. 1998; 32:1015–1046.
- Quandt, Sara A; Grzywacz, Josepha G; Marin, Antonio; Carrillo, Lourdes; Coates, Michael L; Burke, Bless; Arcury, Thomas A. Occupational Illnesses and Injuries Among Latino Poultry Workers in Western North Carolina. *American Journal of Industrial Medicine*. 2006; 49:343–351. [PubMed: 16570254]
- Richardson, Scott; Ruser, John; Suarez, Peggy. Safety is Seguridad: A Workshop Summary. Washington, DC: National Academies Press; 2003. Hispanic Workers in the United States: An analysis of Employment Distributions, Fatal Occupational Injuries, and Non-fatal Occupational Injuries and illnesses; 48–82. National Research Council (ed.)
- Rivera-Batiz, Francisco L. Undocumented Workers in the Labor Market: An Analysis of the Earnings of Legal and Illegal Mexican Immigrants in the United States. *Journal of Population Economics*. 1999; 12:91–116. [PubMed: 12295042]
- Rosenman, Kenneth D; Kalush, Alice; Reilly, Mary Jo; Gardiner, Joseph C; Reeves, Mathew; Luo, Zhewui. How Much Work-Related Injury and Illness is Missed by the Current National Surveillance System? *Journal of Occupational and Environmental Medicine*. 2006; 48:357–365. [PubMed: 16607189]
- Ruser, John W. BLS Office of Survey Methods Research. 2010 Oct. Allegations of Undercounting in the BLS Survey of Occupational Injuries and Illnesses.
- Simon, Rita J; DeLey, Margo. The Work Experiences of Undocumented Mexican Women Migrants in Los Angeles. *International Migration Review*. 1984; 18:1212–1229. [PubMed: 12340235]
- Smith, Robert. Compensating Wage Differentials and Public Policy: A Review. *Industrial and Labor Relations Review*. 1979; 32:339–352.
- U.S. Census Bureau. Annual Social and Economic Supplement. 2004. Available at: <http://www.census.gov/population/www/socdemo/foreign/ppl-176.html#1a> (earnings) and <http://www.census.gov/population/socdemo/foreign/p20-534/tab0111.pdf> (poverty)
- U.S. Department of Homeland Security. 2011 Yearbook of Immigration Statistics. Washington, D.C.: U.S. Department of Homeland Security, Office of Immigration Statistics; 2012.
- U.S. Department of Labor, Employment & Training Administration. O*NET Data Collection Program: Office of Management and Budget Clearance Package, Supporting Statement, and Data Collection Instruments. Washington, DC: Department of Labor; 2012. [<http://www.onetcenter.org/ombclearance.html>]
- Valenzuela, Abel. Day-Labor Work. *Annual Review of Sociology*. 2003; 29:307–333.
- Viscusi, WKip. The Value of Life: Estimates with Risk by Occupation and Industry. *Economic Inquiry*. 2004; 42:29–48.
- Waldinger, Roger; Lichter, Michael I. *How the Other Half Works: Immigration and the Social Organization of Labor*. Los Angeles: University of California Press; 2003.
- Walter, Nicholas; Bourgois, Philippe; Loinaz, Margarita; Schillinger, Dean. Social Context of Work Injury Among Undocumented Day Laborers in San Francisco. *Journal of General Internal Medicine*. 2002; 17:221–229. [PubMed: 11929509]

- Warren, Robert; Warren, John Robert. Unauthorized Immigration to the United States: Annual Estimates and Components of Change, by State, 1990 to 2010. *International Migration Review*. 2013; 47:296–329. [PubMed: 23956482]
- Yoshikawa, Hirokazu. *Immigrants Raising Citizens: Undocumented Parents and Their Young Children*. New York: Russell Sage; 2011.

Table 1

Representation in Five Most-Common Occupations for Less-Skilled Workers, by Legal/Racial Group and Gender

Men									
Undocumented MCA Immigrants		Documented MCA Immigrants		U.S.-born Latinos		U.S.-born non-Latino whites		U.S.-born non-Latino blacks	
Construction Laborers	10.41%	Construction Laborers	9.75%	Light Truck Drivers	6.17%	Light Truck Drivers	7.52%	Janitors and Cleaners	8.10%
Pesticide Handlers	8.65%	Pesticide Handlers	6.60%	Freight/Stock Laborers	5.23%	Freight/Stock Laborers	3.95%	Light Truck Drivers	7.65%
Construction Carpenter	6.83%	Farmworkers	5.74%	Janitors and Cleaners	4.55%	Construction Carpenter	3.11%	Freight/Stock Laborers	6.92%
Short-Order Cooks	6.44%	Short-Order Cooks	5.73%	Construction Carpenter	3.64%	Janitors and Cleaners	3.10%	Short-Order Cooks	4.79%
Farmworkers	6.15%	Construction Carpenter	4.80%	Construction Laborers	3.00%	Construction Laborers	2.69%	Transportation Screener	3.45%
Sum of top-5 jobs		38.48%	32.62%	22.59%		20.37%		30.91%	
Women									
Undocumented MCA Immigrants		Documented MCA Immigrants		U.S.-born Latinos		U.S.-born non-Latino whites		U.S.-born non-Latino blacks	
Maids & Housecleaners	12.66%	Maids & Housecleaners	13.91%	Booth Cashiers	8.83%	Executive Secretaries	7.09%	Booth Cashiers	7.49%
Janitors and Cleaners	9.48%	Janitors and Cleaners	6.62%	Receptionists	5.08%	Booth Cashiers	6.07%	Home Health Aides	6.46%
Food Prep Workers	7.99%	Short-Order Cooks	5.55%	Retail Salespersons	4.59%	Bookkeeping Clerks	3.63%	Maids & Housecleaners	5.61%
Waiters and Waitresses	6.45%	Booth Cashiers	5.23%	Maids & Housecleaners	4.31%	Waiters and Waitresses	3.50%	Short-Order Cooks	4.39%
Short-Order Cooks	5.78%	Farmworkers	4.83%	Executive Secretaries	3.99%	Retail Supervisors	3.26%	Janitors and Cleaners	4.06%
Sum of top-5 jobs		42.36%	36.14%	26.80%		23.55%		28.01%	

Notes: weighted by Wave-2 person weights

Occupational Fatality and Hazard among Less-Skilled Workers by Legal/Racial Group, Men

Table 2

	Undocumented MCA Immigrants	Documented MCA Immigrants	U.S.-born Latinos	U.S.-born non-Latino whites	U.S.-born non-Latino blacks
Fatality rate	10.679	<i>l, w, b</i>	8.271	9.023	8.049
Fatality rate (sqrt)	2.908	<i>l, w, b</i>	2.454	2.568	2.399
Physical strain	.881	<i>d, l, w, b</i>	.480	.350	.516
Exposure to toxic materials	-.142	<i>d, w</i>	-.120	.041	-.152
Environmental exposure	.584	<i>l, w, b</i>	.421	.454	.389
Exposure to heights	.346	<i>d, l, w, b</i>	.086	.034	-.164
Repetitive Motions	.484	<i>d, l, w, b</i>	.256	.199	.374
Exposure to radiation/diseases	-.305	<i>d, l, w, b</i>	-.093	-.143	.041
N of persons (unweighted)	616		1,458	8,689	1,537

Notes: *d*, *l*, *w*, and *b* indicate that means for undocumented MCA immigrants differ from documented MCA immigrants, native Latinos, native whites, and native blacks significantly at $p < .05$ (two-tailed *t*); weighted by Wave-2 person weights

Occupational Fatality and Hazard among Less-Skilled Workers by Legal/Racial Group, Women

Table 3

	Undocumented MCA Immigrants	Documented MCA Immigrants	U.S.-born Latinos	U.S.-born nonLatino whites	-U.S.-born non-Latino blacks
Fatality rate	4.071 <i>l, w, b</i>	4.242	2.467	2.201	2.492
Fatality rate (sqrt)	1.706 <i>l, w, b</i>	1.717	1.277	1.192	1.286
Physical strain	1.244 <i>d, l, w, b</i>	1.018	.361	.219	.575
Exposure to toxic materials	-.824 <i>w</i>	-.744	-.809	-.705	-.717
Environmental exposure	-.222 <i>l, w, b</i>	-.243	-.362	-.379	-.359
Exposure to heights	-.299 <i>l, w</i>	-.262	-.173	-.181	-.236
Repetitive Motions	.371 <i>l, w, b</i>	.390	.153	.070	.169
Exposure to radiation/diseas	.238 <i>w</i>	.290	.186	.073	.326
N of persons (unweighted)	185	844	860	7,431	1,603

Notes: *d*, *l*, *w*, and *b* indicate that means for undocumented MCA immigrants differ from documented MCA immigrants, native Latinos, native whites, and native blacks significantly at $p < .05$ (two-tailed *t*); weighted by Wave-2 person weights

Table 4
Multivariate Models of Occupational Hazard for MCA Less-Skilled Immigrant Workers, Men

	Fatality Rate (sqr)	Physical Strain	Toxic Materials	Environmental Exposure	Exposure to Heights	Repetitive Motions	Exposure to Radiation/Disease
Documented immigrant	.011 (.081)	-.074 + (.042)	.070 + (.041)	.022 (.052)	-.212 ** (.073)	-.102 ** (.038)	.062 + (.033)
Experience (in years)	.035 * (.021)	-.027 * (.011)	.027 * (.011)	.026 + (.014)	.055 ** (.019)	.003 (.010)	-.015 + (.009)
Experience-squared	-.000 * (.000)	.000 + (.000)	-.000 * (.000)	-.000 * (.000)	-.001 ** (.000)	-.000 (.000)	.000 * (.000)
Education (in years)	-.017 * (.011)	-.007 (.006)	-.010 + (.005)	-.024 *** (.007)	.013 (.010)	-.009 + (.005)	.003 (.004)
Union worker	-.060 (.140)	.075 (.074)	-.092 (.072)	-.047 (.091)	.140 (.128)	.051 (.067)	.037 (.058)
Arrived in last 5 years	.178 ** (.081)	-.030 (.043)	.030 (.041)	.028 (.052)	.029 (.074)	.010 (.038)	.021 (.033)
Speaks English	-.153 (.084)	-.159 *** (.044)	.051 (.043)	-.016 (.054)	-.045 (.076)	-.174 *** (.040)	-.009 (.034)
Region (West=ref)							
Northeast	-.511 *** (.149)	.232 ** (.078)	-.161 * (.075)	-.312 ** (.096)	-.117 (.135)	.070 (.070)	.030 (.061)
Midwest	-.112 (.104)	.114 * (.055)	.071 (.053)	-.153 * (.067)	-.009 (.095)	.073 (.049)	-.103 * (.043)
South	.137 * (.079)	.115 ** (.042)	-.000 (.040)	.011 (.051)	.501 *** (.072)	.019 (.037)	-.130 *** (.032)
2008 SIPP	.086 + (.071)	-.005 (.038)	.008 (.036)	.112 * (.046)	.031 (.065)	-.016 (.034)	.002 (.029)
Constant	2.295 *** (.414)	1.426 *** (.217)	-.604 ** (.208)	.293 (.264)	-.996 ** (.373)	.576 ** (.194)	-.051 (.168)
R-squared	.020	.030	.016	.026	.048	.025	.022

Notes:

 $p < .001$,**
 $p < .01$,*
 $p < .05$,

N=2,074; standard errors (clustered on occupation) in parentheses

$p < .10$;

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 5
Multivariate Models of Occupational Hazard for MCA Less-Skilled Immigrant Workers, Women

	Fatality Rate (sqr)	Physical Strain	Toxic Materials	Environmental Exposure	Exposure to Heights	Repetitive Motions	Exposure to Radiation/Disease
Documented immigrant	-.007 (.096)	-.148 + (.084)	.053 (.070)	.005 (.064)	.069 (.058)	-.001 (.067)	.075 (.095)
Experience (in years)	-.013 (.024)	.036 + (.021)	.005 (.017)	-.003 (.016)	-.010 (.014)	.030 + (.016)	.037 + (.021)
Experience-squared	.000 (.000)	-.001 (.000)	.000 (.000)	.000 (.000)	.000 (.000)	.000 + (.000)	.000 (.000)
Education (in years)	-.036 ** (.011)	-.011 (.010)	-.009 + (.008)	-.018 * (.007)	.007 (.007)	-.018 * (.008)	-.002 (.011)
Union worker	-.061 (.132)	-.072 (.115)	.145 (.096)	-.027 (.088)	.105 (.080)	.062 (.091)	.064 (.129)
Arrived in last 5 years	.116 (.094)	.113 + (.082)	-.009 (.068)	.065 (.062)	.053 (.057)	.113 + (.064)	.192 * (.092)
Speaks English	-.210 * (.090)	-.316 *** (.078)	-.118 + (.065)	-.029 (.060)	.121 (.074)	.016 (.062)	.183 * (.088)
Region (West=ref)							
Northeast	.054 (.149)	-.271 * (.130)	.316 ** (.108)	.205 * (.099)	.003 (.091)	.041 (.103)	-.120 (.146)
Midwest	.092 (.107)	.138 (.097)	.313 *** (.081)	-.066 (.074)	-.031 (.068)	-.002 (.077)	-.267 * (.110)
South	-.163 * (.082)	.092 (.071)	-.037 (.059)	-.136 ** (.055)	.016 (.050)	.083 (.057)	.058 (.080)
2008 SIPP	-.131 + (.073)	.145 * (.064)	-.068 (.053)	-.080 (.049)	.006 (.045)	-.035 (.051)	-.029 (.072)
Constant	2.453 *** (.480)	.535 (.418)	-.747 * (.348)	.080 (.320)	-.326 (.291)	-.105 (.332)	-.751 (.471)
R-squared	.041	.055	.045	.030	.017	.018	.036

Notes:

 $p < .001$,**
 $p < .01$,*
 $p < .05$,

N=1,029; standard errors (clustered on occupation)

$p < .10$;

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 6

Group Specific Models of Log Wages for Less-Skilled Workers, Men

	Undocumented MCAs	Documented MCAs	Native Latinos	Native Whites	Native Blacks
Experience (in years)	.020 + (.012)	.040 *** (.007)	.062 *** (.009)	.062 *** (.003)	.049 *** (.007)
Experience-squared	-.000 (.000)	-.000 *** (.000)	-.001 *** (.000)	-.001 *** (.000)	-.000 *** (.000)
Education (in years)	.006 (.005)	.010 ** (.003)	.029 *** (.008)	.043 *** (.005)	.026 ** (.011)
Union worker	.162 + (.090)	.340 *** (.040)	.343 *** (.048)	.256 *** (.015)	.305 *** (.034)
Arrived in last 5 years	-.083 * (.034)	-.046 + (.027)	--	--	--
Speaks English	.089 + (.048)	.107 *** (.025)	--	--	--
Fatality Rate (sqrt)	.003 (.011)	.026 *** (.007)	.024 * (.011)	.030 *** (.004)	.024 ** (.008)
Physical Strain	-.034 (.022)	-.060 *** (.014)	-.107 *** (.019)	-.111 *** (.006)	-.093 *** (.013)
Exposure to Toxic	.020 (.023)	.049 *** (.014)	.064 ** (.021)	.059 *** (.007)	.049 ** (.015)
Environmental	.028 (.019)	.033 ** (.011)	.023 (.018)	.006 (.006)	.033 * (.013)
Exposure to Heights	.011 (.011)	.033 *** (.009)	.026 + (.015)	.049 *** (.005)	.029 * (.013)
Repetitive Motions	-.025 (.025)	-.080 *** (.015)	-.107 *** (.022)	-.101 *** (.006)	-.032 * (.016)
Radiation/Disease	-.037 (.030)	-.102 *** (.017)	-.047 + (.025)	-.083 *** (.009)	-.048 ** (.017)
N of persons	616	1,458	1,079	8,689	1,537

controls included for region and SIPP panel; occupational hazard variables entered singularly into model with human capital variables

$p < .10$;

$p < .05$,

$p < .01$,

$p < .001$,

Notes:

Table 7

Group Specific Models of Log Wages for Less-Skilled Workers, Women

	Undocumented MCAs	Documented MCAs	Native Latinos	Native Whites	Native Blacks
Experience (in years)	.009 (.014)	.029 ** (.009)	.053 *** (.008)	.042 *** (.003)	.025 *** (.006)
Experience-squared	-.000 (.000)	-.000 ** (.000)	-.001 *** (.000)	-.000 *** (.000)	-.000 *** (.000)
Education (in years)	.018 ** (.005)	.014 ** (.005)	.059 *** (.009)	.089 *** (.007)	.057 *** (.010)
Union worker	.289 ** (.094)	.176 *** (.047)	.319 *** (.052)	.168 *** (.020)	.207 *** (.032)
Arrived in last 5 years	-.047 (.045)	-.014 (.038)	--	--	--
Speaks English	.085 (.064)	.159 *** (.033)	--	--	--
Fatality Rate (sqrt)	-.005 (.019)	-.016 (.013)	-.014 (.017)	-.008 (.007)	-.012 (.012)
Physical Strain	.013 (.024)	-.065 *** (.015)	-.131 *** (.013)	-.173 *** (.005)	-.129 *** (.010)
Exposure to Toxic	.012 (.027)	.068 *** (.018)	.166 *** (.024)	.199 *** (.009)	.126 *** (.016)
Environmental	-.045 (.030)	-.008 (.020)	-.083 ** (.024)	-.019 + (.010)	-.007 (.017)
Exposure to Heights	.018 (.032)	.031 + (.019)	.072 ** (.027)	.086 *** (.011)	.034 + (.019)
Repetitive Motions	-.028 (.029)	-.022 (.019)	.024 (.023)	.000 (.008)	.001 (.015)
Radiation/Disease	.001 (.021)	.044 *** (.013)	-.064 *** (.017)	-.037 *** (.007)	-.036 ** (.011)
N of persons	185	844	860	7,431	1,603

Notes:

controls included for region and SIPP panel; occupational hazard variables entered singularly into model with human capital variables

$p < .10$;

$p < .05$;

$p < .10$;

$p < .001$;

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Appendix Table A1

Rotated Factor Loading for O*Net Items Used in Analysis

	Physical Strain	Exposure to Toxic Materials	Environmental Exposure	Exposure to Heights	Repetitive Motions	Exposure to Radiation/Disease	Uniqueness
Cramped Work Space, Awkward Positions	.36	.52	.40	.41			.21
Exposed to Contaminants	.47	.70					.14
Exposed to Disease or Infections						.70	.46
Exposed to Hazardous Conditions		.70		.31			.25
Exposed to Hazardous Equipment	.35	.75	.33				.12
Exposed to High places		.39	.48	.67			.12
Exposed to Minor Burns, Cuts, Bites, or Stings	.60	.58					.18
Exposed to Radiation						.58	.63
Exposed to Whole Body Vibration		.45	.52				.37
Extremely Bright or Inadequate Lighting		.55	.58				.19
Outdoors, Exposed to Weather			.90				.12
Outdoors, Under Cover			.78				.24
Sounds, Noise Levels Are Distracting or Uncomfortable	.36	.69					.26
Spend Time Bending or Twisting the Body	.72	.32			.46		.08
Spend Time Climbing Ladders, Scaffolds, or Poles			.43	.72			.15
Spend Time Keeping or Regaining Balance	.53		.44	.40	.31		.23
Spend Time Kneeling, Crouching, Stooping, or Crawling	.62		.31	.44			.21
Spend Time Making Repetitive Motions	.30				.77		.27
Spend Time Sitting	-.94						.04
Spend Time Standing	.94						.05
Spend Time Using Your Hands to Handle, Control, or Feel	.46	.50			.56		.21
Spend Time Walking and Running	.83						.21
Very Hot or Cold Temperatures	.39	.47	.69				.11
Eignevalue	5.34	4.27	3.87	2.06	1.62	1.01	

Notes: factor loadings below [.3] omitted; factor analysis based on occupations of workers in SIPP sample of low-skilled workforce; "uniqueness" refers to the variance not shared with other variables

Appendix Table A2

Summary Statistics for Variables Used in Analysis

	Undoc MCAs		Doc MCAs		Native Latinos		Native whites		Native blacks	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Fatality Rate (sqrt)	2.66	1.50	2.46	1.51	1.97	1.42	1.95	1.47	1.86	1.38
Physical Strain	.96	.80	.83	.86	.43	1.01	.29	1.03	.55	1.02
Exposure to Toxic Materials	-.29	.77	-.30	.83	-.41	.81	-.30	.85	-.43	.80
Environmental Exposure	.42	.92	.31	.97	.10	.93	.08	.94	.04	.90
Exposure to Heights	.21	1.43	-.01	1.12	-.02	.96	-.06	.88	-.20	.78
Repetitive Motions	.47	.68	.40	.73	.22	.74	.15	.80	.28	.75
Exposure to	-.19	.73	-.05	.82	.03	.77	-.04	.70	.18	.85
Wage rate	9.76	4.42	10.88	6.69	12.71	18.14	14.29	12.69	11.82	9.84
Age (in years)	32.55	9.53	37.53	10.68	35.16	12.06	40.27	12.93	38.46	12.41
Education (in years)	8.26	3.52	8.51	3.43	11.16	1.76	11.69	.98	11.64	1.03
Arrived in last 5 years	.41	.49	.22	.41	--	--	--	--	--	--
Speaks English	.13	.34	.25	.43	--	--	--	--	--	--
Northeast	.10	.30	.07	.25	.17	.38	.19	.39	.12	.33
Midwest	.11	.32	.13	.34	.09	.29	.31	.46	.17	.38
South	.42	.49	.32	.46	.35	.48	.35	.48	.65	.48
West	.37	.48	.48	.50	.39	.49	.15	.36	.06	.23
2008 SIPP	.56	.50	.53	.50	.54	.50	.47	.50	.47	.50

Notes: weighted by person-weights